HEPMPO
CORRIDOR STUDY

Safety Corridor Assessment
Virginia Avenue

June 2025

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FEHR PEERS

Hagerstown Eastern Panhandle MPO

Acknowledgements

The Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) would like to thank the Virginia Avenue Corridor Stakeholders for their valuable contributions throughout the planning process and development of the Safety Corridor Assessment for Viginia Avenue.

- Federal Highway Administration (FHWA)-MD
- MDOT The Secretary's Office (TSO)
- MDOT District 6 Traffic
- MDOT MVA GHSO
- MDOT Office of Traffic Safety
- MDOT SHA District 6 Assistant District Engineer-Traffic
- MDOT SHA Regional Planning
- Washington County Health Department
- Washington County Department of Public Works (DPW)
- Washington County Engineering
- Washington County Transit

Disclaimer

Under 23 U.S. Code § 409 and 23 U.S. Code § 148, safety data, reports, surveys, schedules, lists compiled or collected for the purposes of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damage arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

The analysis and recommendations in this report are conceptual in nature based upon limited information, and before implementing any changes, or using any of its information for design or construction, HEPMPO or local jurisdiction, should conduct a more detailed analysis and make sure that the design or construction documents reflect specific, detailed, local and field conditions.

The scope of this work, including study locations, time frame, and topics, was determined by the client. While it is possible that some locations or issues were not addressed in this report, nothing should be inferred by their omission.

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Introduction

Study Purpose

The HEPMPO Regional Safety Action Plan (SAP) identified a high-injury network (HIN) highlighting roadway segments with disproportionate severe or fatal crashes, particularly for pedestrians, cyclists, and motorcyclists. Three safety corridors were selected for further analysis, including the Virginia Avenue corridor in Washington County, MD. This report summarizes the corridor's existing conditions, concept development for safety countermeasures, and funding strategies.

About Virginia Avenue

Virginia Avenue is part of US-11 in central Washington County, which serves as a key north-south connector between Hagerstown, Williamsport, and Hagerstown Regional Airport. The study focuses on a 3-mile suburban corridor between Armstrong Avenue and Brookmead Road in Halfway, MD (**Figure 1**). This segment features two travel lanes, turn lanes at major intersections, and a mix of commercial, residential, and institutional land uses. While major intersections are signalized, minor ones are uncontrolled. The corridor lacks bicycle facilities and continuous sidewalks. With an AADT of 11,200 (MDOT, 2022), the roadway experiences moderate traffic volumes.

Figure 1: Virginia Avenue Safety Corridor Study Area Map

HEPMPO Regional Safety Action Plan

The HEPMPO Regional SAP was developed to address roadway safety challenges and was officially adopted in May 2024. The plan prioritizes strategies to enhance safety for all users, including pedestrians, cyclists, transit riders, and commercial vehicle operators. A key component is the HIN, which identifies high-crash locations for targeted interventions. Using a data-driven approach and stakeholder input, HEPMPO selected one HIN segment per county for safety assessments: Washington Street (Jefferson County, WV), Edwin Miller Boulevard (Berkeley County, WV), and Virginia Avenue (Washington County, MD). These assessments aim to identify solutions and position jurisdictions for funding opportunities like the Highway Safety Improvement Program (HSIP) or the Safe Streets and Roads for All (SS4A) program.

Needs Assessment Process

The needs assessment process involved collecting and analyzing data, as well as reviewing previous plans.

Data Collection & Evaluation

The project team collected data on crash history (2018–2023), survey responses, future planning designations, and corridor profiles. They also analyzed traffic volumes, land use, roadway characteristics, transit stops, pedestrian and bicycle infrastructure, signal operations, and right-of-way details to assess the study area's safety and mobility needs.

Previous Plans or Work Review

The project team reviewed local documents that provide guidance on existing and future land use and transportation vision for the study corridor:

- Washington County Comprehensive Plan 2040
- HEPMPO Regional Safety Action Plan
- Long Range Transportation Plan
- Transportation Improvement Program
- Maryland Vulnerable Road User Assessment
- Virginia Commons Site Concept Maps

Existing and Future Conditions

Existing Conditions

This section summarizes the existing conditions along the Virginia Avenue safety corridor study area including roadway, active transportation, and transit facilities, as well as reviewing corridor safety and community context.

Roadway Facilities

Virginia Avenue is a 3-mile suburban arterial forming part of US-11, with connections to I-81. The corridor includes four signalized intersections, while all others are stop-controlled on minor approaches (**Figure 2**). The roadway varies in cross-section, transitioning from four lanes near I-81 to two lanes, then to a three-lane segment with a center turn lane, and back to two lanes near Armstrong Avenue. Lane widths range from 11 to 13 feet. The corridor includes both on-street and off-street parking, particularly near commercial areas. Speed limits range from 40 mph near the interstate to 30 mph farther east, and the AADT is 11,200.

Figure 2: Virginia Avenue Safety Corridor Roadway Map

Active Transportation and Transit

Bicycle and Pedestrian Infrastructure

Virginia Avenue lacks dedicated bicycle infrastructure and has limited, non-continuous sidewalks. Narrow sidewalk segments exist primarily near commercial areas, with newer developments contributing minor improvements. Pedestrian crossings with signals are only found at a few signalized intersections, and marked crosswalks are inconsistent (**Figure 3**). Some curb ramps are present but often lead to disconnected paths. A single curb extension exists at Oak Ridge Drive to improve turning movements and avoid parked vehicles.

Figure 3: Virginia Avenue Safety Corridor Pedestrian and Bicycle Facilities Map

Transit System

Washington County Transit (WCT) provides fixed-route bus service along Virginia Avenue, connecting destinations like Valley Mall to nearby communities. Routes 111, 112, 113, 115, and 441 operate in the corridor, primarily converging at the Halfway

Boulevard intersection (**Figure 4**). Service runs from 6:00 AM to 6:00 PM with hourly headways, though most bus stops lack shelter and seating amenities.

Figure 4: Virginia Avenue Safety Corridor Transit Facilities Map

Safety

Crash History

The Virginia Avenue corridor between I-70 and Wilson Boulevard has was identified as a high-risk segment in Maryland's Strategic Highway Safety Plan due to safety concerns such as incomplete sidewalks, high traffic volumes, and elevated vehicle speeds. Between 2018 and 2023, motor vehicle crashes made up 95.5% of all reported incidents, while VRU crashes—which include pedestrians, bicyclists, and motorcyclists—accounted for 4.5% (**Table 1**). Despite their smaller share, VRU crashes were more severe, representing 33.3% of serious injury crashes and 50% of fatal crashes. The most frequent crash types included same-direction rear-end, head-on left-turn, and single-vehicle collisions. About 70% of all crashes took place at

intersections, with the highest concentrations at Halfway Boulevard and Glenside Avenue. Fatal crashes along the corridor occurring at Hoffman Drive and Donelson Drive. The Brookmeade Drive intersection had the most severe injury crashes and the highest number of VRU crashes. Poor lighting conditions were noted in several fatal or severe crashes.

Table 1: Virginia Avenue Safety Corridor – Total Crashes by Mode and Severity (2018 – 2023)

MODE	FATAL	SEVERE INJURY	MINOR INJURY	POSSIBLE INJURY	NO APPARENT INJURY	TOTAL
PEDESTRIAN	1 (50%)	2 (22.2%)	1 (3.4%)	0 (0%)	0 (0%)	4 (1.5%)
BICYCLE	0 (0%)	0 (0%)	2 (6.9%)	0 (0%)	1 (0.6%)	3 (1.1%)
MOTORCYCLE	0 (0%)	1 (11.1%)	2 (6.9%)	0 (0%)	2 (1.1%)	5 (1.9%)
VEHICLE	1 (50%)	6 (66.7%)	24 (82.8%)	46 (100%)	177 (98.3%)	254 (95.5%)
TOTAL	2	9	29	46	180	266

Figure 5: Virginia Avenue Safety Corridor Crash Map (2018 - 2023)

At-Risk Assessment & Alignment with the Safe System Approach

The project team used the FHWA's 2024 Safe System Project-Based Alignment Framework to proactively identify risk factors along the corridor. The completed Safe System Project-Based Alignment Framework for the Virginia Avenue Corridor is included in **Appendix A**. This tool supports agencies in aligning with the Safe System Approach (SSA), adopted by FHWA in 2022 to guide efforts toward zero traffic deaths by encouraging a comprehensive evaluation of safety strategies. A high-level summary of the SSA alignment along the corridor is listed below:

- There is higher alignment with the SSA along in the eastern portion of the corridor (between Roessner Avenue and Armstrong Avenue) for segments.
- VRU risk factors are highest between Donelson Drive and Roessner Avenue.
- The largest risk factors for VRUs across the entire corridor include no bicycle and limited pedestrian facilities (e.g. sidewalks, shared use paths), high operating speeds, insufficient lighting, driveways, and obstructed sight distance.
- Pedestrians and people on bicycles primarily walk or ride on the shoulder, but without protected or painted buffer and poor lighting conditions, VRUs are at risk.
- Heavy vehicles and freight are a risk factor at the Governor Lane Boulevard intersection and segment between the Governor Lane Boulevard intersection to I-81.
- **Table 2** highlights the top least SSA aligned intersections and segments along the corridor. The higher the score the less alignment.

Table 2: Least Safety Aligned Intersections and Segments

LOCATION TYPE	LOCATION NAME	LOCATION SCORE
INTERSECTION	Donelson Drive & Virginia Avenue	9,480
	Halfway Boulevard & Virginia Avenue	9,480
	Cavalry Drive /Anderson Drive & Virginia Avenue	9,360
SEGMENT	Anderson Drive to Bower Avenue	6,750
	Donelson Drive to Anderson Drive	6,750
	Governor Lane Boulevard/Hoffman Drive to Donelson Road	6,030

Community Context

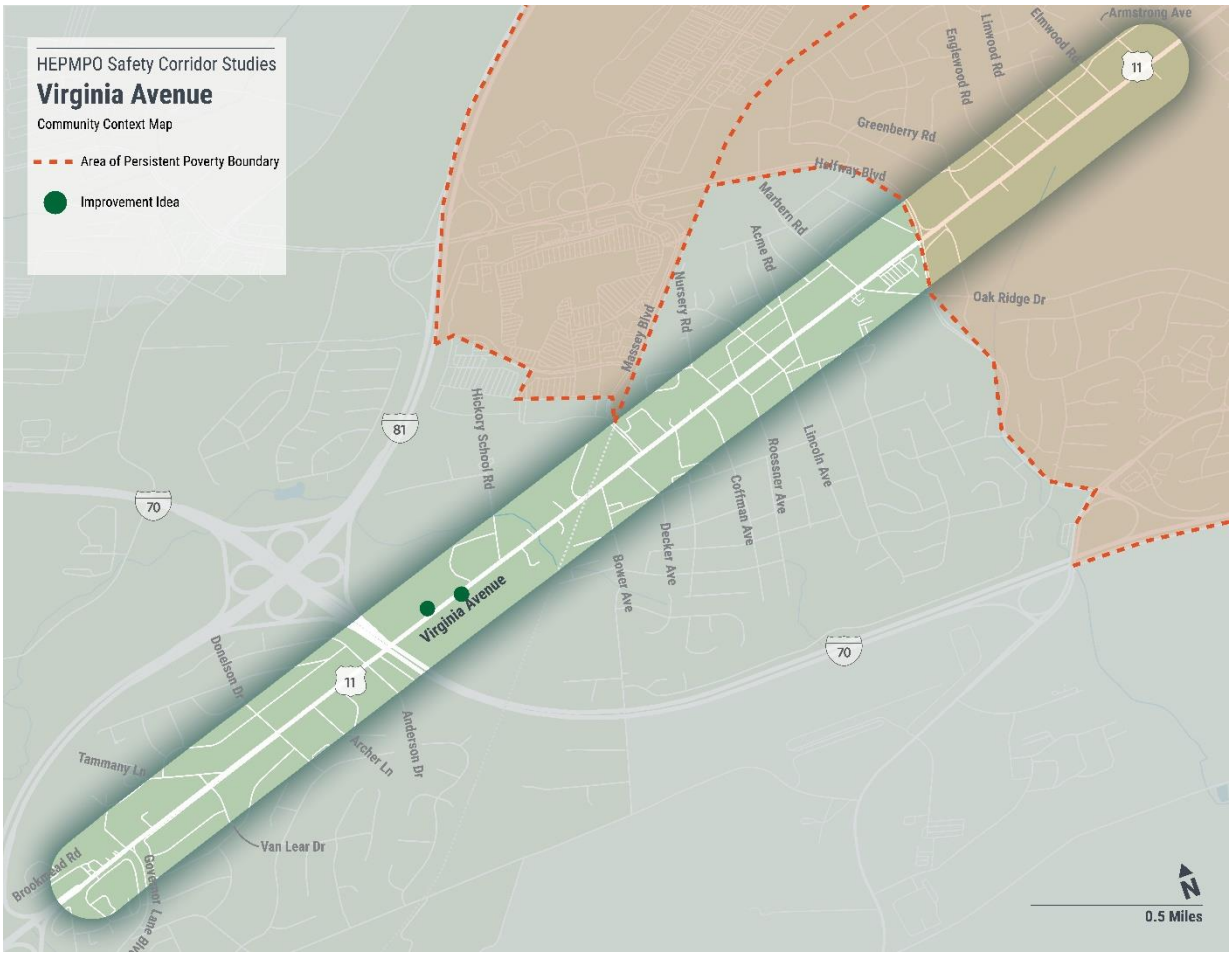
Areas of Persistent Poverty

The northeastern segment of the Virginia Avenue corridor extends into a federally designated Area of Persistent Poverty (APP), delineated by the red dashed boundary in **Figure 6**. This designation is based on U.S. DOT criteria identifying census tracts with poverty rates of 20 percent or more for at least three consecutive decades.

Public Input

Public input was collected through the Regional Safety Action Plan survey to understand safety concerns related to transportation within the region. **Figure 6** displays participant feedback on improving Virginia Avenue, with some highlighting the need for active transportation enhancements, such as adding crosswalks, while others prioritized vehicle-related improvements, including widening the road to four lanes.

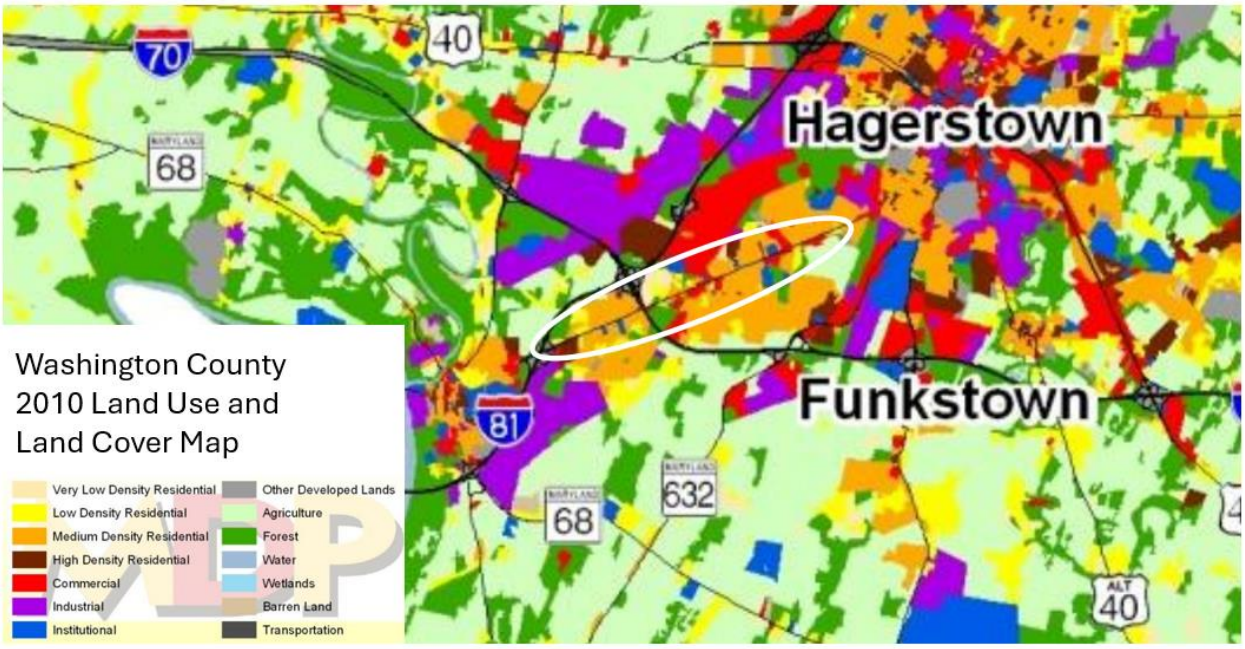
Figure 6: Virginia Avenue Corridor Areas of Persistent Poverty and Public Input Map



Future Conditions

In addition to examining existing conditions, the project team also explored potential future conditions along the corridor. Future conditions could impact countermeasure selection and improvement recommendations. According to the Washington County 2010 Land Use and Land Cover Map (**Figure 7**), the corridor is primarily surrounded by a mix of commercial, low-, medium-, and high-density residential, and industrial. Additionally, it is situated within the designated growth area boundaries, where development is encouraged, and within the priority funding area, underscoring its importance for infrastructure investment and economic development.

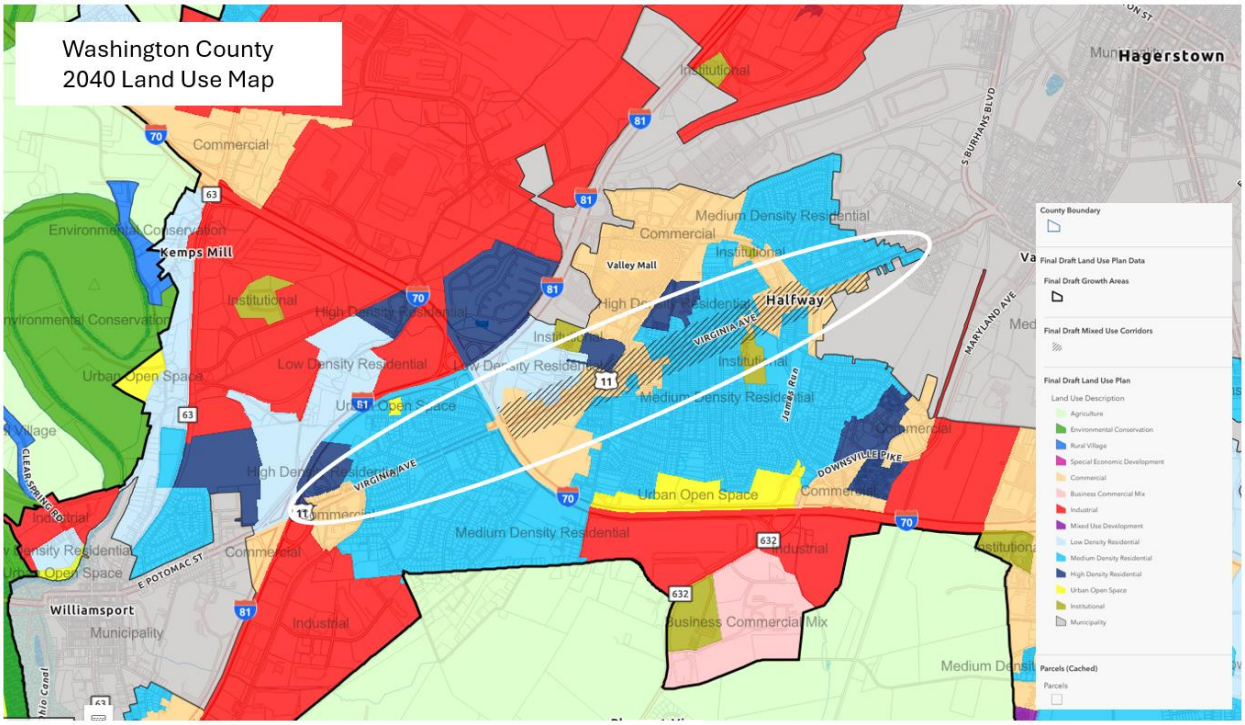
Figure 7: Washington County 2011 Land Use and Land Cover Map



The 2040 Land Use Map (**Figure 8**) does not show significant changes in the types of land uses present in the corridor; however, it highlights the densification of the area. Some low-density residential areas and adjacent agricultural land are planned for redevelopment into medium-density residential use. Notably, the segment of Virginia Avenue from I-70 to Harwood Road is designated as a Mixed-Use Corridor, encouraging a combination of land uses.

A 3.75-acre commercial site is planned along the west side of Virginia Avenue, just north of the I-81 exit. The proposed development concept includes a service station and small retail pads with access onto Virginia Avenue.

Figure 8: Washington County 2040 Land Use Map



Additionally, recent site plans reveal the Maryland Department of Transportation (MDOT) has developed signing and marking plans for a new connecting street at the intersection of Virginia Avenue and Harwood Road. This new street will provide access to a planned residential development, Virginia Commons, consisting of single-family units on a previously vacant 115-acre lot. Furthermore, the team identified a handful of planned, committed, or recommended projects along or near the corridor (**Table 3**).

Table 3: Potential Existing Projects or Recommendations

PLANNING REFERENCE	DESCRIPTION
LONG-RANGE TRANSPORTATION PLAN	Widen to four lanes.
TRANSPORTATION IMPROVEMENT PLAN (TIP) PROJECTS	I-70 Roadway and Bridge Improvements
MARYLAND VULNERABLE ROAD USER ASSESSMENT	The entire corridor is designated as a VRU priority corridor for the state.
VIRGINIA COMMONS	Concept maps for development of Virginia Commons neighborhood along Virginia Avenue.
WASHINGTON COUNTY COMPREHENSIVE PLAN	Future adjacent land use calls for densification of housing and mixed-uses.
BOWMAN DEVELOPMENT PAD SITE	Future commercial development near I-81 with proposed convenience store, service station, and fast-food pads

Engagement Opportunities and Takeaways

Site Visit

On November 14, 2024, the project team held a stakeholder presentation and conducted a site visit along the Virginia Avenue corridor. The event, hosted at Hagerstown City Hall, provided an overview of the corridor and included training on the FHWA Safe System Project-Based Alignment Framework (**Figure 9**). Following the training, stakeholders participated in a site visit, making strategic stops at key intersections and walking portions of the corridor to assess existing conditions and validate risk factors in the field, as shown in **Table 4** and **Table 5**.

Attendees included representatives from local, regional, and state agencies such as the City of Hagerstown, Washington County departments, MDOT offices, FHWA, and emergency response agencies. The site visit facilitated cross-agency discussions on transportation safety and helped align the project with the FHWA's Safe System Approach. Stakeholders were able to document existing challenges, including safety risks at intersections and corridor segments, and identified potential countermeasures to address these issues during interactive group activities.

Figure 9: Stakeholder meeting & observations along the Virginia Avenue Corridor

Table 4: Virginia Avenue Intersection Safety Challenges Identified During Site Visit

LOCATION	SAFETY CHALLENGES AND RISK FACTORS
MARBERN ROAD/ OAK RIDGE DRIVE	• Crosswalk is outdated and lack of signage does not align with MUTCD.
HALFWAY BOULEVARD	• Channelized right turn lane along westbound approach. • No connecting pedestrian facilities, no crosswalks, no pedestrian phase or signal heads. • Limited lighting. • Missing or insufficient pavement markings. • Notable amount of heavy vehicle traffic. • Bank driveway merges with right turn lane, which may contribute to crashes. • Glenside Avenue/ Walgreens driveway encourages risky maneuvers.
LEXINGTON AVENUE	• No curb or gutters. • No lighting. • Intersection is offset.
GOVERNOR LANE BOULEVARD	• West of intersection it opens to two lanes in each direction, which does not seem necessary for traffic volumes based on observations. • Retirement complex employees were observed parking along the eastbound shoulder. • Observed large amount of heavy vehicle/freight taffic.
BROOKEMEAD ROAD	• Higher turning demand (in and out) than at Hoffman Drive signal.

Table 5: Virginia Avenue Segment Safety Challenges Identified During Site Visit

LOCATION	SAFETY CHALLENGES AND RISK FACTORS
ENTIRE CORRIDOR	• No or limited lighting along the entire corridor. • Route 11 is a detour route for I-81. • No or limited sidewalk along corridor. Pedestrians and bicyclists use shoulders which can conflict with passing vehicles and parked cars. • E-bikes and scooters travel faster than standard bicycles on shoulder, which can be unexpected for automobiles. • Crash clusters were noted near churches and could be result of service events.
ANDERSON DR TO RAILROAD TRACK	• Has passing zone which is typically not considered safe in developed areas like the Virginia Avenue corridor with so many residential and commercial driveways.

Risk Assessment Summary

In coordination with the FHWA Office of Safety, the Virginia Avenue Corridor was evaluated for potential safety risks using the Safe System Project-Based Alignment Framework. The Project-Based Framework tool was developed to assess roadway

locations at the intersection and segment level, as highlighted in **Figure 10**, to identify potential hazards and improvements through the lens of the Safe System Approach (SSA).

Figure 10: Virginia Avenue Corridor Intersections and Segments

This framework emphasizes a holistic view of road safety, aiming to minimize the risk of severe injuries and fatalities by considering all aspects of the transportation system. By integrating principles of the SSA, the Project-Based Framework ensures that safety is a fundamental priority in the planning, design, and operation of roadways, ultimately fostering a safer and more resilient transportation network for all users.

The assessment estimates the potential risk to vehicle drivers and vulnerable road users based on existing conditions, and is later reevaluated by considering potential safety countermeasures. The assessment is based on the following:

- *Exposure* – the volume and/or length (distance) various users are using a facility and could be involved in a potential crash.
- *Likelihood* – the elements and/or risks that impact the probability of a crash taking place by influencing the opportunity for conflict or user error rates.
- *Severity* – the elements and/or risks that impact the probability of a crash taking place by influencing the opportunity for conflict or user error rates.

The results demonstrate improved safety along the corridor through the implementation of proven countermeasures. **Table 6** provides a summary of the assessment, and detailed results are included in **Appendix A**.

Table 6: Virginia Avenue Project Summary Assessment by Segment & Intersection

Name	Existing Risk Score	Implementation Risk Score	% Improvement	Any Countermeasures Implemented
Segments				
1: Hoffman Drive/Governor Lane Boulevard	8,820	7,200	18%	Yes
2: Donelson Drive	9,480	6,480	32%	Yes
3: Cavalry Drive /Anderson Drive	9,360	6,792	27%	Yes
4: Bower Avenue	7,770	4,860	37%	Yes
5: Decker Avenue	6,468	3,996	38%	Yes
6: Massey Boulevard	7,704	4,896	36%	Yes
7: Lexington Avenue /Roessner Avenue	6,486	5,112	21%	Yes
8: Lincoln Avenue	5,628	3,996	29%	Yes
9: Marbern Road /Oak Ridge Drive	5,304	3,996	25%	Yes
10: Halfway Boulevard	9,480	7,200	24%	Yes
11: Glenside Avenue	8,796	4,446	49%	Yes
12: Linwood Road	6,432	5,328	17%	Yes
13: Armstrong Avenue	5,541	5,112	8%	Yes
Total Segments	**85,296**	**58,974**	**31%**	**-**
Intersections				
A: Hoffman Drive /Governor Lane Boulevard - Donelson Road	6,030	6,840	-13%	Yes
B: Donelson Road - Anderson Drive	6,750	6,240	8%	Yes
C: Anderson Drive - Bower Avenue	6,750	5,592	17%	Yes
D: Bower Drive - Decker Avenue	4,344	3,096	29%	Yes
E: Decker Ave - Massey Boulevard	5,760	2,880	50%	Yes
F: Massey Blvd - Roessner Avenue	5,058	3,546	30%	Yes
G: Roessner Avenue - Lincoln Avenue	2,715	2,340	14%	Yes
H: Lincoln Avenue - Marbern Road/Oak Ridge Drive	3,615	3,096	14%	Yes
I: Marbern Road/Oak Ridge Drive - Halfway Boulevard	5,220	3,600	31%	Yes
J: Halfway Boulevard - Glenside Avenue	3,024	1,656	45%	Yes
K: Glenside Avenue - Greenberry Road	5,760	2,880	50%	Yes
L: Greenberry Road - Linwood Road	3,858	3,096	20%	Yes
M: Linwood Road - Armstrong Avenue	3,858	3,546	8%	Yes
Total intersections	**58,884**	**44,862**	**24%**	**-**
Total Corridor	**144,180**	**103,836**	**28%**	**-**

Conceptual Design

Three action item concepts were developed, each with proposed safety measures for specific locations along Virginia Avenue; a corridor long systemic countermeasures improvement concept along the entire corridor and two Halfway Boulevard intersection improvement alternatives. These action items and locations were selected due to existing safety concerns and risk factors identified during the stakeholder meeting and field visit. The locations are:

- Virginia Avenue from Brookmead Road to Armstrong Avenue
- Virginia Avenue and Halfway Boulevard Intersection – Alternative 1 (Quick Fix)
- Virginia Avenue and Halfway Boulevard Intersection – Alternative 2 (Full Intersection)

Virginia Ave Between Brookmead Road and Armstrong Avenue Safety Focus Action Items

Corridor Length

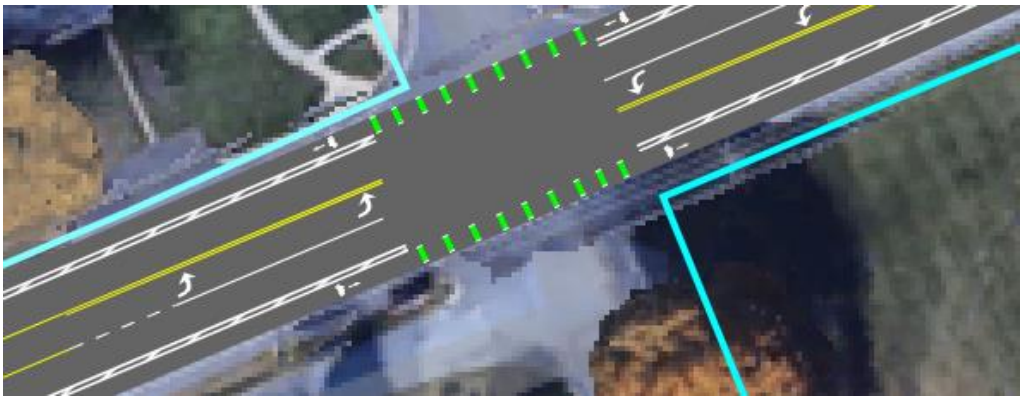
- Reconfigure/restripe Virginia Avenue to include a two-way center left turn lane (TWLTL) (may require shoulder reconstruction for traffic bearing)

Figure 11: Virginia Avenue - Brookmead Drive to Van Lear Drive

Figure 12: Van Lear Drive to East of Wilcox Drive

- Implement 5 ft bike lane and associated features on both sides of Virginia Avenue utilizing existing shoulders and intermittent roadway widening within legal ROW (will require between 43 ft to 47 ft pavement width – existing varies between 36 ft to 48 ft)
    - Construct green painted bike crossings at all public street intersections and major driveways
    - Install bike lane painted buffer pavement markings between bike lanes and travel lanes along corridor from Brookmead Road to Cavalry Drive/Anderson Drive

Figure 13: Green Painted Bike Crossings and Buffered Bike Lane Pavement Markings



- Washington County Transit (WCT) currently operates a flag stop service along Virginia Avenue, which only stops when a passenger signals.
    - Figure 14 represents a typical bus stop pullover integrated into the corridor.
    - Future WCT bus stop locations can be implemented along the corridor as needed.

Figure 14: Typical Bus Stop Pullover Detail

Figure 15: East of Wilcox Drive to West of Coffman Drive

- Implement pedestrian accommodation along corridor.
    - Anticipate pedestrians will use buffered bike lane between Brookmead Road and Cavalry Drive/Anderson Drive
    - Transition to unbuffered bike lane east of Cavalry Drive/Anderson Drive at the I-70 bridge. Simultaneously provide curbline and buffered (with grass strip) sidewalk on the southern side of the travel way. Install/construct buffered (grass strip) sidewalk on the southern side of

roadway between Cavalry Drive/Anderson Drive eastward to Halfway Boulevard.

- East of Halfway Boulevard, construct curbline and buffered sidewalk on the northern side of Virginia Avenue
- Install high visibility crosswalks on side streets and at signalized intersections where sidewalk is present

Figure 16: West of Coffman Avenue to East of Lincoln Avenue

Figure 16: East of Lincoln Avenue to West of Halfway Boulevard

All Signalized Intersections Along Corridor (Governor Lane Boulevard, Massey Boulevard, Lincoln Avenue, Halfway Boulevard)

- Install full suite of pedestrian features at the intersection
    - APS pedestrian push buttons
    - Countdown pedestrian signal heads
    - ADA ramps/access pads
    - High visibility crosswalks
    - Pedestrian actuated traffic signal phasing
- Install backplates with reflectorized strips on all signal heads
- Replace five section protected permissive signal heads with Flashing Red Arrow Singal heads for exclusive left turn lanes. Implement time of day (variable mode) protected/protected-permitted left turn phasing and protected only phasing with pedestrian actuation.

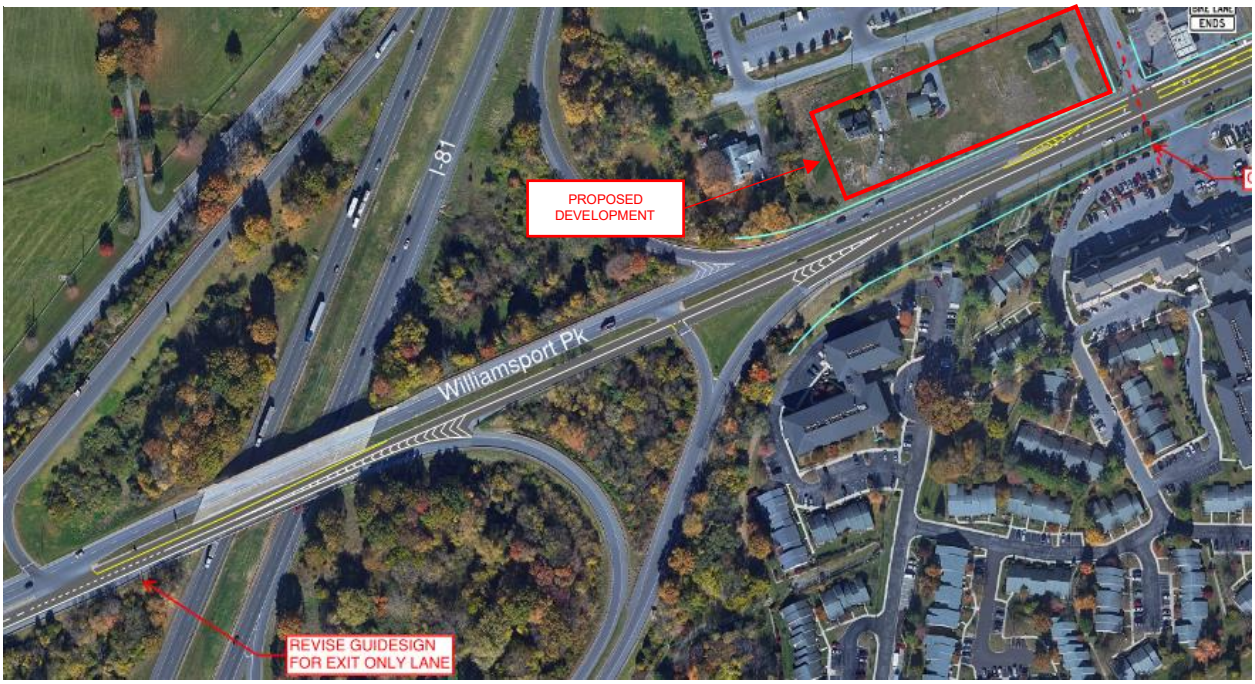
Figure 17: West of Halfway Boulevard to Englewood Road

Figure 18: Englewood Road to East of East of Harwood Road

Location Specific Action Items

- May implement Halfway Boulevard Intersection Alternative 2 action items recommendations concurrently with this systemic corridor action item plan
- Reduce Virginia Avenue travel lanes from four to two east of I-81 interchange
- To tie in with proposed countermeasures at Brookmead Drive western corridor limit, create lane drop at Virginia Avenue EB to I-81 NB ramp and carry single EB lane through corridor. Tie I-81 NB off ramp into this single lane. Revise EB Virginia Avenue interchange and ramp signing accordingly

Figure 19: I-81 Interchange to Brookmead Drive



- Create/install left turn lane from Virgina Avenue EB to Brookmead
- Relocate utility pole on edge of shoulder under the I-70 bridge
- Increase turning radius and relocate utility pole at northeast corner of Halfway Boulevard intersection in conjunction with elimination of channelized right turn lane

Figure 20: Decker Avenue and Massey Boulevard

- At Decker Avenue intersection, implement NO LEFT TURN access control for Decker Ave traffic.
- Add CROSS ROAD with STREET NAME plaque advance warning signs on Virginia Ave for Cavalry Drive/Anderson Drive intersection.
- Add additional SCHOOL CROSSING ASSEMBLY signs for double sided coverage from both approaches at uncontrolled crosswalk across Virginia Avenue at Marbern Road/Oak Ridge Drive intersection.

Figure 21: CROSSROAD with STREET NAME Plaque Advance Warning Sign

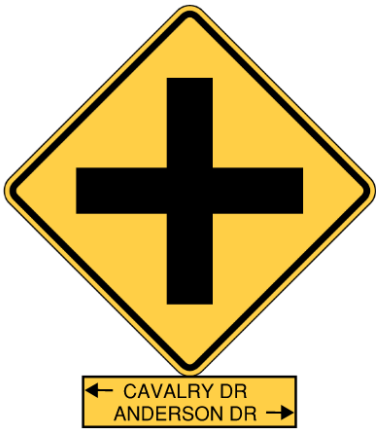
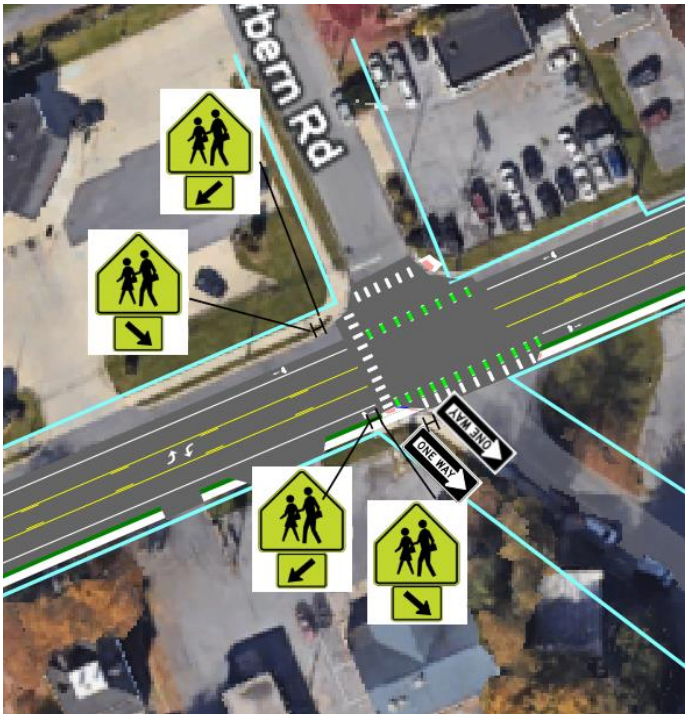
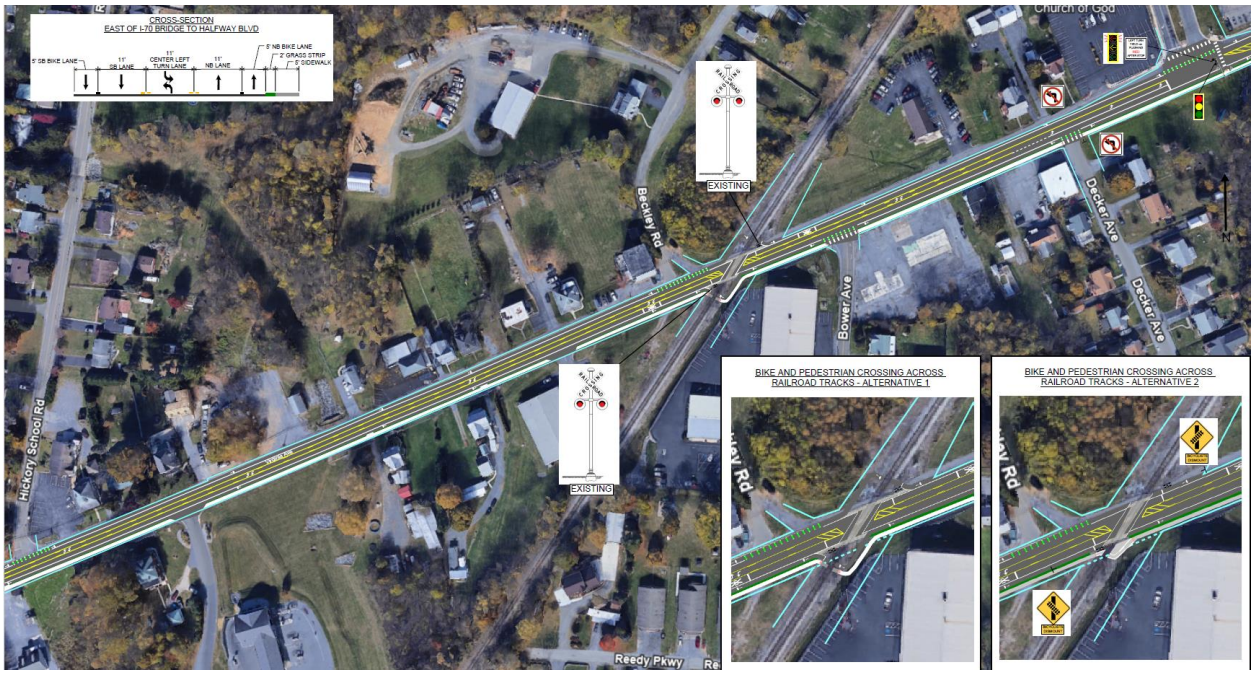


Figure 22: Marbern Road SCHOOL CROSSING ASSEMBLY Signs



- Coordinate with Norfolk Southern Railroad to construct bicycle and ADA compliant/pedestrian safe railroad crossings. Note: Bicycle tires and wheelchair wheels can get stuck or diverted in rail openings. Skewed crossings create additional hazard in this regard. As a result, bicycle and pedestrian paths should cross railroad tracks at 90 degrees. Two alternative schematics are provided to address this at the skewed railroad crossing on Virginia Ave.
    - Alternative 1: Redirect both the bike lane and the sidewalk to cross the railroad tracks at 90 degrees (Departs significantly from existing Virginia Ave right-of-way (ROW) and into Norfgolk Southern Railroad ROW on both sides of the roadway). Bikes and pedestrians can continue at speed when no train present.
    - Alternative 2: Continue bike lane adjacent to vehicle travel lane and provide a SKEWED RAIL CROSSING advance warning signs with a BICYLISTS DISMOUNT auxiliary warning plaque. Widen sidewalk and provide redirecting pavement markings for 90 degree wheelchair path across railroad tracks within widened sidewalk area. (Departs only slightly from existing roadway ROW and into RR ROW on south side of roadway.) Cyclists must dismount to safely cross railroad tracks. Most pedestrians may continue straight ahead, but sufficient width and a demarcated path is provided for wheelchairs to cross tracks safely at a 90 degree angle)

Figure 23: ADA compliant/pedestrian safe railroad crossings

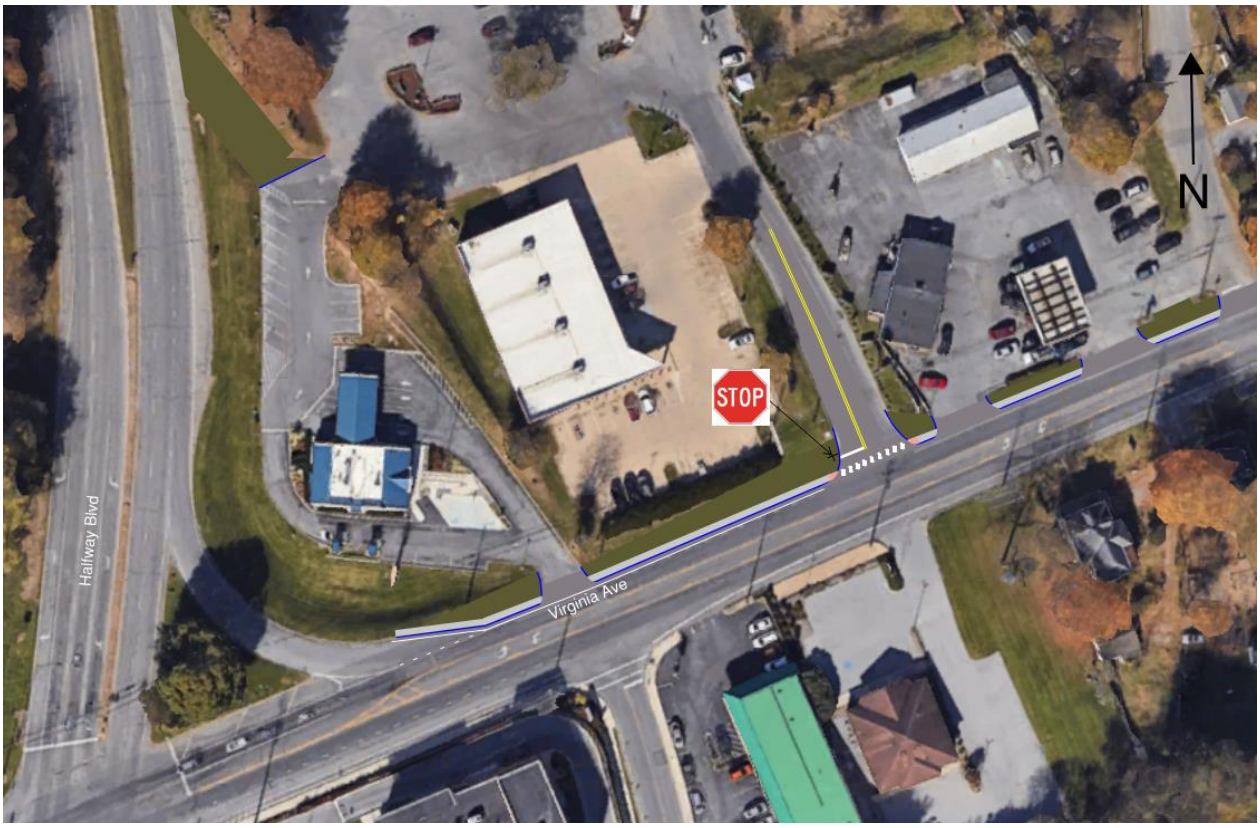


- May extend systemic improvements eastward, beyond eastern corridor limits at Armstrong Avenue into Hagerstown City as desired/ coordinated with Hagerstown City.

Figure 24: East of Harwood Rd to Armstrong Avenue

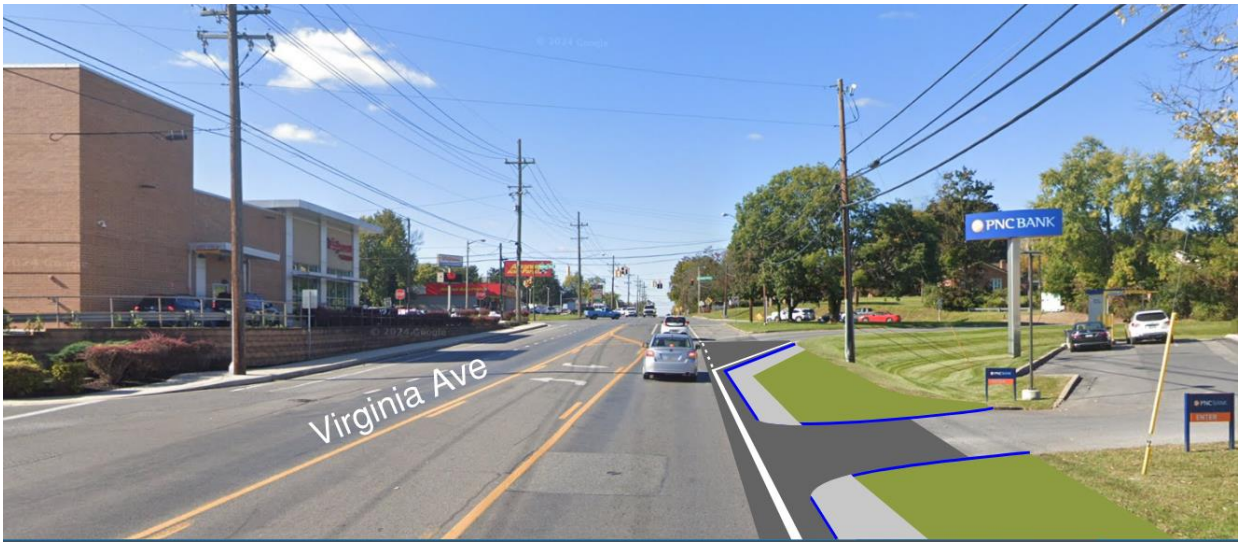
Virginia Avenue and Halfway Boulevard Intersection Alternative 1 Safety Focus Action Items

Figure 25: Virginia Avenue and Halfway Boulevard – Alternative 1 Quick Fix - Proposed Countermeasures



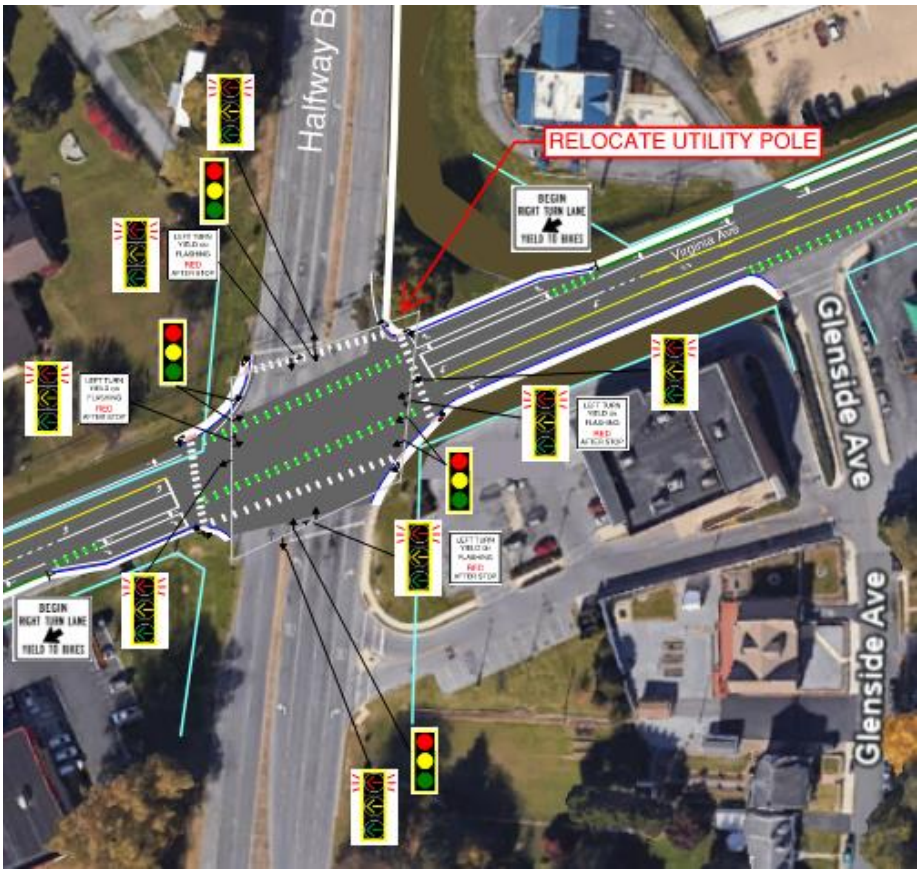
- Eliminate Virginia Avenue WB right turn lane bay
- Eliminate parking lot egress to Halfway Boulevard from PNC Bank (eliminate cut through traffic using parking lots)
- Utilize the existing shoulder and right-turn bay to:
    - Construct continuous curbline and sidewalk along the northern side of Virginia Avenue WB approach from Greenberry Road to Halfway Boulevard
    - Extend driveways to new travel lane edge
    - Eliminate dual lane stop controlled approach at Washington County Board of Elections driveway. Replace with single exit lane at STOP sign (so side by side vehicles do not create a sight distance obstruction for each other)
    - Install ADA ramps at Washington County Board of Elections driveway
    - Install high visibility crosswalk at County Board of Elections driveway

Figure 27: Proposed Virginia Avenue – Alternative 1 Improvements



Virginia Avenue and Halfway Boulevard Intersection Alternative 2 Safety Focus Action Items

Figure 26: Virginia Avenue and Halfway Boulevard – Alternative 2 Full Intersection Proposed Countermeasures



- Eliminate Virginia Avenue WB right turn lane bay and channelized right turn lane and island
- Utilize the existing shoulder, right-turn bay and island to:
    - Construct continuous curbline and sidewalk along the northern side of Virginia Avenue WB approach from Greenberry Road to Halfway Boulevard
    - Extend driveways to new travel lane edge
    - Eliminate dual lane stop controlled approach at Washington County Board of Elections driveway. Replace with single exit lane at STOP sign (so side by side vehicles do not create a sight distance obstruction for each other)
    - Install ADA ramps at Washington County Board of Elections driveway
    - Install high visibility crosswalk at County Board of Elections driveway

Figure 28: Virginia Avenue and Halfway Boulevard – Alternative 2 County Board of Elections and PNC Bank Driveway and Frontage Proposed Countermeasures

- Eliminate parking lot egress to Halfway Boulevard from PNC Bank
- Install sidewalk northward along the eastern side of Halfway Boulevard to provide pedestrian access to Massey Boulevard/the mall area.
- Install full suite of pedestrian features at the intersection
    - APS pedestrian push buttons

  - Countdown pedestrian signal heads
  - ADA ramps/access pads
  - High visibility crosswalks
  - Pedestrian actuated traffic signal phasing
- Replace existing five section protected permitted left turn signal heads with flashing red arrow (FRA) signal heads and time of day protected/ protected-permitted left turn phasing as well as protected only phasing with pedestrian actuation for parallel pedestrian movements.

Figure 29: Proposed Virginia Avenue – Alternative 2 Improvements

Monitoring and Evaluation

To support the ongoing evaluation of the Virginia Avenue corridor, the project team defined a set of performance metrics to assess the change in crash rates over time. As part of this effort, the team developed a crash data monitoring tool for the Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO). The tool allows staff to update and maintain corridor-level data and analyze trends in crash rates, severity, and mode. The tool emphasizes crashes involving vulnerable road users and those that result in someone being killed or seriously injured, while also capturing vehicle-only and non-KSI crashes.

Key features of the tool include:

- An inputs tab labeled "Crashes", which organizes crash data. Users enter 5-year crash counts segregated by mode and severity into designated cells, and the tool calculates the mode percent shares. The tables are formatted to help visualize the distribution of crashes involving VRUs and the share that resulted in KSI.
- An outputs tab labeled "Summary Stats", which calculates Annual Average Crash Rates to help identify long-term trends. A rolling average is used to smoothen any seasonal or one-time variations. This tab also calculates the percent change between the data being evaluated and the baseline or previous iteration of this process.

This method provides a practical and feasible way for HEPMPO to monitor changes in crashes over time using existing data sources. **Table 7** shows the Annual Average Crash Rates for the 2019-2023 Baseline Crashes. As the agency starts to keep track of crashes in the corridor this table will expand to show the new crash rates and percent changes.

Table 7: Baseline Annual Average Crash Rates

Crash Type	Baseline
VRU-KSI	0.8
VRU-nonKSI	1.6
Vehicle-KSI	1.4
Vehicle-nonKSI	49.4
All Crashes	**53.2**

Appendix A: FHWA Safe System Project-Based Alignment Framework

Intersections

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Exposure Scoring Sheet																										
Vulnerable Road Users																										
Vulnerable Road Users Present (users per day)	25	25	30	30	25	25	52	52	25	25	56	56	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Vulnerable Users Score	4	4	6	6	4	4	8	8	4	4	8	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Crossing Distance (Max Number of Lanes)	4	4	4	3	4	3	3	3	3	3	4	4	2	3	2	3	2	3	6	6	5	3	2	3	2	3
Crossing Distance (Max Number of Lanes) Score	8	8	8	6	8	6	6	6	6	6	8	8	4	6	4	6	4	6	10	10	10	6	4	6	4	6
Exposure Vulnerable Road Users Score	12	12	14	12	12	10	14	14	10	10	16	16	8	10	8	10	8	10	14	14	14	10	8	10	8	10
Motor Vehicles																										
Motor Vehicle Volumes (AADT)	16118	16118	12006	12006	11394	11394	13671	13671	11399	11399	19611	19611	11429	11429	12402	12402	14053	14053	31223	31223	11445	11445	11424	11424	11325	11325
Motor Vehicle Volumes (AADT) Score	10	10	8	8	8	8	8	8	8	8	10	10	8	8	8	8	8	8	10	10	8	8	8	8	8	8

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Roadway Width (feet)	50	49	42	33	42	33	36	33	40	33	47	44	36	33	36	33	30	33	66	66	55	33	46	46	24	33
Roadway Width Score	10	10	8	4	8	4	6	4	6	4	8	8	6	4	6	4	4	4	10	10	10	4	8	8	1	4
Exposure Motor Vehicles Score	20	20	16	12	16	12	14	12	14	12	18	18	14	12	14	12	12	12	20	20	18	12	16	16	9	12
Likelihood Risk Factors (Motor Vehicle)																										
Roadside																										
Risk Factor: Lighting Conditions																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Northbound	1.5	1.5	3	3	3	3	3	3	3	3			3	3	3	3	0	0	1.5	1.5	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					1.5	1.5	3	3	1.5	1.5	3	3	1.5	1.5	3	3	3	3	3	3
Intersection Operations																										
Risk Factor: Turn Right on Red Conditions																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	0	0	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Risk Factor: Permissive Left Turns																										
(Virginia Avenue) Eastbound	2	1	3	3	3	3	0	0	3	3	2	1	3	3	3	3	3	3	2	1	3	3	3	3	3	3
(Virginia Avenue) Westbound	2	2	3	3	3	3	3	3	3	3	0	0	3	3	3	3	3	3	2	1	3	3	3	3	3	3
Northbound	0	0	3	3	3	3	3	3	3	3			3	3	3	3	0	0	2	1	3	3	3	3	3	3
Southbound	0	0	3	3	3	3					0	0	3	3	3	3	3	3	2	1	3	3	3	3	3	3
Risk Factor: Obstructed Sight Distance																										
(Virginia Avenue) Eastbound	1.5	1.5	3	3	3	3	0	0	3	3	1.5	1.5	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	0	0	3	3	3	3	3	3	0	0	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Northbound	3	3	0	0	3	3	3	3	3	3			3	3	3	3	0	0	1.5	1.5	3	3	3	3	3	3
Southbound	0	0	0	0	3	3					1.5	1.5	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Risk Factor: Topographical Risks																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	1.5	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northbound	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0	1.5	1.5

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Southbound	0	0	0	0	0	0					0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Risk Factor: Roadside Characteristics																										
(Virginia Avenue) Eastbound	1.5	1.5	1.5	1.5	1.5	1.5	0	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0	0	1.5	1.5
(Virginia Avenue) Westbound	1.5	1.5	1.5	1.5	1.5	1.5	0	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Northbound	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0	0			1.5	1.5	1.5	1.5	0	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Southbound	0	0	0	0	1.5	1.5					1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0	0	1.5	1.5
Risk Factor: Channelized Right-Turn Lane																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
Northbound	1.5	1.5	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southbound	0	0	0	0	0	0					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Risk Factor: Driveways																										
(Virginia Avenue) Eastbound	1.5	1.5	1.5	1.5	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	0	0	3	3	1.5	1.5
(Virginia Avenue) Westbound	1.5	1.5	1.5	1.5	3	3	0	0	1.5	1.5	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3	1.5	1.5
Northbound	0	0	1.5	1.5	1.5	1.5	1.5	1.5	3	3			3	3	3	3	0	0	1.5	1.5	0	0	3	3	3	3

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Southbound	3	3	3	3	1.5	1.5					0	0	3	3	3	3	3	3	0	0	0	0	1.5	1.5	3	3
Risk Factor: Separation of Opposing Vehicular Direction of Travel																										
(Virginia Avenue) Eastbound	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	1.5	1.5	1.5	1.5	3	1.5	3	1.5
*(Virginia **Ave**) Westbound*	3	1.5	3	1.5	3	1.5	3	1.5	3	3	1.5	1.5	3	1.5	3	1.5	3	1.5	1.5	1.5	1.5	1.5	3	1.5	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	0	0	0.75	0.75	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					0.75	0.75	3	3	3	3	3	3	0.75	0.75	3	3	3	3	3	3
Risk Factor Crossing Conflict Driveway (Roundabout)																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	0	0	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Risk Factor: Skewed Intersection																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northbound	3	3	0	0	0	0	3	3	0	0			0	0	0	0	0	0	3	3	3	3	0	0	0	0
Southbound	0	0	0	0	0	0					3	3	3	3	0	0	0	0	3	3	3	3	0	0	0	0
Roadway Information																										
Number of Legs	4	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	3	3	4	4	4	4	4	4	4	4
Likelihood Risk Factor Score - Motor Vehicles	6	6	6	6	7	7	6	6	7	7	5	5	8	8	7	7	7	7	6	5	7	7	7	7	8	8
Likelihood Score: Motor Vehicle Subtotal	15	15	15	15	18	18	15	15	18	18	12	12	21	21	18	18	18	18	15	12	18	18	18	18	21	21
Likelihood Risk Factors (VRU)																										
Pedestrian and Bicycle Accomodation																										
Risk Factor: Pedestrian Space Separation																										
(Virginia Avenue) Eastbound	3	1.5	3	3	3	3	3	3	3	3	3	2.25	3	3	1.5	1.5	1.5	1.5	3	1.5	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	1.5	3	3	3	3	3	3	3	3	2.25	1.5	3	3	3	2.25	3	2.25	3	1.5	3	3	3	3	3	3
Northbound	3	1.5	3	3	3	3	3	1.5	3	1.5			3	1.5	1.5	1.5	3	1.5	3	1.5	2.25	2.25	3	3	3	3
Southbound	3	1.5	3	3	3	3					2.25	1.5	3	3	3	1.5	2.25	1.5	3	1.5	3	3	3	1.5	3	3
Risk Factor: Bike Space Separation																										

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
(Virginia Avenue) Eastbound	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5
(Virginia Avenue) Westbound	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	3	3	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Risk Factor: Pedestrian/ Bike Time Separation																										
(Virginia Avenue) Eastbound	2.25	2.25	3	3	3	3	3	3	3	3	3	2.25	3	3	2.25	2.25	3	2.25	3	2.25	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	2.25	3	3	3	3	3	3	3	3	2.25	2.25	3	3	3	2.25	3	2.25	3	2.25	3	3	3	3	3	3
Northbound	3	2.25	3	3	3	3	3	3	3	3			3	3	2.25	2.25	3	2.25	3	2.25	3	3	3	3	3	3
Southbound	3	2.25	3	3	3	3					2.25	2.25	3	3	3	2.25	3	2.25	3	2.25	3	3	3	3	3	3
Risk Factor: Bicycle Time Separation																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	3	3	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Risk Factor: Lighting Conditions																										

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
(Virginia v) Westbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Northbound	1.5	1.5	3	3	3	3	3	3	3	3			3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					1.5	1.5	3	3	1.5	1.5	3	3	1.5	1.5	3	3	3	3	3	3
Intersection Operations																										
Risk Factor: Right Turn on Red Conditions																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	0	0	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Risk Factor: Permissive Left Turns																										
(Virginia Avenue) Eastbound	2	2	3	3	3	3	0	0	3	3	2	2	3	3	3	3	3	3	2	2	3	3	3	3	3	3
(Virginia Avenue) Westbound	2	2	3	3	3	3	3	3	3	3	0	0	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Northbound	0	0	3	3	3	3	3	3	3	3			3	3	3	3	0	0	2	2	3	3	3	3	3	3
Southbound	0	0	3	3	3	3					0	0	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Roadway and Intersection Geometry																										

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Risk Factor: Obstructed Sight Distance																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	3	3	0	0	1.5	1.5	3	3	1.5	1.5	3	3	1.5	1.5	0	0	3	3	3	3
(Virginia Avenue) Westbound	1.5	1.5	0	0	0	0	1.5	1.5	0	0	0	0	3	3	1.5	1.5	3	3	0	0	3	3	3	3	3	3
Northbound	1.5	1.5	0	0	3	3	1.5	1.5	0	0			3	3	1.5	1.5	0	0	1.5	1.5	3	3	3	3	3	3
Southbound	0	0	0	0	1.5	1.5					1.5	1.5	0	0	1.5	1.5	3	3	1.5	1.5	0	0	3	3	3	3
Risk Factor: Topographical Risks																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	1.5	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northbound	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0	1.5	1.5
Southbound	0	0	0	0	0	0					0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Risk Factor: Channelized Right-Turn Lane																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
Northbound	1.5	1.5	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southbound	0	0	0	0	0	0					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Risk Factor: Driveways																										

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
(Virginia Avenue) Eastbound	1.5	1.5	1.5	1.5	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	0	0	3	3	1.5	1.5
(Virginia Avenue) Westbound	1.5	1.5	1.5	1.5	3	3	0	0	1.5	1.5	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3	1.5	1.5
Northbound	0	0	1.5	1.5	1.5	1.5	1.5	1.5	3	3			3	3	3	3	0	0	1.5	1.5	0	0	3	3	3	3
Southbound	3	3	3	3	1.5	1.5					0	0	3	3	3	3	3	3	0	0	0	0	1.5	1.5	3	3
Risk Factor: Skewed Intersection																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northbound	3	3	0	0	0	0	3	3	0	0			0	0	0	0	0	0	3	3	3	3	0	0	0	0
Southbound	0	0	0	0	0	0					3	3	3	3	0	0	0	0	3	3	3	3	0	0	0	0
Roadway Information																										
Number of Legs	4	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Likelihood Risk Factor Score - Vulnerable Road Users	7	6	8	7	8	8	8	7	8	7	7	6	9	9	8	7	8	7	8	7	8	8	9	9	9	9
Likelihood Score: VRU Subtotal	18	15	21	18	21	21	21	18	21	18	18	15	24	24	21	18	21	18	21	18	21	21	24	24	24	24
Severity Scoring Sheet																										
Vulnerable Road Users																										
Risk Factor: Operating Speed (mph) or Speed	47	45	47	45	47	45	37	35	37	35	37	35	37	35	37	35	37	35	42	40	37	35	37	35	37	35

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Limit +7 mph																										
Severity - Vulnerable Road Users Score	20	20	20	20	20	20	20	15	20	15	20	15	20	15	20	15	20	15	20	20	20	15	20	15	20	15
Motor Vehicles																										
Risk Factor: Operating Speed (mph) or Speed Limit +7 mph	47	45	47	45	47	45	37	35	37	35	37	35	37	35	37	35	37	35	42	40	37	35	37	35	37	35
Severity - Motor Vehicles Score	15	12	15	12	15	12	9	6	9	6	9	6	9	6	9	6	9	6	12	9	9	6	9	6	9	6
Summary Scoring Sheet																										
Exposure - Motor Vehicles Score	20	20	16	12	16	12	14	12	14	12	18	18	14	12	14	12	12	12	20	20	18	12	16	16	9	12
Likelihood - Motor Vehicles Score	15	15	15	15	18	18	15	15	18	18	12	12	21	21	18	18	18	18	15	12	18	18	18	18	21	21
Severity - Motor Vehicles Score	15	12	15	12	15	12	9	6	9	6	9	6	9	6	9	6	9	6	12	9	9	6	9	6	9	6
Mode Subtotal - Motor Vehicles Score	4,500	3,600	3,600	2,160	4,320	2,592	1,890	1,080	2268	1296	1944	1296	2646	1512	2268	1296	1944	1296	3600	2160	2916	1296	2592	1728	1701	1512
Exposure - Vulnerable Road Users Score	12	12	14	12	12	10	14	14	10	10	16	16	8	10	8	10	8	10	14	14	14	10	8	10	8	10

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road /Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Boulevard (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Likelihood - Vulnerable Road Users Score	18	15	21	18	21	21	21	18	21	18	18	15	24	24	21	18	21	18	21	18	21	21	24	24	24	24
Severity - Vulnerable Road Users Score	20	20	20	20	20	20	20	15	20	15	20	15	20	15	20	15	20	15	20	20	20	15	20	15	20	15
Mode subtotal - Vulnerable Road Users Score	4,320	3,600	5,880	4,320	5,040	4,200	5,880	3,780	4,200	2,700	5,760	3,600	3,840	3,600	3,360	2,700	3,360	2,700	5,880	5,040	5,880	3,150	3,840	3,600	3,840	3,600
TOTAL SCORE	**8,820**	**7,200**	**9,480**	**6,480**	**9,360**	**6,792**	**7,770**	**4,860**	**6,468**	**3,996**	**7,704**	**4,896**	**6,486**	**5,112**	**5,628**	**3,996**	**5,304**	**3,996**	**9,480**	**7,200**	**8,796**	**4,446**	**6,432**	**5,328**	**5,541**	**5,112**

Segments

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road/Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Blvd (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Exposure Scoring Sheet																										
Vulnerable Road Users																										
Vulnerable Road Users Present (users per day)	25	25	30	30	25	25	52	52	25	25	56	56	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Vulnerable Users Score	4	4	6	6	4	4	8	8	4	4	8	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Crossing Distance (Max Number of Lanes)	4	4	4	3	4	3	3	3	3	3	4	4	2	3	2	3	2	3	6	6	5	3	2	3	2	3
Crossing Distance (Max Number of Lanes) Score	8	8	8	6	8	6	6	6	6	6	8	8	4	6	4	6	4	6	10	10	10	6	4	6	4	6
Exposure Vulnerable Road Users Score	12	12	14	12	12	10	14	14	10	10	16	16	8	10	8	10	8	10	14	14	14	10	8	10	8	10
Motor Vehicles																										
Motor Vehicle Volumes (AADT)	16118	16118	12006	12006	11394	11394	13671	13671	11399	11399	19611	19611	11429	11429	12402	12402	14053	14053	31223	31223	11445	11445	11424	11424	11325	11325
Motor Vehicle Volumes (AADT) Score	10	10	8	8	8	8	8	8	8	8	10	10	8	8	8	8	8	8	10	10	8	8	8	8	8	8
Roadway Width (feet)	50	49	42	33	42	33	36	33	40	33	47	44	36	33	36	33	30	33	66	66	55	33	46	46	24	33
Roadway Width Score	10	10	8	4	8	4	6	4	6	4	8	8	6	4	6	4	4	4	10	10	10	4	8	8	1	4
Exposure Motor Vehicles Score	20	20	16	12	16	12	14	12	14	12	18	18	14	12	14	12	12	12	20	20	18	12	16	16	9	12
Likelihood Risk Factors (Motor Vehicle)																										
Roadside																										
Risk Factor: Lighting Conditions																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Northbound	1.5	1.5	3	3	3	3	3	3	3	3			3	3	3	3	0	0	1.5	1.5	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					1.5	1.5	3	3	1.5	1.5	3	3	1.5	1.5	3	3	3	3	3	3
Intersection Operations																										
Risk Factor: Turn Right on Red Conditions																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	0	0	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Risk Factor: Permissive Left Turns																										

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road/Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Blvd (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
(Virginia Avenue) Eastbound	2	1	3	3	3	3	0	0	3	3	2	1	3	3	3	3	3	3	2	1	3	3	3	3	3	3
(Virginia Avenue) Westbound	2	2	3	3	3	3	3	3	3	3	0	0	3	3	3	3	3	3	2	1	3	3	3	3	3	3
Northbound	0	0	3	3	3	3	3	3	3	3			3	3	3	3	0	0	2	1	3	3	3	3	3	3
Southbound	0	0	3	3	3	3					0	0	3	3	3	3	3	3	2	1	3	3	3	3	3	3
Risk Factor: Obstructed Sight Distance																										
(Virginia Avenue) Eastbound	1.5	1.5	3	3	3	3	0	0	3	3	1.5	1.5	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	0	0	3	3	3	3	3	3	0	0	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Northbound	3	3	0	0	3	3	3	3	3	3			3	3	3	3	0	0	1.5	1.5	3	3	3	3	3	3
Southbound	0	0	0	0	3	3					1.5	1.5	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Risk Factor: Topographical Risks																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	1.5	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northbound	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0	1.5	1.5
Southbound	0	0	0	0	0	0					0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Risk Factor: Roadside Characteristics																										
(Virginia Avenue) Eastbound	1.5	1.5	1.5	1.5	1.5	1.5	0	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0	0	1.5	1.5
(Virginia Avenue) Westbound	1.5	1.5	1.5	1.5	1.5	1.5	0	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Northbound	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0	0			1.5	1.5	1.5	1.5	0	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Southbound	0	0	0	0	1.5	1.5					1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0	0	1.5	1.5
Risk Factor: Channelized Right-Turn Lane																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road/Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Blvd (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
Northbound	1.5	1.5	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southbound	0	0	0	0	0	0					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Risk Factor: Driveways																										
(Virginia Avenue) Eastbound	1.5	1.5	1.5	1.5	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	0	0	3	3	1.5	1.5
(Virginia Avenue) Westbound	1.5	1.5	1.5	1.5	3	3	0	0	1.5	1.5	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3	1.5	1.5
Northbound	0	0	1.5	1.5	1.5	1.5	1.5	1.5	3	3			3	3	3	3	0	0	1.5	1.5	0	0	3	3	3	3
Southbound	3	3	3	3	1.5	1.5					0	0	3	3	3	3	3	3	0	0	0	0	1.5	1.5	3	3
Risk Factor: Separation of Opposing Vehicular Direction of Travel																										
(Virginia Avenue) Eastbound	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	1.5	1.5	1.5	1.5	3	1.5	3	1.5
(Virginia Avenue) Westbound	3	1.5	3	1.5	3	1.5	3	1.5	3	3	1.5	1.5	3	1.5	3	1.5	3	1.5	1.5	1.5	1.5	1.5	3	1.5	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	0	0	0.75	0.75	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					0.75	0.75	3	3	3	3	3	3	0.75	0.75	3	3	3	3	3	3
Risk Factor Crossing Conflict Driveway (Roundabout)																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	0	0	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Risk Factor: Skewed Intersection																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northbound	3	3	0	0	0	0	3	3	0	0			0	0	0	0	0	0	3	3	3	3	0	0	0	0
Southbound	0	0	0	0	0	0					3	3	3	3	0	0	0	0	3	3	3	3	0	0	0	0
Roadway Information																										
Number of Legs	4	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	3	3	4	4	4	4	4	4	4	4
Likelihood Risk Factor Score - Motor Vehicles	6	6	6	6	7	7	6	6	7	7	5	5	8	8	7	7	7	7	6	5	7	7	7	7	8	8
Likelihood Score: Motor Vehicle Subtotal	15	15	15	15	18	18	15	15	18	18	12	12	21	21	18	18	18	18	15	12	18	18	18	18	21	21
Likelihood Risk Factors (VRU)																										

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road/Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Blvd (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Pedestrian and Bicycle Accomodation																										
Risk Factor: Pedestrian Space Separation																										
(Virginia Avenue) Eastbound	3	1.5	3	3	3	3	3	3	3	3	3	2.25	3	3	1.5	1.5	1.5	1.5	3	1.5	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	1.5	3	3	3	3	3	3	3	3	2.25	1.5	3	3	3	2.25	3	2.25	3	1.5	3	3	3	3	3	3
Northbound	3	1.5	3	3	3	3	3	1.5	3	1.5			3	1.5	1.5	1.5	3	1.5	3	1.5	2.25	2.25	3	3	3	3
Southbound	3	1.5	3	3	3	3					2.25	1.5	3	3	3	1.5	2.25	1.5	3	1.5	3	3	3	1.5	3	3
Risk Factor: Bike Space Separation																										
(Virginia Avenue) Eastbound	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5
(Virginia Avenue) Westbound	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	1.5	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	3	3	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Risk Factor: Pedestrian/Bike Time Separation																										
(Virginia Avenue) Eastbound	2.25	2.25	3	3	3	3	3	3	3	3	3	2.25	3	3	2.25	2.25	3	2.25	3	2.25	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	2.25	3	3	3	3	3	3	3	3	2.25	2.25	3	3	3	2.25	3	2.25	3	2.25	3	3	3	3	3	3
Northbound	3	2.25	3	3	3	3	3	3	3	3			3	3	2.25	2.25	3	2.25	3	2.25	3	3	3	3	3	3
Southbound	3	2.25	3	3	3	3					2.25	2.25	3	3	3	2.25	3	2.25	3	2.25	3	3	3	3	3	3
Risk Factor: Bicycle Time Separation																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	3	3	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Risk Factor: Lighting Conditions																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road/Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Blvd (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
(Virginia Avenue) Westbound	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Northbound	1.5	1.5	3	3	3	3	3	3	3	3			3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					1.5	1.5	3	3	1.5	1.5	3	3	1.5	1.5	3	3	3	3	3	3
Intersection Operations																										
Risk Factor: Right Turn on Red Conditions																										
(Virginia Avenue) Eastbound	3	3	3	3	3	3	3	3	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3
(Virginia Avenue) Westbound	3	3	3	3	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Northbound	3	3	3	3	3	3	3	3	3	3			3	3	3	3	0	0	3	3	3	3	3	3	3	3
Southbound	3	3	3	3	3	3					3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Risk Factor: Permissive Left Turns																										
(Virginia Avenue) Eastbound	2	2	3	3	3	3	0	0	3	3	2	2	3	3	3	3	3	3	2	2	3	3	3	3	3	3
(Virginia Avenue) Westbound	2	2	3	3	3	3	3	3	3	3	0	0	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Northbound	0	0	3	3	3	3	3	3	3	3			3	3	3	3	0	0	2	2	3	3	3	3	3	3
Southbound	0	0	3	3	3	3					0	0	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Roadway and Intersection Geometry																										
Risk Factor: Obstructed Sight Distance																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	3	3	0	0	1.5	1.5	3	3	1.5	1.5	3	3	1.5	1.5	0	0	3	3	3	3
(Virginia Avenue) Westbound	1.5	1.5	0	0	0	0	1.5	1.5	0	0	0	0	3	3	1.5	1.5	3	3	0	0	3	3	3	3	3	3
Northbound	1.5	1.5	0	0	3	3	1.5	1.5	0	0			3	3	1.5	1.5	0	0	1.5	1.5	3	3	3	3	3	3
Southbound	0	0	0	0	1.5	1.5					1.5	1.5	0	0	1.5	1.5	3	3	1.5	1.5	0	0	3	3	3	3
Risk Factor: Topographical Risks																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	1.5	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road/Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Blvd (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northbound	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0	1.5	1.5
Southbound	0	0	0	0	0	0					0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Risk Factor: Channelized Right-Turn Lane																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
Northbound	1.5	1.5	0	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southbound	0	0	0	0	0	0					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Risk Factor: Driveways																										
(Virginia Avenue) Eastbound	1.5	1.5	1.5	1.5	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	0	0	3	3	1.5	1.5
(Virginia Avenue) Westbound	1.5	1.5	1.5	1.5	3	3	0	0	1.5	1.5	3	3	3	3	3	3	1.5	1.5	3	3	3	3	3	3	1.5	1.5
Northbound	0	0	1.5	1.5	1.5	1.5	1.5	1.5	3	3			3	3	3	3	0	0	1.5	1.5	0	0	3	3	3	3
Southbound	3	3	3	3	1.5	1.5					0	0	3	3	3	3	3	3	0	0	0	0	1.5	1.5	3	3
Risk Factor: Skewed Intersection																										
(Virginia Avenue) Eastbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(Virginia Avenue) Westbound	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northbound	3	3	0	0	0	0	3	3	0	0			0	0	0	0	0	0	3	3	3	3	0	0	0	0
Southbound	0	0	0	0	0	0					3	3	3	3	0	0	0	0	3	3	3	3	0	0	0	0
Roadway Information																										
Number of Legs	4	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Likelihood Risk Factor Score - Vulnerable Road Users	7	6	8	7	8	8	8	7	8	7	7	6	9	9	8	7	8	7	8	7	8	8	9	9	9	9
Likelihood Score: VRU Subtotal	18	15	21	18	21	21	21	18	21	18	18	15	24	24	21	18	21	18	21	18	21	21	24	24	24	24
Severity Scoring Sheet																										
Vulnerable Road Users																										
Risk Factor: Operating Speed (mph) or Speed Limit +7 mph	47	45	47	45	47	45	37	35	37	35	37	35	37	35	37	35	37	35	42	40	37	35	37	35	37	35
Severity - Vulnerable Road Users Score	20	20	20	20	20	20	20	15	20	15	20	15	20	15	20	15	20	15	20	20	20	15	20	15	20	15
Motor Vehicles																										
Risk Factor: Operating Speed (mph) or Speed Limit +7 mph	47	45	47	45	47	45	37	35	37	35	37	35	37	35	37	35	37	35	42	40	37	35	37	35	37	35
Severity - Motor Vehicles Score	15	12	15	12	15	12	9	6	9	6	9	6	9	6	9	6	9	6	12	9	9	6	9	6	9	6
Summary Scoring Sheet																										

Intersections Data	1: Hoffman Drive/Governor Lane Boulevard	Hoffman Drive /Governor Lane Boulevard (CM)	2: Donelson Drive	Donelson Drive (CM)	3: Cavalry Drive /Anderson Drive	Cavalry Drive /Anderson Drive (CM)	4: Bower Avenue	Bower Avenue (CM)	5: Decker Avenue	Decker Avenue (CM)	6: Massey Boulevard	Massey Boulevard (CM)	7: Lexington Avenue /Roessner Avenue	Lexington Avenue /Roessner Avenue (CM)	8: Lincoln Avenue	Lincoln Avenue (CM)	9: Marbern Road/Oak Ridge Drive	Marbern Road /Oak Ridge Drive (CM)	10: Halfway Boulevard	Halfway Blvd (CM)	11: Glenside Avenue	Glenside Avenue (CM)	12: Linwood Road	Linwood Road (CM)	13: Armstrong Avenue	Armstrong Avenue (CM)
Exposure - Motor Vehicles Score	20	20	16	12	16	12	14	12	14	12	18	18	14	12	14	12	12	12	20	20	18	12	16	16	9	12
Likelihood - Motor Vehicles Score	15	15	15	15	18	18	15	15	18	18	12	12	21	21	18	18	18	18	15	12	18	18	18	18	21	21
Severity - Motor Vehicles Score	15	12	15	12	15	12	9	6	9	6	9	6	9	6	9	6	9	6	12	9	9	6	9	6	9	6
Mode Subtotal - Motor Vehicles Score	4,500	3,600	3,600	2,160	4,320	2,592	1,890	1,080	2268	1296	1944	1296	2646	1512	2268	1296	1944	1296	3600	2160	2916	1296	2592	1728	1701	1512
Exposure - Vulnerable Road Users Score	12	12	14	12	12	10	14	14	10	10	16	16	8	10	8	10	8	10	14	14	14	10	8	10	8	10
Likelihood - Vulnerable Road Users Score	18	15	21	18	21	21	21	18	21	18	18	15	24	24	21	18	21	18	21	18	21	21	24	24	24	24
Severity - Vulnerable Road Users Score	20	20	20	20	20	20	20	15	20	15	20	15	20	15	20	15	20	15	20	20	20	15	20	15	20	15
Mode subtotal - Vulnerable Road Users Score	4,320	3,600	5,880	4,320	5,040	4,200	5,880	3,780	4,200	2,700	5,760	3,600	3,840	3,600	3,360	2,700	3,360	2,700	5,880	5,040	5,880	3,150	3,840	3,600	3,840	3,600
TOTAL SCORE	**8,820**	**7,200**	**9,480**	**6,480**	**9,360**	**6,792**	**7,770**	**4,860**	**6,468**	**3,996**	**7,704**	**4,896**	**6,486**	**5,112**	**5,628**	**3,996**	**5,304**	**3,996**	**9,480**	**7,200**	**8,796**	**4,446**	**6,432**	**5,328**	**5,541**	**5,112**

Appendix B: Countermeasures Cost Estimates

	Construction Costs	ADA Ramps	Mobilization (4%)	Maintenence and Protection of Traffic (10%)	Contingencies (25%)	Inspection (12%)	Engineering (25%)	TOTAL
Roadway Reconfiguration (Center Turn Lane, Bike Lanes, Sidewalk and Pedestrian Features)								
Widen Roadway and Rebuild Shoulders	$6,121,600		$244,864	$612,160	$1,530,400	$734,592	$1,530,400	$10,774,016
Signal Upgrades - Pedestrian Accommodation	$576,000		$23,040	$57,600	$144,000	$69,120	$144,000	$1,013,760
Signing and Pavement Markings (To Implement Lane Reconfiguration)	$581,400		$23,256	$58,140	$145,350	$69,768	$145,350	$1,023,264
Sidewalk and ADA Ramps	$2,082,000	$767,000	$113,960	$284,900	$520,500	$341,880	$520,500	$4,630,740
Halfway Boulevard Intersection Improvements								
Signal and Pedestrian Improvements	$250,000	$143,000	$15,720	$39,300	$62,500	$47,160	$62,500	$620,180
Eliminate Channelized Right Turn lane and Install Standard Right Turn Bay	$511,200		$20,448	$51,120	$127,800	$61,344	$127,800	$899,712
Add Sidewalk and Curb	$211,250		$8,450	$21,125	$52,813	$25,350	$52,813	$371,800
Total (Rounded) -$19,333,000								

Appendix C: Public Feedback

Public Comment Period

There was a 30-day public comment period from March 23 – June 23, 2025, to allow for the public to review of the draft plan and provide written comment. The draft plan was posted on HEPMPO's website and hard copies of the plan were made available at the Washington County Free Library in Hagerstown. Copies could also be requested directly from HEPMPO.

Response Summary

There were no public comments received on the draft plan.

Public Meeting

A hybrid public meeting was held on June 18, 2025, at the Washington County Free Library in Hagerstown in Conference Room 334. The presentation is posted on HEPMPO's website. A list of the attendees is below.

Virginia Avenue Safety Corridor Study

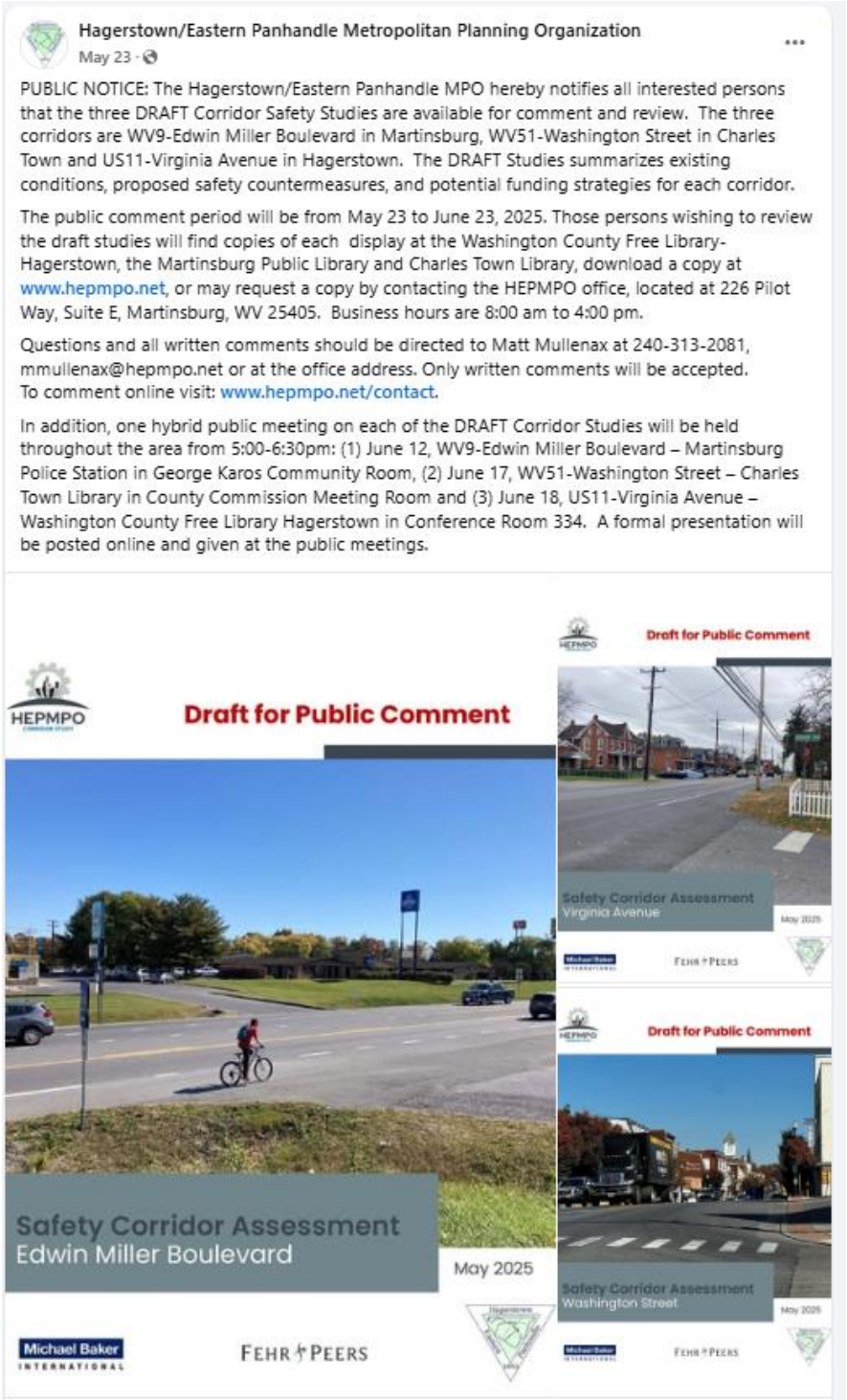
Public Meeting Sign-In Sheet

June 18, 2025

Name	Organization	Email
David Schaile	MDOT SHA R/PD	

Social Media Posts & Website

HEPMPO utilized social media posts and its website to provide public notice on the plan's public comment period and the public meeting.



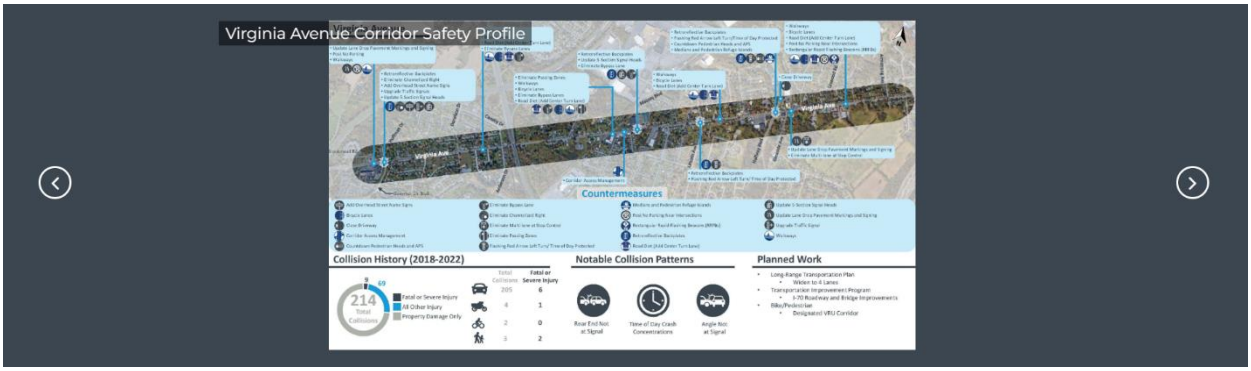
Hagerstown/Eastern Panhandle Metropolitan Planning Organization
May 23 ·

PUBLIC NOTICE: The Hagerstown/Eastern Panhandle MPO hereby notifies all interested persons that the three DRAFT Corridor Safety Studies are available for comment and review. The three corridors are WV9-Edwin Miller Boulevard in Martinsburg, WV51-Washington Street in Charles Town and US11-Virginia Avenue in Hagerstown. The DRAFT Studies summarizes existing conditions, proposed safety countermeasures, and potential funding strategies for each corridor.

The public comment period will be from May 23 to June 23, 2025. Those persons wishing to review the draft studies will find copies of each display at the Washington County Free Library-Hagerstown, the Martinsburg Public Library and Charles Town Library, download a copy at www.hepmpo.net, or may request a copy by contacting the HEPMPO office, located at 226 Pilot Way, Suite E, Martinsburg, WV 25405. Business hours are 8:00 am to 4:00 pm.

Questions and all written comments should be directed to Matt Mullenax at 240-313-2081, mmullenax@hepmpo.net or at the office address. Only written comments will be accepted. To comment online visit: www.hepmpo.net/contact.

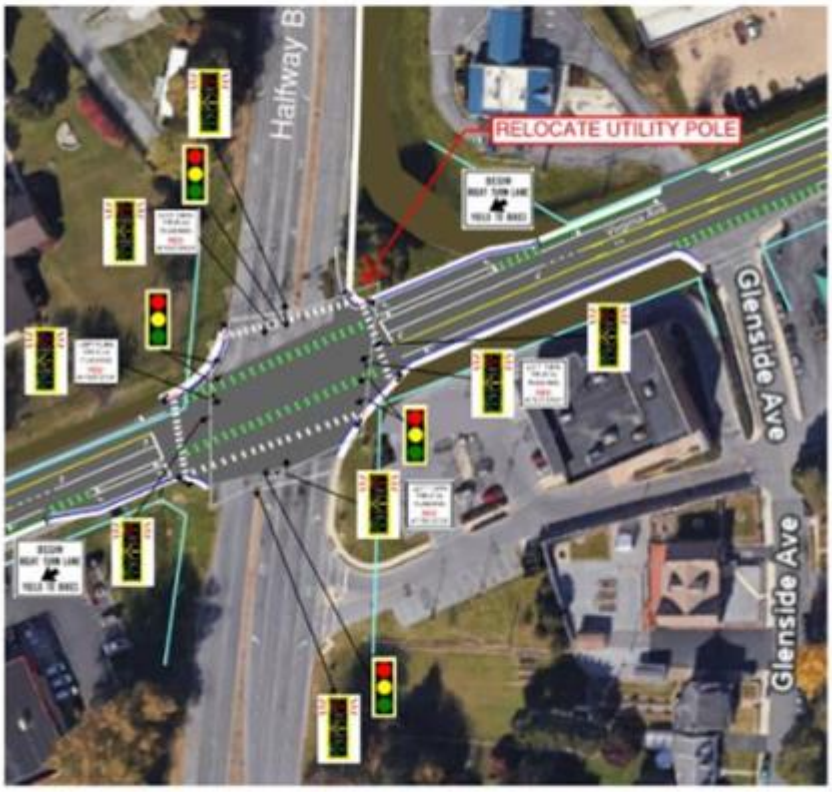
In addition, one hybrid public meeting on each of the DRAFT Corridor Studies will be held throughout the area from 5:00-6:30pm: (1) June 12, WV9-Edwin Miller Boulevard – Martinsburg Police Station in George Karos Community Room, (2) June 17, WV51-Washington Street – Charles Town Library in County Commission Meeting Room and (3) June 18, US11-Virginia Avenue – Washington County Free Library Hagerstown in Conference Room 334. A formal presentation will be posted online and given at the public meetings.



Hagerstown/Eastern Panhandle Metropolitan Planning Organization
June 6 at 8:00 AM ·

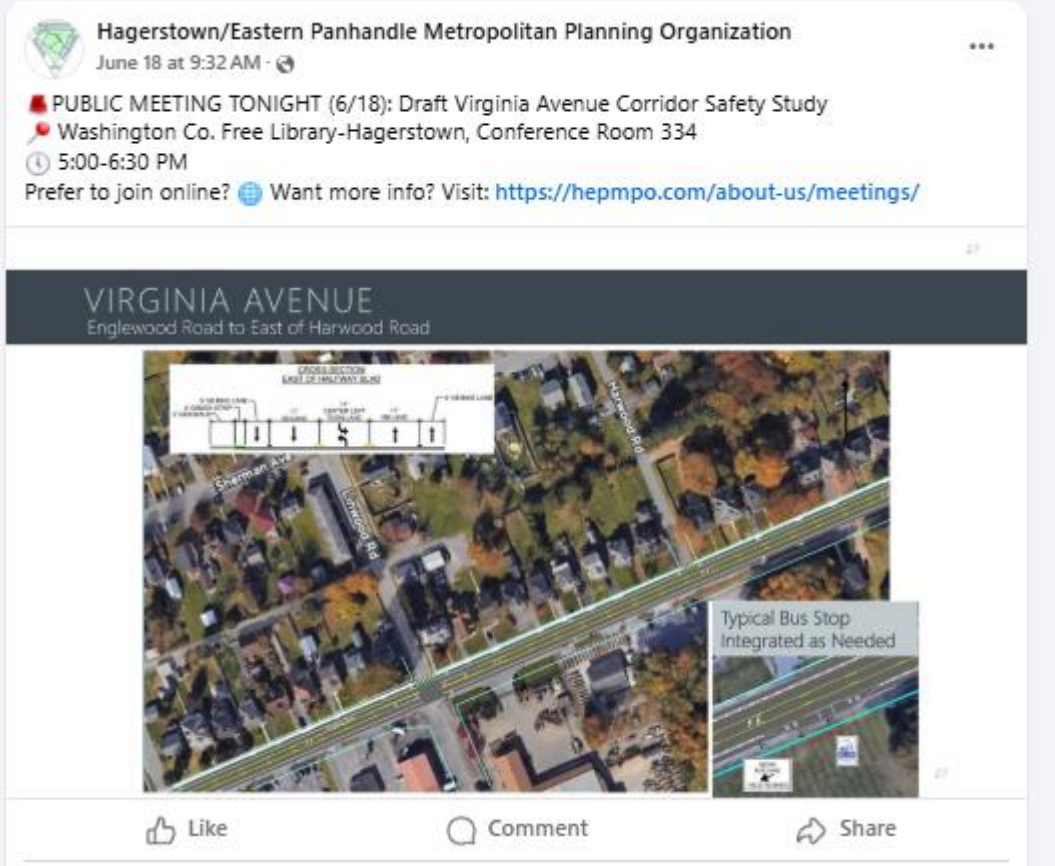
Comment on the Draft Virginia Avenue Corridor Safety Study
Public meeting is scheduled at:
Washington Co. Free Library - Hagerstown (June 18)
From 5:00-6:30 PM.
Prefer to join online? Want more info? Check it out: https://hepmpo.com/

Figure 26: Virginia Avenue and Halfway Boulevard – Alternative 2 Full Intersection Proposed Countermeasures



Like Comment Share

Comment as Rebecca Bankard


Hagerstown/Eastern Panhandle Metropolitan Planning Organization
June 18 at 9:32 AM
PUBLIC MEETING TONIGHT (6/18): Draft Virginia Avenue Corridor Safety Study
Washington Co. Free Library-Hagerstown, Conference Room 334
5:00-6:30 PM
Prefer to join online? Want more info? Visit: https://hepmpo.com/about-us/meetings/
VIRGINIA AVENUE
Englewood Road to East of Harwood Road
Sherman Ave
Englewood Rd
Harwood Rd
Typical Bus Stop
Integrated as Needed
Like
Comment
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