REGIONAL SAFETY ACTION PLAN

HEPMPO

April 2024

Draft for Public Review

Hagerstown Eastern Panhandle MPO

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FEHR PEERS

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Acknowledgements

The Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) would like to thank the Stakeholder Advisory Committee (SAC) for its valuable contributions throughout the planning process.

- Berkeley County
- Charles Town Police Department
- City of Charles Town
- City of Hagerstown
- City of Martinsburg
- Eastern Panhandle Transit Authority
- Federal Highway Administration
- Hagerstown Police Department
- Jefferson County Sheriff's Office
- Martinsburg Police Department
- Maryland Department of Transportation
- Washington County
- Washington County Transit
- West Virginia Department of Transportation

Chapter 1: Introduction

Roadway Safety Crisis

Unmasking the National and Regional Threats

Safety Action Plans (SAP) aim to create safer roads for everyone, fostering a collective commitment to road safety. They provide the framework for enhancing roadway safety that is designed to mitigate and eliminate severe injuries and fatal accidents for all users of our roadways. Leveraging data analysis, SAPs identify and define specific roadway safety challenges to empower communities to adopt targeted projects and strategies, effectively addressing the most critical safety risks.

Over the past decade, there has been an alarming 45 percent surge in pedestrian fatalities across the country. In 2023 alone, almost 45,000 lives were lost on America's roadways (Figure 1). These statistics underscore the urgent need to develop Safety Action Plans to prioritize safety, reduce fatal and severe crashes, and protect vulnerable road users (VRU).

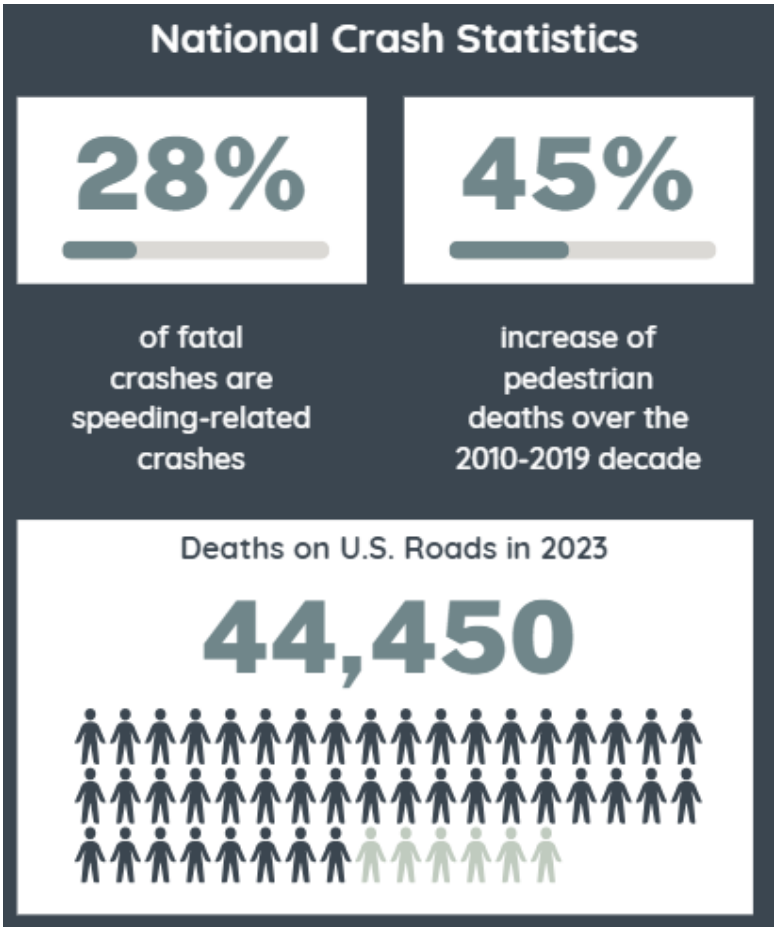


Figure 1: Statistics from the Vision Zero Network

Safe System Approach

Zero is our goal. A Safe System is how we will get there. In 2022, the United States Department of Transportation (FHWA) introduced the National Roadway Safety Strategy (NRSS) to address the safety crisis on our Nation's roadways. The NRSS declares a goal of zero deaths and adopts the **Safe System Approach (SSA)** as the guiding paradigm for addressing roadway safety and achieving this goal. The Safe System Approach equips us with a structured decision-making framework, enabling us to deliberately address five key elements and six guiding principles (Figure 2) during planning and implementation. It prioritizes human fallibility and vulnerability, ultimately designing a protective system for all.

Figure 2: Safe System Approach Principles and Elements

Need for a Safety Action Plan

Roadway safety is a significant issue impacting our communities. An average of three severe injury or fatal traffic crashes occur per week within the Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) 3-County Region (Figure 4). Between 2018 and 2022, 154 fatal crashes occurred in the HEPMPO region on local and state roadways (excluding I-81, I-70, and I-68), 25 of which involved a person walking, and 25 of which involved a person riding a motorcycle. In addition, another 567 crashes occurred where a person was severely injured, and collectivity, these crashes resulting in a person being killed or severely injured are referred to as KSI. These are all tragic losses of someone's friend or family member, and it is our goal to continuously strive for zero traffic deaths.

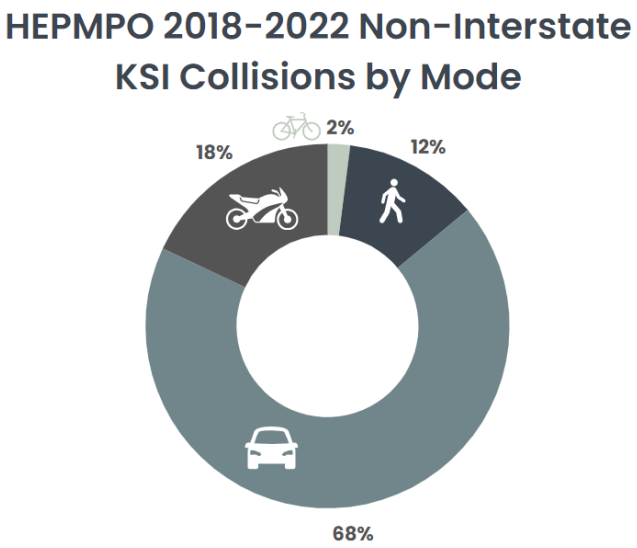


Figure 3: Collisions by mode

In 2022 alone, the HEPMPO region had a total of 4,680 non-interstate crashes, 137 resulted in a person being killed or severely injured (KSI). While the majority of KSI crashes between 2018 – 2022 were motor vehicle, vulnerable road user KSI crashes occurred at a disproportionate rate (Figure 3).

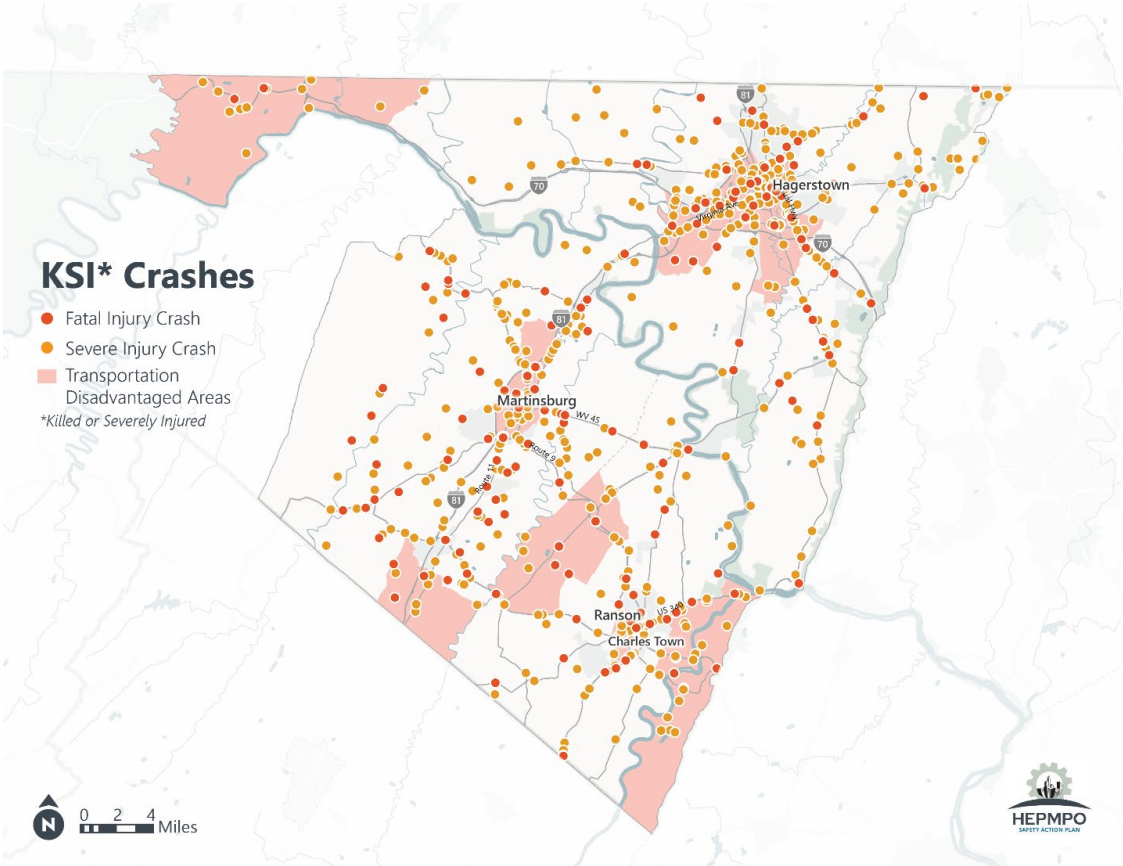


Figure 4: HEPMPO Fatal and Severe Injury Non-Interstate Traffic Crashes

Source: 2018 – 2022 MDOT and WVDOT Crash Data, US DOT Equitable Transportation Explorer (ETC) Tool

To understand where and why fatal and severe injury crashes occurred and reduce the severity and frequency of these crashes, HEPMPO prepared this **Regional Safety Action Plan**, rooted in the core elements of the Safe System Approach. The Action Plan is our roadmap to ensure the streets in the region are safe for people to drive, walk, and bike. It identifies projects, programs, and strategies aimed at eliminating fatalities and severe injuries on the roadways within the region by 2050 and allows the region and local jurisdictions to apply for funding through the **Safe Streets for All (SS4A) grant program** and other federal and state safety-related grant programs.

Importantly, the Action Plan aligns with the prerequisites for the **Safe Streets for All (SS4A) grants**—a substantial $5 billion federal funding source dedicated to critical safety enhancements. This Action Plan serves as the qualifying plan for HEPMPO counties and local jurisdictions, enabling them to apply for SS4A supplemental planning/demonstration and implementation grants, which are integral to the Bipartisan Infrastructure Law (BIL).

Planning Criteria

Table 1 outlines the essential components of the SS4A action plan. These components are necessary to meet eligibility requirements for applying for funding. The table cross-references specific plan sections and describes how each component has been fulfilled.

Table 1: SAP Planning Criteria

Planning Criteria		
	Comprehensive Safety Action Plan Element Criteria	**How HEPMPO Achieved It**
1	Governing body in the jurisdiction publicly committed to an eventual goal of zero roadway fatalities and serious injuries.	The HEPMPO Interstate Council (ISC) is the governing body that reviews and approves the plan.
	Set targets to achieve significant declines in roadway fatalities and serious injuries.	Outlined in **Chapter 1: Introduction.** The region's goal is to reach zero traffic fatalities and severe injuries by 2050.
2	To develop the Action Plan, a committee, task force, implementation group, or similar body established and charged with the plan's development, implementation, and monitoring.	A Stakeholder Advisory Committee was formed to help outline the plan and develop strategies. Outlined in **Chapter 2: Plan Development and Input.**
3	Analysis of existing conditions and historical trends to baseline the level of crashes involving fatalities and serious injuries across a jurisdiction, locality, Tribe, or region.	An online map was created to graphically show 2018 – 2022 MDOT and WVDOT Crashes in the Region. Outlined in **Chapter 3: Our Safety Story.**
	Analysis of systemic and specific safety needs is performed as needed (e.g., high risk)	Outlined in **Chapter 3: Our Safety Story.**
	Analysis of the location where there are crashes, the severity, as well as contributing factors and crash types.	Outlined in **Chapter 3: Our Safety Story.**
	A geospatial identification (geographic or locational data using maps) of higher risk locations.	A High Injury Network (HIN) was created and shown in a map. Outlined in **Chapter 4: Focusing Efforts to Make a Change.**
4	Engagement with the public and relevant stakeholders, including the private sector and community groups.	The team met with Stakeholders through a series of meetings. There were also three public meetings. Outlined in **Chapter 2: Plan Development and Input.**
	Incorporation of information received from the engagement and collaboration into the plan.	Feedback from an outreach survey was incorporated into the plan's strategies. Outlined in **Chapter 2: Plan Development and Input.**
	Coordination that included inter- and intragovernmental cooperation and collaboration, as appropriate.	The Stakeholder Advisory Committee is detailed in **Chapter 2: Plan Development and Input.**

Planning Criteria		
	Comprehensive Safety Action Plan Element Criteria	**How HEPMPO Achieved It**
5	Considerations of equity using inclusive and representative processes.	Equity was a key factor in public outreach, safety analysis, the policy assessment, and project and program prioritization. Outlined in **Chapter 2: Plan Development and Input.**
	Identified underserved communities through data.	The Action Plan used USDOT's Equitable Transportation Community Explorer tool and results during analysis and outreach. Outlined in **Chapter 2: Plan Development and Input.**
	Equity analysis in collaboration with appropriate partners, focused on initial equity impact.	As part of the Stakeholder meetings discussed in **Chapter 2**, the Stakeholders reviewed the analysis inputs including equity.
6	The plan development included an assessment of current policies, plans, guidelines, and/or standards to identify opportunities to improve how processes prioritize safety.	A policy and benchmarking assessment was conducted to gauge's the region's alignment with the Safe System Approach and safety best practices. The assessment reviewed existing plans, reports, and studies from MD, WV, the region, Berkeley County, Jefferson County, Washington County, and local jurisdictions. Outlined in **Chapter 3: Our Safety Story.**
	The plan discusses implementation through the adoption of revised or new policies, guidelines, and/or standards.	Outlined in **Chapter 5: Taking Action.**
7	The plan identifies a comprehensive set of projects and strategies to address the safety problems in the Action Plan, time ranges when projects and strategies will be deployed, and explain project prioritization criteria.	Outlined in **Chapter 4: Focusing Efforts to Make a Change.**
8	A description of how progress will be measured over time that includes, at a minimum, outcome data.	Outlined in **Chapter 6: Performance Evaluation and Transparency.**
	The plan is posted publicly online.	The Plan is available on HEPMPO's website.
9	The plan was finalized and/or last updated between 2018 and 2024.	The Plan was finalized in May 2024.

Chapter 2: Plan Development and Input

The HEPMPO Regional Safety Action Plan was adopted by the HEPMPO Interstate Council (ISC) on May 15, 2024. Resolution XYZ was also adopted by the HEPMPO ISC on the same date to further demonstrate the region's commitment to achieving zero fatal and severe injury crashes by 2050.

Plan Development Structure

The Regional Safety Action Plan development structure included the project team, a stakeholder committee, and the public (Figure 5). HEPMPO staff and the Action Plan project team conducted analyses and led the development of the Regional Safety Action Plan. The Stakeholder committee reviewed analysis results and helped align key priorities throughout the region with the Action Plan during three stakeholder meetings. Members of the public guided the vision for the plan, identified safety concerns, and reviewed the safety action plan elements through an online survey at the beginning of the plan and at three public meetings during the 30-day public comment period.

Figure 5: HEPMPO Regional Safety Action Plan Development Structure

Development Timeline and Elements

Development of the Action Plan started in the summer of 2023 and concluded in the spring of 2024. Figure 6 highlights the Action Plan timeline, including public and stakeholder engagement, and development of key elements.

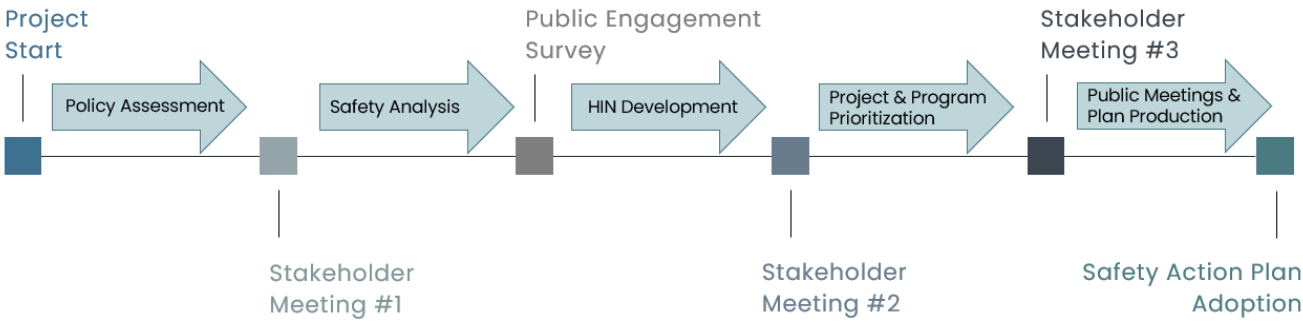


Figure 6: HEPMPO Regional Safety Action Plan Development Timeline

Key elements of the plan are summarized below. Public and stakeholder engagement occurred at distinct checkpoints during Action Plan development, whereas equity considerations were incorporated across multiple elements.

- **Public and stakeholder engagement** – public outreach sought feedback from everyone in the region, including hard-to-reach populations. This occurred through a media blitz promoting the HEPMPO SAP survey, and public meeting invitations. Stakeholder engagement included three interactive meetings to identify technical safety concerns and opportunities for improvement. Three public meetings were also held at public libraries all located in transportation disadvantaged areas in the region.
- **Equity considerations** – equity was a key factor in public outreach, safety analysis, policy assessment, and project and program prioritization. The Action Plan used USDOT's Equitable Transportation Community (ETC) Explorer tool and results during analysis and outreach. The equity data used is referred to as transportation disadvantaged areas.
- **Policy assessment and benchmarking** – a review of existing plans, reports, and studies was conducted to assess the existing safety program. The policy assessment used a benchmarking tool to gauge the region's alignment with the Safe System Approach and safety best practices. The assessment resulted in identifying safety strengths, and opportunities for action items.

- **Safety analysis** – an analysis of non-interstate crashes within the region between 2018 and 2022 was conducted. The analysis examined crash trends related to crash injury severity, mode involvement, crashes within equity areas, and other crash factors. The analysis generated a high-injury network, which identifies unsafe segments and corridors within the region that host a disproportionate number of fatal and severe crashes and crashes involving people walking, biking, or riding a motorcycle, also known as vulnerable road users.

- **Project and program prioritization** – projects and programs were selected from the policy assessment, safety analysis results, and the high-injury network. The priority projects and action items outlined in the Action Plan were prioritized using the following criteria: crash severity (severe and fatal crashes), crash mode (vulnerable road users), vulnerable road user corridors identified by Maryland and West Virginia as part of the 2023 Strategic Highway Safety Plan updates, Maryland's pedestrian safety corridors, public feedback and crashes within transportation disadvantaged areas.

- **Performance measures and evaluation** – monitoring criteria were selected to evaluate the effectiveness of the Safety Action Plan in the years to come. Performance measures include total fatalities and fatality rate, total serious injuries and serious injury rate, non-motorized fatalities and serious injuries, number of killed and seriously injured (KSI) crashes within transportation-disadvantaged areas, and percentage change in crash types. These metrics will continue to be used to track and evaluate progress toward the 2050 target of eliminating severe crashes.

- **Funding opportunities** – grant programs and funding strategies were researched to provide the HEPMPO and local jurisdictions a menu of funding opportunities when considering how to budget for and implement the programs, projects, and strategies outlined in the Action Plan.

Stakeholder and Public Engagement

Stakeholder and public participation played a critical role in identifying issues and priorities during the planning process. Throughout the development of the plan, input and feedback from a diverse group of stakeholders were solicited and incorporated through a series of meetings, as well as through a web-based survey. There were three public meetings and a 30-day public comment period (see **Appendix A**).

Stakeholder Group and Meetings

The Stakeholder Advisory Committee consisted of professionals well-versed in the safety concerns specific to the region (Figure 7). They convened in October, February, and April. During the initial meeting, they kicked off the project by discussing its objectives, goals, and planning activities. In the subsequent meeting, they delved into an overview and analysis of the gathered information. Stakeholders were then presented with a list of draft priority corridors for their valuable feedback.

Figure 7: Members for the Stakeholder Advisory Committee

Public Outreach Survey

To enhance road safety in the region, a web-based survey was conducted through an online engagement platform, MetroQuest. The survey, open from **November 15, 2023, to December 15, 2023**, garnered insights from **574 participants** (Figure 8). These valuable perspectives covered various aspects of safety, including those related to drivers, pedestrians, and bicyclists across the HEPMPO Region.

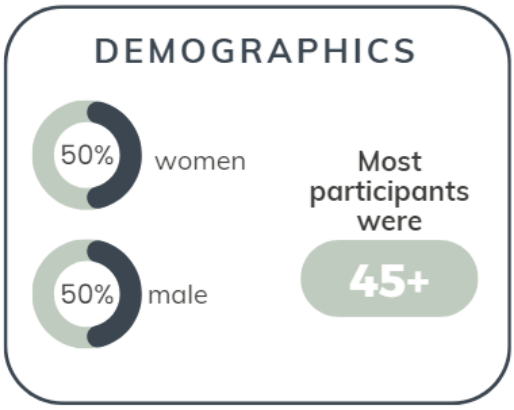


Figure 8: Demographics of survey participants

Safety Concern Ranking

Participants identified and ranked their top five safety concerns. Traffic congestion, aggressive driving, distracted driving, unsafe intersections, and commercial vehicles were the most prominent issues (Figure 9).

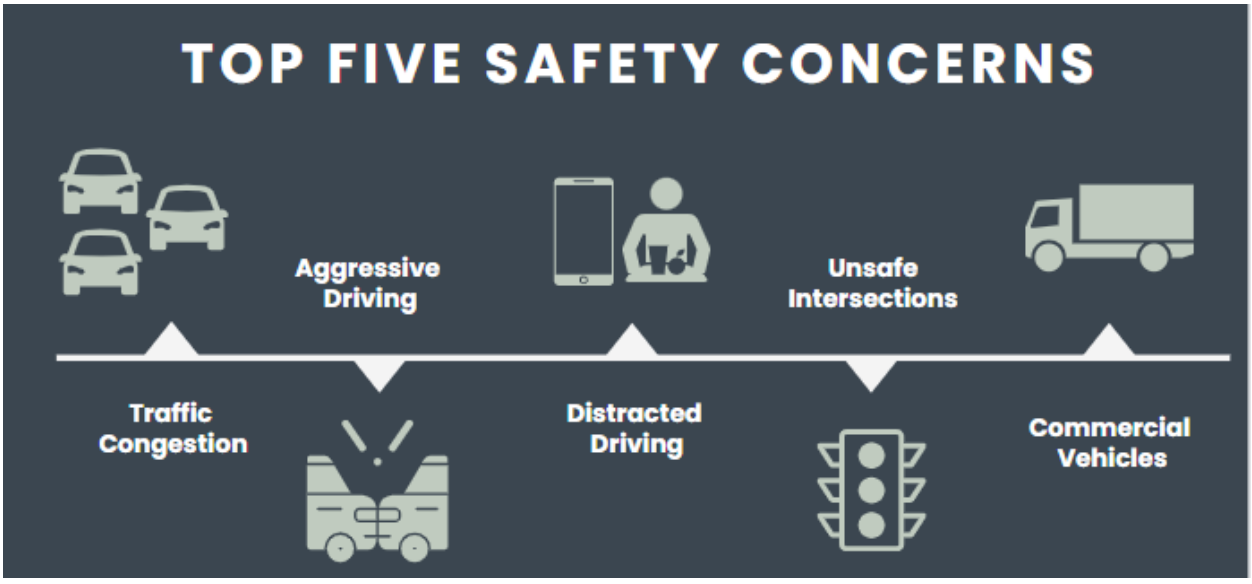


Figure 9: Safety concern ranking results

Bicycle and Pedestrian Safety

More than half of the participants either walk or bike in the area. These road users identified their top five contributors to safety problems.

Almost half of the participants wanted to see safer designed roads which could include lower speeds, separated pathways, and other safety designs (Figure 10).

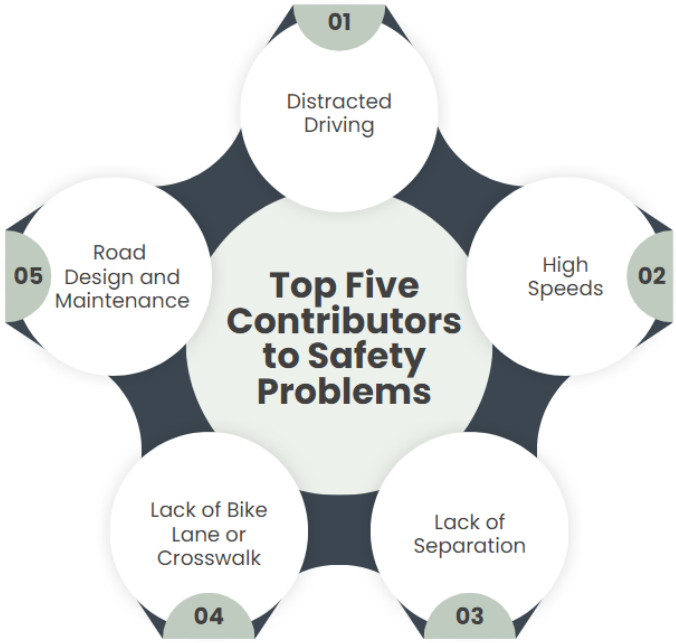


Figure 10: Safety issues related to walking, biking, and driving

Driver Safety

Most participants experienced a driving safety incident within the last year. The majority of the participants were driving when the incident occurred. The top three incidents (Figure 11) were near miss (19%), speeding (18%), or distracted driver, pedestrian, or bicyclist (17%).

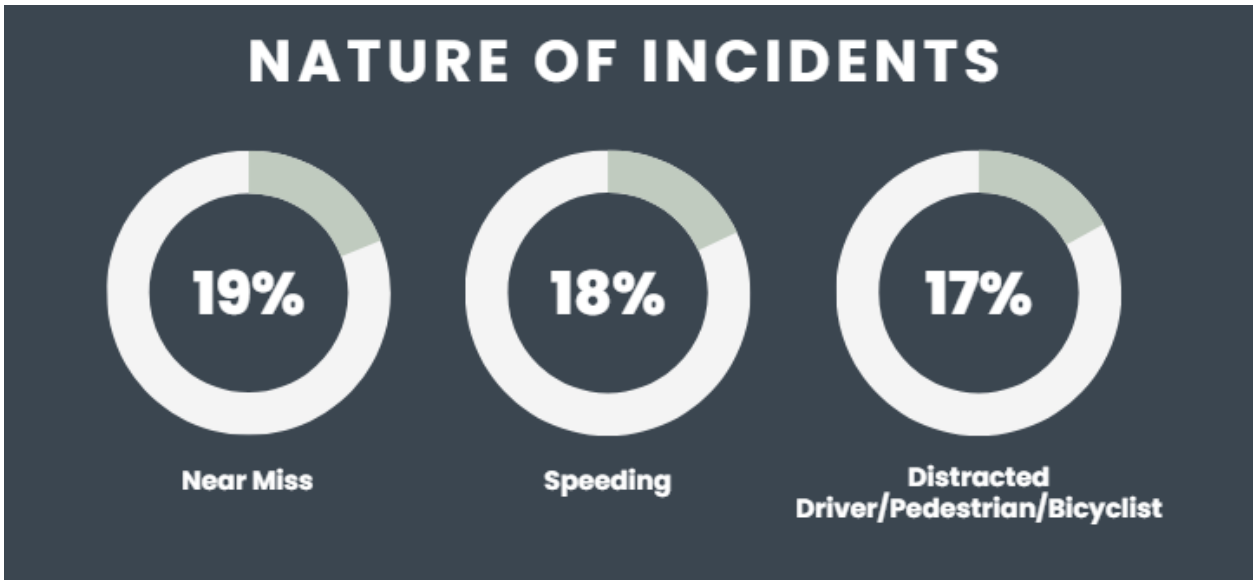


Figure 11: Incident statistics

Mapping

Participants were able to drop a variety of pins on a map including safety issue, improvement ideas, near miss, and congestion areas. There were 1,583 pins and 948 comments. Figure 12 summarizes the key takeaways from each pin option.

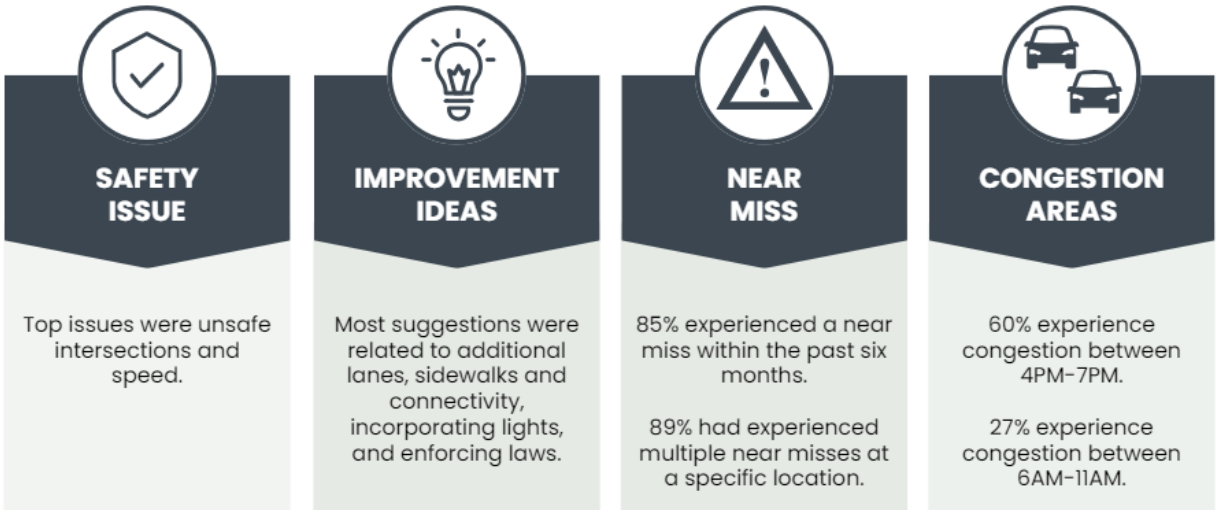


Figure 12: Key takeaways from pin drops

Additional Comments

At the end of the survey, participants were given the chance to share additional comments. The visual representation below (Figure 13) highlights some of the key themes that emerged from these comments.

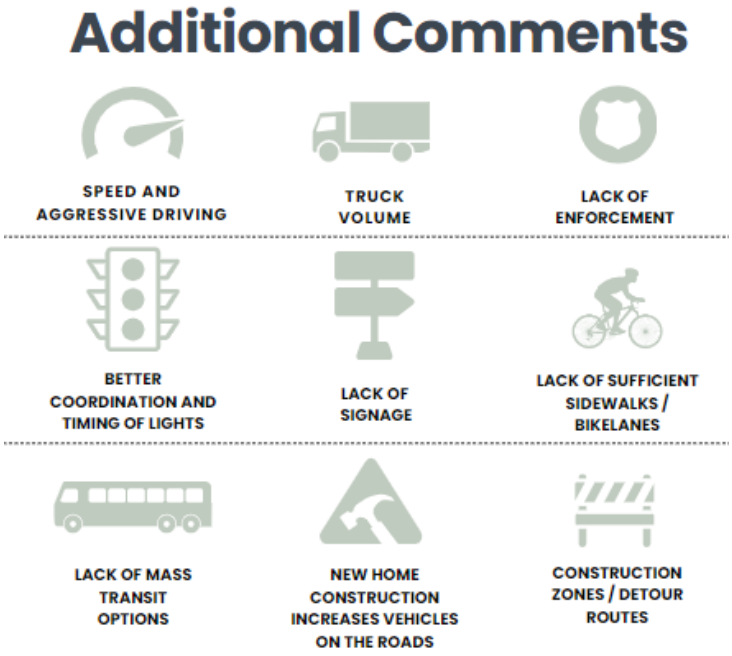


Figure 13: Key words from additional comments received

Chapter 3: Our Safety Story

A two-pronged approach was used as a starting point to understand the broader safety challenges in the region. This included: (1) a policy and benchmarking assessment to gauge the region's alignment with the Safe System Approach and safety best practices and (2) a safety analysis to understand historical crash patterns and what contributes to KSI and vulnerable road user crashes.

Policy and Benchmarking Assessment

A policy and benchmarking assessment was conducted to gauge's the region's alignment with the Safe System Approach and safety best practices. The assessment reviewed existing plans, reports, and studies from Maryland, West Virginia, Berkeley County, Jefferson County, Washington County, and local jurisdictions. The assessment identified safety strengths, challenges, and opportunities for action items. Appendix C: Technical Memos details the policy and benchmarking process, including documents reviewed, data extracted, and the final results.

Key findings from the benchmarking process include:

- **HEPMPO has been successful at identifying corridors of concern**, such as Dual Highway (US 40) within Hagerstown, Washington Street in Washington County, WV 9 in Berkeley County, and Summit Point Road in Jefferson County.
- No fatalities involving transit vehicles occurred in the region.
- **Transportation Improvement Program (TIP) funding** is typically programmed for safety improvements related to roadway departure crashes.
- **Safety performance targets** primarily related to serious injury, serious injury rate, and non-motorized fatal and serious injuries **are not being met**.

- **The region has general alignment with the SSA**, specifically around identifying locations of concern and collecting data, **but opportunities exist** around shifting safety culture and planning, safe users, safe roadways, safe vehicles, safe speeds, and post-crash care.

The policy and benchmarking assessment summarized the top policy and program strengths of the region (Table 2) and alignment with the Safe System approach.

Table 2: HEPMPO Safety Successes and Alignment with SSA

SSA Core Element	Category	HEPMPO Safety Strength
Safety Planning & Culture	Identifying corridors of concern	Dual Highway (US 40) in Hagerstown Washington St in Washington County WV 9 in Berkeley County Summit Point Rd in Jefferson County Foxcroft Avenue Pedestrian Road Safety Audit in Berkeley County
	Funding	TIP funds programmed HSIP for Roadway Departures • Daniel Road • Flowing Springs Exit • Districtwide Roadway Departures • Walnut Street and Virginia Avenue railroad crossings
	Previous planning efforts	The 2019 Regional Traffic Safety Study was the region's first effort to identify areas of safety concern and recommend safety improvement strategies.
Safe Users	Transit safety	No major transit safety concerns within the region.
Safe Roadways	Collision avoidance	Installing proven countermeasures to separate users in space and time, such as infilling sidewalks along segments of Dual Highway.
Safe Speeds	Enforcement	Speed cameras are authorized in Washington County (school zones and work zones) and Hagerstown has a handful of red-light cameras to reduce red light running. Berkeley County has radar speeds signs on I-81 and school zones and has conducted previous safety campaigns.
Post Crash Care	Crash review	HEPMPO conducts additional outreach with local police to capture any missing crashes or obtain further crash details (beyond crash data collected from MDOT and WVDOT).

Beyond the top safety strengths and alignment with SSA within the region, the top opportunities for improvement were also identified (Table 3). The stakeholder committee helped narrow the list of challenges to address, **highlighted in bold text**, which were addressed through the development of the Safety Action Plan or included as Action Items in Chapter 5.

Table 3: HEPMPO Safety Challenges and Alignment with SSA

SSA Core Element	Category	HEPMPO Safety Challenges
Safety Planning & Culture	Leadership and commitment	**No regionwide resolution currently supporting safety program nor committing to specific safety goal.**
	Meaningful engagement and equity	**Limited meaningful engagement with populations that are traditionally underserved.**
	Funding	**Staff time, limited resources, and support to apply for safety funding.**
	Development Review	**No formal process to ensure new developments assess safety impacts**.
Safe Users	Education	**Limited opportunities to raise awareness with the public and stakeholders to create buy-in for safety improvements (i.e., demonstration projects, education programs, tactical urbanism).**
Safe Roadways	Policies and tradeoffs	Lack of regionwide safety related policies to supplement the AASHTO Greenbook, MUTCD, and/or implementation of existing policies (e.g., Complete Streets, modal prioritization).
Safe Vehicles	Best practices guidance	Little knowledge sharing or available resources within the region regarding safe vehicle best practices.
Safe Speeds	Policy and training	Limited awareness of speed management methodologies and strategies in the region.
Post Crash Care	Crash review	Independent crash review of fatal and severe injury crashes involving pedestrians and bicyclists.
	Data sharing	Engagement with emergency responders and hospitals to more effectively share data across agencies.

*Note: **Bold text** indicates the Stakeholder Committee elevated these challenges to be addressed through Action Plan development or to be included as an Action Item.*

Safety Analysis

Five years of crash data, 2018 – 2022, was compiled from individual datasets downloaded from the West Virginia Department of Transportation (WVDOT) and the Maryland Department of Transportation (MDOT) crash portals. The safety analysis focused on local and state roadway crashes, as interstates are the purview of the DOTs. The data was cleaned and reviewed for geospatial accuracy. Appendix C: Technical Memos includes the detailed safety analysis. Table 4 summarizes the total non-interstate crashes by severity and by mode. While the majority of all crashes in the region involve motor vehicles, crashes involving people walking, biking, or riding a motorcycle make up a disproportionate amount of severe and fatal crashes.

Washington County had more KSI crashes annually, an average of 69 per year. In comparison, Jefferson County has an average of 30 per year and Berkeley County had an average of 44 KSI crashes per year.

Table 4: HEPMPO All Non-Interstate Crashes by Mode and Injury (2018 - 2022)

	No Injury	Possible Injury	Minor Injury	Severe Injury	Fatal	All Crashes
Bicycle	21 (0.1%)	31 (0.9%)	41 (2.1%)	11 (2%)	0 (0%)	104 (0.4%)
Motorcycle	105 (0.6%)	92 (2.6%)	124 (6.2%)	101 (18%)	26 (17.1%)	448 (1.9%)
Pedestrian	24 (0.1%)	105 (2.9%)	123 (6.2%)	61 (10.9%)	25 (16.4%)	338 (1.5%)
Vehicle	16,820 (99.1%)	3,368 (93.7%)	1,712 (85.6%)	388 (69.2%)	101 (66.4%)	22,389 (96.2%)
All Crashes	16,970	3,596	2,000	561	152	23,279

Source: 2018 – 2022 MDOT and WVDOT Crash Data

Crashes were also analyzed by location. Figure 14 identifies all non-interstate crashes where a person was killed or severely injured by mode in the region.

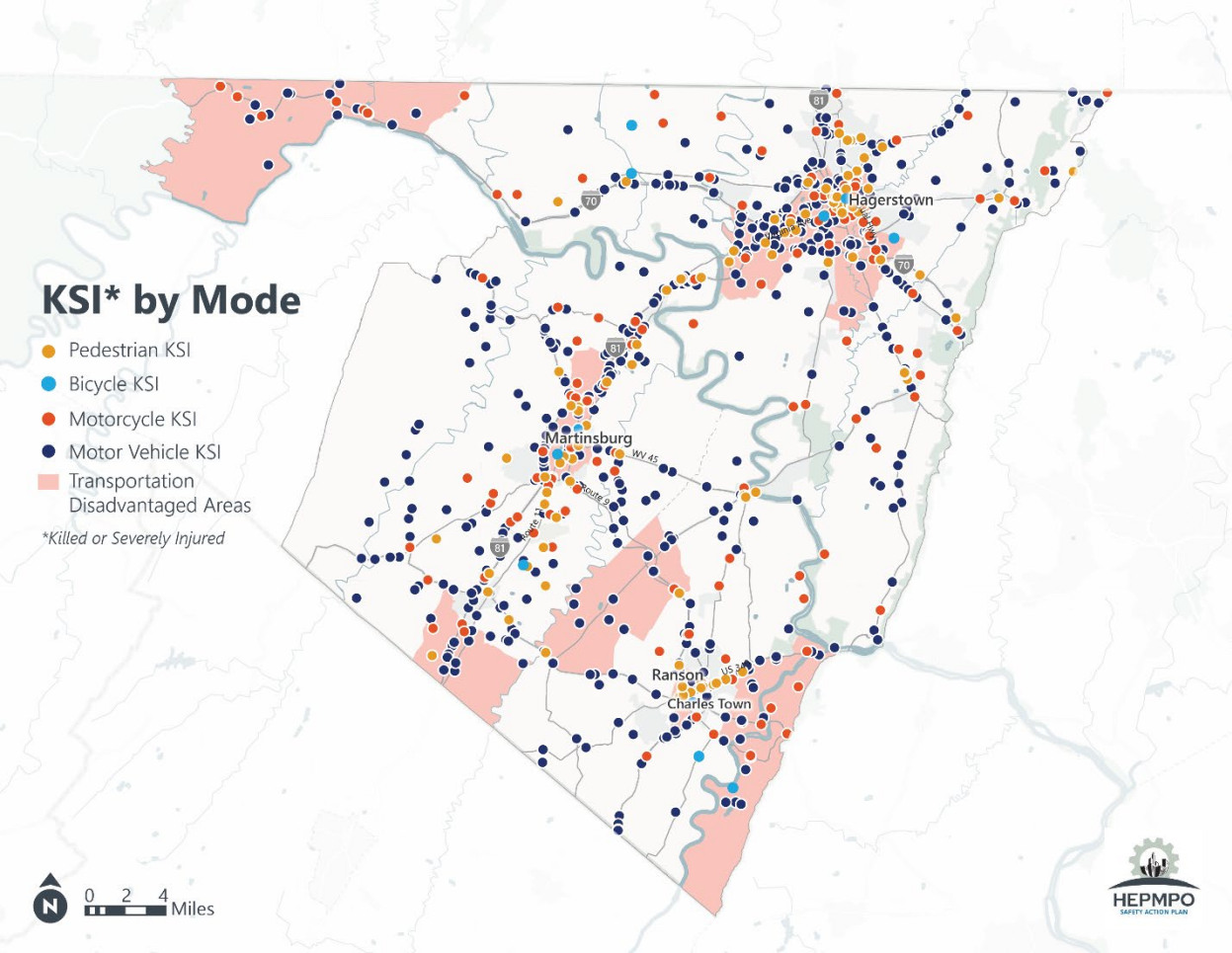


Figure 14: HEPMPO Non-Interstate KSI Crashes by Mode (2018 – 2022)*

Source: 2018 – 2022 MDOT and WVDOT Crash Data, US DOT Equitable Transportation Explorer (ETC) Tool

Fatality Rate

The fatality rate for the region, per county, and for each municipality with a population greater than 5,000 people is summarized in Table 5. Charles Town and Ranson both have fatality rates above 17.0, a threshold designated by the United States Department of Transportation (USDOT) as a Community with a High Fatality Rate.

Table 5: HEPMPO Fatality Crash Rates (2018 - 2022)

	Fatal Crash Rate Per 100,000 People (All Crashes)	Fatal Crash Rate Per 100,000 People (Non-Interstate Crashes)
HEPMPO	11.9	9.5
Berkeley County	13.1	10.2
Jefferson County	12	12
Washington County	10.9	8
Hagerstown, MD	10.5	10.5
Charles Town, WV	23.4	23.4
Martinsburg, WV	2.3	2.3
Ranson, WV	23	23

Source: 2018 – 2022 MDOT and WVDOT Crash Data, American Community Survey 2020 5-Year Estimate.

Collision Types and Contributing Factors

To understand why fatal and severe crashes are occurring, especially related to vulnerable road users and transportation disadvantaged areas, collision types and contributing factors were analyzed. Key findings from the safety analysis include:

- Single vehicle and rear end collisions are the most common crash type for all crashes in the region, but **single vehicle and head-on collisions are the most common that resulted in a KSI**. Vulnerable road user KSI collisions, particularly motorcycle involved, are predominantly single vehicle crashes.
- As posted speed limits increase, the proportion of KSI crashes increased in comparison to the total centerline milage in the region. For example, **roadways with 50-55 MPH post speed limits** only account for 3% of non-interstate roadways in the region, but they **account for 10% of non-interstate KSI crashes**.
- **Bicycle and pedestrian KSI crashes occur at higher rate (35%)** within transportation disadvantaged areas compared to other modes (20%).
- **Motorcycle, bicycle, and pedestrian KSI crashes** more often occur in an urban context such as within a town or municipal boundary.
- **Single vehicle crashes, head-on crashes, angle crashes** (crashes that include two parties colliding at different angles such as turning)**, and bicycle and pedestrian crashes** were identified as the **primary crash KSI types** across the region. These crash types and contributing factors are reinforced by the public survey results around speeding and aggressive driving, bicycle and pedestrian safety concerns, and intersection concerns.

Safety Fact Sheets

The safety analysis identified focus areas for systemwide improvements and countermeasures. The primary collision types and contributing factors are addressed in the following safety profile fact sheets:

1. Single vehicle crashes with particular emphasis on motorcycle crashes.
2. Angle crashes occur when two parties collide at an angle, which can occur at intersections as well as along corridors.
3. Bicycle and pedestrian crashes with particular focus within local jurisdictions and transportation disadvantaged community areas.
4. Head-on collisions involve frontal collisions between two vehicles, often on two-lane roads or due to wrong-way driving.

SAFETY FACT SHEET 1:

Single Vehicles Crashes[1]

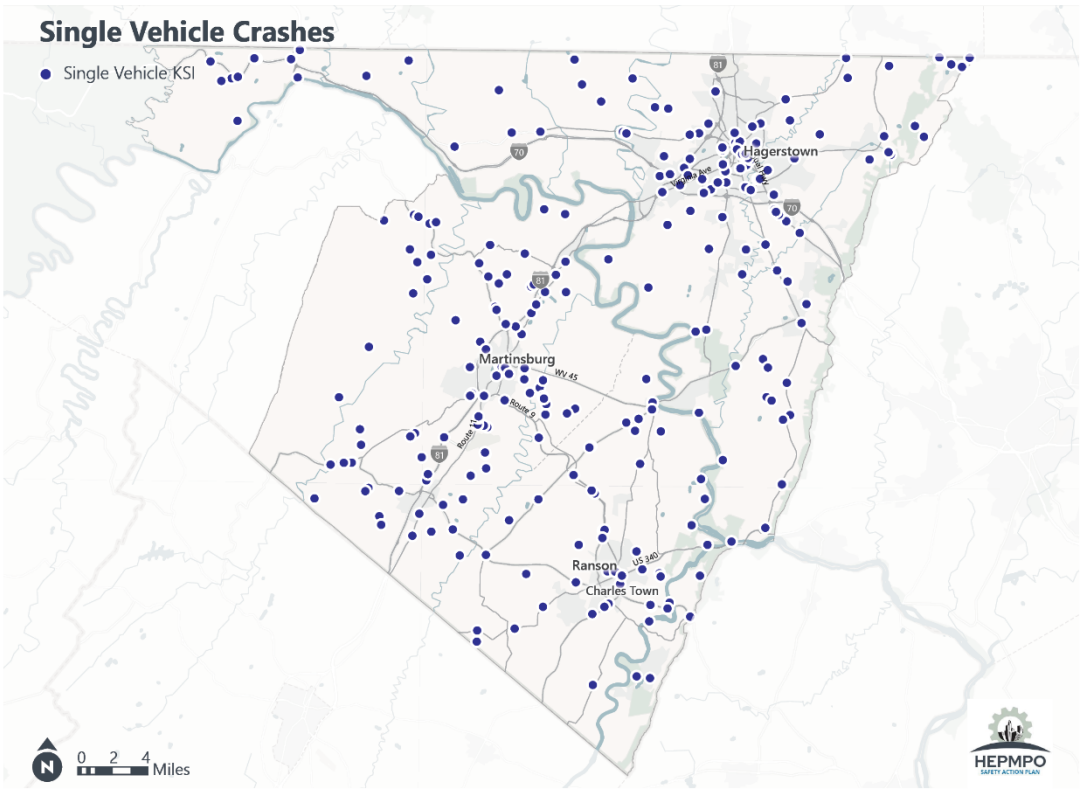
The single vehicle crash profile involves incidents where one vehicle loses control and collides with stationary objects like trees, poles, guardrails, or veers off the road. Contributing factors include driver distraction, impairment, excessive speed, adverse weather, or avoiding obstacles. Despite no other vehicle involvement, the consequences can be severe, including rollovers, ejections, and significant injuries or fatalities. This profile underscores the importance of driver awareness, adherence to speed limits, and roadway designs that minimize off-road hazards for improved safety.

1: Excluding bicyclists and pedestrians.

30%
of all crashes

267
killed or seriously injured (KSI) crashes

37%
of all KSI crashes were within this category



Most commonly seen along:

Along High-Injury Network[2]:

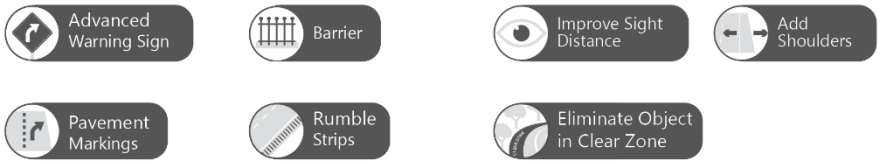
- Apple Harvest Drive
- Hedgesville Road
- Dual Highway
- Winchester Avenue
- Williamsport Pike
- Route 9
- Back Creek Valley Road

Along Non-High-Injury Network:

- Bloomery Road
- Needy Road
- Rohrersville Road

Potential Countermeasures

Fixed Objects



At Night

Speed

2: See Chapter 4 and Figure 16 for High-Injury Network details and map.

SAFETY FACT SHEET 2:

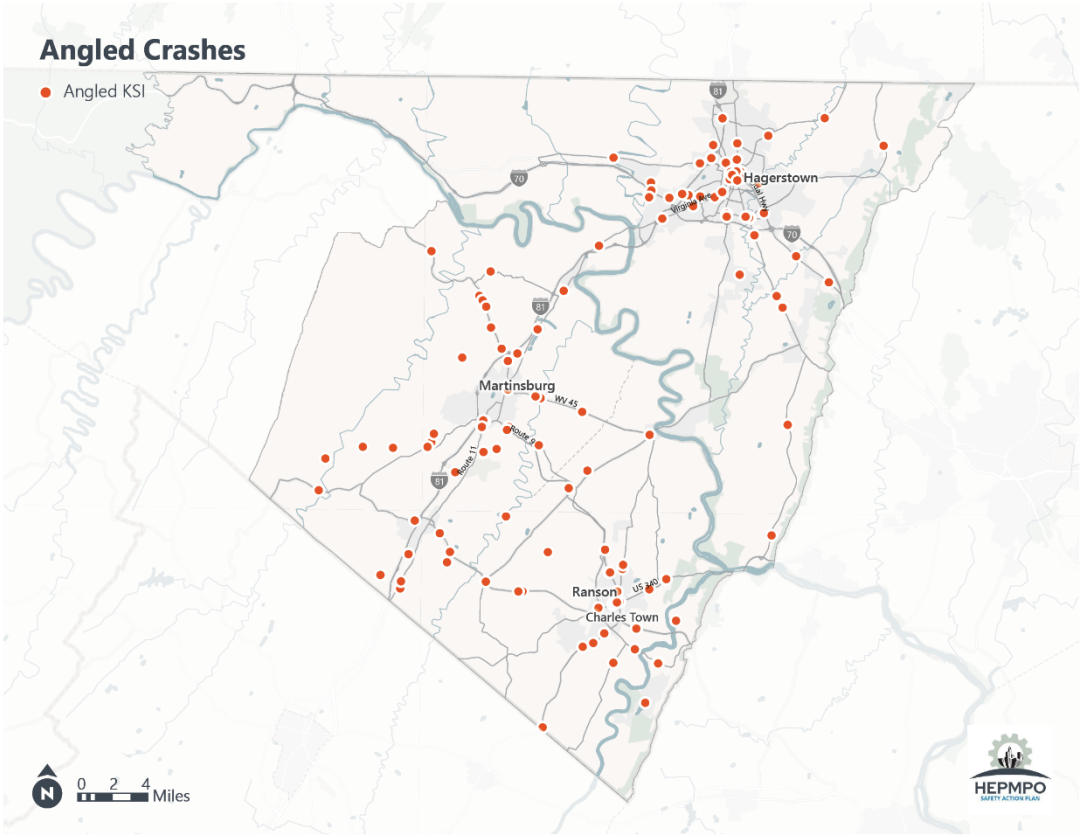
Angled Crashes

This collision profile involves pedestrians, bicyclists, motorcycles, and/or motor vehicles at intersections. It occurs when one vehicle hits another at approximately right angles (90 degrees), with the front of one vehicle striking the side of the other. This type of collision underscores the need for improved visibility of vehicles and enhanced safety measures for pedestrians and cyclists at intersections.

22%
of all crashes

128
killed or seriously injured (KSI) crashes

18%
of all KSI crashes were within this category



Most commonly seen along:

Along High-Injury Network[1]:

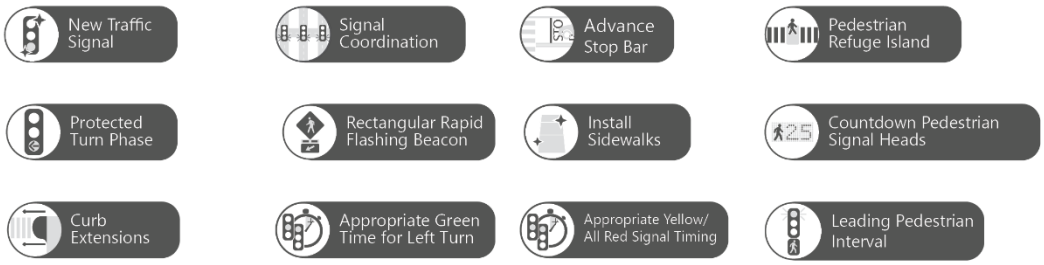
- Baltimore Street
- Burhans Boulevard
- William L Wilson Freeway
- Hedgesville Road
- Dual Highway

Along Non-High-Injury Network:

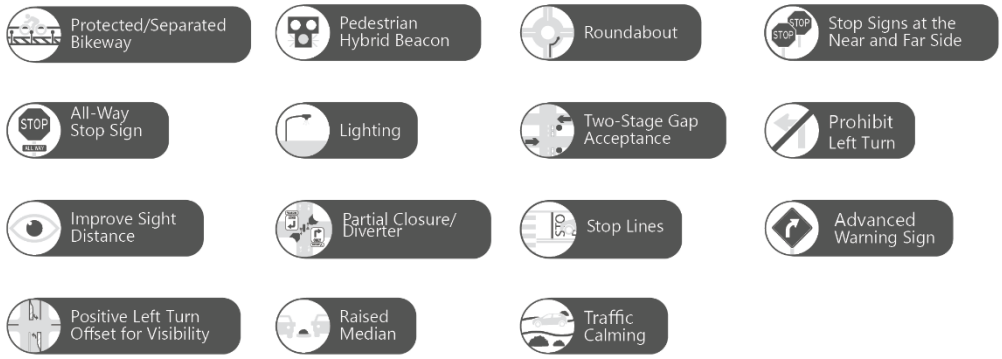
- Charles Town Road
- Williamsport Pike
- Middleway Pike

Potential Countermeasures

Signalized Intersections



Non-Signalized Intersections / Corridors



1: See Chapter 4 and Figure 16 for High-Injury Network details and map.

SAFETY FACT SHEET 3:

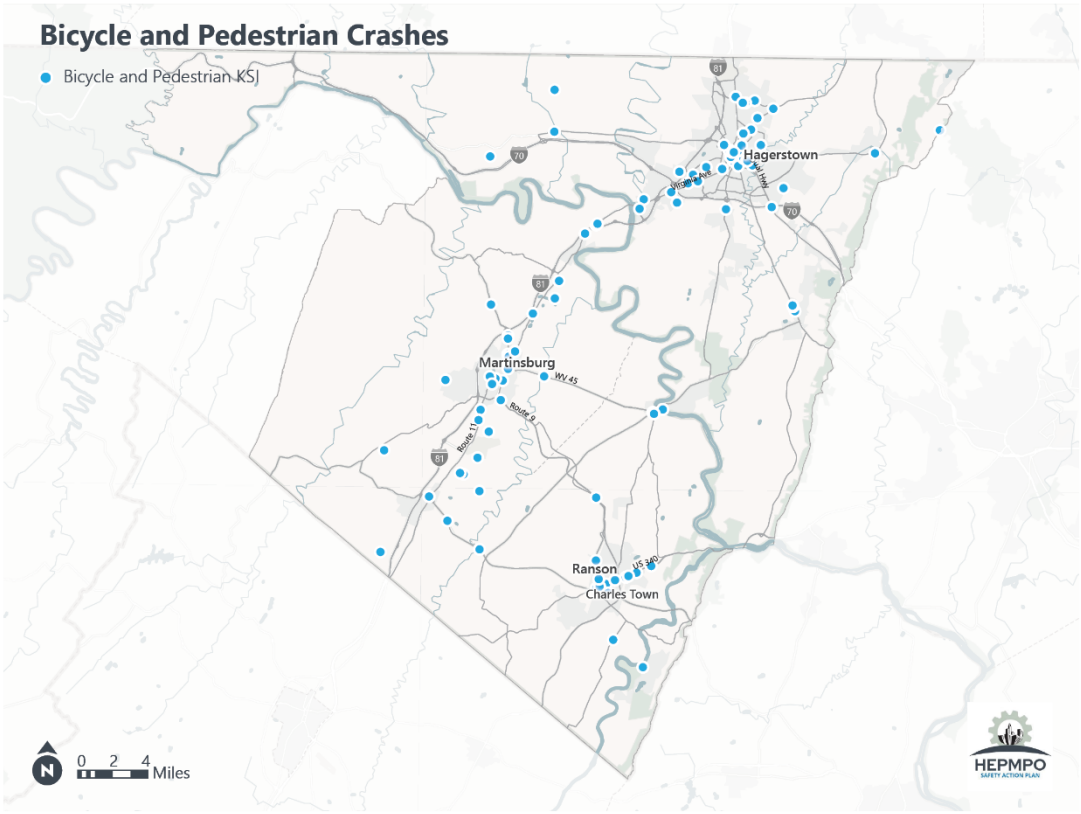
Bicycle and Pedestrian Crashes

This crash profile addresses incidents where cyclists and pedestrians come into contact with motor vehicles. These collisions frequently occure at intersections or crosswalks, where vehicular paths intersect with those of more vulnerable road users. Such crashes often stem from factors like poor visibility, failure to yield right-of-way, and high-speed vehicular movement in close proximity to pedestrians and cyclists.

2%
of all crashes

97
killed or seriously injured (KSI) crashes

14%
of all KSI crashes were within this category



Most commonly seen along:

Along High-Injury Network[1]:

- Williamsport Pike
- Burhans Boulevard
- Dual Highway
- Main Street
- William L Wilson Freeway
- Winchester Avenue

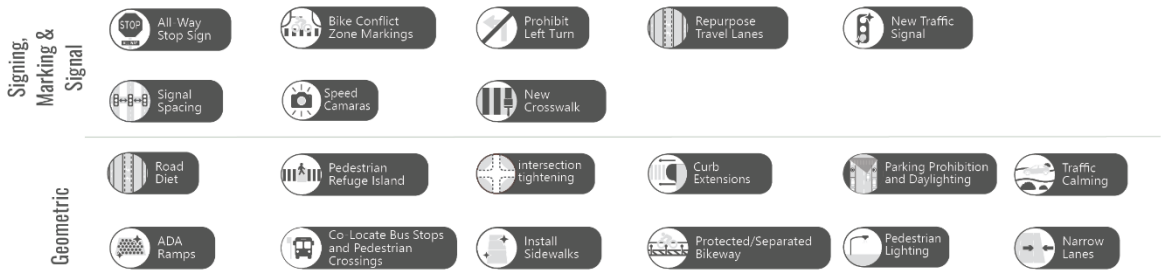
Along Non-High-Injury Network:

- Leitersburg Pike
- Middleway Pike

Potential Countermeasures

Signalized Intersections

Non-Signalized Intersections / Corridors



1: See Chapter 4 and Figure 16 for High-Injury Network details and map.

SAFETY FACT SHEET 4:

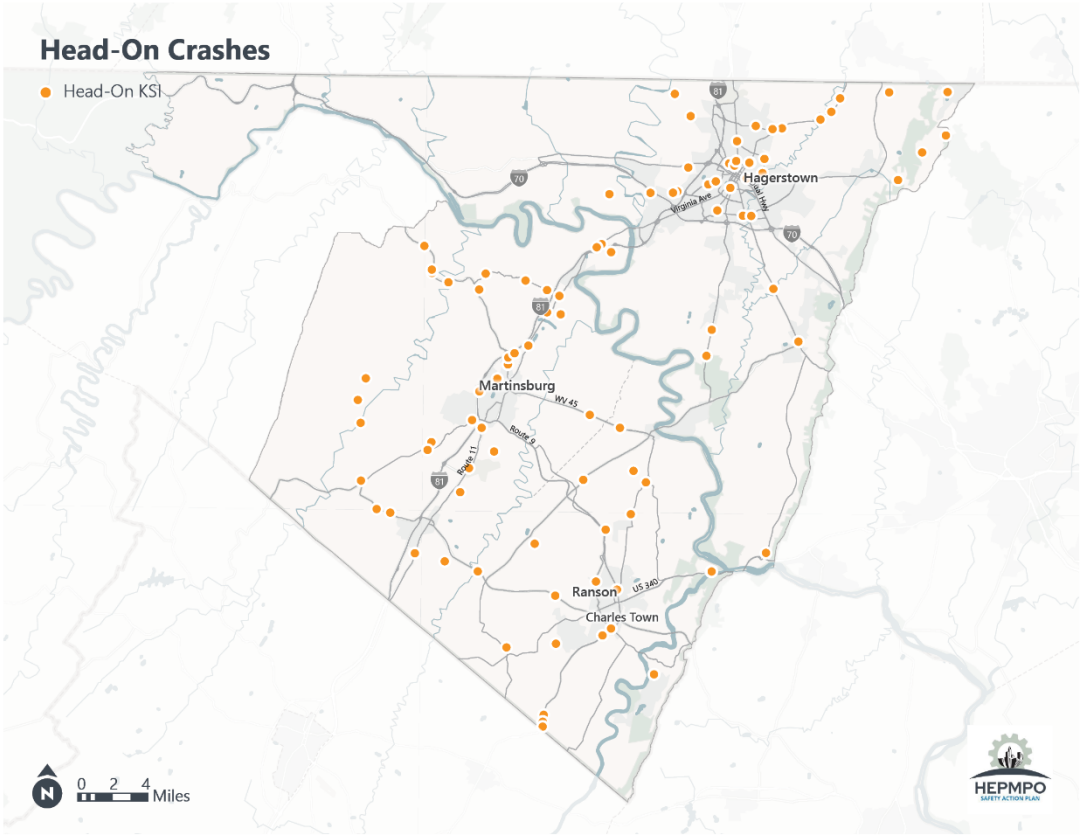
Head-On Crashes

Head-on crash profiles involve frontal collisions between two vehicles, often on two-lane roads or due to wrong-way driving. These crashes are extremely severe due to the combined impact velocities, exerting immense force on occupants. Contributing factors include driver distraction, poor visibility, and unsafe overtaking. The severity of these crashes demands preventive measures like improved road signage, median barriers, and advanced vehicle technologies to prevent lane departures and detect potential collisions.

3%
of all crashes

96
killed or seriously injured (KSI) crashes

13%
of all KSI crashes were within this category



Most commonly seen along:

Along High-Injury Network[1]:

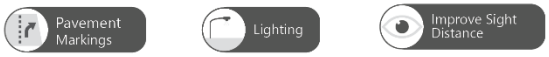
- Berryville Pike
- Williamsport Pike

Along Non-High-Injury Network:

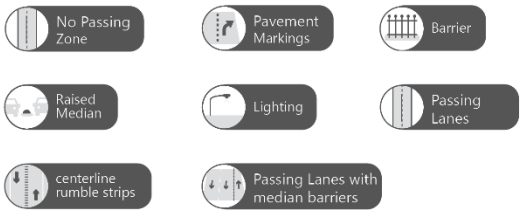
- Berryville Pike
- Hedgesville Road
- Williamsport Pike
- Eastern Boulevard North
- Leitersburg Pike

Potential Countermeasures

Signalized Intersections



Non-Signalized Intersections / Corridors



1: See Chapter 4 and Figure 16 for High-Injury Network details and map.

Deploying Analysis Results

The safety analysis and policy and benchmarking assessment results provided direction for safety projects, programs, and strategies. The efforts generated from the analysis results are described in Chapter 4 or included as Action Items in Chapter 5.

Chapter 4: Focusing Efforts to Make a Change

Addressing Historical Crash Trends

To help the region prioritize safety improvements at locations with the highest safety needs and to address primary collision types and contributing factors, two tools were developed: a high-injury network and priority corridor profiles (Figure 15).

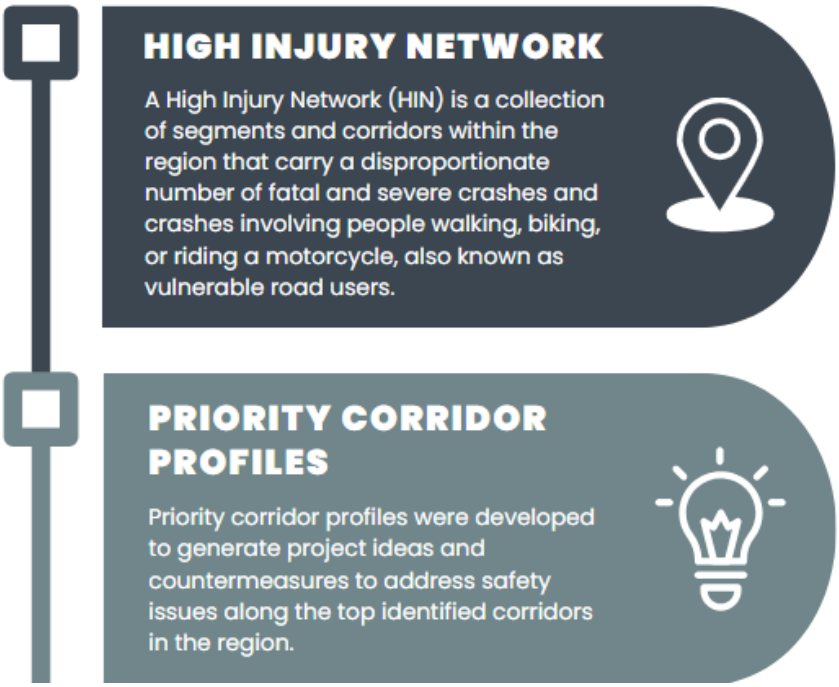


Figure 15: Developed Tools

High-Injury Network

A high-injury network (HIN) (Figure 16) was developed to identify roadway segments and corridors with a history of KSI collisions and/or collision involving a vulnerable road users. The HIN represents only 3% of the non-interstate roadway network in the region, yet crashes that occur on the HIN account for 43 percent of all KSI crashes in the region. The HIN also accounts for 76 percent of pedestrian KSI, 64 percent of

bicyclist KSI, and 69 percent of motorcyclist KSI. A detailed description of the HIN development is included in Appendix C: Technical Memos.

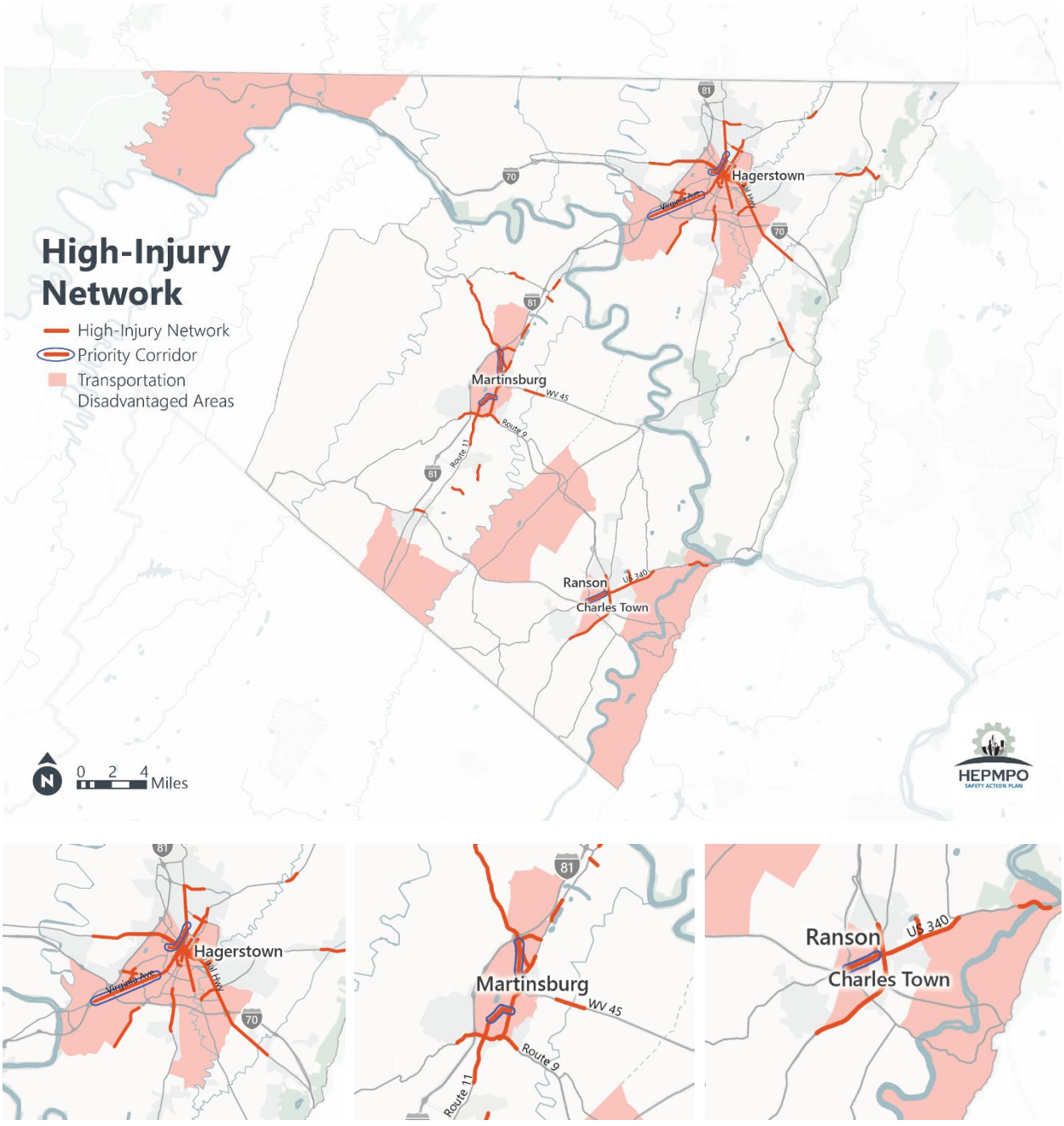


Figure 16: HEPMPO HIN and Priority Corridors

Source: US DOT Equitable Transportation Explorer (ETC) Tool

HIN Development and Prioritization

Data inputs used to generate the HIN per phase are highlighted in (Table 6). Prioritization criteria was included as part of the HIN development and refinement steps. Crashes that resulted in a fatal or severe injury were weighted higher than other injury or not injury crashes. Crashes involving a person walking, bicycling, or riding a motorcycle also received a higher weight than vehicle-only crashes.

Once the initial HIN was developed it was refined using the state vulnerable road user corridors and pedestrian safety priority corridors, transportation disadvantaged areas, and public comments such as near-miss and safety concerns. Stakeholder committee members provided feedback on the HIN, including identifying the final priority corridors.

Table 6: HEPMPO HIN Development Phases and Data Inputs

HIN Development Phase	Data Inputs
Initial HIN Development	2018 – 2022 Collision Dataset, HEPMPO Roadway Network, Collision Severity and Mode Weighting
HIN Refinement	State Vulnerable Road User Corridors, USDOT's Equitable Transportation Communities, Public Input
Final HIN and Priority Corridor	Stakeholder Committee

HIN Top Segments and Corridors

The HIN segments and corridors were scored and ranked using the crash severity weighting and crash mode. Segment and corridors with a higher rate of fatal or severe injury crashes, and crashes involving people walking, biking, or riding a motorcycle were ranked to identify the top ten locations in the region. Segments are individual road segments, typically half a quarter mile to three-quarters of a mile long. Corridors are consecutive segments or continuous roadway and are typically half a mile to four miles long. Table 7 and Table 8 rank the road segments and corridors, and indicate other attributes of each location.

Table 7: HEPMPO High-Injury Network - Top Ten Segments

Rank	Road Name	Extents	Length (Miles)	Location	VRU Crashes	State Priority Corridor	Equity Area
1	E Washington St	Flowing Springs Wy to Jefferson Ter	0.4	Charles Town	N	N	N
2	Dual Highway	Cleveland Ave to Manor Dr	0.3	Hagerstown	Y	Y	Y
3	Dual Highway	Edgewood Dr to Day View Dr	0.3	Hagerstown	N	Y	Y
4	Dual Highway	Cannon Ave to Cleveland Ave	0.4	Hagerstown	Y	Y	Y
5	Virginia Ave	Snyder Ave to Howard St	0.4	Hagerstown	Y	Y	Y
6	Apple Harvest Dr	I-81 ramps to Winchester Ave	0.3	Martinsburg	Y	N	Y
7	W Washington St	Burhans Blvd to Potomac St	0.4	Hagerstown	Y	Y	Y
8	Brown Rd	Williamsport Pk to Willingham Wy	0.4	Spring Mills	Y	N	N
9	Edwin Miller Blvd	McMillan Ct to Meridian Pkwy	0.6	Martinsburg	Y	Y	Y
10	Dual Highway	Mount Aetna to Edgewood Dr	0.7	Hagerstown	N	Y	Y

Table 8: HEPMPO High-Injury Network - Top Ten Corridors

Rank	Road Name	Extents	Length (Miles)	Location	VRU Crashes	State Priority Corridor	Equity Area
1	Brown Rd	Williamsport Pk to Willingham Wy	0.4	Spring Mills	Y	N	N
2	Burnhans Blvd	Cushwas Aly to Pennsylvania Ave	1.4	Hagerstown	Y	Y	Y
3	Dual Highway	Cannon Ave to Beaver Creek Rd	4	Hagerstown	Y	Y	Y
4	Edgewood Dr	Baltimore St to Dual Hwy	0.9	Hagerstown	Y	N	Y
5	Washington St	Railroad Crossing to Jefferson Ter	2.2	Charles Town	Y	Y	Y
6	Edwin Miller Blvd	McMillan Ct to Cloud St	1.5	Martinsburg	Y	Y	Y
7	Church St	Burhans Blvd to Potomac St	0.4	Hagerstown	Y	N	Y
8	Flowing Springs Rd	Pacesetter Wy to E Washington St	0.4	Charles Town	Y	N	Y
9	Warm Springs Ave	Edwin Miller Blvd to Williamsport Pk	0.9	Martinsburg	Y	Y	Y
10	Winchester Ave	King St to Paynes Ford Rd	3	Martinsburg	Y	Y	Y

Program and Project Prioritization

Priority corridor profiles were generated which outline potential countermeasures to address historical and at-risk safety concerns along the select roadways. The priority corridor profiles were selected using the segment and corridor rankings, if the location had VRU crashes, was a priority corridor for the state, and if the location was in an equity area. The project team and the stakeholder committee further narrowed the top segments and corridors to select the final five priority corridors.

Priority Corridors Profiles

Five priority corridors were selected from the HIN for a more in-depth evaluation of crash trends, safety concerns, and potential countermeasures (Table 9). An example of a demonstration corridor in Charles Town, WV is also included for safety improvements near Jefferson County Memorial Park. Demonstration activities include safety improvement that do not make permanent changes to the roadway or infrastructure that make the roads safer for multiple road user types.

Table 9: Priority Corridor Locations

Corridor	From	To
Burhans Blvd., Hagerstown, MD	Cushwas Alley	Pennsylvania Ave
Edwin Miller Blvd., Martinsburg, WV	I-81 NB Ramps	Eagle School Rd
Virginia Ave., Washington County, MD	I-81 NB Ramps	Hagerstown City Limits
Washington St., Charles Town, WV	Flowing Springs Rd	West St
Winchester Ave./King St., Martinsburg WV	Berry St	Queen St
High St/Jefferson Ave/Forest Ave, Charles Town, WV **(Demonstration)**	Charles Town Middle School	Mildred St

For each corridor a suite of recommended safety countermeasures unique to the corridor was developed. The following sources and strategies were utilized in the selection of recommended countermeasures:

- FHWA Proven Safety Countermeasures
- Safe System Roadway Design Hierarchy
- MDOT SHA Context Driven Guide
- Crash Modification Factor (CMF) Clearinghouse
- MUTCD Standards
- Best Practices
- Engineering Judgement

One-page graphic summaries for each of the priority corridors have been prepared depicting safety countermeasures recommended for locations along the corridor. FHWA Proven Safety Countermeasures (Figure 17) are identified as blue background icons, other countermeasures have dark grey icons.

Figure 17: FHWA Toolbox of Proven Safety Countermeasures

The graphics also summarize the crash history along the corridor, any crash trends noted within the crash data, and other highway improvement projects planned, underway, or recently completed. It should be noted that all five of the priority corridors were either on the top ten highest ranked HIN corridors or include a segment from the top 10 highest ranked HIN segments. They all contain some portion of their respective state's vulnerable road users priority networks.

The recommended countermeasures identified for each of the priority corridors are summarized in **Appendix B**. The tables contain more site-specific details about each recommended countermeasure, as well as time ranges for project deployment and a planning level cost estimate. The time ranges were divided into three categories (Figure 18).

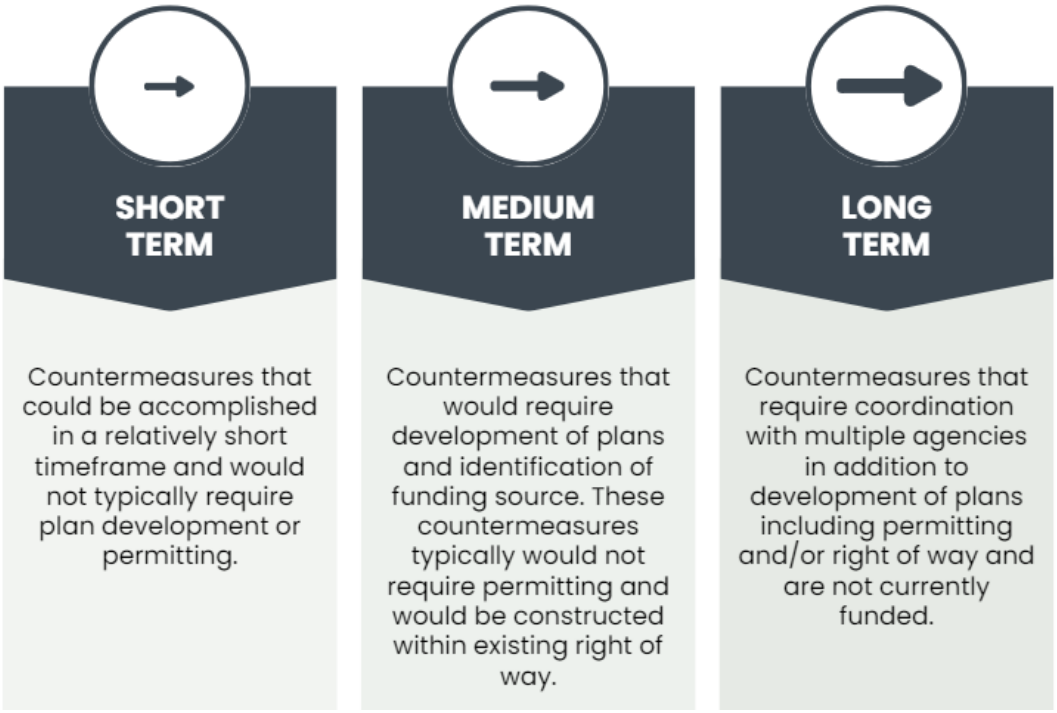
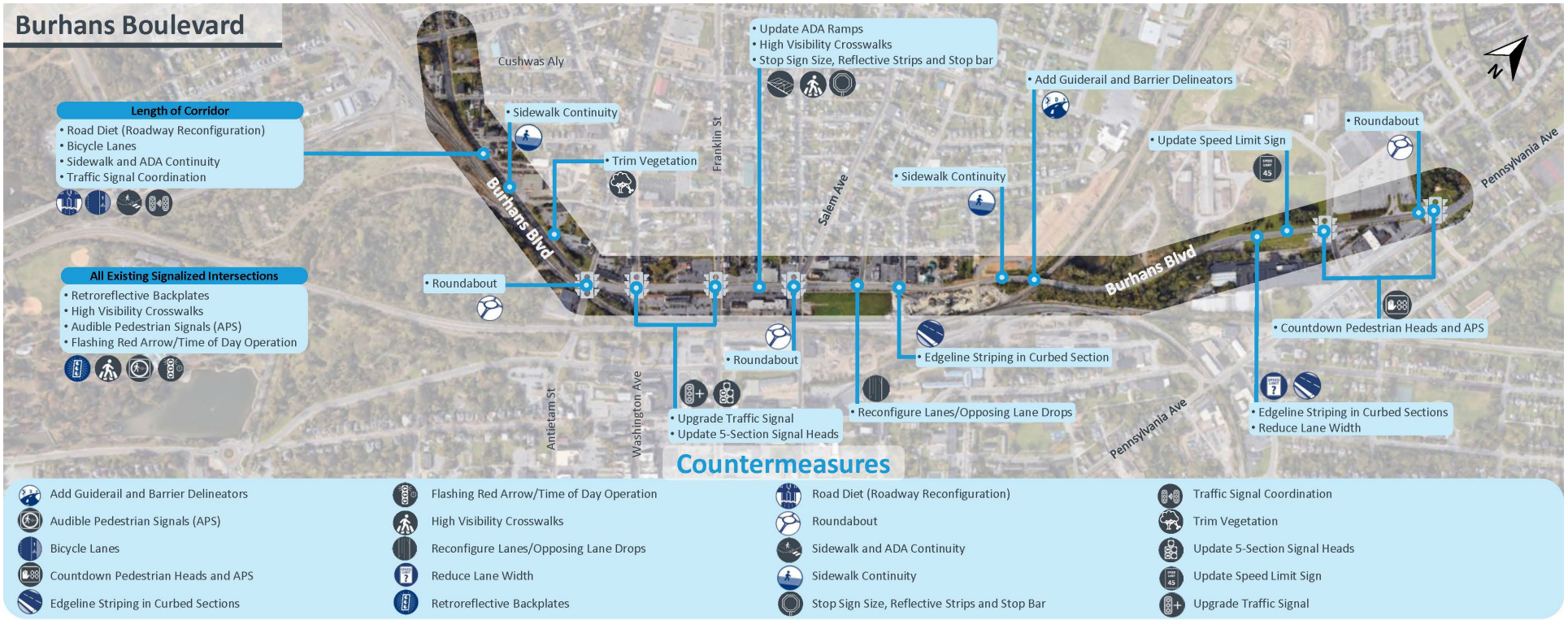


Figure 18: Project deployment time ranges

The planning level cost estimates represent expected effort in engineering costs, construction costs, inspection costs, and traffic control costs. Where a countermeasure would require additional right-of-way (ROW), a flat ROW acquisition cost was assumed, however caution should be exercised in utilizing the planning level estimate in these cases, since ROW acquisition costs are very site/business/residence specific by location and region.



Collision History (2018-2022)

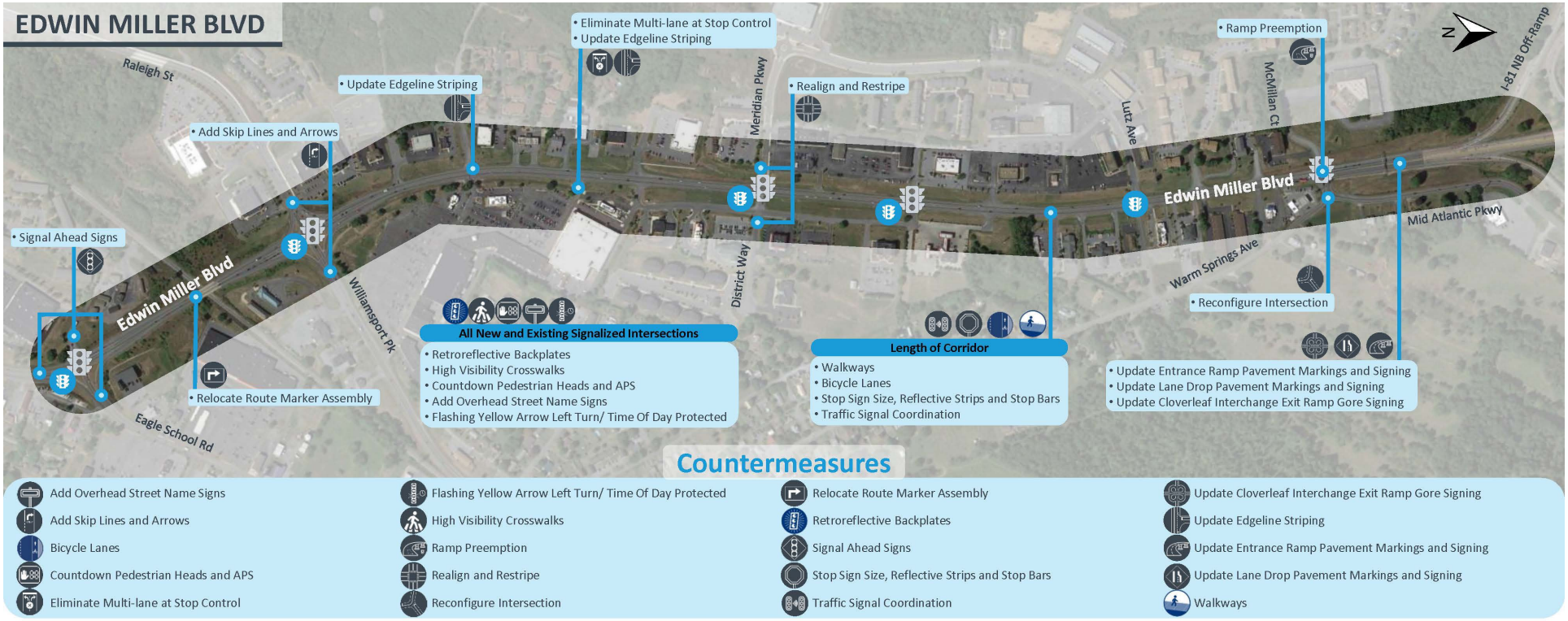
	Total Collisions	Fatal or Severe Injury
	213	6
	1	0
	1	0
	10	3

Notable Collision Patterns

Planning References

- Local Federal Aid Projects
  - W2019-07 Roadway Project
- Bike/Pedestrian
  - Designated VRU Corridor

Figure 19: Burhans Boulevard Summary



Collision History (2018-2022)

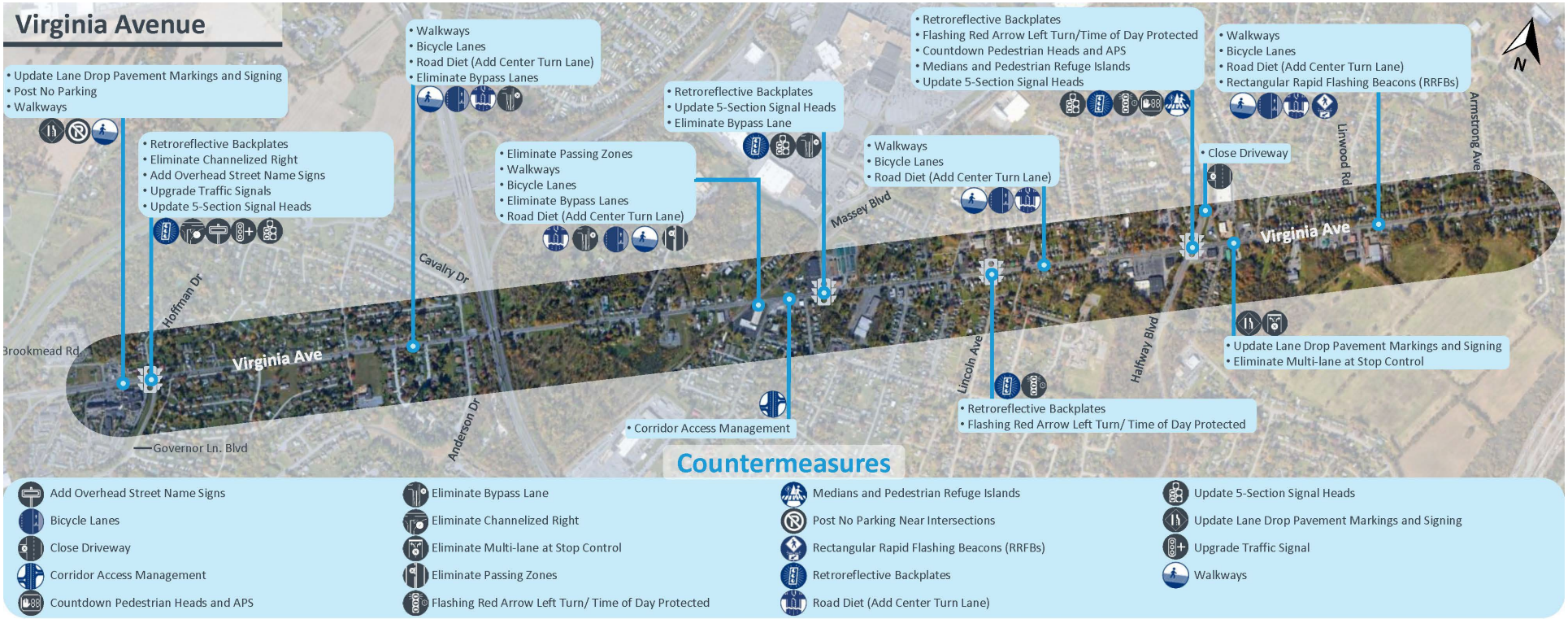
	Total Collisions	Fatal or Severe Injury
	491	3
	3	1
	2	1
	5	3

Notable Collision Patterns

Planning References

- Long-Range Transportation Plan
  - Hedgesville Road
  - Nichols Overhead
- Transportation Improvement Program
  - Lutz Avenue Signal Project
- Bike/Pedestrian
  - Designated VRU Corridor
- Other
  - Courthouse Drive Traffic Signal Project

Figure 20: Edwin Miller Boulevard Summary



Collision History (2018-2022)

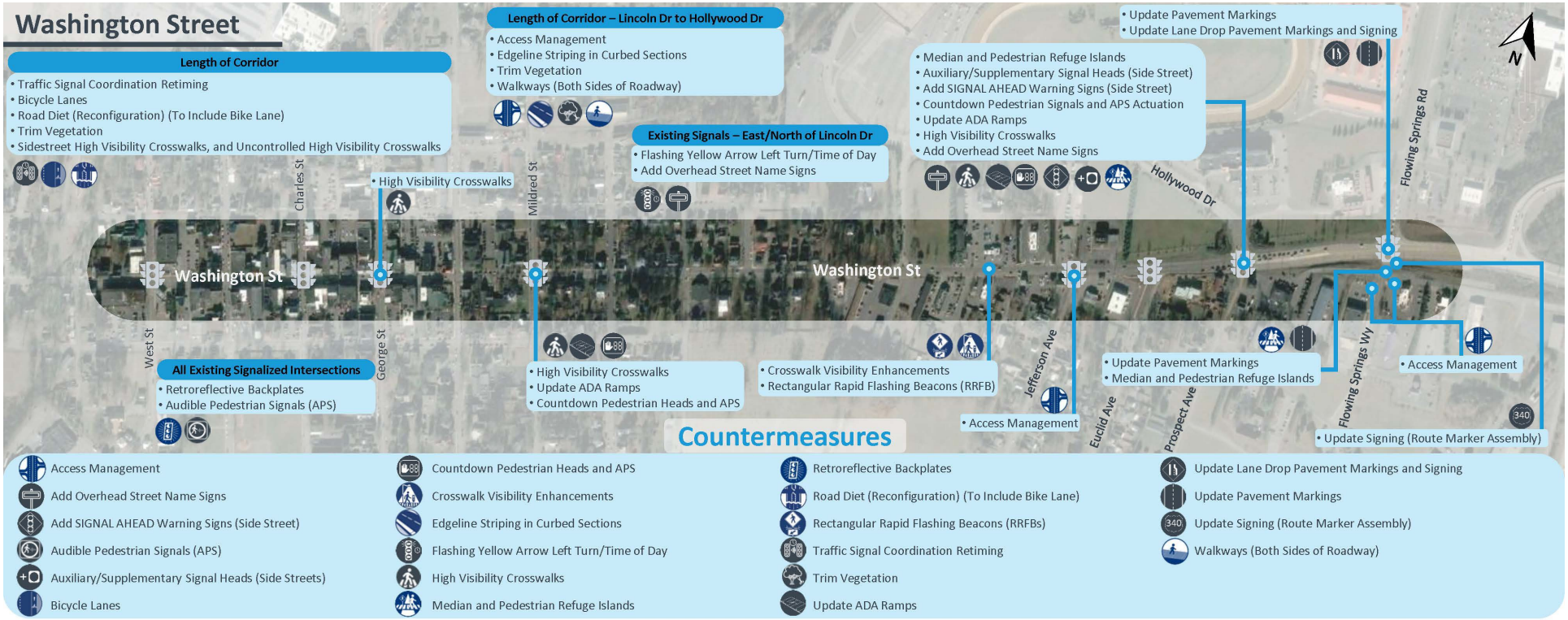
	Total Collisions	Fatal or Severe Injury
	205	6
	4	1
	2	0
	3	2

Notable Collision Patterns

Planning References

- Long-Range Transportation Plan
  - Widen to 4 Lanes
- Transportation Improvement Program
  - I-70 Roadway and Bridge Improvements
- Bike/Pedestrian
  - Designated VRU Corridor

Figure 21: Virginia Avenue Summary



Collision History (2018-2022)

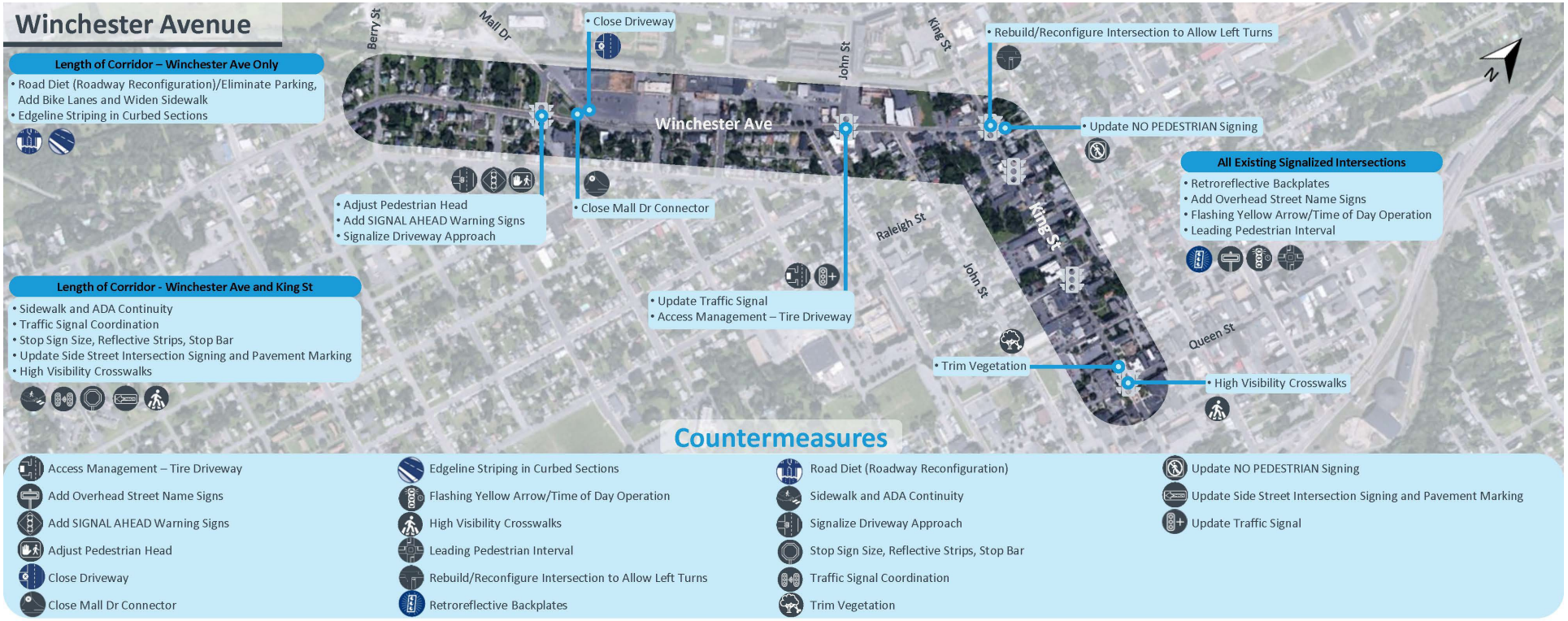
	Total Collisions	Fatal or Severe Injury
	232	2
	2	0
	1	0
	5	4

Notable Collision Patterns

Planning References

- Existing Plus Committed Projects
  - J2016-02 Charles Town CBD Signal System
- TIP Projects
  - J2024-09 Washington St (at West St)
- Fiscally Constrained Projects
  - C34 Washington St Intersection Improvements (at Jefferson Ave)
  - J101.0 Extension of Turn Lanes (at Flowing Springs Rd)
- Bike/Pedestrian
  - Designated VRU Corridor

Figure 22: Washington Street Summary



Collision History (2018-2022)

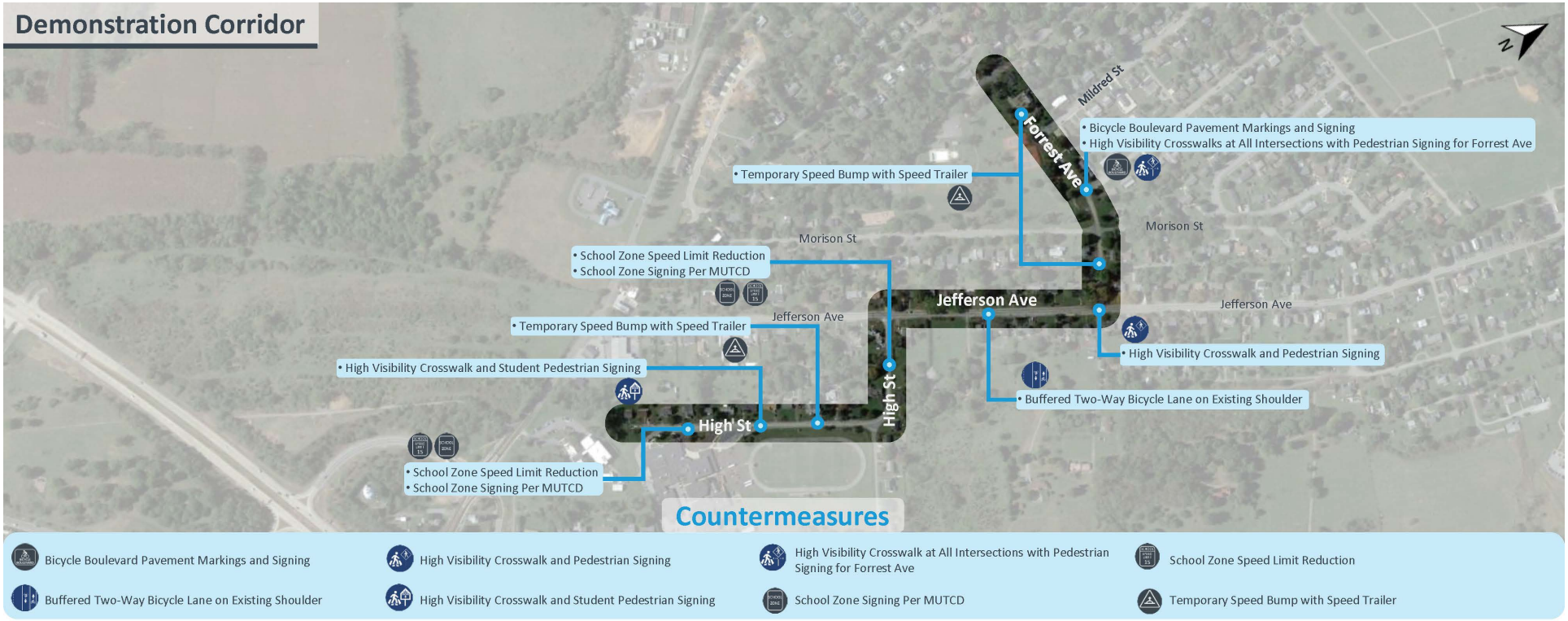
	Total Collisions	Fatal or Severe Injury
	128	1
	1	0
	1	0
	9	2

Notable Collision Patterns

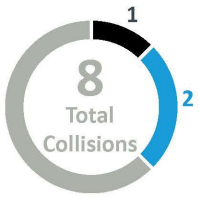
Planning References

- Existing Plus Committed Projects
  - B2016-04 Martinsburg Signal System
- Bike/Pedestrian
  - Designated VRU Corridor

Figure 23: Winchester Avenue Summary



Collision History (2018-2022)



Fatal or Severe Injury
All Other Injury
Property Damage Only

	Total Collisions	Fatal or Severe Injury
	7	0
	0	0
	1	1
	0	0

Notable Collision Patterns

Single Vehicle – Lane Departure

Weekend Crashes

Angle Not at Signal

Planning References

- 2023 Bike/Ped Plan Project List
  - J5 – High St – Improve Sidewalk Connectivity to Charles Town Middle School
  - J4 – Forrest Ave – Install Sidewalk and ADA Ramps Between S Mildred St and Jefferson Ave

Figure 24: Charles Town Demonstration Corridor Summary

Chapter 5: Taking Action

The Plan to Reduce and Prevent Severe Crashes

The HEPMPO Regional Safety Action Plan is committed to taking action to address traffic safety issues in the region and achieving zero traffic fatalities and severe injuries by 2050. Action Items align with the Safe System Approach and follow three implementation priorities: operationalizing safety, educate road users, and safer streets (Figure 25).

Figure 25: Implementation priorities that align with the Safe System Approach

Action Items were developed based on the results of the safety analysis, policy and benchmarking assessment, development of the HIN and priority corridor projects, and based on public comments and the Stakeholder Committee's input. Each Action Item includes a description, responsible agency and partners, timeline.

Action Items

Operationalizing Safety

Operationalizing safety recognizes that responsibility is shared, safety is proactive, redundancy is crucial, and that all traffic deaths and severe injuries are unacceptable. Institutionalize safety into all transportation projects and enhance coordination amongst different agencies. Build sustainable funding and capacity to champion integrated safety at each agency. Develop tools and resources to prioritize safety as part of agency culture and individual job responsibilities (Table 10).

Table 10: Operationalizing Safety Action Items

Action Item	Responsible Agency and Partners	Timeline
Support local jurisdictions in identifying and applying for safety funding. Utilize expertise from partner agencies, such as the MDOT Highway Safety Office, on exploring diverse grant opportunities.	HEPMPO, State DOTs	Short
Collaborate with state agencies and local jurisdictions to ensure rigorous and safety-focused Traffic Impact Study processes. Consider development of safety checklist to be utilized during development review.	HEPMPO, Local Municipalities	Medium
Incorporate HIN as prioritization criteria. Utilize HIN in regional and local budgeting and project decision-making.	HEPMPO, State DOTs, Local Municipalities	Short
Establish a Safety Action Plan Committee. Committee would conduct evaluation and monitoring, including developing Action Plan Progress reports.	HEPMPO	Short

Educate Road Users

Create a culture of traffic safety by promoting awareness amongst all road users. Humans make mistakes, but a lapse in judgement or misstep should not result in a fatality or severe injury. Educate road users to be good stewards of the system and demonstrate the safety benefits when trade-offs must occur between safety and mobility (Table 11).

Table 11: Educate Road Users Action Items

Action Item	Responsible Agency and Partners	Timeline
Evaluate meaningful engagement strategies to enhance outreach with populations that are traditionally underserved. Consider developing meaningful engagement checklist to distribute with local agencies.	HEPMPO and Local Municipalities	Short
Raise awareness of safety countermeasures and treatments. Consider collaborating with businesses and organizations to host joint events, distribute educational materials, endorse safety initiatives, host annual safety walking tours with elected officials and the public, seek public perception through periodic surveys and support local jurisdictions seeking pilot project and demonstration opportunities.	HEPMPO, Local Municipalities	Medium
Promote the release of the Action Plan. Consider conducting a media launch, targeted outreach, and hosting a training or roll-out webinar.	HEPMPO	Short

Safer Streets

Safer streets recognizes that humans are vulnerable and human bodies have a limited ability to tolerate energy impacts. Prioritize and implement proven solutions to reduce speeds, separate road users in space and time, and increase attentiveness and awareness (Table 12).

Table 12: Safer Streets Action Items

Action Item	Responsible Agency and Partners	Timeline
Implement safety improvements and countermeasures along priority corridors (Burhans Blvd, Washington St, Edwin Miller Blvd, Winchester Ave/King St, Virginia Ave)**.** Seek opportunities to further study, fund, and support partner agencies in implementing priority corridor projects.	HEPMPO, State DOTs, Local Municipalities	Long
Systemically install safety countermeasures at locations that match the concerns identified for the four safety fact sheets (Single Vehicle Crashes, Angled Crashes, Bicycle and Pedestrian Crashes, and Head-on Crashes). Seek opportunities to fund and support local agencies in installing countermeasures.	HEPMPO and Local Municipalities	Medium
Share the countermeasures developed for the five priority corridors and the four safety fact sheets with local municipalities and other implementors (i.e., developers). Encourage utilization of countermeasures along HIN and other locations with historical crashes or at-risk factors, such as speeding and higher posted speed limit roadways.	HEPMPO, State DOTs, Local Municipalities, Developers	Short

Chapter 6: Performance Evaluation and Transparency

Monitoring the progress made toward zero traffic fatalities and severe injuries by 2050 will help HEPMPO evaluate the success of current action items and adopt new strategies as needed. Performance metrics will be used to evaluate the effectiveness of the Action Plan.

Monitoring Committee

A Safety Action Committee must be established to evaluate and monitor the Action Plan. The Safety Action Committee will be responsible for developing an annual progress report. The progress report will be generated based on the release of the previous year's crash data. The progress report will calculate and compare performance metrics overtime (Table 13), as well as highlight progress made toward Action Items.

Table 13: HEPMPO Regional Safety Action Plan Performance Metrics

Performance Metric
Total fatalities
Fatality rate
Total serious injuries
Serious injury rate
Non-motorized fatalities and serious injuries
Number of KSI crashes within transportation disadvantaged areas
Percentage change in KSI single vehicle crashes and KSI angled crashes

Action Plan Updates

From plan adoption, the HEPMPO Regional Safety Action Plan will be refreshed or fully updated every five years. A five-year cycle will provide the most up-to-date crash data and incorporate new safety best practices and guidelines.

Funding

SS4A Grants

The Fiscal Year (FY) 2024 Notice of Funding Opportunity (NOFO) for the SS4A grants is now open. The program offers funding for two distinct types of grants:

1. Planning and Demonstration Grants: These grants allocate federal funds to develop, complete, or enhance an Action Plan. Demonstration activities are temporary safety improvements that inform comprehensive safety action plans (referred to as "Action Plans") by testing proposed project and strategy approaches to determine future benefits and future scope.
2. Implementation Grants: These grants provide federal funds to execute projects and strategies outlined in an Action Plan, specifically aimed at addressing roadway safety issues. Eligible projects and strategies may encompass infrastructure, behavioral, and operational activities. HEPMPO will exclusively seek to apply for implementation grants.

Additional Funding

There are various federal and state funding available for safety improvements. These opportunities can be found in Table 14-Table 16.

Table 14: Federal Funding Programs

Funding Program	Description
Safe Streets and Roads for All (SS4A)	The SS4A program funds regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries.
Rebuilding American Infrastructure with Sustainability & Equity (RAISE) Discretionary Grant Program	The program funds multimodal, multi-jurisdiction projects that have significant local or regional impact, but are more difficult to support through traditional DOT programs.
Transportation Alternatives Program (TAP)	The TAP provides funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; safe routes to school projects; and projects for planning, designing, or constructing boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways.
Carbon Reduction Program (CRP)	Provides funds for projects designed to reduce transportation emissions, defined as carbon dioxide (CO2) emissions from on-road highway sources.
Infrastructure for Rebuilding America Discretionary Grant Program (INFRA)	Funds available for multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas.
Reconnecting Communities Pilot Program (RCP)	Planning grants and capital construction grants, as well as technical assistance, to restore community connectivity through the removal, retrofit, mitigation, or replacement of eligible transportation infrastructure facilities.
Federal Transit Administration Capital Funds (FTA)	Funds transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit.
Areas of Persistent Poverty Program (AoPP)	Funds projects that provide access to transit in disadvantaged communities, including safety improvements.
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	Provides funds to States for transportation projects designed to reduce traffic congestion and improve air quality, particularly in areas of the country that do not attain national air quality standards.

Funding Program	Description
Highway Safety Improvement Program (HSIP)	HSIP is a core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance.
Railway-Highway Crossings (Section 130) Program (RHCP)	The Railway-Highway Crossings (Section 130) Program provides funds for the elimination of hazards at railway-highway crossings.
National Highway Performance Program (NHPP)	Provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a state's asset management plan for the NHS.
Promoting Resilient Operations for Transformative, Efficient, and Cost Saving Transportation (PROTECT)	Used to help make surface transportation more resilient to natural hazards, including climate change, sea level rise, flooding, extreme weather events, and other natural disasters through support of planning activities, resilience improvements, community resilience and evacuation routes, and at-risk costal infrastructure.
Surface Transportation Block Grant Program (STBG)	Provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.
Safe Routes to School Program (SRTS)	Projects that improve safety for students going to school.

Table 15: Maryland State Funding

Source	Program
Federal Programs Administered by MDOT	▪ Transportation Alternatives Program ▪ Maryland Bikeways Program ▪ Safe Routes to Schools
MDOT System (Program) Funding	▪ Sidewalk Reconstruction for Pedestrian Access ▪ New Sidewalk Construction for Pedestrian Access ▪ Bicycle Retrofit
Additional State Grant Opportunities	▪ Community Legacy Program ▪ Program Open Space ▪ Community Parks and Playgrounds ▪ Maryland Heritage Areas Program
Maryland Highway Safety Grants	The MHSO administers grant-funded programs that address priority areas such as impaired driving prevention, distracted driving prevention, speeding and aggressive driving prevention, occupant protection, and the safety of pedestrians, bicyclists, motorcyclists, young and older drivers. In addition, grant funds can be awarded toward projects that help improve the quality of traffic safety data.

Table 16: West Virginia State Funding

Funding Program	Description
Recreational Trails Program (RTP)	For towns and cities in West Virginia, these grants help improve the network of recreational trails, biking/walking paths, sidewalks, and more, contributing to a safe, healthier, and more vibrant community.
Transportation Alternatives Program	Grant program for non-traditional transportation related projects. This and other grant programs have also become part of West Virginia's Federal-aid transportation program.

APPENDIX A

Public Meetings

Appendix A: Public Meetings

The public meetings were announced via public notice and social media postings. The draft document was made available on the HEPMPO website. Details regarding the public comment period, including a copy of the press release, articles, and public comments and responses to those comments are below.

Social Media

Facebook

Screenshots to go here.

Linked In

YouTube

Press Release

Articles

Sign-In Sheets

APPENDIX B

Countermeasures

Burhans Boulevard Countermeasures					
Location	**Countermeasure**	**FHWA Proven Safety Countermeasure**	**Countermeasure Description**	**Implementation Horizon**	**2024 Planning Level Costs**
Length of Corridor	Road Diet (Roadway Reconfiguration)	Yes	Adjust curb line and striping as necessary to provide ADA compliant sidewalk on both sides of Burhans Blvd, center turn lane and bike lanes from Cushwas Alley to Peleton St.	Long Term	$9,000,000 - $12,000,000
	Bicycle Lanes	Yes	Include Bicycle Lanes with Road Diet	Long Term	$150,000 - $200,000
	Sidewalk and ADA Continuity	Yes	Complete sidewalk gaps and ADA compliant driveway crossing features through existing sidewalk areas	Long Term	$450,000 - $600,000
	Traffic Signal Coordination	No	Revise traffic signal timing to provide coordination to correspond with speed limit, progression speed and queue clearance based on time-of-day traffic volumes and turning movements	Short Term	$50,000 - $75,000
All Signalized Intersections	Retroreflective Backplates	Yes	Install backplates with retroreflective borders on all vehicular traffic signal heads	Short Term	$25,000 - $30,000
	High Visibility Crosswalks	Yes	Install continental /high visibility crosswalks at all crosswalks on all legs of each signalized intersection	Short Term	$80,000 - $110,000
	Audible Pedestrian Signals (APS)	No	Add APS pedestrian detection/pushbuttons at all signalized intersections with pedestrian crosswalks	Medium Term	$275,000 - $350,000
	Flashing Red Arrow (FRA)/ Time of Day Operation	No	Install FRA left turn traffic signal heads at all approaches with dedicated left turn lanes. Update traffic signal timing and phasing accordingly. Investigate running time of day variable mode phasing	Medium Term	$40,000 - $60,000
Burhans Blvd South of Antietam St	Trim Vegetation	No	Trim roadside tree foliage and branches to facilitate advance visibility of traffic signal for EB traffic approach	Short Term	$10,000 - $15,000
Antietam St Intersection	Roundabout	Yes	Install roundabout to overcome traffic signal/intersection visibility issues as a result of Burhans Blvd curved alignment and Antietam ST NB approach railroad bridges	Long Term	$3,500,000 - $4,500,000
Washington St Intersection	Upgrade Traffic Signal	No	Add/ augment Washington St approach traffic signal heads obstructed by utility wires with auxiliary heads at different elevation and/or nearside heads. Implement pavement marking/ lane configuration revisions for Washington St lanes as identified in Washington St 2018 RSA. Add Overhead ONE WAY and NO RIGHT/LEFT TURN signing on Burhans approaches.	Medium Term	$60,000 - $80,000
	Update 5-Section Signal Heads	No	Replace existing non-compliant 5-section traffic signal heads with compliant 5-section traffic signal heads	Short Term	$2,500 - $3,500
Franklin St Intersection	Upgrade traffic Signal	No	Relocate Franklin St approach traffic signal heads to be more aligned with through lanes and removed from roadside clutter to improve advance visibility. Add overhead ONE WAY and NO RIGHT TURN signing on Burhans approaches	Medium Term	$5,500 - $7,000
	Update 5-Section Signal Heads	No	Replace existing non-compliant 5-section traffic signal heads with compliant 5-section traffic signal heads	Short Term	$2,500 - $3,500
George St Intersection	High Visibility Crosswalk	Yes	Install high visibility crosswalk across George St. Construct new ADA ramps that do not direct pedestrians diagonally off corners. Post Burhans Blvd crossing for No Pedestrians	Medium Term	$18,000 - $24,000
	Stop Sign Size, Reflective Strips , and Stop Bars	Yes (partial)	Increase size of existing stop sign on George St, add retroreflective strip to sign post, and relocate stop sign and stop bar to be behind proposed crosswalk	Short Term	$6,500 - $8,500

Burhans Boulevard Countermeasures					
Location	**Countermeasure**	**FHWA Proven Safety Countermeasure**	**Countermeasure Description**	**Implementation Horizon**	**2024 Planning Level Costs**
Church St Intersection	Roundabout	Yes	Install roundabout to overcome traffic signal visibility issues due to Salem Ave approach skew and Church St approach RR overpass. Also will overcome five point traffic flow issues	Long Term	$3,500,000 - $4,500,000
Burhans Blvd near Cook St	Reconfigure Lanes/Opposing Lane Drops	No	Revise lane configuration to shift single SB lane toward curb to thereby add a NB left turn bat for the Cook St left turn movement. Develop right turn SB bay and shift through lane back to existing alignment south of Cook St. Eliminate ONLY pavement markings for existing left turn NB lane drop until north of Cook St intersection.	Short Term	$45,000 - $55,000
Burhans Blvd North of Mechanic St	Edge line Striping in Curbed Sections	Yes (partial)	Install edge line pavement marking along curbed side (east side) of Burhans Blvd to provide positive guidance, roadside context and nighttime retroreflectivity	Short Term	$5,500 - $7,000
	Reduce Lane Width	Yes	Use pavement markings to reduce lane widths of this section of Burhans from existing 14 ft to proposed 11 ft to function as a self enforcing speed limit reduction measure, provide positive guidance and allow room for road diet features	Short Term	$5,500 - $7,000
Burhans Blvd near RR Overpass	Guiderail and Barrier Delineators	Yes	Enhance delineation at this curve by installing guiderail and barrier delineators on entire length of existing guiderail and bridge barrier	Short Term	$4,000 - $5,500
Burhans Blvd South of Mitchell Ave	Update Speed Limit Sign	No	Replace existing 35 MPH speed limit sign with a 25 MPH speed limit sign to match existing speed limit identified in state record	Short Term	$1,500 - $2,000
Mitchell Ave/ Park Ln Intersection	Countdown Pedestrian Heads and APS	No	Install pedestrian accommodations meeting current standards at signalized intersection for all four approach legs. Update ADA ramps	Medium Term	$100,000 - $125,000
Pennsylvania Ave Intersection	Countdown Pedestrian Heads and APS	No	Install pedestrian accommodations meeting current standards at signalized intersection. Update ADA ramps. Revise traffic signal phasing to accommodate stopping free flow right turn lane if pedestrian actuation is activated for this crossing	Medium Term	$100,000 - $125,000
Pennsylvania Ave Intersection	Roundabout	Yes	Install roundabout to overcome skewed intersection flow challenges, pedestrian accommodation challenges, and insufficient storage length of connector to accommodate larger vehicles	Long Term	$3,500,000 - $4,500,000

Washington Street Countermeasures

Location	Countermeasure	FHWA Proven Safety Countermeasure	Countermeasure Description	Implementation Horizon	2024 Planning Level Costs
Length of Corridor	Traffic Signal Coordination	No	Revise traffic signal timing to provide coordination to correspond with speed limit, progression speed and queue clearance based on time of day traffic volumes and turning movements	Short Term	$65,000 - $85,000
	Bicycle Lanes	Yes	Reconfigure lanes and pavement markings to provide bike lanes through urban section, widen or add multiuse path east of Lincoln Drive	Long Term	$1,400,000 - $1,700,000
	High Visibility Crosswalks	Yes	Install high visibility crosswalks on all side streets and at uncontrolled crossings of Washington St. at selected intersections. Add pedestrian signing for Washington St uncontrolled crosswalks	Short Term	$135,000 - $170,000
	Trim Vegetation	No	Trim streetscape and other vegetation/foliage currently obscuring signs and route markers	Short Term	$15,000 - $20,000
Length of Corridor from Lincoln Drive to Hollywood Drive	Access Management	Yes	Reduce number of driveways and reduce width of many existing driveways. Construct additional curb line to improve driveway delineation as necessary. Revise driveway skews where possible.	Long Term	$350,000 - $425,000
	Edge line Striping in Curbed Sections	No	Install edge line pavement markings (solid past driveways and skips past public side streets) to define and reduce travel lane width and bring awareness to edge of travel lane for vehicles entering from driveways. Reduce speeds by contextual changes and lane width reduction	Short Term	$4,000 - $5,000
	Walkways	Yes	Provide pedestrian accommodation on both sides of the roadway. Add sidewalk on north side, fill sidewalk gaps/provide sidewalk continuity on south side	Long Term	$4,000,000 - $5,000,000
	Remove Sight Distance Obstructions	No	Trim or relocate vegetation and landscaping (bushes) and relocate electric boxes/utilities to provide sufficient sight distance of oncoming vehicles for all driveway accesses	Medium Term	$100,000 - $150,000
All Signalized Intersections	Retroreflective Backplates	Yes	Install backplates with retroreflective borders on all vehicular traffic signal heads	Short Term	$25,000 - $35,000
	Audible Pedestrian Signals (APS)	No	Add APS pedestrian detection/pushbuttons at all signalized intersections with pedestrian crosswalks	Medium Term	$150,000- $200,000
All Signalized Intersections North of Lincoln Drive	Flashing Yellow Arrow (FYA)/ Time of Day Operation	No	Install FYA left turn traffic signal heads at all approaches with dedicated left turn lanes. Update traffic signal timing and phasing accordingly. Investigate running time of day variable mode phasing	Medium Term	$90,000 - $120,000
	Add Overhead Street Name Signs	No	Install overhead street name signs to assist unfamiliar motorists with navigation and provide positive guidance. Reduce motorist indecision	Short Term	$25,000 - $30,000
George St Intersection	High Visibility Crosswalks	Yes	Install high visibility crosswalks over ornamental brick crosswalks	Short Term	$10,000 - $15,000
Mildred St Intersection	Countdown Pedestrian Signals and APS	No	Install pedestrian accommodations meeting current standards at signalized intersection for all four approach legs.	Medium Term	$70,000 - $90,000
Alla Willa Dr Intersection	Crosswalk Visibility Enhancements	Yes	Install crosswalk visibility enhancements such as high visibility pavement markings, pedestrian signing, and illumination to bring attention to this suburban uncontrolled pedestrian crossing	Medium Term	$90,000 - $120,000
	RRFB	Yes	Install RRFB to bring additional attention to location of unexpected pedestrian crossing to motorists	Medium Term	$80,000 - $110,000

Washington Street Countermeasures					
Location	**Countermeasure**	**FHWA Proven Safety Countermeasure**	**Countermeasure Description**	**Implementation Horizon**	**2024 Planning Level Costs**
Jefferson Ave Intersection	Access Management	Yes	Reduce /channelize tobacco shop driveway so that there is no unsignalized access to center area of intersection. Driveway entrance should be located as far south on property as possible. If some portion of driveway remains within the 'intersection, it should be signalized. Build new curb line on southwest quadrant and delineate parking area/driveways for Tire Center/business on that quadrant. On southeast corner, close two 7-11 driveways closest to intersection on both Washington St and Jefferson Ave. (leaving one driveway on each road for continued access to that business)	Long Term	$250,000 - $300,000
Hollywood Dr / Prospect Ave Intersection	Pedestrian Refuge Island/ Medians	Yes	Widen/realign/reconstruct to provide pedestrian refuge and physical medians on Washington St and Hollywood Dr. Will reduce crossing distance for pedestrians and provide positive guidance for potential wrong way motorists	Long Term	$1,350,000 - $1,700,000
	Auxiliary Supplemental Signal Heads	No	Install supplemental signal heads for Hollywood Dr approach to address sharp curve and lack of visibility of signal for that approach to the signalized intersection	Medium Term	$7,000 - $9,000
	Advance SIGNAL AHEAD Warning Sign	No	Install SIGNAL AHEAD warning sign for Hollywood Dr approach to address sharp curve and lack of visibility of signal for that approach to the signalized intersection. (Per MUTCD)	Short Term	$1,500 - $2,000
	Add Overhead Street Name Signs	No	Install overhead street name signs to assist unfamiliar motorists with navigation and provide positive guidance. Include Route Number information for high proportion of visiting motorists. (or add route assembly on side street approaches) Reduce motorist indecision	Short Term	$8,000 - $10,000
	Countdown Pedestrian Heads and APS	No	Install pedestrian accommodations meeting current standards at signalized intersection for all four approach legs. Update ADA ramps	Medium Term	$70,000 - $90,000
	ADA Ramps	No	Install concurrent with pedestrian upgrade	Medium Term	$80,000 - $100,000
	Install High Visibility Crosswalks	Yes	Install concurrent with pedestrian upgrade	Medium Term	$18,000 - $25,000
Flowing Springs Rd Intersection	Update Pavement Markings	No	Confirm stop bars a required to be placed so far back on Hollywood Dr and Washington St approaches. Intersection lacks positive guidance through large expanse of unmarked pavement. Relocate stop bars closer to crossing travelways if possible.	Short Term	$7,000 - $9,000
	Pedestrian Refuge Island/ Medians	Yes	Add median/pedestrian refuge island on west leg of Washington St, reduce radius of Flowing Springs to WB Washington St and eliminate channelized right turn, bring right turn lane to stop bar. Build channelizing island with ADA ramps as pedestrian refuge on NE corner. Provide pedestrian crossings across north leg, west leg and south leg. Prohibit pedestrian crossings on east leg.	Long Term	$850,000 - $1,100,000
	Update Lane Drop Pavement Markings and Signing	No	Update Flowing Springs right turn lane drop pavement markings and signing , and WB Washington St approach lane drop to meet MUTCD guidance	Short Term	$15,000 - $18,000
	Update Signing	No	Add a route marker assembly with guidance for all nearby numbered route on Flowing Springs Way approach/connector north of Willow Spring Dr	Short Term	$1,500 - $2,000

Washington Street Countermeasures					
Location	**Countermeasure**	**FHWA Proven Safety Countermeasure**	**Countermeasure Description**	**Implementation Horizon**	**2024 Planning Level Costs**
Flowing Springs Way Intersection	Update Pavement Markings	No	Add pavement markings on all Willow Spring Dr and Flowing Springs Way approaches to this intersection to provide positive guidance. Include double yellow and stop bars	Short Term	$5,000 - $6,000
	Access Management	Yes	Close closest Walgreens driveway to intersection, widen remaining driveway for two way traffic. Reconfigure frontage road (Willow Spring Dr) Burger King driveway closest to intersection to "enter only'. Revise curb lines to make the access management changes clear	Long Term	$70,000 - $90,000

Edwin Miller Boulevard Countermeasures					
Location	**Countermeasure**	**FHWA Proven Safety Countermeasure**	**Countermeasure Description**	**Implementation Horizon**	**2024 Planning Level Costs**
Length of Corridor	Traffic Signal Coordination	No	Revise traffic signal timing to provide coordination to correspond with speed limit, progression speed and queue clearance based on time of day traffic volumes and turning movements	Short Term	$60,000 - $75,000
	Bicycle Lanes	Yes	Add a multiuse path or widen roadway to provide bike lanes along length of corridor	Long Term	$2,800,000 - $3,600,000
	Walkways	Yes	Add a multiuse path or add sidewalks along length of corridor	Long Term	$2,800,000 - $3,600,000
	STOP Sign Size, Reflective Strips, and Stop Bars	Yes (partial)	Increase STOP sign size, add reflective strip and stop bars at all stop controlled side streets and major driveways	Short Term	$70,000 - $90,000
All New and Existing Signalized Intersections	Retroreflective Backplates	Yes	Install backplates with retroreflective borders on all vehicular traffic signal heads	Short Term	$22,000 - $27,000
	High Visibility Crosswalks	Yes	Install continental /high visibility crosswalks at all crosswalks on all legs of each signalized intersection	Short Term	$80,000 - $100,000
	Countdown Pedestrian Heads and APS	No	Install pedestrian accommodations meeting current standards at signalized intersection for all four approach legs. Update ADA ramps if necessary to provide access to APS push buttons	Medium Term	$525,000 - $650,000
	Flashing Yellow Arrow(FYA)/ Time of Day Operation	No	Install FYA left turn traffic signal heads at all approaches with dedicated left turn lanes. Update traffic signal timing and phasing accordingly. Investigate running time of day variable mode phasing	Medium Term	$300,000 - $375,000
	Add Overhead Street Name Signs	No	Install overhead street name signs to assist unfamiliar motorists with navigation and provide positive guidance. Reduce motorist indecision	Short Term	$28,000 - $35,000
Eagle School Rd Intersection	Advance SIGNAL AHEAD Warning Sign	No	Install SIGNAL AHEAD warning sign for curved approaches on Eagle School Rd, Eclipse Court, and Edwin Miller Blvd NB (Per MUTCD)	Short Term	$1,500 - $2,000
Edwin Miller Blvd North of RR Bridge	Relocate Route Marker Assembly	No	Relocate Route Marker Assembly northward and out of merge area. Will not detract attention from merge, and will provide more positive guidance relocated to the north. (Switch locations with speed limit sign)	Short Term	$3,000 - $4,000
Raleigh St / Williamsport Pike Intersection	Add Skip Lines and Arrows	No	Revise markings for Raleigh St and Williamsport Pike turn lanes and through lanes to clearly indicate primary through 'path'. Add turn arrows and skip lines in left turn lane at decision point (farther upstream in lanes) on Williamsport Pike. Add skip lines to right turn lane drop on Raleigh St approach (MUTCD Figure 3B-10b)	Short Term	$7,000 - $9,000
Edwin Miller Blvd near Courthouse Square	Update Edge line Striping	No	Revise pavement markings for right turn lane to clearly indicate turn lane ends at each driveway. Provide an edge line radius out of each driveway at Old Courthouse and Courthouse Square driveways to clearly terminate forward movement of vehicles in right turn bays (lanes)	Short Term	$500 - $1,000
Old Courthouse Square Driveway Intersection	Eliminate Multi-lane at Stop Control	No	Revise Old Courthouse Square Driveway exit pavement markings to eliminate two separate turn arrows. Revise markings to indicate one lane only, so exiting vehicles are not sight obstructed from adjacent exiting lane.	Short Term	$2,500 - $3,000
Meridian Pkwy / District Way Intersection	Realign and Restripe	No	Realign and restripe side streets so that straight thru movements are not directed into opposing oncoming lanes	Medium Term	$75,000 - $95,000
Mid Atlantic Pkwy /Mcmillan Ct Intersection	Ramp Preemption	No	Add detection and revise signal operation to add ramp preemption for I-81 NB off-ramp onto Edwin Miller Blvd SB. This will allow the signal operation to clear any backups which may develop on I-81 NB as a result of congestion at the signal.	Medium Term	$130,000 - $160,000

Edwin Miller Boulevard Countermeasures					
Location	**Countermeasure**	**FHWA Proven Safety Countermeasure**	**Countermeasure Description**	**Implementation Horizon**	**2024 Planning Level Costs**
Edwin Miller Blvd North of Mid Atlantic Pkwy /Mcmillan Ct Intersection	Update Entrance Ramp Pavement Marking and Signing	No	Update entrance ramp (I-81 NB off-ramp onto SB Edwin Miller Blvd) to follow MUTCD Figure 3B-10 guidance with extended solid white gore line and dotted extension lines.	Short Term	$3,000 - $4,000
	Update Lane Drop Pavement Marking and Signing	No	Update pavement markings for left lane drop (on SB Edwin Miller Blvd) to meet MUTCD Figure 3B-12. Update lane drop signing per MUTCD	Short Term	$7,000 - $9,000
	Update Cloverleaf Interchange Exit Ramp Gore Signing	No	Update exit ramp from NB Edwin Miller onto I-81 guide signing to provide more typical cloverleaf interchange signs per MUTCD Figure 2D-19 (particularly the gore signing. (size and color for visibility)	Short Term	$45,000 - $55,000
Mid-Atlantic Pkwy and Warm Springs Ave Intersection	Reconfigure Intersection	No	Reconfigure /restripe Warm Springs Ave and Mid-Atlantic Pkwy intersection so that Mid-Atlantic Parkway is the free-flowing primary roadway through the intersection and Warm Springs Ave is the stop controlled. Should reduce backups through the Edwin Miller intersection caused by left turns from the Edwin Miller intersection heading toward Mid Atlantic not being able to turn through the queued Warm Springs alignment. Rename roadway at Edwin Miller Blvd signal to Mid-Atlantic Parkway.	Short Term	$12,000 - $16,000

Winchester Avenue Countermeasures					
Location	**Countermeasure**	**FHWA Proven Safety Countermeasure**	**Countermeasure Description**	**Implementation Horizon**	**2024 Planning Level Costs**
Length of Corridor (Winchester Ave and King St)	Traffic Signal Coordination	No	Revise traffic signal timing to provide coordination to correspond with speed limit, progression speed and queue clearance based on time of day traffic volumes and turning movements	Short Term	$60,000 - $75,000
	Update Side Street Intersection Signing and Pavement Marking	No	Update to provide MUTCD recommended ONE WAY signing or add double yellow centerline pavement marking and Stop bars as applicable on all side streets	Short Term	$1,500-$2,000 / intersection
	Sidewalk and ADA Continuity	Yes	Complete sidewalk gaps and ADA compliant driveway crossing features through existing sidewalk areas	Medium Term	$400,000 - $500,000
	STOP Sign Size, Reflective Strips, and Stop Bars	Yes (partial)	Increase STOP sign size, add reflective strip and stop bars at all stop controlled side streets and major driveways	Short Term	$60,000 - $75,000
	High Visibility Crosswalks	Yes	Install high visibility crosswalks on all side streets and at uncontrolled crossings of Winchester Ave. Add pedestrian signing for Winchester Ave uncontrolled crosswalks	Short Term	$55,000 - $70,000
Length of Corridor (Winchester Ave)	Road Diet (Roadway Reconfiguration)	Yes	Adjust curb line and striping as necessary to provide ADA compliant sidewalk on both sides of Winchester Ave, eliminate curbside parking and provide bike lanes.	Long Term	$8,500,000 - $11,000,000
	Bicycle Lanes	Yes	Include Bicycle Lanes with Road Diet	Long Term	Included
	Edge line Striping in Curbed Sections	No	Install edge line pavement markings (solid past driveways and skips past public side streets) to define and reduce travel lane width and bring awareness to edge of travel lane for vehicles entering from driveways. Reduce speeds by contextual changes and lane width reduction	Short Term	$10,000 - $13,000
All Signalized Intersections	Retroreflective Backplates	Yes	Install backplates with retroreflective borders on all vehicular traffic signal heads	Short Term	$19,000 - $24,000
	Leading Pedestrian Interval (LPI)	Yes	Retime/rephase traffic signals at intersections with heavier pedestrian volumes to provide a leading pedestrian interval of 3 to 6 seconds for pedestrian actuations	Short Term	$100,000 - $125,000
	Flashing Yellow Arrow(FYA)/ Time of Day Operation	No	Install FYA left turn traffic signal heads at all approaches with dedicated left turn lanes. Update traffic signal timing and phasing accordingly. Investigate running time of day variable mode phasing	Medium Term	$200,000 - $250,000
	Add Overhead Street Name Signs	No	Install overhead street name signs to assist unfamiliar motorists with navigation and provide positive guidance. Reduce motorist indecision	Short Term	$27,000 -$34,000
Mall Dr Intersection	Adjust Pedestrian Head	No	Adjust pedestrian head on south side of roadway to face pedestrians crossing Winchester Ave	Short Term	$1,500 - $2,000
	Add SIGNAL AHEAD Warning Sign	No	Install SIGNAL AHEAD warning sign for curved approach on Mall Dr (Per MUTCD)	Short Term	$1,500 - $2,000
	Signalize Driveway Approach Within Intersection	No	Update traffic signal to provide detection, phasing and signal heads for the driveway. The Winchester Ave Elementary School driveway is within the signalized intersection and as such is required by MUTCD guidelines to be signalized. Also provide pedestrian indications for crossing driveway	Medium Term	$60,000 - $75,000
Mall Dr Connector	Access Management - Close Driveway	No	Close Shopping Center Driveway at end of Mall Dr connector. Rework curb line at connector tie in to Winchester Ave to reinforce one-way flow by geometric changes and discourage 'sneakers'	Long Term	$90,000-$110,000
	Access Management - Close Mall Dr Connector	No	Close Mall Dr connector. Doe not appear to be a needed access or ROW. Adjacent properties all have other access points	Long Term	$230,000 - $290,000

Winchester Avenue Countermeasures					
Location	**Countermeasure**	**FHWA Proven Safety Countermeasure**	**Countermeasure Description**	**Implementation Horizon**	**2024 Planning Level Costs**
John St Intersection	Access Management - Tire Driveway	Yes	Reduce /channelize tire business driveway on south side of intersection so that there is no unsignalized access to center area of intersection. Driveway entrance should be located as far north on property as possible. If some portion of driveway remains within the 'intersection', it should be signalized	Long Term	$85,000 - $100,000
	Update Traffic Signal	No	Update traffic signal configuration, signal heads, and phasing if tire business driveway remains within intersection and requires a signalized phase	Long Term	$60,000 - $75,000
Winchester Ave and King St Intersection	Update Signing	No	Post NO PEDESTRIAN signing on Eastern leg of intersection since no provision for pedestrians has been included with the traffic signal operation across this leg	Short Term	$2,500 - $3,000
	Rebuild / Reconfigure Intersection	No	Study / reevaluate why left turns are prohibited at this intersection. Consider effect on cut through traffic at other preceding intersections with local streets. Consider effect on pedestrian expectation and indecision here and at John St. Reconfigure and reconstruct approach angle to allow better left turn turning movements.	Long Term	$13,000,000 - $16,500,000
King St and Queen St Intersection	Trim Vegetation	No	Trim vegetation and foliage in advance of overhead signing on EB King St. overhead sign legends are obstructed by tree foliage	Short Term	$2,500 - $3,000
	High Visibility Crosswalks	Yes	Install high visibility crosswalks over ornamental brick crosswalks	Short Term	$14,000 - $18,000

Virginia Avenue Countermeasures

Location	Countermeasure	FHWA Proven Safety Countermeasure	Countermeasure Description	Implementation Horizon	2024 Planning Level Costs
Length of Corridor	Road Diet / Roadway Reconfiguration	Yes (partial)	Reconfigure or Reconstruct roadway /widen roadway to provide a center turn lane, add bicycle lanes and walkways/sidewalk or shared use path	Long Term	$40,000,000 - $50,000,000 (Full Configuration) ---------- $550,000 - $700,000 (Center Turn Lane Reconfiguration Only)
	Bicycle Lanes	Yes	Include Bicycle Lanes with roadway reconfiguration	Long Term	Included
	Walkways	Yes	Include walkways with roadway reconfiguration	Long Term	Included
	Eliminate Bypass Lanes	No	Eliminate bypass lanes at intersections, as this can encourage higher travel speeds. Maintain right turn bays or develop left turn lanes, depending on turning movement volumes	Short Term	$30,000 - $40,000
	Eliminate Passing Zones	No	Eliminate passing zones along this highly developed arterial. Passing encourages higher travel speeds	Short Term	$8,000 - $10,000
	High Visibility Crosswalks	Yes	Install high visibility crosswalks at all side streets that have sidewalks	Short Term	$45,000 - $55,000
All Signalized Intersections	Retroreflective Backplates	Yes	Install backplates with retroreflective borders on all vehicular traffic signal heads	Short Term	$18,000 - $23,000
	High Visibility Crosswalks	Yes	Install continental /high visibility crosswalks at all crosswalks on all legs of each signalized intersection	Short Term	$45,000 - $55,000
	Flashing Red Arrow(FRA)/ Time of Day Operation	No	Install FRA left turn traffic signal heads at all approaches with dedicated left turn lanes. Update traffic signal timing and phasing accordingly. Investigate running time of day variable mode phasing	Medium Term	$180,000 - $225,000
Virginia Ave South of Governor Lane Blvd	Update Lane Drop Pavement Markings and Signing	No	Update Virginia Ave left turn lane drop pavement markings and signing to meet MUTCD guidance	Short Term	$55,000 - $70,000
	Post NO PARKING	No	Post no parking on shoulder adjacent to and in vicinity of I-81 ramp merge area and lane drop area (i.e. south of Governor Lane Blvd). Shoulder provides escape buffer for vehicle conflict areas	Short Term	$5,500 - $7,000
Governor Lane Blvd Intersection	Eliminate Channelized Right Turn Lane	No	Eliminate channelized right turn lane and associated YIELD condition to facilitate safer pedestrian accommodation . Relocate traffic signal support/mast arm	Long Term	$625,000 - $790,000
	Add Overhead Street Name Signs	No	Install overhead street name signs to assist unfamiliar motorists with navigation and provide positive guidance. Reduce motorist indecision	Short Term	$5,500 - $7,000
	Countdown Pedestrian Heads and APS	No	Install pedestrian accommodations meeting current standards at signalized intersection for all four approach legs. Update ADA ramps if necessary to provide access to APS push buttons	Medium Term	$150,000 - $185,000
	Upgrade Traffic Signal	No	Upgrade traffic signal to install Pedestal mounted far side signal heads to provide for placement of both primary Governor Lane Blvd traffic signal heads to be greater than 40 ft from the stop bar as recommended in the MD MUTCD Section 4D.14. Also	Medium Term	$35,000 - $45,000
	Replace 5-Section Signal Heads	No	Replace existing non-compliant 5-section traffic signal heads with compliant 5-section traffic signal heads (or update to FYR traffic signal heads and phasing)	Short Term	$5,500 - $7,000

Virginia Avenue Countermeasures

Location	Countermeasure	FHWA Proven Safety Countermeasure	Countermeasure Description	Implementation Horizon	2024 Planning Level Costs
Virginia Ave from Dollar General Driveway to Massey Blvd	Access Management	Yes	Limit allowable movement at Decker Ave and adjacent driveways along Massey Blvd left turn lane to right-in right-out with signing and property owner/business coordination	Short Term	$12,000 - $16,000
	Medians and Pedestrian Refuge Islands	Yes	Construct a median to prevent cross traffic turning. Provide a pedestrian refuge at intersection	Long Term	$475,000 - $600,000
Massey Blvd Intersection	Update 5-Section Signal Heads	No	Replace existing non-compliant 5-section traffic signal heads with compliant 5-section traffic signal heads (or update to FYR traffic signal heads and phasing)	Short Term	$3,000 - $4,000
	Eliminate Bypass Lane	Yes	Eliminate Bypass Lane, Keep right turn lane but increase turning radius of northwest corner to prevent overrunning of sidewalk/ADA ramp and damage to traffic signal equipment. Rebuild curb line, sidewalk and ADA ramps. Relocate traffic signal pole. Also then Install pedestrian accommodations across southern leg Virginia Ave following Massey Blvd incoming sidewalk. Includes countdown pedestrian signal heads, APS pedestrian detection, high visibility crosswalks, ADA ramps and traffic signal phasing	Long Term	$175,000 - $220,000
Halfway Blvd Intersection	Countdown Pedestrian Heads and APS	Yes	Provide pedestrian accommodation across all four legs of the intersection. Add APS pedestrian detection, countdown pedestrian signal heads, high visibility crosswalks, and ADA ramps. Revise traffic signal timing accordingly	Short Term	$160,000 - $200,000
	Medians and Pedestrian Refuge Islands	Yes	Install medians/ pedestrian refuge islands on all four approaches of sufficient width (minimum 6 ft) to function as a pedestrian refuge. Reduce clearance time for pedestrian crossings, add pedestrian detection and countdown pedestrians signal heads to islands. Revise traffic signal timing accordingly	Long Term	$1,250,000 - $1,600,000
	Access Management - Close Driveway	Yes	Close PNC Bank Driveway onto Halfway Blvd to eliminate cut through traffic from Virginia Ave through AutoZone/ Board of Elections parking lot.	Long Term	$50,000 - $65,000
	Update 5-Section Signal Heads	No	Replace existing non-compliant 5-section traffic signal heads with compliant 5-section traffic signal heads (or update to FYR traffic signal heads and phasing)	Short Term	$11,000 - $14,000
	Eliminate Multi-lane at Stop Control	No	Revise AutoZone/ Board of Elections Driveway exit pavement markings to eliminate two separate turn arrows. Revise markings to indicate one lane only, so exiting vehicles are not sight obstructed from adjacent exiting lane.	Short Term	$5,000 - $6,000
	Update Lane Drop Pavement Markings and Signing	No	Revise pavement markings and add signing to more clearly identify the right turn lane bay approaching Halfway Blvd on SB Virginia Ave and to clearly convey that the edge line striping beginning at Greenberry Rd is not a travel lane nor part of the turn bay. Provide advance street name signing and lane designation signs	Short Term	$7,000 - $9,000
Virginia Ave North of Halfway Blvd	Rectangular Rapid Flashing Beacons	Yes	Install high visibility crosswalks with RRFBs and pedestrian signing across Virginia Ave at intermittent intersections with pedestrian friendly spacing	Medium Term	$80,000-$100,000 / Location

APPENDIX C

Technical Memorandums

Memorandum

Date: February 5, 2024

To: Matt Mullenax and Michaela McDonough, HEPMPO

From: Tory Gibler and Nicole Waldheim, Fehr & Peers

Subject: HEPMPO Regional Safety Action Plan – High Injury Network Development

DC23-0116

Introduction

Between 2018 and 2022, 154 traffic fatalities occurred in the Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) region on non-interstate roadways, 25 of which involved a person walking, and 25 of which involved a person riding a motorcycle. No bicycle fatalities occurred during the study timeframe. In addition to the people who died in non-interstate traffic crashes, another 567 people sustained incapacitating injuries.

To understand where and why crashes that result in fatalities and serious injuries are most likely to occur and how to reduce the severity and frequency of these crashes, HEPMPO is preparing a Regional Safety Action Plan, rooted in the core elements of the Safe System Approach (SSA). The overall purpose of the Action Plan is to identify projects, programs and strategies that will eliminate fatalities and serious injuries on the roadways within the region and allow the region and local jurisdictions to apply for the next round of funding through the Safe Streets for All (SS4A) grant program and other safety related grant programs.

This memo summarizes the methodology to develop a high injury network (HIN) for HEPMPO. The HIN is a collection of roadways where a disproportionate number of collisions that result in someone being killed or severely injured (KSI) occur. Together, these collision types are referred to as KSI collisions throughout this memo.

The identification of the HIN will help inform the types of projects and actions to include in the Action Plan.

The following describes the data sources that were used and explains the methodology employed by Fehr & Peers to develop the HIN.

Data Inputs

Roadway Network

The roadway network that served as the basis for this analysis was obtained from the Replica, which is a land use and transportation platform built upon Open Streets Map and usable across GIS mapping platforms. Preparation of the initial HIN excluded all non-limited access facilities in the network (e.g., interstates such as I-70, I-81, I-68, and private roads).

Collision Dataset

The analysis was completed based on collision data reflective of 2018 to 2022 for the HEMPOM region, compiled from individual datasets downloaded from the West Virginia Department of Transportation (WVDOT) and the Maryland Department of Transportation (MDOT) crash portals in the Fall of 2023.

All collision data was mapped based on the geolocation associated with each crash record, which revealed some crashes with incomplete or incorrect information, such as crashes that did not actually occur in the region. After removing incorrectly geolocated collisions (i.e., those not actually located within the region), a total of 23,279 collisions, including 152 that resulted in a fatality, 561 that resulted in a severe injury, 5,596 that resulted in some injury, and 16,970 that resulted in no injury are considered in the analysis.

Collision Severity Weighting

The Safe System Approach framework aims to eliminate all serious and fatal injury crashes on roadways within HEPMO. This approach recognizes that while it is not feasible to prevent all crashes, implementation of safe system strategies can reduce the severity of crashes. To prioritize efforts at locations where crashes result in a fatality or severe injury, KSI crashes were assigned a weight factor. As presented in **Table 1**, collision weights are derived from comprehensive crash costs (2021 USD) from the West Virginia Department of Transportation, with the

Highway Safety Manual (HSM) Equivalent Property Damage Only (EPDO) weighting applied.

Comprehensive crash costs include both economic costs and monetized pain and suffering costs. Economic costs are monetary costs associated with emergency services deployment, medical services, productivity loss due to victim injury, insurance, and legal costs, cost associated congestion impacts because of the collision, and property damage costs. Monetized pain and suffering costs are an assumption of the costs associated with lost quality-of-life (or Quality-Adjusted Life Years), accounting for reductions in life expectancy and quality of life changes because of a crash.

Application of the EPDO weighting (dividing the cost of each crash type by the cost of a property damage only crash) approach results in different crash types receiving a different weight factor. As shown in **Table 1**, application of the EPDO weight results in fatal crashes receiving a significantly higher weight which could skew the HIN. In many instances, a crash that results in a severe injury could have been a fatality under slightly different circumstances, such as a victim with underlying health issues. Conversely, a fatal crash involving someone not wearing a seatbelt could have been injury only if the victim was wearing a seatbelt. Consequently, a modified EPDO method was used that groups fatal and serious injury crashes together and groups non-incapacitating injuries together. This approach has been used by peer agencies. The approach to develop the regional HIN also includes all crashes – given the low weight applied to property damage only crashes, only locations where there is high frequency of crashes would affect the HIN.

Table 1: Crash Costs[1] and EPDO Weight Factors

Severity	Crash Cost	EPDO Weight	Modified EPDO Weight[2]
Fatal (K)	$9,646,300	1,414	**249**
Incapacitating Injury (A)	$552,200	115	
Non-Incapacitating Injury (B)	$177,300	23	**13**
Possibly Injury (C)	$104,800	14	
No Injury (0)	$10,000	1	**1**

1. Source: West Virginia Department of Transportation KABCO Crash Costs

2. Based on an average weighted KA crash cost developed for the HEPMPO Region (Berkeley, Jefferson, and Washington Counties of $2,494,926 for 2018 – 2022 and an average weighted BC crash cost in Berkely, Jefferson, and Washington Counties of $130,713).

Collision Mode Weighting

In addition to applying a weight factor based on the severity of a crash, a weight factor was developed and applied based on the travel mode of crash victims. Review of the data indicates that people walking, bicycling, and riding motorcycles are disproportionately represented in crashes that result in a KSI. Regionally, people outside of vehicles are involved in about 3.7 % of all reported crashes but are involved in 33.1% of all fatal crashes, 30.5% of all KSI crashes and 8.3% of all injury crashes. For the region, the resulting weight factor, based on the proportion of overall crashes involving someone outside a vehicle to crashes that resulted in an injury, is 3. The factor is in-line with weight factors used by other jurisdictions in the development of their HINs.

HIN Development

Sliding Window Approach

The HIN analysis was conducted using a sliding window approach, which uses overlapping windows to account for errors in collision location reporting. For a specific window length, performance measures are calculated for that window along a corridor (e.g., the number of fatal or serious injury collisions multiplied by the mode). The window is shifted along the corridor for a given offset distance and the analysis is repeated for the shifted window. Using this approach, a single location would be evaluated in several different windows, which would account for any inaccuracies inherent within collision location reporting. Windows with the highest values for the segment or facility are identified as candidate HIN locations.

Sliding Window Parameters

A 0.5-mile window length with a 0.125-mile offset distance was chosen for the HIN analysis. Any segment less than 0.5-mile in length was treated as a single segment without any offset shifting.

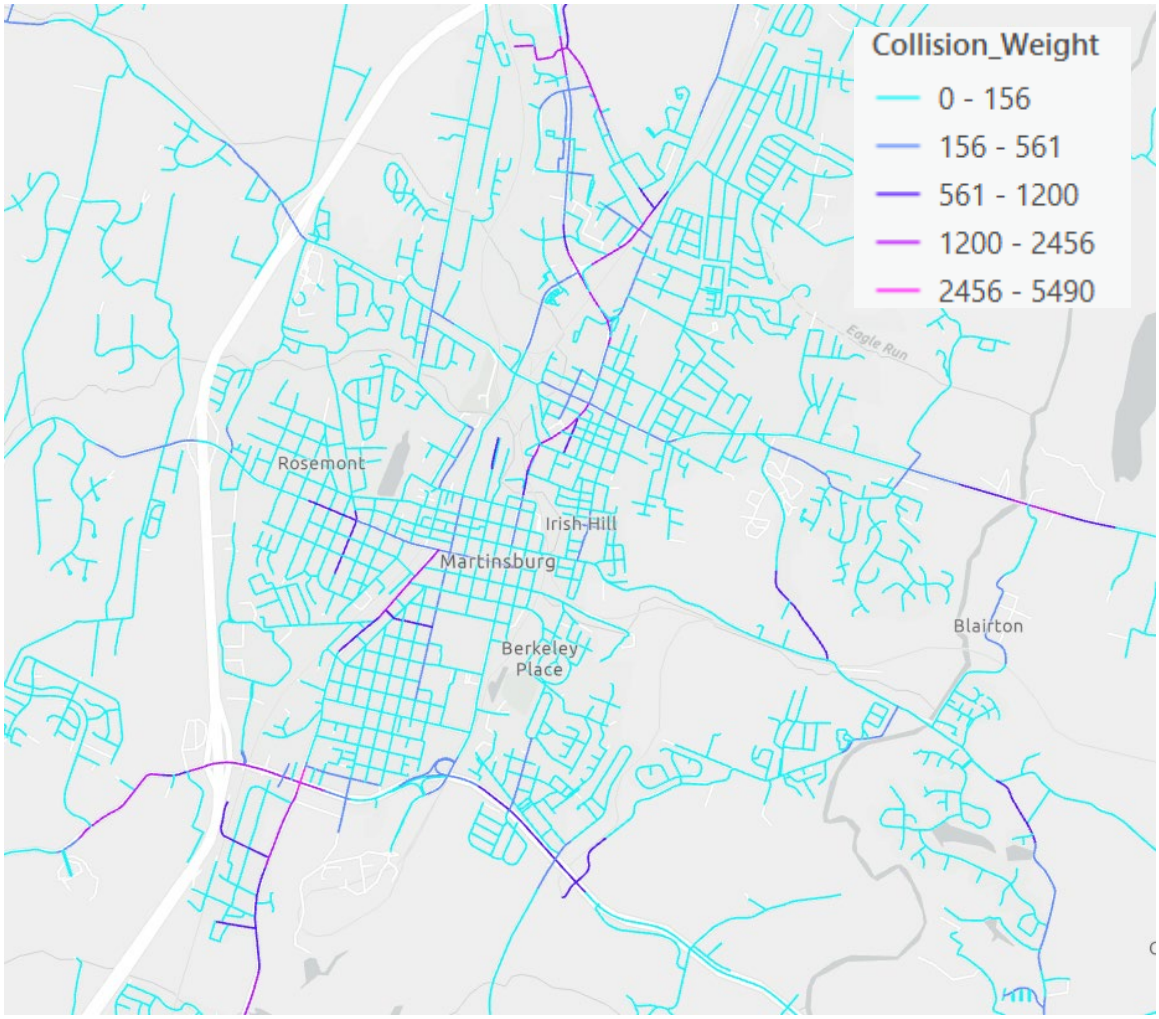
Collision Summary for Each Window

Collisions were summarized for each window using a 120-ft search radius. This radius was chosen by inspecting collision locations relative to the centerline network at various locations throughout the network, including along divided roadways such as Dual Highway. The collision summary for each window consisted of summing all weighted collision values within the search radius. For example, a window with 15 property-damage only, 10 minor injury collisions and 5 KSI collisions within 100 feet would receive a weighted score of 1,390 (15*1+10*13+ 5*249), presuming no pedestrians, bicyclists or motorcyclists were involved. For that same window, if a pedestrian, bicyclist, or motorcyclist was involved in 1 of the 15 property-damage only crashes, 3 of the 10 minor injury collisions and 3 of the 5 KSI collisions, that window would receive a weighted score of 2,964 (14*1+1*3*1+7*17+ 3*3*17+2*317+3*3*317).

HIN Development

After summarizing all collision windows throughout the network, the HIN draft was built using the weighted score of each window. By visualizing the weighted score throughout the network, potential HIN corridors could be identified, as shown on **Figure 1**.

Figure 1: Initial Visualization of Collision Weight Summaries for High Injury Network (Zoomed into Martinsburg)



The HIN draft was built by using the following iterative process, with the goal of achieving a network that accounted for approximately 40-60 percent of the KSI collisions in the region:

1. Select/flag window segments throughout the network with collision weight values above a certain total weight threshold (e.g., 775 as shown on **Figure 1**).
2. Adjacent high-scoring windows (flagged in the previous step) are aggregated into longer corridor segments (greater than 0.5 mile in length) when appropriate.
3. Cleaning/reasonableness check:

a. Some high scoring windows on local roads which intersect with major ones were removed from consideration if it was discovered that the collision score was being skewed by the number of collisions on the major leg of the intersection.
b. Any small gaps (<1/2 mile) in between the aggregated corridor segments in step 2 were added to the draft HIN for continuity.

HIN and HIN Statistics

The resulting high injury network can be viewed on the HEPMPO SAP Data Map, under the "Draft High Injury Network" tab. HEPMPO contains about 3,438 centerline miles. Crashes that occur on the HIN segments account for 43 percent of all KSI crashes in the region. 76 percent of pedestrian KSI, 64 percent of bicyclist KSI, and 69 percent of motorcyclist KSI crashes also occur on these roadways, as summarized in **Table 2**.

Table 2: HEPMPO HIN Statistics

	All Roadways*	Draft All Roadways HIN	HIN % All Roadways
Centerline miles	3,438	113	3%
All collisions**	23,279	7,495	32%
KSI (All modes)	713	306	43%
Ped KSI	86	65	76%
Bike KSI	11	7	64%
Motorcycle KSI	127	88	69%

Source: Replica, Fehr & Peers.
Notes: * All roads in Replica dataset excluding limited access (interstate, privates roads, tolls, etc)
**Collisions within 120' of network

A total of 133 road segments exist on the draft HEPMPO HIN. Each segment will be scored and ranked based on safety score within each segment (e.g. the sum of each collision severity multiplied by the crash mode).

Next Steps

After the HIN is finalized, including the scoring of each segment, the priority corridors will be identified. Crash profiles will be developed based on priority corridors and overall crash trends across the region.

Findings from the HIN and the crash profiles will be highlighted and included in the HEPMPO Regional Safety Action Plan. The HIN and crash profiles will inform potential countermeasures identification and action items recommendations in the final Regional Safety Action Plan.

Memorandum

Date: March 1, 2024

To: Matt Mullenax and Michaela McDonough, HEPMPO

From: Tory Gibler and Nicole Waldheim, Fehr & Peers

Subject: HEPMPO Regional Safety Action Plan – Crash Trends and Contextual Analysis

DC23-0116

Introduction

Between 2018 and 2022, 154 fatal crashes occurred in the Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) region on non-interstate roadways, 25 of which involved a person walking, and 25 of which involved a person riding a motorcycle. No bicycle fatalities occurred during the study timeframe. In addition to the people who died in non-interstate traffic crashes, another 567 severe injury crashes occurred.

To understand where and why crashes that result in fatalities and serious injuries are most likely to occur and how to reduce the severity and frequency of these crashes, HEPMPO is preparing a Regional Safety Action Plan, rooted in the core elements of the Safe System Approach (SSA). The overall purpose of the Action Plan is to identify projects, programs and strategies that will eliminate fatalities and serious injuries on the roadways within the region and allow the region and local jurisdictions to apply for the next round of funding through the Safe Streets for All (SS4A) grant program and other safety related grant programs.

This memo summarizes the fatality crash rate and the methodology to analyze the crash data, identify trends in the data, and complete a contextual analysis to understand the characteristics of roads where a disproportionate number of collisions that result in someone being killed or severely injured (KSI) occur. Together, these collision types are referred to as KSI collisions throughout this memo. The contextual analysis methodology consists of a series of high-level descriptive summary tables to capture relationships between collision data and contextual variables, like posted speed limit. These tables explore overall crash trends and patterns that can be used to guide the selection

of other variables warranting deeper analysis, new road behavior programs, policy changes, or the selection of safety countermeasures for project development. The report is organized as follows:

1. Key Findings
2. Methodology and Data Sources
3. Fatal Crash Rate
4. Crash Trends
5. Contextual Analysis

Key Findings

- Between 2018 and 2022, about 30 crashes per year resulted in a fatality on non-interstate roadways within the HEPMPO, and another 113 crashes on average resulted in a severe injury. This means nearly 3 crashes per week resulted in a fatality or severe injury on roadways within the region.
- Overall, motor vehicle collisions comprise most of the collisions in the MPO, but collisions involving people walking, biking, or riding a motorcycle have a disproportionately higher chance of resulting in crash where someone is killed or severely injured (KSI).
- Single vehicle and rear end collisions are the most common, but single vehicle and head-on collisions are the most common when the collision resulted in a KSI.
- There may be crash report data limitations to understanding the most common collision type where bicycle and pedestrians are involved, specifically regarding single vehicle reports and how collision types are categorized.
- Most crashes did not occur at signalized intersections, and therefore could be at unsignalized intersections or along roadway segments.
- Pedestrian KSI crashes occur at signalized intersections at a higher rate compared to other modes.
- As posted speed limits increase, the proportion of KSI crashes increase in comparison to the total centerline miles in the region. For example, roadways with 50-55 MPH posted speed limits account for only 3% of non-interstate roadways in the region, but account for 10% of KSI non-interstate crashes.
- Most crashes occur outside of Transportation Disadvantaged Community areas, except for bicycle and pedestrian crashes.
- KSI bicycle and pedestrian crashes occur at a higher rate compared to other modes within Transportation Disadvantaged Community areas.
- Most crashes, except for motorcycles, primarily occurred within a local jurisdiction (or municipality) boundary.
- KSI crashes are relatively split between inside and outside local jurisdiction boundaries, except for pedestrian KSI crashes – which primarily occur within local jurisdictions.
- The fatal crash rate, including interstate crashes, per 100,000 people for the region is 11.5, but Berkley County has a higher fatal crash rate of 12.5.

- Single vehicle crashes, head-on crashes, angle crashes (crashes that include two parties colliding at different angles such as turning), and bicycle and pedestrian were identified as the primary crash KSI types across the region.

Methodology and Data Inputs

Roadway Network

The roadway network that served as the basis for this analysis was obtained from Replica, which is a land use and transportation platform built upon Open Streets Map and usable across GIS mapping platforms. Preparation of the crash trends primarily excluded all non-limited access facilities in the network (e.g., interstates such as I-70, I-81, I-68, and private roads).

Collision Dataset

The analysis was completed based on collision data reflective of 2018 to 2022 for the HEPMPO region, compiled from individual datasets downloaded from the West Virginia Department of Transportation (WVDOT) and the Maryland Department of Transportation (MDOT) crash portals in the Fall of 2023.

All non-interstate collision data was mapped based on the geolocation associated with each crash record, which revealed some crashes with incomplete or incorrect information, such as crashes that did not actually occur in the region. After removing incorrectly geolocated collisions (i.e., those not actually located within the region), a total of 23,279 collisions, including 152 that resulted in a fatality, 561 that resulted in a severe injury, 5,596 that resulted in some injury, and 16,970 that resulted in no injury are considered in the analysis.

US DOT Transportation Disadvantage

To understand the impact of the HIN on transportation disadvantaged populations, the US Department of Transportation (DOT) Equitable Transportation Community (ETC) online explorer tool and data was used to understand locations in the region that experience transportation disadvantage. The tool and metric were developed by USDOT to identify communities that experience transportation insecurity through transportation disadvantage. Transportation disadvantage occurs when people are unable to access the needs of their daily life regularly, reliably, and safely. There are five main components of transportation disadvantage with the indicators used to identity communities summarized below:

1. **Transportation Insecurity** occurs when people are unable to get to where they need to go to meet the needs of their daily life regularly, reliably, and safely. Nationally, there are well-established policies and programs that aim to address food insecurity and housing insecurity, but

not transportation insecurity. A growing body of research indicates that transportation insecurity is a significant factor in persistent poverty. This indicator uses measures related to transportation cost burden, access, and safety.

2. **The Environmental Burden** component of the index includes variables measuring factors such as pollution, hazardous facility exposure, water pollution and the built environment. These environmental burdens can have far-reaching consequences such as health disparities, negative educational outcomes, and economic hardship.

3. **Social Vulnerability** is a measure of socioeconomic indicators that have a direct impact on quality of life. This set of indicators measure lack of employment, educational attainment, poverty, housing tenure, access to broadband, and housing cost burden as well as identifying household characteristics such as age, disability status and English proficiency.

4. The **Health Vulnerability** category assesses the increased frequency of health conditions that may result from exposure to air, noise, and water pollution, as well as lifestyle factors such as poor walkability, car dependency, and long commute times.

5. **Climate and Disaster Risk Burden** reflects sea level rise, changes in precipitation, extreme weather, and heat which pose risks to the transportation system. These hazards may affect system performance, safety, and reliability. As a result, people may have trouble getting to their homes, schools, stores, and medical appointments.

Each indicator is comprised of multiple factors. Additional information can be found on the US DOT website: https://www.transportation.gov/priorities/equity/justice40/etc-explorer.

Local Jurisdiction Boundaries

Sixteen local jurisdictions (municipalities) exist within the region. HEPMPO provided a GIS shapefile with the sixteen local jurisdiction boundaries which was used as part of the contextual analysis.

Population Data

The population of each County within the region was pulled from the American Community Survey 5-year estimates for 2022. The population per County was summarized to measure the population for the region.

Analysis

The collision and population datasets were used to measure the fatality rate per 100,000 people per County within HEPMPO and for the entire region. The roadway network, collision dataset, USDOT Transportation Disadvantaged areas, and the local jurisdiction boundary data layers were

analyzed to assess crash trends and contextual impacts. Crash trends reviewed crashes by year, crashes by mode, and crashes by collision type. The contextual analysis reviewed crashes by signalized intersection, posted speed limit, transportation disadvantage area, and local jurisdiction.

Throughout the report, notable findings are highlighted in **green**. Where applicable, a comparative analysis was made between modes (i.e., all modes versus pedestrians and bicyclists) or by severity (i.e., all crashes versus KSI crashes only).

Fatal Crash Rate

As part of the Safe Streets for All (SS4A) Planning and Demonstration Grant criteria, the USDOT has added an additional award selection consideration for the 2024 grant application cycle. The award selection consideration is for applicants that have a fatality rate of 17.0 fatalities per 100,000 persons or greater. USDOT is looking to prioritize funding for communities with high fatality rates through planning and demonstration activities. **Table 1** summarizes the fatality crash rate for the HEPMPO region and for each County for all crashes and for non-interstate crashes.

Table 1: Fatal Crash Rate Per County and Region

	Fatality Crash Rate Per 100,000 People (All Crashes)	Fatality Crash Rate Per 100,000 People (Non-Interstate Crashes)
HEPMPO	11.9	9.5
Berkeley County	13.1	10.2
Jefferson County	12	12
Washington County	10.9	8
Hagerstown, MD	10.5	10.5
Charles Town, WV	23.4	23.4
Martinsburg, WV	2.3	2.3
Ranson, WV	23	23

Source: 2018 – 2022 Maryland Crash Data, 2018 – 2022 West Virginia Crash Data, American Community Survey 2020 5-Year Estimate.

Crash Trends

The following sections summarize non-interstate crash data from 2018 through 2022 to provide statistical trends by year, by mode, severity, and crash type.

Crashes by Year

The number of crashes by year by severity on all non-interstate roads in the region are summarized in **Table 2** for reported crashes from 2018 through 2022. The severity level reflects the maximum injury severity of any crash participant and is reflected as:

- No Injury – crashes where no persons were reported to be injured. Also known as property damage only crashes.
- Possible Injury – crashes where there is a possible injury.
- Minor Injury – crashes where there is a non-incapacitated injury which may or may not require hospitalization.
- Serious Injury – crashes where there is an incapacitating injury, such as burns, lacerations, or broken bones that require hospitalization.
- Fatality – crash results in a fatality.

Table 2: HEPMPO Crashes by Year

	No Injury	Possible Injury	Minor Injury	Severe Injury	Fatality	Total
2018	3,499 (72.8%)	771 (16%)	397 (8.3%)	109 (2.3%)	28 (0.6%)	4,804
2019	3,501 (71.9%)	776 (15.9%)	427 (8.8%)	131 (2.7%)	36 (0.7%)	4,871
2020	3,092 (72.6%)	652 (15.3%)	371 (8.7%)	114 (2.7%)	32 (0.8%)	4,261
2021	3,458 (74.2%)	670 (14.4%)	409 (8.8%)	100 (2.1%)	26 (0.6%)	4,663
2022	3,420 (73.1%)	727 (15.5%)	396 (8.5%)	107 (2.3%)	30 (0.6%)	4,680
Total	16,970 (72.9%)	3,596 (15.4%)	2,000 (8.6%)	561 (2.4%)	152 (0.7%)	23,279

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

In 2018 and 2019, the average number of reported non-interstate crashes was 4,837. In 2020, the number of reported crashes decreased by about 12 percent. This reduction in total crashes, but with a percent increase in fatal or severe injury was likely influenced by the COVID-19 pandemic. The pandemic led to a significant reduction in overall travel for a portion of 2020. This reduction

in travel led to an increase in severe crashes as a proportion of overall crashes as people tended to be driving faster, worsening crash outcomes. During this time, there was also an overall decrease in reporting for non-injury crashes related to social distancing.

Table 3 summarizes KSI crashes per County per year. Washington County typically has twice as many KSI crashes annually in comparison to Jefferson County.

Table 3: HEPMPO KSI Crashes by Year by County

	Berkeley	Jefferson	Washington	Total
2018	45	26	66	137
2019	49	37	81	167
2020	40	35	71	146
2021	42	22	62	126
2022	43	29	65	137
Total	219	149	345	713

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Crashes by Mode

Table 4 summarizes non-interstate crashes by injury severity and mode. Crashes involving cars and trucks only (also referred to as Motor Vehicle crashes) accounted for almost 96% of all crashes in the region. Motorcyclists, pedestrians, and bicyclists were involved in the remaining crashes, with each mode involved in about 0.5-2% of the total crashes.

Table 4: HEPMPO Crashes by Mode

	No Injury	Possible Injury	Minor Injury	Severe Injury	Fatality	Total
Bicycle	21 (0.1%)	31 (0.9%)	41 (2.1%)	11 (2%)	0 (0%)	104 (0.4%)
Motorcycle	105 (0.6%)	92 (2.6%)	124 (6.2%)	101 (18%)	**26 (17.1%)**	448 (1.9%)
Pedestrian	24 (0.1%)	105 (2.9%)	123 (6.2%)	61 (10.9%)	**25 (16.4%)**	338 (1.5%)
Vehicle	16,820 (99.1%)	3,368 (93.7%)	1,712 (85.6%)	388 (69.2%)	101 (66.4%)	22,389 (96.2%)
Total	16,970	3,596	2,000	561	152	23,279

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

While motor vehicle crashes accounted for the largest share of both overall crashes and KSI crashes, when vulnerable road users were involved in a crash (defined for the purposes of this memorandum as someone outside a vehicle, including a pedestrian, bicyclist or motorcyclist) the risk of death or serious injury increased disproportionately; vulnerable road users were involved in about 4% of overall crashes, but 31% of severe injury crashes and 34% of fatal crashes.

Crashes by Type

Table 5 summarizes non-interstate crashes based on the recorded crash type for all crashes where a crash type is known and includes the crash type's percent of all crashes, and percent of KSI crashes. The most common collision type in the region includes single vehicle crashes and same direction rear end crashes. The most common collision types that result in a KSI include single vehicle crashes and head on crashes.

Table 5: HEPMPO – All Crashes by Collision Type

	No Injury	Possible Injury	Minor Injury	Severe Injury	Fatality	Total	Percent of Total	Percent of KSI Crashes
Angle (Front to Side) Opp. Direction	607	170	56	16	4	853	3.7%	2.8%
Angle (Front to Side) Same Direction	512	53	17	4	1	587	2.5%	0.7%
Angle Direction Not Specified	183	28	6	2	1	220	0.9%	0.4%
Angle Meets Left Head On	26	3	5	1	-	35	0.2%	0.1%
Angle Meets Left Turn	39	13	6	-	-	58	0.2%	0.0%
Angle Meets Right Turn	28	5	3	3	-	39	0.2%	0.4%
Head On	366	169	117	64	32	748	3.2%	**13.5%**
Head On Left Turn	308	105	105	16	5	539	2.3%	2.9%
Opposite Direction Both Left Turn	16	1	2	-	-	19	0.1%	0.0%
Opposite Direction Sideswipe	548	95	50	11	-	704	3.0%	1.5%
Rear-to-Rear	16	1	1	-	-	18	0.1%	0.0%
Rear-to-Side	76	3	1	-	-	80	0.3%	0.0%
Right Angle	1,187	381	130	33	15	1,746	7.5%	6.7%
Same Direction Both Left Turn	28	1	1	-	-	30	0.1%	0.0%
Same Direction Left Turn	113	22	21	2	1	159	0.7%	0.4%
Same Direction Rear End	4,080	985	364	59	6	5,494	**23.6%**	9.1%

	No Injury	Possible Injury	Minor Injury	Severe Injury	Fatality	Total	Percent of Total	Percent of KSI Crashes
Same Direction Rear End Left Turn	35	11	14	2	-	62	0.3%	0.3%
Same Direction Rear End Right Turn	28	5	5	-	-	38	0.2%	0.0%
Same Direction Right Turn	93	15	10	2	1	121	0.5%	0.4%
Same Direction Sideswipe	1,253	88	44	8	1	1,394	6.0%	1.3%
Single Vehicle	5,376	986	661	267	74	7,364	**31.6%**	**47.8%**
Straight Movement Angle	974	323	258	42	6	1,603	6.9%	6.7%
Other / Unknown	1,078	133	123	29	5	1,368	5.9%	4.8%
Total	16,970	3,596	2,000	561	152	23,279	100%	100%

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Table 6 and **Table 7** summarize the collision types for bicycle/pedestrian and motorcycle crashes. Unfortunately, when a crash involves a pedestrian or bicyclist the collision type can typically be recorded as "Single Vehicle" as only one motor vehicle is involved in the crash. This is likely an incorrect use of "Single Vehicle" as that collision type is typically intended for a motor vehicle crash that involved no other parties/modes. While this is considered the most common collision type for bicycle and pedestrian crashes in the region, it does not necessarily paint an accurate reflection of the movement of both the motor vehicle and the bicycle/pedestrian prior to the crash. The second most common collision type for bicycle and pedestrian involved crashes are categorized as "Other / Unknown." This further demonstrates a limitation of crash reporting and understanding the movements and collision types that impact people walking and biking. Beyond single vehicle and other/unknown, the most common crash type for bicycle and pedestrian crashes in the region are straight movement angle, and same direction rear end.

Table 6: HEPMPO - Collision Type for Bicycle and Pedestrian Crashes

	No Injury	Possible Injury	Minor Injury	Severe Injury	Fatality	Total	Percent of Total	Percent of KSI Crashes
Head On	-	-	3	-	-	3	1%	0%
Head On Left Turn	-	-	2	-	-	2	0%	0%
Opposite Direction Both Left Turn	-	-	1	-	-	1	0%	0%

	No Injury	Possible Injury	Minor Injury	Severe Injury	Fatality	Total	Percent of Total	Percent of KSI Crashes
Opposite Direction Sideswipe	1	1	1	-	-	3	1%	0%
Right Angle	-	-		-	1	1	0%	1%
Same Direction Both Left Turn	-	-	1	-	-	1	0%	0%
Same Direction Left Turn	-	2	1	1	-	4	1%	1%
Same Direction Rear End	-	1	2	3	1	7	**2%**	**4%**
Same Direction Right Turn	-	1	1	-	-	2	0%	0%
Same Direction Sideswipe	3	1	1	-	1	6	1%	1%
Single Vehicle	22	81	88	55	19	265	60%	76%
Straight Movement Angle	7	10	18	2	-	37	**8%**	**2%**
Other / Unknown	12	39	45	11	3	110	25%	14%
Total	45	136	164	72	25	442	100%	100%

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Table 7 summarizes motorcycle crash types. Unlike bicycle and pedestrian crashes, motorcycle crashes that are considered "Single Vehicle" do indicate that only the motorcycle was involved in the crash and no other mode or user was involved. Single vehicle and same direction rear end are the most common motorcycle collision types and the most common KSI motorcycle collision types.

Table 7: HEPMPO - Collision Type for Motorcycle Crashes

	No Injury	Possible Injury	Minor Injury	Severe Injury	Fatality	Total	Percent of Total	Percent of KSI Crashes
Angle (Front to Side) Opp. Direction	2	2	2	4	3	13	3%	**6%**
Angle (Front to Side) Same Direction	1	1	1	-	-	3	1%	0%
Angle Direction Not Specified	1	-	1	-	1	3	1%	1%

	No Injury	Possible Injury	Minor Injury	Severe Injury	Fatality	Total	Percent of Total	Percent of KSI Crashes
Angle Meets Left Head On	-	-	-	1	-	1	0%	1%
Angle Meets Left Turn	-	1	-	-	-	1	0%	0%
Angle Meets Right Turn	-	-	-	1	-	1	0%	1%
Head On	3	2	4	6	5	20	4%	**9%**
Head On Left Turn	2	3	7	4	2	18	4%	**5%**
Opposite Direction Sideswipe	5	2	3	2	-	12	3%	2%
Right Angle	2	9	9	6	3	29	6%	**7%**
Same Direction Both Left Turn	1	-	-	-	-	1	0%	0%
Same Direction Left Turn	1	-	3	1	-	5	1%	1%
Same Direction Rear End	25	14	13	14	2	68	15%	**13%**
Same Direction Rear End Left Turn	-	-	2	-	-	2	0%	0%
Same Direction Rear End Right Turn	1	-	1	-	-	2	0%	0%
Same Direction Right Turn	1	1	1	1	-	4	1%	1%
Same Direction Sideswipe	11	4	6	1	-	22	5%	1%
Single Vehicle	28	46	56	51	10	191	43%	**48%**
Straight Movement Angle	6	5	9	5	-	25	6%	4%
Other / Unknown	15	2	6	4	0	27	6%	3%
Total	105	92	124	101	26	448	100%	100%

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Contextual Analysis

The following section summarizes crash outcomes relative to contextual factors such as signalized intersection, posted speed limit, disadvantaged community area, and local jurisdiction.

Signalized Intersections

Table 8 summarizes non-interstate crashes within 250 feet of a signalized intersection for all modes of travel. About 17% of all crashes occur at a signalized intersection. While bicycle and pedestrian crashes are more likely to not occur at a signalized intersection, they have a higher rate of crashes at signalized intersection in comparison to all modes.

Table 8: All Crashes by Mode at Signalized Intersections - HEPMPO

	Motor Vehicle	Motorcycle	Bicycle	Pedestrian	Total
Signalized Intersection	3,840 (17.2%)	40 (8.9%)	24 (23.1%)	75 (22.2%)	3,979 (17.1%)
Not Signalized Intersection	18,549 (82.8%)	408 (91.1%)	80 (76.9%)	263 (77.8%)	19,300 (82.9%)
Total	22,389	448	104	338	23,279

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Table 9 summarizes non-interstate KSI crashes within 250 feet of a signalized intersection for all modes of travel. The majority of KSI crashes did not occur at signalized intersections (89.3%), but pedestrian KSI crashes had a slightly higher rate at signalized intersections in comparison to all modes.

Table 9: KSI Crashes by Mode at Signalized Intersections - HEPMPO

	Motor Vehicle	Motorcycle	Bicycle	Pedestrian	Total
Signalized Intersection	51 (10.4%)	13 (10.2%)	1 (9.1%)	11 (12.8%)	76 (10.7%)
Not Signalized Intersection	438 (89.6%)	114 (89.8%)	10 (90.9%)	75 (87.2%)	637 (89.3%)
Total	489	127	11	86	713

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Posted Speed Limit

The number of reported crashes by the speed limit of the road where the crash occurred is summarized in **Table 10**. The percentage of non-interstate centerline miles per speed limit category is included in the second column. Roadways with posted speed limits of 25 MPH have the greatest number of crashes, but as speed limits increase, the ratio of crashes in comparison to centerline miles with that speed limit increases.

Table 10: All Crashes by Post Speed Limit and Mode - HEPMPO

	Centerline Miles %	Motor Vehicle	Motorcycle	Bicycle	Pedestrian	Total
25 MPH or Less	64%	8,038 (36.1%)	145 (32.7%)	61 (58.7%)	205 (61.6%)	8,449 (36.5%)
30 – 35 MPH	21%	7,715 (34.7%)	154 (34.8%)	31 (29.8%)	79 (23.7%)	7,979 (34.5%)
40 – 45 MPH	10%	4,233 (19%)	94 (21.2%)	9 (8.7%)	38 (11.4%)	4,374 (18.9%)
50 – 55 MPH	3%	1,346 (6.1%)	32 (7.2%)	3 (2.9%)	9 (2.7%)	1,390 (6%)
60+ MPH	1%	912 (4.1%)	18 (4.1%)	-	2 (0.6%)	932 (4%)
Total	100%	22244	443	104	333	23,124

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) roadways and crashes. Not all crashes included a posted speed limit.

KSI crashes by the posted speed limit of the road where the crash occurred is summarized in **Table 11**. As speed limits increase, they account for a higher proportion of KSI crashes, despite those roadways decreasing in the amount of non-interstate centerline mile percentage. For example, roadways with 50-55 MPH posted speed limits account for only 3% of non-interstate roadways in the region, but account for 10% of KSI crashes. KSI crashes within the 25 MPH or less category only slightly decrease in comparison to all crashes. This could indicate that travel speeds are higher than 25 MPH despite the sign posting.

Table 11: KSI Crashes by Post Speed Limit and Mode - HEPMPO

	Centerline Miles %	Motor Vehicle	Motorcycle	Bicycle	Pedestrian	Total
25 MPH or Less	64%	146 (30%)	38 (30.2%)	6 (54.5%)	45 (52.3%)	235 (33.1%)
30 – 35 MPH	21%	154 (31.7%)	46 (36.5%)	3 (27.3%)	20 (23.3%)	223 (31.5%)
40 – 45 MPH	10%	103 (21.2%)	27 (21.4%)	2 (18.2%)	17 (19.8%)	149 (21%)
50 – 55 MPH	3%	60 (12.3%)	9 (7.1%)	-	3 (3.5%)	72 (10.2%)
60+ MPH	1%	23 (4.7%)	6 (4.8%)	-	1 (1.2%)	30 (4.2%)
Total	100%	486	126	11	86	709

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) roadways and crashes. Not all crashes included a posted speed limit.

Transportation Disadvantaged Community Area

Table 12 summarizes non-interstate crashes that occurred within a transportation disadvantaged community area by mode. While most crashes occur outside of disadvantaged areas, more bicycle and pedestrian crashes are occurring within disadvantaged areas than outside disadvantaged areas.

Table 12: HEPMPO All Crashes within Transportation Disadvantaged Communities

	Motor Vehicle	Motorcycle	Bicycle	Pedestrian	Total
Within Disadvantaged Area	6,680 (29.8%)	104 (23.2%)	**55 (52.9%)**	**176 (52.1%)**	7,015 (30.1%)
Outside Disadvantaged Area	15,709 (70.2%)	344 (76.8%)	49 (47.1%)	162 (47.9%)	16,264 (69.9%)
Total	22,389	448	104	338	23,279

Source: Maryland Crash Data, West Virginia Crash Data, Replica, USDOT ETC Explorer Tool, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Table 13 summarizes non-interstate KSI crashes that occurred within a transportation disadvantaged community area by mode. While most KSI crashes occur outside of disadvantaged areas, bicycle and pedestrian crashes occur at a higher rate within disadvantaged areas compared to all modes.

Table 13: HEPMPO KSI Crashes within Transportation Disadvantaged Communities

	Motor Vehicle	Motorcycle	Bicycle	Pedestrian	Total
Within Disadvantaged Area	100 (20.4%)	26 (20.5%)	**4 (36.4%)**	**30 (34.9%)**	160 (22.4%)
Outside Disadvantaged Area	389 (79.6%)	101 (79.5%)	7 (63.6%)	56 (65.1%)	553 (77.6%)
Total	489	127	11	86	713

Source: Maryland Crash Data, West Virginia Crash Data, Replica, USDOT ETC Explorer Tool, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Local Jurisdiction Crashes

Sixteen local jurisdictions (municipalities) are included in HEPMPO. **Table 12** summarizes non-interstate crashes that occurred within local jurisdiction boundaries. Most crashes occur within local jurisdictions, particularly for bicycle and pedestrian crashes. Motorcycle crashes are nearly half in local jurisdictions and half outside local jurisdictions.

Table 14: HEPMPO All Crashes within Local Jurisdictions

	Motor Vehicle	Motorcycle	Bicycle	Pedestrian	Total
Within Local Jurisdiction Boundary	14,177 (63.3%)	233 (52%)	89 (85.6%)	277 (82%)	14,776 (63.5%)

Outside Local Jurisdiction Boundary	8,212 (36.7%)	215 (48%)	15 (14.4%)	61 (18%)	8,503 (36.5%)
Total	22,389	448	104	338	23,279

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Table 15 summarizes non-interstate KSI crashes that occurred within local jurisdiction boundaries. KSI crashes are a bit more evenly split, across all modes except pedestrian crashes, as occurring in local jurisdictions or outside local jurisdictions.

Table 15: HEPMPO KSI Crashes within Local Jurisdictions

	Motor Vehicle	Motorcycle	Bicycle	Pedestrian	Total
Within Local Jurisdiction Boundary	232 (47.4%)	67 (52.8%)	6 (54.5%)	**68 (79.1%)**	373 (52.3%)
Outside Local Jurisdiction Boundary	257 (52.6%)	60 (47.2%)	5 (45.5%)	18 (20.9%)	340 (47.7%)
Total	489	127	11	86	713

Source: Maryland Crash Data, West Virginia Crash Data, Replica, Fehr & Peers.
Notes: Excludes limited access (interstate, private roads, tolls, etc.) crashes.

Next Steps

The key findings from the crash trends and contextual analysis will help inform countermeasures selection for regionwide safety improvements. The selected countermeasures could be included in the final Regional Safety Action Plan as Action Items are systemwide project improvements. Potential focus areas for systemwide improvements and toolbox strategies could include:

- Single vehicle crashes, with particular emphasis on motorcycle crashes.
- Angle crashes at conflict points such as intersections and driveways.
- Bicycle and pedestrian crashes, with particular focus within local jurisdictions and transportation disadvantaged community areas.
- Speed reduction and redundant efforts in areas with 25 MPH or less post speed limit.

FEHR PEERS

Memorandum

Date: March 29, 2024

To: Matt Mullenax and Michaela McDonough, HEPMPO

From: Tory Gibler and Nicole Waldheim, Fehr & Peers

Subject: HEPMPO Regional Safety Action Plan – Policy and Benchmarking Assessment

DC23-0116

Overview

This memorandum summarizes the results of a policy review and benchmarking assessment of transportation and land-use policies, plans, guidelines, and standards against a framework of the Safe System elements for the Hagerstown Eastern/Panhandle Metropolitan Planning Organization (HEPMPO Regional Safety Action Plan). The review sought to identify potential policy barriers to reaching zero serious injuries and fatalities on roads throughout the region and identify opportunities to integrate recommended Action Items as part of the Action Plan.

As a part of the Regional Safety Action Plan, a policy benchmarking assessment was conducted. The policy review and benchmarking assessment consisted of the following steps:

1. Identify and review relevant documents and procedures.
2. Populate the benchmarking tool with findings from the policy and plan review.
3. Stakeholders select top five benchmarking opportunities.
4. Develop the Action Plan.

Safe System Approach

In 2022, the United States Department of Transportation introduced the National Roadway Safety Strategy (NRSS) to address the safety crisis on our Nation's roadways. The NRSS declares a goal of zero deaths and adopts the Safe System Approach (SSA) as the guiding paradigm for addressing roadway safety and achieving this goal. The Safe System Approach equips us with a structured decision-making framework, enabling us to deliberately address five key elements and six guiding principles (Figure 2) during planning and implementation. It prioritizes human fallibility and vulnerability, ultimately designing a protective system for all.

Figure 1: Safe System Approach Principles and Elements

The Safe System principles and elements provide a framework for what an effective safety program encompasses. Evaluating existing policies, programs, and projects against the core elements, along with safety planning and culture, helped HEPMPO understand what is working to reduce severe crashes and what gaps exists in their safety programs. This information was then used to inform the development of stronger safety-related policies and programs as part of the City's Action Plan.

Policy Review and Benchmarking

The following presents the results of the policy review and benchmarking as applied to HEPMPO.

Step 1 – Identify and Review Relevant Policies and Plans

The following documents were identified by the working group to be included in the policy review:

State

- 2021-2025 Maryland Strategic Highway Safety Plan
- 2022-2026 West Virginia Strategic Highway Safety Plan
- 2021 Maryland Highway Safety Improvement Program
- 2021 West Virginia Highway Safety Improvement Program
- MD and WV State Performance Measures
- MDOT SHA Pedestrian Safety Action Plan

Regional

- 2019 HEPMPO Regional Traffic Safety Study
- Direction 2050: HEPMPO LRTP (2022)
- 2023-2026 HEPMPO Transportation Improvement Program (TIP)
- Regional Safety Performance Metrics
- Transit Safety Performance Metrics

County

- 2021 – 2025 Washington County Strategic Highway Safety Plan

As a part of the benchmarking process, clear documentation of critical information from each plan is important. For each document reviewed the following information was documented. Each summary element is defined below.

> **Document Name**: Name of document (and link to where the document can be found).
> **Document Description**: One to three sentence description of the purpose of the document.
> **Safety Vision, Goals and Policies**: Documentation of what is intended to be achieved with transportation safety and supporting guidance, rules, procedures to achieve it.
> **Safety Data and Analysis**: Documentation of existing safety data/analysis or known challenges (if any).
> **Countermeasures**: Documentation of proposed or programmed safety solutions to address key needs.

Safe System Element: How the document addresses one or more of the Safe System Approach elements (see Table 1), or Safey Planning and Culture.
Opportunities for Safety Program and Action Items: Initial ideas for Action Items to introduce new safety practices or institutionalize current or occasional safety practices.

Data Extraction Summary

- **HEPMPO has been successful at identifying corridors of concern**, such as Dual Highway (US 40) within Hagerstown, Washington Street in Washington County, WV 9 in Berkeley County, and Summit Point Rd in Jefferson County.
- **No fatalities involving transit vehicles occurred in the region**.
- **Transportation Improvement Program (TIP) funding** is typically earmarked **for safety improvements related to roadway departure crashes**.
- **Safety performance targets** primarily related to serious injury, serious injury rate, and non-motorized fatal and serious injuries **are not being met**.
- **The region has general alignment with the SSA**, specifically around identifying locations of concern and collecting data, **but opportunities exist** around shifting safety culture and planning, safe users, safe roadways, safe vehicles, safe speeds, and post-crash care.

Step 2 – Populate the Benchmarking Tool with Findings from the Policy and Plan Review

The project team populated the benchmarking tool with findings from the policy and plan review conducted in step 1. Table 1 highlights the elements and categories in the benchmarking tool. Each benchmark category can have between one and six individual benchmarks. The benchmarking tool is intended to assess what the region is currently doing well related to SSA and where potential changes to policies, programs and practices could be considered as a part of the development of their HEPMPO Regional Safety Action Plan. The benchmarking tool also assessed if the benchmark is an occasional practice, an institutional practice, or not a current practice by the agency. Not all benchmarking criteria applied to HEPMPO.

Table 1: Benchmarking Tool Elements & Categories

Benchmark Elements	Benchmark Categories
Safety Planning & Culture	Leadership and Commitment Meaningful Engagement Data and Analysis Funding Development Review Equity First
Safe Users	Education Enforcement Research
Safe Roadways	Collision Avoidance Kinetic Energy Reduction Policies and Tradeoffs Innovation
Safe Vehicles	Supportive Infrastructure Fleet Management Data
Safe Speeds	Design and Operations Enforcement Policy and Training
Post-Crash Care	Crash Investigation Partnerships

Next, MPO staff were interviewed, and the benchmark tool results were modified because of the discussion. At the conclusion of Step 2, the top ten benchmark strengths of the HEPMPO safety program where highlighted (Table 2), as well as the top ten benchmark opportunities (Table 3).

Table 2: HEPMPO Top 10 Benchmark Strengths

Element	Category	HEPMPO Safety Strength
Safety Planning & Culture	Identifying corridors of concern	• Dual Highway (US 40) in Hagerstown • Washington St in Washington County • WV 9 in Berkeley County • Summit Point Rd in Jefferson County • Foxcroft Avenue Pedestrian Road Safety Audit in Berkeley County
	Funding	TIP funds programmed HSIP for Roadway Departures • Daniel Road • Flowing Springs Exit • Districtwide Roadway Departures • Walnut Street and Virginia Avenue railroad crossings
	Previous planning efforts	The 2019 Regional Traffic Safety Study was the region's first effort to identify areas of safety concern and recommend safety improvement strategies.
Safe Users	Transit safety	No major transit safety concerns within the region.
Safe Roadways	Collision avoidance	Installing proven countermeasures to separate users in space and time, such as infilling sidewalks along segments of Dual Highway.
Safe Speeds	Enforcement	Speed cameras are authorized in Washington County (school zones and work zones) and Hagerstown has a handful of red-light cameras to reduce red light running. Berkeley County has radar speeds signs on I-81 and school zones and has conducted previous safety campaigns.
Post Crash Care	Crash review	HEPMPO conducts additional outreach with local police to capture any missing crashes or obtain further crash details (beyond crash data collected from MDOT and WVDOT).

Table 3: HEPMPO Top 10 Benchmark Opportunities

Element	Category	HEPMPO Safety Opportunity
Safety Planning & Culture	Leadership and commitment	No regionwide resolution currently supporting safety program nor committing to specific safety goal.
	Meaningful engagement and equity	Meaningful engagement with populations that are traditionally underserved.
	Funding	Staff time, limited resources, and support to apply for safety funding.
	Development Review	No formal process to ensure new developments assess safety impacts.
Safe Users	Education	Limited opportunities to raise awareness with the public and stakeholders to create buy-in for safety improvements (i.e., demonstration projects, education programs, tactical urbanism).
Safe Roadways	Policies and tradeoffs	Lack of regionwide safety related policies to supplement the AASHTO Greenbook, MUTCD, and/or implementation of existing policies (e.g., Complete Streets, modal prioritization).
Safe Vehicles	Best practice guidance	Little knowledge sharing or available resources within the region regarding safe vehicle best practices.
Safe Speeds	Policy and training	Limited awareness of speed management methodologies and strategies in the region
Post Crash Care	Crash review	Independent crash review of fatal and severe injury crashes involving pedestrians and bicyclists.
	Data sharing	Engagement with emergency responders and hospitals to more effectively share data across agencies.

Step 3 – Stakeholders Select Top Five Benchmark Opportunities

The Stakeholder Committee was identified as the critical group to review the benchmark tool results and identify the top five benchmark opportunities. The Stakeholder Committee met virtually, reviewed benchmarks results, and voted on the top five benchmark opportunities to incorporate as part of the Action Plan development or to include as an Action Item (Table X). The Stakeholder Committee then brainstormed potential Action Item solutions to the top five benchmark opportunities.

Table 4: HEPMPO Five Selected Benchmark Opportunities

Element	Category	HEPMPO Safety Opportunity
Safety Planning & Culture	Leadership and commitment	No regionwide resolution currently supporting safety program nor committing to specific safety goal.
	Meaningful engagement and equity	Meaningful engagement with populations that are traditionally underserved.
	Funding	Staff time, limited resources, and support to apply for safety funding.
	Development Review	No formal process to ensure new developments assess safety impacts.
Safe Users	Education	Limited opportunities to raise awareness with the public and stakeholders to create buy-in for safety improvements (i.e., demonstration projects, education programs, tactical urbanism).

Step 4 – Develop the Action Plan

Based on the benchmarking effort and findings, actions and next steps were identified to enhance the regional safety program. Drawing from the challenges and ideas generated at the Stakeholder Meeting, the project team developed Table 5, a list of proposed Action Items to be included in the final HEPMPO Regional Safety Action Plan based on the policy review and benchmarking assessment. A safety resolution is recommended to be included with the adoption of the HEPMPO Regional Safety Action Plan.

Table 5: Proposed HEPMPO Regional Safety Action Plan Action Items from Benchmarking Assessment

Action Item	Responsible Agency and Partners	Timeline
Support local jurisdictions in identifying and applying for safety funding. Utilize expertise from partner agencies, such as the Maryland Highway Safety Office, on exploring diverse grant opportunities.	HEPMPO, MDOT SHA, WVDOT	Short
Collaborate with state agencies and local jurisdictions to ensure rigorous and safety-focused Transportation Impact Study processes. Consider development of safety checking to be utilized during development review.	HEPMPO	Medium
Evaluate meaningful engagement strategies to enhance outreach with populations that are traditionally underserved. Consider developing meaningful engagement checklist to distribute with local agencies.	HEPMPO and Local Municipalities	Short
Raise awareness of safety countermeasures and treatments. Consider collaborating with businesses and organizations to host joint events, distribute educational materials, endorse safety initiatives, host annual safety walking tours with elected officials and the public, seek public perception through periodic surveys and support local jurisdictions seeking pilot project and demonstration opportunities.	HEPMPO	Medium