The State of West Virginia

Community Development Block Grant – Mitigation

Draft Proposed Action Plan

Released for Public Comment: August 24, 2020

WEST VIRGINIA
DEVELOPMENT OFFICE

Contents

1. Definitions, Acronyms, and Abbreviations

100-year flood plain—The geographical area defined by FEMA as having a 1% chance of being inundated by a flooding event in any given year

500-year flood plain—The geographical area defined by FEMA as having a .2% chance of being inundated by a flooding event in any given year

AMI—Area Median Income

CDBG—Community Development Block Grant

CDBG-DR—Community Development Block Grant - Disaster Recovery

CDBG-MIT—Community Development Block Grant - Mitigation

DHSEM—Previously the West Virginia Division of Homeland Security and Emergency Management. Currently known as the Division of Emergency Management (EMD)

DOB—Duplication of Benefits. Any assistance provided to subrecipients for the same purpose (i.e., for repair, replacement or reconstruction) as any previous financial or in-kind assistance already provided for the same. This prohibition comes from the Robert T. Stafford Disaster Assistance and Emergency Relief Act (Stafford Act) and therefore, these other sources of funds must be deducted from any potential award

EMD—West Virginia Division of Emergency Management (formerly DHSEM – Division of Homeland Security and Emergency Management)

FEMA—Federal Emergency Management Agency

FRN—Federal Register Notice. The Federal Register Notice for CDBG-MIT funds was published August 30, 2019 (84 FR 45838)

GIP—General Infrastructure Program

HCDA—Housing and Community Development Act of 1974

HMGP—Hazard Mitigation Grant Program

HMP—Hazard Mitigation Plan

HUD—U.S. Department of Housing & Urban Development

HUD MID—Most Impacted and Distressed areas as determined by HUD in the CDBG-MIT Federal Register Notice (84 FR 45838)

LEP—Limited English proficiency. Individuals who do not speak English as their primary language and who have a limited ability to read, speak, write, or understand English

LMA—Low- to Moderate-Income Area Benefit describes activities where the area served includes 51% or more LMI households

LMI—Low- to Moderate-Income. An income of less than 80% of the local area median income (AMI).

LMH—Low- to Moderate-Income Household. A household with an income of less 80% of the local area median income (AMI)

MIDs—Most Impacted and Distressed areas

MNA—Mitigation Needs Assessment (also, Risk-Based Mitigation Needs Assessment)

NFIP—National Flood Insurance Program

RPDC—Regional Planning and Development Council

SHMO—State Hazard Mitigation Officer

SRO—State Resiliency Office

State MID—Most Impacted and Distressed areas as determined by the State of West Virginia, based on the Presidentially Declared counties in FEMA Disaster Declaration DR-4273

Subrecipient—A city or a county or other eligible applicant that has applied for and been awarded a grant by the West Virginia Development Office

WVCAD—West Virginia Office of Community Advancement and Development

WVDO—West Virginia Development Office

UGLG—Units of General Local Government. Cities, counties, towns, villages and other general-purpose political subdivisions of a state

2. Executive Summary

On June 23, 2016, West Virginia was struck with record-breaking rainfall resulting in a "1000-year event" for much of the state, leading to widespread and devastating flash floods. Then-Governor Earl Ray Tomblin declared a state of emergency for 44 of the state's 55 counties. Tragically, 23 people died and 1200 houses were damaged or destroyed by the flood. Impacted communities continue to work to recover and rebuild, and many experts believe this once-in-a-millennia event will not be isolated. West Virginia has a long history of flooding—the National Centers for Environmental Information reported 2,302 flood events in the state between January 1992 and July 2017. West Virginia's unique landscape contributes to its flood risk. As a result of its mountainous topography, rain that falls in the state's mountains eventually runs down into the valleys. The state experiences both riverine flooding (when streams and rivers overflow their banks) and flash flooding. Additionally, because of this topography, the comparatively flat valley land that runs along creeks can be a natural place for development, potentially placing additional structures at risk of flooding.

As a result of the 2016 disaster, the State of West Virginia is the recipient of a $106,494,000 Community Development Block Grant – Mitigation (CDBG-MIT), administered by the U.S. Department of Housing and Urban Development (HUD). These funds, known as CDBG-MIT, represent a unique and significant opportunity for the state of West Virginia, and in particular the counties most impacted by recent disaster events, to carry out strategic, data-driven, transformative activities to minimize or eliminate the risks and reduce losses from future disasters. CDBG-MIT funds will both enable the State to mitigate against these disaster risks, as well as provide the opportunity to improve state and local planning to align with its mitigation goals.

CDBG-MIT funds are distinct and apart from the State's disaster recovery funding. In June 2016, the State of West Virginia experienced catastrophic flooding, landslides, mudslides, and severe storms. On June 25, 2016, a major disaster declaration was declared, encompassing 12 FEMA designated counties: Clay, Fayette, Greenbrier, Jackson, Kanawha, Lincoln, Monroe, Nicholas, Pocahontas, Roane, Summers, and Webster. In response to this disaster, the State of West Virginia received a total of $149,875,000 in Community Development Block Grant – Disaster Recovery (CDBG-DR) funding from the U.S. Department of Housing and Urban Development (HUD) through appropriations made in Public Law 114-223, Public Law 114-254, and Public Law 115-31.

In August 2019, $6.875 billion in CDBG-MIT funds were allocated by HUD to grantees recovering from qualifying 2015, 2016, and 2017 disasters, including the State of West Virginia's $106,494,000 allocation. In the CDBG-MIT Federal Register Notice (84 FR 45838) mitigation activities are defined as:

> *"…those activities that increase resilience to disaster and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future disasters. "*

The West Virginia Development Office (WVDO) has been designated as the lead administrative agency for the CDBG-MIT funds. As such, WVDO has lead the effort to create this Action Plan and provide an in-depth analysis of current and future risks to the state, as well as to propose a high-level strategy for how the funding will be used to address these risks and disaster mitigation needs in eligible communities.

This Action Plan has been developed through collaboration and partnership with appropriate state and federal agencies, including the State Resiliency Office and FEMA. Citizen and stakeholder participation has been key throughout the process; WVDO has engaged with Regional Planning and Development Councils, city and local governments, non-profits and social service providers, the business community, and the general public to create an Action Plan that is reflective of local needs and priorities.

West Virginia is focused on making data-informed investments through high-impact projects that will reduce risks attributable to natural disasters, with particular attention to repetitive loss properties and critical infrastructure. The State also supports the adoption of policies, planning agendas, and flood plain management efforts that reflect local and regional priorities and will have long-lasting effects on community risk reduction. In order to make such investments, the State conducted a thorough Risk-Based Needs Assessment to identify and analyze all significant current and future disaster risks in order to provide a substantive basis for the activities proposed for CDBG-MIT funding. To the meet the requirements of the Federal Register Notice, the Risk-Based Needs Assessment provided in this plan:

- Provides an overview of West Virginia's geographic landscape;
- Summarizes climate trends and projections that may contribute to current and future risks;
- Discusses historic damage patterns that have impacted the State of West Virginia;
- Identifies all considered resources including the FEMA approved State Hazard Mitigation Plan (SHMP) and local Hazard Mitigation Plans (HMP);
- Assesses current and future risk to critical service areas or community lifelines;
- Assesses risk to vulnerable populations and LMI; and
- Addresses unmet mitigation needs in response to identified current and future risks.

The Federal Register Notice (FRN) allocating the $106,494,000 requires that all programs or projects using CDBG-MIT funds meet the definition of mitigation and that at least 50% (or $53,247,000) of funding must be spent in the HUD identified "Most Impact and Distressed (MID)" areas. The remaining 50% of funds may be spent for activities that meet the definition of mitigation in the following eligible State-identified MID counties when supported by determinations based on the Risk-Based Needs Assessment.

- HUD MID Counties: Clay, Greenbrier, Kanawha, and Nicholas
- State MID Counties: Fayette, Jackson, Lincoln, Monroe, Pocahontas, Roane, Summers, and Webster

The State consulted with the West Virginia Division of Emergency Management (EMD), regional planning commissions, the private sector, and other governmental agencies to provide a multi-hazard risk-based mitigation needs assessment for the eligible counties. The data suggests that based on the total number of high-ranking hazards in each of West Virginia's county local hazard mitigation plans, the top risks impacting the state in order are:

1. Flooding
2. Winter Weather
3. Severe Storms

Based on the findings of West Virginia Mitigation Needs Assessment (MNA) there is a high demand and need for the implementation of infrastructure mitigation projects that will improve resiliency to hazard impacts, such as flooding. Considering this data-driven analysis along with stakeholder and community input, WVDO is proposing the following CDBG-MIT programs that will work to achieve the goals of risk reduction and increased resilience:

1. General Infrastructure – This program will provide funding opportunities for local governments and state agencies to develop large-scale mitigation activities that allow communities to better withstand future disasters. Projects may include the rehabilitation of critical infrastructure; rehabilitation or construction of stormwater management systems; improving or installing retention basins; relocating water lines; culvert improvements; and green infrastructure.

2. Public Facility Hardening – This program will assist local governments and state agencies with hardening public facilities. This includes all critical public facilities such as potable water facilities, wastewater treatment facilities, public shelters, fire and police stations, medical centers, etc. CDBG-MIT funds will allow local communities to fund previously identified public facility mitigation needs and/or identify public facility mitigation needs that will harden the facility and reduce or eliminate damages and loss of life and property.

3. Regional and Local Planning – This program will make competition-based allocations to local governments and other eligible applicants to cover a wide variety of planning activities related to local and regional mitigation needs.

4. Hazard Mitigation Plans - West Virginia will use funding to update and develop a Hazard Mitigation Plan (HMP) or enhanced HMP. FEMA approval of the enhanced HMP would make the state eligible for assistance up to 20 percent for estimated aggregate amounts of a disaster. This State plan would serve as the framework for local hazard mitigation plans within the state. CDBG-MIT funds will also be used for these local planning efforts managed by the five Regional Planning and Development Councils (RPDCs) found within the HUD and State MID areas.

5. State Planning - The State may select and execute planning studies in coordination with groups such as state agencies, federal agencies, universities, regional planning groups, to

conduct studies with CDBG-MIT funds. Studies and planning efforts may be identified through local community input, including public meetings, requests for information, or surveys. Communities may recommend studies to be completed, but these planning funds will be administered by the State. State planning funds may also be used for capacity building at the state and local level.

The proposed allocations for the CDBG-MIT programs are presented below:

Table 1: Proposed Allocations

CDBG-MIT Program	Allocation	Percent of Overall Funding	LMI Designation Allocation Minimum (50%)	Max Grant Award
Infrastructure	**$86,169,300**	**81%**	**$43,086,650**	-
General Infrastructure Program	$72,169,300	68%	$36,084,650	$10,000,000
Public Facility Hardening Program	$14,000,000	13%	$7,000,000	$5,000,000
Planning and Capacity	**$15,000,000**	**14%**	**$7,500,000**	-
State Planning	$6,500,000	6%	$3,250,000	-
Regional and Local Planning	$6,000,000	6%	$3,000,000	$250,000
Hazard Mitigation Plans	$2,500,000	2%	$1,250,000	$200,000
Administration	**$5,324,700**	**5%**	**$2,662,350**	-
Total Budget	**$106,494,000**	**100%**	**$53,247,000**	-

Additional information on all above programs, including eligible applicants, can be found in Section 5 of this Action Plan.

3. Introduction

Hazard Mitigation and CDBG-MIT

The U.S. Department of Housing and Urban Development (HUD) published its Federal Register Notice (FRN) for the allocation of $106,494,000 in Community Development Block Grant – Mitigation (CDBG-MIT) funds to the state of West Virginia for qualifying 2016 disasters (DR-4273) on August 30, 2019 (84 FR 45838). These funds were allocated by Congress through its allocation of $6.875 billion in funding made available by the Further Additional Supplemental Appropriations for Disaster Relief Requirements Act of 2018 (approved February 9, 2018). The CDBG-MIT funds are intended for the grantee to carry out high-impact, data-driven activities to mitigate disaster risks and reduce future losses.

Hazard Mitigation is defined as any action taken to reduce or eliminate long-term risk to human life and property from man-made or natural hazards. A hazard is any event of condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other structural or financial losses.

For the purpose of the CDBG-MIT program, and as defined in the CDBG-MIT FRN, mitigation activities are defined as those activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future disasters.

HUD has established the following main objectives for the CDBG-MIT program:

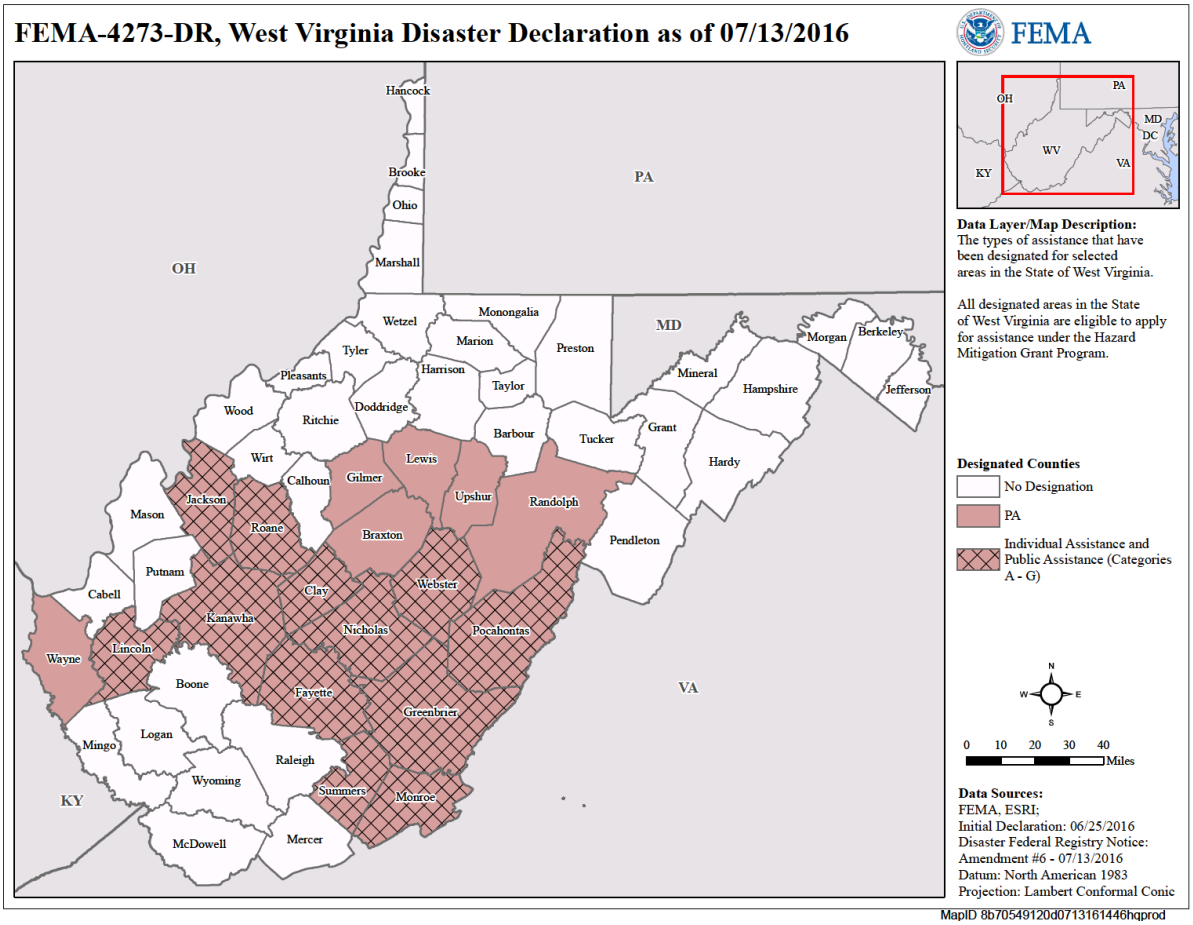
- Support data-informed investments in high-impact projects that will reduce risks attributable to natural disasters, with particular focus on repetitive loss of property and critical infrastructure;
- Build the capacity of States and local governments to comprehensively analyze disaster risks and to update hazard mitigation plans through the use of data and meaningful community engagement;
- Support the adoption of policies that reflect local and regional priorities that will have long-lasting effects on community risk reduction, to include the risk reduction to community lifelines such as Safety and Security, Communications, Food, Water, Sheltering, Transportation, Health and Medical, Hazardous Material (management), and Energy (Power and Fuel);
- Adopt a forward-looking land use plan that integrates the hazard mitigation plan, latest edition of published disaster-resistant building codes and standards, vertical flood elevation protection, and policies that encourage hazard insurance for private and public facilities; and

- Maximize the impact of available funds by encouraging leverage, private-public partnerships, and coordination with other Federal programs.

Summary of Impacts under DR-4273

The CDBG-MIT funds were allocated to grantees recovering from qualifying 2015, 2016, and 2017 disasters. The State of West Virginia, with the West Virginia Development Office (WVDO) as the administering agency, received an allocation related to the flooding, landslides, and mudslides which impacted the state in June 2016 (FEMA Disaster Declaration 4273).

Figure 1: FEMA DR-4273 Disaster Declaration



Source: FEMA.gov/disaster/4273

West Virginia experienced record-breaking rainfall in June 2016, resulting in flooding across 17 counties. Between 8 and 10 inches of rain fell in only 12 hours, causing widespread damage to housing, businesses, and infrastructure. A state of emergency was declared in 44 of West Virginia's 55 counties. A Presidentially Declared Disaster was issued June 25, 2016, designating 12 counties: Clay, Fayette, Greenbrier, Jackson, Kanawha, Lincoln, Monroe, Nicholas, Pocahontas, Roane, Summers, and Webster. Tragically, 23 lives were lost as a result of the devastating floods.

Adding to the devastation and difficulty of recovery, many of the flood-impacted areas were outside of the FEMA-defined flood plains, and therefore were not required to carry flood insurance. It is estimated that 90% of the state's almost 9,000 FEMA applicants did not have flood insurance.[1]

The State has been allocated over $149 million in CDBG-Disaster Recovery funds to respond to the unmet recovery needs resulting from the 2016 disaster. The majority of these funds are being used to implement a housing recovery program, with a focus on the repair and rehabilitation of single-family and mobile homes. West Virginia's CDBG-DR Action Plan highlights that "mitigation and resiliency is especially important…considering the history of flooding in the state. Mitigating against future disasters will be an integral part of the State's approach to minimize loss of life and property in the future." For the CDBG-DR program, this includes housing mitigation efforts such as elevation. The CDBG-MIT program will further this priority for mitigation through a variety of resiliency measures.

HUD and State Most Impacted and Distressed (MID) Areas

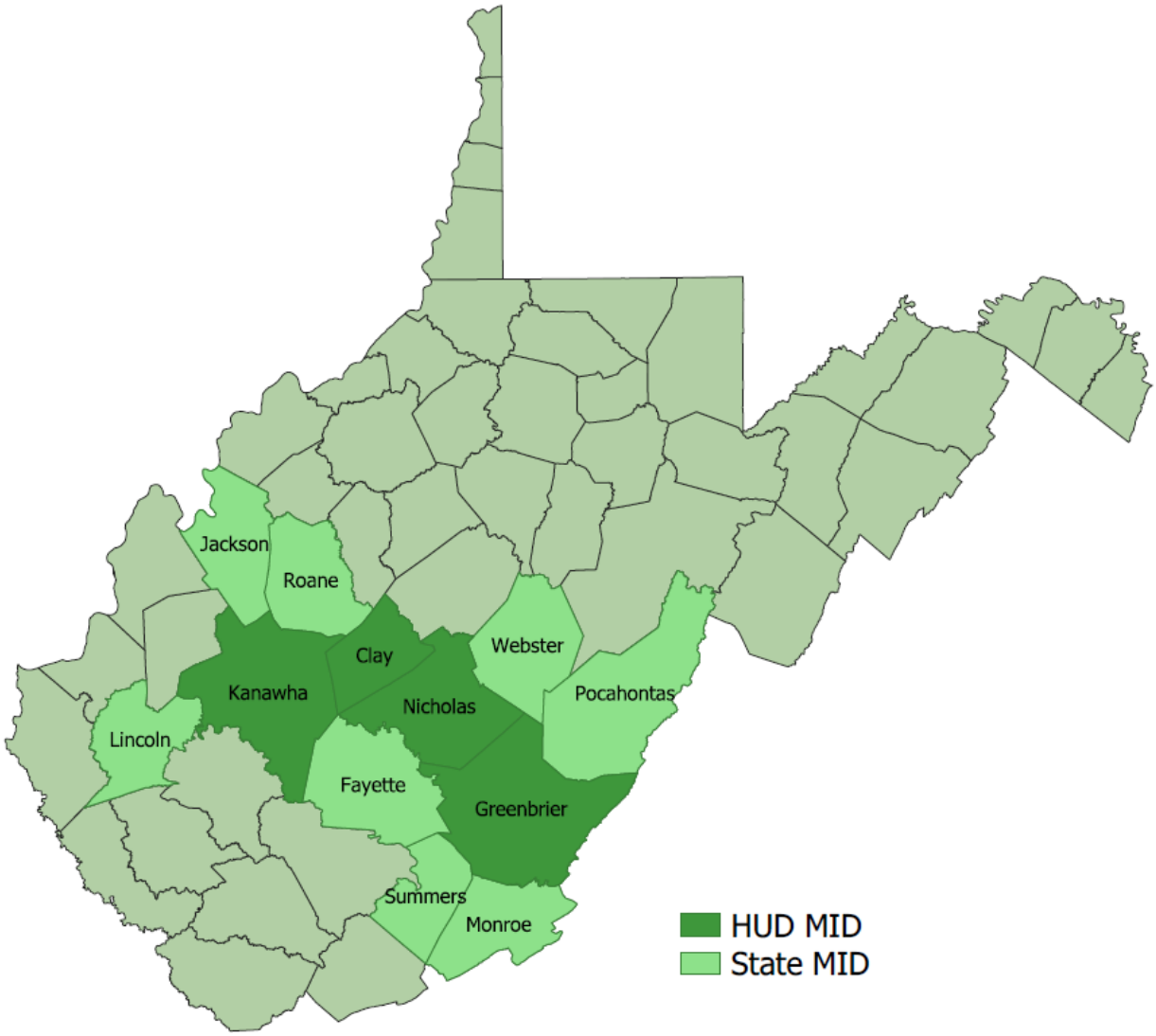
The Federal Register Notice (FRN) which allocates the $106,494,000 requires that all programs or projects using CDBG-MIT funds meet the definition of mitigation and that at least 50% (or $53,247,000) of funding must be spent in the HUD identified "Most Impact and Distressed (MID)" areas. The remaining 50% of funds may be spent for activities that meet the definition of mitigation in eligible State-identified MID counties, when supported by determinations based on the Risk-Based Needs Assessment. HUD MID areas are determined through federal designation. State-identified MID areas were identified by the state of West Virginia as areas of need that were not specified by HUD. State MID areas include counties that were eligible for FEMA Individual and Public Assistance Categories A-G in presidentially declared counties for the 2016 disaster (DR-4273).

Table 2: HUD and State Most Impacted and Distressed Areas

HUD MID Counties	• Clay • Greenbrier • Kanawha • Nicholas
State MID Counties	• Fayette • Jackson • Lincoln • Monroe • Pocahontas • Roane • Summers • Webster

[1] FEMA Individual and Households Program application dataset

Figure 2: HUD and State Most Impacted and Distressed (MID) Counties



Activities and programs that support hazard mitigation in these 12 counties will be eligible for CDBG-MIT funding as identified in Section 5 of this Action Plan.

Expenditure Requirements

As with all CDBG funds, the CDBG-MIT program must prioritize benefit low- to moderate-income (LMI) beneficiaries. The FRN requires that at least 50% of West Virginia's total CDBG-MIT allocation must be spent in a manner which benefits LMI persons, households, or areas. The State prioritizes the protection of LMI individuals in the proposed programs and projects described in this Action Plan.

The FRN requires that 50% of CDBG-MIT funds be expended within six (6) years of the execution of the grant agreement with HUD, and 100% of funds be expended within twelve (12) years of the

execution of the CDBG-MIT grant agreement. Expenditure projections for the 12 years can be found in Appendix E of this Action Plan.

4. Risk-Based Mitigation Needs Assessment

Needs Assessment Introduction

To align with the requirements in the CDBG-MIT Federal Register Notice (84 FR 45840), the State of West Virginia Development Office has developed this risk-based Mitigation Needs Assessment to identify and analyze all significant current and future risks impacting the State. The Mitigation Needs Assessment provides a substantive data-drive basis for the mitigation activities proposed in Section 5 of this Action Plan.

This assessment:

1. Provides an overview of the state of West Virginia's geographic landscape as relevant to the hazards discussed.
2. Summarizes current climate trends and analyzes climate projections that may contribute to current and future risks in the state.
3. Provides an overview of historic damage patterns and that have impacted the State.
4. Identifies all considered resources, including West Virginia's FEMA-approved State Hazard Mitigation Plan and West Virginia's Regional Planning & Development Council Multi-Jurisdictional Hazard Mitigation Plans for various regions.
5. Identifies and analyzes all significant current and future disaster risks (84 FR 45840) as addressed in the State Hazard Mitigation Plan.
6. Analyzes vulnerable populations within the state.
7. Includes a quantitative assessment to demonstrate the significant potential impacts and risks of hazards affecting the seven critical service areas or community lifelines: Safety and Security, Communications, Food/Water/Shelter Transportation, Health and Medical, Hazardous Material (Management), and Energy (Power and Fuel) [84 FR 45847].

The Mitigation Needs Assessment utilizes the findings of West Virginia's 2018 Statewide Hazard Mitigation Plan (SHMP), regional and local mitigation plans, data and research acquired from additional resources including but not limited to, National Centers for Environmental Information, US Department of Homeland Security's Homeland Infrastructure Foundation-Level Data. Throughout this assessment, the State cites relevant data sources (84 FR 45847).

In preparation of this Mitigation Needs Assessment, the State also consulted with other jurisdictions, the private sector, and other government agencies, including State and local emergency management agencies that have primary responsibility for the administration of FEMA mitigation funds (84 FR 45840). This collaboration with multiple stakeholders and analysis of various data sources was key to ensuring a comprehensive analysis of the hazards addressed here

and subsequent mitigation measures to be implemented to reduce or eliminate the substantial risk of loss of life, injury, damage and loss of property, along with suffering and hardship.

Overview of State Landscape and Climate Conditions

State Topography

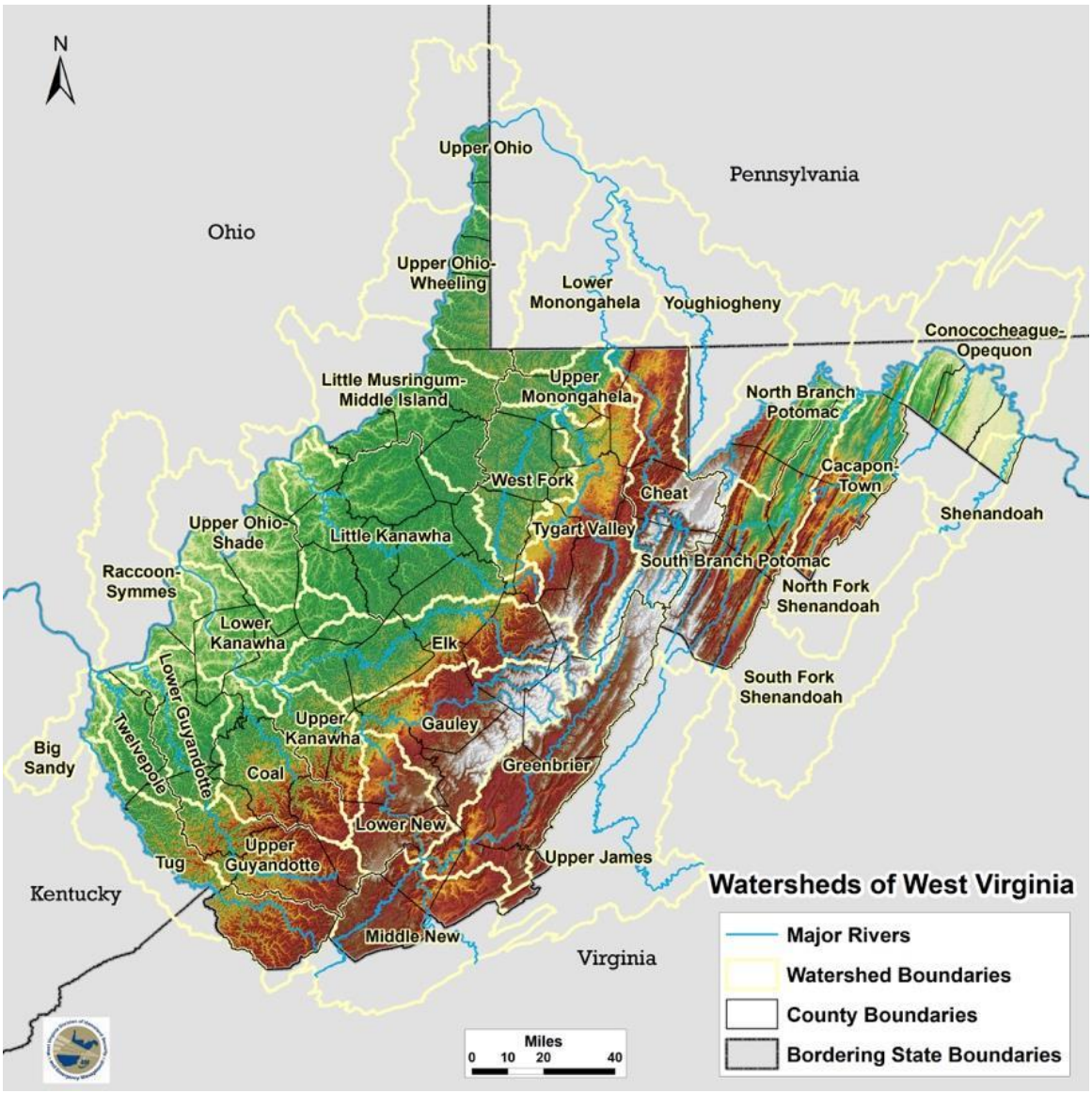
West Virginia's landscape poses unique circumstances that predispose the State to a multitude of hazards discussed in this section. West Virginia is often referred to as the Mountain State because of the mountainous terrain that comprises essentially all the State's area. The State is situated within two divisions of the Appalachian Highlands. Most of the eastern panhandle, which is crossed by the Allegheny Mountains, is in the Ridge and Valley region, and the remaining two-thirds of the state is part of the Allegheny Plateau.[2]

Within the high mountain regions are where most of the rivers and waterbodies located throughout the State begin. West Virginia has 32 watersheds divided according to the USGS hydrologic unit codes (HUC) that contribute to the Chesapeake Bay and the Gulf of Mexico.[3] Major watersheds include the Shenandoah, Cheat, James, Kanawha, Monongahela, New, Ohio, Potomac, Shenandoah, and Youghiogheny. Figure 3 shows both the elevation and watersheds that comprise the State's topography.

[2] West Virginia Statewide Hazard Mitigation Plan, p. 29, Accessed on 6/4/2020 from: https://dhsem.wv.gov/MitigationRecovery/Documents/WV%20State%20Hazard%20Mitigation%20Plan%20FINAL%2011-2018.pdf

[3] West Virginia Department of Environmental Protection, Accessed on June 6th, 2020 from: https://dep.wv.gov/WWE/Pages/default.aspx

Figure 3: Topographic Relief and Watershed Map of West Virginia



Source: Figure from West Virginia 2018 Statewide Hazard Mitigation Plan, p. 29.

Current Climate Conditions

The diverse topography of West Virginia contributes to different climate conditions across the state. High elevations moderate summer temperatures in the mountains by several degrees, with average maximum temperatures in the southwest, near the Ohio river, around 85°F, and average maximum temperatures in the east-central mountains less than 80°F. Winter temperatures show similar variation, with temperatures much colder in the mountainous central and northeastern parts of the state, sinking to the low 20s, while minimum temperatures in the south are around

30°F. Overall, temperatures statewide have increased less than 1°F since the early 20th century, and the number of very hot days (over 95°F) has been below average in this century (to 2014).[4]

Precipitation levels likewise vary across the state, with central regions having average annual rainfall of 50 inches or more, areas along the Ohio River receiving about 40 inches, and areas west of the Eastern Panhandle having about 35 inches annually.[5]

More significant than average annual temperature and precipitation, however, is the incidence of extreme weather in the state. As reported by the NOAA National Center for Environmental Information, "West Virginia is subject to a wide array of extreme weather including tornadoes, thunderstorms, snowstorms, hurricane remnants, and flooding. Tornadoes occasionally occur (an average of two-to-five per year) and are usually weak. Flood-producing extreme precipitation over the rugged topography is the costliest and most severe natural hazard for the state." Records of disastrous extreme flood events include the Great Ohio River Flood (1937), which set record-level flood heights of 69 feet at Huntington and caused extensive damage. River flooding in the east in 1985 resulted in an estimated $570 million in damages (in 1985 dollars). In recent years, of the 16 FEMA disaster declarations that West Virginia received between 2005 and 2014, 12 were related to severe storms and flood events.[6]

Projected Climate Conditions

Climate change is projected to increase average temperatures in West Virginia, as illustrated in Figure 4: Observed and Projected Changes (compared to the 1901 - 1960 average) in Near-Surface Air Temperature for West Virginia. The degree of climate change is driven by the level of global greenhouse gas (GHG) emissions. While the state has taken steps to address GHG emissions from sources in West Virginia, the impact of climate change on West Virginia will depend on global emission levels. Therefore, the state has examined the implications of climate change as part of this mitigation needs assessment.

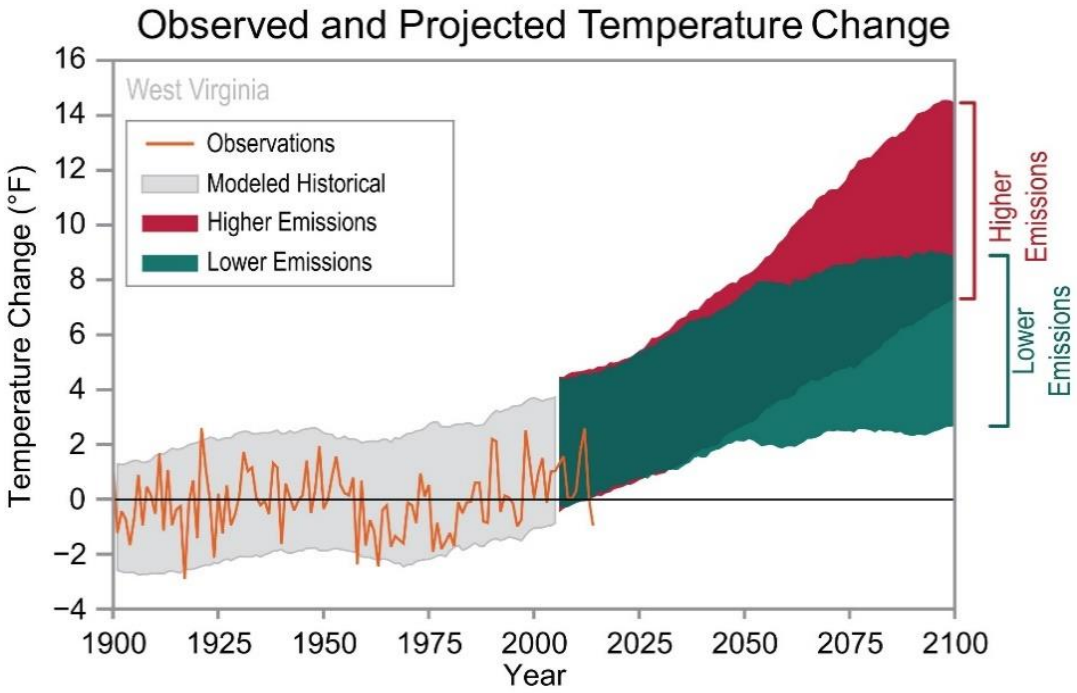
Scientists use different GHG emissions scenarios, called Representative Concentration Pathways (RCPs), to model future climate conditions under different scenarios. These scenarios assume higher or lower emissions levels depending on future economic conditions and policies to reduce GHG emissions. Under a higher emissions pathway, GHG emissions continue to increase worldwide; a low emissions pathway assumes that GHG emissions are reduced. Figure 4 shows the projected impact of these different scenarios on temperatures in West Virginia. Under a high emission scenario, climate models project historically unprecedented warming by the end of the 21st century, with increases in heat wave intensity and decreases in cold wave intensity.[7] Under a lower-emissions pathway, temperatures are still likely to exceed historical record levels by the

[4] Runkle, J., K. Kunkel, R. Frankson, and B. Stewart, 2017: West Virginia State Climate Summary. NOAA Technical Report NESDIS 149-WV, 4 pp. https://statesummaries.ncics.org/chapter/wv/
[5] Ibid.
[6] Ibid.
[7] Ibid.

middle of the century.[8] These increasing temperatures will contribute to increasing rates of soil moisture loss, resulting in more intense drought during dry spells and contributing to higher risks of wildfires. Higher temperatures can also have serious implications on public health, particularly among vulnerable populations.

Precipitation patterns are also projected to change (using the same RCP scenarios), with annual precipitation projected to increase over the century in West Virginia and across the northeast United States (Figure 5).This increased rainfall is expected to be concentrated in the winter and spring, with an increase in the number and intensity of extreme events. The projected increased severity of rainfall events heightens the risk of flooding.

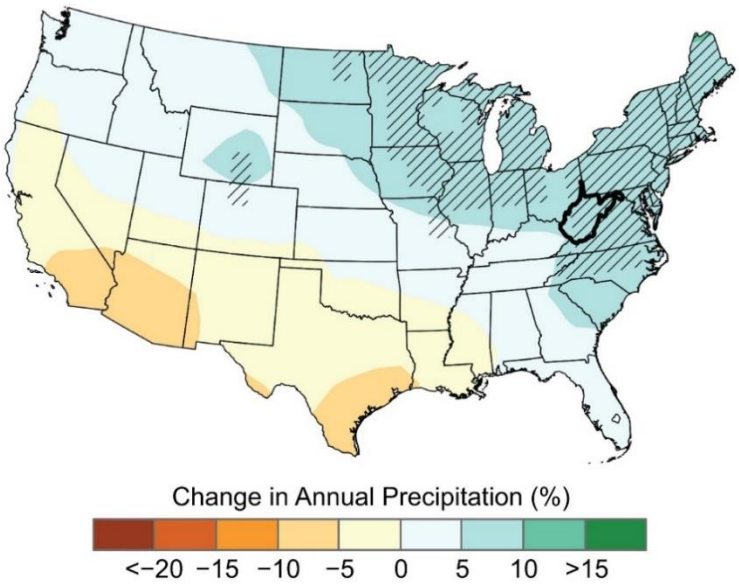
Figure 4: Observed and Projected Changes (compared to the 1901 - 1960 average) in Near-Surface Air Temperature for West Virginia



Source: CICS-NC and NOAA NCEI. 2017.

[8] Representative Concentration Pathways (RCP) are greenhouse gas concentration trajectories adopted by the Intergovernmental Panel on Climate Change. Different RCPs have been defined that assume different levels of greenhouse gas (GHG) concentrations; these pathways are used in global climate models to project future climate conditions under different GHG emissions futures. The RCP 8.5 scenario assumes continued increases in GHG emissions; the RCP 4.5 scenario assumes lower GHG emissions. For more information about RCPs, see https://science2017.globalchange.gov/chapter/appendix-e/.

Figure 5: Projected Changes in Annual Precipitation (%) for the Middle of the 21st Century



Source: CICS-NC, NOAA NCEI, and NEMAC. 2017.

Regional Variations in Climate Conditions

Analysis of a range of climate models for future temperature and precipitation indicates that climate conditions across the state will vary among regions in a similar pattern to historic climate conditions. That is, as average temperature and precipitation levels rise across the state, the same areas of the state will continue to have more or less rainfall, or higher or lower temperatures, than other parts of the state. These projected changes have particular implications for state and HUD-designated MID counties.

To develop a more nuanced understanding of the potential effects of climate change on future conditions in MID counties, further analysis was conducted through an aggregation and downscaling of a portfolio of global climate models. As a conservative approach to understand potential impacts, this assessment used RCP 8.5, a higher emissions scenario, to consider potential future climate conditions in West Virginia. The findings of this analysis are described in the discussion of future flooding and drought hazards, below.

Previous Damage Patterns

Due to West Virginia's geography and weather patterns discussed in the sections above, the state has a long history of natural disasters. Flooding and severe storms are all common occurrences that impact the state based on previous major disaster declarations.

Major Disaster Declarations

Provided by FEMA, Table 3 shows major disaster declarations in the state of West Virginia since 1954 by Year, Declaration Date, Incident Type, and Disaster Number.

Table 3: Major Disaster Declarations in State of West Virginia 1954 – 2020

Year	Declaration Date	Incident Type	Disaster Number
2020	4/3/2020	COVID-19	125
2019	8/2/2019	Flood	67
2018	4/17/2018	Flood	117
2018	7/12/2018	Flood	147
2017	8/18/2017	Flood	21
2016	6/25/2016	Flood	165
2015	5/21/2015	Flood	224
2015	3/31/2015	Severe Storm	278
2015	5/14/2015	Severe Storm	279
2015	5/18/2015	Flood	323
2015	8/7/2015	Severe Storm	344
2014	1/10/2014	Chemical	349
2013	7/26/2013	Flood	416
2012	6/30/2012	Severe Storm	426
2012	10/29/2012	Hurricane	481
2012	3/16/2012	Severe Storm	531
2012	7/23/2012	Severe Storm	569
2012	3/22/2012	Severe Storm	628
2012	11/27/2012	Hurricane	4221
2010	3/2/2010	Snow	706
2010	3/29/2010	Severe Storm	753
2010	4/23/2010	Snow	1060
2010	6/24/2010	Flood	1084
2009	5/15/2009	Severe Storm	1096
2008	6/19/2008	Severe Storm	1115
2007	5/1/2007	Severe Storm	1132
2005	2/1/2005	Severe Storm	1137
2005	9/5/2005	Hurricane	1168
2004	6/7/2004	Severe Storm	1229
2004	8/6/2004	Severe Storm	1319
2004	9/20/2004	Severe Storm	1378
2003	6/21/2003	Severe Storm	1410
2003	9/23/2003	Hurricane	1474

Year	Declaration Date	Incident Type	Disaster Number
2003	11/21/2003	Severe Storm	1496
2003	3/14/2003	Severe Storm	1500
2002	5/5/2002	Severe Storm	1522
2001	6/3/2001	Severe Storm	1536
2001	11/16/2001	Fire	1558
2001	11/16/2001	Fire	1574
2000	2/28/2000	Flood	1838
1998	7/1/1998	Severe Storm	1881
1997	3/7/1997	Flood	1893
1996	1/13/1996	Snow	1903
1996	1/25/1996	Flood	1918
1996	5/23/1996	Flood	3345
1996	8/14/1996	Fire	3358
1996	9/11/1996	Severe Storm	3366
1995	7/12/1995	Severe Storm	4059
1993	3/17/1993	Snow	4071
1985	11/7/1985	Flood	4210
1984	5/15/1984	Flood	4219
1980	8/15/1980	Flood	4220
1978	12/14/1978	Flood	1696
1977	4/7/1977	Flood	1769
1977	1/19/1977	Drought	2391
1977	8/24/1977	Drought	2392
1977	8/24/1977	Flood	3021
1975	9/12/1975	Flood	3051
1974	1/29/1974	Flood	3052
1974	4/11/1974	Flood	3109
1972	2/27/1972	Flood	3221
1972	7/3/1972	Flood	4061
1972	8/23/1972	Flood	4093
1969	9/3/1969	Hurricane	4132
1969	9/24/1969	Flood	1455
1967	3/13/1967	Flood	4236
1964	3/20/1964	Flood	4273

Year	Declaration Date	Incident Type	Disaster Number
1963	3/13/1963	Flood	4331
1962	3/9/1962	Flood	4359
1961	7/23/1961	Flood	4378
1957	1/31/1957	Flood	4455
1954	8/4/1954	Flood	4517

Source: https://www.fema.gov/disasters

Table 4 below summarizes total disaster declarations by incident type to highlight the type of hazards that most often result in formal disaster declarations and subsequent disaster relief funding.

Table 4: Total Disaster Declarations 1954 - 2020 by Incident Type

Incident Type	Total Disaster Declarations 1954 - 2020
Flood	33
Severe Storm	23
Hurricane	5
Snow	4
Fire	3
Drought	2
Chemical	1
COVID-19	1
Total	72

Source: https://www.fema.gov/disasters

Based on the above, the most common natural disasters that cause damages to an extent that results in a federal disaster declaration are flooding and severe storms. This historical pattern of extreme weather is expected to continue and become more severe due to climate change. Based on this, mitigation measures to reduce impacts caused by these types of hazards is critical.

National Flood Insurance Program Policies and Claims

Given the state's history with disaster declarations, particularly those related to flooding, it is important to note the current state of the National Flood Insurance Program (NFIP) NFIP coverage.

The National Flood Insurance Program's is operated through the Federal Emergency Management Agency (FEMA) and aims to reduce the impact of flooding on private and public structures. The NFIP provides affordable insurance to property owners, renters and businesses, and encourages communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. The NFIP's Community Rating

System (CRS) provides a reduction in flood insurance premium rates of up to 45% for communities that implement activities which go above and beyond the minimum requirements of the NFIP.

As of 2020, West Virginia had 13,594 National Flood Insurance Program (NFIP) policies in force, representing a total coverage $2,210,335,500.[9]

The 2018 West Virginia State Hazard Mitigation Plan notes statewide, 9% of structures are in the effective 100-year floodplains, and 14% are in both the 100- year and 500-year floodplains. Effectively, 99,520 to 159,804 structures are located in Special Flood Hazard Area (SFHA). With respect to flooding that occurred as part of DR-4273, 77% of the nearly 1,000 flood insurance claims in the declared counties were in the 1% annual-chance floodplain and approximately 23% of the insurance claims were outside.

NFIP participation had initially increased after 2016 due to FEMA group policies placed on flooded areas for three years at no cost because of the June 2016 floods. These free group policies have since expired and, according to the National Flood Insurance Program under the West Virginia State Insurance Commission, there was only approximately five percent retention of those policies. West Virginia had 16,985 policies in force on August 31,2016, and the current policies in force stands at 13,301.

Resources and Data Sources Utilized

With an overview of the State's landscape, climate conditions, and history of disasters examined above, this Mitigation Needs Assessment serves to present an analysis of all current and future hazards that the state faces as a result of its unique landscape and climate conditions. Through this Mitigation Needs Assessment, The West Virginia Development Office certifies that, in responding to this action plan requirement and presenting the required information, the State has reviewed and considered all applicable sources to ensure a comprehensive and data-driven analysis that serves as a foundation for mitigation programs. These data sources include, but are not limited to, the following:

1. **FEMA Hazard Mitigation Planning Resources:**
   https://www.fema.gov/hazard-mitigation-planning-resources
2. **FEMA State Mitigation Planning Resources**
   https://www.fema.gov/state-mitigation-planning-resources
3. **FEMA State Mitigation Planning Key Topics Bulletins**
   https://www.fema.gov/media-library/assets/documents/115780
4. **FEMA Local Mitigation Planning Resources**
   https://www.fema.gov/local-mitigation-planning-resources

[9] FEMA, Policy & Claim Statistics for Flood Insurance https://www.fema.gov/policy-claim-statistics-flood-insurance

5. **U.S. Forest Service Wildland Fire Resources**
   https://www.fs.fed.us/managing-land/fire
6. **National Interagency Coordination Center**
   https://www.nifc.gov/nicc/
7. **HUD CPD Mapping Tool**
   https://egis.hud.gov/cpdmaps/
8. **DHS Office of Infrastructure Protection**
   https://www.dhs.gov/topic/critical-infrastructure-security
9. **FEMA Community Lifelines Implementation Toolkit**
   https://www.fema.gov/media-library/assets/documents/177222
10. **West Virginia Division of Highways Transportation Asset Management Plan, August 2019**
    https://transportation.wv.gov/highways/programplanning/Documents/2019-Final-TAMP.pdf
11. **Fourth National Climate Assessment, Volume II, 2018**
    https://nca2018.globalchange.gov
12. **West Virginia State Climate Summary. NOAA Technical Report NESDIS 149-WV**
    https://statesummaries.ncics.org/chapter/wv/
13. **American Society of Civil Engineers (ASCE) Infrastructure Report Card 2017**
    https://www.infrastructurereportcard.org/

In addition, the State has reviewed and coordinated with the following plans/data sources in the sections below to ensure as comprehensive of a Mitigation Needs Assessment as possible.

West Virginia State Hazard Mitigation Plan

West Virginia's Statewide Hazard Mitigation Plan, updated as of 2018, is the most recent risk assessment completed through FEMA's Hazard Mitigation Plan process and serves as the foundational starting point for the risks and subsequent analysis performed in this Mitigation Needs Assessment. The State's FEMA approved Hazard Mitigation Plan (SHMP) was completed by the West Virginia Division of Emergency Management (EMD) (formerly the Division of Homeland Security and Emergency Management (DHSEM)).

The West Virginia Statewide Standard Hazard Mitigation Plan provides guidance to reduce loss and prevent injury from all hazards impacting the State and reflects a combination of goals, objectives, and strategies with input from the general citizenry and representatives from all levels of government.

This plan is a critical component of state-level programs for management of disasters and their impacts and takes into account years of mitigation experience and initiatives.

Critically, the State's Hazard Mitigation Plan includes a risk assessment that identifies the type and location of hazards that can affect the State and vulnerability to those hazards identified. This Risk-Based Mitigation Needs assessment aligns with the hazards and data compiled in the SHMP as a starting point to quantitatively evaluate significant potential impacts and risks of hazards affecting the seven community lifelines and inform the use of CDBG–MIT funds (84 FR 45840).

National Oceanic and Atmospheric Administration (NOAA)'s National Centers for Environmental Information (NCEI) Storm Event Database

Much of the data utilized and cited from the West Virginia 2018 State Hazard Mitigation Plan and in this Mitigation Needs Assessment rely on loss data reported by the National Oceanic and Atmospheric Administration (NOAA)'s National Centers for Environmental Information (NCEI) Storm Event Database. NCEI receives storm event data from the National Weather Service to quantify damage in terms of loss estimates. The National Weather Service quantifies damage using all available data at the time of the publication, which are received from a variety of sources including county, state and federal emergency management officials, local law enforcement officials, sky warn spotters, NWS damage surveys and the insurance industry.[10] For this reason, property and crop damages reported in this Mitigation Needs Assessment should be considered as a broad estimate.

FEMA National Flood Hazard Layer (NFHL)

The National Flood Hazard Layer (NFHL) is the geospatial database that contains current effective flood hazard data which has been utilized as part of this analysis. The National Flood Insurance Reform Act of 1994 requires that FEMA assess the need to revise and update all flood maps every 5 years. The analysis with respect to flood risk contained in this Action Plan is based on the effective NFHL that was current at the time of this Action Plan's development. The State notes that because of continual updates, FEMA flood maps may not accurately represent the actual total areas at risk or may not accurately show the severity of the flood risk for a given area. Future updates that FEMA makes to flood layers may increase risk or analysis contained here. Subsequent updates to flood layers may be considered in future amendments to this Action Plan. Additionally, as of the publishing of this Action Plan, any information regarding FEMA's Flood Insurance Rate Maps (FIRM) is current, however it should be noted that based on coordination and information received from FEMA Region 3, restudies for certain flood areas are currently underway or planned in the following counties: Kanawha, Nicholas, Greenbrier, Monroe, Summers, Pocahontas and Webster. New maps or analysis may include additional projects that were not previously in flood plan maps but will be in updated maps.

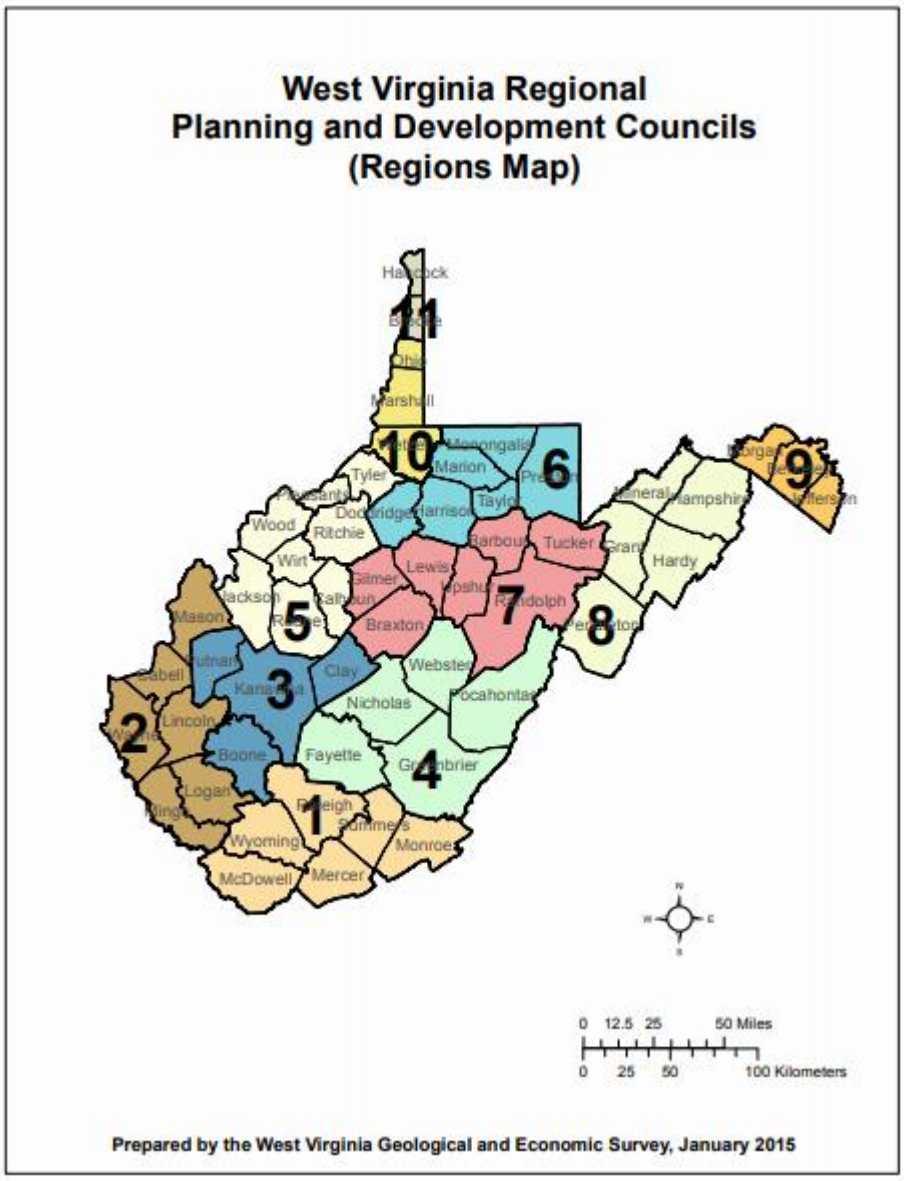
Local Hazard Mitigation Plans – Regions I – V

There are eleven Regional Planning Councils representing the various counties across the State. The Regional Planning and Development Councils (RPDCs) are considered "development districts"

[10] https://www.ncdc.noaa.gov/stormevents/faq.jsp

and focus on the expansion and improvement of water systems, infrastructure, transportation, employment, industry, small business development, housing, health care, education, and recreation.[11] A key function of the RPDCs is assisting local jurisdictions too small to maintain staff for grant writing and planning with support and project management functions where needed. As part of this function, each of the RPDCs maintains a Regional Hazard Mitigation Plan to comply with 44 CFR Part 201.6 which requires localities to complete a natural hazards plan. Each RPDC is shown in Error! Reference source not found..

Figure 6: West Virginia Regional Planning and Development Councils



Source: http://www.wvgs.wvnet.edu/bb/images/WVPlanningRegionsMap.pdf

[11] West Virginia Statewide Hazard Mitigation Plan, p. 26, Accessed on 6/4/2020 from: https://dhsem.wv.gov/MitigationRecovery/Documents/WV%20State%20Hazard%20Mitigation%20Plan%20FINAL%2011-2018.pdf

While West Virginia's 2018 Statewide Hazard Mitigation Plan is a foundational resource for state-level planning, RPDC mitigation plans offer a localized analysis and highlight key regional-level planning that provide additional detail at the local level. For this Mitigation Needs Assessments, the Regional Hazard Mitigation Plans that encompass the 12 Most Impacted and Distressed (MID) counties (Table 5) were reviewed to ensure a comprehensive analysis.

Table 5: HUD and State MID Counties by West Virginia Regional Planning and Development Council

County	Regional Planning & Development Council	Year Local HMP Last Updated
Summers	1	2016
Monroe		
Lincoln	2	2018
Clay	3	2017
Kanawha		
Greenbrier	4	2016
Nicholas		
Fayette		
Pocahontas		
Webster		
Jackson	5	2016
Roane		

Key
HUD MID
State MID

Source: http://www.wvgs.wvnet.edu/bb/images/WVPlanningRegionsMap.pdf

With CDBG-MIT funds, RPDCs may be eligible for funding to update local hazard mitigation plans through this funding opportunity. To ensure coordination with FEMA and minimize duplication of funding, the State notes the following funding allocations that have been made to the RPDC regions.

Table 6: FEMA Funding Allocations

Funding Source	RPDC	Cost to Update Plan	Approved FEMA Funding	Funding Gap	Status
HMGP-DR-4359 (2018 Flooding)	RPDC 1	$175,000.00	$131,250.00	$43,750.00	Pending Approval
PDM-C 2019 - Non-Disaster Mitigation	RPDC 3	$100,000.00	$75,000.00	$25,000.00	Under Review
HMGP-DR-4359 (2018 Flooding)	RPDC 4	$175,000.00	$131,250.00	$43,750.00	Pending Approval
HMGP-DR-4378 (2018 Flooding)	RPDC 5	$80,000.00	$60,000.00	$20,000	Pending Approval

West Virginia State Disaster Recovery Action Plan (for 2016 Floods)

In June 2016, the state of West Virginia suffered record breaking amounts of rainfall causing catastrophic flooding across 12 counties. Of these counties, 4 were designated as HUD MIDs, and 8 were designated as State MIDs. West Virginia was awarded a total of $149,875,000 in Community Development Block Grant – Disaster Recovery funds from the U.S. Department of Housing and Urban Development (HUD) to address unmet needs as a result of the floods. As part of the $149.875 million appropriated from Congress, Federal Register Notices were then published by HUD which outlined the requirements and stipulations for the use of the grant. Under its CDBG-DR Action Plan, West Virginia has outlined the programs to be administered during the next several years based on an unmet needs assessment performed with available post-flood data. Federal, state, and local partners provided input on all funds awarded thus far and the needs that remain for which CDBG-DR funding may be used. To ensure a comprehensive analysis of the impacts that occurred in 2016 and potential remaining unmet mitigation needs, the State has used the CDBG-DR Action Plan to inform the development of this Mitigation Needs Assessment.

West Virginia Social Vulnerability Assessment

As part of conducting this Mitigation Needs Assessment, the state has conducted an analysis of vulnerable populations and presented it here in the Social Vulnerability section of this document. This assessment serves as a key piece of the analysis informing mitigation program design. In West Virginia's 2018 Statewide Hazard Mitigation Plan, vulnerable populations were determined and identified by the characteristics that make them vulnerable. These include limited financial resources; those under 5 or over 65 years of age; non-white; or with those with disabilities. The vulnerability of people is called "social vulnerability" and describes risks to health, safety, or financial stability even before a storm or disaster occurs. Mitigation funds can be used for preparedness and resiliency programs that pro-actively address social vulnerability to hazards. There are two indexes often used to measure social vulnerability, the Social Vulnerability Index developed by the Center for Disease Control and the Hazard and Vulnerability Research Institute's Social Vulnerability Index developed by the Hazards and Vulnerability Research Institute (HVRI) in South Carolina. Both indexes synthesize common demographic information, such as income and disability status, alongside information on living arrangements, such as mobile home ownership or overcrowding.

This analysis combined information from both most common Social Vulnerability indexes, data from the American Community Survey, and information from previous plans to describe the relative vulnerability of each county. The analysis for use of CDBG-MIT funds will inform program design to minimize the impacts of disasters on vulnerable populations.

Surveys with Key Stakeholders

In anticipation of the development of this Action Plan and its Mitigation Needs Assessment, West Virginia included initial resiliency questions in an online survey for the State Consolidated Plan that was distributed to over 3000 stakeholders in September 2019. The initial responses to this survey

identified the greatest barriers to implementing hazard mitigation projects to build resiliency, hazard issues specific to local communities, and mitigation activities needed but have yet to be implemented.

To expand on this opportunity to consult with other jurisdictions; public citizens; the private sector; non-profit organizations and social services providers; and other government agencies, including State and local emergency management agencies, West Virginia collected additional resiliency activities in the "Community Development Block Grant - MIT Survey" that was distributed in June 2020.

These surveys provided a platform, outside of the public hearings and other meetings, for public input. The results accounted for entity representation, county representation, civic engagement with hazard management, local perception of risks, resilient activities performed in the past, and mitigation activities of interest. The surveys presented meaningful feedback and opportunity to gather a better understanding of local perceptions and mitigation needs. These data findings were integrated into this mitigation needs assessment and can be found referenced throughout the following sections. The full version of the survey can be found in Appendix B.

Analysis of State and Local Plans to Identify Key Risks

As part of the development of the 2018 SHMP, West Virginia reviewed each of the Regional Planning Development Council's local Hazard Mitigation Plans to identify hazards threatening the State and to determine the level of risk posed to lives and property at a regional level to ensure as comprehensive of a plan as possible. Because hazards can either be specific to small geographies, or occur statewide, the state recorded a uniform ranking of High, Medium, or Low for each hazard by county.

As part of this CDBG-MIT Action Plan, this uniform county risk rating is presented here for the MID counties to exemplify the risks each county faces.

Table 7: Hazard Risk Levels by County

County	Flood	Landslide	Severe Storms	Winter Weather	Wildfire	Dam Failure	Drought	Earthquake
Clay	H	H	H	H	L	L	M	L
Fayette	H	L	H	H	N/A	L	L	L
Greenbrier	H	L	H	H	N/A	L	L	L
Jackson	H	L	H	H	L	L	L	L
Kanawha	H	H	H	H	L	L	M	L
Lincoln	H	M	M	M	H	L	M	N/A
Monroe	H	M	L	H	H	M	N/A	M
Nicholas	H	L	H	H	N/A	L	L	L
Pocahontas	H	L	H	H	N/A	L	L	L
Roane	H	L	H	H	M	L	L	L
Summers	H	L	L	H	M	L	N/A	L
Webster	H	L	H	H	N/A	L	L	L

Key
HUD MID
State MID
High Risk
Med Risk
Low Risk
Data N/A

Based on the above, a total count was taken to determine the hazards with the highest risk across West Virginia's MID counties (Table 8).

Table 8: Total Count of Hazard Ranking for Each Hazard for West Virginia MID Counties

	High Risk	Medium Risk	Low Risk
Flood	12	0	0
Winter Weather	11	1	0
Severe Storms	9	1	2
Landslide	2	2	8
Wildfire	2	2	3
Dam Failure	0	1	11
Drought	0	3	7
Earthquake	0	1	10

Table 8 shows that flooding is the most prevalent high-risk hazard followed by winter weather and severe storms. To ensure a compressive mitigation needs assessment, both the current and future risks of the hazards addressed above as included in the West Virginia 2018 State Hazard Mitigation Plan are addressed in the section that follows - Greatest Risk Hazards.

Greatest Risk Hazards

Flooding

Overview of Hazard

Flooding is defined as the partial or complete inundation of land areas that are normally dry as a result of the overflow of inland or tidal water and surface water runoff from any source.

Two types of flooding occur in West Virginia, either separately or simultaneously. These are:

- Flash Flood: a flood event where water levels rise at an extremely rapid rate from short, heavy rainfall accumulating in areas faster than the ground can absorb it. West Virginia's steep terrain and numerous narrow valleys contribute to higher water levels and destructive flow speed. Urban flooding occurs due to the combination of impervious surfaces (e.g., streets, roads, parking lots) and inadequate drainage. Flash flooding typically occurs with little to no warning, bringing a significant threat to loss of life and property and disruption of critical services. Projections for increasing intensity of rainfall events point to an increasing risk of flash flood hazards, absent mitigation actions.
- Riverine Flooding: Riverine flooding occurs when an increase in water volume within a river channel causes an overflow onto the surrounding floodplain. Riverine flooding tends to rise slowly, incrementally, and impacts can be delayed downstream for days. Seasonal

increases in average precipitation due to climate change may increase the risk of riverine flooding.

Dam & Levee Failure

Dams and levees have the potential to be a risk to communities living in proximity if they are not designed, constructed, operated, or maintained properly. In the event of a catastrophic dam or levee failure, the energy the water released from even a small structure can cause extensive property damage, injury, and potential loss of life. This is especially true in West Virginia where many communities lie along steep (or high) gradient streams and rivers within narrow valleys.

The 2018 West Virginia SHMP addresses dam and levee failure as their own separate hazard but notes there are no comprehensive databases of historical dam or levee failure in West Virginia at the time the plan was published.[12] While the SHMP describes the overall hazard in the event of dam failure and specifies specific dams of concern, it notes that the data and time necessary to perform a probabilistic failure analysis for each dam and levee in West Virginia is beyond the scope of the SHMP.[13] For this reason, the historical impact and future risk of flooding are discussed in this Action Plan as one sole hazard. However, the State recognizes that the degree of risk of dam and levee failure is a function of not only the amount and severity of precipitation events but the structural condition and sensitivity of the infrastructure assets as well. A review conducted by the American Society of Engineers found that of the West Virginia's 586 dams, 432 are high-hazard potential.[14]

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[12]West Virginia Statewide Hazard Mitigation Plan, p. 220, Accessed on 6/4/2020 from: https://dhsem.wv.gov/MitigationRecovery/Documents/WV%20State%20Hazard%20Mitigation%20Plan%20FINAL%2011-2018.pdf

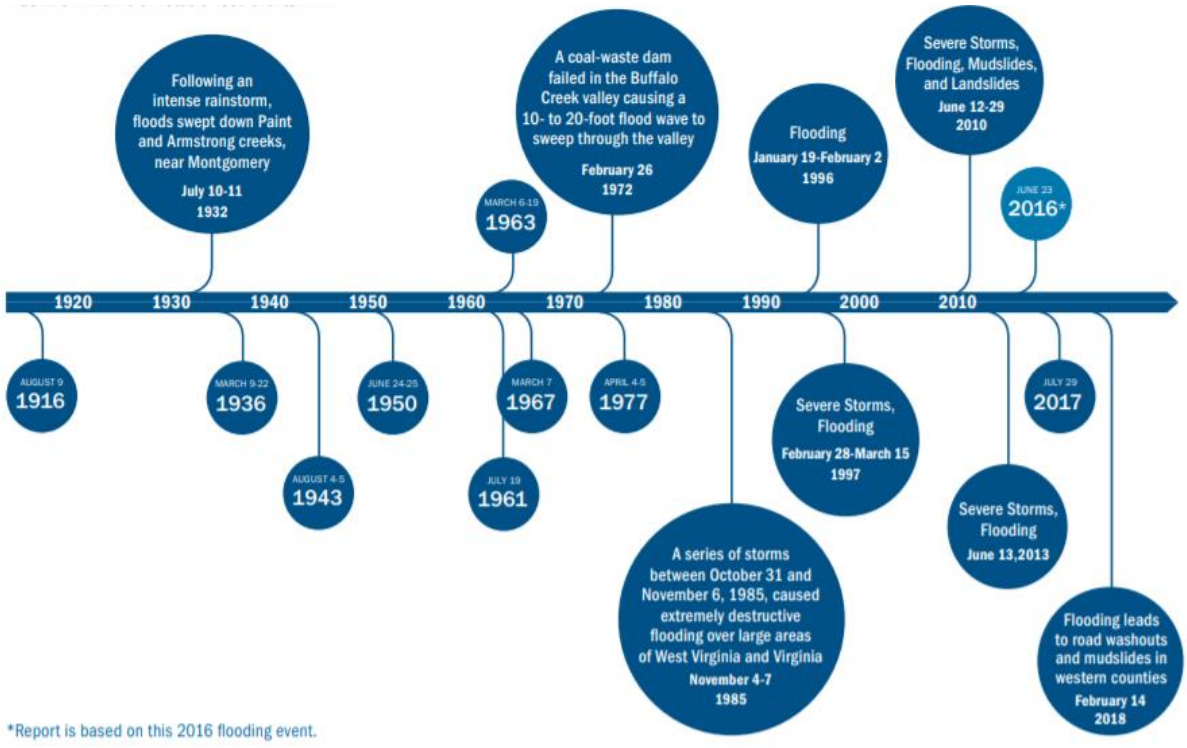
[13] West Virginia Statewide Hazard Mitigation Plan, p. 232, Accessed on 6/4/2020 from: https://dhsem.wv.gov/MitigationRecovery/Documents/WV%20State%20Hazard%20Mitigation%20Plan%20FINAL%2011-2018.pdf

[14]ASCE Key Facts About West Virginia's Infrastructure. 2019. https://www.infrastructurereportcard.org/state-item/west-virginia/

Historical Impact

According to FEMA, floods are one of West Virginia's most frequent and costly disasters. Storm data from NOAA shows that every county in the state reported at least 14 floods between 1991 and 2016, with Kanawha County reporting the most during this 20-year interval at 69 floods.[15] The frequency of flooding in the state (Figure 7) highlights the importance of and need for flood mitigation actions.

Figure 7: History of Flooding in West Virginia



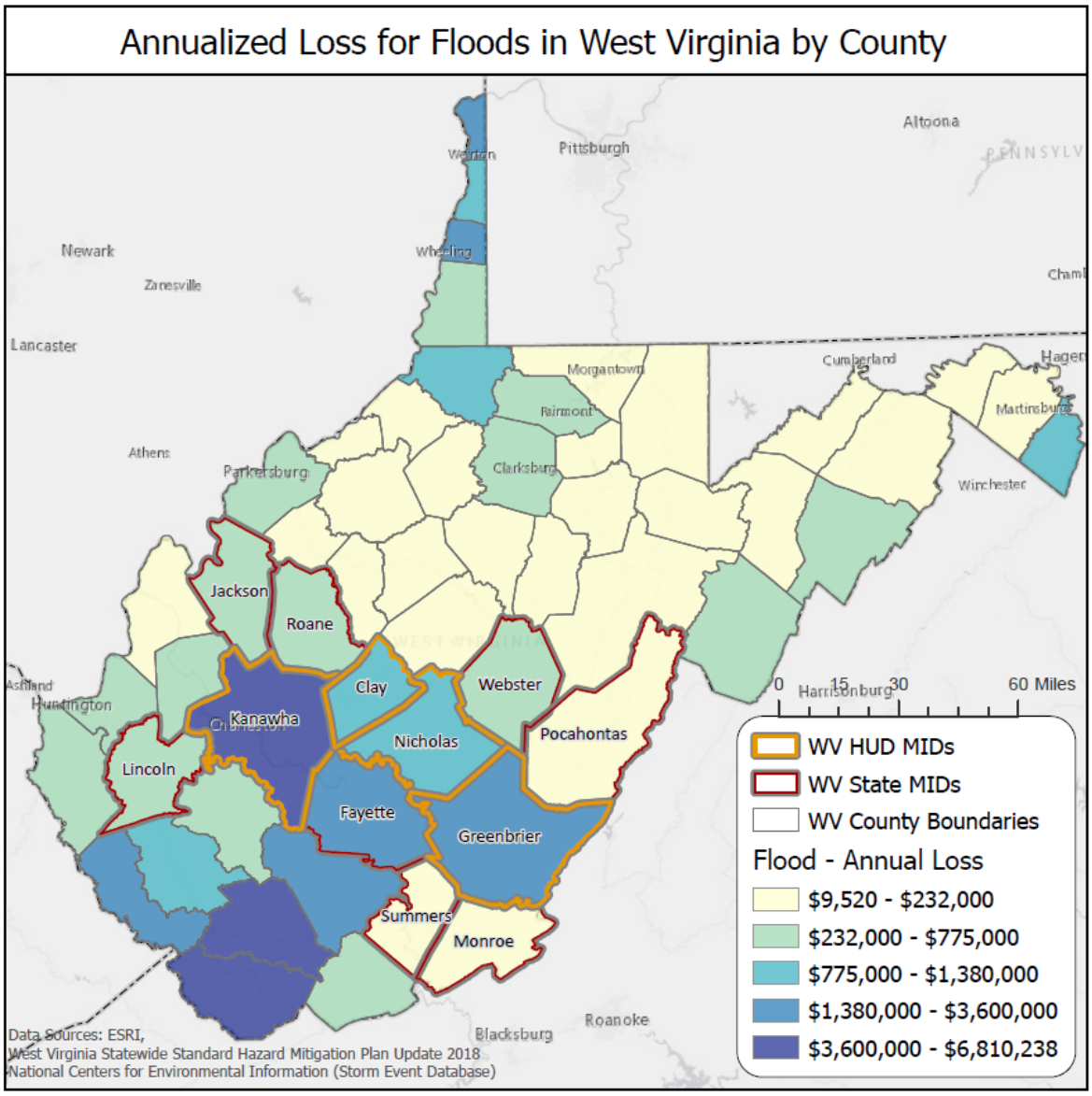
Source: FEMA Region III WV Flood Report.

Using data from NOAA's National Centers for Environmental Information (NCEI) Storm Event Database and data from the 2018 SHMP, the state of West Virginia determined the annual number of events based on historical impact and the annualized cost associated with flooding (the total of both property and crop losses). Annualized loss is calculated by dividing the number of events by the total number of years. For each of the hazards the total property damage and crop damage values were also recorded for each county. The annualized loss for each county is then calculated by dividing the total cost by the total number of years to arrive at annualized loss, which is what each county can expect to spend on a yearly basis in losses related to flooding.

[15]FEMA RiskMap "Understanding Flood Dangers in Central West Virginia, Lessons Learned from the June 2016 Flood", Accessed from: https://www.fema.gov/media-library-data/1541185743622 4dac85e81afe3034a6799d8b5b9df2bf/Region_III_WV_FloodReport.pdf

Figure 8 below displays the annualized loss by county related to flooding.

Figure 8: Annualized Loss Due to Floods in West Virginia Show HUD MIDs with High Loss



Based on Figure 8, the MID counties with the highest annualized loss from flooding are Kanawha, Fayette, Greenbrier, Nicholas and Clay. These are areas of the state where mitigation measures to prevent further losses from flooding may have the greatest impact.

Table 9 below shows the breakdown of loss by property and for flooding events with respect to MID counties in West Virginia. Annualized cost is what a county may expect in terms of loss to property and crops on a yearly basis as a result of flooding. These projected costs are based solely

on historic flood trends and do not incorporate the additional risks of flood events as a result of climate change.

Table 9: Annualized Events and Costs of Flooding in West Virginia MID Counties

County	Flood Events	Property Loss	Crop Loss	Annualized Events	Total Cost	Annualized Cost
Kanawha	71	$100,263,000	$0	3.38	$100,263,000	$4,774,429
Fayette	27	$54,453,000	$0	1.29	$54,453,000	$2,593,000
Greenbrier	53	$42,990,000	$50,000	2.52	$43,040,000	$2,049,524
Nicholas	29	$27,885,000	$0	1.38	$27,885,000	$1,327,857
Clay	28	$19,505,000	$0	1.33	$19,505,000	$928,810
Lincoln	47	$13,826,000	$0	2.24	$13,826,000	$658,381
Webster	33	$11,154,000	$0	1.57	$11,154,000	$531,143
Roane	42	$10,747,000	$0	2.00	$10,747,000	$511,762
Jackson	47	$7,482,000	$25,000	2.24	$7,507,000	$357,476
Summers	21	$2,502,000	$0	1.00	$2,502,000	$119,143
Pocahontas	29	$2,269,000	$0	1.38	$2,269,000	$108,048
Monroe	29	$1,015,000	$0	1.38	$1,015,000	$48,333

Key | HUD MID | State MID

Source: NOAA'S NCEI and West Virginia 2018 SHMP.

Loss values presented here are determined by using a variety of sources including county, state and federal emergency management officials, local law enforcement officials, sky warn spotters, NWS damage surveys and the insurance industry.[16] For this reason, property, crop damages and subsequent annualized losses should be considered estimates but based on the best available data. This is consistent with the same data and the methodology presented in the FEMA approved State Hazard Mitigation Plan to keep consistent and align with HUD requirements

Mitigation measures such as infrastructure activities or other resiliency solutions can reduce future costs by minimizing losses that result from flooding. This is especially the case when considering those properties that are deemed a Repetitive Loss property. FEMA defines a Repetitive Loss (RL) property as 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. Table 10 below shows the total number of non-mitigated repetitive loss properties in each MID county, and the total amount paid for those properties in flood insurance claims.

[16] NOAA NCEI Storm Data FAQ Page https://www.ncdc.noaa.gov/stormevents/faq.jsp

Table 10: Number of Non-Mitigated Repetitive Loss Properties by MID County (as of 2018)

Name	Number of Properties	Number of Losses	Total Contents Paid	Total Building Paid	Total Paid
Kanawha	240	661	$1,420,185	$10,930,460	$12,350,645
Pocahontas	82	230	$3,697,828	$4,766,428	$8,464,256
Greenbrier	38	96	$676,002	$2,597,320	$3,273,322
Lincoln	35	100	$799,203	$1,719,241	$2,518,444
Nicholas	15	35	$733,746	$1,111,657	$1,845,403
Jackson	33	85	$338,514	$1,155,917	$1,494,432
Summers	22	58	$192,172	$879,019	$1,071,191
Roane	20	50	$233,500	$644,006	$877,507
Fayette	27	65	$67,983	$542,224	$610,208
Webster	18	45	$110,566	$386,385	$496,952
Clay	5	11	$42,696	$257,823	$300,518
Monroe	0	0	$0	$0	$0

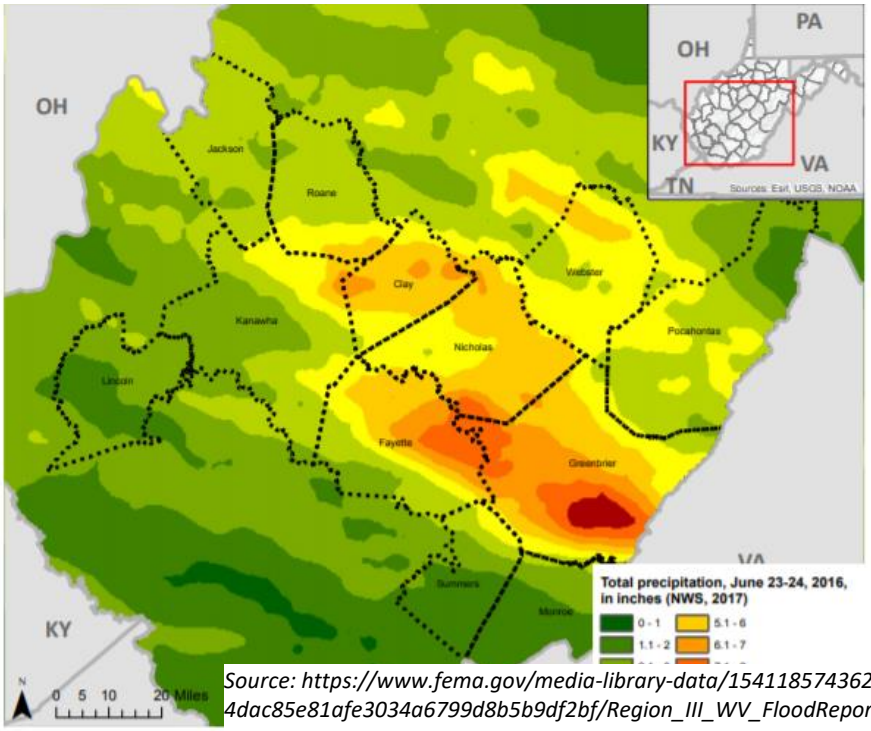
Key: HUD MID | State MID

Source: NOAA'S NCEI and West Virginia 2018 SHMP

June 2016 Floods (DR-4273)

While annualized losses and repetitive loss are important historical context on flood impacts over time, specific major disasters highlight the impact that a single hazard event can have on the state

Figure 9: Estimated Rainfall Totals During WV June 23-24, 2016 Floods



Source: https://www.fema.gov/media-library-data/1541185743622-4dac85e81afe3034a6799d8b5b9df2bf/Region_III_WV_FloodReport.pdf

and the lasting damage that it can have. Major flood events highlight the need for mitigation measures to prevent similar losses in the future.

On June 23, 2016, central and southeastern West Virginia began to experience heavy rainfall that lasted over 24 hours causing widespread flooding (Figure 9). According to FEMA, thousands of buildings were destroyed or damaged, with at least 23 people killed, and communities throughout West Virginia were inundated with floodwaters.[17] As a result, a State of Emergency was declared in 44 of West Virginia's 55 counties, with 12 of these counties receiving a Presidential Disaster Declaration.

In West Virginia, the State Department of Transportation (DOT), estimated roads and bridges suffered nearly $55 million in damages, affecting 624 routes, with 1,300 different damage sites, and stretching over 200 miles. This flooding caused significant damage to state infrastructure and facilities that provide essential services such as wastewater treatment and educational facilities. West Virginia also had numerous rural waters and wastewater collection systems that sustained millions of dollars in damage from the flood.[18]

The impacts from both historical flood loss, as well as specific losses tied to the floods of June 2016, highlight the need for further resiliency and mitigation measures in the state to reduce the magnitude of future damages when a similar or even more severe flood event occurs. In addition to the points assessed in this section, the detailed impacts of flooding to West Virginia's critical service areas are addressed in the Community Lifelines Section.

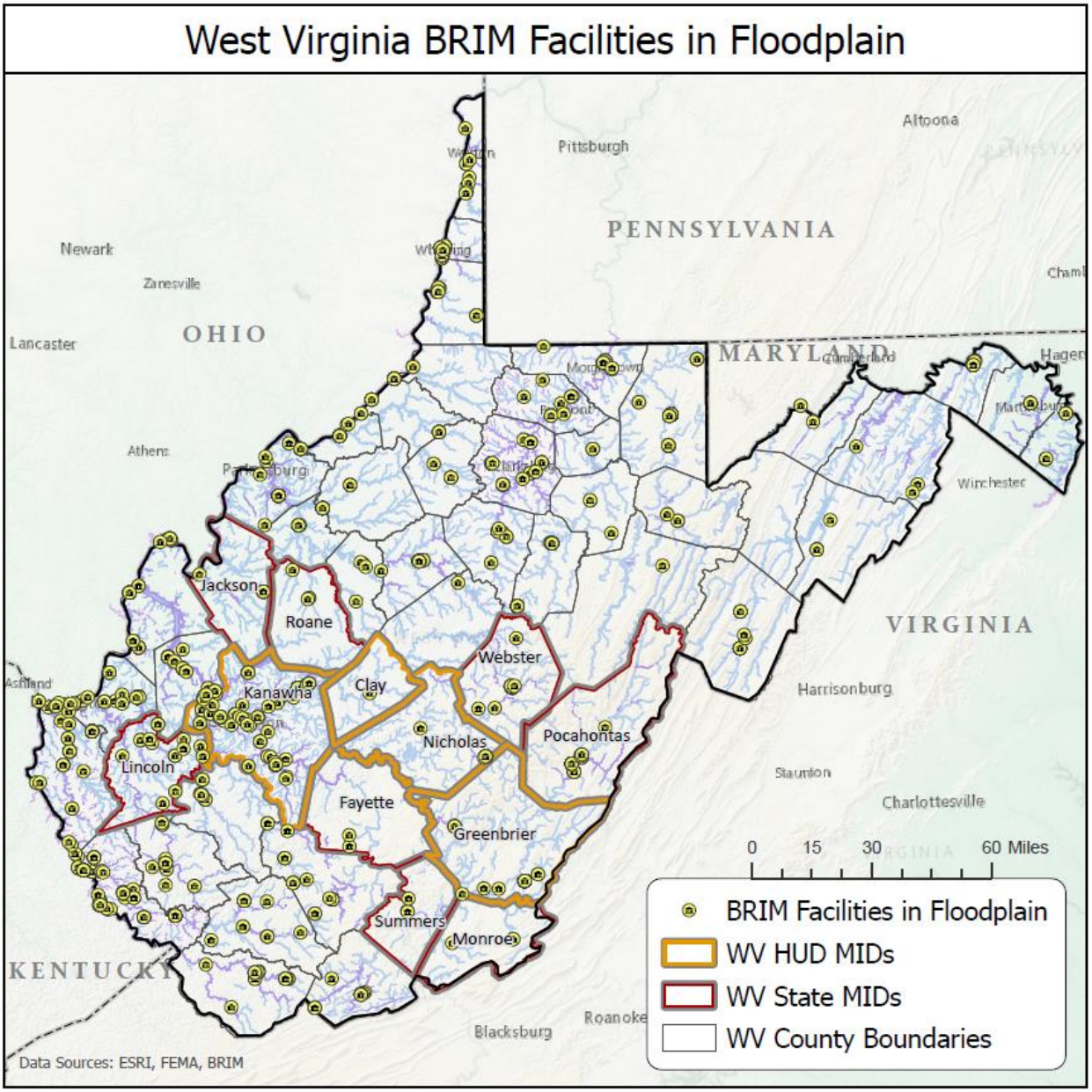
Future Risk

A comprehensive source of state facility information is maintained in a database by the West Virginia Board of Risk and Insurance Management (BRIM). This database stores facilities information for over 15,000 records and tracks structure value, value of the contents, and other key data points. As part of an assessment for future risk, the locations of these facilities within floodplains were identified. Those within 1% and 0.2% chance flood zones are highlighted in Figure 10 below.

[17] FEMA RiskMap "Understanding Flood Dangers in Central West Virginia, Lessons Learned from the June 2016 Flood", Accessed from: https://www.fema.gov/media-library-data/1541185743622-4dac85e81afe3034a6799d8b5b9df2bf/Region_III_WV_FloodReport.pdf

[18] West Virginia Community Development Block Grant- Disaster Recovery Action Plan, accessed June 16th, 2020 from https://wvfloodrecovery.com/useful-resources/

Figure 10: West Virginia Board of Risk and Insurance Management (BRIM) Facilities in Floodplains

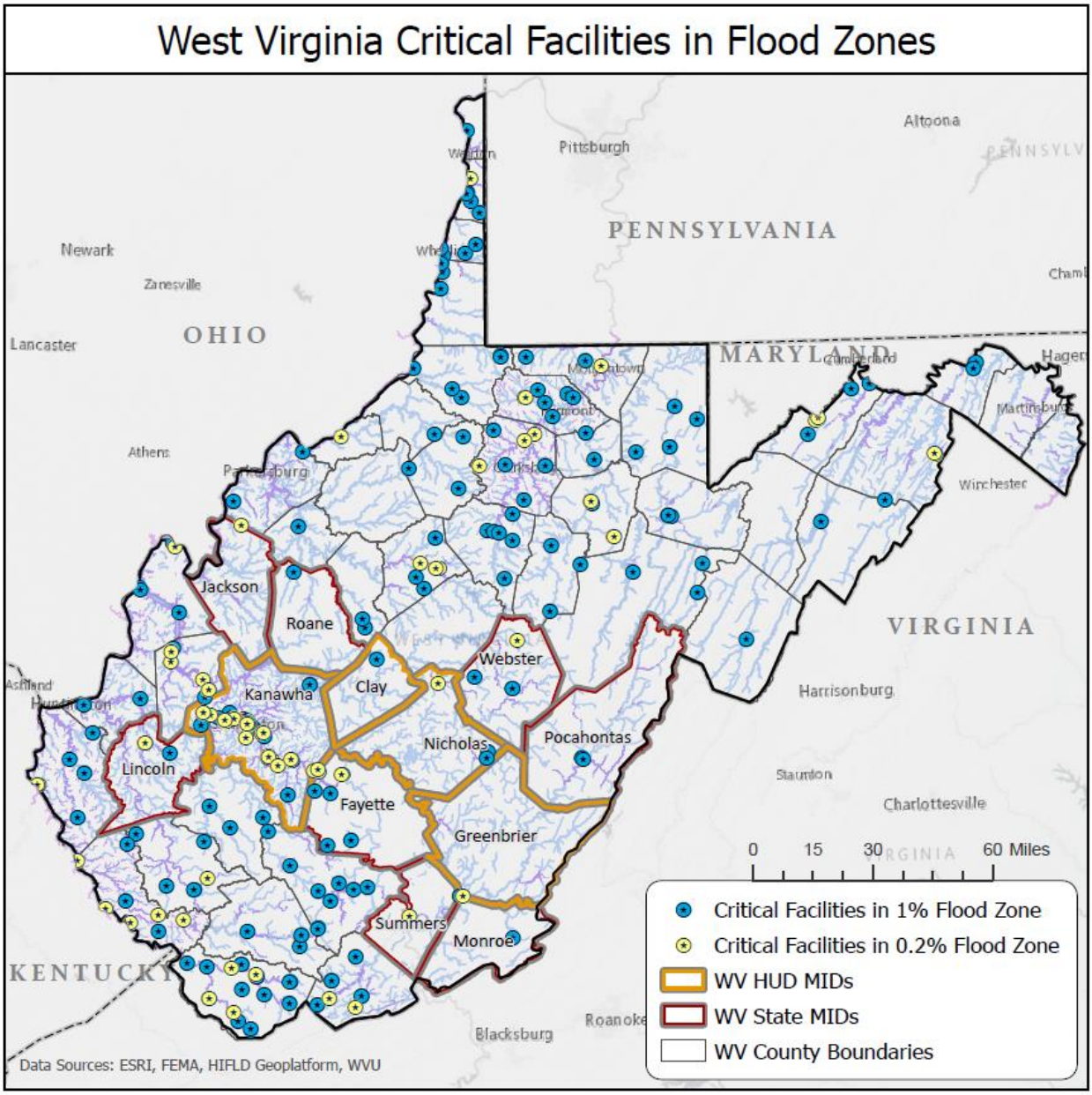


Across the state, there are over 1,200 total BRIM facilities in floodplains, with nearly 500 of those located in the State and HUD MIDs, specifically in Kanawha County. This underscores the importance of proactive steps to increase the resilience of current and planned infrastructure and community services to ensure that losses from future flood events can be minimized.

In addition to BRIM facilities at risk, the state also analyzed critical facilities located in the flood zones. Critical facilities included in this analysis are fire departments, medical facilities, and law enforcement locations, but the state recognizes there is a wide array of various other critical

facility types beyond these. This sample of critical facilities that are located within floodplains is shown in Figure 11.

Figure 11: West Virginia Fire, Medical, and Law Enforcement Facilities Located in Flood Zones



This analysis shows that there are 192 Critical Facilities in floodplains located in State MIDs and 277 located within the HUD MIDs. These findings highlight the need for mitigation activities that minimize flood impact and ensure these facilities can continue to operate during flooding events.

In its assessment related to flood mitigation efforts, West Virginia is required to consider high wind and continued sea level rise. As an inland state with no coastline, sea level rise will not directly impact West Virginia, as the State's flood risk is related to flash flooding and riverine flooding

events caused by heavy precipitation. However, based on the history of flood mitigation efforts and the frequency and intensity of precipitation events, the State conducted an analysis of how potential future precipitation may impact the state to further support responsible floodplain and wetland management.

Impact of Climate Change on Precipitation

An analysis of climate change projections, as discussed earlier, indicate that average annual precipitation is likely to increase statewide in the coming decades, and that the incidence of extreme rainfall events is also projected to increase. These projected changes in precipitation further increase the risk of flood events and the potential increases in property damage, disruption of critical services, and loss of life.

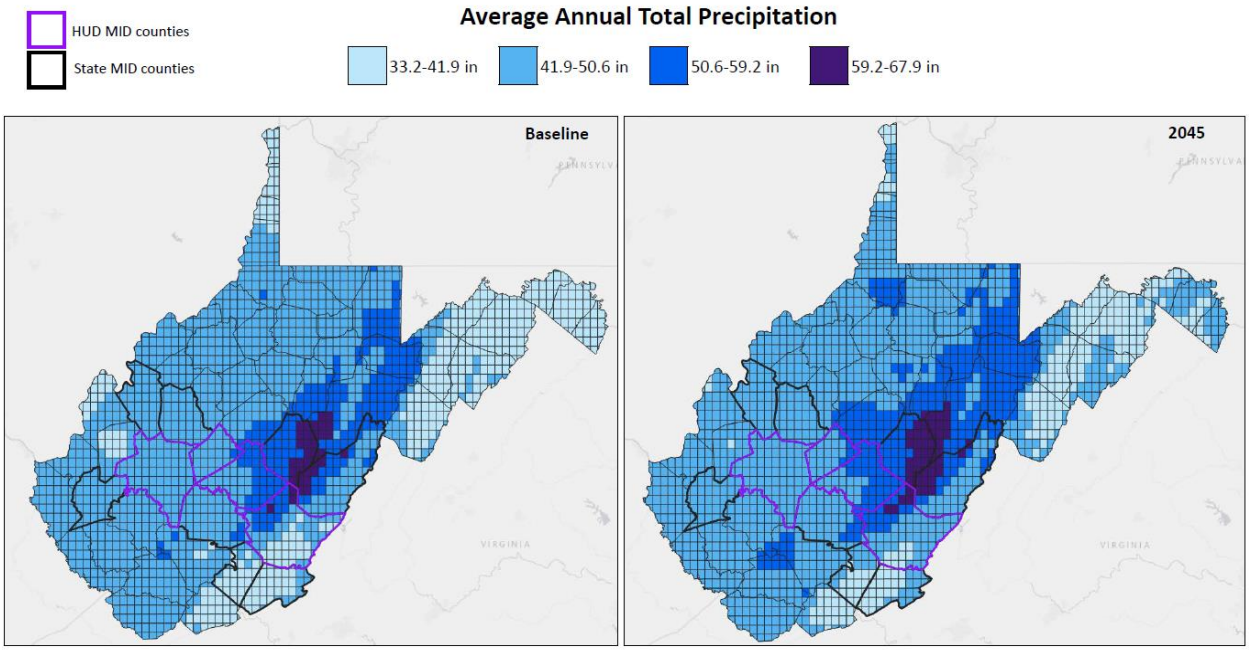
The State conducted an analysis to assess how future precipitation may impact different regions of the state under a conservative, high emissions scenario (RCP 8.5). The analysis examined projected change in annual average precipitation and projected change in levels of extreme precipitation from baseline levels. A data processing tool was used to synthesize observed precipitation data and model outputs from 32 global climate models and downscale these projections to the state and county level.

Under these assumptions annual average rainfall is expected to rise under future climate change, with the risk of extreme precipitation events increasing in state and HUD-designated MIDs. Figure 12 shows that as average annual precipitation levels rise, more of the state will have total rainfall of 50.6 inches or more per year, with an average increase of 2.1 inches of rainfall statewide. Projections for extreme rainfall indicate a consistent increase across the state of the annual number of days experiencing heavy precipitation. Figure 13 shows that the frequency of extreme rainfall events will increase in HUD and State-designated MIDs, further increasing the potential risk of hazard events in priority locations for mitigation.

Values in Figure 12 are calculated using the annual average of cumulative precipitation per year. Historical observed values are shown for the baseline (1986-2005). Projected values are shown for 2045 (2036-2055) for a continued high-emissions scenario in the future (RCP 8.5). Comparing the two figures, projections indicate an increase in average annual total precipitation across the state of West Virginia with highest levels of annual precipitation remaining in the eastern regions of the

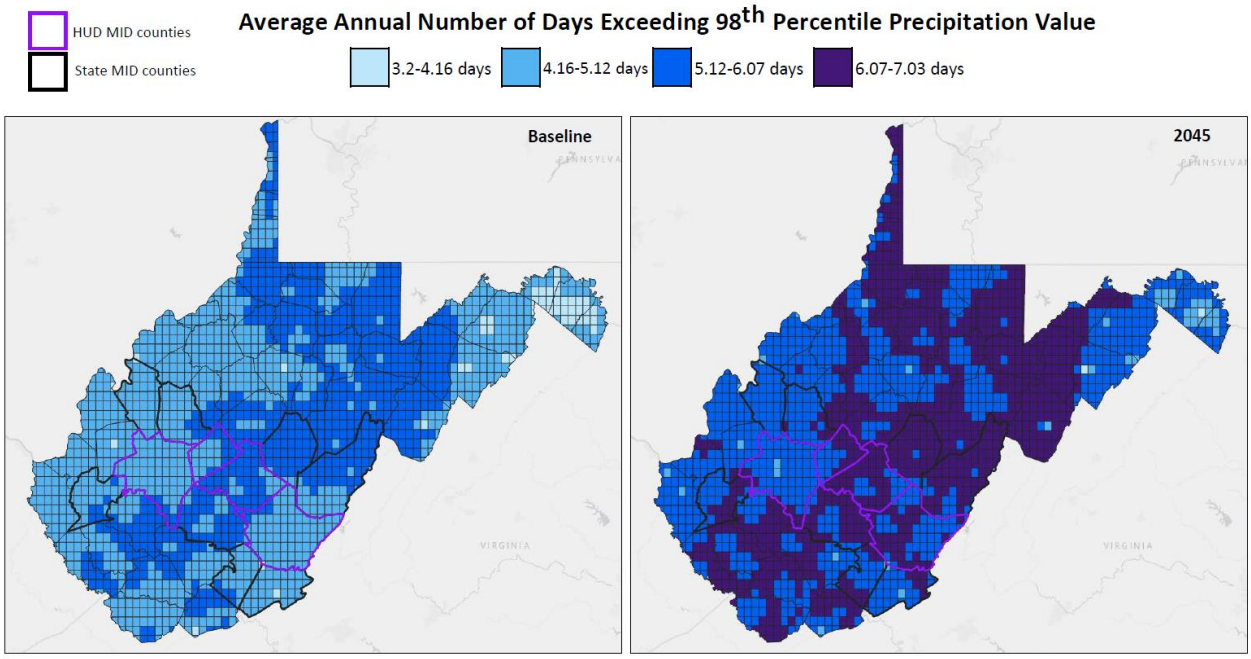
state. The average projected change in annual total precipitation across the state is an increase of 2.1 inches.

Figure 12. Projected Change in Average Annual Total Precipitation for West Virginia (inches) Between Baseline and 2045 (under high emission climate change scenario RCP 8.5)



Source: ICF ClimDa Maps produced with Baseline Data from Liyneh, et.al. and Projected Data from Pierce, et.al.

Figure 13. Average Annual Number of Days Exceeding the Observed 98th Percentile Precipitation Value for West Virginia Between Baseline and 2045 (under high emission climate change scenario RCP 8.5.)



Source: ICF ClimDa Maps produced with Baseline Data from Liyneh, et.al. and Projected Data from Pierce, et.al.

Values here represent the average annual number of days exceeding the observed (1986-2005) 98th percentile precipitation value. Historical observed values are shown for the baseline (1986-2005). Projected values are shown for 2045 (2036-2055) for a continued high-emissions scenario (RCP 8.5). Comparing the two figures, projections indicate a consistent increase across the state of the annual number of days experiencing precipitation amounts at or above the observed 98th percentile precipitation value. The average projected change is an increase of 1.09 days.

Severe Storms

Overview of Hazard

In West Virginia's 2018 Statewide Hazard Mitigation Plan, the West Virginia Division of Emergency Management (EMD) categorizes severe storms and subsequent risks associated as those that result from thunderstorms, lightning, hail, tornadoes, high winds, hurricanes and tropical events.

High winds, thunderstorms, lightning, hail, tornadoes, and remnants of hurricanes can impact widespread areas of the state quickly and without sufficient warning. Thunderstorms and hurricanes can lead to flooding, fires can occur as a result of lightning strikes, and significant structural damage to critical facilities, homes, and businesses are possible. Severe storms also result in power outages which impact emergency response operations, critical communications, and safety and security of the community.

Historical Impact

Historically, property damage is the largest impact severe storms have had in the state. Structures that are most often impacted are lightweight, such as outbuildings, mobile homes and new light weight construction. Strong winds have caused a variety of secondary events where wind blows trees down and impacts power lines or blocks roadways, thereby disrupting provision of critical services to impacted communities. Wind also frequently causes damages to home exteriors such as roofs and sidings.

Severe storms have historically posed significant risks to West Virginia. Because severe storms are encompassing of hazards that bring heavy rains and significant flooding, the data regarding annualized loss for severe storms in the 2018 West Virginia State Hazard Mitigation plan mirrors the data captured in Figure 8 in the section above for flooding. However, several other weather events such as tornadoes and hurricanes still impact the State in a variety of ways. Figure 14 shows one such example with the historical impact of tornadoes that have been recorded from 1970 – 2020 across the state.

Figure 14: Historical Impact of Tornadoes in West Virginia, Identifying Damage Levels

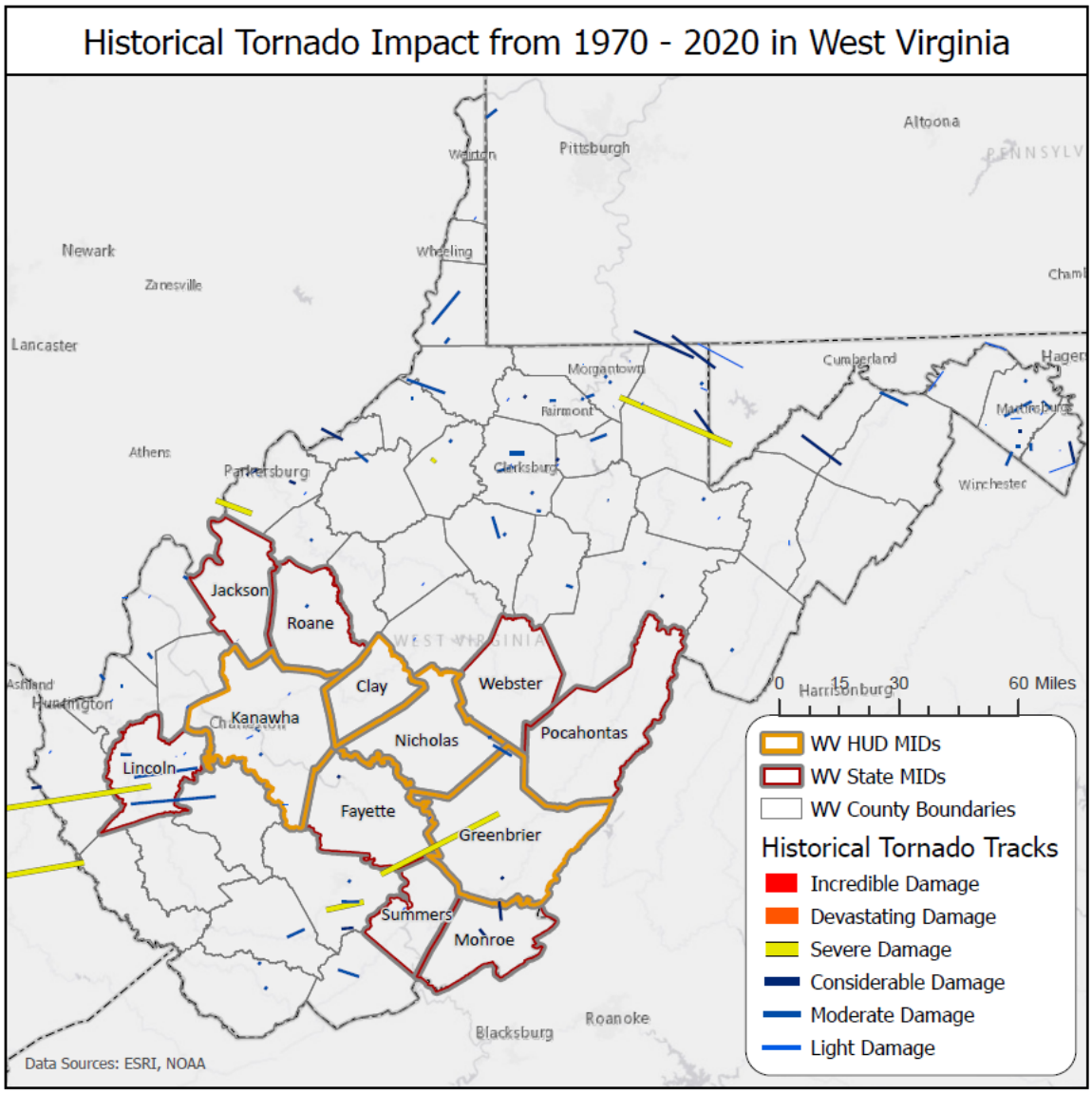


Figure 14 above highlights the paths that tornadoes have taken historically across the state to highlight the locations most susceptible. While tornadoes are not as frequent in volume for the state, they still occur and are representative of the type of damages that severe windstorms can have, specifically to susceptible infrastructure. Table 11 below quantifies damages from wind events from 2000 to 2016 by the five Regional Planning and Development Councils that contain a MID County.

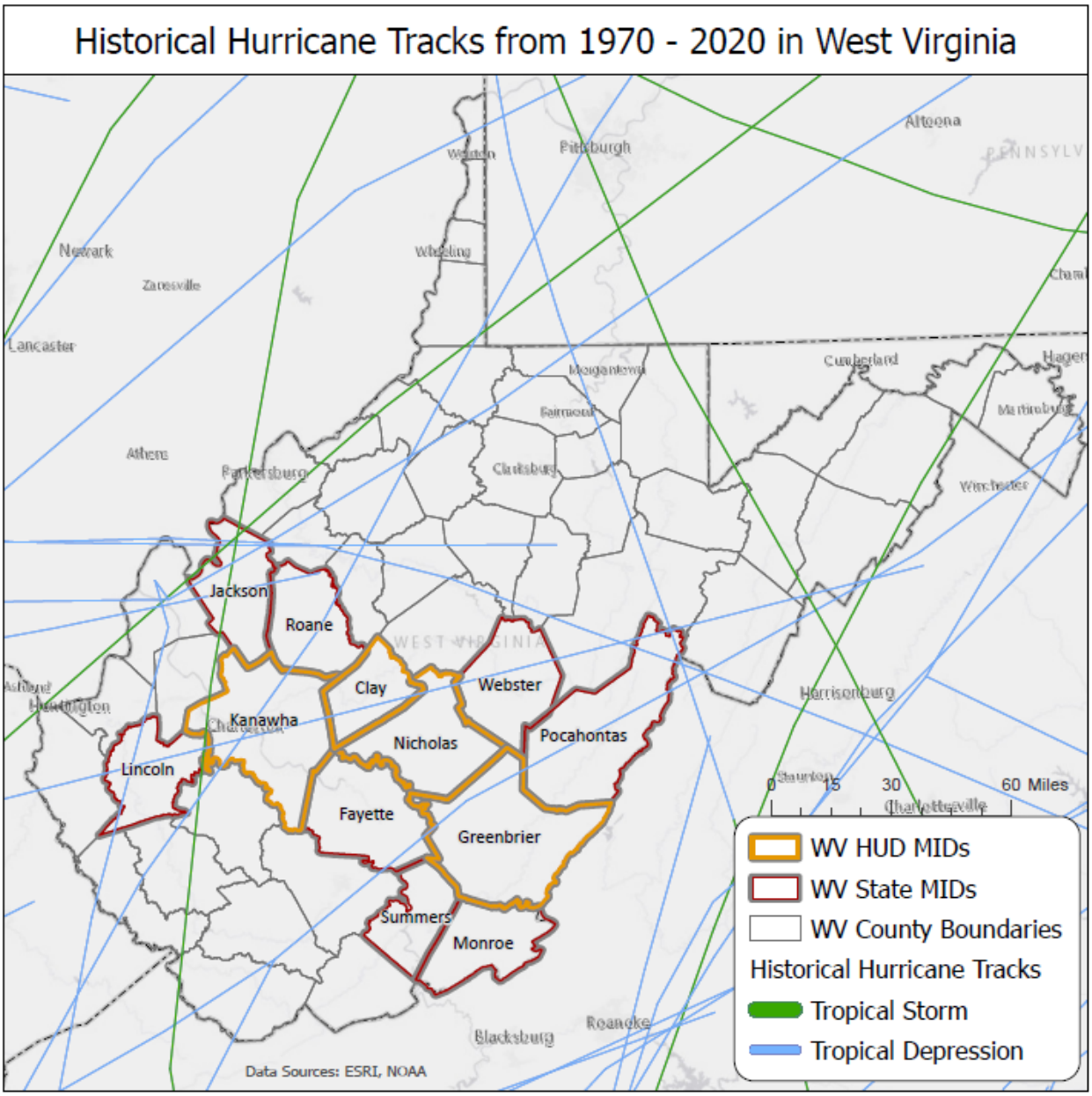
Table 11: Wind Damages 2000 - 2016 by MID-Containing Regional Planning & Development Council

RPCD Region	Damages
1	$8,155,400
2	$10,651,010
3	$189,014
4	$9,282,900
5	$15,164,000

Source: West Virginia 2018 Hazard Mitigation Plan

In addition, while West Virginia is not a coastal state, there is still a potential for residual impacts of hurricanes and tropical depressions as remnants of weather systems move through the state. By the time a hurricane moves from the coastline over West Virginia, it has most likely weakened. However, tropical storms can still have sustained winds from 39 to 73 mph, and depressions have sustained winds of less than 39 mph. Both of these low-pressure systems can be accompanied by significant rainfall and carry the same threat of impacts discussed in the flooding section of this assessment and pose similar dangers as hurricanes, but with reduced threat from wind speeds. To highlight this risk, Figure 15 shows historical hurricane tracks that have passed over West Virginia.

Figure 15: Historical Hurricane Tracks Over West Virginia Since 1970



Future Risk

The 4th National Climate Assessment indicates that the strongest hurricanes are anticipated to become both more frequent and more intense in the future, with greater amounts of precipitation, tropical storm activity, and more severe thunderstorms and tropical storms in the state. These state-wide findings are underscored by the precipitation projections at the county level discussed above. The increasing intensity of storm events will contribute to higher costs of

damage throughout the region.[19] To minimize losses to buildings and facilities, mitigation measures should be considered to lessen the impact of tropical storms and depressions.

Winter Weather

Overview of Hazard

Hazardous winter weather includes a combination of heavy snows (defined in the 2018 SHMP as more than eight (8) inches of accumulation in less than 24 hours), ice and extreme cold. Heavy snow can impact transportation by impeding roadways and creating dangerous conditions and also cause structural damage by knocking down trees, utility lines, or causing collapse in buildings not designed to withstand the weight of the snow. In West Virginia, it is typical for extreme cold to involve temperatures below 0° Fahrenheit; these frigid temperatures threaten the population—particularly groups that are poor or physically vulnerable—with hypothermia, frostbite, carbon monoxide poisoning, and heart attacks from overexertion.[20]

Rapid melting or a rain event after heavy snowfall can also result in substantial flooding, especially along small streams and in urban areas where there are not as many porous surfaces. The risks of flooding from snow should be considered similar to the impacts assessed in the Flooding section of this Action Plan.

Historical Impact

Using data from NOAA's National Centers for Environmental Information (NCEI) Storm Event Database and data from the 2018 SHMP, the state of West Virginia determined the annual number of winter weather events based on historical impact and the annualized cost associated (total of both property and crop losses). Figure 16 below displays the annualized loss by county related to winter weather.

Based on Figure 16, MID counties with the highest annualized loss from winter weather are Kanawha, Jackson and Fayette. These counties are areas of the state where mitigation measures to reduce the impact of winter weather may have the greatest benefit.

[19] Dupigny-Giroux, L.A., E.L. Mecray, M.D. Lemcke-Stampone, G.A. Hodgkins, E.E. Lentz, K.E. Mills, E.D. Lane, R. Miller, D.Y. Hollinger, W.D. Solecki, G.A. Wellenius, P.E. Sheffield, A.B. MacDonald, and C. Caldwell, 2018: Northeast. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 669–742. doi: 10.7930/NCA4.2018.CH18
On the Web: https://nca2018.globalchange.gov/chapter/northeast

[20] Snowstorms & Extreme Cold, Accessed June 6th, 2020 from: https://www.ready.gov/winter-weather

Figure 16: Annualized Loss Due to Winter Weather in West Virginia

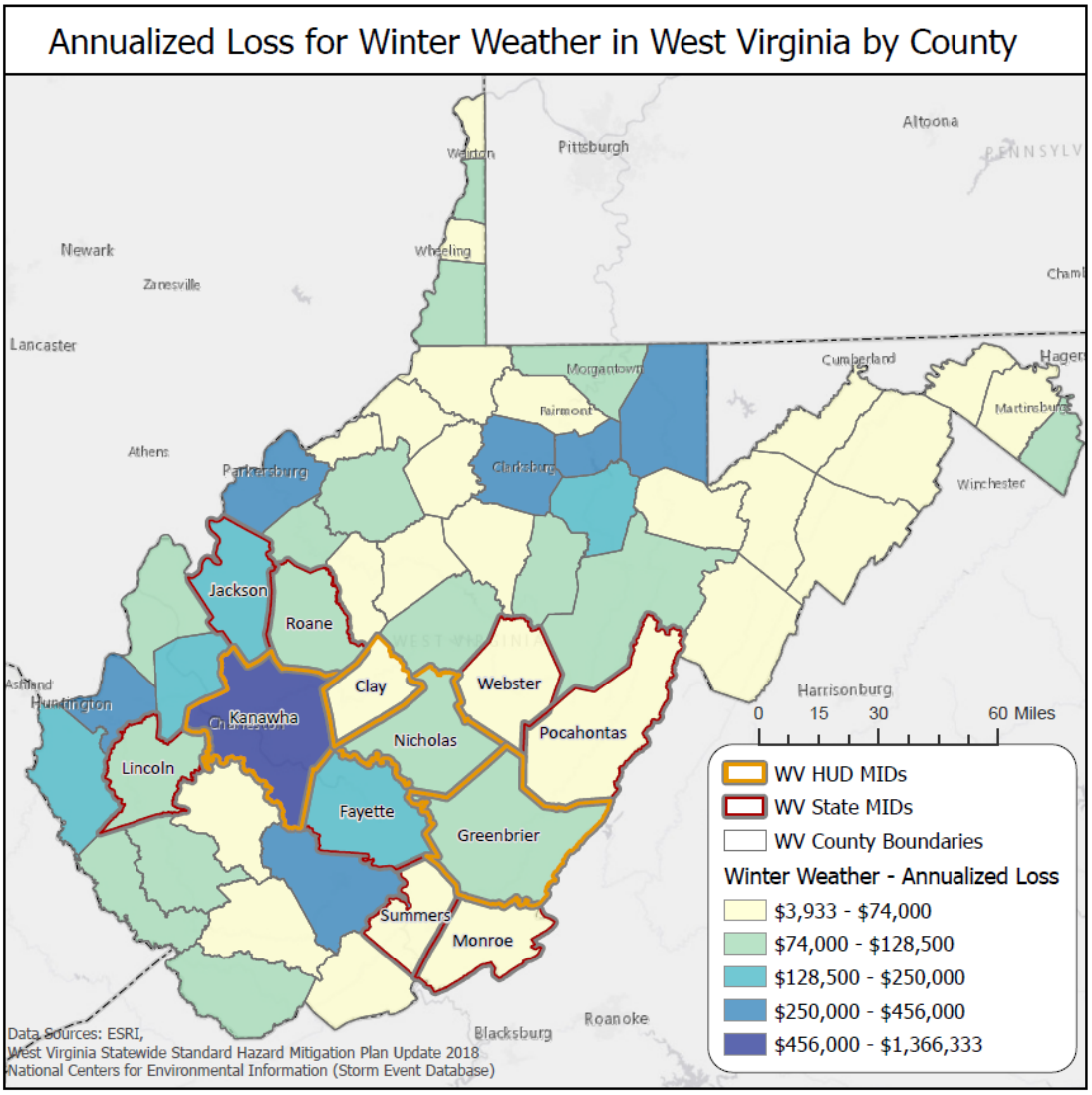


Table 12 below shows the breakdown of loss by property and number of winter weather events for MID counties in West Virginia.

Table 12: Annualized Events and Costs of Winter Weather in West Virginia MID Counties

County	Winter Weather Events	Property	Crop	Annualized Events	Total Cost	Annualized Cost
Kanawha	445	$28,693,000	$0	21.19	$28,693,000	$1,366,333
Jackson	163	$4,299,000	$0	7.76	$4,299,000	$204,714
Fayette	130	$3,410,000	$0	6.19	$3,410,000	$162,381
Nicholas	89	$2,418,000	$15,000	4.24	$2,433,000	$115,857
Roane	110	$2,424,000	$0	5.24	$2,424,000	$115,429
Greenbrier	210	$2,207,000	$100	10	$2,207,100	$105,100
Lincoln	152	$2,043,000	$0	7.24	$2,043,000	$97,286
Webster	80	$1,356,000	$0	3.81	$1,356,000	$64,571
Clay	86	$1,151,000	$0	4.1	$1,151,000	$54,810
Monroe	100	$1,049,000	$5,300	4.76	$1,054,300	$50,205
Pocahontas	46	$933,000	$0	2.19	$933,000	$44,429
Summers	98	$554,000	$0	4.67	$554,000	$26,381

Key | HUD MID | State MID

Source: NOAA NCEI and West Virginia 2018 SHMP.

Future Risk

Under future climate change, as annual average temperatures increase, winters are expected to become milder, with less seasonal differentiation (see discussion of temperature changes in the Drought section below). These changes may reduce the incidence of severe snowstorms but increase the incidence of rainfall during early and late winter, with implications for snowpack and the overall ecology of West Virginia forests and other natural areas.[21] The economic impacts of these changes extend to key sectors of the state's economy, including tourism, forestry and agriculture, with implications for the welfare and adaptive capacity of West Virginia communities.

[21] Dupigny-Giroux, L.A., E.L. Mecray, M.D. Lemcke-Stampone, G.A. Hodgkins, E.E. Lentz, K.E. Mills, E.D. Lane, R. Miller, D.Y. Hollinger, W.D. Solecki, G.A. Wellenius, P.E. Sheffield, A.B. MacDonald, and C. Caldwell, 2018: Northeast. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 669–742. doi: 10.7930/NCA4.2018.CH18
On the Web: https://nca2018.globalchange.gov/chapter/northeast

Landslides and Land Subsidence

Overview of Hazard

The term "landslide" describes a wide variety of processes that result in the movement of slope-forming materials including rock, soil, artificial fill, or a combination of these which can have a negative impact on the surrounding infrastructure.[22] The materials may move by falling, toppling, sliding, spreading, or flowing and are primarily associated with mountainous regions like West Virginia. Debris flows generally occur during intense rainfall on water saturated soil and can accelerate to speeds as great as 35 miles (56 km) per hour.[23] Land subsidence is vertical earth movement that is a result of increased stresses in the soil mass, or loss of shallow soil support when large amounts of groundwater have been withdrawn from the sediment.[24] Land subsidence primarily occurs in two types of areas: abandoned mines or karst areas underlain by carbonate rocks (limestone and dolomite).

The risks associated with both landslides and subsidence can typically be directly linked to flooding events in the state and can cause significant damage to highways, buildings, homes, and other structures that support a wide range of economies and activities.[25]

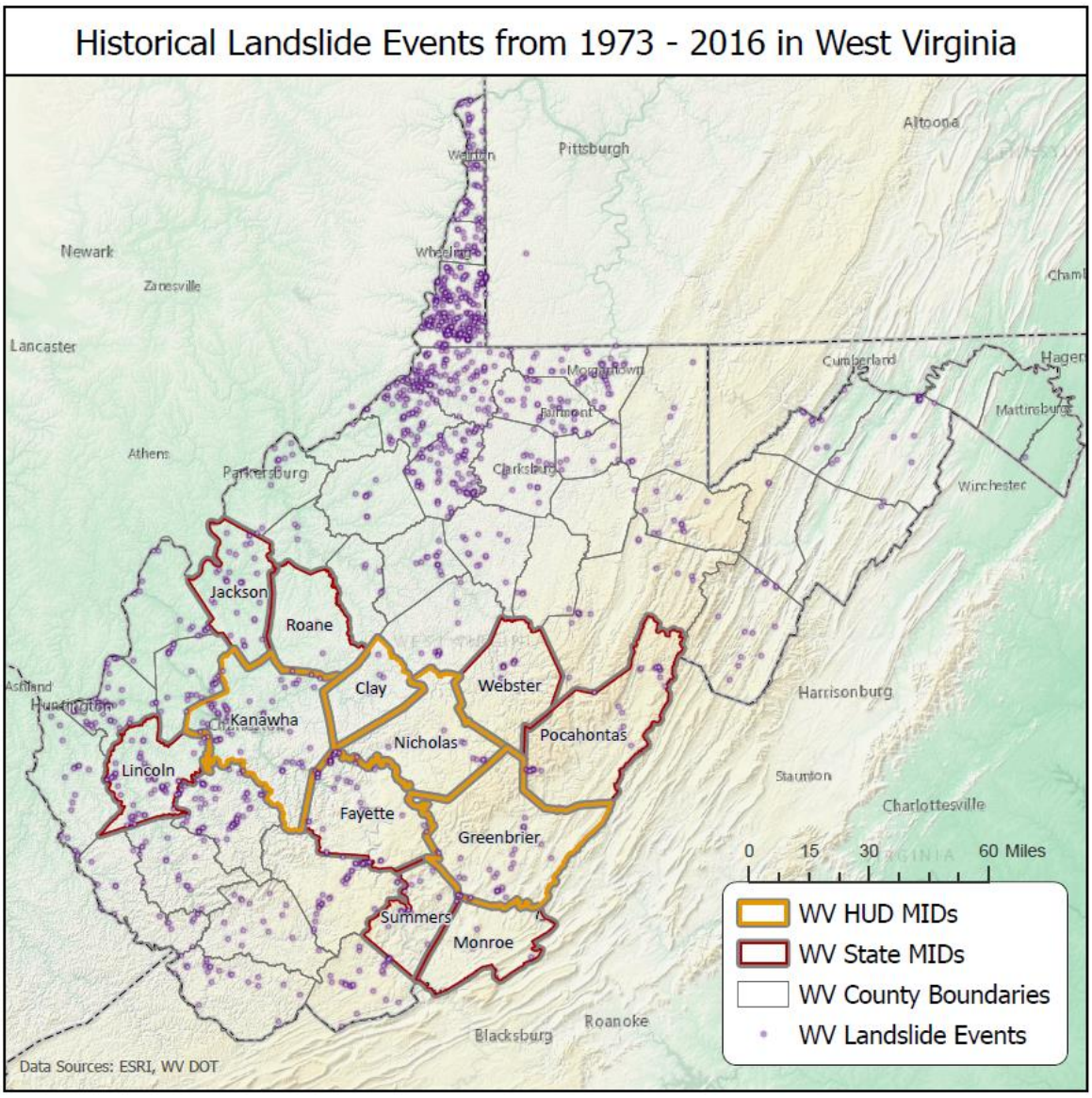
Historical Impact

Landslide is a major geological hazard in West Virginia as nearly all of the state exists in a zone of high landslide incidence. Landslides have historically posed a significant threat to those living in mountainous regions of the State and their property.

Most of West Virginia is susceptible to landslides. As part of an effort to develop a comprehensive database documenting landslide occurrence in the State, West Virginia developed the "West Virginia Landslide Tool" which documents landslide susceptibility and maps locations of previously occurring events on record. Figure 17 below shows the historical record of landslide events across the state from 1973 to 2016 that were collected by the WV Department of Transportation.

[22] U.S. Department of the Interior, U.S. Geological Survey, Fact Sheet 2004-3072, July 2004
[23] Landslide Hazards, U.S. Geological Survey Fact Sheet 0071-00, Version 1.0
[24] https://www.usgs.gov/special-topic/water-science-school/science/land-subsidence?qt-science_center_objects=0#qt-science_center_objects
[25] West Virginia Statewide Hazard Mitigation Plan, p. 138, Accessed on 6/4/2020 from: https://dhsem.wv.gov/MitigationRecovery/Documents/WV%20State%20Hazard%20Mitigation%20Plan%20FINAL%2011-2018.pdf

Figure 17: Historical Landslide Events in West Virginia



Both Kanawha and Clay County noted in their respective Regional Planning and Development Council Mitigation Plan that landslides were a high risk. This coincides with the data in the figure above which shows these areas as having frequent landslide occurrences. While great strides have been made to observe historical data to pinpoint locations of previous landslide occurrences. Several regional level hazard mitigation plans noted that specific loss data is difficult to quantify. West Virginia's RPCD Region 1 2017 Hazard Mitigation Plan for example, where Lincoln County is located, noted that due to the limited data available for this type of hazard, losses and damages sustained by land movements are difficult to calculate.[26]

[26] West Virginia Region 2 Planning & Development Council 2017 Multi-Jurisdictional Hazard Mitigation Plan, p. 157

Future Risk

Because landslides are triggered in part by severe rainfall events, the risk of landslides can be expected to increase as the incidence of extreme weather increases. An increase in potential flooding events can be assumed to cause increasing landslide events. Additional planning will be needed to further understand the consequences and impacts that varying levels of landslide (extent, magnitude, location, frequency, etc.) will continue to have on the State.

Wildfire

Overview of Hazard

A wildfire is an uncontrolled fire in areas of vegetation such as woodlands, grasslands, or brush that commonly burn in excess of 50 acres. West Virginia is dominated by hardwood forests which bring in billions of dollars in significant economic benefit from areas such as the wood products industry, wildlife- and forest-related recreation, and selling of specialty forest products.[27] West Virginia's forests also provide an overall benefit of improved air and water quality that results from heavily forested areas. For this reason, wildfires pose a significant risk should they occur. However, West Virginia's 2018 SHMP notes that wildfires in the state have not affected large areas since the early 1960s.

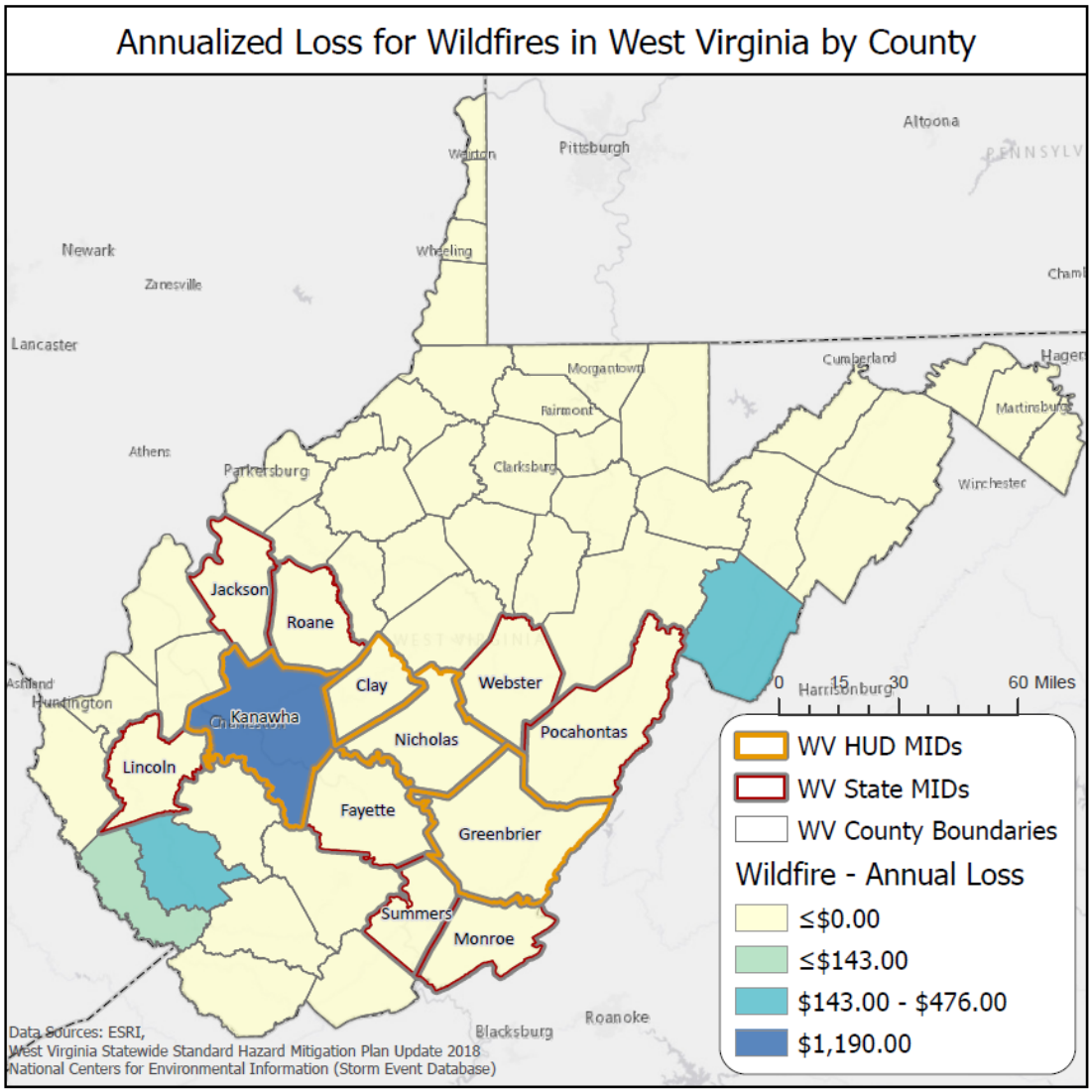
Historical Impact

Wildfires are most common during warm months of the year but can occur year-round, dependent on weather. Wildfires impact the state in a variety of ways, but the main impacts are damage or destruction of structures both in the wild and urban interface, and residual health impacts to the community from smoke. Injury and death are also potential threats for people unable to escape wildfires.

While wildfires pose a significant threat to West Virginia should they occur, data from NOAA's National Centers for Environmental Information (NCEI) Storm Event Database and from the 2018 SHMP is sparse regarding property damage as a result of wildfire. However, Figure 18 below notes the few pieces of recorded data for annualized wildfire losses in the state.

[27] West Virginia Statewide Hazard Mitigation Plan, p. 201, Accessed on 6/4/2020 from: https://dhsem.wv.gov/MitigationRecovery/Documents/WV%20State%20Hazard%20Mitigation%20Plan%20FINAL%2011-2018.pdf

Figure 18: Annualized Loss Due to Wildfires in West Virginia



The WV 2018 SHMP notes that fires in the state are rarely the result of natural causes, and that statistics collected by the West Virginia State Fire Marshal Office (WVSFMO) show that arson or negligence cause most structural fires, and they top the list for wilderness fires as well.[28] However, preparedness measures to ensure resilient wildland-fire suppression services are critical to more reliable responses to wildfires.

[28] West Virginia Statewide Hazard Mitigation Plan, p. 203, Accessed on 6/15/2020 from: https://dhsem.wv.gov/MitigationRecovery/Documents/WV%20State%20Hazard%20Mitigation%20Plan%20FINAL%2011-2018.pdf

Future Risk

The increase in annual average temperatures and in periods of extreme heat due to climate change may increase the risks of fires across West Virginia. The projected impact of climate change on temperature is discussed in the section below.

Drought

Overview of Hazard

A drought is a persistent and extended period of below normal precipitation causing abnormal moisture deficiency that results in adverse impacts on vegetation, animals and/or people.

NOAA defines droughts in four subdivisions or stages:

- Meteorological Drought: This drought stage is defined by a period of substantially diminished precipitation long enough to produce significant hydrologic imbalances. A meteorological drought generally occurs over months or years, during which moisture supply in a specific geography is below normal
- Agricultural Drought: This drought stage occurs when there is inadequate precipitation and/or soil moisture to sustain crop production systems, which can result in serious damage and economic loss to plant or animal agriculture.
- Hydrological Drought: This drought stage is a result of deficiencies in surface and subsurface water supply in sources such as stream flow, reservoirs, and ground water levels.
- Socio-economic Drought: This drought stage occurs when physical water shortages start to affect the health, well- being and quality of human life, or when the drought starts to affect the supply and demand of an economic product.

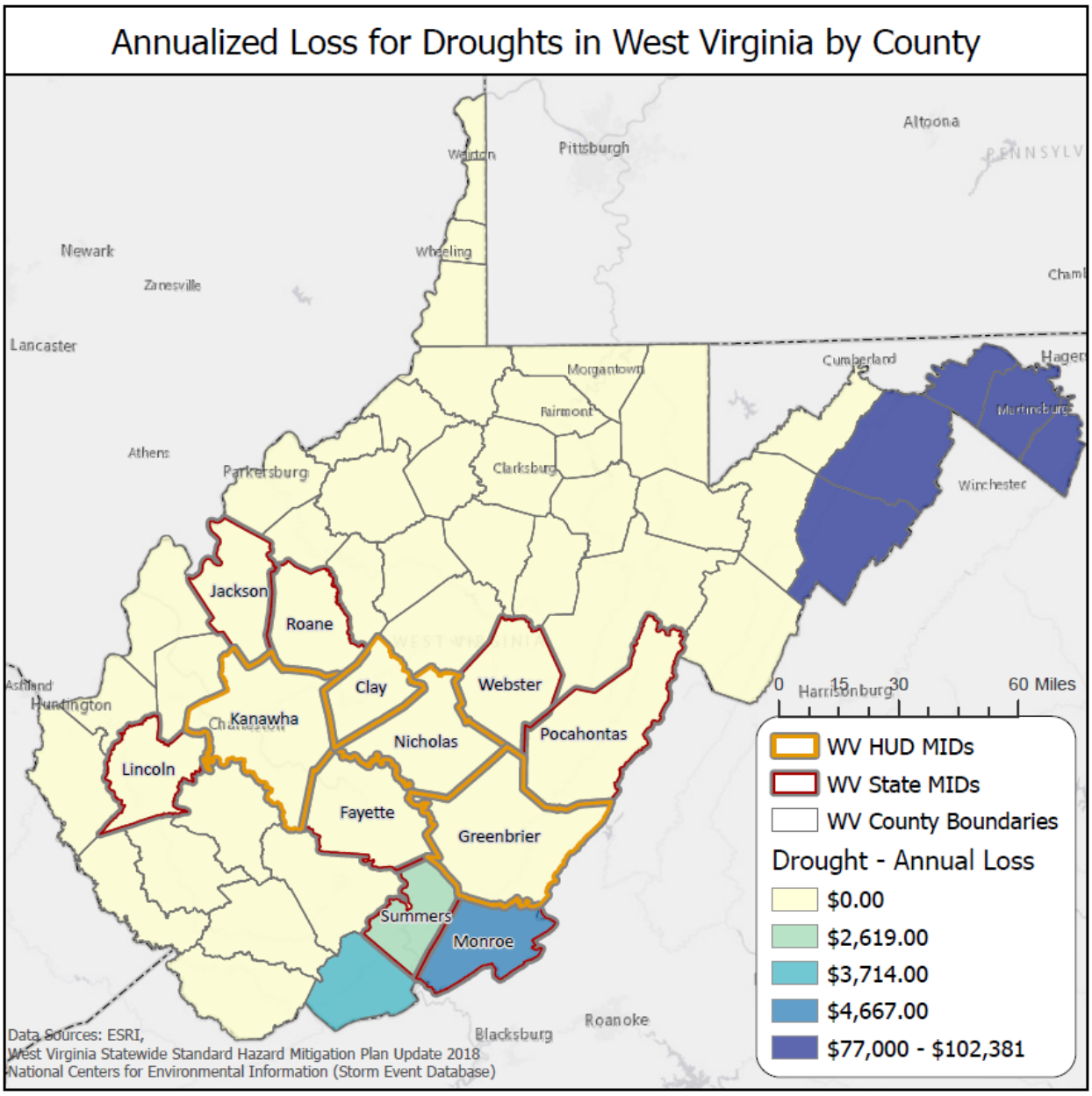
Extended droughts can severely diminish the amount of water in streams, reservoirs, and aquifers population. West Virginia is equally dependent on public ground water systems, private wells or cisterns and surface water for their water supply.[29]

Historical Impact

While West Virginia has only received two Federal Emergency declarations due to drought, the National Center for Environmental Information (NCEI) database includes over 500 records of drought events and over $12 million in crop damages across the state. Figure 19 below shows the annualized loss of droughts as reported in the 2018 West Virginia State Hazard Mitigation Plan.

[29] West Virginia Division of Homeland Security and Emergency Management (WVDHSEM) Emergency Operations Plan, Incident Specific Annex 6 Drought

Figure 19: Annualized Loss Due to Droughts in West Virginia



It should be noted that drought damages reported do not contain deaths, injuries or property damage based on NCEI datasets. This is further highlighted in Table 13.

Table 13: Annualized Events and Costs of Drought in West Virginia MID Counties

County	Drought Events	Property	Crop	Annualized Events	Total Cost	Annualized Cost
Monroe	7	$0	$98,000	0.33	$98,000	$4,667
Summers	7	$0	$55,000	0.33	$55,000	$2,619
Fayette	0	$0	$0	0	$0	$0
Jackson	15	$0	$0	0.71	$0	$0
Lincoln	14	$0	$0	0.67	$0	$0
Pocahontas	0	$0	$0	0	$0	$0
Roane	12	$0	$0	0.57	$0	$0
Webster	0	$0	$0	0	$0	$0
Clay	10	$0	$0	0.48	$0	$0
Greenbrier	0	$0	$0	0	$0	$0
Kanawha	14	$0	$0	0.67	$0	$0
Nicholas	0	$0	$0	0	$0	$0

Key: HUD MID | State MID

Source: NOAA NCEI and West Virginia 2018 SHMP.

Future Risk

Increased periods of drought are projected due to climate change despite projected increases in annual average rainfall. This is due to an increase in temperatures and periods of extreme heat. Increasing droughts can be expected to contribute to greater losses in agricultural production and stress on natural habitats. Availability of potable water may be a concern in areas dependent on shallow wells or surface water.

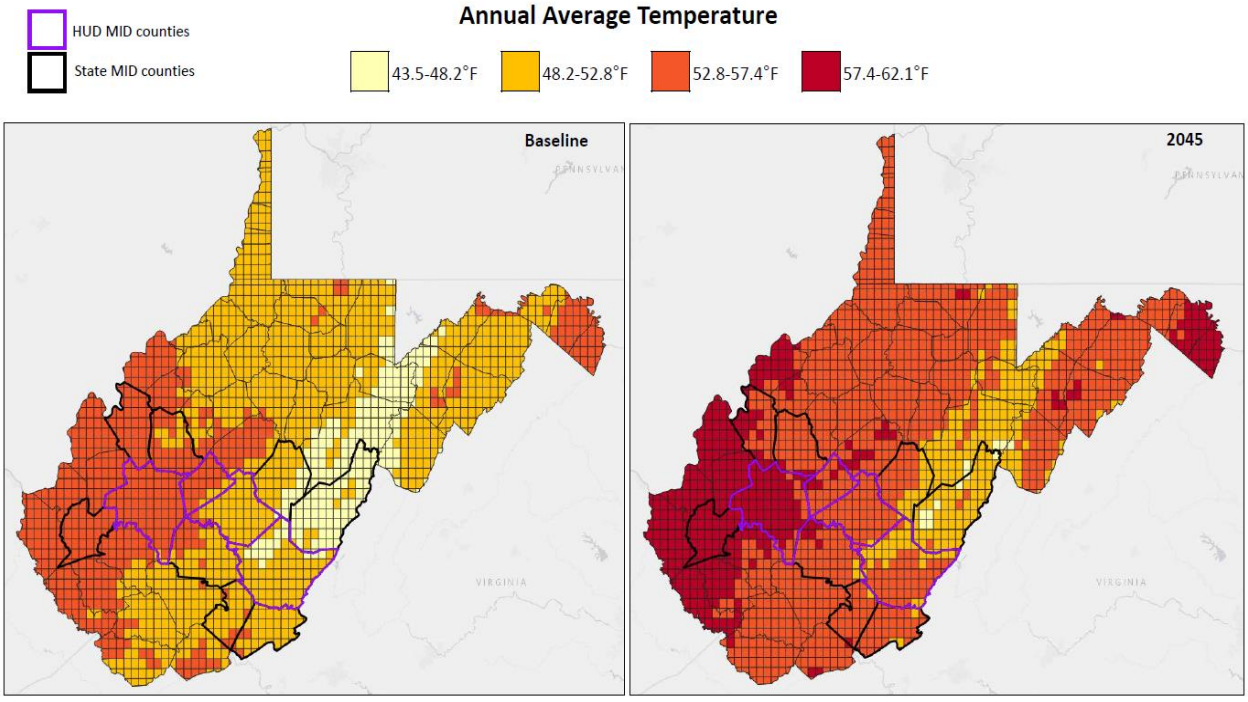
Impact of Climate Change on Temperature

An analysis of climate change projections, as discussed earlier, indicate that average temperature is projected to increase statewide in the coming decades; the degree of increase will depend on the level of global greenhouse gas emissions globally.

The State conducted an analysis to assess how future temperatures may impact different regions of the state under a conservative, high emissions scenario (RCP 8.5). The analysis examined projected change in annual average temperature and projected change in levels of extreme heat from baseline levels. A data processing tool was used to synthesize observed temperature data and model outputs from 32 global climate models and downscale these projections to the state and county level.

Temperatures are projected to increase statewide due to climate change, with periods of extreme heat exacerbating concerns regarding heat stress to vulnerable populations, increasing risk of wildfires, and drought conditions that may impact West Virginia's agricultural production, forests, and other habitats. Figure 20 shows a projected increase under a high emissions scenario of 4.1°F in annual average temperature across the state by 2045, with highest temperatures in the south-western regions of the state. Figure 21 shows an increase in the temperature of "Very Hot Days", indicating that observed high temperatures are projected to exceed at least 90°F in MID counties.

Figure 20: Observed and Projected Annual Average Temperature for West Virginia (°F)



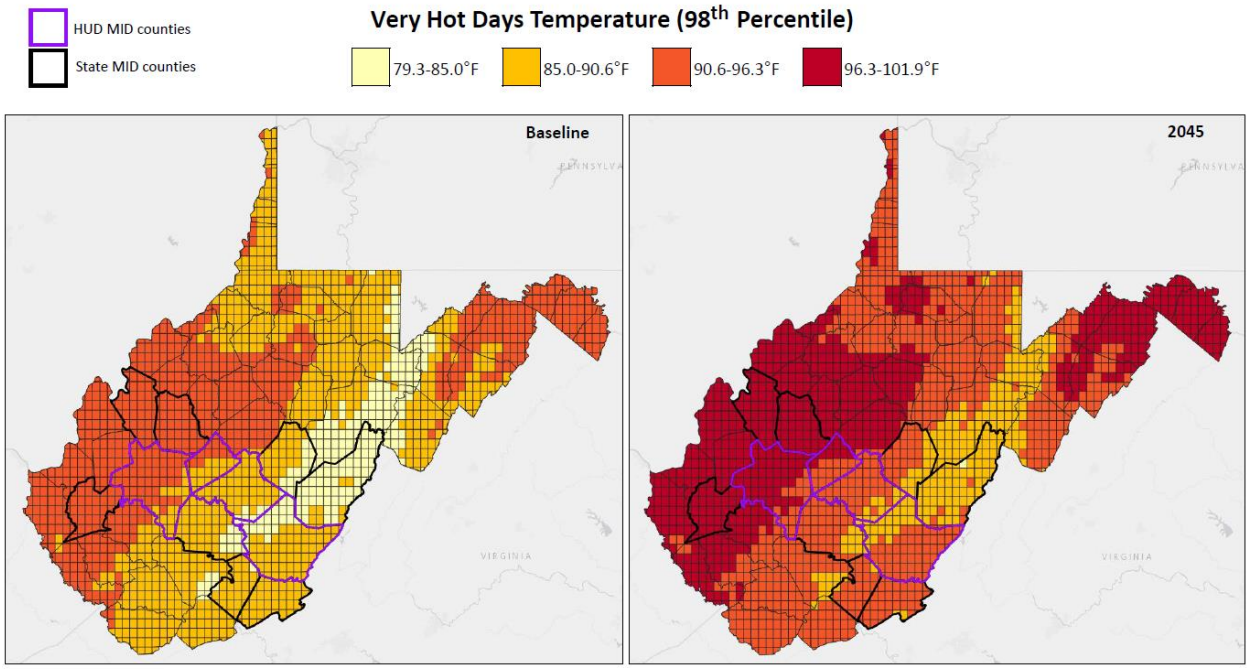
Source: ICF ClimDa Maps produced with Baseline Data from Liyneh, et.al. and Projected Data from Pierce, et.al.

Values are calculated here using the average of the daily maximum and minimum temperatures. Historical observed values[30] are shown for the baseline (1986-2005). Projected values[31] are shown for 2045 (2036-2055) for RCP 8.5. Comparing the two figures, projections indicate a consistent increase in annual average temperature across the state of West Virginia with highest annual temperatures remaining in the south-western regions of the state. The average projected change in annual average temperature is 4.1°F.

[30] Livneh B., E.A. Rosenberg, C. Lin, B. Nijssen, V. Mishra, K.M. Andreadis, E.P. Maurer, and D.P. Lettenmaier, 2013: A Long-Term Hydrologically Based Dataset of Land Surface Fluxes and States for the Conterminous United States: Update and Extensions, Journal of Climate, 26, 9384–9392.

[31] Pierce, D. W., D. R. Cayan, and B. L. Thrasher, Statistical Downscaling Using Localized Constructed Analogs (LOCA), Journal of Hydrometeorology, 15(6), 2558-2585, 2014.; and Pierce, D. W., D. R. Cayan, E. P. Maurer, J. T. Abatzoglou, and K. C. Hegewisch, 2015: Improved bias correction techniques for hydrological simulations of climate change. J. Hydrometeorology, v. 16, p. 2421-2442. DOI: http://dx.doi.org/10.1175/JHM-D-14-0236.1.

Figure 21: Temperature (°F) for a "Very Hot Day" in West Virginia.



Source: ICF ClimDa Maps produced with Baseline Data from Liyneh, et.al. and Projected Data from Pierce, et.al.

A "Very Hot Day" is defined as the 98th percentile of maximum temperature. Historical observed values are shown for the baseline conditions (1986-2005). Projected values are shown for 2045 (2036-2055) for high-emissions scenario (RCP 8.5) which assumes a lack of concerted efforts to cut greenhouse gas emissions. Comparing the two figures, projections indicate a consistent increase in the 98th percentile maximum temperature across the state of West Virginia.

Earthquake

Overview of Hazard

An earthquake is the shaking of the surface of the Earth resulting from a sudden release of energy in the Earth's lithosphere that creates seismic waves. Shaking and ground rupture are the main effects created by earthquakes which can result in severe damage to buildings, injury to inhabitants of buildings, and damage to other rigid structures. The severity of the local effects depends on complex combinations of magnitude, the distance from the epicenter, and the local geological and geomorphological conditions.

Historical Impact

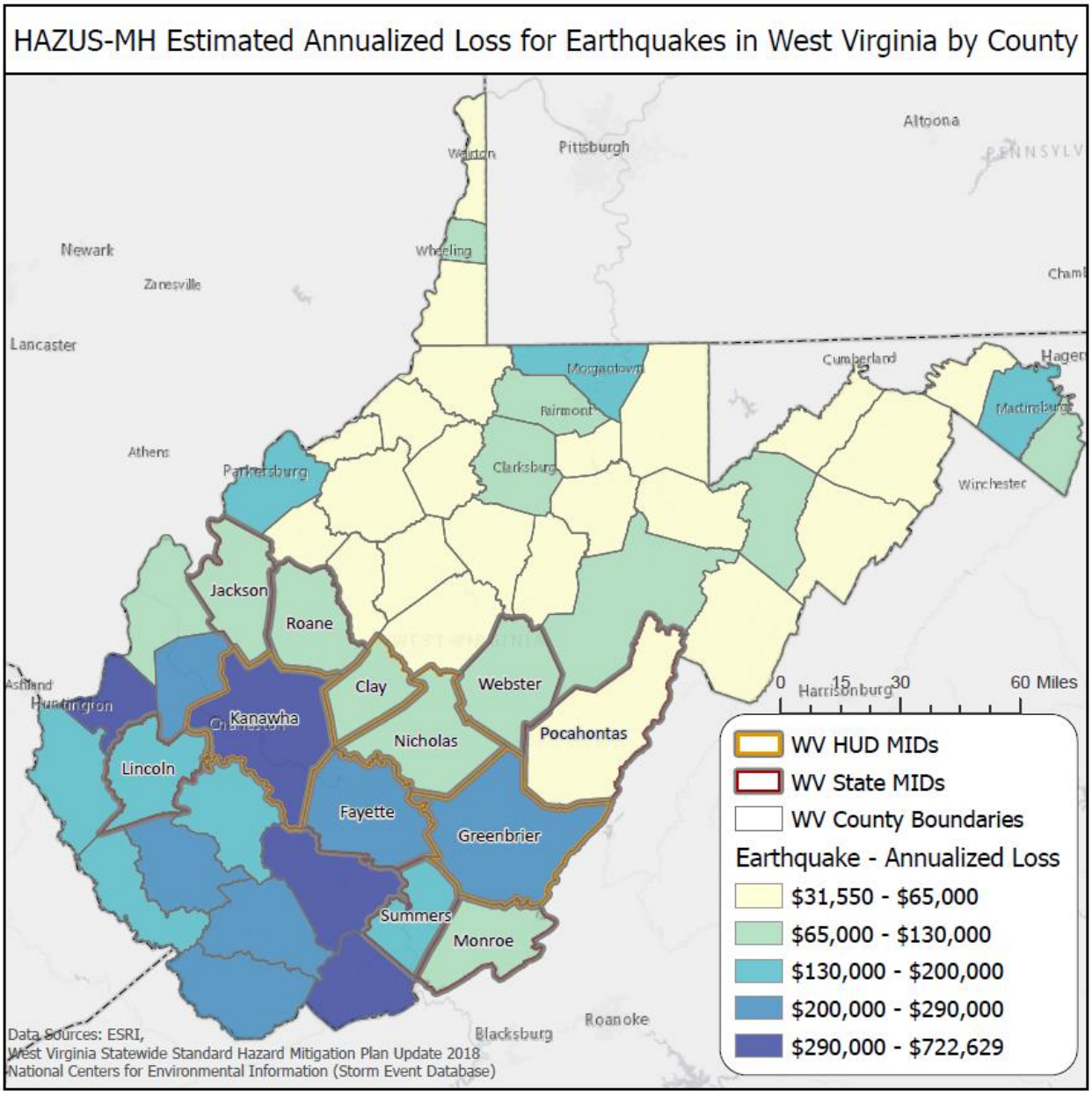
At time of this Action Plan's publishing, West Virginia has had no Federally Declared Disasters related to earthquakes. The National Center for Environmental Information (NCEI) also shows no recorded events for earthquakes in West Virginia. West Virginia has a moderate risk of seismic activity; however, any potential damage from this seismic activity is relatively low, when compared to states with more dense populations and tall buildings.

Future Risk

FEMA has developed a loss-estimation software known as HAZUS, which can run different scenarios to determine potential losses from various disasters. The HAZUS-MH earthquake model estimates damages and loss to buildings, lifelines, and essential facilities from scenario and probabilistic earthquakes.

By multiplying losses from eight potential ground motions by their respective annual frequencies of occurrence, and then summing the values – estimated annualized loss can be computed. As part of the WV 2018 SHMP, HAZUS results for the probabilistic annualized loss were run by county and are shown in Figure 22 below with respect to the MID counties.

Figure 22: Estimated Loss Due to Earthquake in West Virginia



Kanawha County has the highest estimated annualized loss due to earthquake, with the entire state could expect $7,159,176 in annualized losses due to earthquake.[32] With future growth in infrastructure, zoning and grading ordinances to avoid building in areas of potential hazard or to regulate construction to minimize potential for landslide is one non-structural method to reduce

[32] West Virginia Statewide Hazard Mitigation Plan, p. 266, Accessed on 6/15/2020 from: https://dhsem.wv.gov/MitigationRecovery/Documents/WV%20State%20Hazard%20Mitigation%20Plan%20FINAL%2011-2018.pdf

the likely consequences of debris flows are important mitigation measures to reduce potential losses from earthquakes.

Greatest Risk Hazards Summary

Flooding

Based on this assessment, flooding is the most financially impactful hazard both historically and in terms of future risk. It is also the hazard that every MID county rated as a "High Risk". The data in this assessment show that hundreds of millions of dollars in property and infrastructure (both critical and non-critical) have been lost historically and continue to be at risk to future flood events. The extent of flood-prone locations can be expected to increase as the incidence and intensity of severe precipitation events increases due to climate change. While threat level in individual locations vary – across the MIDs this assessment finds that infrastructure, buildings and homes all share some measurable level of threat to flooding. Because of this, mitigation measures to reduce the impact of flooding are determined to be the most impactful.

Severe Storms

Similar to flooding, severe storms pose a great threat to the infrastructure and lives of people across West Virginia and present similar financial threats. Winds and rain as remnants from hurricanes and tornadoes all have the potential to create disaster scenarios and significant losses to infrastructure. The increasing intensity of severe precipitation events can be expected to increase the risks of property damage and threats to public safety. Nine (9) of the 12 State and MID Counties rated severe storms as a high risk, both for reasons similar to flooding with the added threat of wind damage. Wind damage alone from 2000 – 2016 represents over $40M in costs to RPDC's 1 through 5.

Winter Weather

Winter weather is ranked as a high risk by 11 of the 12 MID counties. The analysis here shows the state can expect annual losses of over $2M in winter weather related damages. Winter weather poses threats similar to flooding when snow rapidly melts, but also creates concerns for utility infrastructure like powerlines, roofs of buildings, and threatens lives with extreme cold. Mitigation measures to reduce loss to property would benefit MID counties most impacted by winter weather.

Landslides and Land Subsidence

Only 2 out of the 12 MID Counties – Kanawha and Clay – noted landslides as a high risk. We note in this assessment that qualitative data on losses to landslides is sparse and not easily available. However, this does not undercut the risk the state faces from landslide events, especially those that occur simultaneously with or as a result of flooding. Further research and analysis are needed to accurately quantify infrastructure at risk but based on historical occurrence alone - mitigation measures to prevent losses from landslides would benefit many areas of the state.

Wildfires

Similar to landslides, wildfire data and historical losses across the state vary in quality, availability and consistency. However, West Virginia is a heavily forested area and the timber industry provides great economic benefit in addition to recreation for those living in or visiting the state. Increasing levels of extreme heat may contribute to higher incidence of wildfires. Lincoln and Monroe County noted this hazard to be of high risk to them. However, this assessment notes that wildfire rarely results from natural causes, and losses to wildfire are much lower in comparison to flooding and severe storms.

Drought

Compared to all the risks analyzed in this assessment, the data available for drought represents minimal historical impact compared to hazards such as flooding or severe storms. This is supported by the fact that none of the 12 MID Counties considered drought a high risk. In addition, there have only been two disaster declarations for droughts in the State. This assessment does indicate that drought risk may increase over time as a result of higher average and extreme temperatures driven by climate change.

Earthquake

Similar to droughts, none of the MID counties considered earthquake a high risk. There have also been no disaster declarations related to earthquakes, and no significant historical impact from earthquakes in the state observed in this assessment. Earthquakes present a unique “what if?” scenario where should the occur, the impacts can be disastrous. Mitigation measures to fortify buildings could prevent losses in the future should an earthquake occur in the state.

Conclusion

The analysis of these hazards, historical impact, and future risk as observed in this section are key component of understanding risk from a financial perspective. However, the impact that disasters and natural hazards have on the people of West Virginia varies. Populations that are considered vulnerable through several factors discussed in the section below may be more predisposed to suffering increased hardship as a result of hazards or disaster events analyzed in this assessment. Future climate conditions are likely to have more severe impacts on populations with lower adaptive capacity. Because of this, the State conducted an analysis to understand areas of the State which are more vulnerable.

Social Vulnerability

The Federal Register requires grantees to assess how the use of CDBG-MIT funds may affect members of protected classes under fair housing and civil rights laws, racially and ethnically concentrated areas, as well as concentrated areas of poverty.

Vulnerability not only applies to infrastructure, but to residents of an area as well. The vulnerability of people is called "social vulnerability" and describes risks to health, safety, or financial stability even before a storm or disaster occurs. Social Vulnerability is a pre-existing condition based on the characteristics of the population and where they live. In the State's Hazard Mitigation Plan, it determined the most vulnerable populations and identified what characteristics make them vulnerable, such as limited financial resources; those under 5 or over 65 years of age; non-white; or those living in renter occupied housing. Mitigation funds can also be used for preparedness and resiliency programs that pro-actively address social vulnerability to hazards. The analysis for use of CDBG-MIT funds will inform program design to minimize the impacts of disasters on vulnerable populations.

A community's ability to prepare for and respond to a disaster is dependent on how their lives were structured before the event. In this analysis of HUD and State Identified Most Impact and Distressed (MID) counties, Social Vulnerability is based on a variety of social factors, especially disability, income, race, and age. As these communities rebuild from previous events, the state will use mitigation funds to ensure that future risks are prepared for equitably.

Social Vulnerability Indexes

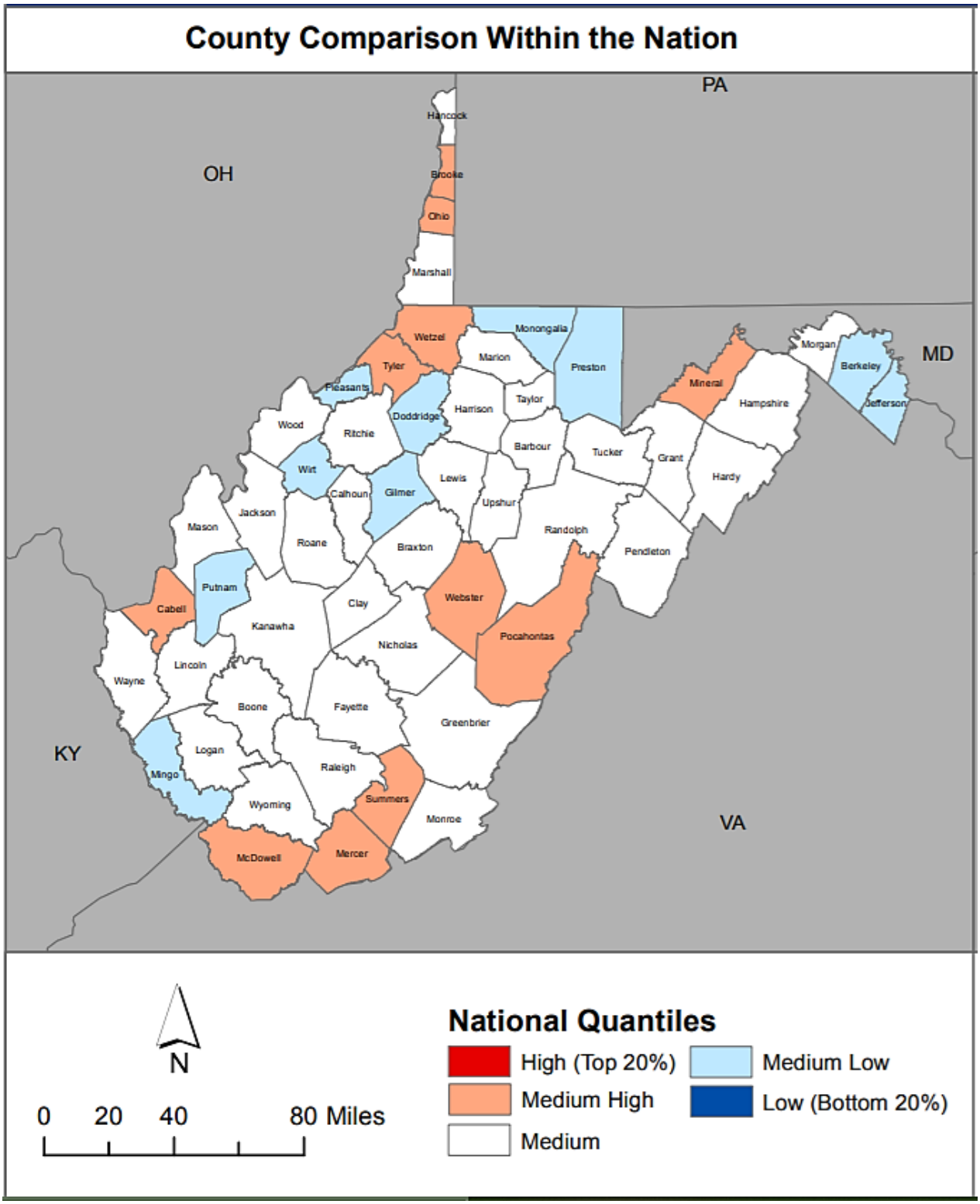
There are two indexes often used to measure social vulnerability, the Social Vulnerability Index developed by the Center for Disease Control and the Hazard and Vulnerability Research Institute's Social Vulnerability Index developed by the Hazards and Vulnerability Research Institute (HVRI). Both indexes analyze variables that impact a community's ability to prepare for, and respond to, disasters. The Hazard and Vulnerability Research Institute's Social Vulnerability Index (SoVI®) is a proprietary formula that measures the social vulnerability of U.S. counties to environmental hazards. The SoVI® index synthesizes 29 socioeconomic variables that impact a community's ability to prepare for, and respond to, disasters. The CDC's Social Vulnerability Index focuses on 15 variables from the American Community Survey that are grouped into four themes of vulnerability: socioeconomic status, household composition/disability, housing and transportation, and race/ethnicity/language. The CDC's SVI is not limited to environmental hazards and is used by practitioners in many disciplines such as public health to understand social vulnerability to a multitude of adverse events. Both indexes are explored in this analysis to understand how mitigation activities on a local level can alleviate the impact of disasters on communities. Both indexes of variables include, but are not limited to, age, sex, race, disability, income and unemployment rate. A full list of the variables included in each index is located in Appendix C.

SoVI® Ranking at the State and National Level

The SoVI compares counties in two ways, first by ranking them across the entire United States, and then by repeating this process within the state. This helps emergency managers understand which areas could most benefit from assistance when impacted by disasters and can act as a starting point to understanding relevant types of resiliency measures. According to the SoVI® in Figure 23, most counties in West Virginia have Medium vulnerability and 11 counties are Medium-High risk compared to the nation.

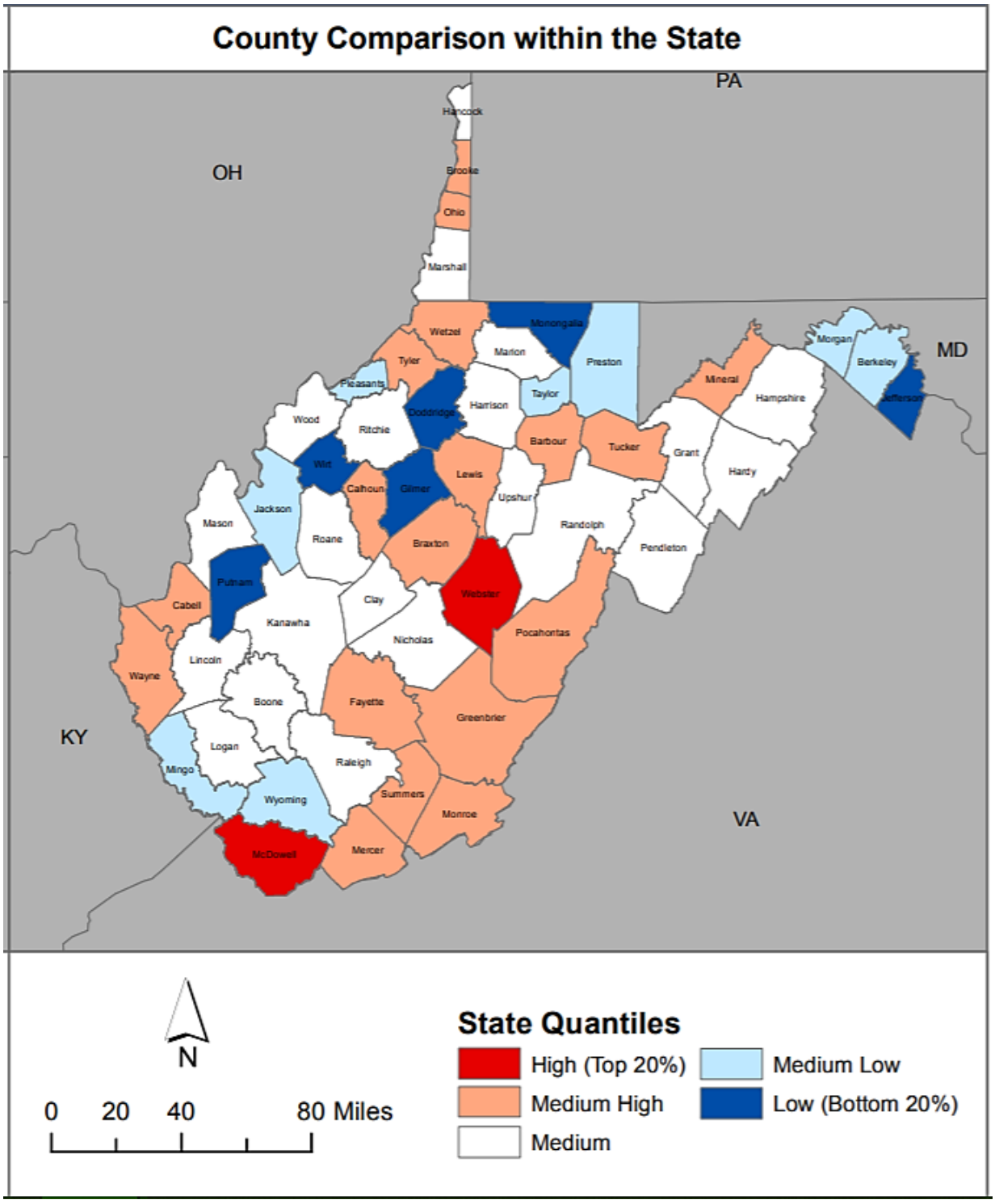
However, at the state level displayed in Figure 24, counties identified as Most Impacted and Distressed by HUD and the State are considered Medium-High risk. Five of the MID counties are considered Medium-High risk: Greenbrier County (HUD MID), Fayette County (State MID), Pocahontas County (State MID), Summers County (State MID), and Monroe County (State MID). Webster County is one of the two counties in West Virginia considered High risk, or in the top 20% in the state and is identified as a State MID county. The SoVI Index in Figure 24 also identifies two (2) State MID counties, Lincoln County, Roane County, and three (3) HUD MID counties, Kanawha County and Nicholas County, and Clay County, as Medium risk. Jackson county is the only State or HUD MID county identified as having low social vulnerability to environmental hazards.

Figure 23: SoVI County Comparison within the Nation



Source: Hazards Vulnerability Research Institute, Retrieved from: http://artsandsciences.sc.edu/geog/hvri/sovi%C2%AE-2010-2014-state-maps.

Figure 24: SoVI County Comparison within the State



Source: Hazards Vulnerability Research Institute, Retrieved from: http://artsandsciences.sc.edu/geog/hvri/sovi%C2%AE-2010-2014-state-maps.

CDC Social Vulnerability Index (SVI)

The CDC Social Vulnerability Index (SVI) is another often-used tool to help emergency response planners identify and map the communities that will most likely need support before, during, and after a hazardous event. The CDC's SVI provides more granular information to understand the regions demographics. The SVI ranks counties to compare their relative vulnerability to other areas of the state. Tract rankings are based on percentiles, with values ranging from 0 (low) to 1 (high). SVI ranks the census tracts based on 15 social factors, including unemployment, minority status, and disability, and groups these factors into four related themes: socioeconomic status, household composition & disability, race & ethnicity & language, and housing & transportation. The most prevalent vulnerable populations in West Virginia are the elderly, disabled, and low-income residents – as seen on Table 14.

American Community Survey Demographics

In addition to the information provided by SoVI® and SVI, the State is considering demographic characteristics and their connection to risk during disasters in state and HUD MID areas. Information from the CDC SVI was combined with data from the American Community Survey to provide an overview of the factors that can contribute to a resident or community's ability to prepare for a disaster. In West Virginia, communities with higher percentages of socially vulnerable residents are impacted adversely by disasters at a rate that is higher than state-wide averages. Table 14 presents demographics that are useful for predicting community needs in a disaster scenario, for instance, by allowing the State to send additional resources to communities, such as personnel to help aging populations evacuate before storms, sending public service alerts through channels accessible to older populations who may not have cell phones readily available, as well as to target mitigation activities to those vulnerable areas in order to reduce future disaster risk and losses in these communities that face additional difficulties in disaster recovery.

Table 14: Demographic Profile of MID Areas

Demographic Profile Information - American Community Survey (2018)		
Socio-Demographic Characteristics	HUD & State MID Area Average	West Virginia
Population		
Population estimates, July 1, 2018, (V2018)	378,109	1,829,054
Age and Sex		
Persons under 5 years, percent	5.30%	5.40%
Persons under 18 years, percent	20.29%	20.41%
Persons 65 years and over, percent	20.24%	18.85%
Race		
White alone, percent	92.3%	93.2%
Black or African American alone, percent	4.7%	3.7%
Hispanic or Latino, percent	1.1%	1.5%
American Indian and Alaska Native alone, percent	0.2%	0.2%

Demographic Profile Information - American Community Survey (2018)		
Socio-Demographic Characteristics	HUD & State MID Area Average	West Virginia
Asian alone, percent	0.7%	0.8%
Native Hawaiian and Other Pacific Islander alone, percent	0.0%	0.0%
Two or More Races, percent	2.0%	1.8%
Population Characteristics		
Veterans, 2014-2018	9.10%	9.30%
Foreign born persons, percent, 2014-2018	1.30%	1.60%
Persons (age 5+) who speak English "less than well" estimate, SVI 2018	0.002%	0.36%
Age 65+, Living Alone, 2014-2018	13.5%	12.9%
Education		
High school graduate or higher, percent of persons age 25 years+	85.40%	86.50%
Bachelor's degree or higher, percent of persons age 25 years+	19.60%	20.30%
Health		
With a disability, percent, SVI 2018	19.5%	16.1%
Persons without health insurance, under age 65 years, percent	6.5%	6.5%
Economy		
In civilian labor force, total, percent of population age 16 years+	42.3%	43.6%
Median household income (in 2018 dollars)	$41,498	$44,921
Per capita income in past 12 months (in 2018 dollars)	$24,964	$25,479
Persons in poverty, percent	18.4%	14.50%

As illustrated in the table above, the MID counties have a higher percentage of elderly residents at 22.2% per county on average as compared to the state average of 18.8%. MID counties also have more people with disabilities on average, lower median income households, lower per capita incomes and more people living in poverty than in the rest of the state. These kinds of population demographics can help states invest in mitigation efforts that support a community's ability to respond to crises, for example by supplying power generators, emergency communications, shelter, emergency food and hydration.

HUD also measures racially/ethnically-concentrated areas of poverty for use in program design.[33] While this dataset was considered in this analysis, the low overall population in West Virginia results in few statistically significant areas available for accurate comparison. Instead, race and ethnicity are discussed through the CDC SVI as the ranking systems allows for comparison of relative vulnerability within the state.

CDC Social Vulnerability Index Themes and County Ranking

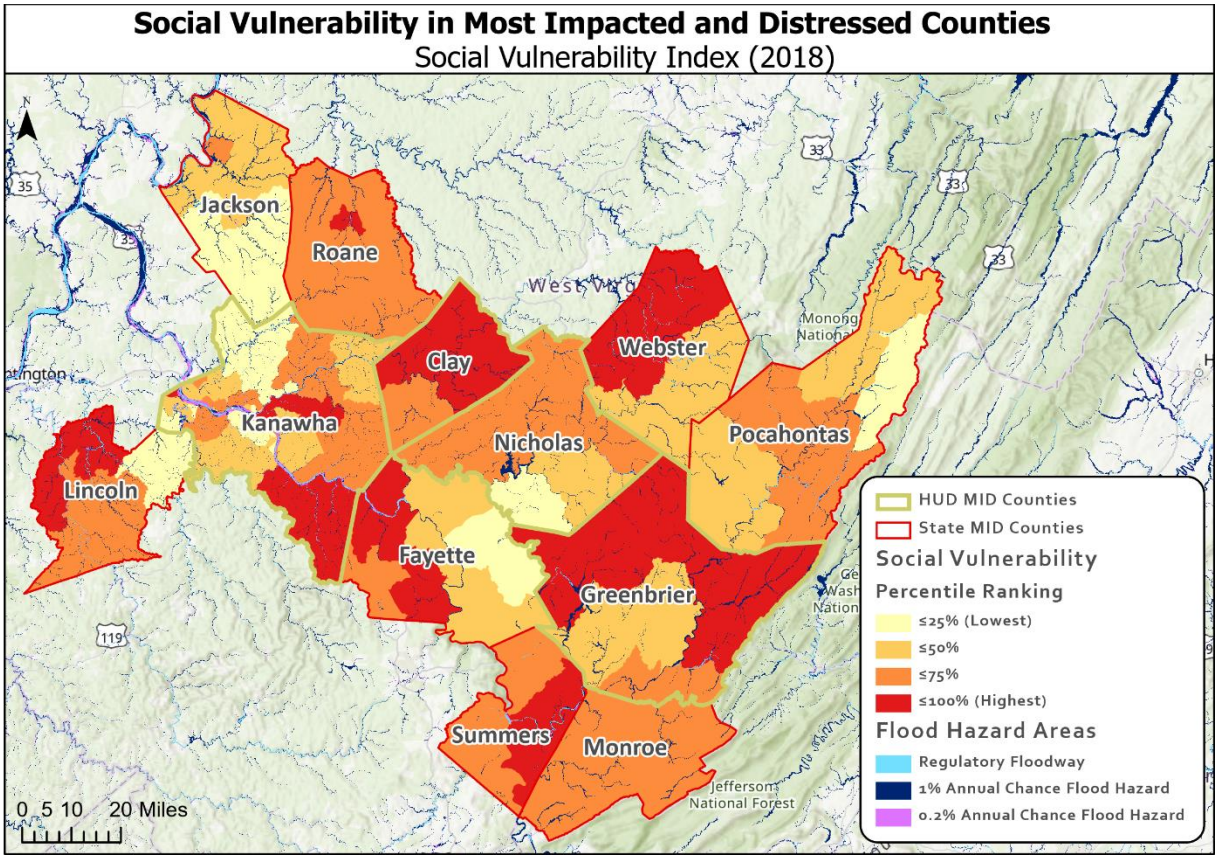
The CDC Social Vulnerability Index (SVI) is another often-used tool to help emergency response planners identify and map the communities that will most likely need support before, during, and after a hazardous event. The SVI compares the relative vulnerability of census tracts to other areas of the state. SVI ranks the census tracts based on 15 social factors, including unemployment, minority status, and disability, and groups these factors into four related themes: socioeconomic status, household composition & disability, race & ethnicity & language, and housing & transportation as well an overall composite layer highlighting the most and least vulnerable populations according to the index.

Social Vulnerability by Theme

In West Virginia, the largest populations of vulnerable people are low-income, disabled, and elderly residents living alone. Figure 25 below illustrates overall social vulnerability by census tract within the 12 MID counties. The MID counties with the highest rate of overall social vulnerability include Webster county, Jackson county, Clay county, Summers county and Fayette county. In the maps below, each theme of vulnerability is explored in relation to the 100-year (1%) and 500-year (0.2%) floodplains.

[33] HUD Open Datasets. Racially or Ethnically Concentrated Areas of Poverty (R/ECAPs). Accessed 6/11/2020 at http://hub.arcgis.com/datasets/56de4edea8264fe5a344da9811ef5d6e_0

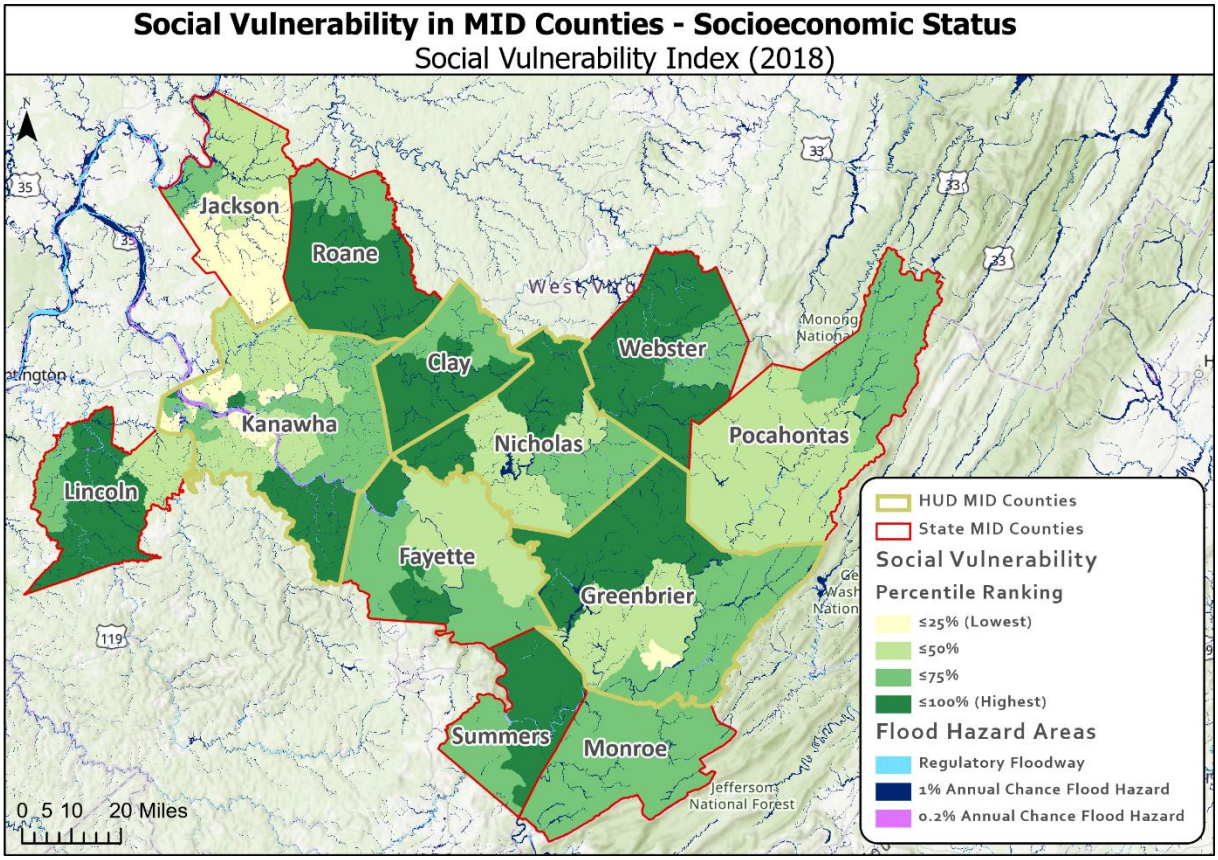
Figure 25: Social Vulnerability in Most Impacted and Distressed (MID Counties)



Socioeconomic Status

In West Virginia, all the MID counties have significant low- to moderate-income populations. Connections to jobs often incentivizes residents to live near industries, increasing their exposure to the negative environmental hazards associated with industrial uses. In every MID county in West Virginia, at least 30% of residents are considered low-moderate income. Low income residents are generally less able to invest in risk-reducing measures, for instance, lack of access to insurance means that lower income residents rely on their relatively limited assets to buffer disaster losses, exacerbating their financial burden. Taking economic status into consideration in program design can ensure CDBG-MIT funds make a significant impact in communities with limited financial resources.

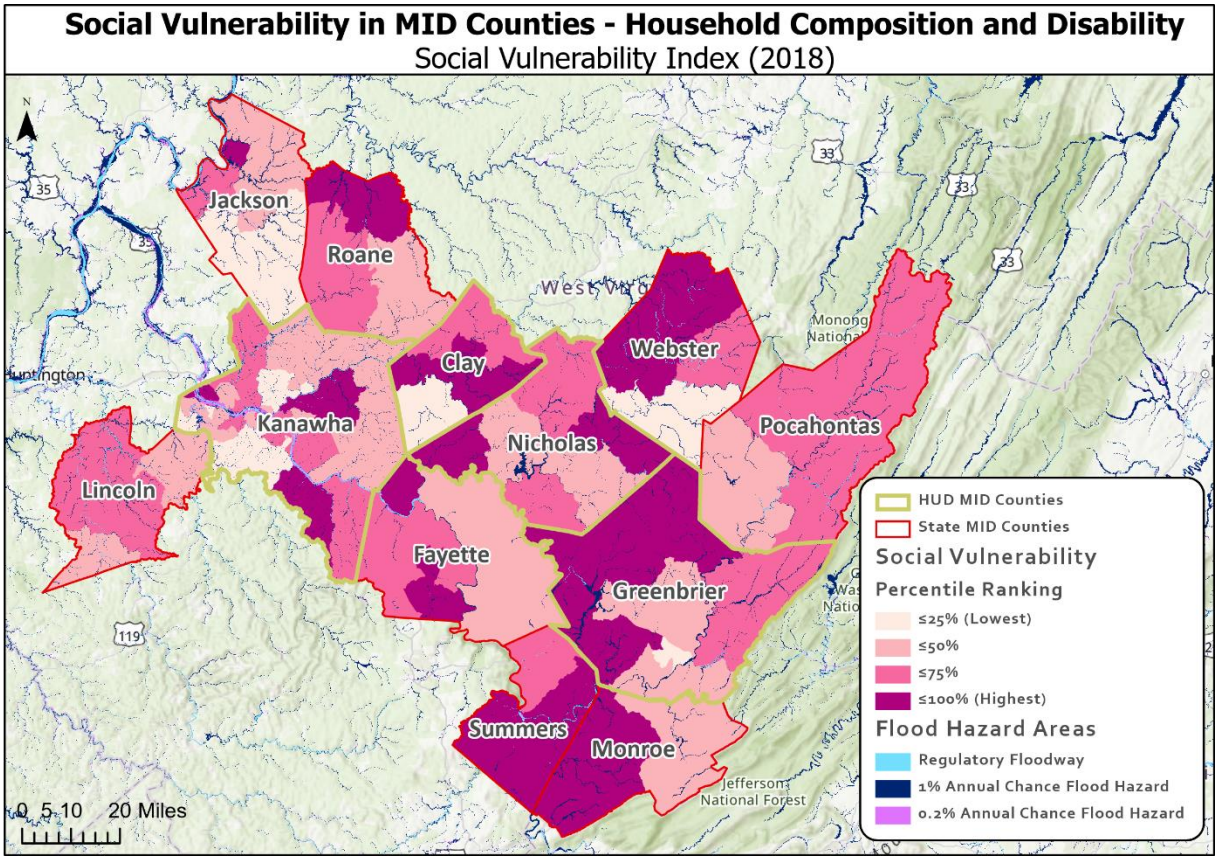
Figure 26: Social Vulnerability in MID Counties - Socioeconomic Status



Household Composition/Disability

Household composition (Figure 27) can have significant influence on recovery outcomes following a disaster. This data is useful for understanding needs both immediately after a disaster, during short-term recovery, and in planning for mitigation of future incidents. For instance, elderly residents may need extra assistance in evacuation, but even well after disasters households may be disrupted by adult children or others providing in-home physical or economic assistance being forced to move away. Understanding household structures prior to storms is key to mitigating long-term repercussions of disruptions and is a reminder to planners to provide for extended-family households in mitigation program design.

Figure 27: Social Vulnerability in MID Counties - Household Composition/Disability



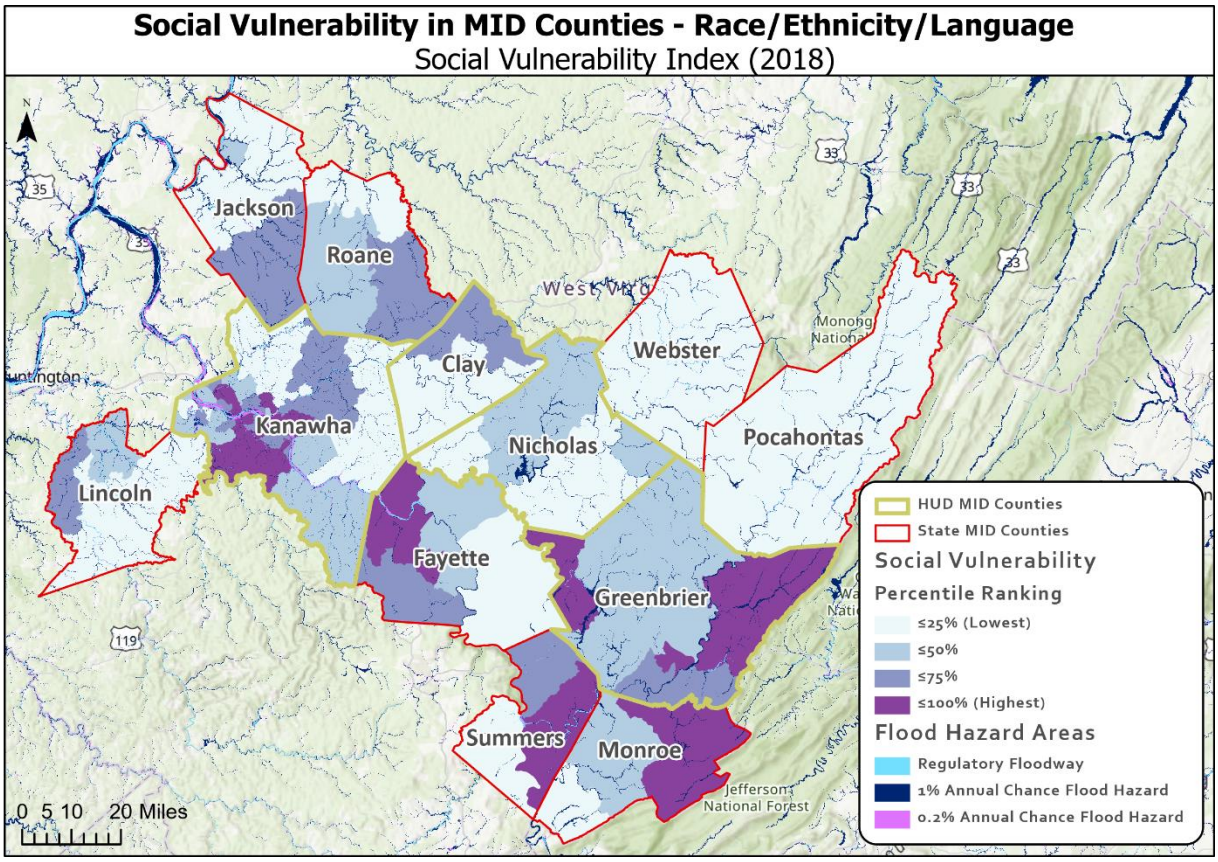
Race/Ethnicity/Language

Race, ethnicity, and language isolation play a significant role in housing patterns and income across the United States. Both historic segregation policy and subsequent discriminatory housing policies have resulted in geographic clustering of minority populations, often in regions vulnerable to environmental hazards. By evaluating areas of concentrated non-white populations in relation to physical vulnerabilities, such as floodplains, local governments can plan to mitigate the impacts of disasters in a way that ensures equal protection to all residents.

Kanawha County, Fayette County, Summers County, and Greenbrier County are the most vulnerable with regards to race and ethnicity (Figure 28). Kanawha County is home to the city of Charleston, which is 15% Black, nearly double the metro region at state. In the United States, race and class are highly linked, and the long history of exclusionary practices has disproportionately impacted minority groups earnings in the workforce, educational attainment, and ability to access benefit programs. These disadvantages significantly impact a community's ability to prepare for a disaster and underline the importance of considering social vulnerabilities with regard to mitigation activities.

West Virginia has significantly fewer limited English proficiency residents than the average state, and every MID county has a less than 1% of limited English proficiency residents. Regardless, residents with limited English proficiency are encouraged to participate in mitigation planning efforts and the State will make an effort to provide accommodations for residents, such as providing language interpretation or making published documents available in multiple languages upon request.

Figure 28: Social Vulnerability in MID Counties - Race/Ethnicity/Language



Housing and Transportation

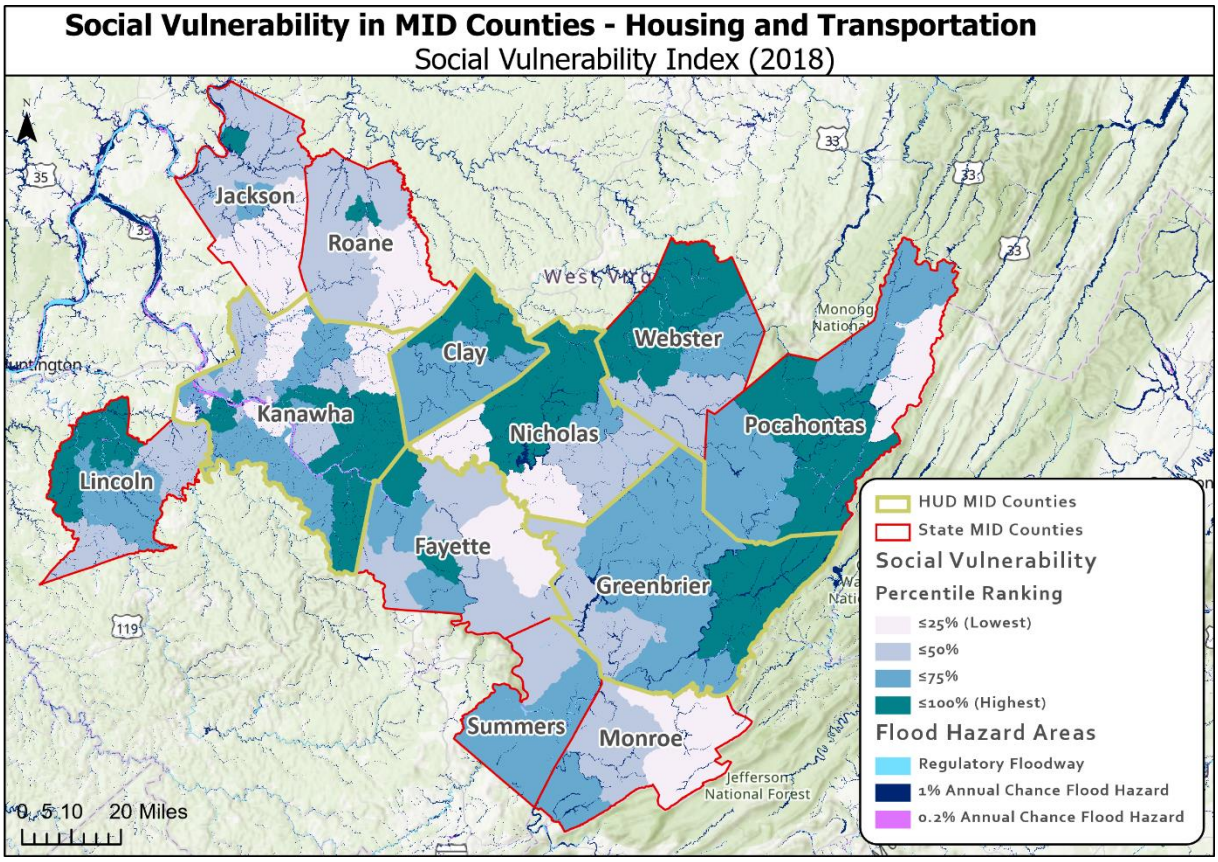
Housing and transportation data include factors like large apartment buildings or group quarters such as dormitories or prisons, people who live in mobile homes, and people who do not have access to a vehicle. These factors make it more difficult adhere to evacuation orders and leverage personal assets to prepare for disasters. Dormitories and prisons may include government owned facilities that already serve socially vulnerable populations. The State of West Virginia will ensure sufficient coordination with those populations to ensure hazards do not have a disproportionately negative impact and that hazard, risks, and preparedness options are well understood.

Transportation routes are often discussed in terms of evacuation routes, but in states with large rural populations with spread out development across rugged terrain and lack of public

transportation, social demographics like car ownership can help evaluate a community's ability to prepare for and react to storm events.

East Kanawha County, north Lincoln County, central Pocahontas County, southeast Greenbrier County and northern portions of Clay, Nicholas, and Webster Counties are some of the most vulnerable areas with regards to housing and transportation in the state (Figure 29). Mitigation activities could address vulnerability of these census tracts by investing in buildings that are essential to the resiliency of the community, such as sites used as distribution centers or emergency shelters in accessible locations. Another example of a potential mitigation activity which could alleviate travel burden on residents accessing emergency food and water and evacuation routes would be bridge strengthening work, including (1) aluminum decks, (2) fiber-reinforced concrete decks, (3) fiber-reinforced composite decks, (4) member strengthening using of post-tensioning, (5) fiber reinforce polymers (FRP), or (6) partial end restraint, as outlined by the Federal Highway Administration.

Figure 29: Social Vulnerability in MID Counties- Housing and Transportation



Social Vulnerability by County

The CDC's social vulnerability index identifies vulnerabilities in communities and compares social factors, by geography, that may determine a community's uneven ability to prevent suffering and

loss after a disaster. The overall percentile ranking displayed in the figures showcased in this section include many social and housing categories that may impact the community, including the LMI population, disability status, number of multifamily developments and mobile homes, and rates of overcrowding. The State considered the relative social vulnerability of each of the MID counties as part of this analysis.

All 12 identified state and HUD MID counties are displayed in the table below. Counties are ranked by relative vulnerability and then separated into four buckets from to from highest (75-100th percentile) to lowest (0-25th percentile). The figures below display more vulnerable areas in darker shades and less vulnerable areas lighter shades. According to Table 15, in terms of overall vulnerability, five of the 12 counties are in the highest (75-100th) percentile rank. Household composition and disability status is an overwhelming theme among MID Counties, nine of the 12 counties are in the top 50th percentile of vulnerability. Of these nine counties, seven are also in the top 50th percentile of vulnerability by socioeconomic status. Many counties are ranked highly in multiple themes of vulnerability including Clay, Fayette, Lincoln, Summers, and Webster.

Table 15: Social Vulnerability Themes by MID County

County	Overall Social Vulnerability	Themes			
		Socioeconomic Status	Household Composition and Disability	Race, Ethnicity, and Language	Housing and Transportation
Clay	H	H	MH	L	MH
Kanawha	MH	L	MH	H	MH
Greenbrier	MH	ML	MH	MH	ML
Nicholas	MH	MH	MH	L	MH
Fayette	H	MH	H	MH	MH
Jackson	L	L	L	L	L
Lincoln	MH	H	ML	ML	MH
Monroe	MH	MH	MH	MH	L
Pocahontas	L	ML	ML	L	ML
Roane	H	H	H	ML	ML
Summers	H	H	H	MH	H
Webster	H	H	H	L	MH

Key			
	HUD MID	Highest Risk	Med-Low Risk
	State MID	Med-High Risk	Lowest Risk

Source: CDC Social Vulnerability Index.

Vulnerability by County - MID Counties

The maps below allow for analysis of each county's relative social vulnerability by census tract to better understand concentrations of social vulnerability in relation to the floodplain, as flooding has been identified as a key risk factor in MID counties. As displayed in Figure 30, most census tracts in Clay County are ranked as among the in the highest (75-100 percentile) for social vulnerability. Clay County residents are most vulnerable with regards to socioeconomic status and have a medium ranked vulnerability based on both household composition/disability and housing/transportation. In Clay County, 54% of residents are considered low-moderate income, and 27% are living in poverty, the highest among MID counties. The county has the highest rate of disabled compared to other MID counties, with 29.6% of the population identifying as disabled.

Kanawha County, displayed in Figure 31, has the highest percentage of minority residents across the MID counties at 12.2% percent, slightly higher than the MID county average of 8%. Kanawha County is one of the more densely populated counties in West Virginia. In 2000, the County's population was 200,073 according to the US Census. The 2018 American Community Survey estimates a slight population decline to 185,710. The south eastern tract of the county is higher vulnerability than other tracts in the county, corresponding to a relatively high (75-100 percentile) rank in housing and transportation vulnerability.

Figure 30: Clay County SVI Index, 2018

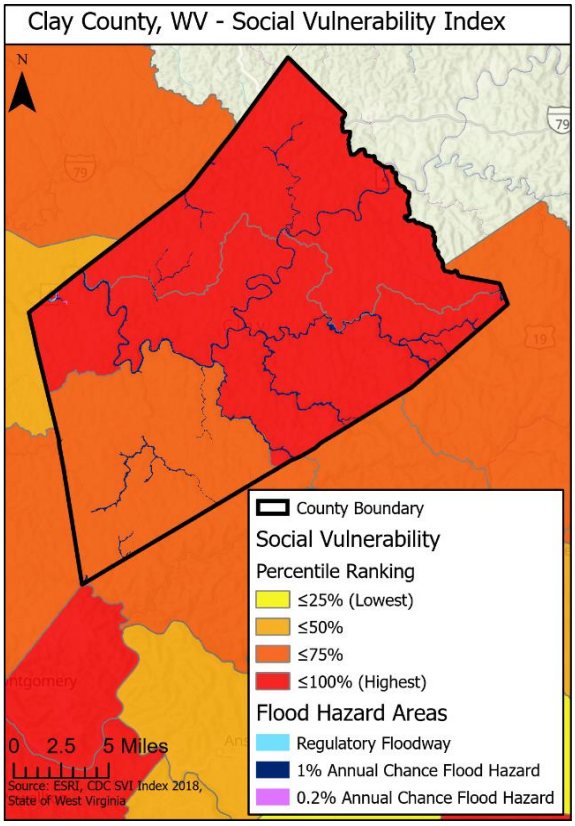


Figure 31: Kanawha County, SVI Index, 2018

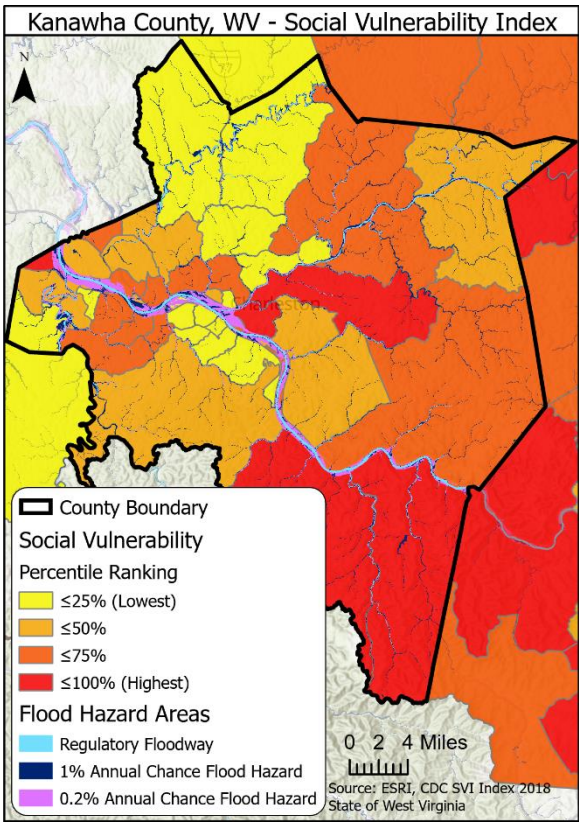


Figure 33: Nicholas County, SVI Index, 2018

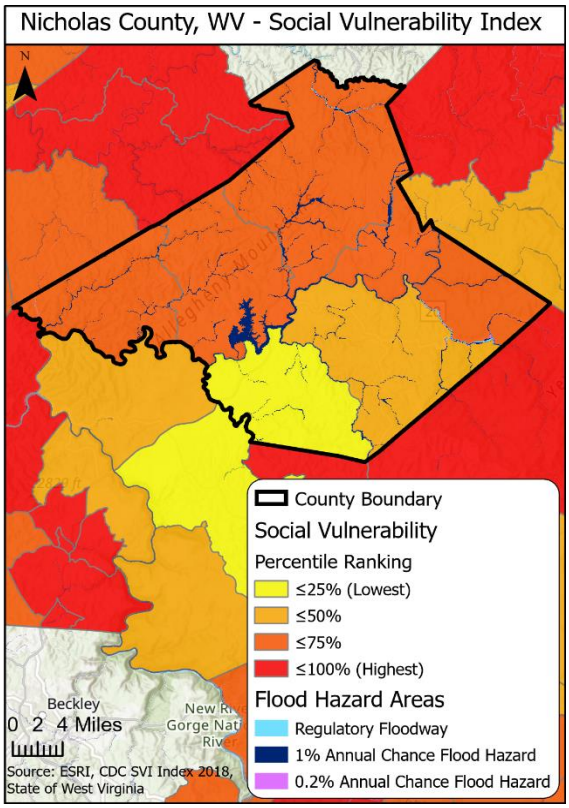
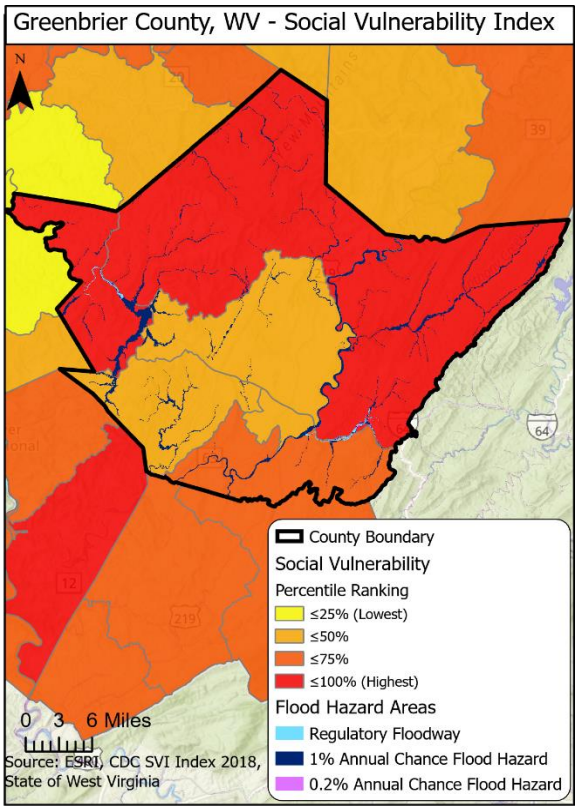


Figure 32: Greenbrier County SVI index, 2018



Kanawha County has been identified as high risk for severe storms and flooding in the 2018 State Mitigation Plan. In addition to this physical vulnerability, the social vulnerability of the county indicates that measures could be taken to alleviate financial and barriers to accessing information. With 17% in poverty, and 37% of residents qualifying as low-moderate income, even routine damage during "smaller" storms, as individual houses and vehicles are damaged by fallen limb or businesses are forced to close due to a lack of electricity, could exacerbate financial strain.

Figure 33 demonstrates that Nicholas County has a relatively high vulnerability (50-75th percentile) in terms of the population's socioeconomic status, household composition and disability. In the county, 21.1% of the population are seniors and 13.2% of households are occupied by seniors who live alone. Household composition also takes into account family support, and the county has one of the higher rates of single parent households with children under 18 at 7.4% Nicholas County has been identified as experiencing a high financial loss due to flooding, and with 36.6% of county residents qualifying as low-moderate income, this represents an area where mitigation efforts could alleviate existing financial burden. The county also has a relatively high vulnerability in terms of housing and transportation, 9% of residents in the county do not own a car. Census tracts in the southern portion of the county are the least vulnerable, and the county has an overall low vulnerability in terms of race, ethnicity, and language.

The northern most census tracts in Greenbrier County, in Figure 32, are more socially vulnerable than the southern and central tracts. Greenbrier is most vulnerable with regards to race and household composition/disability. Between June 22 and June 29, 2016, multiple rounds of storms hit portions of the nearby area and small streams turned into a record setting flood along portions of the Elk and Gauley Rivers in central West Virginia. A total of 23 deaths were linked with this disaster, including 16 in Greenbrier. High rates of social vulnerability can be an early indicator that a community may experience worse outcomes during and after a storm event. During this recent deadly event, the bulk of the rain fell in less than 12 hours throughout the day. Individuals over age 65 make up 22% of the population and 21% have a disability, about 6% higher than average for MID counties. Additionally, 7.6% of the county's residents are minorities, which is below the MID county average, but relatively high given the low population of only 35,347 people.

As highlighted in the State Hazard Mitigation Plan, the I-64 corridor through southern Fayette County and Greenbrier County is seeing denser residential development near municipalities and along roadways near increasing commercial and industrial development. Fayette County, displayed in Figure 34 below, is ranked one of the counties with the highest social vulnerability with regards to household composition/disability—19% of the population is disabled. The county's lowest vulnerability rank is medium (50-75 percentile) in housing/transportation. Fayette County has the third highest percentage of minority residents in among MID counties at 7.5 %.

With ample access to development near the Ohio River, Jackson County has a relatively low social vulnerability in any given census tract. In central Jackson County, the town of Ripley represents the highest risk area in the county; however, the census tract is still in the lower 50% of vulnerability across the state.

Figure 34: Fayette County SVI Index, 2018

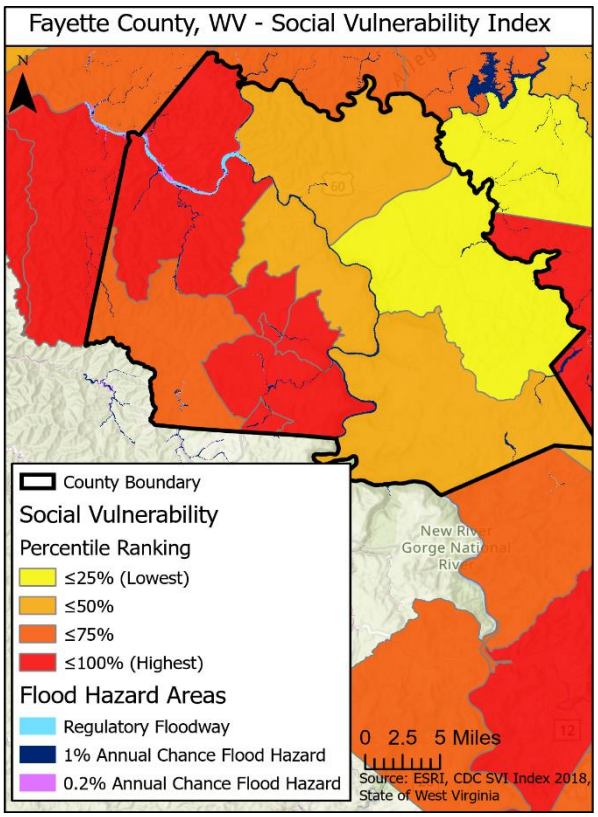


Figure 35: Monroe County SVI Index, 2018

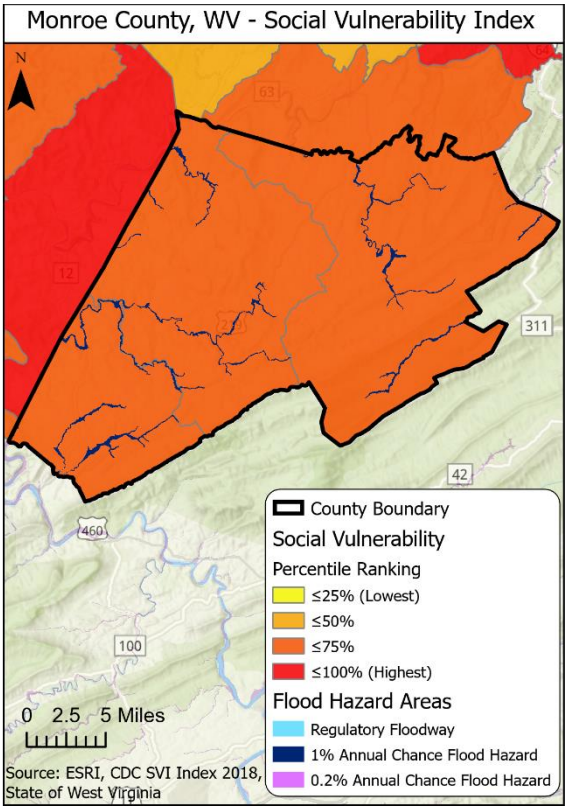


Figure 36: Jackson County SVI Index, 2018

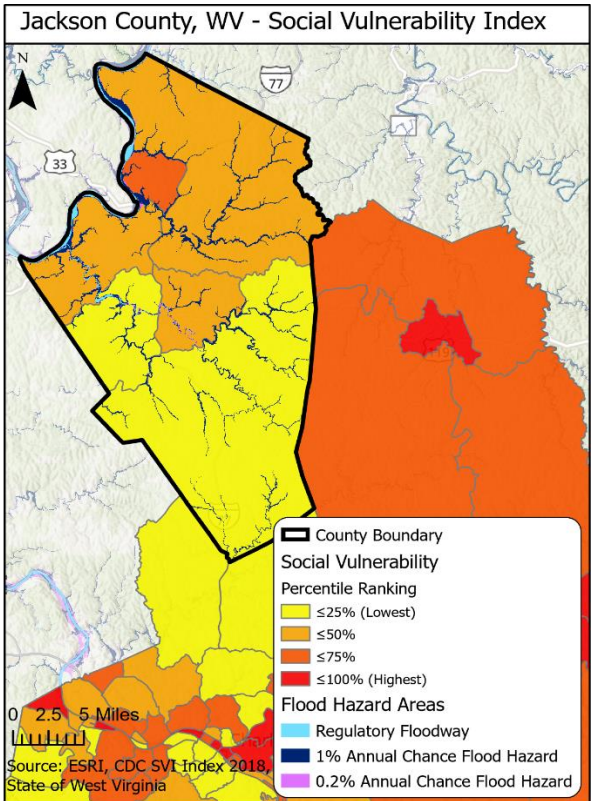
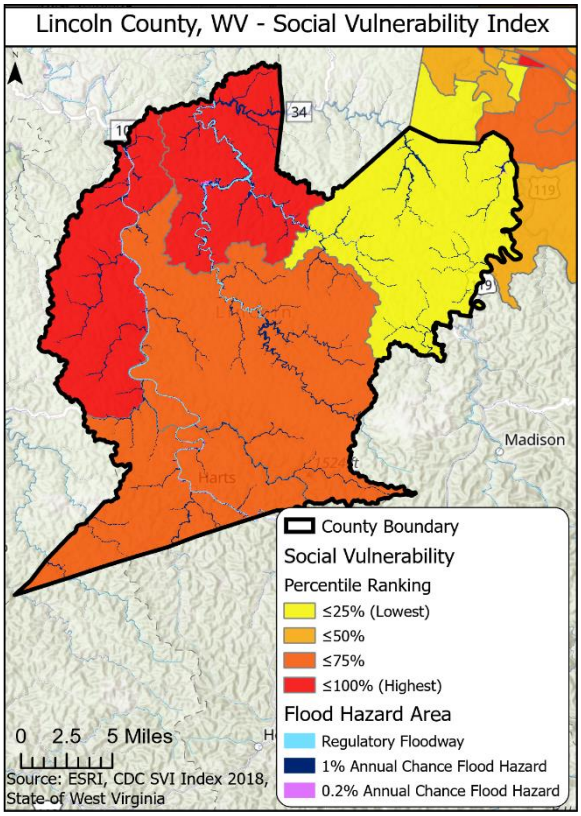


Figure 37: Lincoln County SVI Index, 2018



All census tracts in Monroe County are in the high-medium (50-75 percentile) range of social vulnerability, higher than over half of the census tracts in the state. Figure 35 illustrates the uniformity of the County with regards to overall social vulnerability. In Lincoln County, tracts in the West and North side of the County are among the most vulnerable counties in the state. Lincoln County is a largely rural county with only a handful of incorporated towns and ranks in the highest risk percentile for household composition/disability, with 26.5 of residents identified as disabled. In 2015, severe storms led to flooding, landslides, and mudslides. The northwest part of the county is the highest risk and has a significant concentration of floodplain zones, as demonstrated in Figure 37.

Census tracts in Pocahontas County have a relatively low (0-50 percentile) vulnerability rank compared to the rest of the state. Pocahontas is the least dense county with just under nine people per square mile. Many (42%) residents qualify as Low-moderate income, the percentage of residents over age 65 and with a disability are both 24%.

All of the census tracts in Roane County are identified as at least the top 50th percentile of social vulnerability in the state. According to the State Hazard Mitigation Plan, the county is located in a more rugged interior region of the Ohio River valley displayed in Figure 41. While more census tracts, and correspondingly more residents, in Summers County are in the highest (75-100 percentile) vulnerability rank, both of these counties have a relatively high social vulnerability. Roane County is most highly ranked (75-100 percentile) in vulnerability with regards to Socioeconomic status and Household Composition/Disability. Summers shares these vulnerabilities but is additionally highly ranked in Housing/Transportation.

Census tracts in Webster County have the highest overall vulnerability, household composition/ disability, and socioeconomic status vulnerability rank of the MID counties. In Webster County, displayed in Figure 38, 22% of residents are over age 65, and 19.6% are disabled. The state may require, through its subrecipient run programs, further analysis into these clear vulnerabilities and any proposed program impacts.

Figure 38: Webster County SVI Index, 2018

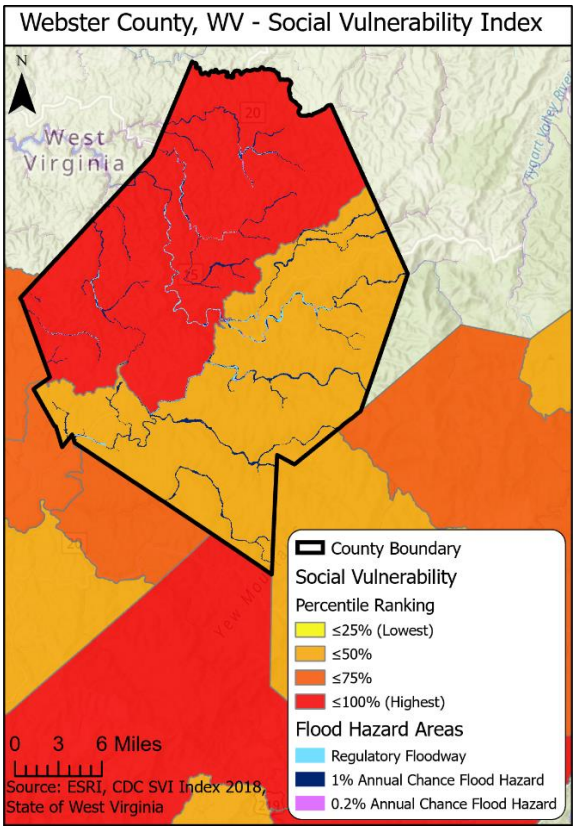


Figure 39: Pocahontas County SVI Index, 2018

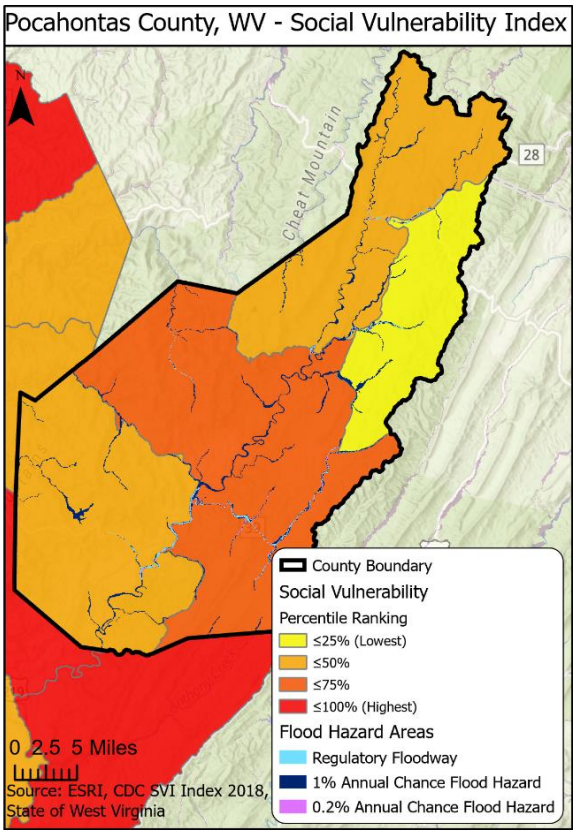


Figure 40: Summers County SVI Index, 2018

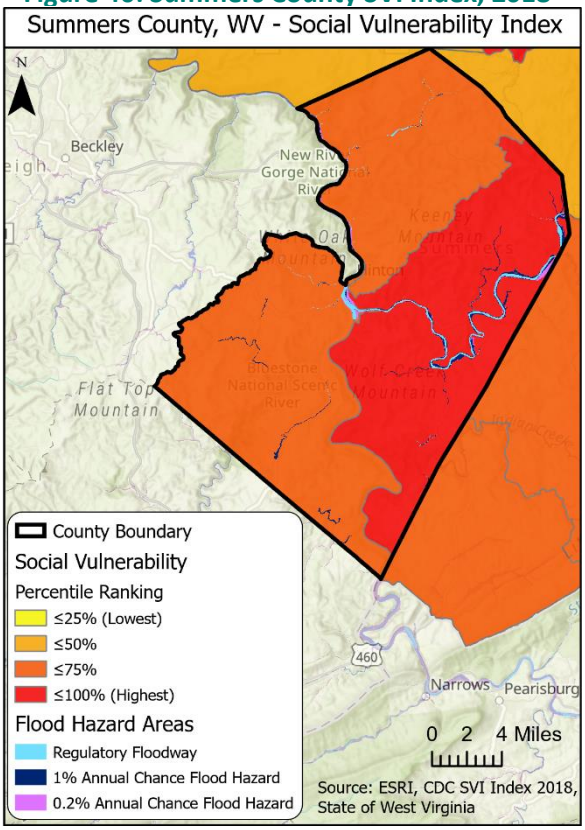
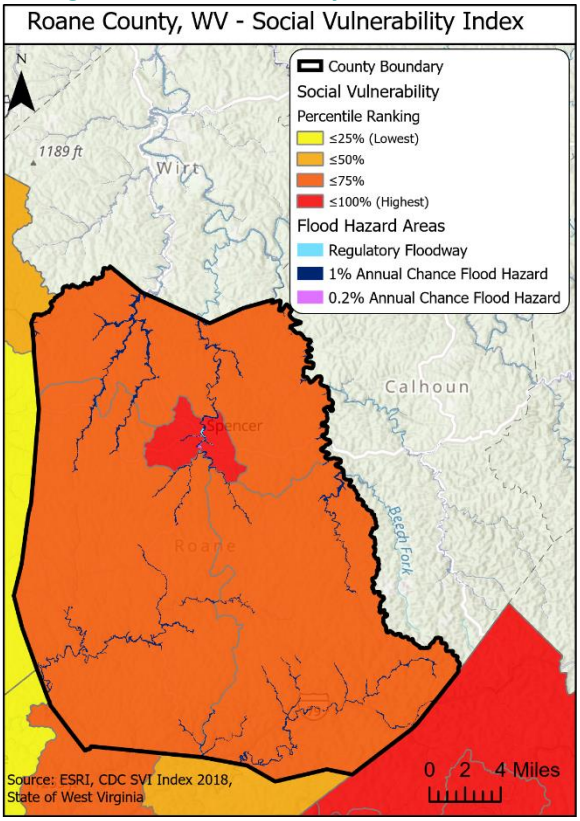


Figure 41: Roane County SVI Index, 2018

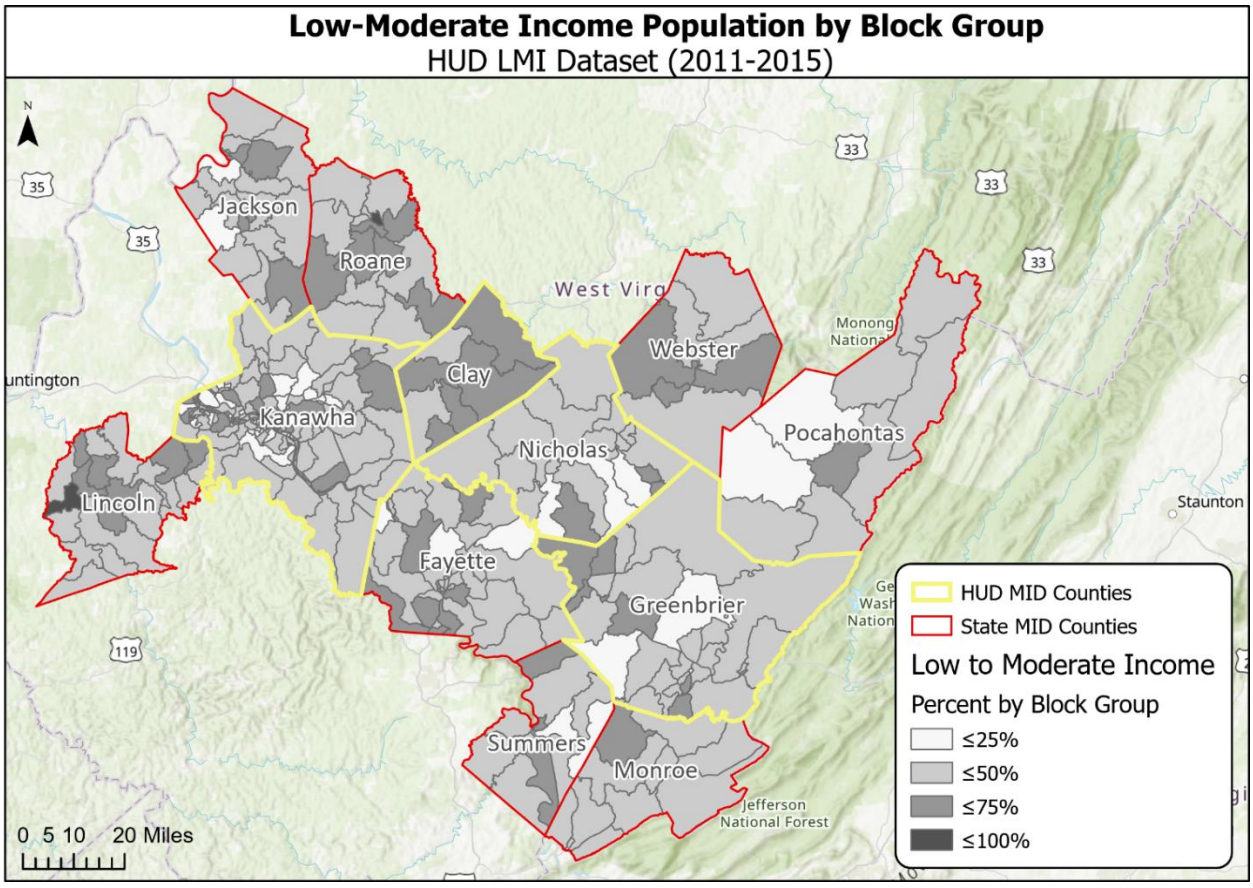


Impact on Low- to Moderate-Income Populations

All projects supported by HUD Community Development Block Grant – Mitigation (CDBG-MIT) assistance must meet one of the program's two National Objectives: (1) benefiting low- and moderate-income (LMI) persons or (2) meeting a particularly urgent need. This CDBG-MIT allocation is focused on addressing both LMI and Urgent Needs.

Low- to Moderate-Income (LMI) households are defined as households that do not exceed 80% of the median income for their area, as determined by HUD. The map below illustrates the percentage of residents in MID counties who qualify as Low-Moderate Income by block group.

Figure 42: Low-Moderate Income Individuals in MID Counties by Census Tract



For the purpose of the CDBG-MIT programs, a minimum of 50% of funds must benefit LMI persons. For a CDBG-MIT project to qualify as having benefited LMI persons, its service area must have a population with at least 51% LMI households. Every West Virginia county has areas that fall within the threshold of LMI income households. In Table 16, data regarding the LMI income population estimates are based upon HUD's LMI Summary Data (2011-2015 ACS). Please see Appendix D for a table of LMI percentages by block group.

Analysis from the Risk-Based Needs Assessment ties directly to the programs presented in the Action Plan in Section 5. Further, through a competitive application process, specific program

projects will be selected with high consideration of special populations, in particular LMI populations. Current proposed usage of the CDBG-MIT funds is focused on hardening critical facilities, updating, or creating mitigation plans and general infrastructure. The scoring criteria for each of these programs is weighted in favor of benefiting LMI and vulnerable populations, as noted in the program descriptions in Section 5 of this Action Plan.

Table 16: HUD MID and State MID Counties - Key Demographic Information

	Total Population	Percent Minority	Percent Over Age 65	Percent Over Age 65, Living Alone	Percent LEP	Percent Persons with Disabilities	Percent LMI
HUD MID Counties							
Clay	8,785	0.8%	19.6%	9.5%	0.1%	29.6%	54.0%
Kanawha	185,710	12.2%	19.4%	13.3%	0.3%	18.1%	37.7%
Greenbrier	35,347	7.6%	22.2%	14.1%	0.2%	21.0%	39.1%
Nicholas	25,324	3.0%	21.2%	13.2%	0.0%	20.3%	36.6%
State MID Counties							
Fayette	44,126	7.5%	19.7%	12.8%	0.2%	26.3%	44.2%
Jackson	29,018	3.0%	19.5%	12.4%	0.1%	17.1%	40.4%
Lincoln	21,078	2.1%	18.0%	12.3%	0.2%	26.5%	45.3%
Monroe	13,467	3.9%	24.2%	15.4%	0.4%	25.6%	40.6%
Pocahontas	8,531	1.7%	24.0%	16.6%	0.0%	24.4%	42.0%
Roane	14,205	3.1%	20.6%	14.1%	0.1%	26.0%	46.8%
Summers	13,018	8.2%	23.2%	16.3%	0.1%	28.5%	37.0%
Webster	8,518	0.3%	22.0%	12.4%	0.0%	19.6%	53.5%
MID Averages	33,927.25	7.9%	20.9%	13.5%	0.2%	23.0%	42.9%
State Total							
West Virginia	836,469	8.1%	17.86%	12.9%	0.4%	16.1%	41.1%

Source: (ACS 5-Year 2011-2015) at the County Level, Social Vulnerability Index (2018).

The LMI Summary Data may be used by CDBG-MIT grantees to determine whether a CDBG-MIT-funded activity qualifies as meeting the LMI national objective. The LMI percentages are calculated at various principal geographies provided by the U.S. Census Bureau. While the program areas included in this Action Plan do not define eligibility based on protected class status, the State is prioritizing both disaster risk mitigation and benefit to LMI households. Some vulnerability factors are lower than the national average in West Virginia, including the percentage of minority and limited English proficiency residents. Percentage of minority residents is calculated as all persons

except white, non-Hispanic divided by total population in the ACS 5-year estimate and has been considered in this analysis as a component of overall social vulnerability above.

Impact on Special Needs Populations

West Virginia will consider accessibility issues and functional needs of vulnerable populations in planning for and carrying out activities using CDBG-MIT funds. WVDO will satisfy effective communications, language assistance needs, and reasonable accommodations procedures required of recipients of Federal financial assistance. The State will implement HUD guidance to plan for the functional needs of persons with disabilities in the implementation of its CDBG-MIT programs. West Virginia plans for and accommodates the functional needs of persons with disabilities, persons with limited English proficiency and other vulnerable populations - including, but not limited to, public or private social services, information sharing in multiple languages upon request, and other services for those persons who may be visually or speech-impaired. This information can be found in the Citizen Participation Plan (Section 8) in this Action Plan.

The State recognizes the importance of social vulnerability in the Most Impacted and Distressed counties and will put forth every reasonable effort to accommodate the needs of vulnerable populations including children, senior citizens, persons with disabilities, persons from diverse cultures, immigrants, homeless persons, persons with chronic medical disorders and/or a pharmacological dependency. Vulnerable populations also include individuals with functional needs who may require assistance with accessing and/or receiving mitigation benefits, such the State's investment in critical facilities that serve the community during disasters, including persons with limited English proficiency, without access to a motor vehicle, living with disabilities, or living in institutions.

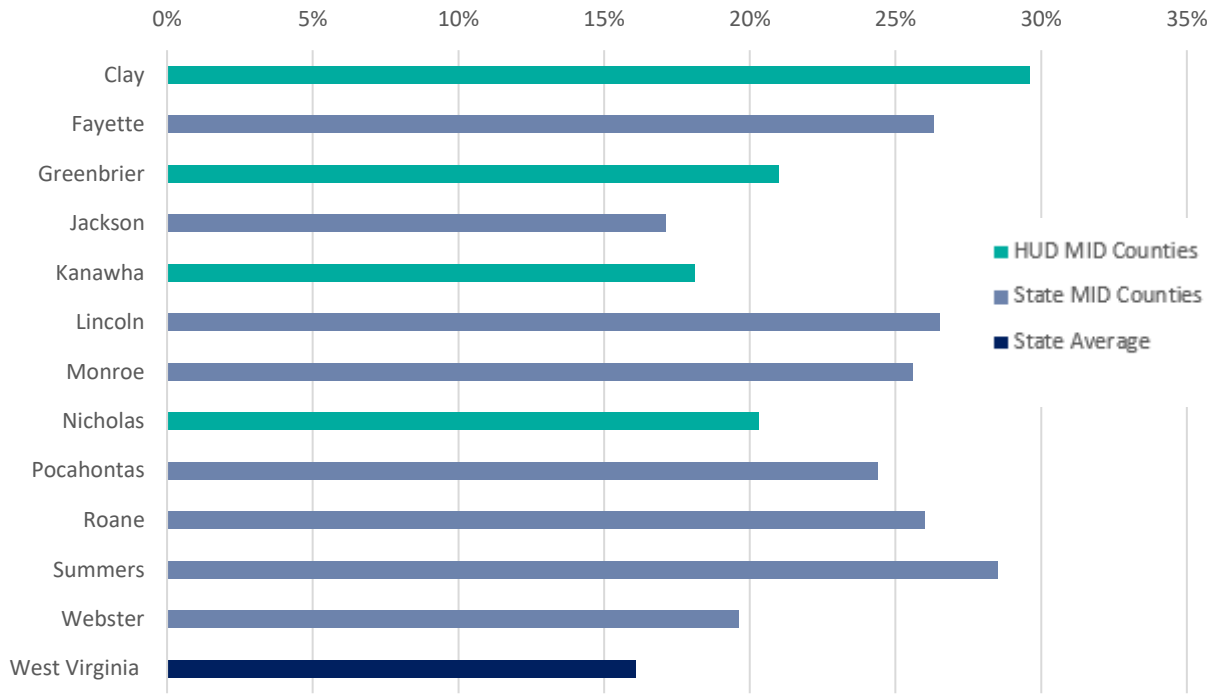
The 2020 Homeless Population Estimate from the West Virginia Coalition to End Homelessness (WVCEH) claims that homelessness affects 731 West Virginians. Organizations like WVCEH have worked with the State to provide data on the pre-flood and post-flood homeless population. The WVDO has used this data to account for the changes in homelessness due to the flood and to formulate housing programs which will benefit this vulnerable population with previous allocations of CDBG-DR funds. While the State has not currently decided to pursue resilient housing activities with CDBG-MIT funds, it will continue to coordinate with the WVCEH to ensure the homeless population is prioritized for assistance through any of its CDBG-MIT programs which could meet the needs of this population. The State certifies that it will conduct and carry out grant expenditures in conformity with Title VI of the Civil Rights Act of 1964 (42 USC 2000d) and the Fair Housing Act (42 USC 3601-3619) and implementing regulations, and that it will affirmatively further fair housing as applicable to its projects.

We will work with local partners to ensure accommodation of vulnerable populations throughout the life of the program. Specialized resources may include, but are not limited to, public or private social services, accommodations, information, or transportation. Regardless of the nature of the

need, care must be taken to ensure that all special need individuals are beneficiaries of mitigation activities.

Disability

Figure 43: Percentage of Residents with Disabilities in MID Counties



Source: CDC Social Vulnerability Index (2018) data available at https://svi.cdc.gov/index.html

In West Virginia, all the Most Impacted and Distressed Counties are above the state average for percentage of disabled residents (Figure 43). In three of the four HUD MID counties and six of the eight State MID Counties, the percentage of residents with a disability is over 20%. In the CDBG-DR Action Plan, the State identified that one of the most pressing issues is disability tied to employment, particularly with the high incidence of black lung disease among former coal miners. In fact, residents in West Virginia with black lung disease received almost $41 million in Part C Black Lung Claims and Disbursements in FY 2019 from the U.S. Department of Labor (DOL), the highest amount among all 50 states. The Division of Coal Mine Workers' Compensation at the DOL administers the claims filed under the Black Lung Benefits Act.

Respiratory illness are an additional layer of pre-existing vulnerability that can be woven into mitigation programs, such as ensuring electricity supply for respiratory devices like nebulizers or CPAP machines or protecting healthcare facilities and supply chains to ensure residents have access to adequate supply of medications, rescue drugs, or oxygen tanks, which can be critical when preparing to evacuate or shelter in place for extended periods of time.

Seniors Living Alone

As of 2020, seniors comprise approximately 18% of the population in West Virginia, and 12.9% of households are occupied by seniors living alone. Seniors are more likely to have a disability, and those with disabilities are more likely to be low-income. Elderly residents are often reliant on fixed incomes, such as social security, to meet their daily needs, and consequently demonstrate high socioeconomic sensitivity to the financial burden of disaster preparedness and recovery. Additionally, nursing homes and other assisted living facilities can physically vulnerability to storm impacts, such as flooding or power outage, endangering residents who rely on electricity for medical care. Transportation network disruptions can prevent caretakers from reaching their patients, leaving older residents suddenly without assistance cooking, cleaning, or taking medications.

The analysis of prominent social characteristics is a critical component of understanding the pre-disaster community conditions and potential for loss. In addition to a broad understanding of demographic composition, it is key to understand support networks and infrastructure that residents depend on for basic services. The section below explores impacts that disasters and natural hazards have on the community operations.

Community Lifelines

The FEMA Community Lifelines are "services that enable a continuous operation of critical government and business functions that are essential to ensuring human health, safety, and economic security."[34] They serve as the integrated, inextricably linked network of infrastructure, services, assets, and capabilities[35] that sustain the recurring needs of West Virginia's communities. The seven community lifelines represent only the most basic services a community relies on and which, when stable, enable all other activity within a community – making them highly interconnected and dependent on one another. Figure 44 identifies the seven community lifelines: Safety and Security; Food, Water, Shelter; Health and Medical; Energy (Power & Fuel); Communications; Transportation; and Hazardous Material.

[34] FEMA. National Response Framework, Fourth Edition, October 28, 2019, p. ii. Retrieved from https://www.fema.gov/media-library-data/1572366339630-0e9278a0ede9ee129025182b4d0f818e/National_Response_Framework_4th_20191028.pdf

[35] FEMA Community Lifelines Implementation Toolkit, Version 2.0, November 2019. Retrieved from https://www.fema.gov/media-library-data/1576770152678-87196e4c3d091f0319da967cf47ffd9c/CommunityLifelinesToolkit2.0v2.pdf

Figure 44: FEMA Community Lifelines for Incident Stabilization

Source: FEMA Community Lifelines Implementation Toolkit, Version 2.0.

Community Lifelines do not operate in silos. Therefore, their interdependence requires state, regional, and local synergy to address the security and reliability of its various lifelines.[36] The following section evaluates each lifeline, how the historic 2016 disaster and other disasters may have disrupted or destabilized critical services, how West Virginia responded, and potential future risks. West Virginia's CDBG-MIT mitigation activities seek to safeguard these fundamental services and ensure their resiliency and reliability during future disasters. Doing so will reduce the risk of loss of life, injury, and property damage and accelerate recovery efforts following a disaster.[37]

Safety and Security

On Thursday, June 23rd, 2016 a diagonal strip of thunderstorms and heavy rains began moving from Jackson County to Greenbrier County. It caused streams to rapidly rise producing destructive flash floods and mudslides that would ultimately claim 23 lives before the day was over. The day would become known as the nation's highest death toll from flash floods since May 2010.[38] The first community lifeline, Safety and Security, considers the critical services responsible for emergency response including search and rescue operations, fire services, law enforcement, government services including emergency operation centers, government offices and schools. It also includes services for community safety, including flood control and other protective actions. The 2016 floods rattled the safety and security of communities as transportation and communications lifelines collapsed, making search and rescue missions dangerous - and in some cases impossible.

Emergency Responders

The West Virginia Division of Highways (DOH) prepared for the storm's arrival and responded immediately, barricading roads, placing signs of high water, assessing damages and developing plans to reopen roads as quickly as possible.[39] First responders relied on the highways department to clear the roads so they could respond to any emergency. Equipped with boats, helicopters and ropes, over 250 National Guard personnel worked with 12 West Virginia swift water teams, an additional seven out-of-state swift water teams[40], firefighters, and law enforcement officers to

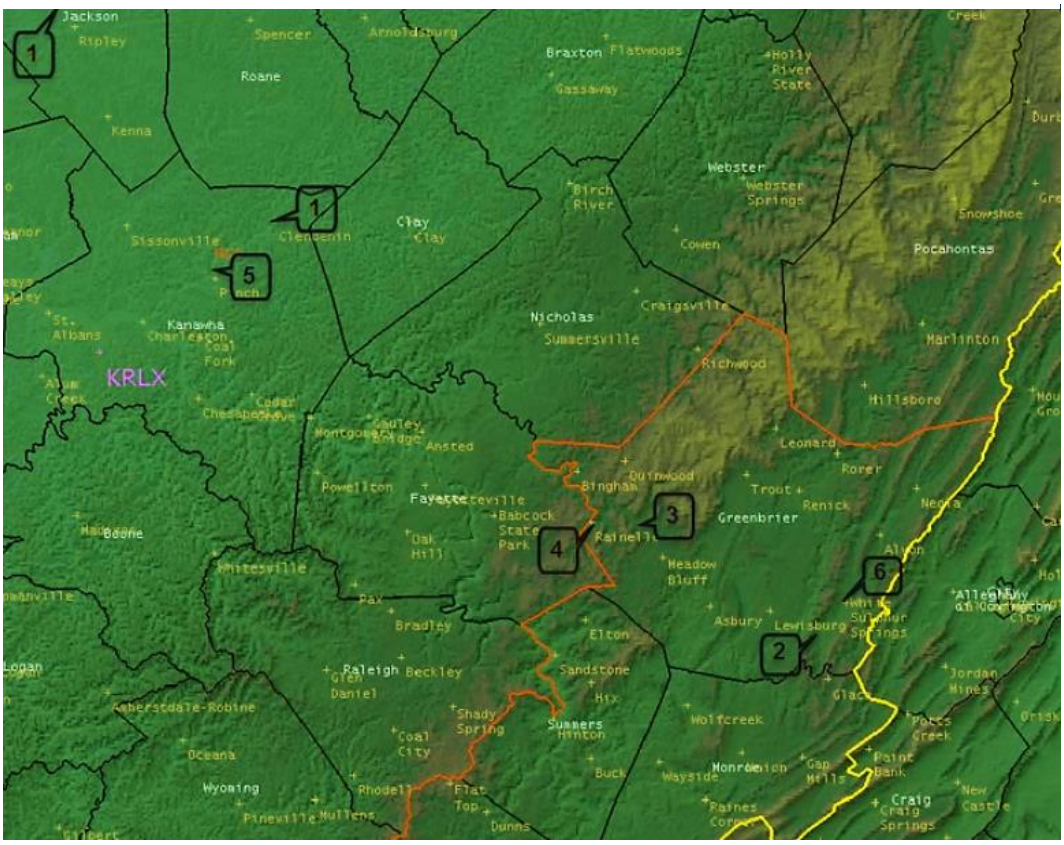
[36] https://www.naco.org/sites/default/files/documents/NACo_ResilientCounties_Lifelines_Nov2014.pdf
[37] 45838 Federal Register, Vol. 84, No. 169, Friday, August 30, 2019, Notices.
[38] https://www.cnn.com/2016/06/27/us/west-virginia-flooding-deaths/index.html
[39] https://www.youtube.com/watch?v=CftfZBtV4A4 – WV DOT YouTube, June 2016 Flood: "Highways & High Water"
[40] http://www.disastercenter.com/FEMA+Daily+Ops+Briefing+06-25-2016.pdf

rescue people from roofs of flooded houses, cars and trucks, and even mounds that had become temporary islands.[41] First responders worked for 24 hours straight and into the weekend, saving numerous lives. Yet, not all were lucky. As flash floods ravished communities, many areas were inaccessible due to destruction of roads and bridges, downed internet and cellphone services, as well power outages.

In Richwood, state police and local responders managed to rescue a woman trapped in her car with water up to her neck.[42] In Kanawha a woman would call 911 operators around 4:30pm, trapped in floodwater from Wills Creek that was pouring into her SUV. Emergency responders navigated multiple routes, including Interstate 79, yet Wills Creek road was inaccessible. A hospice patient also died as first responders were unable to reach her home. In Clendenin, emergency responders were not able to reach the vicinity until the following morning on Friday.[43] Rainelle had roughly six buses full of displaced residents that were evacuated to a fire department facility, until they were flooded out and forced to move to an abandoned store, until that location was also flooded, ultimately settling at a church 40 miles away.[44] Through the weekend, responders spent long days doing search and rescues, taking abandoned pets to a shelter, and saving residents from roofs, out of attics, and from trees into rescue boats.[45] Although the state experienced record fatalities, agency coordination and cooperation between first responders, DOH, and dispatch saved many others.

[41] https://www.nytimes.com/2016/06/25/us/west-virginia-floods.html
[42] https://wvmetronews.com/2020/06/22/a-dark-anniversary-in-west-virginia/
[43] https://www.wvgazettemail.com/news/at-least-22-confirmed-dead-in-massive-wv-flooding/article_b0a3a2f6-82e3-55eb-98f2-8b6c8d2d0b55.html
[44] https://apnews.com/49cdb3e20bcf4cb9b847b4657f6a16fa/multiple-fatalities-reported-west-virginia-flooding
[45] https://apnews.com/49cdb3e20bcf4cb9b847b4657f6a16fa/multiple-fatalities-reported-west-virginia-flooding

Figure 45: Map of Fatality Locations Showing Majority of Deaths in Greenbrier



Source: 2017, AMS 97th American Meteorological Society Annual Meeting, The West Virginia Historic and Devastating Floods of 23 June 2016: Summary of Impacts and National Weather Service Decision Support Services

Schools

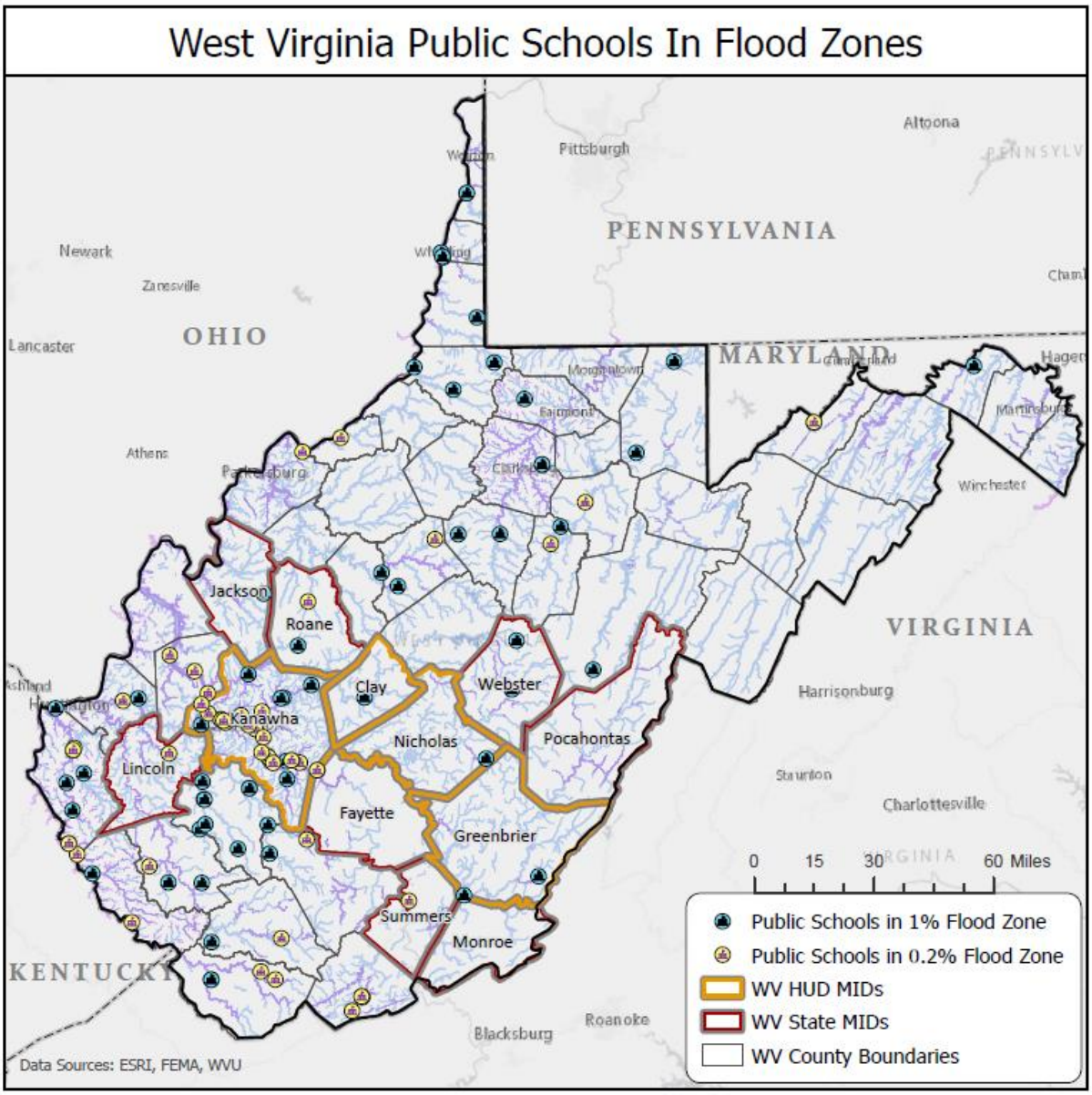
Across the state, flood waters damaged a total of 67 schools. In Kanawha and Nicholas counties, five schools were deemed "substantially damaged" and approved by FEMA for demolition and rebuild. The five schools include Clendenin Elementary and Herbert Hoover High School in Kanawha, and Richwood High and Middle Schools, and Summersville Middle School in Nicholas County. This resulted in over 2,000 students relocated to nearby schools, mostly housed in portable classrooms. All five schools will be moved outside of the floodplain to mitigate the effect of future flooding.[46] Below, Figure 46 reveals 110 public schools currently sit within the floodplain and risk substantial damages. Thirty-two of those schools are in HUD MIDs and 41 are in State MIDs. Four years after the storm in 2016, Clendenin Elementary was just recently approved for construction, following an extensive approval process that proved it difficult to locate flat land that was not in a floodplain. The school will now be built on a hill site that will require lots of earth-moving before construction can start.[47] As West Virginia moves forward rebuilding and

[46] West Virginia CDBG-DR Action Plan, 04.21.2017

[47] http://wvmetronews.com/2020/06/18/fema-approves-27-million-for-new-clendenin-elementary-school-funding-now-complete-following-june-2016-flood/

consolidating schools - whether due to low-enrollment rates[48] or substantial damage to the infrastructure - the State will need to mitigate flood, landslide, or mudslide hazards from school areas and subsequent travel routes.

Figure 46: 110 of West Virginia's Public Schools are in Flood Zones



Additional Future Risks

The resiliency of government functions – such as the capacity and security of emergency responders like fire departments and police – is critical for ensuring that response times do not

[48] https://kapost-files-prod.s3.amazonaws.com/published/56f02c3d626415b792000008/2016-state-of-our-schools-report.pdf?kui=wo7vkgV0wW0LGSjxek0N5A

suffer, and communities can remain the focus in times of need. Investments in public education can also foster a shared understanding of the risks of driving into flooded areas, reducing the need for life-saving interventions. Resilient construction or renovation can ensure buildings, like schools and other government services, are properly sited and strengthened to withstand and bounce back following a disaster. Additionally, new resilient construction of critical facilities, like schools or fire stations, can serve an additional purpose during storms as storm shelters or community spaces. In the Flooding section of the hazard's assessment, maps that present BRIM facilities in floodplains (Figure 10) and critical facilities in floodplains- fire departments, medical facilities, and law enforcement locations – (Figure 11) raise an alarm for needed investment in hardening these facilities to reduce risk.

Food, Water, & Shelter

In 2016, the incessant rainfall that led to the swelling of creeks and rivers, flooded homes and businesses, caused widespread power outages, leaving thousands homeless. Daily survival during normal conditions is dependent on the fundamental operation of the Food, Water, and Shelter Lifeline, which becomes especially critical during times of disaster. This lifeline analyzes the impact of hazards on housing, drinking water utilities, wastewater systems, food supply chains, and agriculture. Disasters, like floods, can instantly put a significant strain on the ability to maintain access to potable water, shelter for residents, and interrupt food supply. Without proper mitigation measures, this strain will increase as projected flood risk increases with the prospect of climate change. Below is a further discussion on an example of how the 2016 floods impacted this lifeline.

Shelter

The June floods devastated residential areas, inundating homes and washing others off their foundation. The State opened 17 shelters serving hundreds of families, on June 25th – three days after the torrential rains began – the shelter served almost 400 occupants.[49] Roughly 129 residents of Rainelle found shelter at the Amsted Baptist Church gymnasium.[50] And about 500 people were stranded overnight in a shopping center when a bridge washed out and had to wait for emergency crews to construct a way out for individuals and their vehicles.[51] For the month that followed, the Salvation Army, American Red Cross, AmeriCorps, and other partners opened 13 shelters which resulted in 2,300 overnight stays, 198,300 meals and snacks served, 133,000 relief items distributed, and 1,700 cases were opened to help individuals and families in need. The Greenbrier Resort hosted another 300 displaced residents in the aftermath.[52] Public and private partnerships, and the goodwill of the community, proved essential to ensuring that displaced families were provided with food, water, and shelter.

[49] http://www.disastercenter.com/FEMA+Daily+Ops+Briefing+06-25-2016.pdf
[50] https://apnews.com/49cdb3e20bcf4cb9b847b4657f6a16fa/multiple-fatalities-reported-west-virginia-flooding
[51] https://apnews.com/49cdb3e20bcf4cb9b847b4657f6a16fa/multiple-fatalities-reported-west-virginia-flooding
[52] https://www.wsls.com/news/2016/06/28/flood-carves-a-path-of-destruction-at-historic-resort/

Following the destruction of 2016, FEMA determined that nearly 3,500 homes were deemed structurally damaged. At least 1,500 homes were destroyed and an additional 4,000 damaged in the flood. Additionally, more than 2,300 properties were recorded as having an average high-water mark of two feet or more in their homes throughout basements, first floors, and over roofs. Due to the inundation levels of water, FEMA deemed 98% of the homes as unsafe, with most lacking flood insurance.[53]

Water Systems

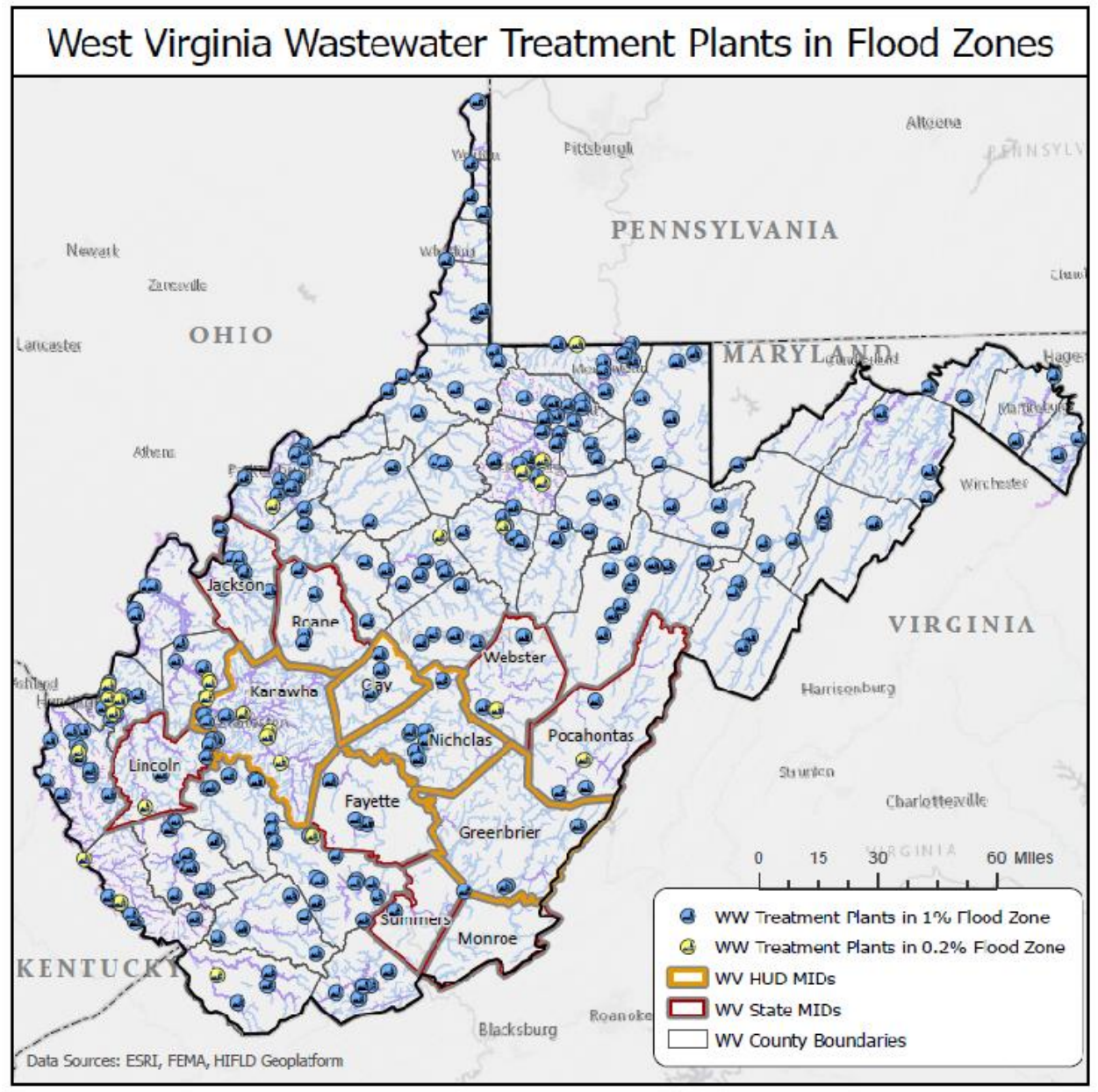
As torrential rains and high waters devastated homes, access to potable water was also threatened. On June 25th, over 22 municipal water systems were recorded as damaged.[54] The hardest hit areas included Clendenin, Clay, Richwood, Rainelle, Alderson, Ronceverte, and White Sulphur Springs. Recorded damage was to electrical systems including substations, motors, control panels, junction boxes, and instrumentation.[55] The West Virginian American Water (WVAW) utility logged over 3,000 customers without water in Kanawha County, 500 customers without water in Fayette County, and 50 in Boone County. The water utility faced hardship in restoring services as many areas were completely inaccessible and their main office was without power with several booster stations running on generators.[56] In response, the utility arranged water stations where residents could fill jugs for themselves.

Small towns, like Rainelle and Richwood, suffered severe damage to the local water and wastewater systems.[57] The Rainelle water department filtration system, which was freshly built (two months before the storm) with a $2.6 million USDA loan, was damaged.[58] As the State assists local governments in navigating public assistance and other grant processes, rebuilding efforts will need to consider the entirety of the water systems to ensure risk of breaches remain low and interruptions can be quickly addressed.

Figure 47 shows an example of the vulnerability of wastewater systems, which may be at risk of overloading or facing electrical damages due to their proximity to flood plains. There are over 1,200 wastewater treatment plants in West Virginia, 243 of the plants are in State MIDs and 98 in HUD MIDs. Of those, 19% of State MIDs and 20% of HUD MIDs wastewater plants are in a 1% annual chance flood hazard, at risk of future impacts. Flooding of wastewater systems has the potential for pollutants and disease-causing agents to spill into communities and natural water systems, giving rise to disease and detrimental environmental effects.

[53] Approved Action Plan summary for grant B-16-DL-54-0001, HUD DRGR: https://drgr.hud.gov/public/downloads/action-plans/B-16-DL-54-0001-AP.pdf
[54] http://www.disastercenter.com/FEMA+Daily+Ops+Briefing+06-25-2016.pdf
[55] West Virginia CDBG-DR Action Plan, 04.21.2017
[56] https://www.wvgazettemail.com/news/at-least-22-confirmed-dead-in-massive-wv-flooding/article_b0a3a2f6-82e3-55eb-98f2-8b6c8d2d0b55.html
[57] Approved Action Plan summary for grant B-16-DL-54-0001, HUD DRGR: https://drgr.hud.gov/public/downloads/action-plans/B-16-DL-54-0001-AP.pdf
[58] https://apnews.com/49cdb3e20bcf4cb9b847b4657f6a16fa/multiple-fatalities-reported-west-virginia-flooding

Figure 47: Wastewater Treatment Plants Are At-Risk



Additional Future Risks

Flood risk continues to increase in West Virginia and the prospect of increasing frequency and severity of severe rainfall events further heightens the need to increase resilience to flooding – especially for housing. Devastating floods have swept the impacted areas of 2016, twice in 2020 thus far (February and June)[59] - the timeframe of this assessment's development. Increased risk to flooding contributes to an increased need for flood insurance. Planning and allocations for

[59] https://www.wvpublic.org/post/floods-hit-southern-wva-region-still-recovers-past-damage#stream/0; https://weather.com/news/news/2020-06-15-west-virginia-fayette-county-oak-hill-flooding-impacts

increasing public awareness of the National Flood Insurance Program can ensure West Virginians can receive timely and more substantial support following a disaster. Flood planning and the revitalization of building codes at the local level can also help prevent widespread destruction to communities. To support the need for planning activities, the Public Water System Supply Study Commission issued a report to the State of West Virginia recommending three main planning activities to preserve water supplies: 1) draft water source protection plans; 2) develop emergency plans; and 3) develop processes for timely notification of spills that may have contaminated water sources.[60] Infrastructure systems specific to drinking water and wastewater treatment have the potential to be compromised more frequently by extreme weather events, especially with aging infrastructure. Investments should be flood proofed and include emergency backup power to ensure their safety and continued service.[61] Gaps in the availability of potable water can have cascading impacts on individual health and may increase the demand for health care, particularly for vulnerable populations. Increased attention to the unmet needs of housing and shelter remain of interest to the public – as was expressed during the public hearings and in the CDBG-MIT Stakeholder Survey. When asked to rank the Community Lifelines most impacted and remain most vulnerable, "Food, Water, and Shelter" gained the highest ranking with a 10% lead over other lifelines. The CDBG-DR Action Plan in response to the 2016 floods provides an in-depth analysis and plan for addressing the unmet need for housing recovery.

Health and Medical

The Health and Medical Lifeline includes medical care services, patient movement, fatality management, public health services, and the medical supply chain. These critical systems can be impacted by disasters both directly and indirectly: facilities can be damaged or destroyed, or access to services, supplies and equipment can be disrupted such that health facilities and personnel are unable to function and provide care.

Public Health Services

Following the floods of 2016, the West Virginia Bureau for Public Health (WVBPH) released a health advisory to healthcare providers, hospitals, and other facilities in anticipation of increased reports of illnesses and injuries among emergency responders and residents. Flood-affected populations have an increased risk of injuries, heat-related illnesses, carbon monoxide poisoning, gastrointestinal illnesses, and mosquito-borne diseases.[62] The Health and Human Services Division coordinated for the delivery and distribution of tetanus vaccinations to several impacted

[60] Report to the Joint Committee on Government Finance of the West Virginia Legislature by the Public Water System Supply Study Commission. West Virginia Division of Homeland Security and Emergency Management. December 15, 2014.

[61] Carter, L., A. Terando, K. Dow, K. Hiers, K.E. Kunkel, A. Lascurain, D. Marcy, M. Osland, and P. Schramm. 2018. Southeast. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, pp. 743–808. doi: 10.7930/NCA4. 2018.CH19. Available at https://nca2018.globalchange.gov/chapter/southeast

[62] https://www.wvoems.org/media/310597/wv%20han%20advisory%20123%2006_30_2016%20final.pdf

counties.[63] Greenbrier Care, a social service provider, also provided 500+ free tetanus vaccines to the community.[64] Communication channels between state agencies and local governments ahead of the storm can ensure supplies and supply chains are prepared to move materials quickly and efficiently, especially if areas become inaccessible.

Medical Care Services

In 2014, a chemical spill near the Elk River – detailed in the Hazardous Waste Lifeline section below - impacted the West Virginia American Water intake and treatment distribution center. The governor declared a State of Emergency and a "Do Not Use" water order was shared with a nine-county area, impacting an estimated 300,000 residents. In addition, six hospitals were directedly affected requiring access to potable water and additional supplies to manage the unavailability of water such as sanitizing wipes or gels, sterile surgical equipment, ice, linens that were disposable or laundered off-site, and disposable dishware. Infection control practices were also impacted as hospital staff would need to pour bottled water for each other to execute proper handwashing techniques. Overall the loss of potable water affected several day-to-day operations and patient care.[65]

Vulnerable populations, such as the elderly community, require extra attention and strategy planning to protect their fragile health needs. In 2003, Richwood flooded, and the local nursing home was forced to move its residents to the back of the building. Yet, the 2016 floods were much worse for this rural community. Moving to the back of the building was no longer viable, personnel pushed their resident's wheelchairs as the waves reached over their laps and in some cases pushed the wheelchairs out from under the residents. Personnel moved quickly to carry the more fragile elderly that may have had feeding tubes, IVs, or bandaged limbs. Most residents escaped on the busses that came to take them to safer ground, twelve residents had to be taken out using sheets as stretchers.[66] As noted in the Vulnerability Assessment of this report, the increasing population of aging, disabled, or immunocompromised residents – especially in rural counties – makes the Health and Medical lifeline of grave need for the State. This includes a deeper understanding of long-term care facilities, VA health system, rural health systems, home care, pharmacies, and dialysis centers as they intersect with natural hazards and require coordination across State and local agencies.

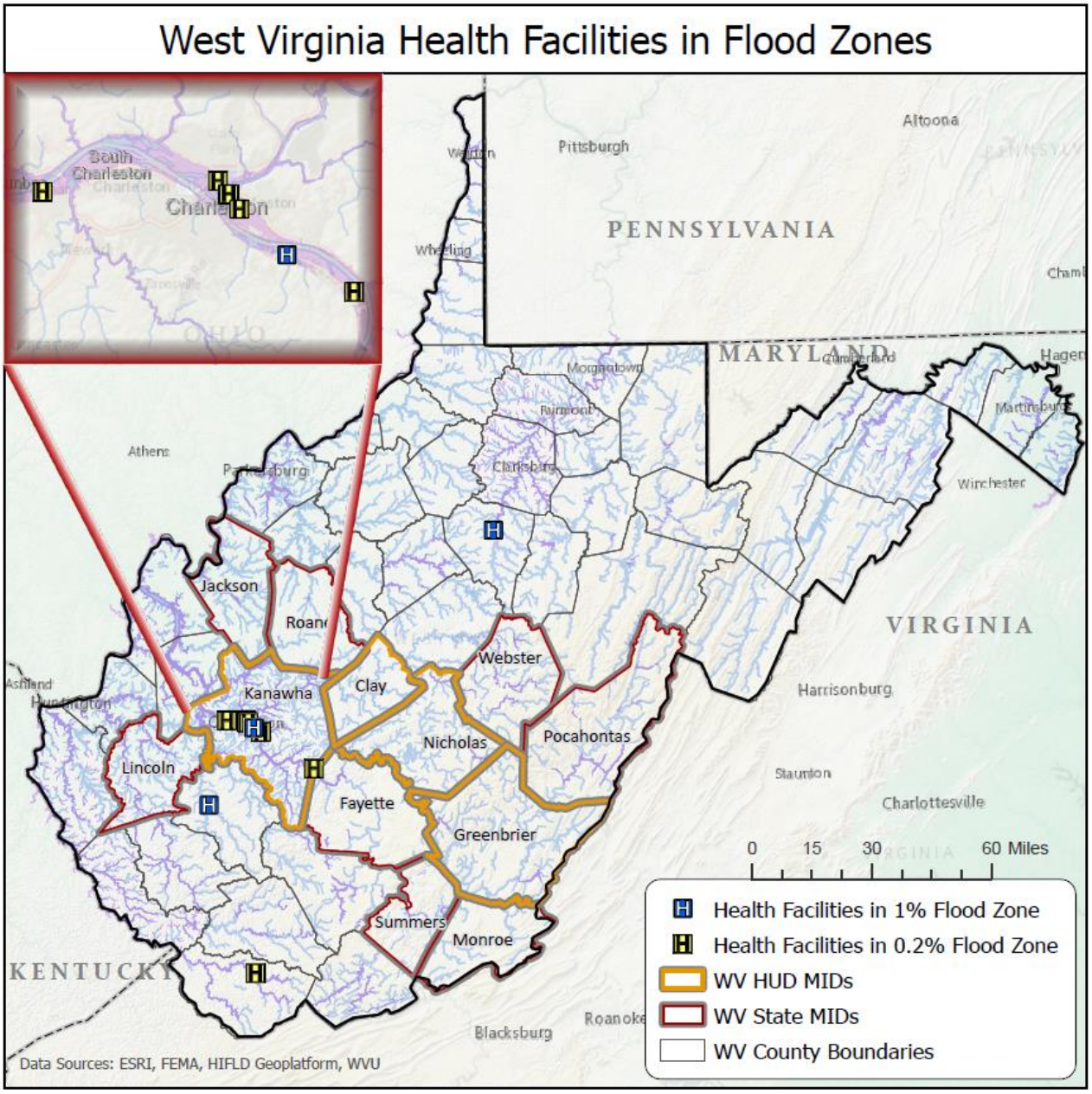
Additional Future Risks

Water is considered a critical component to medical care services; enhanced emergency preparedness plans can identify protocols and alternative sources for enough potable water to meet operational needs. A compromised water supply can be caused by a variety of emergencies,

[63] https://abcnews.go.com/US/west-virginia-wake-devastating-flood/story?id=40143110
[64] https://wset.com/news/local/the-greenbrier-opening-doors-to-provide-shelter-victims-of-flood-devestation#:~:text=The%20Greenbrier%20is%20also%20refunding,from%20Greenbrier%20Care%20Family%20Practice.&text=Starting%20tomorrow%20at%208%3A00am,volunteers%20helping%20in%20the%20community.
[65] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5587347/
[66] https://narratively.com/this-flood-savaged-hamlet-proves-climate-change-isnt-just-a-coastal-concern/

such as water-main breaks, pathogen contamination, natural disasters, and manmade disasters (e.g. chemical spills). While water is considered a critical component to medical care services, enhanced emergency preparedness plans can identify protocols and alternative sources for enough potable water to meet operational needs. Resilient renovation plans can include a centralized water-shut-off mechanism; a water-intake site where delivery trucks can easily unload tanks; or a establishing a well water as a backup supply.[67]

Figure 48: Health Facilities in Flood Zones with a Focus on Kanawha County



[67] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5587347/

In addition, emergencies can present difficult decisions on resource allocations that impact medical service delivery. The COVID-19 pandemic has presented the nation an unprecedented challenge of redefining emergency preparedness plans, response plans, and resource allocation. Balancing compounding disasters requires heavy investment in planning for surge capacity across all lifelines, with a direct impact on public health services and medical care.[68] This is especially true in rural areas where medical facilities face closures or limited access to staff and supplies.[69] And for West Virginia, as described in the Vulnerability Assessment, the increasing size of an aging population, high rates of residents with disabilities and chronic conditions, and epidemics (whether drug overdose/use or black lung disease) should make the Health and Medical lifeline of dire interest to safeguard its reliability, access, and resilience. Planning for vulnerable communities and the services that they require can reduce life threatening incidents. The increased frequency in extreme precipitation events, severe storms, wildfires and extreme heat as a result of climate change may exacerbate the risk of hazard impacts to the Health and Medical Lifeline. Mitigation measures, such as those that reduce future potential for disruption to clean water supply, increasing flood emergency response measures, and improving rural access to healthcare that service the aging population will lead to a reduced threat to loss of life.

Energy

The Energy Lifeline is comprised of two major components - the power grid and its critical facilities, including fuel supply lines that ensure continuous power supply. Preserving the continuity of power and fuel services during a disaster is critical to ensuring that other community lifelines can maintain operations to ensure an emergency response that limits loss of life and property. In a long-term power outage as a result of storms, FEMA emphasizes that emergency power generation assets (e.g., generators and fuel) are critical to maintain essential functions and provide lifesaving and life sustaining support.[70] The impacts of an Energy Lifeline collapse have already been described in previous sections as interruptions to the Safety and Security Lifeline, the Food, Water, and Shelter Lifeline, and the Health and Medical Lifeline, proving their inextricable linkages.

The 2016 storm that caused catastrophic flooding left residents without water, power, and gas. Mountaineer Gas had to shut off service to over 1,680 customers in White Sulphur Springs and Caldwell located in Greenbrier County – including the Greenbrier Resort.[71] Appalachian Power was also down, leaving more than 21,000 customers that included more than 6,500 in Kanawha County without power. It took several days to restore power for some areas as Appalachian Power crews were unable to access their substations due to extreme flooding in Clendenin and in Fayette County's Brackens Creek. In addition, Mon Power had more than 26,000 customers without

[68] https://www.fema.gov/media-library/assets/documents/188203
[69] https://wvrha.org/wp-content/uploads/2017/08/2018-State-Rural-Health-Plan-Final.pdf
[70] FEMA Power Outage Incident Annex to the Response and Recovery Federal Interagency Operational Plans Managing the Cascading Impacts from a Long-Term Power Outage Final - June 2017. Retrieved from: https://www.fema.gov/media-library-data/1512398599047-7565406438d0820111177a9a2d4ee3c6/POIA_Final_7-2017v2_(Compliant_pda)_508.pdf
[71] http://www.disastercenter.com/FEMA+Daily+Ops+Briefing+06-25-2016.pdf

power, where more than half were in Greenbrier County. Even the West Virginian American Water utility had several booster stations running on generators as the power was lost.[72] Local officials was estimated that some 66,000 residences were without power as the storm passed through West Virginia.[73] Decision-making and coordination processes among government officials and operators of public and private infrastructure require resilient communications capabilities to respond and recover as promptly as possible during a storm. Developing and activating holistic continuity plans are necessary to sustain essential community lifeline functions.[74]

Additional Future Risks

The energy sector provides for and relies on transportation, water, information technology, communications, finance, government, and other critical infrastructures. Electricity is essential for daily life, by helping meet basic functions like food, water, housing, healthcare, communications, and transportation. As most of the energy sector is private, operators are responsible for developing their own emergency plans and conducting training and exercises to validate and test their procedures.[75] Increasing temperatures and increased incidence of extreme events – including heavy precipitation or winter storms– will increase the risks to energy systems of West Virginia as the frequency, duration, and intensity of events increase. These risks include both direct damage to generation and transmission infrastructure, as well as pressure on energy utilities due to increasing demand.[76] These growing risks point to the need for further mitigation actions to reduce flooding, and to site, design, and construct new or replacement infrastructure to reduce exposure and increase resilience to future impacts. Local investments can include building smart grids, investing in emergency backup power, and updating building codes such as emergency shutoff valves.[77]

As discussed in the Introduction, the number of days of extreme heat is projected to increase due to climate change. Increases in the cost of energy have impacts across the economy, affecting both local businesses and households, and can increase the level of "energy poverty" among

[72] https://www.wvgazettemail.com/news/at-least-22-confirmed-dead-in-massive-wv-flooding/article_b0a3a2f6-82e3-55eb-98f2-8b6c8d2d0b55.html

[73] https://af.reuters.com/article/africaTech/idAFL1N19G249

[74] FEMA Power Outage Incident Annex to the Response and Recovery Federal Interagency Operational Plans Managing the Cascading Impacts from a Long-Term Power Outage Final - June 2017. Retrieved from: https://www.fema.gov/media-library-data/1512398599047-7565406438d0820111177a9a2d4ee3c6/POIA_Final_7-2017v2_(Compliant_pda)_508.pdf

[75] FEMA Power Outage Incident Annex to the Response and Recovery Federal Interagency Operational Plans Managing the Cascading Impacts from a Long-Term Power Outage Final - June 2017. Retrieved from: https://www.fema.gov/media-library-data/1512398599047-7565406438d0820111177a9a2d4ee3c6/POIA_Final_7-2017v2_(Compliant_pda)_508.pdf

[76] U.S. Department of Energy. October 2015. Climate Change and the U.S. Energy Sector: Regional Vulnerabilities and Resilience Solutions. Retrieved from https://www.energy.gov/sites/prod/files/2015/10/f27/Regional_Climate_Vulnerabilities_and_Resilience_Solutions_0.pdf

[77] NACo_ResilientCounties_Lifelines_Nov2014 https://www.naco.org/sites/default/files/documents/NACo_ResilientCounties_Lifelines_Nov2014.pdf

vulnerable populations.[78] Surges in demand can increase the risk of disruption to electricity supply; loss of power can disrupt the full range of essential public services, including medical support, water and sanitation services, communications, and emergency response. Ensuring that energy and power availability is resilient is vital to ensuring the continuity of critical operations, such as emergency response and communications during disaster. This may include the development of back-up generation and transmission systems to ensure uninterrupted electricity service, especially to the State and County critical facilities.

Communications

Channels of information keep residents, businesses, and local services aware of disaster developments, including storm updates, safety information, potential hazards, and state or regional coordination for emergency response and recovery needs. For this reason, the Communications Lifeline is an essential function that crosses other lifeline functions already mentioned, like Safety and Security, Health and Medical, and Energy lifelines. The subcomponents to communications include local alerts, warnings and messages, 911 and dispatch, infrastructure streams (i.e., internet, broadcast, and satellite), and finance (i.e., banking services and electronic payments).

During any disaster, like the 2016 floods, federal, state, and local coordination – including broadcasters and nonprofits - are the backbone to response and recovery. Alerting partners and the public on storm updates and safety messages will need to be shared promptly and efficiently, with the consideration of other community lifelines collapsing. As the unprecedented storm and floods of 2016 moved across West Virginia, the National Weather Service (NWS) of Blacksburg and Charleston worked closely with officials, providing daily video briefings on the severe storm threat as it evolved through the weekend. As torrential rain and flash floods poured through West Virginia cresting streams and rivers, the NWS made swift phone call to emergency management officials to share the "Flash Flood Emergency", providing strong worded statements – a rare emergency message as noted by NWS.[79] As responders examined impacted areas, internet and cellphone service went out making it difficult to assess damage. In Kanawha County, emergency officials (including state police) urged residents not to travel in flood-ravaged areas, and asked people non-emergency 911 calls to be patient.[80]

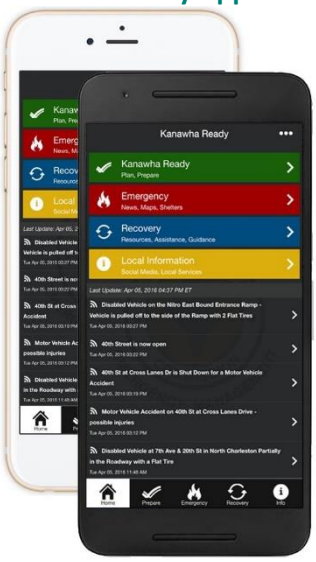
[78] U.S. Department of Energy. October 2015. Climate Change and the U.S. Energy Sector: Regional Vulnerabilities and Resilience Solutions. Retrieved from https://www.energy.gov/sites/prod/files/2015/10/f27/Regional_Climate_Vulnerabilities_and_Resilience_Solutions_0.pdf

[79] 2017, AMS 97th American Meteorological Society Annual Meeting, The West Virginia Historic and Devastating Floods of 23 June 2016: Summary of Impacts and National Weather Service Decision Support Service

[80] https://www.wvgazettemail.com/news/at-least-22-confirmed-dead-in-massive-wv-flooding/article_b0a3a2f6-82e3-55eb-98f2-8b6c8d2d0b55.html

During extreme events, key communication avenues outlined by ReadyWV! Includes emergency alerts, radio and television, social media apps (i.e. Facebook and Twitter), and mobile apps like Kanawha County's KC Ready App.[81] The KC Ready App launched less than two weeks before the 2016 floods with great success. It was built to help clear the Metro 911 dispatch by sending push notifications to users using Metro 911's live feed, reducing the number of residents that call to report the same problem. The app includes disaster preparedness recommendations and a live tracker for emergencies, providing street updates. Following the storm, a month later it was recorded that the app was downloaded 7,179 times and had delivered 368,088 push notifications, much related to the storm. Funded by private companies, the app cost was roughly $100,000.[82] Localized emergency apps can help reduce overloads to the 911 dispatch, create a wider understanding of disaster conditions useful to both emergency responders and residents, and serves as additional communication line to bolster other government communication channels.

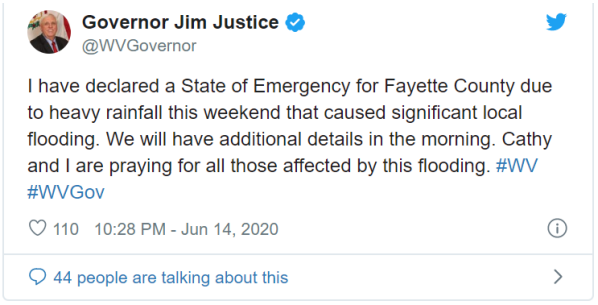
KC Ready App



Source: WV Gazettemail for Metro Kanawha, Article on KC Ready App Provides Emergency Assistance at Your Fingertips,

Social media also has proven to be a significant vehicle for effectively sharing information during an emergency with government agencies, community members, media outlets, and nonprofit partners. Storm alerts, updates that include images, and messages can reach a diverse audience of stakeholders and ensured that the public was connected and engaged. These communication channels provide weather conditions, safety tips, where to access resources such as water, volunteer opportunities, and appreciation for fellow community members.[83]

Governor Justice Announces State of Emergency via Twitter



Source:twitter.com/WVGovernor/status/1272355236846407680

Additional Future Risks

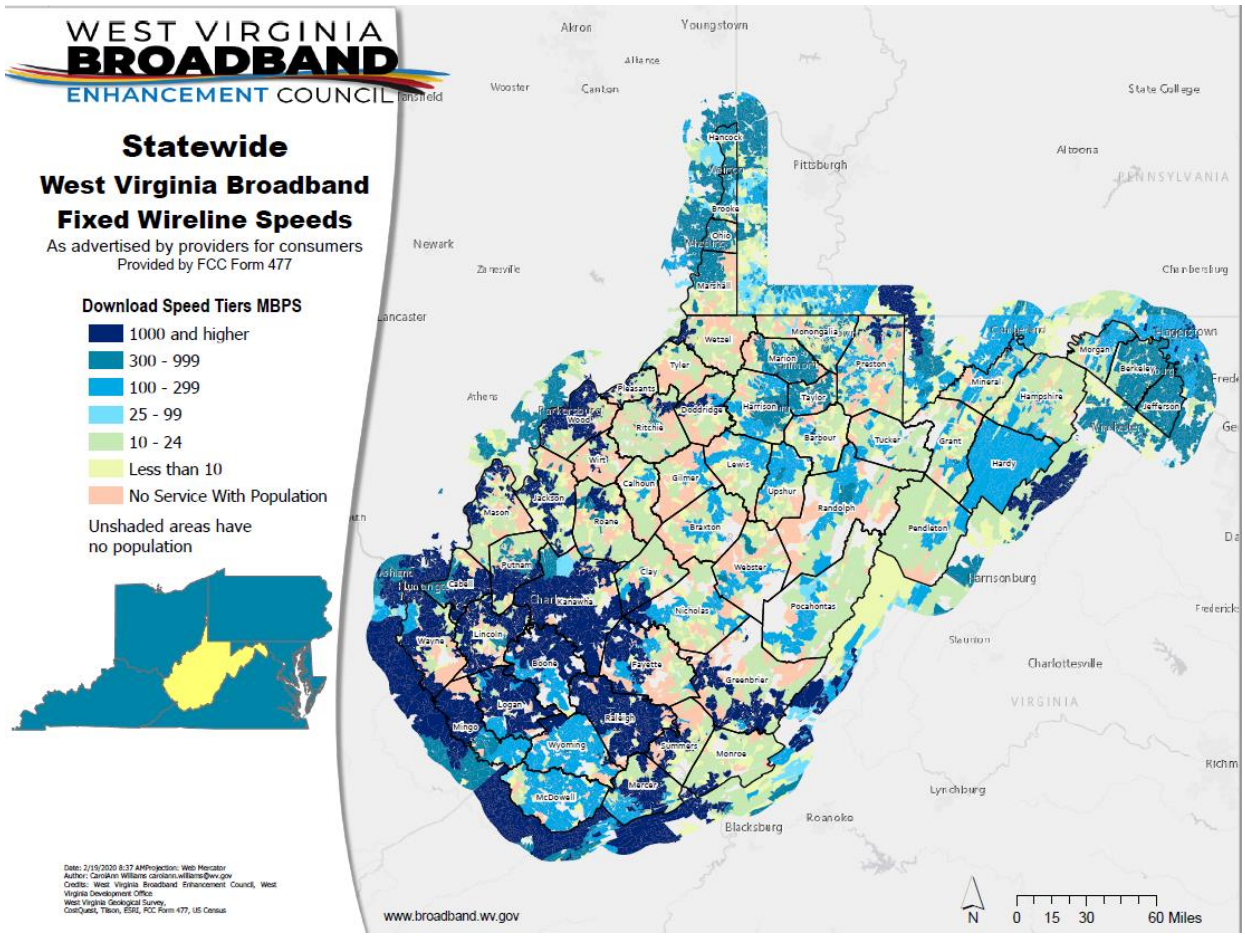
Coordination across government agencies and local partners, such as local broadcasters and nonprofits, indeed showcase the importance of a robust Communications Lifeline during disaster events. Emergency communication plans and disaster preparedness plans that include public education and public safety points can mean life-saving results when communication systems are

[81] https://ready.wv.gov/Resources/Documents/ReadyWV_Em.%20Prep%20Slides_PDF.pdf
[82] https://www.govtech.com/applications/KC-Ready-App-Serves-as-Mobile-Resource-During-Disasters.html
[83] 2017, AMS 97th American Meteorological Society Annual Meeting, The West Virginia Historic and Devastating Floods of 23 June 2016: Summary of Impacts and National Weather Service Decision Support Service

disrupted via power outages, equipment damage, or overloaded channels. The CDBG-MIT Survey to key stakeholders and the public revealed that the top three ways that individuals received the threat of a potential natural hazard was via text, television communications, and social media platforms. The survey also identified "Preparedness and Coordinated Response" as the number one need and highest priority when taking into consideration past experiences with natural hazards. And when asked to rate top mitigation activities, "Improve Community Education and Awareness" was ranked in the top three most important actions that can be taken. Indeed, one comment even noted, "Get the information out!" Communication is a necessary and vital element to survival and recovery. Resilient infrastructure, connections, and alternative methods must ensure state, local, and regional information distribution channels to reach the State's diverse population.

The COVID-19 pandemic has also revealed the urgency to expand broadband, Wi-Fi, and overall virtual connectivity. Keeping communities connected digitally can preserve and uplift economic outcomes while also keep residents informed ahead of a storm. In Figure 49 we can see the limitations of West Virginia's broadband reach, a current development project as part of the larger CDBG efforts. Updating, hardening, or installing cable systems and wireline connections (fiber optic, coaxial and twisted pair) can reduce the vulnerability of communities.

Figure 49: Broadband Access and Speeds Show the Divide Between Rural and Urban Areas



Transportation

The Transportation Lifeline is all-encompassing, including highways and roadways, mass transit, railways, aviation, and maritime. Transportation networks support the mobility of people and goods. The network of roads, bridges, railways, and waterways are essential for day-to-day operations and a highly dependent infrastructure feature during disasters. The need for mobility in times of crisis makes the Transportation Lifeline a fundamental service interconnected to other lifelines. Response and recovery operations rely on accessible transportation routes in order to ensure the provision of food or medical supplies to those in need. Damaged or flooded transportation networks such as roads and bridges can impede access to essential services such as hospitals, and stifle support from fire departments and police.

Mobility collapsed as the severe storm ripped through West Virginia during the 2016 disaster, making roads impassable and trapping others. Based on estimates by the West Virginia Department of Transportation (DOT), roads and bridges suffered nearly $55 million in damages, affecting 624 routes, stretching over 200 miles. FEMA estimated damages totaled over $34 million and the Federal Highways Administration estimated costs more than $20 million. The damages are attributed to the consequences of flash flood waters washing out roadways, mudslides, landslides, road slides and slips, damaged or clogged culverts, embankment and shoulder erosion, clogged ditches, and trees and debris on the roadway. [84] 1,300 different damage sites of state roads were washed out, 123 bridges were damaged, and 15 bridges were destroyed. Throughout the impacted counties, several streetlights and traffic signals were damaged. As a result, 250 roads were closed due to the 2016 storm.[85] Figure 50 from the West Virginia Department of Highways (DOH) outlines the number of routes affected, not select damage sites as there can be multiple damage sites on one route. If damage occurred on WV and US Routes or Interstates, the routes may be duplicated from county to county. Estimated damages in Figure 51 by the DOH also shows that the two hardest hit counties are Kanawha, with more than $15.6 million in damage, and Clay, with more than $12.8 million in damage.

Figure 50: Number of Affected Routes by DOH

Flooding Damage Estimates Updated: August 5		
District	County	# of Routes
1	Clay	60
1	Kanawha	71
2	Lincoln	8
2	Wayne	26
3	Jackson	36
3	Roane	38
7	Braxton	33
7	Gilmer	5
7	Lewis	8
7	Upshur	5
7	Webster	31
8	Pocahontas	22
8	Randolph	8
9	Fayette	66
9	Greenbrier	121
9	Nicholas	81
9	Summers	5

Figure 51: DOH Estimated Costs of Flood Damage by County, Representing Bridges and Damage Type

Estimated Costs for Flood Event Beginning 6/22/2016 Updated: 8/5/2016				
County	District	Total FEMA Cost	Total FHWA Cost	Total
Clay	1	$8,646,291	$4,188,000	$12,834,291
Kanawha	1	$8,735,005	$6,871,000	$15,606,005
Lincoln	2	$428,450	$0	$428,450
Wayne	2	$334,400	$100,000	$434,400
Jackson	3	$696,500	$15,000	$711,500
Roane	3	$1,713,500	$1,045,500	$2,759,000
Braxton	7	$367,500	$85,000	$452,500
Gilmer	7	$244,250	$135,000	$379,250
Lewis	7	$126,500	$0	$126,500
Upshur	8	$119,000	$0	$119,000
Webster	8	$1,575,100	$457,350	$2,032,450
Pocahontas	8	$418,085	$213,550	$631,635
Randolph	8	$245,000	$25,500	$270,500
Fayette	9	$2,343,200	$1,407,500	$3,750,700
Greenbrier	9	$3,423,320	$3,665,500	$7,088,820
Nicholas	9	$4,317,685	$2,535,400	$6,853,085
Summers	9	$478,000	$0	$478,000
Total		**$34,211,786**	**$20,744,300**	**$54,956,086**

Bridges: Total Loss

County	Route #	Route name	Bridge Name	Status
Clay	CO 15/4		Robinson Fork Bridge	
Clay	WV2		East Porter Creek Bridge	
Clay	CO 1/5		Left Fork Bridge	
Kanawha	CO 50		Queen Shoals Creek Bridge	
Kanawha	CO 50	Queen Shoals Hollow	Less than 20'	
Kanawha	CO 50		Queen Shoals Creek Bridge	
Fayette	CO 82/5	Keeneys Creek Road	Less than 20'	Bypass in place
Greenbrier	CO 63/10		Caldwell Pedestrian Bridge	
Nicholas	WV 39	Turnpike Road	Less than 20'	Temp bridge in place

Bridge Damage by Type

District	County	Structural damage	Debris, other damage	Damage not yet classified
1	Clay	13	23	4
1	Kanawha	4	12	7
7	Webster	1		
9	Fayette	2		
9	Greenbrier	9		1
9	Nicholas	4		

Source (51 & 52): Estimated Costs for Flood Event Beginning 6/22/2016, Uploaded by Jeff Morris to Scribd.com.

[84] https://wchstv.com/news/local/department-of-transportation-estimates-flood-damage-at-more-than-549-million

[85] West Virginia CDBG-DR Action Plan, 04.21.2017

Although the DOT and DOH prepared days ahead of the storm, the unprecedented flash floods led to crews and emergency responders working day and night. Teams hit the streets once reports started coming in, coordinating with emergency responders to assist with rescue missions. The situation became so dire, DOT crews ran out of high-water signs in some areas and had to use flaggers ahead of the areas in lieu.[86] When freight barges broke loose and slammed into bridges in Kanawha, responders waited for inspectors to determine whether the integrity of the bridges was unharmed.[87] Residents were stranded, unable to get in and out of areas – a situation that was applicable to many areas across the impacted counties. Temporary solutions were quickly devised, placing pipes in the creeks and creating gravel roads so residents could get out.[88]

Additional Future Risks

Transportation networks and subsequent emergency response efforts in West Virginia will continue to face increased risk to flooding, mudslides, and winter weather. During the week of the four-year anniversary of the 2016 floods, similar counties like Clay, Fayette, and Greenbrier faced destructive mudslides and flash floods. Given the increasing frequency of severe rainfall events, as discussed in the Introduction, the potential flood risk to West Virginia roads and bridges can be expected to increase over time – especially as infrastructure continue to age. The ASCE Infrastructure Report Card for West Virginia estimates almost 19% of bridges of structurally deficient, 432 dams are considered high hazard, and 31% of roads are in poor condition.[89]

The increased disruption of roads and bridges due to heavy rains, flood waters, and mudslides have cascading impacts across all Community Lifelines, as transportation is a critical element of each essential service component. It is worth noting that future climate change stressors also have longer range impacts on transportation infrastructure that increase the costs of operations and maintenance. High heat, inundation, and mudslides take a toll on road surfaces and bridges, leading to roads buckling, cracking, washing away, damage to traffic lights and signage during severe storms, and increased erosion rates.[90] These more gradual impacts on infrastructure resilience should be considered as the State considers repairs and reconstruction. Holistic recovery, such as improvements to local stormwater capacity can contribute to minimizing threats to transit infrastructure.

Hazardous Material

The final Community Lifeline, Hazardous Materials, refers to Oil/HAZMAT facilities, toxic incidents, hazardous materials, pollutants, or contaminants. This can include explosives, flammable and combustible substances, poisons, and radioactive materials. Often hazardous materials are used

[86] WV DOT YouTube, June 2016 Flood: "Highways & High Water": https://www.youtube.com/watch?v=CftfZBtV4A4

[87] https://www.nytimes.com/2016/06/25/us/west-virginia-floods.html

[88] http://wvmetronews.com/2016/06/29/highway-damage-from-floods-at-16-million/

[89] https://www.infrastructurereportcard.org/state-item/west-virginia/

[90] NACo_ResilientCounties_Lifelines_Nov2014 https://www.naco.org/sites/default/files/documents/NACo_ResilientCounties_Lifelines_Nov2014.pdf

or transported as part of daily operations yet can become a risk to the public when the chemicals are used precariously or released in harmful amounts where people live, work, or play. Emergencies can thus occur during the production, storage, transportation, use or disposal of chemicals.[91]

Figure 52: Spill from Freedom Industries Impacts the Kanawha River and Neighboring Areas

In 2014, about 7,500 gallons of Methylcyclohexane methanol (MCHM) and a mixture of glycol ethers, was leaked from a Freedom Industries facility into the ground by the Elk River, impacting the West Virginia American Water intake and treatment distribution center. It was the third major chemical accident in five years – coming after two investigations in Kanawha Valley or "Chemical Valley." By this moment, federal regulators and environmental advocates were already pushing the State to adopt rules safeguarding chemicals. In the morning, following the leak, Governor Tomblin ordered a ban on drinking, bathing and cooking with tap water in nine counties, impacting over 300,000 people. Schools closed, businesses like restaurants and hotels were also forced to close. Four major hospitals were also impacted and forced to take emergency measures to conserve water.[92] The West Virginia Bureau of Public Health and the West Virginia National Guard developed a long-term plan to ensure water and food was available to the population. As bottled waters disappeared from shelves, the National Guard distributed water via tankers. FEMA sent additional trucks, each carrying 4,900 gallons.[93] As public anxiety grew over what the possible health risks were, the Kanawha-Charleston Health Department began receiving complaints of irritation of the skin, throat, chest, and stomach.[94] As days followed, emergency rooms treated 169 patients for symptoms related to chemical exposure and ten people were admitted.[95]

The West Virginia Department of Environmental Protection (DEP) received calls from Charleston residents about a licorice smell in the air by 8:15am. Freedom Industries noted employees noticed the leak and began cleanup around 10:30am. By the time DEP inspectors arrived at 11:10am, a 4-foot wide stream of chemical liquid was flowing across the containment dike, amongst another pool measuring 400 square feet. The dike appeared old, full of cracks and holes. Freedom Industries failed to call American Water and DEP notified the water plant around noon. By 5:00pm

[91] https://www.ready.gov/hazardous-materials-incidents#:~:text=Hazardous%20materials%20can%20include%20explosives,you%20live%2C%20work%20or%20play.
[92] https://www.nytimes.com/2014/01/14/us/ban-on-tap-water-being-lifted-in-west-virginia.html
[93] https://www.wvgazettemail.com/news/special_reports/300k-lack-water-in-southern-w-va/article_74817364-e9e4-54f8-8f9a-7e9816fa1200.html
[94] https://www.cnn.com/2014/01/11/us/west-virginia-contaminated-water/
[95] https://www.nytimes.com/2014/01/13/us/critics-say-chemical-spill-highlights-lax-west-virginia-regulations.html

the chemicals were running through the carbon filters and notification for the public was released almost an hour later. Ultimately, DEP issued a violation to Freedom Industries for violating the State's Air Pollution Control Act and the Water Pollution Control Act.[96] The West Virginia American Water company setup a webpage dedicated to alert residents of when and how to remove the tainted residue from pipes and water heaters.[97]

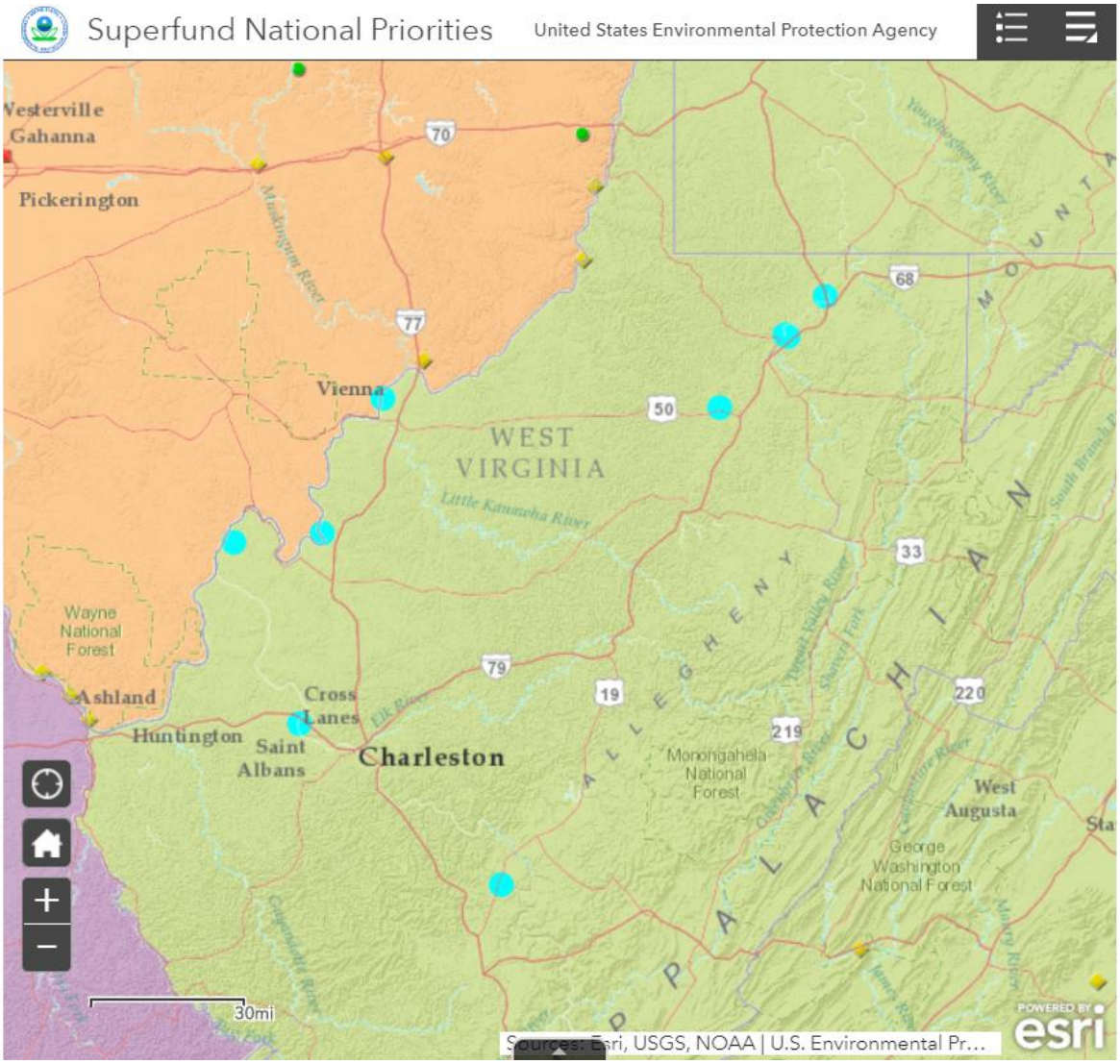
Future Risks

In its entirety, the Elk River spill paints the interdependencies of the Community Lifelines and the necessary elements of state, local, and business coordination to address an emergency. Hazardous materials can quickly impact all critical lifelines and cause more long-term effects, specific to individual health, the environment, and agricultural production. West Virginia, aside from the chemical tragedies of its past, also hosts nine Superfund sites – contaminated sites where the Environmental Protection Agency has the authority and funds to clean up. An example site is in Minden, where Shaffer Equipment Company started storing Polychlorinated Biphenyl (PCB), a chemical linked to cause cancer. EPA determined that the soil in Minden is contaminated. Consequently, when floods impact the Minden area – as it did in the writing of this assessment (June 2020) – residents fear the chemical is flushed from the soil and are further exposed to the hazardous chemical.[98] Management and containment of hazardous materials must account for

[96] https://www.wvgazettemail.com/news/special_reports/dep-inspectors-describe-early-scene-at-freedom-leak-site/article_50247d9d-69f6-5533-9676-ff04532f6264.html
[97] https://www.nytimes.com/2014/01/14/us/ban-on-tap-water-being-lifted-in-west-virginia.html
[98] https://www.wvpublic.org/post/fayette-county-flood-stirs-long-held-concerns-cancer-causing-oil-site#stream/0

possible release and exposure due to natural disasters like floods, high winds, earthquakes, fires, and mudslides.

Figure 53: West Virginia's Nine Superfund Sites are Represented by Blue Dots



Source: EPA's Search Superfund Sites Where You Live, https://www.epa.gov/superfund/search-superfund-sites-where-you-live

Existing Resiliency and Mitigation Measures

In preparation for development of this Mitigation Needs Assessment, and to align planned CDBG–MIT activities with other federal, state, and local mitigation projects and planning processes (including coordinating and aligning with other mitigation projects funded by FEMA, the U.S. Army Corps of Engineers (USACE), and other agencies as appropriate (84 FR 45840)), the State reviewed existing resiliency and mitigation measures. Key to this was reviewing the Mitigation Strategies[99] section as outlined in the State's 2018 Statewide Hazard Mitigation Plan.

[99] West Virginia 2018 Statewide Hazard Mitigation Plan, p. 285

Table 17: West Virginia's 2018 Statewide Hazard Mitigation Plan Mitigation Strategies

Mitigation Actions	Mitigation Strategy
FL-01	Promote/Enhance RL/SRL Program
FL-02	Promote/Enhance CRS Program
FL-03	Promote/Enhance NFIP
FL-04	Conduct Flood Mitigation Planning
LS-01	Soil Erosion Reduction Measures
LS-02	Understanding Landslide Risks
WF-01	Develop Wildfire Prevention Measures
WV-02	Fund Community Wildfire Protection Plan Program
DL-01	Coordinate Dam and Levee Safety Issues
CF-01	Complete Threat Assessments
CF-02	Utilize Risk Information in Planning
CF-03	Build Relationships with Critical Facilities
CF-04	Promote Building Codes
PL-01	Enhance Planning Process
PL-02	Utilization of Benefit-Cost Analysis
PL-03	Integration of Climate/Land Use Change into Planning
TE-01	Conduct Public Outreach
TE-02	Improve Use of Media
TE-03	Conduct Wildfire Suppression Training
GL-01	Obtain Executive/Legislative Support
GL-03	Explore Enhanced Funding Methods

As a supplemental review, as part of the State's Community Development Block Grant - MIT Survey with Key Stakeholders (Appendix B), the State inquired about mitigation activities (protection or planning) that have been performed in the last five years by various stakeholders and their respective counties. The answers show the following:

**Table 18: Community Development Block Grant - MIT Survey -
What Mitigation Activities (protection or planning) have you performed in the last 5 years?
Please select all that apply.**

Answer Choices	Responses (%)	Responses (#)
Encourage Purchase of Flood Insurance	32.08%	17
Natural Hazard/Disaster Training/Education	28.30%	15
Acquisitions	22.64%	12
Clear Brush	22.64%	12
Property Elevation	22.64%	12

Answer Choices	Responses (%)	Responses (#)
Unknown	22.64%	12
Infrastructure-Water and Sewer, Stormwater	20.75%	11
Shelters	20.75%	11
Flood Proofing and/or Enhancing Function of Natural Hazard Flood Mitigation	18.87%	10
Other (please specify) *	18.87%	10
Property Buyouts	18.87%	10
Infrastructure-Bridges, Roads	13.21%	7
Enhance Vulnerable Utilities	11.32%	6
Infrastructure-Levees, Flood Walls, Dams	9.43%	5
Natural Hazard Warning System	9.43%	5
Updated Building Codes, Zoning, Land Use Plans	9.43%	5
Green Building Standards	5.66%	3
Removal of Culverts	5.66%	3

*Other (Please Specify)
None of the above
We have a FEMA buyout awaiting funding. Been working on it several years
We do educational webinars and would be happy to provide yours to our 800+ statewide members
Provided healthcare assessments, treatment and vaccinations during Flood 2016
mitigation of mining related emergencies (landslides, blowouts, subsidence)
Kanawha county emergency management frequently clear stream blockages and clear clogged culverts when they become a threat to a community
all of the above
None
Weatherization services
Food pantries

Unmet Mitigation Needs

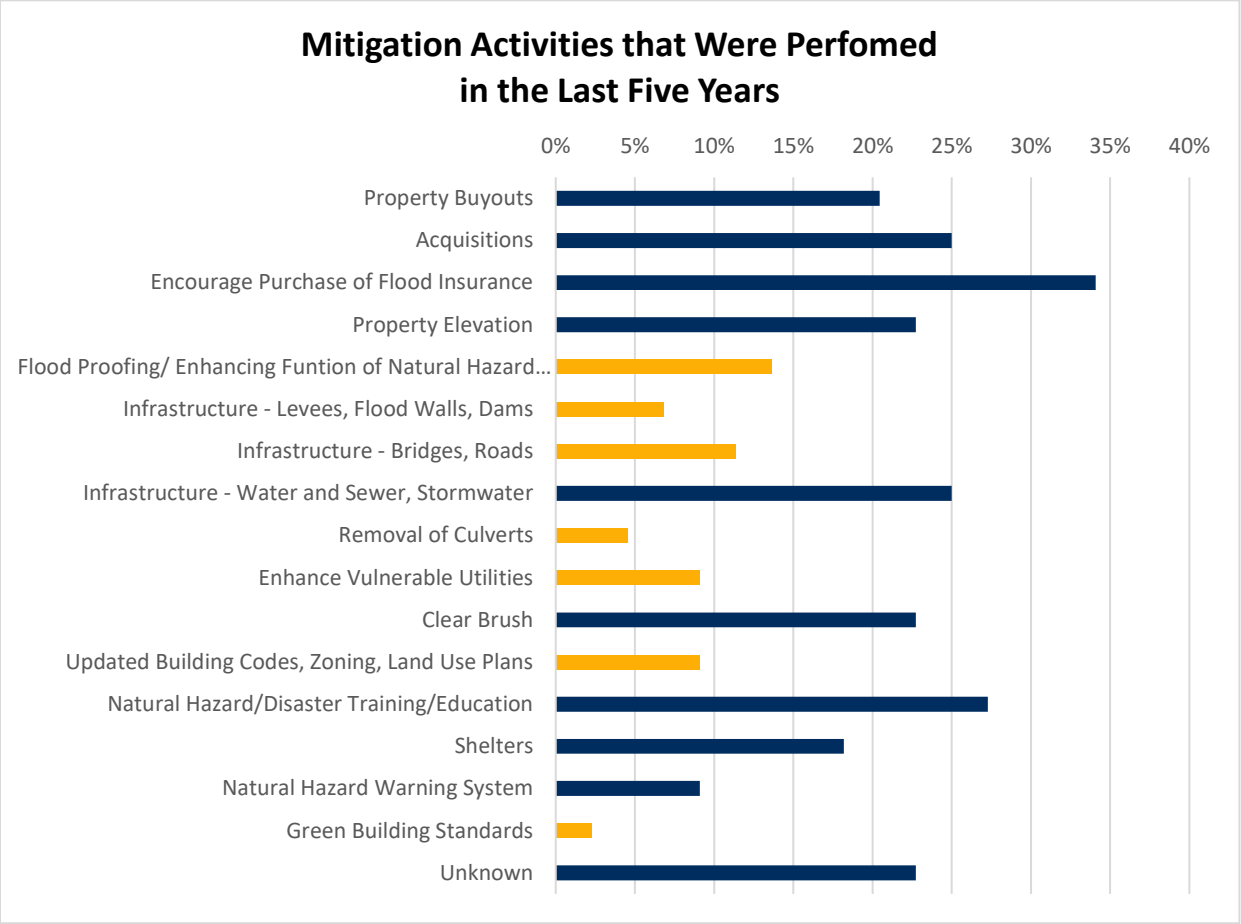
Investing in Resilient Infrastructure

Based on the findings of this Mitigation Needs Assessment and results noted in Existing Resiliency and Mitigation Measures section above, there is a high demand and need for the implementation of infrastructure mitigation projects that will improve resiliency to hazard impacts discussed here, such as flooding. This analysis finds that in the MID's alone, hundreds of millions of dollars of infrastructure has been damaged due to flooding and continues to be at risk. In many

communities, essential mitigation projects have gone unimplemented due to a lack of the necessary funding to complete them. The 2016 CDBG-DR Action Plan presented a brief summary of the historical influence of West Virginians settling near rivers to access natural resources, transportation, and for the development of industry. This summary noted that these once thriving communities are now suffering from declining local economies, populations, and health, events which are inseparable from decreased tax revenues and aging infrastructure that require repairs and upgrades. The deteriorating infrastructure requires investment at all levels of the government. Aging infrastructure across the state is proven to be vulnerable to the effects of hazard shocks, such as flooding and severe storms as noted in this assessment.

A majority of West Virginia's 2016 CDBG-DR allocation, which was received as a result of the June 2016 flooding, has been prioritized to fulfill the unmet housing needs left by the storm's impacts. However, the Plan identified that additional infrastructure activities are needed and should be considered for future funding sources. These were activities such as raising facilities above base flood elevation, strengthening critical systems, having backup power generators for critical systems (water, sewer, etc.), providing retention basins, larger culverts, or culvert debris guards. This coincides with the CDBG-MIT Survey results from key stakeholders across the state that identified infrastructure-related mitigation activities, or the enhancement of vulnerable utilities or critical infrastructure. However, these activities have been implemented at a much lower percentage than activities such as acquisition or property buyouts, as seen in Figure 54. This is additionally supported by questions in the survey, such as "What are the biggest barriers to implementing hazard mitigation projects?" where the overwhelming majority (82.50%) rated "funding" as the biggest barrier. Table 18 above from the MIT Survey which contains the question "What Mitigation Activities (protection or planning) have you performed in the last 5 years?" also gives valuable insight into which activities are those that stakeholders reported have not been performed as often or as frequently. This is highlighted in Figure 54.

Figure 54: Identified Mitigation Activities by Key Stakeholders in the CDBG-MIT Survey Show Lower Investment in Infrastructure Projects in Yellow



CDBG-MIT funding represents an opportunity for local governments and state agencies in West Virginia to implement infrastructure activities that allow communities to better withstand future disasters by reducing the impacts that hazards have, as analyzed in this Mitigation Needs Assessment.

Strengthening Critical Facilities

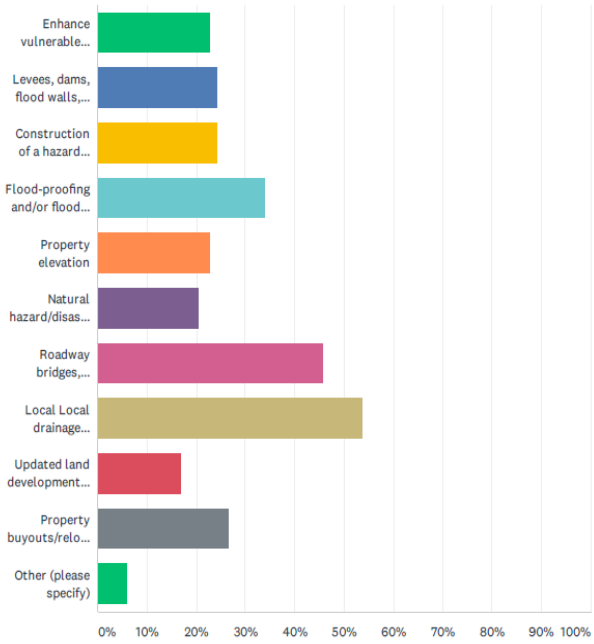
Every day, residents, local organizations, and governments deliver critical services and operate essential functions upon which West Virginians depend. Resilience of these services signifies ensuring their continuity and sustaining their performance when normal operations are disrupted by a disaster. In the Flooding section of the hazard's assessment, we analyze there are nearly 500 BRIM facilities in the State and HUD MIDs in floodplains, and 469 critical facilities (fire departments, medical facilities, and law enforcement) within State and HUD MIDs located in floodplains. In addition, the Community Lifelines section redefines critical facilities as necessary lifelines for community stability. The section highlights the increased risk to critical facilities such as medical centers, schools, fire stations, and utility services based on prior disaster destabilization examples. Community Lifelines are interdependent services that maintain prosperous

communities. As such, it is recognized that mitigation activities that reduce the loss of life, property, and hardship are those which serve to strengthen the infrastructure and critical lifelines that support West Virginians both during day-to-day activities and during times of disaster and heightened risk.

The CDBG-MIT Survey in conjunction with a broader survey conducted for the development of the Consolidated Plan, reached the entire State and included heavy representation from residents. The Consolidated Plan's survey, engaged a wider audience and was distributed prior to the MIT survey, proving consistent unmet needs from the community. In Figure 56, mitigation activities specific to critical facilities include enhancing vulnerable utilities, construction of a hazard shelter, and addressing roadway bridges, culverts, and other forms of storm water conveyance.

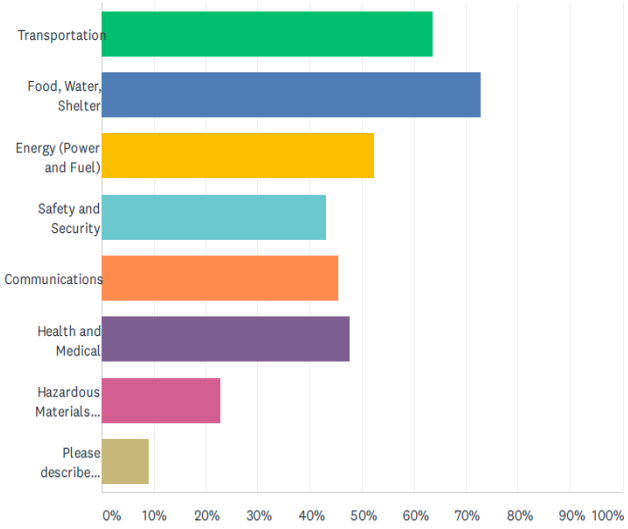
Investment in water and wastewater management are part of a larger picture that depict the need for an integrated water system that is resilient to floods and other storms threat of damaging or overloading the system. Investing in water management systems directly influences the Food, Water, Shelter lifeline by ensuring the reliability of clean drinking water; the Transportation lifeline by reducing the likelihood of stormwater flooding on roadways; and the Health and Medical lifeline for its safety and stability. Continued investment in the Communications lifeline ensures services like broadband and hazard warning systems can elevate and reach crucial, life-saving messages to residents. Public facilities, like fire stations and schools, can serve several purposes such as shelters and safe areas during emergencies. The

Figure 56: Planning, Mitigation, or Protection Activities Identified as Needed, But Not



Source: 2020 - 2024 West Virginia 5-Year Consolidated Plan Community Needs Assessment Survey.

Figure 56: Community Lifelines that were Most Impacted and Remain Most Vulnerable



Source: Community Development Block Grant - Mitigation

reliability of public facilities are daily essentials that influence preparedness, response, and recovery.

As communities face shrinking populations, declining economies, increased unemployment due to COVID-19, and mounting health challenges, critical services represent life-saving opportunities for residents. These challenges are even more pronounced in rural areas of the state. Investing in critical facilities across the state ensures communities continue to thrive. Mitigation funds represent an opportunity for units of general local governments and state agencies to conduct much needed mitigation activities related to hardening critical lifelines. These hardening programs can reduce or eliminate damages, loss of life and property.

Building a Culture of Planning and Preparedness

Addressing the mitigation needs of West Virginia require the continued fostering of a culture of preparedness and the provision of tools for proper planning. To accomplish this goal, HUD encourages two main activity types: 1) data-informed, high-impact mitigation projects, and 2) State and local resiliency and mitigation planning. Planning is a significant aspect of a state's overall resiliency efforts. Throughout the CDBG-MIT Federal Register Notice, HUD has highlighted the need for investment in these activities to transform State and local planning. Planning activities will enable West Virginia to build its capacity to comprehensively analyze disaster risks and update hazard mitigation plans through the use of data and meaningful community engagement. Additionally, these funds are intended to be used to support the adoption of policies that reflect local and regional priorities regarding the reduction of risk to community lifelines.

A limitation that was noted in both the State's 2018 Hazard Mitigation Plan, and each of the regional planning council's mitigation plans was that availability, standardization, or access to data related on historical or future risk for several hazards did not exist or was difficult to find. While the State has made great strides though HMGP funding to produce web mapping tools, local level analysis across many hazards varies in availability and consistency across the State. Planning studies in coordination with groups such as state agencies, federal agencies, universities and regional planning groups, to better identify hazard risks, impacts, and subsequent mitigation measures can serve as a valuable use of mitigation funds.

In addition, knowledge of funding, capacity to apply, and ability to oversee mitigation programs is regionally dependent. Mitigation funds can provide additional staffing capacity where needed to support implementation of mitigation activities. Through increased planning, communities across West Virginia can better understand the risks they face and put measures in place to lessen the impacts in the future.

5. Mitigation Programs and Activities

Overview

CDBG-MIT funds must be used to mitigate against future disasters as described in the CDBG-MIT Federal Register Notice (84 FR 45838). Mitigation activities are defined as those activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future disasters. The amount of funding provided through the CDBG–MIT allocation and the nature of the programs and projects that are likely to be funded requires that CDBG–MIT grantees and their subrecipients strengthen their program management capacity, financial management, and internal controls.

WVDO proposes two primary mitigation program categories: Infrastructure and Planning. Within these two categories are programs that focus on risk reduction for the hazards identified in the Mitigation Need Assessment. These hazards include flood, winter weather, severe storms, and landslides.

Eligible CDBG-MIT Infrastructure and Planning activities are set forth in Federal Register Notice FR-6109-N-02J which refers to the Housing and Community Development Act of 1974 (HCDA) and also may be found at 24 CFR § 570.201. Such activities, which must be carried out by public entities or nonprofit entities, include acquisition of real property, construction, reconstruction, rehabilitation or installation of public facilities (except for buildings for the general conduct of government), site improvements for commercial or industrial buildings or structures and other commercial or industrial real property improvements. Additionally, the payment of the non-Federal share required in connection with a Federal grant-in-aid program undertaken as part of activities assisted under this title and the provision of assistance including loans (both interim and long-term) are considered eligible. Finally, planning activities as defined in 24 CFR § 570.205 may be funded with this grant.

The following table provides funding levels for program areas as well as individual programs set forth in this CDBG-MIT Action Plan. Details regarding program eligible activities, allocations, and methods of distribution are outlined in the sections below.

Table 19: Program Allocations

Program	Allocation	Percent of Overall Funding	LMI Designation Allocation Minimum (50%)
Infrastructure	**$86,169,300**	**81%**	**$43,086,650**
General Infrastructure Program	$72,169,300	68%	$36,084,650
Public Facility Hardening Program	$14,000,000	13%	$7,000,000
Planning and Capacity	**$15,000,000**	**14%**	**$7,500,000**
State Planning	$6,500,000	6%	$3,250,000

Program	Allocation	Percent of Overall Funding	LMI Designation Allocation Minimum (50%)
Regional and Local Planning	$6,000,000	6%	$3,000,000
Hazard Mitigation Plans	$2,500,000	2%	$1,250,000
Administration	**$5,324,700**	**5%**	**$2,662,350**
Total Budget	**$106,494,000**	**100%**	**$53,247,000**

As noted in Table 19 above, West Virginia is required to allocate a minimum of 50% of CDBG-MIT program funds to activities benefitting low- and moderate-income persons. The table above sets forth targets for each program, however, these targets are based on estimates to be refined once subrecipient awards are made. While program LMI targets may vary upon subrecipient award, West Virginia's overall grant allocation will meet the 50% LMI requirement.

Additionally, the State of West Virginia has determined that all proposed mitigation activities are informed based on the Risk-Based Needs Assessment and meet the HUD requirements for mitigation activities including:

1. Meets the definition of a mitigation activity by increasing resilience to disasters and will reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship by lessening the impact of future disasters.
2. Each proposed mitigation activity addresses the current and future risks identified in the Risk-Based Needs Assessment discussed in Chapter 4 of this Action Plan.
3. Are CDBG-eligible activities under title I of the Housing and Community Development Act of 1974 or HCDA or otherwise eligible pursuant to a waiver or alternative requirement.
4. Meets a national objective, including additional criteria for mitigation activities and Covered Projects.

Table 20: CDBG-MIT Activities Alignment with Risk-Based Needs Assessment

Mitigation Activity	1. Meets Mitigation Definition	2. Current & Future Risk Addressed	3. CDBG Eligible Activity	4. National Objective
General Infrastructure	Projects increasing the resiliency of infrastructure such as water, wastewater, storm water, and drainage systems to future risks through installation and improvement. Look to increasing capacity of storm water systems, improving or installing retention basins, relocating water lines and critical public facilities, and increasing the capacity of culverts as potential activities.	From the 2016 floods, in the MID's alone, hundreds of millions of dollars of infrastructure were damaged. Much of the infrastructure requires upgrades to withstand future disasters.	Acquisition of Real Property [HCDA - 105(a)(1)] Public Facilities and Improvements [HCDA - 105(a)(2)] Clearance, Rehabilitation, Reconstruction, and Construction of Buildings (Including Housing) [HCDA - 105(a)(4)] Payment of Non-Federal Share [HCDA - 105(a)(9)] Relocation [HCDA - 105(a)(11)]	Low-Mod Area Benefit: 24 CFR 570.483(b)(1)(i) Urgent Need: 24 CFR 570.483(d)
Public Facility Hardening	Projects increasing the resiliency of critical public facilities such as fire and police stations, medical centers, schools, emergency shelters, and water and wastewater treatment plants to future risks. Look to activities such as floodproofing public facilities and installing back-up power generators.	Local communities in the HUD and State MIDs suffered loss of public facilities due to flooding and severe weather.	Acquisition of Real Property [HCDA - 105(a)(1)] Public Facilities and Improvements [HCDA - 105(a)(2)] Clearance, Rehabilitation, Reconstruction, and Construction of Buildings (Including Housing) [HCDA - 105(a)(4)] Payment of Non-Federal Share [HCDA - 105(a)(9)] Relocation [HCDA - 105(a)(11)]	Low-Mod Area Benefit: 24 CFR 570.483(b)(1)(i) Urgent Need: 24 CFR 570.483(d)
Regional/Local Planning	Support the adoption of policies that reflect local and regional priorities that will have long-lasting effects on community risk reduction.	Development and adoption of plans that integrate resilient Building Codes, Zoning Ordinances, and hazard mitigation plans.	Planning and Capacity Building HCDA –105(a)(12) Public Service HCDA – 105(a)(8)	Planning and Administration: 24 CFR 483(f) Low-Mod Benefit: 24 CFR 570.483(b)
Hazard Mitigation Plans	Funding to address preparedness and the provision of tools for proper planning.	Increase the availability of data about historical and future risk.	Planning and Capacity Building HCDA – 105(a)(12)	Planning and Administration: 24 CFR 483(f)

Mitigation Activity	1. Meets Mitigation Definition	2. Current & Future Risk Addressed	3. CDBG Eligible Activity	4. National Objective
State Planning	CDBG-MIT funds cannot be expended until the State completes a HUD approved Risk Assessment and CDBG-MIT Action Plan.	CDBG-MIT Action Plan includes the State's Risk-Based Needs Assessment and programs and funding designed to address risks.	Planning and Capacity Building HCDA – 105(a)(12)	Planning and Administration: 24 CFR 483(f)

The State currently has no plans to fund housing programs with the CDBG-MIT funds, but recognizes that vulnerable populations include children, senior citizens, persons with disabilities, persons from diverse cultures, immigrants, transportation disadvantaged, homeless persons, persons with chronic medical disorders and persons with limited English or who are altogether non-English speaking. The State certifies that it will conduct and carry out grant expenditures in conformity with Title VI of the Civil Rights Act of 1964 (42 USC 2000d) and the Fair Housing Act (42 USC 3601-3619) and implementing regulations, and that it will affirmatively further fair housing, as applicable, through the implementation of its projects.

The FRN (84 FR 45838) requires grantees to assess how planning decisions may affect members of protected classes, racially and ethnically concentrated areas, as well as concentrated areas of poverty; will promote the availability of affordable housing in low poverty, non-minority areas where appropriate; and will respond to natural hazard-related impacts. All grantees of CDBG-MIT funds must adhere to this requirement when applying for planning and other CDBG-MIT activities.

Most programs outlined in this Action Plan will be subrecipient run. As such, the State will require project applications for CDBG-MIT funding make reference to potential vulnerable population impacts, efforts to affirmatively further fair housing through the use of project funds and minimize displacement, as practicable. The State will use this information as part of its evaluation of grant applications to adhere to the FHEO requirements outlined in the FRN (84 FR 45838) and make good on its commitment to minimize impacts on vulnerable populations and protected classes.

Infrastructure Programs

Aligning Program Design with West Virginia's Highest Risks

Investing in Resilient Infrastructure

Based on the findings of West Virginia Mitigation Needs Assessment (MNA), there is a high demand and need for the implementation of infrastructure mitigation projects that will improve resiliency to hazard impacts, such as flooding. The MNA analysis found that in the MIDs alone, hundreds of millions of dollars of infrastructure has been damaged due to flooding and continues to be at risk. In many communities, essential mitigation projects have gone unimplemented due to a lack of the necessary funding to complete them. The 2016 CDBG-DR Action Plan presented a brief summary of the historical influence of West Virginians settling near rivers to access natural

resources, transportation, and for the development of industry. This summary noted that these once thriving communities are now suffering from declining local economies, populations, and health - events which are inseparable from decreased tax revenues and aging infrastructure that require repairs and upgrades. The deteriorating infrastructure requires investment at all levels of the government. Aging infrastructure across the state is proven to be vulnerable to the effects of hazard shocks, such as flooding and severe storms as noted in the needs assessment.

A majority of West Virginia's 2016 CDBG-DR allocation, which was received as a result of the June 2016 flooding, has been prioritized to fulfill the unmet housing needs left by the storm's impacts. However, the Plan identified that additional infrastructure activities are needed and should be considered for future funding sources. These activities include raising facilities above base flood elevation, strengthening critical systems, having backup power generators for critical systems (water, sewer, etc.), and providing retention basins, larger culverts, culvert debris guards. This coincides with the CDBG-MIT Survey results from key stakeholders across the state that identified infrastructure-related mitigation activities, or the enhancement of vulnerable utilities or critical infrastructure, as a critical mitigation need. However, these activities have been implemented at a much lower percentage than activities such as acquisition or property buyouts, as seen in Figure 54. This is additionally supported by questions in the survey, such as "What are the biggest barriers to implementing hazard mitigation projects?" where the overwhelming majority (82.50%) rated "funding" as the biggest barrier.

Strengthening Critical Facilities

Everyday, residents, local organizations, and governments deliver critical services and operate essential functions upon which West Virginians depend. Creating resilience of these services means ensuring continuity and sustained performance when normal operations are disrupted by a disaster. The Community Lifelines section of the MNA highlights the increased risk to critical facilities such as medical centers, schools, fire stations, and utility services. Community Lifelines are interdependent services that maintain prosperous communities. As such, it is recognized that mitigation activities that reduce the loss of life, property, and hardship are those which serve to strengthen the infrastructure and critical lifelines that support West Virginians both during day-to-day activities and during times of disaster and heightened risk.

Investment in storm water systems is part of a larger picture that depicts the need for an integrated water system that is resilient to floods and other storms damages or overloads to the system. Investing in storm water systems directly influences the Food, Water, Shelter Lifeline by ensuring the reliability of clean drinking water; the Transportation Lifeline by increasing the likelihood of continuity; and the Health and Medical lifeline for its safety and stability. Continued investment in the Communications lifeline through infrastructure activities ensures services like broadband and hazard warning systems can elevate and reach crucial, life-saving messages to residents. Investment, retrofitting and hardening of public facilities, like fire stations and schools, can serve several purposes such as shelters and safe areas during emergencies. The reliability of

public facilities are daily essentials that influence preparedness, response, and recovery. These investments across the state ensures communities continue to thrive.

As a result of this need and potential transformative impacts of investment, the State has chosen infrastructure as the largest program area. This allocation is comprised of two programs: General Infrastructure and Public Facility Hardening. These infrastructure programs will account for 80.9% of the total CDBG-MIT allocation.

General Infrastructure Program (GIP)

General Infrastructure Program (GIP)	
Funding Level	$72,169,300
Funding Percentage	67.8%
HUD MID Allocation Minimum	$36,084,650
CDBG Eligible Activity	HCDA Section 105(a)(1) – Acquisition of Real Property HCDA Section 105(a)(2) – Public Facilities and Improvements HCDA Section 105(a)(4) – Clearance, Rehabilitation, Reconstruction, and Construction of Buildings (Including Housing) HCDA Section 105(a)(9) – Payment of Non-Federal Share HCDA Section 105(a)(11) – Relocation
National Objectives Fulfilled	Low- to Moderate-Income (LMI) Urgent Need Mitigation
Method of Distribution and Eligible Entities	Subrecipient: municipalities, counties, state agencies, Regional Planning and Development Councils, public service districts. Nonprofit entities may partner with these government entities as co-applicants to receive funds.
Maximum Grant Award	$10,000,000
Geographic Eligibility	State and HUD MID Counties
Hazard Risks Addressed	flood, winter weather, severe storms, and landslides
Lifelines Protected	Safety and Security, Food, Water and Shelter, Health and Medical, Energy, Communications, Transportation, Hazardous Materials

The GIP will account for 67.8% of the total CDBG-MIT grant funding. It is the broadest, most flexible program, and is anticipated to provide the greatest range of impact among the proposed programs. The GIP will fund large-scale and high-impact local, multi-jurisdictional, and regional investments. Eligible projects may include upgrading of water, sewer, solid waste, communications, energy, transportation, health and medical and other public infrastructure

projects to reduce the hazard risks identified in the Mitigation Needs Assessment portion of this Action Plan.

General Infrastructure dollars will allow local and regional units of government to address their most pressing hazard mitigation needs and will require subgrantee applicants to document how their proposed projects will meet or exceed hazard reduction needs of their most vulnerable citizens and identify which critical lifelines are protected by each proposed project. Other considerations such as multi-use facilities and natural infrastructure components will be encouraged through the subgrantee application process described herein.

In accordance with the HCDA, eligible activities for infrastructure projects include the acquisition, construction, reconstruction, or installation (including design features and improvements with respect to such construction, reconstruction or installation that promote energy efficiency) of public works, facilities (except for buildings for the general conduct of government), and site or other improvements.

Additionally, per Federal Register Notice FR-6109-N-02J, CDBG-MIT funds can be used to meet a matching requirement, share or contribution for other federal grant programs if they are used to carry out an eligible mitigation activity. This includes mitigation grants administered by FEMA and the United States Army Corps of Engineers (the maximum amount for the US Army Corps of Engineers is $250,000). Activities that are funded with match dollars must meet the definition of a mitigation activity and must meet the eligibility requirements for the CDBG-MIT program and the federal program that is being aided with CDBG-MIT funds. Accordingly, eligible subrecipients may seek matching funds under this program.

The State will release the full allocation for GIP in an initial Request for Proposals (RFP) release. All potential eligible applicants are encouraged to submit an application at this time. Funds will be awarded based on the scoring criteria outlined below. Should this initial RFP not result in the full obligation of the program allocation, subsequent rounds of applications will be conducted via RFP on an annual basis until the full allocation has been obligated.

Funding will provide resources to units of local government (UGLG) and entities that apply in partnership with their UGLG, such as nonprofits, with an emphasis on innovative, collaborative and/or large-scale mitigation activities that reduce risks. The State anticipates that regional coalitions and local governments or local public entities will act as partners in the implementation of the programs. WVDO will solicit applications for projects from eligible applicants. Each project will be prioritized based on the overall score following the scoring criteria outline below. Applications submitted by eligible applicants must meet the criteria listed below in order to progress to the scoring stage of the program.

The GIP will select projects based on the rankings from the scores with additional consideration to ensure that funding is applied in an equitable manner on a geographic basis to be in compliance with HUD MID spending and LMI benefits. The application process will be competitive. The maximum allowable award will be $10 million. The State reserves the ability to allocate funds to

program applicants that require additional technical assistance or capacity in order to submit an infrastructure project which is ready to proceed.

GIP Eligibility Criteria

To be eligible for funding, an application must:

1. Be in conformance with the State Mitigation Plan and Local Mitigation Plan approved under 44 CFR part 201.4; or for Indian Tribal governments acting as grantees, be in conformance with the Tribal Mitigation Plan approved under 44 CFR 201.7;
2. Have a beneficial impact upon the designated disaster area;
3. Solve a problem independently or constitute a functional portion of a solution in which there is assurance that the project will be completed. Projects that merely identify or analyze hazards or problems are not eligible;
4. Consider the following for any flood mitigation project: high wind, continued sea level rise and ensure responsible floodplain and wetland management based on the history of flood mitigation efforts and the frequency and intensity of precipitation events.
5. Identify plans for funding operations and maintenance costs (when applicable). Long-term maintenance and operating costs are ineligible under CDBG-MIT funding except as identified at 84 FR 45838 Section V.A.9.
6. Be cost-effective and substantially reduce the risk of future damage, hardship, loss or suffering resulting from a major disaster. The grantee must demonstrate this by documenting that the project:
    a. Addresses a problem that has been repetitive or a problem that poses a significant risk to public health safety if left unsolved;
    b. Costs less than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future disasters were to occur;
    c. Has been determined to be the most practical, effective and environmentally sound alternative after consideration of a range of options;
    d. Contributes, to the extent practicable, to a long-term solution to the problem it is intended to address; and
    e. Considers long-term changes to the areas and entities it protects and have manageable future maintenance and modifications requirements.

GIP Application Process

Eligible applicants will be invited to submit applications proposing GIP projects for funding to the CDBG-MIT Program. Responses will be evaluated to ensure the proposed projects meet the minimum criteria as outlined in the GIP Program Guidelines and application materials. Responses

that meet minimum threshold requirements will then be evaluated according to the scoring criteria outlined below.

Applications must, at a high level, describe their infrastructure project and address how it will serve to mitigate risks attributable to threats identified in the State of West Virginia Action Plan Risk-Based Mitigation Needs Assessment. Plans must also include a proposed budget with a detailed description of anticipated costs by category, including support services and program management and administration.

WVDO will host a webinar to provide an overview of the GIP Guidelines, specific to the application process. The webinar will include a live question and answer period. These questions and answers will be published on WVDO's website within five business days after the webinar. WVDO will also provide an opportunity for applicants to schedule phone calls with WVDO's mitigation staff. These calls will provide applicants an opportunity to ask questions and/or discuss issues specific to their project and the application process. Applicants may check on the status of their submissions by sending an email to CDBGMITIGATION@wv.gov or checking online at https://wvfloodrecovery.com/mitigation

GIP Criteria & Scoring

Applications will be evaluated to determine the mitigation value and cost effectiveness of the proposed project. An applicant's planning strategy and management capacity must be evident. The threshold eligibility (unscored) requirements include meeting all GIP eligibility criteria (see previous page). Applicants that do not meet threshold eligibility requirements will not progress to the scoring stage.

Each scored element of the applications is included in a Criteria Evaluation Rubric and has a value associated with it. If eligible applications exceed available funding, applicants will be funded in rank order based on evaluation scores, with consideration for overall MID spending and LMI grant requirements. WVDO reserves the option to fund all, a portion of, or none of each application submitted by an applicant. Scored criteria is listed below in its order of importance. A total of 150 points are available.

Table 21: GIP Scoring Criteria

Criteria	Description	Points
Mitigation Impact	Project meets the HUD definition of a mitigation activity and clearly demonstrates reduction of risk to life and repetitive loss to property and critical community facilities	25
Project Description	Project demonstrates detailed scope of work, professional up-to date cost estimates (e.g., preliminary engineering report), clearly defined milestones, and quantifiable outcome measurements. Budget supplements and does not supplant already existing public or private funding	20

Criteria	Description	Points
Quantity of Protection	Project demonstrates a high quantity of structures will be made more resilient to future disasters and/or that the risk to a higher number of lives from future disasters will be reduced	15
Readiness to Proceed	Project has completed pre-construction requirements such as design, permitting, and environmental review and can quickly proceed to construction phase functionally complete (a stand-alone project that is not dependent upon completion of a separate project)	15
Capacity	Project sponsor demonstrates extensive project and financial management experience and internal controls	15
LMI Priority	Project benefits an area with a population of at least 50% low- to moderate-income (LMI) households.	15
HUD MID Areas Served	Project demonstrates significant and quantifiable benefits to HUD MID areas (Clay, Greenbrier, Kanawha, and Nicholas Counties)	10
Implementation Plan	Project demonstrates long-term ability by responsible entity to sustain improvements made by grant	10
Leverage	Project demonstrates committed matching dollars from federal and other sources of funding	10
Investment Linkage	Project complements other mitigation-focused activities and projects in the area and demonstrates consistency with local, regional, or state plans	10
Vulnerable Populations	Project benefits an area with a with a high overall Social Vulnerability ranking according to the CDC (https://svi.cdc.gov/prepared-county-maps.html)	5
Total		**150**

Public Facilities Hardening Program (PFHP)

Public Facilities Hardening Program	
Funding Level	$14,000,000
Funding Percentage	13.1%
HUD MID Allocation Minimum	$7,000,000
CDBG Eligible Activity	HCDA Section 105(a)(1) – Acquisition of Real Property HCDA Section 105(a)(2) – Public Facilities and Improvements HCDA Section 105(a)(4) – Clearance, Rehabilitation, Reconstruction, and Construction of Buildings (Including Housing)

	HCDA Section 105(a)(9) – Payment of Non-Federal Share HCDA Section 105(a)(11) – Relocation
National Objectives Fulfilled	Low- to Moderate-Income (LMI) Urgent Need Mitigation
Method of Distribution and Eligible Entities	Subrecipient; municipalities, counties, state agencies, RPDCs, Public Service Districts. Nonprofit entities may partner with government entities as co-applicants to receive funds.
Maximum Grant Award	$5,000,000
Geographic Eligibility	HUD and State MID identified areas
Hazard Risks Addressed	flood, winter weather, severe storms, and landslides
Lifelines Protected	Safety and Security, Food, Water and Shelter, Health and Medical, Energy, Communications, Transportation, Hazardous Materials

The PFHP will allow eligible entities (municipalities, counties, state agencies, RPDCs, Public Service Districts; nonprofit entities may partner with government entities as co-applicants) to harden public buildings that serve a public safety purpose for local communities. This program will enable local police, fire, shelters and local emergency management facilities and other designated public facilities to better withstand the effects of the previously identified hazard risks. Examples of hardening against flood, winter weather, and severe storms include, but are not limited to, dry flood proofing, wet flood proofing, anchoring roof-mounted heating, shelters, ventilation and air-conditioning units and retrofitting building exteriors with hazard-resistant materials in accordance with national safety standards.

The hardening program will also encompass energy resiliency projects that help ensure that the most critical facilities in West Virginia's communities have access to power throughout and following an emergency when local sources of power are down. Eligible public facilities include, but are not limited to: potable water facilities, wastewater facilities, police departments, fire departments, hospitals, emergency operation centers and emergency shelters. Local units of government that apply for this program will need to identify critical public facilities that have a need to update or replace existing power sources (such as stationary generators or resiliency systems) so as to allow these facilities to safely maintain power during emergencies.

PFHP eligible activities include: clearance, demolition, removal, reconstruction and rehabilitation (including rehabilitation which promotes energy efficiency) of buildings and improvements (including interim assistance, and financing public or private acquisition for reconstruction or rehabilitation, and reconstruction or rehabilitation, of privately owned properties, and including the renovation of closed school buildings); special projects directed to the removal of material and architectural barriers which restrict the mobility and accessibility of elderly and persons with

disabilities; and lead-based paint hazard evaluation and reduction, as defined in section 1004 of the Residential Lead-Based Paint Hazard Reduction Act of 199253.

PFHP Eligibility Criteria

To be eligible for funding, an application must:

1. Be in conformance with the State Mitigation Plan and Local Mitigation Plan approved under 44 CFR part 201.4; or for Indian Tribal governments acting as grantees, be in conformance with the Tribal Mitigation Plan approved under 44 CFR 201.7;
2. Have a beneficial impact upon the designated disaster area; Solve a problem independently or constitute a functional portion of a solution in which there is assurance that the project will be completed. Projects that merely identify or analyze hazards or problems are not eligible;
3. Consider the following for any flood mitigation project: high wind, continued sea level rise and ensure responsible floodplain and wetland management based on the history of flood mitigation efforts and the frequency and intensity of precipitation events;
4. Identify plans for funding operations and maintenance costs (when applicable). Long-term maintenance and operating costs are ineligible under CDBG-MIT funding except as identified at 84 FR 45838 Section V.A.9.
5. Be cost-effective and substantially reduce the risk of future damage, hardship, loss or suffering resulting from a major disaster. The grantee must demonstrate this by documenting that the project:
    a. Addresses a problem that has been repetitive or a problem that poses a significant risk to public health safety if left unsolved;
    b. Will not cost more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future disasters were to occur;
    c. Has been determined to be the most practical, effective and environmentally sound alternative after consideration of a range of options;
    d. Contributes, to the extent practicable, to a long-term solution to the problem it is intended to address; and e. Considers long-term changes to the areas and entities it protects and has manageable future maintenance and modifications requirements.

PFHP Application Process

Eligible applicants will be invited to submit applications proposing PFHP projects for funding to the CDBG-MIT program. Responses will be evaluated to ensure the proposed projects meet the minimum criteria as outlined in the Program Guidelines and application materials. Responses that

meet minimum threshold requirements will then be evaluated according to the scoring criteria outlined below. Applications must, at a high level, describe what is being identified as a critical facility and address how and why it needs to be hardened to mitigate risks attributable to threats identified in the Mitigation Needs Assessment. Plans must also include a proposed budget with a detailed description of anticipated costs by category, including support services, program management, and administration.

WVDO will host a webinar to provide an overview of the PFHP Guidelines, specific to the application process. The webinar will include a live question and answer period. These questions and answers will be published on WVDO's website within five business days after the webinar. WVDO will also provide an opportunity for applicants to schedule one-on-one phone calls with WVDO's mitigation staff. These calls will provide applicants an opportunity to ask questions and/or discuss issues specific to their project and the application process. Applicants may check on the status of their submissions by sending an email to CDBGMITIGATION@wv.gov or checking online at https://wvfloodrecovery.com/mitigation

PFHP Criteria & Scoring

Applications will be evaluated to determine the mitigation value and cost effectiveness of the proposed project. An applicant's planning strategy and management capacity must be evident. The threshold/unscored requirements include meeting all PFHP eligibility criteria (see previous page). Applicants that do not meet threshold eligibility requirements will not progress to the scoring stage.

Each scored element of the applications is included in a Criteria Evaluation Rubric with an associated value. If eligible applications exceed available funding, applicants will be funded in rank order based on evaluation scores, with consideration for overall MID spending and LMI grant requirements. WVDO reserves the option to fund all, a portion of, or none of each application submitted by an applicant. Scored criteria is listed below in its order of importance. A total of 150 points are available.

Table 22: PFHP Scoring Criteria

Criteria	Description	Points
Mitigation Impact	Project meets the HUD definition of a mitigation activity and clearly demonstrates reduction of risk to life and repetitive loss to property and critical community facilities	25
Project Description	Project demonstrates detailed scope of work, professional up-to date cost estimates (e.g., preliminary engineering report), clearly defined milestones, and quantifiable outcome measurements. Budget supplements and does not supplant already existing public or private funding	20
Quantity of Protection	Project demonstrates a high quantity of structures will be made more resilient to future disasters and/or that the risk	15

Criteria	Description	Points
	to a higher number of lives from future disasters will be reduced	
Readiness to Proceed	Project has completed pre-construction requirements such as design, permitting, and environmental review and can quickly proceed to construction phase functionally complete (a stand-alone project that is not dependent upon completion of a separate project)	15
Capacity	Project sponsor demonstrates extensive project and financial management experience and internal controls	15
LMI Priority	Project benefits an area with a population of at least 50% low- to moderate-income (LMI) households.	15
HUD MID Areas Served	Project demonstrates significant and quantifiable benefits to HUD MID areas (Clay, Greenbrier, Kanawha, and Nicholas Counties)	10
Implementation Plan	Project demonstrates long-term ability by responsible entity to sustain improvements made by grant	10
Leverage	Project demonstrates committed matching dollars from federal and other sources of funding	10
Investment Linkage	Project complements other mitigation-focused activities and projects in the area and demonstrates consistency with local, regional, or state plans	10
Vulnerable Populations	Project benefits an area with a with a high overall Social Vulnerability ranking according to the CDC (https://svi.cdc.gov/prepared-county-maps.html)	5
Total		**150**

Planning Programs and Administrative Costs

Aligning Program Design with West Virginia's Highest Risks

Building a Culture of Planning and Preparedness

Addressing the mitigation needs of West Virginia requires the continued fostering of a culture of preparedness and the provision of tools for proper planning. A limitation that was noted in both the State's 2018 Hazard Mitigation Plan, and each of the regional planning council's mitigation plans was that availability, standardization, or access to data related to historical or future risk for several hazards did not exist or was difficult to find. While the State has made great strides through HMGP funding to produce web mapping tools, local level analysis across many hazards varies in availability and consistency across the state. Planning studies in coordination with groups such as state agencies, federal agencies, universities, and regional planning councils, to better identify hazard risks, impacts, and subsequent mitigation measures, can serve as a valuable use of mitigation funds.

In addition, knowledge of funding, capacity to apply, and ability to oversee mitigation programs is regionally dependent. Mitigation funds can provide additional staffing capacity where needed to support implementation of mitigation activities. Through increased planning, communities across West Virginia can better understand the risks they face and put measures in place to lessen the impacts in the future.

The CDBG-MIT Planning allocation is $15,000,000 and will be used to support local, regional and statewide mitigation planning efforts. Planning funding can be used for land use planning, hazard mitigation planning, modernization and resiliency planning, upgrading mapping capabilities and other plans or capabilities to better understand evolving disaster risks, and planning and community outreach to provide education regarding the NFIP Voluntary Community Rating System Incentives Program.

Additionally, the State will retain 5% of the total CDBG-MIT grant, or $5,324,700, for costs associated with the administration of the grant.

Planning and Administrative Costs shall not exceed a combined 20% and are currently allocated at 19.1% of the total CDBG-MIT award. Further details regarding planning programs and initiatives are provided below.

Regional and Local Planning Grant Program

Regional and Local Planning Grant Program	
Funding Level	$6,000,000
Funding Percentage	5.6%
CDBG Eligible Activity	HCDA Section 105(a)(12) – Planning and Capacity Building HCDA Section 105(a)(8) – Public Services
National Objectives Fulfilled	Low- to Moderate-Income (LMI), and N/A (planning)
Method of Distribution and eligible entities	Subrecipient; municipalities, counties, regional planning development councils, nonprofit entities higher education universities
Maximum Grant Award	$250,000
Geographic Eligibility	HUD and State MID identified areas
Hazard Risks Addressed	flood, winter weather, severe storms, and landslides
Lifelines Protected	Safety and Security, Food, Water and Shelter, Health and Medical, Energy, Communications, Transportation, Hazardous Materials

The Regional and Local Grant Program (RLPG program) will provide funding opportunities for variety of regional and local mitigation planning efforts, including for local capacity building. WVDO recognizes that planning is an important aspect of mitigation and that not all UGLGs have access to full-time planning staff nor the resources to contract studies that would help local communities better understand their vulnerabilities. The creation of this program seeks to address this gap, as well as aims to build local capacity to better plan for impactful projects that may be funded

through the GIP and PFGP programs outlined above. Proposed planning efforts are encouraged to address the limited availability, standardization, or access to data related to historical or future risk for several hazards as noted in the mitigation needs assessment.

Examples of projects include, but are not limited to:

- Land use, comprehensive and neighborhood planning;
- Regional mitigation planning;
- Modernization and resiliency planning;
- Upgrading and coordinate research, data collection, mapping and other capabilities to better understand evolving disaster risks;
- Planning to reduce flood insurance premiums through the National Flood Insurance Program (NFIP) Voluntary Community Rating System Incentives Program;
- Code and zoning evaluation and updates; and
- Education and outreach designed to support local and regional mitigation efforts and encourage best mitigation practices.
- Technical Assistance -increase participation in CRS, leverage planning activities to adopt modernize building codes and policies at a local level, assess current policies programs and practices to identify redundant and conflicting policies, training, outreach/education

The goal of the RLGP program is to prepare West Virginia's communities to respond to and recover from future disasters, including the four major priorities referenced in the Mitigation Needs Assessment: flood, winter weather, severe storms, and landslides.

Eligible RLGP activities include but are not limited to:

- Activities necessary to develop a comprehensive community development plan and to develop a policy-planning management capacity so that the recipient of assistance under this title may more rationally and effectively determine its needs, set long-term goals and short-term objectives, devise programs and activities to meet these goals and objectives, evaluate the progress of such programs in accomplishing these goals and objectives, and carry out management, coordination, and monitoring of activities necessary for effective planning implementation;
- Activities necessary to the development of energy use strategies related to a recipient's development goals, to assure that those goals are achieved with maximum energy efficiency, including items such as an analysis of the manner in, and the extent to, which energy conservation objectives will be integrated into local government operations, purchasing and service delivery, capital improvements budgeting, waste management, district heating and cooling, land use planning and zoning, and traffic control, parking, and public transportation functions, and a statement of the actions the recipient will take to foster energy conservation and the use of renewable energy resources in the private sector, including the enactment and enforcement of local codes and ordinances to encourage or mandate energy conservation or use of renewable energy resources,

financial and other assistance to be provided (principally for the benefit of low- and moderate-income persons) to make energy conserving improvements to residential structures, and any other proposed energy conservation activities;

- Provision of assistance by subrecipients under this program to institutions of higher education having a demonstrated capacity to carry out eligible activities under this program.

RLPG Eligibility Criteria

To be eligible for funding, an application must:

1. Be in conformance with the State Mitigation Plan and Local or Tribal Mitigation Plan approved under 44 CFR part 201.4; or for Indian Tribal governments acting as grantees, be in conformance with the Tribal Mitigation Plan approved under 44 CFR 201.7;
2. Have a beneficial impact upon a designated State or HUD MID area;
3. Be cost-effective and result in an actionable plan that will provide strategies for high-impact mitigation activities.

RLPG Application Process

Eligible applicants will be invited to submit applications proposing RLPG projects for funding through the CDBG-MIT program. Responses will be evaluated to ensure the proposed projects meet the minimum criteria as outlined in the RLPG Program Guidelines and application materials. Responses that meet minimum threshold requirements will then be evaluated according to the scoring criteria outlined below. Applications must, at a high level, describe the planning project and how it will be used to help to mitigate risks attributable to threats identified in the State of West Virginia Action Plan Risk-Based Mitigation Needs Assessment. Plans must also include a proposed budget with a detailed description of anticipated costs by category, including support services and program management and administration.

WVDO will host a webinar to provide an overview of the RLPG Program Guidelines, specific to the application process. The webinar will include a live question and answer period. These questions and answers will be published on WVDO's website within five business days after the webinar. WVDO will also provide an opportunity for applicants to schedule one-on-one phone calls with WVDO's mitigation staff. These calls will provide applicants an opportunity to ask questions and/or discuss issues specific to their project and the application process. Applicants may check on the status of their submissions by sending an email to CDBGMITIGATION@wv.gov or checking online at https://wvfloodrecovery.com/mitigation.

RLPG Criteria & Scoring

Applications will be evaluated to determine the mitigation value and cost effectiveness of the proposed project. An applicant's strategy and management capacity must be evident. The threshold/unscored requirements include meeting all RLPG eligibility criteria (see previous page). Applicants that do not meet threshold eligibility requirements will not progress to the scoring

stage. Each scored element of the applications is included in a Criteria Evaluation Rubric and has a value associated with it. If eligible applications exceed available funding, applicants will be funded in rank order based on evaluation scores. WVDO reserves the option to fund all, a portion of or none of each application submitted by an applicant. Scored criteria is listed below in its order of importance. A total of 100 points are available.

Table 23: RLPG Scoring Criteria

Criteria	Description	Points
Mitigation Value	Planning efforts and product are focused on mitigation and demonstrate significant mitigation benefits to the project area	25
Project Description	Application includes detailed scope of work, firm and up-to-date cost estimates, and clearly defined milestones	20
Regional Solution	Plan will benefit a regional or multi-jurisdictional area	15
Level of Need	Project will directly benefit high need area (such as HUD MID areas, LMI populations, SoVI populations)	15
Capacity	Applicant demonstrates capacity to manage and complete the planning project	15
Leverage	Project has committed funds from other funding sources	10
Total		100

Hazard Mitigation Planning Grant Program

Hazard Mitigation Planning Program	
Funding Level	$2,500,000
Funding Percentage	2.3%
CDBG Eligible Activity	HCDA Section 105(a)(12) – Planning and Capacity Building
National Objectives Fulfilled	N/A (planning)
Method of Distribution and Implementing Entity	Subrecipient; Regional Planning Development Council (RPDCs); and State Resiliency Office; municipalities, counties
Geographic Eligibility	HUD and State MID identified areas; State-wide for State HMP
Maximum Award	$200,000 per plan update
Hazard Risks Addressed	flood, winter weather, severe storms, and landslides

Hazard Mitigation Planning Program	
Lifelines Protected	Safety and Security, Food, Water and Shelter, Health and Medical, Energy, Communications, Transportation, Hazardous Materials

To provide continued support to eligible Regional Planning Development Councils (RPDCs), the State will provide non-competitive direct grants for Hazard Mitigation Plan updates. This will occur on a rolling basis as the plan expire. There are five RPDCs that operate in the HUD and State MID areas; these RPDCs will be eligible for grants under this program.

Additionally, the State may reserve funds under this program to update its State Hazard Mitigation Plan as related to the 12 HUD and State MID counties.

State Planning and Administration

State Planning and Administration	
State Planning Funding Level	$6,500,000
State Planning Funding Percentage	6.1%
State Administration Funding Level	$5,324,700
State Administration Funding Percentage	5%

State Planning

In accordance with the Federal Register, WVDO's aggregate total for administrative planning and administrative costs combined my not exceed 20%, with administrative funds capped at 5%. Because the State is allocating its full 5% to the cost of administering the CDBG-MIT grant, the State has 15% remaining for planning activities. At this time, the State wishes to only allocate 6.1% to state-level planning activities. In total, the planning programs described in the previous section allocate a combined 8%, and the State will retain the 6.1% (totaling 14.1% for planning; 5% for administration).

Activities the State may undertake with its planning allocation include but are not limited Action Plan writing and amendments, capacity support for the State's Resiliency Office (SRO), funding for the update of the State Hazard Mitigation Plan, and coordination of a State wide data collection system for the WVCAD office to centralize risk and hazard data.

State Administration

In accordance with the Federal Register, WVDO's aggregate total for administrative expenditures will not exceed 5% of its total grant (plus any program income). Accordingly, the State is allocating a budget of 5% ($5,324,700) to cover the costs of administering the CDBG-MIT grant for the 12-year grant period as well as a closeout and monitoring period following the close of the grant.

Eligible project delivery costs, which will cover the subrecipients costs of administering their grants, are presumed included as a portion of the overall CDBG-MIT grant funding allocation provided to each subrecipient.

6. Long-Term Planning and Risk Mitigation Consideration

Sources of Funding to be Leveraged

The WVDO, and more specifically, the WV Community Advancement and Development Office (WVCAD) as a unit of the WVDO, manages a wide variety of programs targeting infrastructure, sustainability, and resiliency. WVDO utilizes existing relationships and aims to create new partnerships with other federal and state agencies, corporations, foundations, non-profits, and other stakeholders as a means of leveraging all viable sources of funding. To maximize impact of the state's CDBG-MIT funding, WVDO is committed to identifying and leveraging additional federal and non-federal funding sources. This funding will not duplicate the proposed CDBG-MIT programs; rather, it will aim to fill existing mitigation needs gaps. In particular, this identifies other infrastructure funds and programs, as the majority of the CDBG-MIT funds have been allocated to infrastructure programs. The following programs are managed through WVCAD and will be considered as CDBG-MIT programs are developed and implemented across the 12 MID counties.

Table 24: WVCAD-Managed Programs

Program	Description	Average Annual Funding
Appalachian Regional Commission Federal Grant Programs (ARC)	ARC is a federal economic development agency that provides funding to West Virginia and 12 other states. The goal of ARC is to create opportunities for self-sustaining economic development and improved quality of life by providing grants for economic and community development projects. The majority of ARC funding in West Virginia is used for infrastructure projects (water, sewer, storm water, and broadband). Projects benefiting ARC-designated distressed counties in the state receive highest priority.	$ 8,000,000
Community Development Block Grant (CDBG)	Administered by the U.S. Department of Housing and Urban Development, CDBG has the objective to develop sustainable satisfactory communities by providing decent housing, a suitable living environment and expanded economic opportunity (principally for persons of low to moderate income). CDBG- funding is used for infrastructure development, public facilities, demolition, and planning. Currently there are 47 infrastructure projects throughout the state which represents an investment of approximately $50 million worth investment in infrastructure improvements.	$14,258,806

Program	Description	Average Annual Funding
Land and Water Conservation Fund (LWCF)	The Land and Water Conservation Fund (LWCF) is a state and federal partnership program for the state. It is a community outdoor recreation development and open space preservation. LWCF grants are available on a competitive application to state agencies, political subdivisions of the state, and independent park boards.	$520,000
Weatherization Assistance Program (WAP)	The United States Department of Energy's (DOE) Weatherization Assistance Program (WAP) was created in 1976 to assist low-income families who lacked resources to invest in energy efficiency. The WAP mission is to reduce energy costs for low-income families, particularly for the elderly, people with disabilities, and children, by improving the energy efficiency of their homes while ensuring their health and safety.	$3,158,033 (Program Year 2016-2017)
Community Development Block Grant – Disaster Recovery (CDBG-DR)	The programs funded through the CDBG-DR award will address the State's unmet housing, infrastructure, planning, and economic development needs as allowable under the program requirements. West Virginia's CDBG-DR program primarily funds housing recovery, however approximately $12 million has been allocated as a local match for FEMA's Hazard Mitigation Grant Program (HMGP).	$149,875,000 (one-time allocation)

The WVDO maintains a relationship with partners at other federal agencies in order to coordinate mitigation activities and identify potential sources for leveraged funds. This includes regular communication with WV representative for FEMA and USACE. WVDO staff participate in monthly meetings with USACE's Silver Jackets team to aid in this coordination.

Activities funded with CDBG-MIT are encouraged to leverage other resources in order to maximize the impact of available funds. Sources of leveraged funding frequently include:

- Infrastructure and Jobs Development Council (IJDC)
- Drinking Water Revolving Loan Funds (DWTRF)
- Clean Water Revolving Loan Funds (CWSRF)
- Local Lending Institutions
- Local Funds
- Private Resources
- State Resources
- U.S. Department of Agriculture – Rural Development

- U.S. Economic Development Authority
- U.S. Army Corps of Engineers

State Resiliency Office

In February 2020, the State Senate passed Senate Bill 586, which further refined the April 2017 House Bill 2935 creating the West Virginia's State Resiliency Office (SRO). The key purpose of the SRO will be to coordinate the development of community and economic resiliency plans including, but not limited to, planning to mitigate flood damage, protect the environment and the promotion of efforts to support the state's economy. Upon the receipt of certain federal and/or state disaster or resiliency funds, the SRO shall coordinate all activities related to those funds. This central office will be critical to the long-term recovery and resiliency of West Virginia. WVDO has consulted with the SRO in the preparation of this Action Plan and will continue to coordinate closely with this office in the planning and implementation of mitigation activities.

Additionally, one of the primary responsibilities of the SRO is to fortify statewide resiliency by coordinating government agencies, first responders, and other stakeholders in efforts for emergency and disaster planning, response and recovery, and mitigation activities to help rebuild stronger communities. Recognizing that flooding is the highest hazard for West Virginia, WVDO intends to partner with the SRO and the State Office of the National Flood Insurance Program to support growing participation in NFIP.

7. General CDBG-MIT Action Plan Requirements

Implementation Plan and Capacity Assessment

In conjunction with this Action Plan, WVDO will submit an Implementation Plan and Capacity Assessment no later than November 1, 2020.

WVDO has demonstrated its management capacity through procedures for grant administration and oversight of subrecipients. The Implementation Plan describes WVDO's capacity to carry out mitigation activities, how it will address any capacity gaps, and how agency staff that administer CDBG-MIT, CDBG-DR, and FEMA-funded mitigation activities will work together. The plan addresses the following topics:

(a) Capacity Assessment

WVDO has the capacity to carry out mitigation activities and has developed a timeline with milestones describing when and how to address any identified capacity gaps. WVDO also describes any open CDBG-DR findings and an update on the corrective actions to address each finding. All open CDBG-DR findings at the time of the publication of the CDBG-MIT Action Plan have been addressed.

(b) Staffing Plan

WVDO has identified adequate personnel who have experience in the timely development and implementation of mitigation programs, are familiar with federal regulations; and are responsible for monitoring, quality assurance, and financial management. The plan also describes the agency's internal audit function. Additionally, the State has been a recipient of CDBG entitlement funds since the program's inception in the 1970's and may draw from staff expertise and knowledge of CDBG regulations and apply it to the programs described in this Action Plan.

(c) Procedures to ensure internal and interagency coordination

The plan describes how the grantee will ensure effective communication and coordination between State and local departments and divisions involved in the design and implementation of mitigation planning and projects.

(d) Procedures to provide technical assistance

The plan describes how WVDO will procure and provide technical assistance for any personnel that is not employed at the time of Action Plan submission.

(e) Accountability Procedures

The plan details the role of WVDO as the lead agency responsible for implementation of the CDBG-MIT grant.

Application Status

Application materials will be posted to the WVCAD CDBG-MIT website (https://wvfloodrecovery.com/mitigation). The WVCAD will accept and process applications from eligible applicants for eligible CDBG-MIT projects. Once applications are submitted by the deadline, applicants will receive a confirmation of receipt, and the applications will be classified as "Pending" until a decision is made. WVCAD will manage the application review process and will inform applicants regarding the status of their application on the day the decision is made.

Applicants who have questions or require assistance with their application can reach out to CDBGMitigation@wv.gov or contact the following CDBG-MIT staff at WVCAD:

Name	Title	Email	Phone No.
Sherry Risk	CDBG Program Manager	sherry.l.risk@wv.gov	304-957-2068
Ryan Halsey	CDBG Project Manager	ryan.j.halsey@wv.gov	304-957-2096

The CDBG mitigation website will have the contact info (telephone number and email address) available on the website. The CDBG mitigation website will also have information about the application deadline and the decision date. Applicants can check on the status of their applications at any time. Questions received about application status during the application review period will be answered within 48 hours of their receipt.

Projections for Expenditures and Performance Outcomes

The CDBG-MIT FRN requires that 50% of the State's allocation must be spent within 6 years of grant execution, and the full 100% of the allocation must be spent within 12 years of grant execution. WVDO projects the following expenditures and performance outcomes. As funds become available and applications for mitigation projects have been approved, the WVDO will adjust projections to align with awarded projects.

Table 25: Projections for Expenditures and Performance Outcomes

Program	Allocation	% Total Funds	Expended in 6 years	Expended in 12 years	Max Award	Performance Outcomes
Infrastructure	$86,169,650	80.90%	$43,084,650	$86,169,3 00		20 projects
• General Infrastructure	$72,169,300	67.8%	$36,084,650	$72,169,300	$10,000,000	10 projects
• Public Facility Hardening	$14,000,000	13.1%	$7,000,000	$14,000,000	$5,000,000	10 projects
Planning and Capacity Grants	$15,000,000	14.10%	$7,500,000	$15,000,000		37 plans
• State Planning	$6,500,000	6.1%	$3,250,000	$6,500,000	N/A	Update State HMPs and build disaster/ resilience database
• Regional/Local Planning	$6,000,000	5.6%	$3,000,000	$6,000,000	$250,000	24 plans
• Hazard Mitigation Plans	$2,500,000	2.4%	$1,250,000	$2,500,000	$200,000	12+ plan updates
WVDO Administration	$5,324,700	5.0%	$2,662,350	$5,324,700	N/A	N/A
Total Budget	$106,494,350	100%	$53,247,000	$106,494,000		

WVDO has compiled projections based on each quarter's expected performance, beginning with the initial quarter. Funds are available through each quarter until all funds are expended. The projections will enable HUD and the public to track proposed versus actual performance. The projections will be available on the website and are published in Appendix E of this Action Plan. The published Action Plan will be amended for any subsequent changes, updates, or revision of the projections.

These projections include measurements for the following:

- Requirement to expend at least 50% of funds to the benefit of LMI persons

- Requirement to expend at least 50% of funds to the benefit of HUD MIDs
- Requirement to expend 50% of CDBG-MIT funds within six years of HUD's execution of the grant agreement
- Requirement to expend 100% of CDBG-MIT funds within 12 years of HUD's execution of the grant agreement

Timely Expenditures

The WVDO will ensure timely expenditure of funds through the following means:

- All grant awards will be tracked and monthly expenditure reports will be generated by the state and all subrecipients.
- Subrecipients will be required to report quarterly on program performance of CDBG-MIT activities.
- If a subrecipients appears to be falling behind in its expenditure schedule, WVDO will meet with the subrecipients to determine why the project is not moving forward and a corrective action plan will be developed.
- If a subrecipient cannot meet the first 6-year expenditure requirement of 50% of the funds, WVDO reserves the right to recapture the grant and fund an alternative mitigation project.

Subrecipients will be required to show through source documentation demonstrating that invoices and bills submitted were paid in a timely manner and only eligible costs that are included in the scope of work were reimbursed before WVDO will expend CDBG-MIT funds to reimburse its subrecipients.

Program Income

WVDO does not anticipate program income from the administration of the projects and programs in this Action Plan.

To the maximum extent feasible, HUD requires that program income shall be used or distributed before additional withdrawals from the U.S. Treasury are made. If WVDO were to change the scope of the activities to include the potential for program income, WVDO will develop and adopt program income policies and procedures for the specific program. In this potential scenario, WVDO has opted to return any program income received to the CDBG-MIT program.

Efforts to Minimize or Address Displacement

All CDBG-MIT funded activities will be designed to eliminate (or minimize) the occurrence of displacement. WVDO will minimize displacement of persons or entities and assist persons or entities displaced as a result of implementing a project with CDBG-MIT funds by ensuring that all programs are administered in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act (URA) of 1970, as amended (49 CFR Part 24) and Section 104(d)

of the Housing and Community Development Act of 1974 and the implementing regulations at 24 CFR Part 570.496(a), subject to any waivers or alternative requirements provided by HUD. The URA provides that a displaced person is eligible to receive a rental assistance payment that covers a period of 42 months. Efforts to conduct voluntary buyouts for destroyed and substantially damaged buildings in a floodplain may not be subject to all provisions of the URA requirements.

While nonstructural mitigation (such as elevations, buyout and/or acquisition) programs may be necessary to achieve flood risk mitigation goals and may cause displacement, most of the programs detailed in this Action Plan will be implemented with the goal of minimizing displacement of families from their homes, whether rented or owned. Moreover, in the event displacement does occur, WVDO will take into consideration the functional needs of the displaced persons in accordance with guidance outlined in Chapter 3 of HUD's Relocation Handbook.

Protection of People, Property, and Construction Methods

WVDO will require both quality inspections and code compliance inspections on all projects. Site inspections will be required on all projects to ensure quality and compliance with building codes. WVDO will encourage and support subrecipients' efforts to update and strengthen local compliance codes to mitigate hazard risks where applicable.

Subrecipients will submit an explanation of both current and future planned codes to mitigate hazard risks. WVDO will provide technical guidance on hazard mitigation code examples. For flood mitigation efforts, subrecipients must consider high wind and continued sea level rise and ensure responsible floodplain and wetland management based on the history of flood mitigation efforts and the frequency and intensity of precipitation events.

In addition to the licenses and insurance requirements, contractors will be required to provide a warranty period for all work performed. All work performed by the contractor will be guaranteed consistent with standards of West Virginia, or standards adopted by WVDO.

Section 3

The definition of "low-income persons" in 12 U.S.C. 1701u and 24 CFR 135.5 is the basis for eligibility as a section 3 resident. A Section 3 resident refers to:

(1) A public housing resident; or

(2) an individual who resides in the metropolitan area or nonmetropolitan county in which the section 3 covered assistance is expended, and who is:

  (i) A low-income person or

  (ii) a very-low-income person.

WVDO determines that an individual is eligible to be considered a Section 3 resident if the annual wages or salary of the person are at, or under, the HUD-established income limit for a one-person family for the jurisdiction—which is eighty percent of the median income for the area. This

authority does not impact other section 3 resident eligibility requirements in 24 CFR 135.5. WVDO will submit form HUD-60002 annually through the Section 3 Performance Evaluation and Registry System (SPEARS) on HUD's website.

Procured contractors will comply with Section 3 regulations. Contractors will ensure, to the greatest extent feasible, that employment and business opportunities will be directed to qualified low- and very low-income persons and business concerns that provide economic opportunities to low-income persons. Contractors will make every effort to recruit, target, and direct opportunities to Section 3 residents and businesses as well as notifying Section 3 residents about training opportunities. WVDO will provide contractors with resources to maximize and monitors these efforts.

Flood Insurance & Elevation Standards

As applicable, future property damage will be minimized by requiring that any rebuilding be done according to the best available science for that area with respect to base flood elevations. Infrastructure hardening projects within a floodplain will be built with compliance to elevation standards.

As applicable and within its policies and procedures on a program-by-program basis, the State or its subrecipients will document decisions to elevate structures. This documentation will address how projects will be evaluated and how elevation costs will be reasonably determined relative to other alternatives or strategies, such as the demolition of substantially-damaged structures with reconstruction of an elevated structure on the same site, property buyouts, or infrastructure improvements to reduce the risk of loss of life and property.

Natural or Green Infrastructure Standards

WVDO will seek to develop a process to incorporate natural or green infrastructure in the design of CDBG-MIT projects. Natural or green infrastructure is defined as the integration of natural processes or systems (such as wetlands or land barriers) or engineered systems that mimic natural systems and processes into investments in resilient infrastructure. Natural or green infrastructure methods provide drainage functions to reduce storm water runoff while offering low-cost and attractive site design options. Examples of green infrastructure include:

- Bioretention areas such as rain gardens and bioswales
- Permeable pavements
- Street trees
- Open spaces that incorporate drainage and infiltration functions

Applicants that are considering green infrastructure projects or including those elements in their overall project are encouraged to incorporate multiple forms of green infrastructure, have extensive planning (such as a master plan) already completed, demonstrate community support, and show how the improvements will provide significant mitigation impacts as well as cross-

cutting benefits to the community or region (community quality of life, attraction to a downtown area that can benefit businesses and merchants).

Green Building Standards

WVDO will meet the Green Building Standard for: (i) All new construction of residential buildings and (ii) all replacement of substantially damaged residential buildings. Replacement of residential buildings may include reconstruction (i.e., demolishing and rebuilding a housing unit on the same lot in substantially the same manner) and may include changes to structural elements such as flooring systems, columns, or load-bearing interior or exterior walls.

The Green Building Standard means that WVDO will consider meeting one of the following industry recognized standards for all construction through implementation of one or more of the following programs:

- ENERGY STAR (Certified Homes and Multifamily High-Rise),
- Enterprise Green Communities,
- LEED (New Construction, Homes, Midrise, Existing Buildings Operations and Maintenance, or Neighborhood Development),
- ICC-700 National Green Building Standard,
- EPA Indoor AirPlus (ENERGY STAR a prerequisite) or
- any other equivalent comprehensive green building program acceptable to HUD.

WVDO will identify, in each project file, which Green Building Standard will be used. For construction projects completed, under construction or under contract prior to the date that assistance is approved for the project, adherence to the applicable standards to the extent feasible is encouraged, but not required.

All state-administered programs may use a third-party inspection service to ensure that Green Building Standards are met using standardized checklists developed from the above-listed programs.

Operation and Maintenance Plans

Any public infrastructure or facilities funded with CDBG-MIT resources must illustrate their ability to account for long-term operation and maintenance needs beyond an initial investment of CDBG-MIT funds.

For each eligible activity, state and/ or local resources must be identified for the operation and maintenance costs of projects assisted with CDBG-MIT funds. If operations and maintenance plans are reliant on any proposed changes to existing taxation policies or tax collection practices, those changes and relevant milestones must be expressly addressed.

WVDO will address the requirements within its policies and procedures on a program-by-program basis, including specific benchmarks instituted to ensure operations and maintenance requirements are met.

Cost Verification Procedures

All construction activities that utilize CDBG-MIT funds must be reasonable and consistent with market costs at the time and place of construction. For infrastructure projects, WVDO will rely on licensed engineers responsible for project budget justification, construction code requirements and CDBG-MIT project funding maximums. Cost estimates must be recent as of 12 months of application submission.

WVDO will encourage subrecipients to consider the costs and benefits of the project, along with the total cost per person or structure served when selecting CDBG-MIT-eligible projects. WVDO may use an independent, qualified third-party architect, construction manager or other professional (e.g., a cost estimator) to verify the planned project costs and cost changes to the contract (e.g., change orders) during implementation are reasonable. The proposed projects will undergo application review which includes a cost verification.

To evaluate costs and benefits, subrecipients may draw upon the FEMA's "Understanding the FEMA Cost-Benefit Analysis Process" guidance which may be found at the following website: https://www.fema.gov/media-library-data/20130726-1506-20490-9382/fema259_app_b.pdf. While this document outlines the specific FEMA process, West Virginia does not require a formal BCA to be completed for its projects. This document is simply a guide to assist potential subrecipients in an evaluation of their projects which outlines various factors that may be considered in justifying the cost.

Each identified covered projects will be required to conduct a benefit cost analysis (BCA). More detailed cost verification requirements for Covered Projects will be provided by WVDO in as applicable.

Monitoring Standards and Procedures

The complete West Virginia Monitoring Plan / Policies and Procedures (Monitoring Plan) were submitted to HUD. WVDO already possesses the necessary systems and procedures which formally establish the critical monitoring strategies for all cross-cutting regulatory requirements. These well-established systems incorporate HUD program rules and regulations, civil rights, environmental, labor standards, fair housing, Section 3, citizen participation, reporting and recordkeeping requirements. The current CDBG-MIT award will leverage these existing resources and adapt them to the requirements of Public Law 114-223/254 and any subsequent related guidance.

Monitoring functions will ensure funding recipients, developers, contract service providers, and all contracted agencies adhere to state and federal regulations and requirements when operating, facilitating, or developing programs and activities.

WVDO performs monitoring and compliance project by project, as well as monitoring related to acute or chronic issues identified by an external audit or necessitated by the possibility of fraud, waste, or mismanagement. The Monitoring Plan includes timelines, monitoring procedures, scheduling, documentation requirements, and corrective actions necessary to resolve issues or concerns discovered through a review. The monitoring process spans entrance meetings, analysis of documentation, interviews, exit meetings, development and issuance of compliance review reports, corrective action plans, and if necessary, follow-up reviews and letters.

Broadband Infrastructure

As applicable, WVDO will ensure that any new construction or substantial rehabilitation, as defined by 24 CFR 5.100, of a building with four or more rental units, will include installation of broadband infrastructure (as defined in 24 CFR 5.100), except where the grantee documents that:

i. the location of the new construction or substantial rehabilitation makes installation of broadband infrastructure infeasible;
ii. the cost of installing broadband infrastructure would result in a fundamental alteration in the nature of its program or activity or in an undue financial burden; or
iii. the structure of the housing to be substantially rehabilitated makes installation of broadband infrastructure infeasible.

Urgent Need National Objective for Mitigation

The Appropriations Act directs the Department to allocate CDBG–MIT funds to grantees that received CDBG–DR funds to assist in recovery from major federally declared disasters occurring in 2015, 2016 and 2017. To reflect the direction of the Appropriations Act to allocate funds to grantees recovering from recent disasters and to address the demonstrable need for significant mitigation improvements by those grantees, the Department is waiving the criteria for the urgent national objective as provided at 24 CFR 570.208(c) and 24 CFR 570.483(d) and is establishing an alternative requirement to include new urgent need national objective criteria for CDBG–MIT activities. To meet the alternative criteria for the urgent need mitigation (UNM) national objective, each grantee must document that the activity: (i) Addresses the current and future risks as identified in the grantee's Mitigation Needs Assessment of most impacted and distressed areas; and (ii) will result in a measurable and verifiable reduction in the risk of loss of life and property.

The State of West Virginia will prioritize LMI beneficiaries to the greatest extent possible and will ensure meeting or exceeding the 50% expenditure requirement for LMI activities. The UNM national objective will be used as described below and result in measurable and verifiable reduction of the risk of loss of life and property as follows:

- General Infrastructure will improve critical infrastructure and ensure they will be operational during future flooding and storms as identified in the Risk Assessment reducing the vulnerability to hazards from deteriorating infrastructure.

- Public Facility Hardening provides mitigation by fortifying public facilities, like fire stations and schools, that are essential and can serve as shelters and safe areas during emergencies. Investing in critical facilities across the state ensures communities continue to thrive.

Covered Projects

In the CDBG-MIT FRN, a Covered Project is defined as an infrastructure project having a total project cost of $100 million or more, with at least $50 million of CDBG funds regardless of source (CDBG–DR, CDBG-National Disaster Resilience (NDR), CDBG–MIT, or CDBG)). The State of West Virginia does not anticipate any projects that meet the definition of a covered project. If it is determined that a project will meet the definition of a Covered Project, the State will include the Covered Project in a substantial Action Plan amendment and follow the public hearing process before committing to funding.

Exception Policy

The State of West Virginia will make exceptions to the maximum award amounts based on its Exception Policy. Each request for an exception to the maximum award amount or other program policies will be reviewed on a case-by-case basis by WVDO. Requests must be submitted in writing and include a justification for exceeding the maximum award amount or other policy requirements. The policy exception is not to be implemented until the WVDO authorizes the exception in writing. Requests will be review by WVDO and a response will be provided in writing within 5 business days. All exceptions must still meet HUD's requirements for necessary and reasonable.

8. Citizen Participation Plan

The State takes great value in meaningful citizen and stakeholder engagement. To ensure engagement, West Virginia developed a Citizen Participation Plan in compliance with 24 CFR 91.115 and applicable HUD requirements. This plan is intended to maximize the opportunity for citizen involvement in the planning, development, and implementation of the West Virginia CDBG-MIT program.

West Virginia intends to focus outreach efforts to facilitate participation from individuals of low to moderate income (LMI) and vulnerable populations. In addition, West Virginia encourages the participation of regional, state and federal entities.

West Virginia will consider any comments received in writing, via email, mail, or in person or virtually at official public hearings. West Virginia has prioritized a robust citizen participation process to ensure all citizens and stakeholders are provided the opportunity to contribute to and understand the mitigation efforts that will be undertaken by the State.

The State anticipates re-evaluating this plan annually to ensure the underlying demographics that have informed outlined strategies remain consistent with the plan.

Public Hearings

Public Hearing Process

Public hearings and stakeholder briefings are held both during Action Plan development, as well as during the official public comment period after the proposed Action Plan or any subsequent substantial amendments have been published.

West Virginia will consider any comments or view of citizens in writing or orally at the public hearings. Responses to those comments are incorporated into the final Action Plan in the Appendix. Notice of Public Hearings will be announced on https://wvfloodrecovery.com/mitigation, in the local newspapers, and on social media.

Public Hearings will be held at a time and location convenient to impacted residents. For in-person public meetings, the State will choose locations that are accessible to persons with disabilities.

The COVID-19 crisis has presented both challenges and opportunities for the state's public hearing process. In order to balance the safety of citizens and stakeholders and the obligation to actively engage with the public, hearings may be held virtually over webinar if it is determined to be in the best interest of public health and safety. For virtual public hearings, participants will be able to ask questions, provide comments, and received a response from a representative of West Virginia in real time. While in-person engagement is preferred, this virtual setting will allow citizens and stakeholders the opportunity to participate actively from the safety of their homes or offices. Additionally, recordings of the webinars will be publicly posted to www.wvfloodrecovery.com/mitigation.

Special assistance will be provided by contacting the West Virginia Community Advancement and Development Office, West Virginia Flood Recovery Office by contacting the CDBG-MIT Program Manager at 304-558-2234 or CDBGMITIGATION@wv.gov five (5) days prior to the public hearing.

Overview of Public Hearing Efforts to Date

West Virginia held two public hearings during the Action Plan development to inform the public on the basics of CDBG-MIT funds, types of eligible activities, the methods and means by which assistance may be provided, and the general process and timeline. These public hearings provided the State the opportunity to collect input from citizens and stakeholders regarding mitigation priorities.

After this proposed Action Plan is published, West Virginia will hold four public hearings during the public comment period. These hearings will review the proposed programs and allocations, as well as method of distribution, and will allow for public comments and questions.

The Action Plan Public Hearings schedule is as follows:

Pre-Action Plan Publication Virtual Public Hearings:

- Tuesday, June 23, 2020, 2:00 – 4:00pm ET

- Thursday, June 25, 2020, 6:00 – 8:00pm ET

Virtual Public Hearings during Public Comment Period:

- Tuesday, September 1, 2020, 1:00 – 3:00pm ET
- Thursday, September 3, 2020, 6:00 – 8:00pm ET
- Tuesday, September 8, 2020, 6:00 – 8:00pm ET
- Thursday, September 10, 2020, 1:00 – 3:00pm ET

Summary of Pre-Action Plan Virtual Public Hearings

WVCAD held its first two public hearing prior to the release of its CDBG-MIT Action Plan to inform the public of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. The hearing was advertised publicly via newspaper ad, WVCAD CDBG-MIT website at https://wvfloodrecovery.com/mitigation, and social media. Additionally, WVCAD issued a notification to its 500+ member stakeholder list to solicit maximum participation. To ensure public safety during the COVID-19 pandemic, the hearing was held virtually via GoToWebinar. A recording of the hearing will be created and posted on the WVCAD CDBG-MIT website. A total of 23 attendees participated in the first hearing, and 14 attendees participated in the second hearing. Seven public comments or questions were received and are summarized below:

- Eligible Activities: The majority of questions received during the public hearing were related to potential eligible activities under CDBG-MIT funding. Participants inquired about economic development activities, green infrastructure, conservation easements, buyout activities, local match for other mitigation programs, and building and safety code development and adoption.
- Stakeholder Participation: The State received questions about how to remain engaged as a stakeholder and participate in future CDBG-MIT discussion or where to send additional data or information that could be incorporated into the development of the Action Plan. They were encouraged to email CDBGMitigation@wv.gov with all requests and additional information.

Public Notice and Comment Period

Notice of public comment period will be provided by publication on the West Virginia Disaster Recovery Office website https://wvfloodrecovery.com/mitigation/. West Virginia will open the citizen comment period for the following timeframes:

- Comment for the draft Action Plan will take place forty-five (45) days after the publication of the Action Plan

- Comment period for Substantial Amendments will take place for thirty (30) days after the publication of the Substantial Amendment All public comments received during the official 45-day public comment period for the draft Action Plan will be incorporated into the final Action Plan for submission to HUD.

Stakeholder Consultation and Coordination

The planning and implementation of CDBG-MIT activities require coordination across multiple federal, state, and local stakeholders. WVDO is committed to engaging with these relevant stakeholders throughout the life of this grant.

During the development of this Action Plan, the State conducted consultation meetings with key regional stakeholders including other jurisdictions; the private sector; social service agencies and the Continuum of Care; and other government agencies, including State and local emergency management agencies that have primary responsibility for the administration of FEMA mitigation funds, including the State Mitigation Officer. These consultations were conducted to ensure consistency of the Action Plan with applicable regional development plans as well as local needs and priorities.

The State has conducted meetings with the Regional Planning Development Councils (RPDCs), units of local government, public representatives, and other State agencies including the State Resiliency Office and the State Hazard Mitigation Officer. West Virginia maintains a contact list of over 500+ stakeholders, which include members of the public, private and nonprofit sectors, and government entities, who regularly receive updates on the CDBG-MIT program and Action Plan Development. Feedback from these consultations has been considered and incorporated in programmatic design decisions.

The following stakeholder consultations took place in the months of July and August 2020:

- July 14, 2020 – Consultation with Regional Planning and Development Councils and HUD MID Counties and Cities
- July 14, 2020 – Consultation with Social Service Providers and the Continuum of Cares
- July 16, 2020 – Consultation with Federal Agencies and Emergency Management
- July 16, 2020 – Consultation with the State Resiliency Office
- July 21, 2020 – Consultation with State MID Counties and Cities and Public Housing Authorities
- July 29, 2020 – Consultation with State Hazard Mitigation Officer
- August 5, 2020 – Consultation with U.S. Army Corps of Engineers

Meeting notes from each of the stakeholder consultations can be found in Appendix A.

Citizen Advisory Group for CDBG-MIT Activities

The FRN for the CDBG-MIT funds requires that following the CDBG-MIT Action Plan approval, the State of West Virginia is to form one or more citizen advisory committees that shall meet in an

open forum not less than twice annually in order to provide increased transparency in the implementation of CDBG-MIT funds, to solicit and respond to public comment and input regarding the grantee's mitigation activities, and to serve as an ongoing public forum to continuously inform the grantee's CDBG-MIT projects and programs.

WVDO will work with the HUD and State MID counties to form the required Citizen Advisory Group(s). WVDO will use the CDBG-MIT website and outreach strategies to notify residents of the opportunity to participate. Once the group(s) are established, WVDO will post meeting times and places, agendas, and meeting minutes to the CDBG-MIT website.

Public Survey

WVDO conducted an online survey from June 5 – June 19, 2020 in an effort to gather feedback from impacted communities and stakeholders on their mitigation priorities. The survey was sent to the entire CDBG-MIT stakeholder list of over 500 contacts. The results of this survey are incorporated into the Action Plan's Mitigation Needs Assessment. Full results from the survey can be found in Appendix B of the Action Plan.

Public Website

West Virginia will maintain a comprehensive website dedicated to the CDBG-MIT program and related activities, including the final Action Plan, public comments, and Citizen Participation Plan. The website can be found at the following address: https://wvfloodrecovery.com/mitigation.

Action Planning Process and Action Plan Updates

The Action Plan defines how West Virginia will effectively use all available funding to support a data-driven mitigation effort based on the calculation of need in the 12 impacted counties in West Virginia. The plan describes the State's proposed allocations by activity, outlines program design for each program activity, beginning and end dates for each mitigation activity, and performance and expenditure schedules.

During the development of the CDBG-MIT Action Plan, the State will seek public input on program design issues including the allocation amount to West Virginia expects to receive, the range of activities that may be undertaken, the estimated amount that will benefit persons of low-to-moderate (LMI) and plans to mitigate displacement.

A summary of all comments received will be included in the Final Action Plan submitted to the U.S. Department of Housing and Urban Development (HUD) for approval. The Final Action will be posted to the West Virginia Disaster Recovery Program website: https://wvfloodrecovery.com/mitigation.

Amendments to the Action Plan

Substantial Amendments

West Virginia will engage citizens throughout the program duration to maximize opportunities for input on proposed program changes that result in a Substantial Amendment. Program changes that constitute a Substantial Amendment include the following:

- An addition or deletion of any allowable activity described in the approved application
- The addition of a covered project
- An allocation or re-allocation of more than $5 million
- A change in planned beneficiaries

Citizens will be provided with no less than thirty (30) days to review and provide comment on the proposed substantial changes. A summary of all comments received will be included in the final Substantial Amendment submitted to HUD for approval. Final Substantial Amendments approved by HUD will be posted to https://wvfloodrecovery.com/mitigation

Non-Substantial Amendment

Non-substantial amendments are minor, administrative changes that do not materially alter activities or eligible beneficiaries. For other non-substantial amendments which do not meet the criteria listed above for substantial amendments, the State will notify HUD five days prior to incorporation into the comprehensive Action Plan; public comments are not required for non-substantial amendments.

Every amendment will be numbered sequentially and posted to https://wvfloodrecovery.com/mitigation/ after HUD review period not replacing, but in addition to all previous versions of the Action Plan.

Performance Reporting

West Virginia will submit a Quarterly Performance Report (QPR) in the HUD Disaster Recovery Grant Reporting (DRGR) system no later than thirty (30) days following the end of each calendar quarter. QPRs will be posted on a quarterly basis upon approval by HUD until all CDBG-MIT funds have been expended and all expenditures reported.

Limited English Proficiency

West Virginia is mindful that vulnerable populations could include elderly, disabled, low- to moderate-income, or those with limited English proficiency. In order to identify these populations, the State will follow its Limited English Proficiency Plan (LEP) as amended to include the CDBG-MIT program by conducting a four-factor analysis. The State follows HUD regulation 24 CFR Part 1 "Nondiscrimination in Federally Assisted Programs of the Department of Housing and Urban Development-Effectuation of Title VI of the Civil Rights Act of 1964," which requires all recipients of federal financial assistance from HUD to provide meaningful access to LEP persons. Based on the four-factor analysis, the State is falls under the safe harbor provision therefore, not requiring

written translations of vital documents. However, the State of West Virginia will make all reasonable attempts to accommodate language access for residents requesting written and/or oral translations during the implementation of the CDBG-MIT grant.

As a result of LEP and the four-factor analysis, the State will post the Language Assistance Plan to outline the services provided to Limited English Proficiency during the development of the CDBG-MIT Action Plan and subsequent amendments.

Technical Assistance

Upon request, technical assistance will be provided by CDBG-MIT program staff. Requests should be made in a timely manner within the time parameters of the program design.

Citizen Compliant Procedures

The State of West Virginia will handle citizen complaints through a Constituent Services Team. All complaints received by the State, its CDBG-MIT contractors, vendors and/or other program sources, will be reviewed by the Constituent Services Team for investigation as necessary The Constituent Services Team will ensure complaints are resolved, escalated to appropriate personnel if needed, and any necessary follow-up actions are completed.

It will remain the goal of the State to always attempt to resolve complaints in a manner that is both sensitive to the complainant's concerns and that achieves a fair result.

The goal of the State and its Constituent Services Team is to provide an opportunity to resolve complaints in a timely manner. The State will provide a timely written response (by letter or email) within 15 days of the receipt of the compliant. If it is not practicable to provide a response within this time period, then the complainant shall be notified of the reason for the delay and the expected time period for a response. It shall be the right of any party filing a complaint to participate in the process and appeal a decision reached by the State. A log of all complaints and responses shall be maintained by the West Virginia Development Office.

Citizens may file a written complaint or appeal through the Department of Commerce email at CDBGMITIGATION@wv.gov or submit by postal mail to the following address:

Attention: Constituent Services
West Virginia Development Office
1900 Kanawha Blvd., East
Capitol Complex, Building 3 Room 700
Charleston, WV 25305-0311

Additionally, complaints may be made directly to HUD Office of Inspector General or to the Fair Housing and Equal Opportunity Office (FHEO) at the following locations:

Attention: HUD OIG Hotline
451 7th Street SW

Washington D.C. 20410
Email: hotline@hudoig.gov

FHEO Complaints may be filed online at the following address: https://www.hud.gov/program_offices/fair_housing_equal_opp/online-complaint.

9. List of Figures and Tables

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Appendices

Appendix A: Public Outreach and Stakeholder Consultations

Summary Table of Public and Stakeholder Outreach

CDBG-MIT Public Hearing and Consultation Requirements			
Meeting Type	**FRN Requirement**	**WV Activity Conducted to Meet Requirement**	**Outreach Type and Targeted Entities**
Pre-publication public hearing	For grantees <$500M - at least one public hearing in the HUD MID prior to publication of AP for public comment (84 FR 45852)	Virtual Public Hearing - 6/23/2020 2pm ET	Public Notice Stakeholder list email Website
		Virtual Public Hearing - 6/25/2020 6pm ET	Public Notice Stakeholder list email Website
Stakeholder Consultations	Affected local governments (84 FR 45855)	Stakeholder Consultation with HUD MIDs and RPDCs - 7/14/2020 11am ET	Targeted outreach to Regional Planning and Development Councils, HUD MID Counties
		Stakeholder Consultation with State MIDs and PHAs - 7/21/2020 11am ET	Targeted outreach to State MID Counties and PHAs
		Public Survey – available 6/5/2020-6/19/2020	Stakeholder email list
		Virtual Public Hearings - 6/23/2020 2pm ET; 6/25/2020 6pm ET	Public Notice Stakeholder list email Website
	Indian Tribes (84 FR 45855)	N/A - No federally or state recognized Indian Tribes in WV	N/A
	Public Housing Authorities (84 FR 45855)	Stakeholder Consultation with State MIDS and PHAs - 7/21/2020 11am ET	Targeted outreach to State MID Counties and PHAs
	Federal Partners (84 FR 45855)	Stakeholder Consultation with federal agencies and emergency managers- 7/16/2020 11am ET	Targeted outreach to Federal Agencies and Emergency Managers

CDBG-MIT Public Hearing and Consultation Requirements			
Meeting Type	FRN Requirement	WV Activity Conducted to Meet Requirement	Outreach Type and Targeted Entities
Stakeholder Consultations	Federal Partners (84 FR 45855) cont.	Stakeholder Consultation U.S. Army Corps of Engineers – 8/5/2020 4pm ET	Targeted outreach to USACE
		Public Survey (6/5-6/19/2020)	Stakeholder email list including federal agency partners
		Public Hearings (6/23 and 6/25/2020)	Stakeholder email list including federal agency partners
	Nongovernmental Organizations (84 FR 45855)	Meeting with West Virginia Land Trust - 7/13/2020 2pm ET	WV Land Trust
		Stakeholder Consultation with social service providers, Continuum of Care - 7/14/2020 3pm ET	Targeted outreach to Social Service/CoC Providers
		Public Survey (6/5-6/19/2020)	Stakeholder email list including NGOs and social service providers
		Public Hearings (6/23 and 6/25/2020)	Stakeholder email list including NGOs and social service providers
	Private Sector (84 FR 45855)	Public Survey (6/5-6/19/2020)	Stakeholder email list including Chambers of Commerce
		Public Hearings (6/23 and 6/25/2020)	Stakeholder email list including Chambers of Commerce

CDBG-MIT Public Hearing and Consultation Requirements			
Meeting Type	FRN Requirement	WV Activity Conducted to Meet Requirement	Outreach Type and Targeted Entities
Stakeholder Consultations	State Hazard Mitigation Officer; agency responsible for FEMA HMP (84 FR 45855)	Meeting with WV GIS Technical Center - 6/26/2020 2:30pm ET	Meeting with WVGISTC reps on mapping efforts and data
		Meeting with FEMA on HMGP data -7/13/2020 1pm ET	Targeted outreach to FEMA partners
		Stakeholder Consultation with RPDCs - 7/14/2020 11am ET	Targeted outreach to Regional Planning and Development Councils (and HUD MID counties)
		Meeting with State Resiliency Office - 7/16/2020 3pm ET	Targeted outreach to SRO
		Meeting with SHMO - 7/29/2020 1pm ET	Targeted outreach to SHMO
Post-publication AP Public Hearings	For grantees <$500M - At least two public hearings in the HUD-Identified MID areas - (at least one of these prior to publication of AP for public comment) (84 FR 45852)	Four public hearings planned – 9/1/2020 1pm ET; 9/3/2020 6pm ET; 9/8/2020 6pm ET; 9/10/2020 1pm ET	Public Notice Stakeholder list email Website
Coordinate and Align with other Mitigation Projects	To maximize the impact of all available funds, grantees must coordinate and align these CDBG–MIT funds with other mitigation projects funded by FEMA, the U.S. Army Corps of Engineers (USACE), the U.S. Forest Service, and other agencies as appropriate. (84 FR 45840)	Meeting with FEMA on HMGP and coordinated match – 7/13/2020 1pm ET	Targeted outreach to FEMA
		Stakeholder Consultation U.S. Army Corps of Engineers – 8/5/2020 4pm ET	Targeted outreach to USACE

Pre-Publication Public Hearing Minutes

Public Hearing #1

Date: July 14, 2020; 11PM-1PM

Presenter: Sherry Risk, CDBG-MIT Program Manager, WVCAD

Attendees: 23 attendees

Hearing Overview

WVCAD held its first public hearing prior to the release of its CDBG-MIT Action Plan to inform the public of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. The hearing was advertised publicly via newspaper ad, WVCAD CDBG-MIT website at https://wvfloodrecovery.com/mitigation/, and social media. Additionally, WVCAD issued a notification to its 500+ member stakeholder list to solicit maximum participation. To ensure public safety, the hearing was held virtually via GoToWebinar. A recording of the hearing was created and posted on the WVCAD CDBG-MIT website. A detailed list of attendees is attached for reference.

Presentation

WVCAD provided a PowerPoint presentation containing the following information regarding the CDBG-MIT allocation and Action Plan process.

- Introductions
- Goals and Objectives
- Disaster Overview and Impacted Counties
- What is Community Development Block Grant-Mitigation (CDBG-MIT)?
- What are the Main Requirements of CDBG-MIT?
- What is an Action Plan?
- Action Plan Timelines and Stakeholder Engagement
- How to Stay Involved
- Q&A

Discussion and Public Comment

Terrel Ellis: Could you please cover more detail around eligible activities? What constitutes economic revitalization for CDBG-MIT?

Answer: Evaluating the local economic impacts and creating programs which will assist in the resiliency of the economy. Examples: Infrastructure Improvements to businesses to enable operation in changing climate. Resiliency assessments for small business and grants to provide funding to implement measure which would improve business resiliency.

Francis Holton: The state may be using old mitigation plans. For example, region II did an update to its mitigation plan; will that be incorporated to use the most recent information?

Answer: Yes – we are reaching out to communities. We will follow up to ensure we are using the most recent plan data for the Mitigation Needs Assessment.

Lisa Berger: From the International Code Council; West Virginia Rep; International Code Council provides model building and safety codes. State fire commission adopted 2015 building code and 2009 energy code. Only 8 counties in the state have adopted the code; including impacted counties of Greenbrier and Fayette. Remaining 10 of 12 have not adopted the building code. Suggesting and encouraging the State take into consideration to encourage adoption and enforcement of the state building code. This activity is listed under federal register notice that both HUD and FEMA encourage. FEMA loss avoidance studies show that proper staff and training provides a loss reduction value between 15-25%. Additionally, FEMA national building study shows every 1 dollar invested equals $12 back in flood and wind resiliency. Reduces energy costs and keeps people safer during the winter. FEMA requires minimum standards including using the most recent international codes be used for its projects. Listed under state hazard mitigation plan as something that will provide communities with a set of life and safety standards, provides flood protections and lowers NFIP premiums. In spirit of maximizing how far the dollars can go and aligning with other programs this is encouraged. Application priority may be given for code adoption, for example. She offers support for an initiative to include the codes. While It is expensive to standup new departments; current telework conditions may just cost one staff person and software for code compliance. Code officials are also good well-paid jobs and codes help local revenue by bringing in permitting dollars.

Answer: We encourage the submission of study data through the CDBG MIT email to be considered in the mitigation needs assessment. This can be incorporated into program design. Code development is an eligible planning activity and code enforcement also eligible under the HUD CDBG MIT notice.

Brian Farkas: Once you submit the plan and receive funding, is match an eligible activity? We are a conservation agency dealing with flooding of streams and impact to streams. How can we include natural hazard mitigation, development of wetlands, detention lakes, and pressure relief for flooding into the plan? Natural-side of flooding is a priority - supporting green infrastructure.

Answer: Local Match for federal grants is an eligible activity. Please submit information to the CDBG Mitigation email address and this will be reviewed for incorporation into the mitigation needs assessment which is used to make programmatic decisions.

Francis Holton: Can these funds be used to buyout homes in the floodplain?

Answer: FEMA funds were used for this activity; we did not find data supporting the need for additional buyout and acquisition homes.

Follow up: What information is needed to make sure this can be included?

Answer: Provide WVCAD via CDBG MIT email information regarding what you consider an unmet buyout need in your region and we will consider this data in our Mitigation Needs Assessment.

Terrel Ellis: Will you consider conservation easements as an eligible activity? Looking at purchasing property along floodplains; Clay county is a good option and may have some projects. Easements would provide protection of water quality, watersheds, stream banks flowing into the Elk.

Answer: Easements can be considered as long as the potential disaster reduction risk can be quantified. Please submit additional information to CDBGMIT email for consideration.

Brian Farkas: When did you say you were going to reach out to various state and government agencies to input?

Answer: We offered a survey until the 19th of June; public hearing today and Thursday; July 14, 16 consultation hearings with stakeholders.

Follow up: Will you reach out to me? Executive Director of West Virginia Conservation Agency.

Answer: The following entities will be recipients of direct outreach: Cities and Counties; Federal and State Agencies; Regional Planning and Development Councils; State Hazard Mitigation Officers. If you are with one of those entities, you would be invited to those meetings.

Public Hearing #2

Date: June 25, 2020; 6PM-7 PM ET

Presenter: Sherry Risk, CDBG-MIT Program Manager, WVCAD

Attendees: 14 attendees

Hearing Overview

WVCAD held its second public hearing prior to the release of its CDBG-MIT Action Plan to inform the public of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. The hearing was advertised publicly via newspaper ad, WVCAD CDBG-MIT website at www.wvfloodrecovery.com/mitigation, and social media. Additionally, WVCAD issued a notification to its 500+ member stakeholder list to solicit maximum participation. To ensure public safety, the hearing was held virtually via GoToWebinar. A recording of the hearing was created and posted on the WVCAD CDBG-MIT website. A detailed list of attendees is attached for reference.

Presentation

WVCAD provided a PowerPoint presentation containing the following information regarding the CDBG-MIT allocation and Action Plan process.

- Introductions
- Goals and Objectives
- Disaster Overview and Impacted Counties
- What is Community Development Block Grant-Mitigation (CDBG-MIT)?
- What are the Main Requirements of CDBG-MIT?
- What is an Action Plan?
- Action Plan Timelines and Stakeholder Engagement
- How to Stay Involved
- Q&A

Discussion and Public Comment

Francis Holton: In the floodplain area, we have 100 to 200 houses that could possibly qualify for buyout. We might even have more than 200 houses. Is there a way to do this without listing each address individually? We are located in Hamlin where everything from Vine Avenue south

toward the river is in the floodway. All of that would qualify for a buyout. Could these funds be used for that type of project?

Answer: For acquisition and buyout, we need to know specific addresses, initially, a map of the area could be used for eligibility analysis. Are these houses part of the FEMA programs related to the 2016 storm?

Follow-up: No, these addresses are not involved with the FEMA buyout program.

Answer: With CDBG-DR funding, we needed a direct tie-back to the 2016 floods. With the CDBG-MIT funds, we have to protect against future risks. We could look at resiliency measures and possible buyout and acquisition. If you identify an area for an initial analysis, we can incorporate this into our assessment. At this time, we are assessing risks and mitigation needs and have not determined which programs will receive funding.

Conclusion: Mr. Holton offered to send a map of the houses in Hamlin by or around July 1st via e-mail to Sherry Risk for evaluation in the mitigation needs assessment.

Stakeholder Consultation Minutes

Stakeholder Consultation: Regional Planning and Development Councils, HUD MIDs

Date: July 14, 2020; 11PM-1PM

Presenter: Sherry Risk, CDBG-MIT Program Manager, WVCAD

Attendees: 37

Hearing Overview

To ensure full key stakeholder participation, WVCAD held a series of targeted stakeholder consultation meetings prior to the release of its CDBG-MIT Action Plan to inform key stakeholders of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. For the July 14th meeting, WVCAD met with Regional Planning Development Councils, and HUD MID representatives. To ensure public safety due to the COVID-19 pandemic, the meeting was held virtually via GoToWebinar.

Presentation

WVCAD provided a PowerPoint presentation containing the following information regarding the CDBG-MIT allocation and Action Plan process.

- Introductions
- Goals and Objectives
- Overview of Community Development Block Grant-Mitigation (CDBG-MIT)
    - Main requirements
    - Action Plan process and timeline
- Mitigation Needs Assessment
    - Key Takeaways
- Program Design
- Stakeholder Engagement

Discussion and Comment

(Note: all comments and questions were received via the Question box in text on GoToWebinar and read aloud and responded to by the presenter during the meeting. Names for participants who posed questions were not captured.)

Speaker #1: The mapping identifies wastewater treatment plants in the flood zone. Has a similar analysis been done for potable water plants?

Answer: Yes, an analysis for potable water was completed.

Speaker #2: The State has a mitigation plan that needs to be updated. Can these funds be used to update that?

Answer: Yes, updating mitigation plans is an eligible planning activity.

Speaker #3: Will the new mitigation needs assessment data be integrated into the regional and/ or state plans?

Answer: This analysis incorporated information from regional development plan councils and Homeland Security as well as new data. Moving forward, we plan to provide those partners with the new data that we have gathered so that they can update their plans accordingly.

Speaker #4: For a comprehensive plan to be eligible, would it focus only on mitigation or be part of a larger plan?

Answer: The plan has to be tied to hazard mitigation.

Speaker #5: What is the maximum funding per project?

Answer: The maximum funding per project will be published in the draft action plan.

Speaker #6: I believe the analysis for landslide is off.

Answer: The information is the most current available information and will be updated as needed.

Speaker #7: Near Rainelle, we are working on damaged train tracks from the floods. Would this project qualify?

Answer: We have not yet identified specific projects at this time. However, in terms of eligible activities, transportation activities, could qualify. Transportation activities are a priority for the development of this Action Plan.

Speaker #8: Can projects that are deferred maintenance be funded?

Answer: Regular maintenance is not an eligible activity. Addressing deferred maintenance may, in some instances, qualify as eligible rehabilitation, however it depends on the specific proposed project scope.

Speaker #9: Are we qualified to rehab a building for use as a storm shelter?

Answer: We do not plan to rehab buildings, but we are considering hardening facilities.

Speaker #10: If structured buyouts are an activity, would we apply to your office?

Answer: Buyouts and elevation are eligible activities, but from CDBG-DR, we have already allocated $12 million for coordinated match. FEMA does not have documentation of a current additional buyout need.

Speaker #11: How does the CDBG money offset the FEMA hazard mitigation funding for the 2016 flood?

Answer: FEMA provided 75% of funding for their project. HUD allowed us to use our DR funds to match the non-federal share (i.e., the 25%), so we have allocated $12 million (of CDBG-DR) toward the coordinated match.

Speaker #12: Is updating dam structures an eligible activity?

Answer: If this is a maintenance project, it would be ineligible. If not, this could be an eligible activity, however, dams were not identified as the Top 5 highest risk in our assessment.

Speaker #13: If applying with a communications application, would CDBG broadband requirements apply?

Answer: We have not yet released application details yet. However, it is always important to consider minimum CDBG standards when considering projects.

Speaker #14: Is this program funding tied only to disaster 4273 (i.e., 2016 floods)?

Answer: The awarded mitigation funds were calculated by Congress based on the CDBG-DR grant for that disaster. In addition, we have to prioritize the twelve counties identified in DR grant. The key difference is that we can select projects that are at risk even if they were not necessarily damaged in 2016. A direct tie-back to DR-4273 is not required.

Stakeholder Consultation: Social Service Providers

Date: July 14, 2020; 3PM-5PM ET

Presenter: Sherry Risk, CDBG-MIT Program Manager, WVCAD

Attendees: 8

Hearing Overview

To ensure full key stakeholder participation, WVCAD held a series of targeted stakeholder consultation meetings prior to the release of its CDBG-MIT Action Plan to inform key stakeholders of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. For the July 14th meeting, WVCAD met with Social Service Providers. To ensure public safety due to the COVID-19 pandemic, the meeting was held virtually via GoToWebinar.

Presentation

WVCAD provided a PowerPoint presentation containing the following information regarding the CDBG-MIT allocation and Action Plan process.

- Introductions
- Goals and Objectives
- Overview of Community Development Block Grant-Mitigation (CDBG-MIT)
    - Main requirements
    - Action Plan process and timeline
- Mitigation Needs Assessment
    - Key Takeaways
- Program Design
- Stakeholder Engagement

Discussion and Comment

Attendees did not provide any comments or questions for the duration of the webinar. Contact information was provided to attendees if any comments or question arise later.

Stakeholder Consultation: Federal Agencies and Emergency Management

Date: July 16, 2020; 11AM-1PM

Presenter: Sherry Risk, CDBG-MIT Program Manager, WVCAD

Attendees: 20

Hearing Overview

To ensure full key stakeholder participation, WVCAD held a series of targeted stakeholder consultation meetings prior to the release of its CDBG-MIT Action Plan to inform key stakeholders of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. For the July 16th meeting, WVCAD met with federal agencies and emergency managers. To ensure public safety due to the COVID-19 pandemic, the meeting was held virtually via GoToWebinar.

Presentation

WVCAD provided a PowerPoint presentation containing the following information regarding the CDBG-MIT allocation and Action Plan process.

- Introductions
- Goals and Objectives
- Overview of Community Development Block Grant-Mitigation (CDBG-MIT)
    - Main requirements
    - Action Plan process and timeline
- Mitigation Needs Assessment
    - Key Takeaways
- Program Design
- Stakeholder Engagement

Discussion and Comment

Francis Holton: On slide 21, does the map include water lines that can be easily damaged from floods too?

Answer: No, this map does not account for water lines. It shows wastewater treatment plants.

Carrie Robinette: For the planning activities, can we use the funds towards updating the 5-year plans for regional planning and development councils? A few plans will need to be updated in the next year to eighteen months. Is this eligible activity?

Answer: Yes, it is an eligible activity. We were planning to assist for this update and even subsequent updates. We should discuss further about trying to determine whether FEMA could leverage funds toward the areas outside of the 12 counties.

John Butterworth: I would strongly encourage acquisition, demolition, buyout, and elevation projects. We already have priorities detailed in the local Charleston plans for hazard mitigation.

Answer: This point was acknowledged by the presenter.

Carrie Robinette: Can funding be used for private water crossings to help reduce water flow and reduce future damage? For example, many private bridges that cross waterways for private housing were destroyed in 2016. Is this an eligible activity?

Answer: In CDBG-DR program, we have a program that assists homeowners with damaged private bridges from the 2016 floods. However, for CDBG-MIT, we are not opening an individual application process for private bridge owners. This is because we aim to maximize risk reduction the overall regions. Application processes will target local government on a regional level, not individuals.

Francis Holton: Would I be better off applying through Lincoln County government or through a regional planning & development council?

Answer: You can apply through either entity. Funds will be made available for cities and counties.

John Butterworth: Are you focusing exclusively on infrastructure rather than individual property projects (e.g., relocations, retrofits, acquisitions)?

Answer: In CDBG-DR, we provide coordinated match to serve projects related to acquisition, buyout, elevation, etc. At this point, we don't have data that supports an additional need. However, we have identified a need for infrastructure projects.

Matt McCullough: Does data collection qualify as an eligible activity?

Answer: Yes, data collection is eligible as a planning activity.

Stakeholder Consultation: State Resiliency Office

Date: July 16, 2020; 3:00 p.m. - 4 p.m. ET

Presenter: Sherry Risk, CDBG-MIT Program Manager, WVCAD

Attendees:

- Sherry Risk, WVCAD
- Bobbly Cales, State Resiliency Office
- Daina Ruback, Amber Madden, Tidal Basin

Meeting Overview

To ensure full key stakeholder participation, WVCAD held a series of targeted stakeholder consultation meetings prior to the release of its CDBG-MIT Action Plan to inform key stakeholders of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. On July 16, 2020, WVCAD met with the West Virginia State Resiliency Office. This particular meeting is essential coordination between agencies in the development of the state's CDBG-MIT Action Plan.

Discussion Notes

- In 2019, the SRO bill was introduced in WV. Mr. Cales is the new coordinator of this agency. He attended the previously held public hearing and stakeholder consultation webinar and is familiar with the proposed development of the CDBG-MIT Action Plan
- Meeting goal is to ensure alignment between offices
- SRO is currently working on a Statewide Recovery Plan
- Offices will continue to coordinate to ensure funds are properly leveraged.
- Mr. Cales inquired as to whether MIT funds could be used for the SRO to review local and regional HMPs. Would need to ensure no duplication of benefits/supplantation of state funds, as this one of the main functions of the office.

Conclusion: Mr. Cales will maintain coordination/communication with WVCAD team. WVCAD will continue to update SRO as the CDBG-MIT Action Plan is developed. Because the office and position are both brand new, no current programs or policies that may impact CDBG-MIT Action Plan.

Stakeholder Consultation: State MID Counties and Public Housing Authorities

Date: July 21, 2020; 11PM-1PM

Presenter: Sherry Risk, CDBG-MIT Program Manager, WVCAD

Attendees: 17 attendees

Hearing Overview

To ensure full key stakeholder participation, WVCAD held a series of targeted stakeholder consultation meetings prior to the release of its CDBG-MIT Action Plan to inform key stakeholders of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. For the July 14th meeting, WVCAD met with State MID county and PHA representatives. To ensure public safety due to the COVID-19 pandemic, the meeting was held virtually via GoToWebinar.

Presentation

WVCAD provided a PowerPoint presentation containing the following information regarding the CDBG-MIT allocation and Action Plan process.

- Introductions
- Goals and Objectives
- Overview of Community Development Block Grant-Mitigation (CDBG-MIT)
    - Main requirements
    - Action Plan process and timeline
- Mitigation Needs Assessment
    - Key Takeaways
- Program Design
- Stakeholder Engagement

Discussion and Comments

Paula Brown: When will County Emergency Managers have input?

WVDO Response: We had public hearing and a session last Thursday including emergency managers; you can email the mitigation team to provide additional input.

Follow up: So there is no further County input at this point in time?

Response: We maintain a list of 500 stakeholders which were advertised to for input on the action planning process; this meeting is to garner additional County input and we do advertise the email for further comments. Additionally, once we have draft Action Plan published, we welcome additional comments from the public and all stakeholders.

Luke Peters: I saw public service districts listed as eligible applicants; that still needs to be done with the county commission as eligible applicants, correct?

WVDO Response: This is the process for CDBG. We don't have that level of detail yet defined in our application process as we are still designing programs, however, we do encourage public service districts to partner with counties to provide meaningful coordination.

Stakeholder Consultation: State Hazard Mitigation Office

Date: July 29, 2020 1pm – 2pm ET

Attendees:

- Lonnie Bryson, Assistant Deputy Director, Grants, Division of Homeland Security and Emergency Management
- Bobby Cales, State Resiliency Office
- David Hoge, Director, Grants, Division of Homeland Security and Emergency Management
- Sherry Risk, WVCAD
- Leanne Thompson, WVCAD
- Michelle Tharp, WVCAD
- Daina Ruback, Tidal Basin
- Amber Madden, Tidal Basin

Meeting Overview

To ensure full key stakeholder participation, WVCAD held a series of targeted stakeholder consultation meetings prior to the release of its CDBG-MIT Action Plan to inform key stakeholders of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. On July 29, 2020, WVCAD met with representatives from the SHMO's office within the Division of Emergency Management (EMD), and SRO. This particular meeting is essential coordination between agencies in the development of the state's CDBG-MIT Action Plan.

Discussion Notes

- Coordination of projects under HMGP – under EMD, this is managed as one project
    - Match is funded under DR, not MIT
- Gave overview of action plan process status and proposed programs
- Agree that proposed programs align with priorities from EMD/SHMO perspective.
    - HMGP scope is broader, not just the 12 impacted counties in MIT
- Concern – potential for duplication of benefits – PDM (pre-disaster mitigation) program, being replaced by BRIC. BRIC doesn't include planning costs. EMD is working to figure out how to cover those planning activities previously funded by PDM.
- What, historically, has been the specific need ($) under PDM?
    - Been funded on a rotating basis, so different counties can get funded – PDM has been used as a funding source for state HMP and local/regional HMP
        - MIT can supplement funding for next round
        - Can work with EMD to fund future rounds in light of BRIC funding
        - Previously, all funds have gone to regional plans, state plan has been managed in-house
- They have recently updated HMP section on dams. Future plans will need to include lifelines. Lonnie to send updates HMP for review by CAD.
- CAD will forward most recent spreadsheet w/ HMGP with match identified, all to be covered by DR
- Had identified projects that were withdrawn from HMGP

- Request to EMD: Can we get a list of current grants on FEMA side for mitigation?
    - Especially on planning, database management
- Follow-up for EMD: confirm schedules for updating HMPs
- Set up standing monthly meeting w/ EMD, SRO, DR, MIT
    - Leanne to coordinate
- Bluestone dam planning (critical infrastructure) in Kanawha county- Any additional information that could be brought from there?
    - CAD will be talking to USACE next week

Stakeholder Consultation: U.S. Army Corps of Engineers (USACE)

Date: August 5, 2020 4pm-5pm ET
Attendees:

- Lesli Smith, USACE
- Lacy Ward, USACE
- Kenneth Woodard, USACE
- Michelle Brown, USACE
- Alex Phares, WVCAD
- Sherry Risk, WVCAD
- Michelle Tharp, WVCAD
- James Bush, WVCAD
- Daina Ruback, Tidal Basin

Meeting Overview

To ensure full key stakeholder participation, WVCAD held a series of targeted stakeholder consultation meetings prior to the release of its CDBG-MIT Action Plan to inform key stakeholders of the HUD funding allocations, the planning process, and garner input regarding potential mitigation priorities. On August 5, 2020, WVCAD met with representatives from the U.S. Army Corps of Engineers. This particular meeting is essential coordination between agencies in the development of the state's CDBG-MIT Action Plan.

Presentation

WVCAD provided a PowerPoint presentation containing the following information regarding the CDBG-MIT allocation and Action Plan process.

- Introductions
- Goals and Objectives
- Overview of Community Development Block Grant-Mitigation (CDBG-MIT)
    - Main requirements
    - Action Plan process and timeline
- Mitigation Needs Assessment
    - Key Takeaways
- Program Design
- Stakeholder Engagement

Discussion Notes

- Follow-up - Send powerpoint slides to USACE
- Section 340, 571 of USACE (WV) - pursuing enviro infrastructure programs
    - Assist with wastewater, waterline extensions, treatment plant rehab, etc.
    - Work with IJDC (infrastructure and jobs development council)
    - Work with local sponsors
- Non-structural flood risk management
    - Getting homes out of floodplain (mostly buyouts, but also elevations, wet/dry floodproofing)

- Silver jackets program
    - Interagency projects to help areas at risk of flooding
    - Work in Greenbrier
        - Non-structural assessment – 15 structures, critical facilities and commercial,
        - Looking at first floor elevations and other non-structural elevation opportunities.
    - Structural (dams or levees, involves construction)- overall community benefit
    - Non-structural – raising things on stilts, floodproof doors, gates, individual location
    - Updating west Virginia flood tool - FEMA
        - Will involve some community outreach over the next year
    - Will include WVCAD team in invite to silver jackets meeting
    - Emergency table-top exercises – making sure all parties come together for planning for flood activities
        - Community must have emergency action plan in place for this to happen
        - USACE can help with this, not write it, but assist
    - Every March they put in proposals for activities that the silver jackets can pursue.
    - Can do inundation mapping for communities
    - Can Michelle (USACE) send planned outreach activities?
- Marshall Univ. Working with Rainelle, searching for funding on part of a project
- Bluestone dam- USACE spending money on strengthening dam, silver jackets making sure ppl downstream of bluestone dam understand the impacts in case of a failure of dam/hazards of living downstream
- CDBG can be used for local match cost share
- Section 205 – small flood reduction projects, $10M cap, structural and non-structural, 65/35 cost share
- Hardening critical facilities/structures - how can we leverage USACE's expertise? Ken to get back to CAD on additional people/resources/experience.
- Does USACE do storm sewers? Not much, but will look further into this
    - 319 has a state program, can focus on stormwater
    - EPA and DOT grants available for stormwater as well
- Michelle (USACE) will send list of other funding sources available
- Oct- weekly presentations from silver jackets. Michelle to share all silver jackets information
- Follow-up:
    - WVCAD to participate in Silver Jackets meetings
    - WVCAD to review materials USACE will share
    - USACE to be invited to public hearings
    - Will ensure draft Action Plan is sent for USACE to review

Appendix B: Public Surveys

Please see attached Appendix B for full results from the 2020-2024 Consolidated Plan and CDBG-MIT surveys.

Appendix C: SoVI Index Variables

Center for Disease Control (CDC) SoVI 2018 Documentation

	Themes	Vulnerability Factors	ACS (2014-2018) Data Source
Overall Vulnerability	Socioeconomic	Below Poverty	Persons below poverty estimate
		Unemployed	Persons below poverty estimate
		Income	Per capita income estimate
		No High School Diploma	Persons (age 25+) with no high school diploma estimate
	Household Composition/Disability	Aged 65 or Older	Persons aged 65 and older estimate
		Aged 17 or Younger	Persons aged 17 and younger estimate
		Civilian with a Disability	Civilian noninstitutionalized population with a disability estimate
		Single-Parent Households	Single parent household with children under 18 estimate
	Minority Status/Language	Minority	Minority (all persons except white, non-Hispanic) estimate
		Speak English "Less than Well"	Persons (age 5+) who speak English "less than well" estimate
	Housing/Transportation	Multi-Unit Structures	Housing in structures with 10 or more units estimate
		Mobile Homes	Mobile homes estimate
		Crowding	At household level (occupied housing units), more people than rooms estimate
		No Vehicle	Households with no vehicle available estimate
		Group Quarters	Persons in institutionalized group quarters estimate

Variables included in the Social Vulnerability Index (SVI) were obtained from the 2014-2018 American Community Survey. The Social Vulnerability Index includes 15 different social factors

that may affect a community's ability to prevent human suffering and financial loss in the event of disaster. The table above outlines variables that the Center for Disease Control (CDC) groups into four themes of social vulnerability as well as an overall vulnerability ranking. The SVI Data used in this analysis is available to download from the Center for Disease Control here: https://svi.cdc.gov/data-and-tools-download.html.

Appendix D: Low- to Moderate-Income Status by Block Group

Source: HUD LMI Dataset (ACS 2015)

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Clay County	54	15	957900	1	950	1770	53.7%
Clay County	54	15	957900	2	785	1910	41.1%
Clay County	54	15	958000	1	685	1185	57.8%
Clay County	54	15	958000	2	830	1600	51.9%
Clay County	54	15	958000	3	400	555	72.1%
Clay County	54	15	958100	1	265	590	44.9%
Clay County	54	15	958100	2	480	745	64.4%
Clay County	54	15	958100	3	485	700	69.3%
Fayette County	54	19	20100	1	205	865	23.7%
Fayette County	54	19	20100	2	445	1205	36.9%
Fayette County	54	19	20100	3	345	795	43.4%
Fayette County	54	19	20100	4	880	1815	48.5%
Fayette County	54	19	20100	5	290	680	42.7%
Fayette County	54	19	20201	1	480	1240	38.7%
Fayette County	54	19	20201	2	680	1720	39.5%
Fayette County	54	19	20201	3	1145	1675	68.4%
Fayette County	54	19	20202	1	480	1345	35.7%
Fayette County	54	19	20202	2	455	1050	43.3%
Fayette County	54	19	20202	3	595	1680	35.4%
Fayette County	54	19	20300	1	405	720	56.3%
Fayette County	54	19	20300	2	725	1480	49.0%
Fayette County	54	19	20300	3	410	770	53.3%
Fayette County	54	19	20400	1	540	1325	40.8%
Fayette County	54	19	20400	2	590	1030	57.3%
Fayette County	54	19	20400	3	700	995	70.4%
Fayette County	54	19	20400	4	490	1140	43.0%
Fayette County	54	19	20500	1	240	650	36.9%
Fayette County	54	19	20500	2	1165	1560	74.7%
Fayette County	54	19	20600	1	325	645	50.4%
Fayette County	54	19	20600	2	485	1255	38.7%
Fayette County	54	19	20700	1	300	730	41.1%
Fayette County	54	19	20700	2	35	360	9.7%
Fayette County	54	19	20700	3	565	1345	42.0%
Fayette County	54	19	20700	4	905	1400	64.6%

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Fayette County	54	19	20800	1	305	825	37.0%
Fayette County	54	19	20800	2	660	1575	41.9%
Fayette County	54	19	20800	3	535	1165	45.9%
Fayette County	54	19	20800	4	270	800	33.8%
Fayette County	54	19	20900	1	460	1315	35.0%
Fayette County	54	19	20900	2	635	1160	54.7%
Fayette County	54	19	20900	3	280	1050	26.7%
Fayette County	54	19	20900	4	200	790	25.3%
Fayette County	54	19	21000	1	785	1730	45.4%
Fayette County	54	19	21000	2	135	805	16.8%
Fayette County	54	19	21100	1	300	740	40.5%
Fayette County	54	19	21100	2	485	1315	36.9%
Fayette County	54	19	21100	3	365	925	39.5%
Greenbrier County	54	25	950100	1	650	1775	36.6%
Greenbrier County	54	25	950100	2	545	1695	32.2%
Greenbrier County	54	25	950100	3	445	995	44.7%
Greenbrier County	54	25	950100	4	590	970	60.8%
Greenbrier County	54	25	950200	1	300	800	37.5%
Greenbrier County	54	25	950200	2	385	890	43.3%
Greenbrier County	54	25	950200	3	410	790	51.9%
Greenbrier County	54	25	950200	4	415	750	55.3%
Greenbrier County	54	25	950200	5	145	570	25.4%
Greenbrier County	54	25	950300	1	400	670	59.7%
Greenbrier County	54	25	950300	2	345	785	44.0%
Greenbrier County	54	25	950300	3	635	1210	52.5%
Greenbrier County	54	25	950300	4	400	990	40.4%
Greenbrier County	54	25	950400	1	500	2400	20.8%
Greenbrier County	54	25	950400	2	815	1460	55.8%
Greenbrier County	54	25	950400	3	380	1200	31.7%
Greenbrier County	54	25	950400	4	445	1605	27.7%
Greenbrier County	54	25	950400	5	455	1120	40.6%
Greenbrier County	54	25	950500	1	190	815	23.3%
Greenbrier County	54	25	950500	2	435	1370	31.8%
Greenbrier County	54	25	950500	3	540	1105	48.9%
Greenbrier County	54	25	950600	1	370	1125	32.9%
Greenbrier County	54	25	950600	2	910	2130	42.7%
Greenbrier County	54	25	950600	3	30	790	3.8%
Greenbrier County	54	25	950600	4	295	1070	27.6%
Greenbrier County	54	25	950700	1	270	775	34.8%

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Greenbrier County	54	25	950700	2	820	1375	59.6%
Greenbrier County	54	25	950700	3	435	1345	32.3%
Greenbrier County	54	25	950700	4	415	1055	39.3%
Greenbrier County	54	25	950700	5	325	725	44.8%
Greenbrier County	54	25	950700	6	395	630	62.7%
Jackson County	54	35	963200	1	750	1735	43.2%
Jackson County	54	35	963200	2	495	1120	44.2%
Jackson County	54	35	963200	3	670	1065	62.9%
Jackson County	54	35	963200	4	330	985	33.5%
Jackson County	54	35	963300	1	670	1665	40.2%
Jackson County	54	35	963300	2	290	810	35.8%
Jackson County	54	35	963300	3	545	870	62.6%
Jackson County	54	35	963300	4	535	855	62.6%
Jackson County	54	35	963400	1	325	1395	23.3%
Jackson County	54	35	963400	2	555	1795	30.9%
Jackson County	54	35	963400	3	440	1115	39.5%
Jackson County	54	35	963500	1	645	1445	44.6%
Jackson County	54	35	963500	2	250	1695	14.8%
Jackson County	54	35	963600	1	170	620	27.4%
Jackson County	54	35	963600	2	595	865	68.8%
Jackson County	54	35	963600	3	800	1525	52.5%
Jackson County	54	35	963600	4	520	1890	27.5%
Jackson County	54	35	963700	1	430	1215	35.4%
Jackson County	54	35	963700	2	885	1840	48.1%
Jackson County	54	35	963700	3	305	1075	28.4%
Jackson County	54	35	963700	4	640	1690	37.9%
Jackson County	54	35	963700	5	635	930	68.3%
Jackson County	54	35	963700	6	255	870	29.3%
Kanawha County	54	39	100	1	505	660	76.5%
Kanawha County	54	39	100	2	395	650	60.8%
Kanawha County	54	39	200	1	770	1395	55.2%
Kanawha County	54	39	200	2	250	895	27.9%
Kanawha County	54	39	300	1	425	1085	39.2%
Kanawha County	54	39	300	2	100	495	20.2%
Kanawha County	54	39	300	3	315	650	48.5%
Kanawha County	54	39	300	4	200	690	29.0%
Kanawha County	54	39	500	1	315	1190	26.5%
Kanawha County	54	39	500	2	415	1010	41.1%
Kanawha County	54	39	600	1	395	2085	18.9%

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Kanawha County	54	39	600	2	505	595	84.9%
Kanawha County	54	39	600	3	280	815	34.4%
Kanawha County	54	39	600	4	570	740	77.0%
Kanawha County	54	39	700	1	590	690	85.5%
Kanawha County	54	39	700	2	560	870	64.4%
Kanawha County	54	39	700	3	445	605	73.6%
Kanawha County	54	39	800	1	505	580	87.1%
Kanawha County	54	39	800	2	570	860	66.3%
Kanawha County	54	39	900	1	435	675	64.4%
Kanawha County	54	39	1100	1	55	1020	5.4%
Kanawha County	54	39	1100	2	605	885	68.4%
Kanawha County	54	39	1100	3	575	1005	57.2%
Kanawha County	54	39	1100	4	305	660	46.2%
Kanawha County	54	39	1100	5	365	630	57.9%
Kanawha County	54	39	1100	6	240	535	44.9%
Kanawha County	54	39	1200	1	345	405	85.2%
Kanawha County	54	39	1200	2	720	1185	60.8%
Kanawha County	54	39	1300	1	115	410	28.1%
Kanawha County	54	39	1300	2	310	610	50.8%
Kanawha County	54	39	1300	3	295	820	36.0%
Kanawha County	54	39	1300	4	220	440	50.0%
Kanawha County	54	39	1500	1	225	1085	20.7%
Kanawha County	54	39	1500	2	100	490	20.4%
Kanawha County	54	39	1500	3	215	835	25.8%
Kanawha County	54	39	1500	4	240	1235	19.4%
Kanawha County	54	39	1500	5	50	335	14.9%
Kanawha County	54	39	1700	1	320	695	46.0%
Kanawha County	54	39	1700	2	415	1020	40.7%
Kanawha County	54	39	1800	1	270	755	35.8%
Kanawha County	54	39	1800	2	210	780	26.9%
Kanawha County	54	39	1800	3	295	815	36.2%
Kanawha County	54	39	1901	1	45	1035	4.4%
Kanawha County	54	39	1901	2	155	1190	13.0%
Kanawha County	54	39	1901	3	210	1815	11.6%
Kanawha County	54	39	1902	1	465	1395	33.3%
Kanawha County	54	39	1902	2	370	2450	15.1%
Kanawha County	54	39	2000	1	100	975	10.3%
Kanawha County	54	39	2000	2	105	810	13.0%
Kanawha County	54	39	2000	3	120	785	15.3%

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Kanawha County	54	39	2000	4	10	695	1.4%
Kanawha County	54	39	2100	1	515	960	53.7%
Kanawha County	54	39	2100	2	765	1880	40.7%
Kanawha County	54	39	2100	3	30	965	3.1%
Kanawha County	54	39	2100	4	515	1560	33.0%
Kanawha County	54	39	10100	1	215	640	33.6%
Kanawha County	54	39	10100	2	440	1215	36.2%
Kanawha County	54	39	10100	3	205	830	24.7%
Kanawha County	54	39	10100	4	505	1075	47.0%
Kanawha County	54	39	10200	1	300	540	55.6%
Kanawha County	54	39	10200	2	200	1005	19.9%
Kanawha County	54	39	10200	3	265	500	53.0%
Kanawha County	54	39	10300	1	155	700	22.1%
Kanawha County	54	39	10300	2	545	1130	48.2%
Kanawha County	54	39	10300	3	335	630	53.2%
Kanawha County	54	39	10400	1	195	380	51.3%
Kanawha County	54	39	10400	2	305	735	41.5%
Kanawha County	54	39	10500	1	725	2730	26.6%
Kanawha County	54	39	10500	2	140	1085	12.9%
Kanawha County	54	39	10500	3	735	1435	51.2%
Kanawha County	54	39	10600	1	245	1165	21.0%
Kanawha County	54	39	10600	2	300	975	30.8%
Kanawha County	54	39	10600	3	275	775	35.5%
Kanawha County	54	39	10600	4	220	345	63.8%
Kanawha County	54	39	10600	5	470	1055	44.6%
Kanawha County	54	39	10600	6	250	780	32.1%
Kanawha County	54	39	10701	1	685	1830	37.4%
Kanawha County	54	39	10701	2	635	1150	55.2%
Kanawha County	54	39	10701	3	440	2115	20.8%
Kanawha County	54	39	10702	1	160	1260	12.7%
Kanawha County	54	39	10702	2	490	1495	32.8%
Kanawha County	54	39	10702	3	705	2295	30.7%
Kanawha County	54	39	10801	1	585	1405	41.6%
Kanawha County	54	39	10801	2	305	1065	28.6%
Kanawha County	54	39	10801	3	420	1315	31.9%
Kanawha County	54	39	10801	4	600	1535	39.1%
Kanawha County	54	39	10801	5	380	1265	30.0%
Kanawha County	54	39	10802	1	665	2070	32.1%
Kanawha County	54	39	10802	2	685	1455	47.1%

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Kanawha County	54	39	10900	1	750	1400	53.6%
Kanawha County	54	39	10900	2	380	1545	24.6%
Kanawha County	54	39	11000	1	35	740	4.7%
Kanawha County	54	39	11000	2	195	1970	9.9%
Kanawha County	54	39	11000	3	505	1130	44.7%
Kanawha County	54	39	11000	4	350	980	35.7%
Kanawha County	54	39	11100	1	705	1865	37.8%
Kanawha County	54	39	11100	2	235	1030	22.8%
Kanawha County	54	39	11100	3	990	1995	49.6%
Kanawha County	54	39	11200	1	400	1190	33.6%
Kanawha County	54	39	11200	2	700	1390	50.4%
Kanawha County	54	39	11200	3	275	720	38.2%
Kanawha County	54	39	11200	4	445	830	53.6%
Kanawha County	54	39	11301	1	335	1000	33.5%
Kanawha County	54	39	11301	2	1315	1930	68.1%
Kanawha County	54	39	11302	1	405	1160	34.9%
Kanawha County	54	39	11302	2	600	1395	43.0%
Kanawha County	54	39	11302	3	340	1545	22.0%
Kanawha County	54	39	11302	4	380	1730	22.0%
Kanawha County	54	39	11401	1	485	1140	42.5%
Kanawha County	54	39	11401	2	205	545	37.6%
Kanawha County	54	39	11401	3	215	650	33.1%
Kanawha County	54	39	11402	1	430	1290	33.3%
Kanawha County	54	39	11402	2	1150	2555	45.0%
Kanawha County	54	39	11500	1	340	835	40.7%
Kanawha County	54	39	11500	2	730	1010	72.3%
Kanawha County	54	39	11500	3	675	920	73.4%
Kanawha County	54	39	11500	4	355	1050	33.8%
Kanawha County	54	39	11800	1	440	1170	37.6%
Kanawha County	54	39	11800	2	270	575	47.0%
Kanawha County	54	39	11800	3	180	405	44.4%
Kanawha County	54	39	11800	4	430	1275	33.7%
Kanawha County	54	39	11800	5	240	615	39.0%
Kanawha County	54	39	11800	6	455	900	50.6%
Kanawha County	54	39	12100	1	275	865	31.8%
Kanawha County	54	39	12100	2	340	1200	28.3%
Kanawha County	54	39	12100	3	735	1730	42.5%
Kanawha County	54	39	12200	1	660	1545	42.7%
Kanawha County	54	39	12200	2	660	890	74.2%

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Kanawha County	54	39	12200	3	590	1490	39.6%
Kanawha County	54	39	12200	4	465	1080	43.1%
Kanawha County	54	39	12300	1	315	805	39.1%
Kanawha County	54	39	12300	2	425	885	48.0%
Kanawha County	54	39	12300	3	540	2370	22.8%
Kanawha County	54	39	12300	4	375	1325	28.3%
Kanawha County	54	39	12300	5	675	1550	43.6%
Kanawha County	54	39	12800	1	125	835	15.0%
Kanawha County	54	39	12800	2	320	845	37.9%
Kanawha County	54	39	12800	3	100	900	11.1%
Kanawha County	54	39	12800	4	490	1595	30.7%
Kanawha County	54	39	12900	1	295	650	45.4%
Kanawha County	54	39	12900	2	275	640	43.0%
Kanawha County	54	39	13000	1	930	1340	69.4%
Kanawha County	54	39	13000	2	340	555	61.3%
Kanawha County	54	39	13000	3	980	2805	34.9%
Kanawha County	54	39	13100	1	275	785	35.0%
Kanawha County	54	39	13100	2	905	2105	43.0%
Kanawha County	54	39	13100	3	450	1075	41.9%
Kanawha County	54	39	13200	1	215	680	31.6%
Kanawha County	54	39	13200	2	625	1615	38.7%
Kanawha County	54	39	13200	3	715	1195	59.8%
Kanawha County	54	39	13300	1	105	900	11.7%
Kanawha County	54	39	13300	2	255	1825	14.0%
Kanawha County	54	39	13400	1	985	1670	59.0%
Kanawha County	54	39	13400	2	240	590	40.7%
Kanawha County	54	39	13500	1	525	900	58.3%
Kanawha County	54	39	13500	2	680	1375	49.5%
Kanawha County	54	39	13500	3	125	400	31.3%
Kanawha County	54	39	13600	1	405	885	45.8%
Kanawha County	54	39	13600	2	675	2255	29.9%
Kanawha County	54	39	13600	3	255	675	37.8%
Kanawha County	54	39	13600	4	410	775	52.9%
Kanawha County	54	39	13701	1	230	960	24.0%
Kanawha County	54	39	13701	2	445	1225	36.3%
Kanawha County	54	39	13702	1	810	1650	49.1%
Kanawha County	54	39	13702	2	215	745	28.9%
Kanawha County	54	39	13702	3	320	1325	24.2%
Kanawha County	54	39	13702	4	910	1640	55.5%

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Kanawha County	54	39	13702	5	130	845	15.4%
Kanawha County	54	39	13800	1	410	710	57.8%
Kanawha County	54	39	13800	2	420	805	52.2%
Kanawha County	54	39	13800	3	740	1115	66.4%
Lincoln County	54	43	955400	1	510	1285	39.7%
Lincoln County	54	43	955400	2	745	1445	51.6%
Lincoln County	54	43	955400	3	860	1300	66.2%
Lincoln County	54	43	955400	4	310	905	34.3%
Lincoln County	54	43	955400	5	305	950	32.1%
Lincoln County	54	43	955400	6	390	890	43.8%
Lincoln County	54	43	955500	1	275	750	36.7%
Lincoln County	54	43	955500	2	250	900	27.8%
Lincoln County	54	43	955500	3	640	1320	48.5%
Lincoln County	54	43	955500	4	280	510	54.9%
Lincoln County	54	43	955600	1	870	1425	61.1%
Lincoln County	54	43	955600	2	395	1175	33.6%
Lincoln County	54	43	955600	3	825	1005	82.1%
Lincoln County	54	43	955600	4	155	540	28.7%
Lincoln County	54	43	955700	1	445	1390	32.0%
Lincoln County	54	43	955700	2	420	1385	30.3%
Lincoln County	54	43	955700	3	200	660	30.3%
Lincoln County	54	43	955800	1	315	680	46.3%
Lincoln County	54	43	955800	2	495	845	58.6%
Lincoln County	54	43	955800	3	680	1235	55.1%
Lincoln County	54	43	955800	4	365	910	40.1%
Monroe County	54	63	950100	1	465	1510	30.8%
Monroe County	54	63	950100	2	595	1265	47.0%
Monroe County	54	63	950100	3	350	850	41.2%
Monroe County	54	63	950200	1	590	960	61.5%
Monroe County	54	63	950200	2	185	495	37.4%
Monroe County	54	63	950200	3	465	930	50.0%
Monroe County	54	63	950200	4	260	630	41.3%
Monroe County	54	63	950200	5	360	1075	33.5%
Monroe County	54	63	950300	1	190	625	30.4%
Monroe County	54	63	950300	2	975	2430	40.1%
Monroe County	54	63	950300	3	715	2035	35.1%
Monroe County	54	63	950300	4	285	605	47.1%
Nicholas County	54	67	950100	1	425	1640	25.9%
Nicholas County	54	67	950100	2	615	1470	41.8%

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Nicholas County	54	67	950200	1	645	1510	42.7%
Nicholas County	54	67	950200	2	350	830	42.2%
Nicholas County	54	67	950200	3	495	1175	42.1%
Nicholas County	54	67	950200	4	395	1050	37.6%
Nicholas County	54	67	950200	5	505	1985	25.4%
Nicholas County	54	67	950300	1	460	1245	37.0%
Nicholas County	54	67	950400	1	600	1240	48.4%
Nicholas County	54	67	950400	2	395	1010	39.1%
Nicholas County	54	67	950400	3	970	2045	47.4%
Nicholas County	54	67	950400	4	200	485	41.2%
Nicholas County	54	67	950500	1	230	575	40.0%
Nicholas County	54	67	950500	2	510	775	65.8%
Nicholas County	54	67	950600	1	730	1195	61.1%
Nicholas County	54	67	950600	2	155	675	23.0%
Nicholas County	54	67	950600	3	480	1710	28.1%
Nicholas County	54	67	950600	4	310	1830	16.9%
Nicholas County	54	67	950700	1	250	470	53.2%
Nicholas County	54	67	950700	2	280	1285	21.8%
Nicholas County	54	67	950700	3	410	1580	26.0%
Pocahontas County	54	75	960101	1	520	1320	39.4%
Pocahontas County	54	75	960102	1	320	665	48.1%
Pocahontas County	54	75	960102	2	215	630	34.1%
Pocahontas County	54	75	960200	1	65	605	10.7%
Pocahontas County	54	75	960200	2	745	1265	58.9%
Pocahontas County	54	75	960200	3	325	745	43.6%
Pocahontas County	54	75	960200	4	440	890	49.4%
Pocahontas County	54	75	960300	1	190	765	24.8%
Pocahontas County	54	75	960300	2	695	1495	46.5%
Roane County	54	87	962800	1	340	1225	27.8%
Roane County	54	87	962800	2	185	610	30.3%
Roane County	54	87	962800	3	385	605	63.6%
Roane County	54	87	962900	1	310	705	44.0%
Roane County	54	87	962900	2	280	540	51.9%
Roane County	54	87	962900	3	660	1305	50.6%
Roane County	54	87	962900	4	190	380	50.0%
Roane County	54	87	962900	5	400	1175	34.0%
Roane County	54	87	963000	1	810	1040	77.9%
Roane County	54	87	963000	2	335	720	46.5%
Roane County	54	87	963000	3	325	885	36.7%

County Name	State	County	Tract	Block Group	Low-Moderate Income Persons	Low-Moderate Income Universe*	Percent Low-Moderate Persons
Roane County	54	87	963000	4	450	835	53.9%
Roane County	54	87	963100	1	420	775	54.2%
Roane County	54	87	963100	2	365	1275	28.6%
Roane County	54	87	963100	3	735	1055	69.7%
Roane County	54	87	963100	4	615	1405	43.8%
Summers County	54	89	500	1	350	935	37.4%
Summers County	54	89	500	2	640	940	68.1%
Summers County	54	89	500	3	405	765	52.9%
Summers County	54	89	600	1	175	590	29.7%
Summers County	54	89	600	2	205	1470	14.0%
Summers County	54	89	600	3	270	890	30.3%
Summers County	54	89	600	4	460	775	59.4%
Summers County	54	89	600	5	185	985	18.8%
Summers County	54	89	700	1	680	1495	45.5%
Summers County	54	89	800	1	375	1175	31.9%
Summers County	54	89	800	2	245	715	34.3%
Summers County	54	89	800	3	600	1660	36.1%
Webster County	54	101	970100	1	390	780	50.0%
Webster County	54	101	970100	2	350	960	36.5%
Webster County	54	101	970100	3	690	1175	58.7%
Webster County	54	101	970100	4	845	1200	70.4%
Webster County	54	101	970200	1	760	1530	49.7%
Webster County	54	101	970200	2	650	1045	62.2%
Webster County	54	101	970300	1	1050	2180	48.2%

Appendix E: Quarterly Budget and Milestone Projections

Please see attachment for Appendix E.