



# Safety Corridor Study: Winchester Avenue

May 2026

**Draft for Public Comment**



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# Introduction

The Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) Regional Safety Action Plan produced a high-injury network (HIN) for the region that identified roadway segments with disproportionate fatal or serious injury crashes, especially those involving people walking, biking, or riding a motorcycle. Winchester Avenue was among the safety corridors identified along the HIN to further assess and identify safety solutions.

This memo summarizes the existing conditions and assesses the safety needs and risk factors for the Winchester Avenue safety corridor study area in Martinsburg, WV. The memo highlights the needs assessment process, existing conditions, future conditions, site visit, and how the findings will inform concept development and funding strategy.

## About the Winchester Avenue Safety Corridor

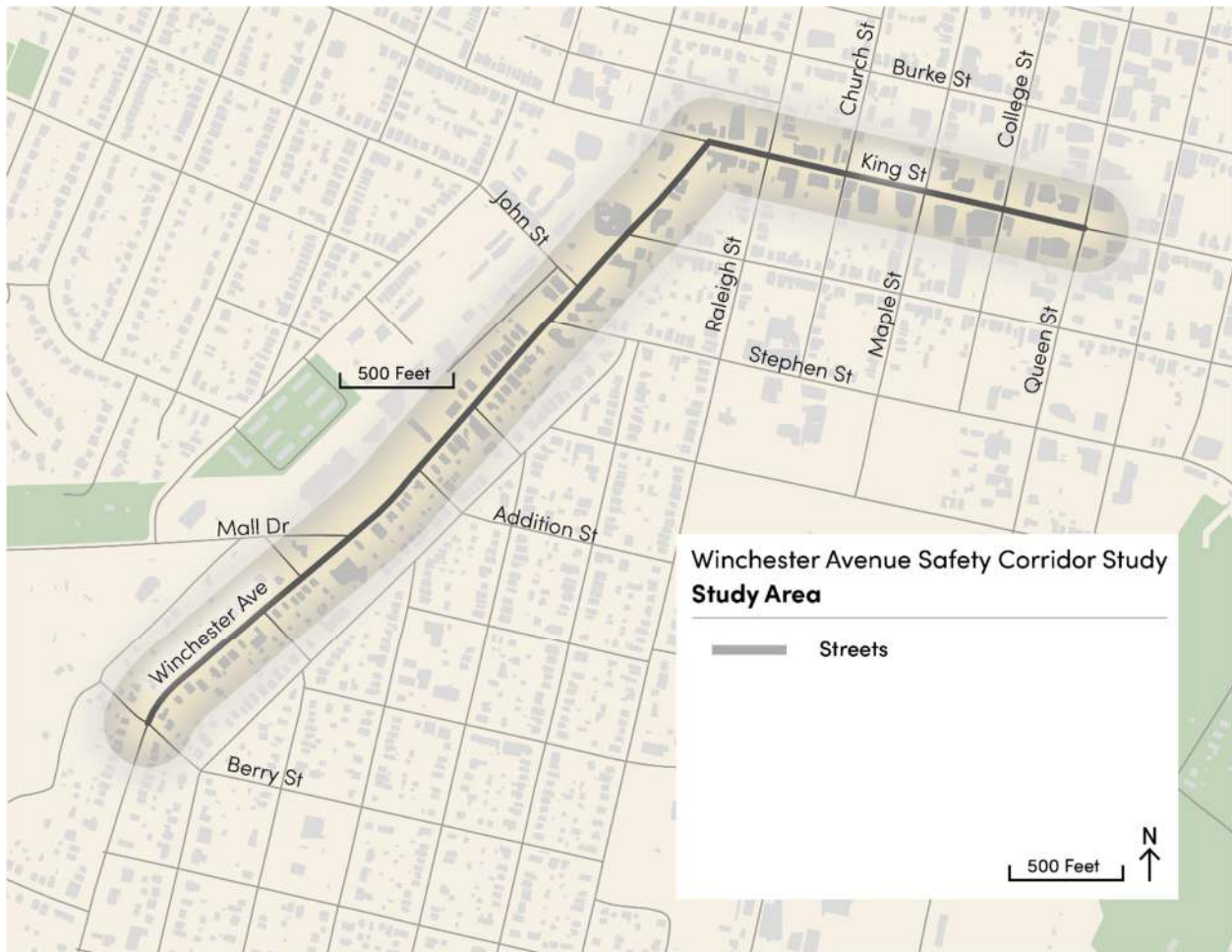
The Winchester Avenue safety corridor is part of the State-owned US Route 11 in Berkeley County, WV. The study area includes Winchester Avenue from Berry Street to King Street, as well as King Street in downtown Martinsburg from Winchester Avenue to Queen Street, as shown in

**Figure 1.** The corridor serves as a critical transportation route into downtown Martinsburg, connecting traffic from I-81 and WV-9 to the historic downtown core. The roadway consists of two travel lanes with on-street parking in select areas. Sidewalks are present on both sides of the roadway, though their quality varies highly on Winchester. Nearly all intersections have some type of control, with signals present at six intersections and stop signs on smaller side streets. The Annual Average Daily Traffic (AADT) volumes vary between 9,968 at the southern extent of the corridor and 16,194 on King Street east of the corridor near I-81, indicating moderate to high traffic activity.<sup>1</sup>

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<sup>1</sup> WEST VIRGINIA DEPARTMENT OF HIGHWAYS. (N.D.). WEST VIRGINIA ANNUAL AVERAGE DAILY TRAFFIC (AADT) MAP. RETRIEVED OCTOBER 30, 2025, FROM [HTTPS://GIS.TRANSPORTATION.WV.GOV/AADT/](https://gis.transportation.wv.gov/aadt/)

Figure 1: Winchester Avenue Safety Corridor Study Area Map



Adjacent land uses include commercial establishments concentrated in the downtown area and residential neighborhoods south of the city center. Public transit services, operated by the Eastern Panhandle Transit Authority (EPTA), provide regional connectivity through designated stops along the corridor.

The corridor is on the HIN developed through the HEPMPO Regional Safety Action Plan, and sections of it are on the 2023 West Virginia Vulnerable Road User Assessment HIN. Recommendations developed through this plan, and through previous planning processes, seek to make the corridor safer for all road users.

## HEPMPO Regional Safety Action Plan

In 2023, the HEPMPO Regional Safety Action Plan (SAP) was developed as a comprehensive effort to address roadway safety challenges across the region. The Plan was officially adopted by the HEPMPO Policy Board in May 2024, marking a significant milestone in the region's commitment to achieving zero fatalities and serious injuries. Central to the plan's development

was the identification and prioritization of strategies to enhance safety for all road users, including pedestrians, bicyclists, public transit riders, and commercial vehicle operators.

A key component of the Safety Action Plan was the creation of a HIN, which identifies roadway segments and intersections with the highest concentrations of fatal and serious injury crashes. This data-driven approach enabled HEPMPO to prioritize locations where interventions could have the greatest impact on reducing fatalities and serious injuries. Previous safety corridor studies were conducted on Washington Street in Jefferson County, WV, Edwin Miller Boulevard in Berkeley County, WV, and Virginia Avenue in Washington County, MD. This study focuses on Winchester Avenue in Berkeley County, WV, which ranked 10<sup>th</sup> among all corridors in the HEPMPO HIN.

These assessments aim to evaluate specific safety challenges and identify feasible solutions tailored to each location. By addressing these high-priority areas, HEPMPO intends to position its member jurisdictions to secure potential funding through programs like Safe Streets and Roads for All (SS4A), ensuring that actionable steps can be implemented to improve safety across the region. HEPMPO also developed recommendations that State DOT partners could implement utilizing Highway Safety Improvement Program (HSIP) funding.

# Needs Assessment Process

This section outlines the primary steps taken to examine the safety needs along the Winchester Avenue safety corridor. Needs assessments steps included collecting and evaluating data and previous plans and conducting a site visit with stakeholders which applied a proactive safety tool.

## Data Collection & Evaluation

The project team collected the following data to understand and evaluate the contextual and roadway characteristics of the study area:

- 2019 – 2024 Crash Data
- Future Planning Designations & Development
- HEPMPO Regional Safety Action Plan - Corridor Profiles
- Vehicle Volumes
- Existing & Future Land Use
- Roadway Characteristics (Speeds, Lanes, On-Street Parking, Loading Zones, Presence and Width of Shoulders, Lighting)
- Transit Stops & Routes
- Pedestrian & Bicycle Infrastructure (Sidewalks, Crosswalks, Curb Ramps, Bike Lanes)
- Site Visit Observations, including Signal Operations
- Right-of-Way
- Historical Public Outreach Survey Responses

## Previous Plans or Work Review

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

- HEPMPO Regional Safety Action Plan
- Martinsburg Gateway Vision Plan
- Martinsburg Comprehensive Plan
- WV Vulnerable Road User Safety Assessment
- North Martinsburg Area Pedestrian Plan
- Interwoven Mill Apartments Traffic Impact Assessment
- Martinsburg-Berkeley County Parks and Recreation Master Plan

## Site Visit

The project team conducted a site visit with stakeholders on October 1, 2025, to examine historical safety issues and systemically identify potential risk factors using a proactive safety lens. Site visit participants identified risk factors using criteria from the [FHWA Safe System](#)

[Project-Based Alignment Framework](#). Criteria from the framework include variables related to exposure, such as AADT, risk factors that can increase the likelihood of a crash, such as number of conflict points at an intersection, and severity of a crash, such as speed along a corridor. The FHWA framework was released in April of 2024 to assist agencies in assessing their alignment with the [Safe System Approach](#) (SSA). FHWA adopted the SSA in 2022 as a guiding paradigm for addressing roadway safety and achieving a goal of zero traffic deaths. The SSA helps transportation agencies and stakeholders re-think and evaluate existing safety efforts and implement other intentional solutions to achieve the goal of zero deaths and serious injuries.

Through this approach, the team identified safety concerns related to multiple aspects of roadway safety, including traffic flow patterns and turning movements that have contributed to previous crashes, as well as road conditions such as pavement quality, signs, pavement markings, lighting, and roadside conditions. Additionally, they examined pedestrian and bicycle safety concerns stemming from insufficient infrastructure. Throughout the visit, the team discussed safety risks and community concerns and began to identify potential solutions to mitigate these risks.

# Existing Conditions

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

## Previous Work

Seven previous studies and planning efforts were reviewed as part of the existing conditions assessment, with two studies provided a strong foundation: the HEPMPO Regional Safety Action Plan and the Martinsburg Gateway Vision Plan.

### HEPMPO Regional Safety Action Plan

The 2024 [HEPMPO Regional SAP](#) emphasizes prioritizing safety improvements by identifying high-risk locations and addressing primary collision types and contributing factors. For this purpose, two key tools were developed:

1. **High-Injury Network (HIN):** This network identifies roadway segments with a high frequency of fatal and serious injury crashes. The HIN represents only 2.5% of the non-interstate road network but accounts for a significant proportion of severe crashes, including 56% of pedestrian and 32% of motorcycle fatalities and injuries.
2. **Priority Corridor Profiles:** The corridor profiles were selected based on the HIN rankings and refined through public input and state-designated priority areas. These corridors focus on addressing safety concerns for vulnerable road users (pedestrians, bicyclists, and motorcyclists) and underserved areas.

Additionally, safety improvement strategies and countermeasures were proposed for the selected priority corridors, tailored to address specific safety challenges and historical trends. The priority corridor profile for Winchester Avenue, as well as the SAP countermeasure toolbox, from the regional SAP can be found in **Appendix D: HEPMPO SAP – Winchester Ave. Corridor Profile and Countermeasure Toolbox**.

### Martinsburg Gateway Vision Plan

The 2023 [Martinsburg Gateway Vision Plan](#) provided a long-term strategy to strengthen the city's identity, enhance economic development opportunities, and improve pedestrian and bicycle connections. The plan focused on key gateways including Queen Street, King Street, Raleigh Street, Winchester Avenue, and Moler Avenue. Through public engagement, site analysis, and conceptual planning, the project culminated in a block-by-block guide of improvements and future city investment.

The Martinsburg Gateway Vision Plan includes conceptual renderings to substantially change the intersections of Winchester Avenue and King Street as well as Winchester Avenue and Mall

Drive. The plan envisions this study's portion of Winchester Avenue as a multi-use innovation zone, and King Street as a downtown zone. Among the changes is a proposal to redesign the intersection at Winchester and King to allow left turns from northbound Winchester onto westbound King. This recommendation is a high priority for the city and would substantially impact traffic patterns at this intersection and along the corridor. The conceptual plans also envision closing the one-way connector from Mall Drive to Winchester Avenue and converting that roadway to a shared use path.

Additional recommendations in the Gateway Plan that would impact the Winchester Avenue safety corridor include the following:

- Repurpose on-street parking on Winchester to create space for bike facilities and wider sidewalks
- Reduce travel lanes on Winchester to 11 feet wide
- Widen sidewalks on Winchester
- Add streetscaping with planted buffers along Winchester
- Add a 10-foot wide shared use path in the alley parallel to Winchester
- Add a 10-foot wide shared use path along King
- Add landscape buffers and bump-outs along King

In addition to these design recommendations, both the Gateway Plan and the HEPMPO Regional Safety Action Plan recommend adding high visibility crosswalks and retroreflective backplates on signals. The Regional Safety Action Plan further recommends traffic signal coordination, resizing stop signs, adding reflective strips and stop bars, updating side street intersection signing and pavement markings, and adding leading pedestrian intervals and flashing yellow arrows to signals. A comparison of countermeasures and recommendations from both the Martinsburg Gateway Vision Plan and the Regional SAP can be found in **Appendix C: Combined Previous Study Recommendations**.

## Roadway Facilities

The one-mile Winchester Avenue priority corridor forms part of US Route 11, extending from Berry Street at its southwestern extent and continuing on King Street to Queen Street (WV-45;

**Figure 3).** To the south, the corridor connects to both I-81 and WV-9 via Apple Harvest Drive, making it a critical regional transportation connection. The corridor receives interstate traffic diverted from I-81 and is also the primary route into downtown for delivery trucks. The corridor is an urban minor arterial with average daily traffic on Winchester Avenue just south of Berry Street estimated at 9,968 in 2023. The closest count to the corridor on King Street shows daily volumes over 16,000 vehicles; because this reading was taken close to I-81, it may be an overestimation. However, heavy traffic was observed throughout the study area during the site visit. Updated traffic counts within the study limits may be warranted.

The corridor includes six signalized intersections. All other intersections along Winchester Avenue and King Street are stop-controlled minor street approaches. T-intersections are common along Winchester Avenue.

Winchester Avenue is a two-lane road throughout the study extent, with left turn pockets at the signalized intersections at Mall Drive and at John Street. King Street is also two lanes, with left turn pockets at its intersections with Winchester Avenue, Raleigh Street, and Queen Street. King Street does not have turn pockets at its signalized intersection with Maple Street. Left turns are not permitted from northbound Winchester onto King Street. The posted speed limit along the corridor is 25 miles per hour.

Right of way and lane widths are widest at the southern extent of the corridor, where traffic transitions from faster speeds on I-81 and Apple Harvest Drive to the corridor's more urban context. At Winchester Avenue and Berry Street, the right of way is approximately 65 feet. The roadway is 43 feet wide, with travel lanes that are 21-22 feet wide. Moving north along Winchester, the right of way narrows. Near Addition Street, the roadway narrows to 29 feet total with lane widths narrowing to roughly 14 to 15 feet. Between John Street and King Street, the roadway narrows even further to 24 feet. Along this stretch of Winchester, historic buildings from the Interwoven site constrict the sidewalk width on the east side for about 175 feet, posing challenges for pedestrian improvements. Along King Street, roadway width is roughly 40 feet wide with ~12-13 foot lanes.

*Figure 2. Roadway facilities on King Street.*



On-street parking is available on both sides of King Street except where turning lanes are present. While parking is permitted along Winchester Avenue, it is infrequently used. Due to higher utilization of on-street parking on King Street, lanes and conditions feel more compact and narrower, which can result in traffic calming.

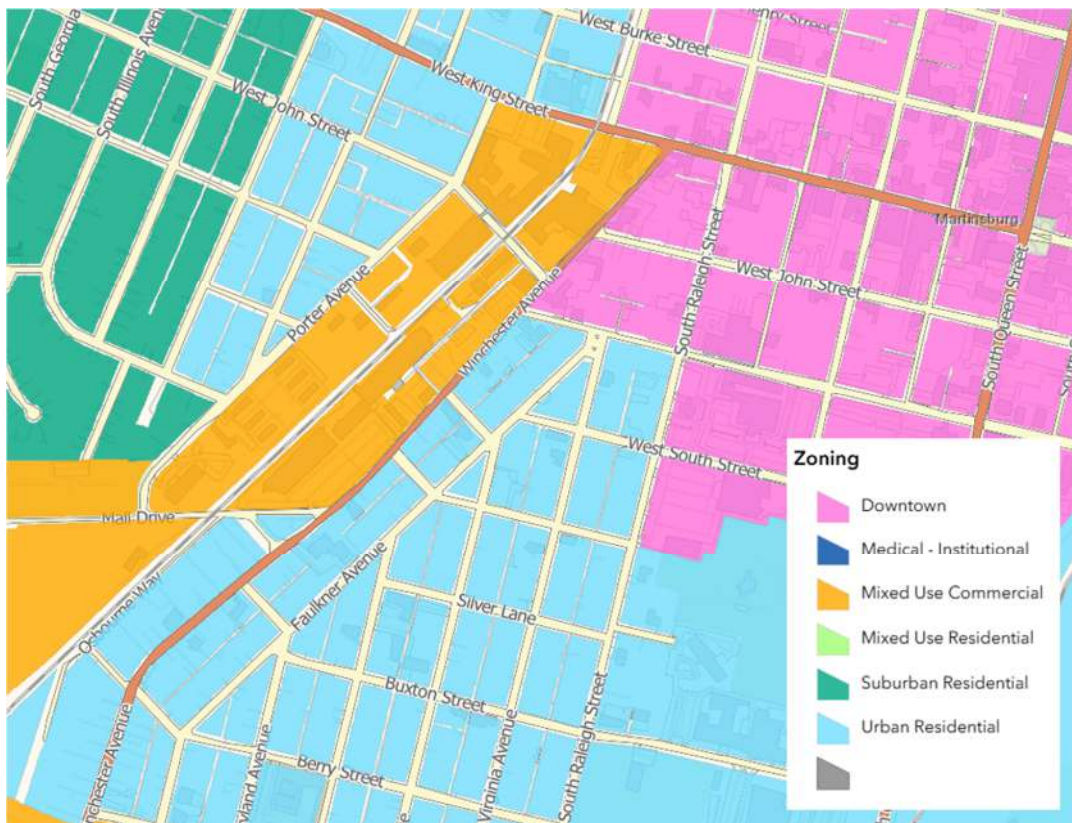
Figure 3: Winchester Avenue Safety Corridor Roadway Map



## Land Use

Much of the area around the corridor is low-density residential, with commercial uses interspersed with residences along Winchester Avenue, as shown in **Figure 4**. Parcels on the west side of Winchester Avenue are zoned mixed-use commercial. Stephen Street demarcates the transition from residential zoning to downtown. Properties southeast of the Winchester Avenue and Stephen Street intersection are zoned urban residential and properties northeast of the intersection are zoned as downtown. Commercial uses along Winchester Avenue range from businesses within converted homes to a large strip mall plaza on the northwest side of Winchester Avenue between Mall Drive and South Street. King Street is zoned as downtown and falls within Martinsburg's historic district. Commercial land use predominates King Street, which is dotted with small businesses within historic buildings, community uses such as churches, and private residences.

Figure 4: Martinsburg Zoning Map<sup>2</sup>



<sup>2</sup> CITY OF MARTINSBURG, ONLINE PLANNING MAP (N.D.), MAP. RETRIEVED OCTOBER 22, 2025, [HTTPS://EXPERIENCE.ARCGIS.COM/EXPERIENCE/100D79CEF0B4424AA7DC9BAE5F0D90DC/](https://experience.arcgis.com/experience/100d79cef0b4424aa7dc9bae5f0d90dc/)

# Active Transportation and Transit

## Bicycle and Pedestrian Infrastructure

The corridor currently lacks designated bicycle facilities, with no bike lanes or infrastructure to accommodate cyclists. Pedestrian infrastructure is present but varies in quality, as shown in Figure 5.

Figure 5: Winchester Avenue Safety Corridor Pedestrian and Bicycle Facilities Map



Along Winchester Avenue, sidewalks are generally present on both sides of the street but do not meet Americans with Disabilities Act (ADA) standards. Sidewalks are generally narrow (less than 4 feet wide) with heaving and crumbling concrete, as highlighted in **Figure 6**. Utilities, street signs, and fire hydrants obstruct the sidewalk in some places. In most locations, sidewalks are attached to the street with varying curb heights. In some locations, such as in front of Winchester Avenue Elementary School, the sidewalk is nearly at-grade with the road. In other locations, driveways cut through the sidewalks. The sidewalk disappears for about one-half block between Stephen Street and John Street, in front of Buettner Tire & Auto, which is entirely driveway for the business.

Along King Street, sidewalks are wider and in better repair, although parking meters, street trees, and utility poles encroach on pedestrian space. Parked cars provide a buffer from traffic in many locations.

Curb cuts are present at all intersections along the corridor. Crosswalks are present at all intersection legs on King Street, but missing along most minor approaches at unsignalized intersections along Winchester Avenue, including the following:

- Berry Street
- Buxton Street
- Mall Drive (unsignalized intersection only)
- Addition Street
- South Street
- John Street (northern intersection)

Crossing opportunities along Winchester Avenue are widely spread out or unevenly spaced, and uncontrolled crosswalks have limited additional safety countermeasures (e.g., in-road pedestrian crossing signs, shark teeth yield road markings, rectangular rapid flashing beacon, etc.) shown in **Table 1**. Crossing opportunities along King Street exist at every block, roughly every ~300 feet, and are primarily facilitated by signalized intersections. **Table 2** highlights

*Figure 6. Deficiencies in sidewalk conditions along portions of Winchester Avenue, as shown here near 205 Winchester Avenue.*



uncontrolled crossings along King Street and crosswalk support treatments at those locations. Pedestrian push buttons are present at all signalized locations. At Winchester Avenue and King Street, the pedestrian push button activates a pedestrian-only walk phase. Though short (10-second cycle), this phase provides a designated time for pedestrians to cross.

*Table 1: Winchester Avenue Pedestrian Crossing Opportunities*

WINCHESTER AVENUE INTERSECTION	CONTROL TYPE	DISTANCE TO NEXT CROSSWALK IN STUDY AREA	CROSSWALK SUPPORT TREATMENTS
MALL DR	Signal	~600'	Pedestrian signal heads, pedestrian push buttons, pedestrian crossing signs, continental crosswalk striping, advanced stop bars, overhead lighting
ADDITION ST	Uncontrolled	~900'	Pedestrian crossing signs, continental crosswalk striping, overhead lighting
STEPHEN ST	Uncontrolled	~180'	Pedestrian crossing signs, continental crosswalk striping, overhead lighting
JOHN ST	Signal	~875'	Pedestrian signal heads, pedestrian push buttons, continental crosswalk striping, advanced stop bars, overhead lighting

*Table 2: King Street Uncontrolled Crossing Treatments*

KING STREET INTERSECTION	CONTROL TYPE	CROSSWALK SUPPORT TREATMENTS
CHURCH ST	Uncontrolled	Continental crosswalk striping
COLLEGE ST	Uncontrolled	Continental crosswalk striping

## Transit System

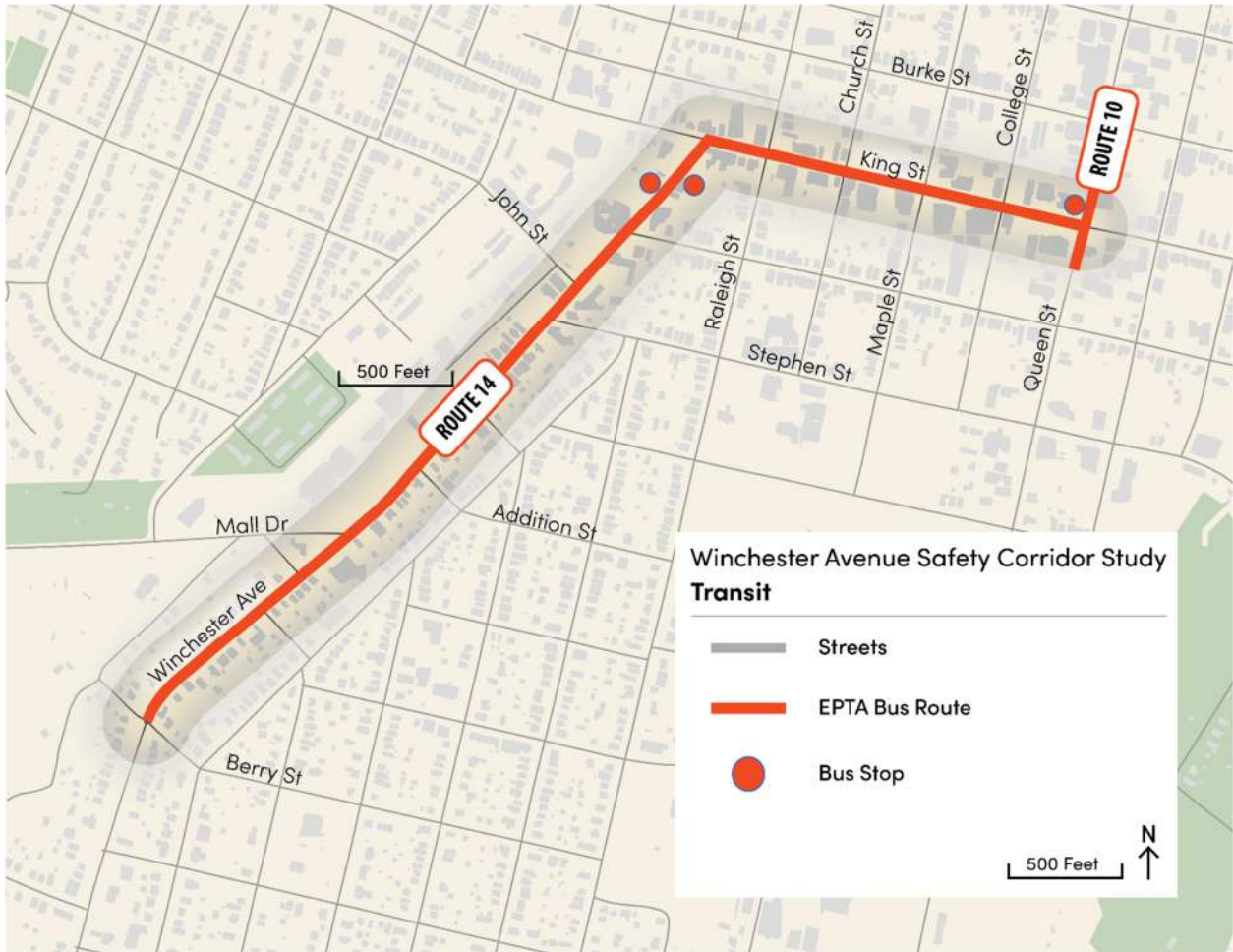
The Eastern Panhandle Transit Authority (EPTA) operates public transportation services throughout Berkeley and Jefferson Counties in West Virginia. Within Martinsburg, EPTA routes 14, 25/30, and 40 serve the Winchester Avenue corridor. Route 14 has one-hour headways on weekdays, with frequency increasing to 40-minute headways during the AM and PM peak hour. Route 25/30 runs once each evening. Route 40 has 80-minute headways between 10am and 6pm on Saturdays and holidays.

Stops are located on Winchester Avenue just south of King Street, at King Street and Raleigh Street, and at King Street and Queen Street. The stop at Winchester Avenue and King Street utilizes a private parking lot (7-Eleven parking lot) rather than public right of way.

*Figure 7. An EPTA shuttle in the 7-Eleven parking lot at Winchester Avenue and King Street.*



Figure 8: Winchester Avenue Safety Corridor Transit Facilities Map



## Safety

### Crash History

The Winchester Avenue corridor is part of the high injury network developed for the HEPMPO Regional Safety Action Plan. In addition, the 2023 West Virginia Vulnerable Road User Safety Assessment identified portions of the corridor as particularly dangerous to pedestrians, cyclists, and people using mobility devices. Specifically, the King Street segment between Maple Street and Queen Street is ranked 41st in the West Virginia High Injury Network and the Winchester Avenue / King Street segment from Stephen to Raleigh is ranked 71st.<sup>3</sup>

The following section summarizes crash data from 2019 through 2024 to provide trends by mode, severity, and crash type. Severity definitions follow those described in the Model Minimum Uniform Crash Criteria.<sup>4</sup>

Between 2019 and 2024, 154 crashes were reported in the study area. **Table 3** summarizes these crashes by injury, severity, and mode and **Figure 9** highlights the crash locations by severity along the corridor. Crashes involving cars and trucks (also referred to as Vehicle crashes) account for 93% of all crashes along the Winchester Avenue corridor. Pedestrians were involved in 6% of all crashes, and bicycles were involved in just 1% of all crashes.

*Table 3: Winchester Avenue Safety Corridor - Crashes by Mode and Severity (Total) from 2019 to 2024*

MODE	FATAL INJURY	SERIOUS INJURY	MINOR INJURY	POSSIBLE INJURY	NO APPARENT INJURY	TOTAL
BICYCLE	0 (0%)	0 (0%)	0 (0%)	2 (7.7%)	0 (0%)	2 (1.3%)
PEDESTRIAN	1 (100%)	1 (100%)	1 (16.7%)	5 (19.2%)	1 (0.8%)	9 (5.8%)
VEHICLE	0 (0%)	0 (0%)	5 (83.3%)	19 (73.1%)	119 (99.2%)	143 (92.9%)
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>26</b>	<b>120</b>	<b>154</b>

<sup>3</sup> WEST VIRGINIA DIVISION OF HIGHWAYS. (2023). WEST VIRGINIA VULNERABLE ROAD USER ASSESSMENT. WEST VIRGINIA DEPARTMENT OF TRANSPORTATION. [HTTPS://TRANSPORTATION.WV.GOV/HIGHWAYS/TRAFFIC/SITEASSETS/PAGES/DEFAULT/WV%20VRU%20ASSESSMENT.PDF](https://transportation.wv.gov/highways/traffic/siteassets/pages/default/wv%20VRU%20Assessment.pdf)

<sup>4</sup> NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION (2025, FEBRUARY, REVISED). MMUCC GUIDELINE: MODEL MINIMUM UNIFORM CRASH CRITERIA, 6TH EDITION (REPORT NO. DOT HS 813 525A).

Figure 9: Winchester Avenue All Crashes by Severity 2019 - 2024



While motor vehicles crashes accounted for the largest share of both overall crashes and killed or seriously injured (KSI) crashes, when vulnerable road users (VRU) 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 serious injury increased disproportionately; vulnerable road users were involved in 7% (11) of overall crashes, but 100% (2) of all fatal or serious injury crashes. Although motorcycles are considered vulnerable road users, the only crash involving a motorcycle during this time period also involved a pedestrian.

**Table 4** and **Table 5** summarize the crashes based on the recorded crash type and severity for all incidents in the corridor. The most common collision types on Winchester Avenue are rear end (35) and right-angle (31) crashes. The only fatal crash observed in the corridor during the study period was a single-vehicle crash into a pedestrian. All crashes involving a VRU during the study period were recorded as single-vehicle crashes.

Table 4: Winchester Avenue Safety Corridor - Crashes by Type and Severity (Total) from 2019 to 2024

CRASH TYPE	FATAL INJURY	SERIOUS INJURY	MINOR INJURY	POSSIBLE INJURY	NO APPARENT INJURY	TOTAL
ANGLE – DIRECTION NOT SPECIFIED	0 (0%)	0 (0%)	1 (16.7%)	0 (0%)	1 (0.8%)	2 (1.3%)
ANGLE (FRONT TO SIDE) OPP. DIRECTION	0 (0%)	0 (0%)	1 (16.7%)	3 (11.5%)	7 (5.8%)	11 (7.1%)
ANGLE (FRONT TO SIDE) SAME DIRECTION	0 (0%)	0 (0%)	0 (0%)	2 (7.7%)	16 (13.3%)	18 (11.7%)
HEAD-ON	0 (0%)	0 (0%)	0 (0%)	1 (3.8%)	2 (1.7%)	3 (1.9%)
REAR END	0 (0%)	0 (0%)	1 (16.7%)	5 (19.2%)	29 (24.2%)	35 (22.7%)
REAR-TO-SIDE	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.8%)	1 (0.6%)
RIGHT ANGLE	0 (0%)	0 (0%)	0 (0%)	5 (19.2%)	26 (21.7%)	31 (20.1%)
SIDESWIPE, OPPOSITE DIRECTION	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (2.5%)	3 (1.9%)
SIDESWIPE, SAME DIRECTION	0 (0%)	0 (0%)	0 (0%)	0 (0%)	23 (19.2%)	23 (14.9%)
SINGLE VEHICLE CRASH	1 (100%)	1 (100%)	3 (50%)	10 (38.5%)	12 (10%)	27 (17.5%)
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>26</b>	<b>120</b>	<b>154</b>

Table 5: Winchester Avenue Safety Corridor - Crashes by Type and Severity (VRU) from 2019 to 2024

CRASH TYPE	FATAL INJURY	SERIOUS INJURY	MINOR INJURY	POSSIBLE INJURY	NO APPARENT INJURY	TOTAL
ANGLE – DIRECTION NOT SPECIFIED	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
ANGLE (FRONT TO SIDE) OPP. DIRECTION	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
ANGLE (FRONT TO SIDE) SAME DIRECTION	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
HEAD-ON	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
REAR END	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
REAR-TO-SIDE	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
RIGHT ANGLE	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

CRASH TYPE	FATAL INJURY	SERIOUS INJURY	MINOR INJURY	POSSIBLE INJURY	NO APPARENT INJURY	TOTAL
SIDESWIPE, OPPOSITE DIRECTION	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
SIDESWIPE, SAME DIRECTION	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
SINGLE VEHICLE CRASH	1 (100%)	1 (100%)	1 (100%)	7 (100%)	1 (100%)	11 (100%)
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>11</b>

**Table 6** and **Table 7** summarize crashes at each intersection for all crashes and VRU crashes. Crashes within a 75-foot radius of an intersection were assigned to that intersection. The remaining crashes were categorized as non-intersection crashes. About 78% of all crashes occurred at intersections, with the highest number of crashes at the intersection of King Street and Raleigh Street (37), followed by the Winchester Avenue and King Street intersection (20). The only fatal crash occurred at the intersection of Winchester Avenue and Addition Street.

*Table 6: Crashes by Intersection (Total)*

INTERSECTION	FATAL INJURY	SERIOUS INJURY	MINOR INJURY	POSSIBLE INJURY	NO APPARENT INJURY	TOTAL
<b>NON-INTERSECTION CRASHES</b>	0 (0%)	0 (0%)	0 (0%)	5 (19.2%)	29 (24.2%)	34 (22.1%)
KING / MAPLE	0 (0%)	0 (0%)	0 (0%)	1 (3.8%)	3 (2.5%)	4 (2.6%)
KING / QUEEN	0 (0%)	0 (0%)	1 (16.7%)	0 (0%)	6 (5%)	7 (4.5%)
KING / RALEIGH	0 (0%)	0 (0%)	2 (33.3%)	7 (26.9%)	28 (23.3%)	37 (24%)
WINCHESTER / ADDITION	1 (100%)	0 (0%)	1 (16.7%)	4 (15.4%)	5 (4.2%)	11 (7.1%)
WINCHESTER / BERRY	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (1.7%)	2 (1.3%)
WINCHESTER / BUXTON	0 (0%)	0 (0%)	0 (0%)	2 (7.7%)	12 (10%)	14 (9.1%)
WINCHESTER / JOHN NORTH	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.8%)	1 (0.6%)
WINCHESTER / JOHN SOUTH	0 (0%)	0 (0%)	1 (16.7%)	2 (7.7%)	6 (5%)	9 (5.8%)
WINCHESTER / KING	0 (0%)	1 (100%)	1 (16.7%)	3 (11.5%)	15 (12.5%)	20 (13%)
WINCHESTER / MALL EXTENSION	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (4.2%)	5 (3.2%)
WINCHESTER / SOUTH	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (2.5%)	3 (1.9%)

INTERSECTION	FATAL INJURY	SERIOUS INJURY	MINOR INJURY	POSSIBLE INJURY	NO APPARENT INJURY	TOTAL
WINCHESTER / STEPHEN	0 (0%)	0 (0%)	0 (0%)	2 (7.7%)	5 (4.2%)	7 (4.5%)
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>26</b>	<b>120</b>	<b>154</b>

The most VRU crashes occurred at the intersections of Winchester Avenue and Addition Street (4) and Winchester Avenue and King Street (3). VRU crashes were also reported at the intersections of King Street and Raleigh Street (2) and Winchester Avenue and John Street (2).

*Table 7: Crashes by Intersection (VRU)*

INTERSECTION	FATAL INJURY	SERIOUS INJURY	MINOR INJURY	POSSIBLE INJURY	NO APPARENT INJURY	TOTAL
<b>NON-INTERSECTION CRASHES</b>	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
KING / MAPLE	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
KING / QUEEN	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
KING / RALEIGH	0 (0%)	0 (0%)	1 (100%)	1 (14.3%)	0 (0%)	2 (18.2%)
WINCHESTER / ADDITION	1 (100%)	0 (0%)	0 (0%)	3 (42.9%)	0 (0%)	4 (36.4%)
WINCHESTER / BERRY	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
WINCHESTER / BUXTON	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
WINCHESTER / JOHN NORTH	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
WINCHESTER / JOHN SOUTH	0 (0%)	0 (0%)	0 (0%)	2 (28.6%)	0 (0%)	2 (18.2%)
WINCHESTER / KING	0 (0%)	1 (100%)	0 (0%)	1 (14.3%)	1 (100%)	3 (27.3%)
WINCHESTER / MALL EXTENSION	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
WINCHESTER / SOUTH	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
WINCHESTER / STEPHEN	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>11</b>

## Community Context

### Demographic Context

The Winchester Avenue corridor falls completely within Census Tracts that qualify as areas of persistent poverty. The US Department of Transportation uses “Areas of Persistent Poverty” as an indicator of underserved communities. Areas of persistent poverty are defined as (1) any county where 20% or more of the population lived in poverty during the 30-year period preceding November 15, 2021, or (2) Census Tracts where 20% or more of the population lived in poverty during the 5-year period from 2014 through 2018.

The area is experiencing rapid population growth. Between the 2010 and 2020 Census, Berkeley County’s population grew by 17%, more than any other county in West Virginia.<sup>5</sup> During this time, Martinsburg’s population grew by 1,550 residents (9.2%).

### Public Input

Public input collected during previous projects has found that vehicle traffic is prioritized along the corridor, creating concerns for pedestrians. Residents have flagged inadequate pedestrian facilities along Winchester Avenue, as well as a short pedestrian crossing phase at King Street and Queen Street that provides inadequate time for pedestrians to cross safely. Residents also note that high vehicle volumes and speeds along Winchester Avenue make walking or biking along the corridor feel unsafe. In addition, residents note that northbound left turns from Raleigh Street onto King Street can be challenging and at times risky, particularly during peak hours.

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<sup>5</sup> MARTINSBURG-BERKELEY COUNTY PARKS AND RECREATION. (2022). MARTINSBURG-BERKELEY COUNTY PARKS AND RECREATION MASTER PLAN. [WWW.MBCPARKS-REC.ORG/WP-CONTENT/UPLOADS/2020/03/MBCPR-1.3.2022\\_FINAL\\_19DEC2022\\_SINGLE-PAGE-LAYOUT.PDF](http://WWW.MBCPARKS-REC.ORG/WP-CONTENT/UPLOADS/2020/03/MBCPR-1.3.2022_FINAL_19DEC2022_SINGLE-PAGE-LAYOUT.PDF)

## 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.

A substantial redevelopment, the Interwoven Lofts, is converting an abandoned textile factory into 418 market-rate apartments. As of October 2025, 225 units have been completed, with an additional 193 units slated for completion by 2026. The project also includes restaurant space. The development will add 600 parking spaces across three site parking lots. One parking lot (approximately 50 spaces) has one entrance driveway and one entrance and exit driveway on Winchester Avenue. A 2023 Traffic Impact Assessment (TIA) estimated nearby intersections would continue to operate with the same level of service when the site is fully built out. The TIA recommended removing on-street parking along Winchester Avenue to increase storage for left-turning vehicles at Mall Drive and John Street. The study also recommended retiming and coordinating signals at the King Street and Winchester Avenue, and King Street and Raleigh Street intersections.

*Figure 10. The Interwoven Development, as seen from 324 Winchester Avenue.*



# Site Visit

On Wednesday, October 1, 2025, the project team held a stakeholder presentation with HEPMPO and conducted a site visit along the corridor. The presentation provided an overview of the corridor and introduced risk factor categories from the FHWA Safe System Project-Based Alignment Framework. The site visit included strategic stops along the corridor at intersections with known safety issues.

## Attendees

Stakeholders from the City, County, region, regional transit agency, state, FHWA and emergency response agencies were invited to attend the site visit. The list below highlights the organizations that attended the stakeholder presentation and/or site visit.

- City of Martinsburg Mayor
- City of Martinsburg Staff
- City of Martinsburg Police
- Eastern Panhandle Transit Authority
- Hagerstown/Eastern Panhandle Metropolitan Planning Organization
- West Virginia Department of Highways
- Civil & Environmental Consultants (CEC)
- Legend Property Group

## Agenda

The presentation and site visit with stakeholders was held at Martinsburg City Hall from 9:00 AM to 1:00 PM on Wednesday, October 1, 2025. The agenda is listed below:

- 9:00 AM – 9:15 AM **Welcome and Introductions**
- 9:15 AM – 10:30 AM **Site Visit Presentation**
  - o Project and meeting purpose, Previous work, Historical crash review, Existing conditions, Overview of SSA framework and project lens
- 10:30 AM – 11:00 AM **Site Visit Travel**
- 11:00 AM – 1:00 PM **Winchester Avenue Corridor Site Visit**
  - o Observe existing conditions, Assess risk factors, Discuss crash history in the field

# Site Visit Photos



## Challenges Identified at Site Visit

Stakeholders and project team members documented safety challenges and risk factors during the site visit. **Table 8** provides a high-level summary of issues identified at intersections during the site visit.

*Table 8: Winchester Avenue Intersection Safety Challenges Identified During Site Visit*

LOCATION	SAFETY CHALLENGES AND RISK FACTORS
<b>BERRY ST</b>	<ul style="list-style-type: none"> <li>• Speeding as northbound traffic transitions into more urban context</li> <li>• Wide travel lanes (21 to 22 feet)</li> <li>• Deficient pedestrian infrastructure: no crosswalks, narrow sidewalk on west side, poor lighting</li> <li>• Sight distance challenges due to curve, vacant business, setback of stop sign, on-street parking (if utilized)</li> </ul>
<b>MALL DR</b>	<ul style="list-style-type: none"> <li>• Significant pedestrian activity driven by school staff and visitors parking in plaza parking lot and crossing to the school</li> <li>• Deficient pedestrian infrastructure: crosswalk not located where people cross in practice, narrow sidewalk on both sides with obstructions, poor lighting, visibility obstructions from vegetation</li> <li>• Pedestrian signal head on western leg facing wrong direction</li> <li>• Right on red prohibited but not signalized properly or followed</li> <li>• School entrance is not signalized but within the signalized portion of the intersection</li> <li>• Eastbound left turns observed bypassing signal due to protected phase and turning left into Westbound channelized right</li> </ul>
<b>ADDITION ST</b>	<ul style="list-style-type: none"> <li>• Fatal pedestrian crash history</li> <li>• New pedestrian crossing does not align with where people want to cross and leads to a sidewalk that is only 31 inches wide with fire hydrant and utility pole obstructions</li> <li>• Limited crossing enhancements to support uncontrolled crossing (no in-street signs, no yield shark teeth markings, no Rectangular Rapid Flashing beacon, no raised crosswalk, no curb extensions, no high visibility crosswalk markings across Addition Street)</li> <li>• Plaza driveway offset from intersection, adding conflict point</li> <li>• Sight distances reduced by hill north of intersection, shopping center parking, and vegetation</li> </ul>
<b>STEPHEN ST</b>	<ul style="list-style-type: none"> <li>• Narrow sidewalk</li> <li>• Uncontrolled crosswalk exists, but less than 200' feet from John Street signalized crossing</li> <li>• Limited enhancements to support uncontrolled crossing (no in-street signs, no yield shark teeth markings, no Rectangular Rapid Flashing beacon, no raised crosswalk, no curb extensions, no high visibility crosswalk markings across Stephen Street)</li> </ul>

LOCATION	SAFETY CHALLENGES AND RISK FACTORS
<b>JOHN ST (SOUTH)</b>	<ul style="list-style-type: none"> <li>• Northbound left turns from Winchester Ave: hill crest presents sight distance challenge for permissive left turns; traffic reported to back up during peak periods</li> <li>• Left turns from tire shop: unchannelized, unsignalized driveway coupled with limited visibility of signal head from shop driveway create significant risk</li> <li>• Left turns from Interwoven driveway: limited building setbacks sight distance issues</li> <li>• Deficient pedestrian infrastructure: massive driveway in front of tire shop instead of sidewalk</li> </ul>
<b>KING ST</b>	<ul style="list-style-type: none"> <li>• Observed near miss: car turning Right on Red from King St to Winchester Ave while bike crossing Winchester Ave with walk light</li> <li>• 7-Eleven parking lot has large, unmarked areas of pavement with substantial cut-through traffic</li> <li>• Deficient pedestrian infrastructure: missing sidewalks and huge driveways for 7-Eleven and Boost shops; utility poles obstruct sidewalks</li> <li>• Anecdotal demand for left turn phasing</li> </ul>
<b>RALEIGH ST</b>	<ul style="list-style-type: none"> <li>• No pavement markings on Raleigh St northbound approach</li> <li>• Eastbound through traffic does a weird jog around left turning vehicles</li> <li>• Parking on King comes right up to the crosswalk</li> <li>• Locals use Raleigh as an alternative to Winchester to avoid congestion</li> <li>• Northbound left reported to back up in afternoon</li> <li>• Anecdotal demand for left turn phasing</li> </ul>
<b>COLLEGE ST</b>	<ul style="list-style-type: none"> <li>• Limited enhancements to support uncontrolled crossing (no pedestrian crossing signs, no in-street signs, no yield shark teeth markings, no Rectangular Rapid Flashing beacon, no raised crosswalk, no curb extensions)</li> </ul>
<b>CHURCH ST</b>	<ul style="list-style-type: none"> <li>• Limited enhancements to support uncontrolled crossing (no pedestrian crossing signs, no in-street signs, no yield shark teeth markings, no Rectangular Rapid Flashing beacon, no raised crosswalk, no curb extensions)</li> </ul>
<b>WINCHESTER AVE SEGMENT</b>	<ul style="list-style-type: none"> <li>• Very limited lighting – generally only 1 light per intersection</li> <li>• Narrow, often obstructed sidewalks</li> <li>• Crosswalk locations frequently mismatched with where crossings are more convenient for pedestrians</li> <li>• Pedestrian crossing opportunities are widely spaced, typically more than 600' from the nearest crosswalk</li> <li>• Traffic volumes felt higher than the team expected</li> <li>• Reportedly serves as I-81 detour and functions as a cut-through from Queen</li> <li>• Signals last retimed in 2018</li> </ul>

# Concept Development

The project team developed a comprehensive set of action item concepts for the Winchester Avenue safety corridor, grounded in safety challenges, operational issues, and risk factors identified during the stakeholder meeting and site visit. Recommendations focus on targeted safety enhancements for pedestrians and bicyclists, access management, lane reconfiguration, traffic signal upgrades, and corridor-wide speed management. Concept areas include:

- Winchester Avenue safety corridor
  - Winchester Avenue from Bowers Street to King Street
  - King Street from Winchester Avenue to Queen Street

## Winchester Avenue Between Bowers Street and King Street Safety Focus Action Items

### Corridor-Wide Treatments

- Relocate utility poles and streetscape elements impacted by new improvements, including utility poles, signs, fire hydrants, and decorative lighting.
- Stripe or restripe stop bars and high-visibility crosswalks at all minor street stop-controlled and signalized intersections.
- Add painted skip lines through minor street stop-controlled intersections to reinforce travel lane alignment.

### Bicyclist Accommodations

- Add 6-foot bicycle lanes with 3-foot painted buffers on both sides of Winchester Avenue between Bowers Street and Berry Street.
- Install bicycle lane signing and pavement marking legends at the beginning and end of each bike lane between Bowers Street and Berry Street.
- Install sharrows and bicycle signs along Maiden Avenue and Cumberland Valley Place directing bicyclists to the multi-use path on the southern side of Winchester Ave, crossing to the northern side at Mall Dr and continuing on the multi-use path.
- Provide an alternate westbound bicycle route using sharrows and bicycle signs on Berry Street and Osborne Way.

### Curblin Reconstruction and Sidewalk/Multi-use Path Enhancements

- Construct new curblin on both sides of Winchester Avenue between Berry Street and W John Street with 11-foot travel lanes.
  - Eliminate curbside parking between Bowers Street and Mall Drive.
  - Southern Side
    - Construct an 8-12 foot multi-use path between Berry Street and Mall Drive.

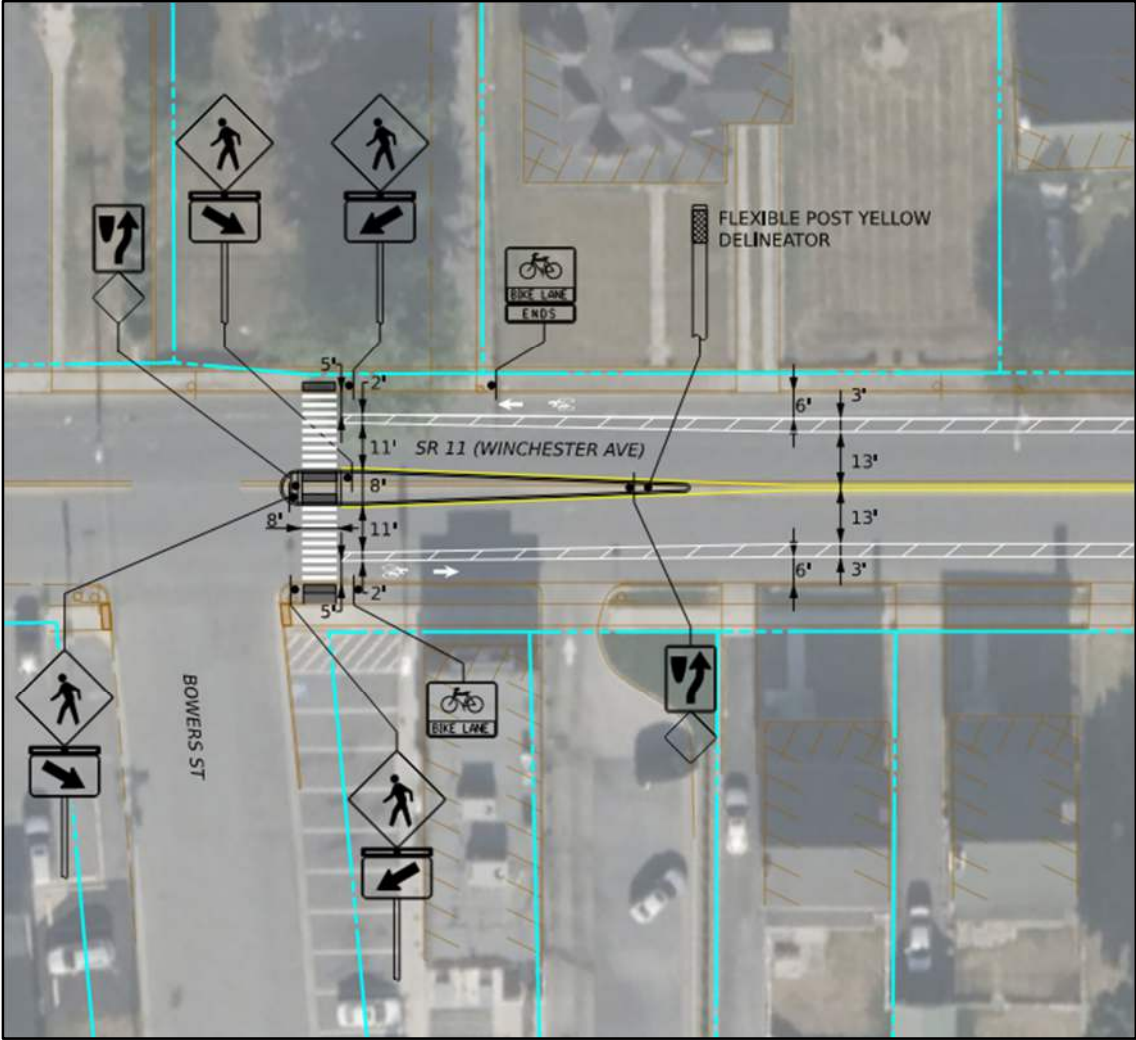
- Reconstruct sidewalk and add a variable-width planted buffer between Mall Drive and W John Street.
- Northern Side
  - Reconstruct sidewalk and add a variable-width planted buffer from Berry Street to Mall Drive and Maiden Avenue to approximately 350 feet east of Maiden Avenue.
  - Install a variable-width planted buffer from 350 feet east of Maiden Avenue to W John Street.
  - Construct an 8-10 foot multi-use path between Mall Drive and Maiden Avenue.
- Install ADA-compliant curb ramps at all public streets, alleys, and driveways where sidewalk or curblines modifications occur due to:
  - New or replaced sidewalk,
  - New buffered areas,
  - Relocated curblines,
  - Relocated crosswalks.

### Location-Specific Treatments

#### Gateway Treatment (North of Bowers Street)

- Construct an 8-foot wide gateway island to encourage lower speeds and establish a streetscaped corridor transition. The median refuge island serves as a refuge area to help protect pedestrians crossing Winchester Avenue.
- The gateway treatment includes:
  - Rectangular Rapid Flashing Beacon (RRFB),
  - High-visibility crosswalk,
  - ADA ramps for both crossings and median refuge,
  - KEEP RIGHT signs with object markers,
  - Yellow flexible delineator post at the median's eastern nose,
- Transition from 11-foot travel lanes to 13-foot travel lanes widths downstream.

Figure 11: Gateway Island (North of Bowers Street)



### Mall Drive – Access Management and School-Related Enhancements

- Prohibit left turns to and from Buxton Street at Winchester Avenue (NO LEFT TURN signs).
- Add SCHOOL CROSSING ASSEMBLY signs along Mall Drive and revise signs along Winchester Avenue:
  - Replace distance plaque with SCHOOL sign at Buxton Street.
  - Add SCHOOL sign at Martinsburg Shopping Plaza Driveway.

### Mall Drive –Signalized Intersection Improvements

- Relocate NE quadrant signal pole and extend guy wire.
- Install overhead street name signs.
- Relocate pedestrian signal heads and push buttons on NE and NW quadrants; add new equipment on SE and SW quadrants.
- Add a 3-section left-turn arrow for the Winchester Avenue eastbound left turn.
- Install reflectorized backplates on all signal heads.
- Signalize the Winchester Avenue Elementary School driveway.
  - Install a mast arm and two 3-section 12-inch signal heads.
  - Install NO RIGHT TURN ON RED sign.
  - Widen the school driveway to accommodate two-way traffic.
  - Add stop bar and lane separation markings.
- Refresh lane markings and legends on all approaches.
- Add a dedicated westbound right-turn lane on Winchester Avenue.
- Add skip lines to guide the westbound thru-lane shift.

*Figure 12: Winchester Avenue and Mall Drive Intersection Improvements*



Mall Drive – Connector Closure

- Close the Mall Drive connector and construct a 10-foot multi-use path from Osborne Way to Winchester Avenue.
- Reconfigure the Safe Haven Advocacy Center driveways along Winchester Avenue and Mall Drive.
- Install a midblock crosswalk across Mall Drive at Osborne Way.

*Figure 13: Mall Drive Connector Closure and Driveway Reconfiguration*

W Addition Street / Martinsburg Shopping Plaza Driveway

- RRFB installation planned for construction by WVDOT.
- Realign the shopping plaza driveway to align with W Addition Street.
- Install a painted buffer to prohibit parking within 20 ft of the stop bar.
- Relocate and increase the W Addition Street stop sign size; add reflectorized strip on the sign post.

#### Midblock Crossing West of W Stephen Street

- Install RRFB, high-visibility crosswalk, and ADA ramps.

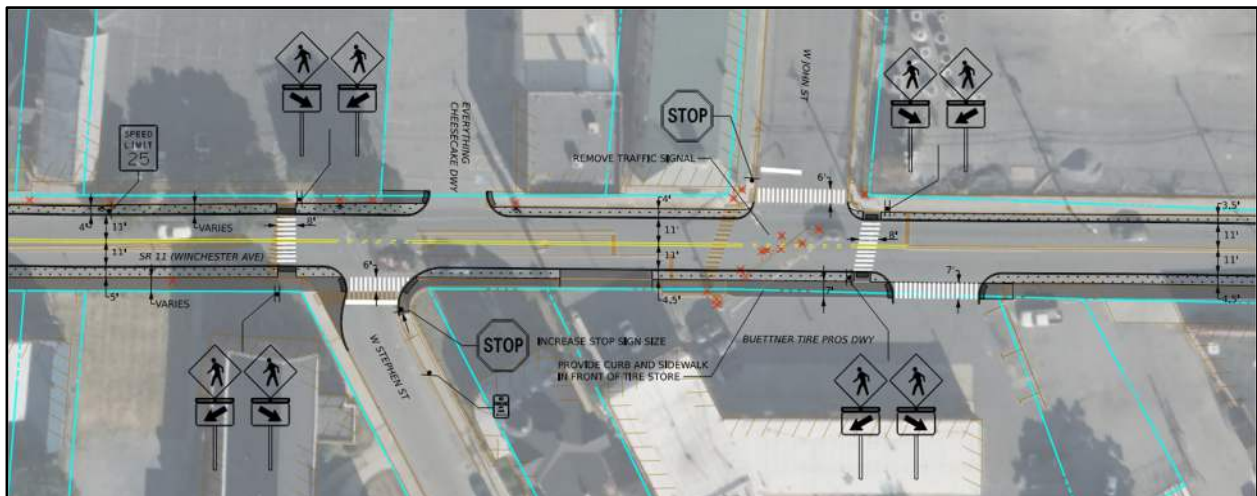
#### W Stephen Street Intersection Improvements

- Construct an intersection bulb-out (i.e., curb extension) on the SW quadrant to narrow and realign the W Stephen Street approach.
- Relocate and increase stop sign size.
- Install NO PARKING sign approximately 20 feet from the stop bar.

#### W John Street Intersection Conversion

- Convert the existing signalized intersection to a minor street stop-controlled intersection.
  - Remove all existing signal equipment.
  - Install a stop sign on the W John Street approach.
  - Eliminate the eastbound left-turn lane; continue 11 ft lanes with skip lines through the intersection.
  - Remove eastbound approach crosswalk and install an RRFB with high-visibility crosswalk on the westbound approach.
  - Channelize the Buettner Tire Pros driveway by extending the curblines, sidewalk and buffered area.

*Figure 14: Stephen Street RRFB and W John Street Conversion*



#### W John Street Approach Reconstruction

- Construct intersection bulb-outs on the southern quadrants to narrow and realign the approach.

#### King Street Intersection Improvements

- Realign the northbound approach to include a designated left-turn lane and improve truck turning accommodations; widening to the west side of Winchester Avenue.
- Add lane designation signs and pavement legends.

- Improve northbound truck turning movements:
  - Pull back eastbound and westbound King Street stop bars.
  - Construct mountable curb truck aprons on the southern quadrants.
  - Remove the two parking spaces in front of Progressive Printing and Graphics and install NO PARKING signs and markings.
- Improve eastbound truck right-turn movements:
  - Remove the dedicated right-turn lane and installing a mountable curb bulb-out.
  - Add skip line edge markings along the retail driveway.
  - Convert the retail driveway along King Street to a one-way entrance.
- Refresh King Street pavement markings west of Winchester Avenue to the railroad tracks.
- Replace and relocate traffic signal supports/equipment and install:
  - 3-section 12-inch signal heads with reflectorized backplates,
  - Protected–permissive flashing yellow arrow (4-section 12-inch signal head) for the westbound left turn from King Street,
  - Relocate and modernize the signal cabinet; update phasing for protected–permissive left turns,
  - Overhead street name signs for all approaches,
  - NO TURN ON RED for the northbound right turn.
- Upgrade pedestrian features:
  - Accessible pedestrian signals (APS),
  - Countdown pedestrian signals,
  - ADA ramps.

Figure 15: Winchester Avenue Approach Reconfiguration and King Street Signal Improvements



# King Street Between Winchester Avenue and Queen Street Safety Focus Action Items

## Corridor-Wide Treatments

- Relocate utility poles and streetscape elements impacted by new improvements, including utility poles, signs, fire hydrants, and decorative lighting.
- Install ADA-compliant curb ramps at all public streets, alleys, and driveways where sidewalk or curblines modifications occur due to:
  - New or replaced sidewalk,
  - New buffered areas,
  - Relocated curblines,
  - Relocated crosswalks.
- Reconfigure roadway cross section between S Raleigh Street and S Queen Street:
  - 13-foot travel lanes,
  - Intersection bulb-outs on southern quadrants to narrow the roadway, shorten crossing distances, and increase road user visibility,
  - Restripe pavement markings on all minor street approaches,
  - Relocate curblines along the northern side of King Street with a 6-11 foot variable-width planted buffer,
  - 10-foot high-visibility crosswalks at southbound approaches.

## King Street Signalized Intersections (S Raleigh Street and S Maple Avenue)

- Install NO TURN ON RED for all approaches.
- Install overhead street name signs.
- Replace traffic signals with 12-inch signal heads with reflectorized backplates.
- Replace all pavement markings and legends.
- Eliminate on-street parking within 30-feet of the signalized intersections.

Minor Street Stop-Controlled Intersections (S Church Street and S College Street)

- Install pedestrian crosswalk signs.
- Eliminate on-street parking within 20-feet of the intersection using bulb-outs and painted markings.
- Paint skip lines through the intersections to maintain lane alignment.

Figure 16: Typical Minor Street – Stop-Controlled Improvements

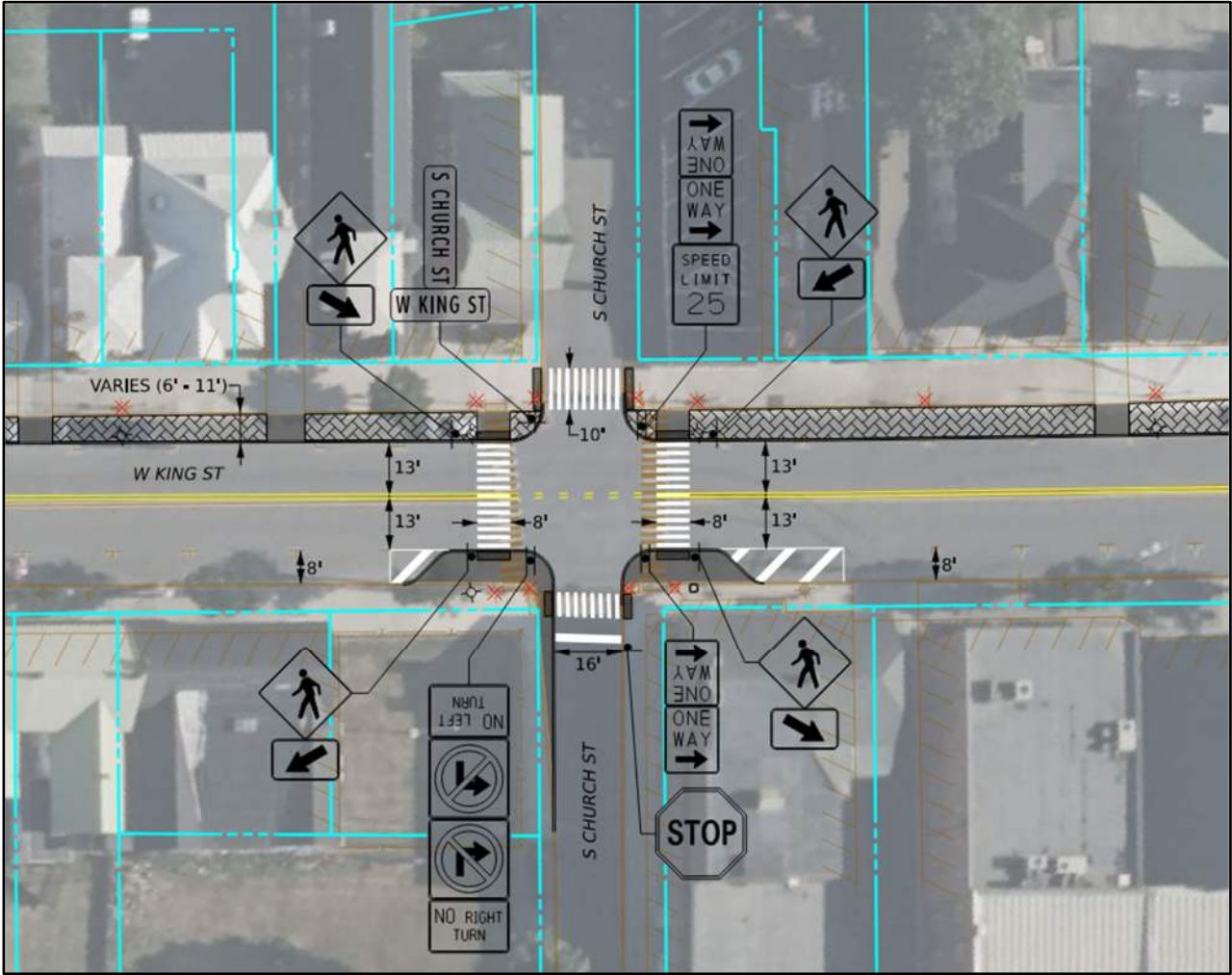


Figure 17: King Street Between Winchester Avenue and S Queen Street



## Location-Specific Treatments

### King Street – Between Winchester Avenue and S Raleigh Street

- Extend left-turn lanes.
- Install roadside lane designation signs.
- Eliminate on-street parking on the southern side of King Street to provide additional left-turn lane storage.

*Figure 18: King Street Lane Reconfiguration between Winchester Avenue and S Raleigh Street*



### King Street and S Raleigh Street – Signalized Intersection Improvements

- Install protected-permissive flashing yellow arrows for all left-turn lane movements.
- Improve traffic signal coordination between the Winchester Avenue and S Raleigh Street signals to prevent gridlock and resolve midblock queuing of left-turning vehicles.
- Transition roadway cross section east of S Raleigh Street by:
  - Striping travel lane shifts,
  - Constructing a curbed intersection bulb-out at the end of the southern lane shift.

### King Street – S Raleigh Street to S Maple Avenue Improvements

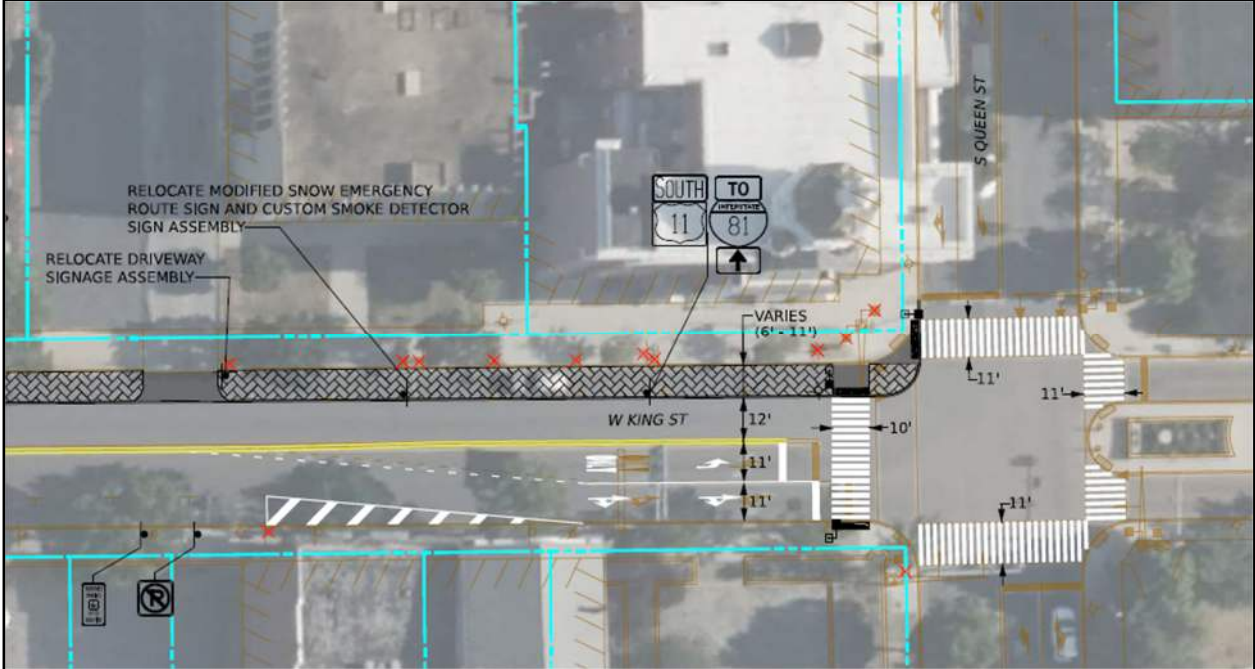
- Widen driveway and reconstruct sidewalk east of The Garage on King Food Hall.
- Reconstruct the curblin on the northbound approach of S Church Street to eliminate the tapered curblin.
- Implement Leading Pedestrian Intervals (LPI) at the King Street and S Maple Avenue signalized intersection.

### King Street and S Queen Street – Intersection Improvements

- Install high-visibility crosswalks.
- Relocate the west leg crosswalk along with associated pedestrian signal heads and push buttons.
- Adjust the King Street eastbound left-turn stop bar to match the revised lane configuration.
- Modify the thru/right-turn lane shift to accommodate the relocated left-turn lane.

- Eliminate the easternmost on-street parking spot (existing handicap stall) and install NO PARKING signs; relocate the handicap stall upstream before the lane shift begins.

Figure 19: King Street and S Queen Street Intersection Improvements



# Monitoring and Evaluation

To support the ongoing evaluation of the Winchester 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 HEPMPPO to monitor changes in crashes over time using existing data sources. **Table 9** shows the Annual Average Crash Rates for the **2020-2024** 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 9: Baseline Annual Average Crash Rates*

CRASH TYPE	BASELINE
VRU – KSI	0.2
VRU-nonKSI	1.4
Vehicle-KSI	0
Vehicle-nonKSI	26.0
All Crashes	27.6

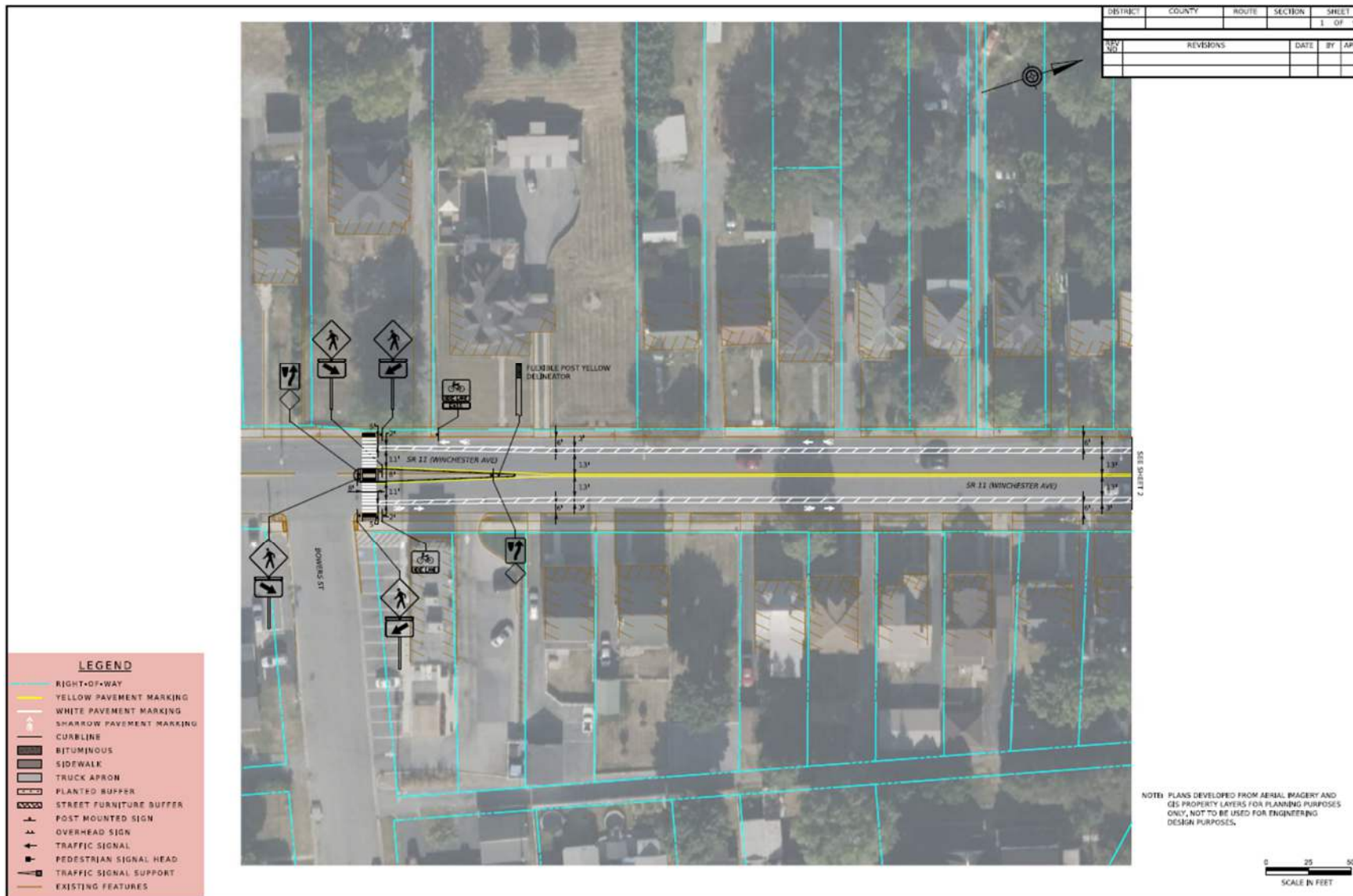
# Disclaimer

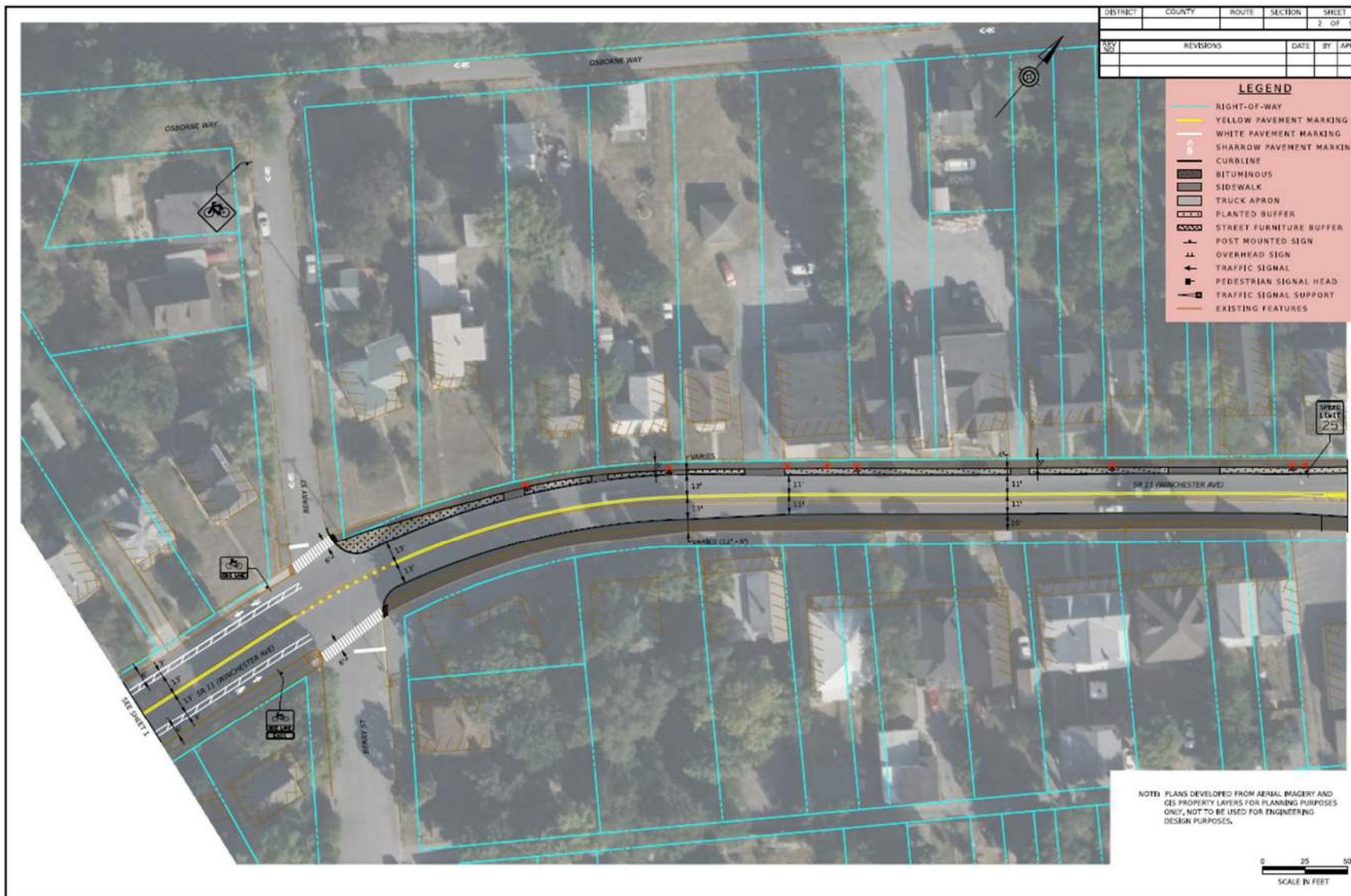
Under 23 U.S. Code § 409 and 23 U.S. Code § 148, safety data, reports, surveys, schedules, lists compiled or collected for the purposes of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to 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.

# Appendix A: Winchester Avenue Corridor Study Plan Sheets

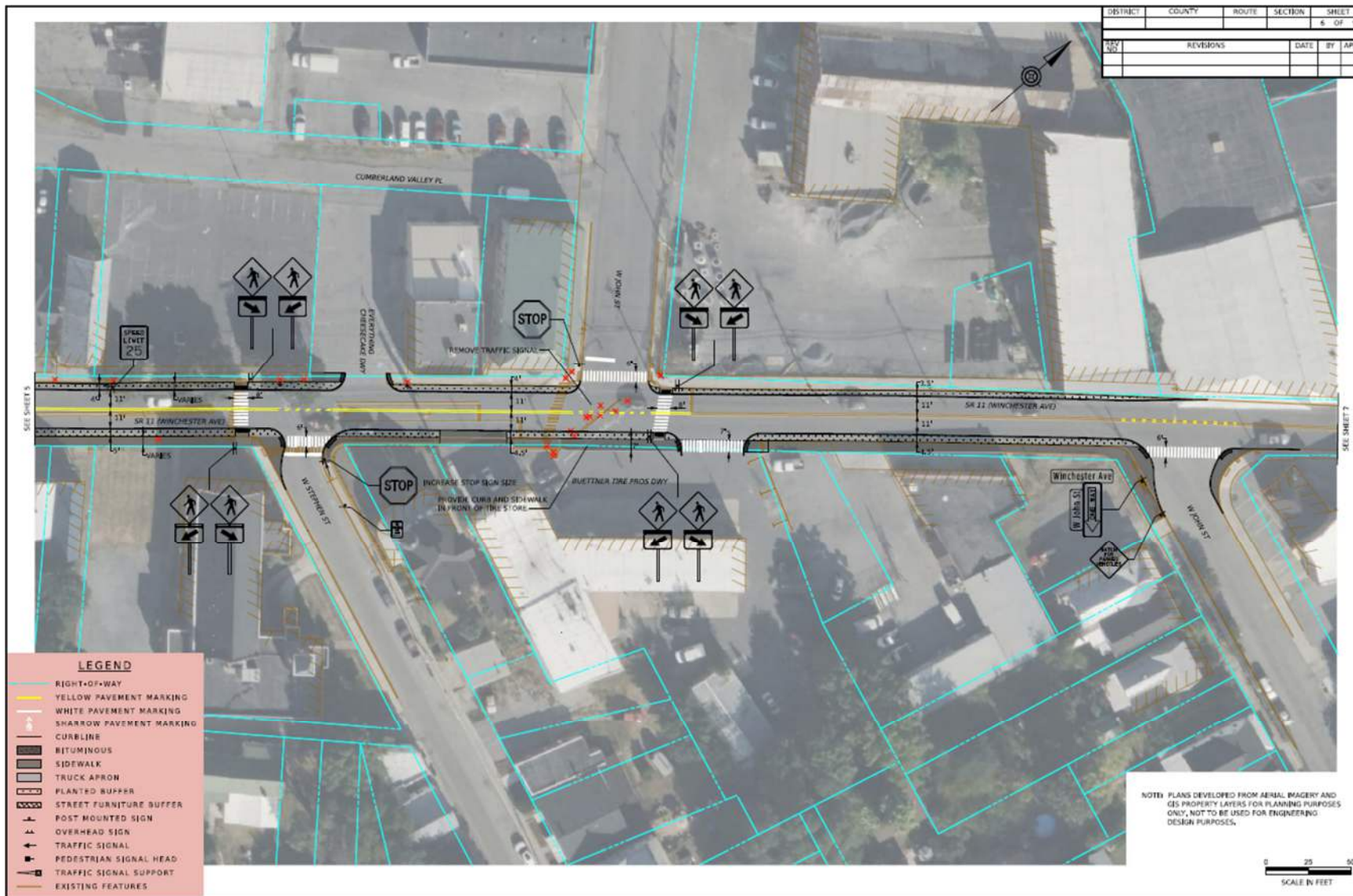


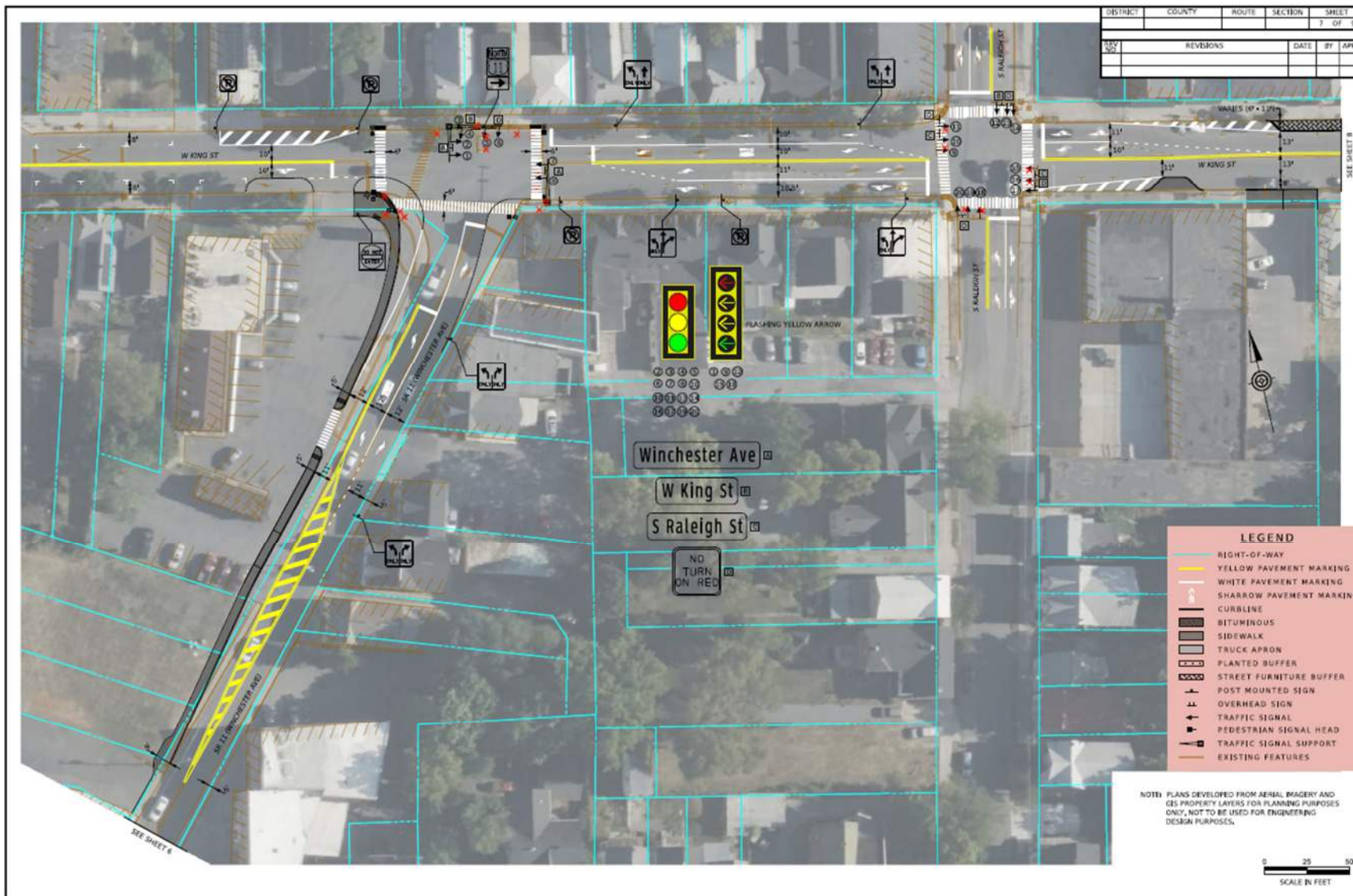


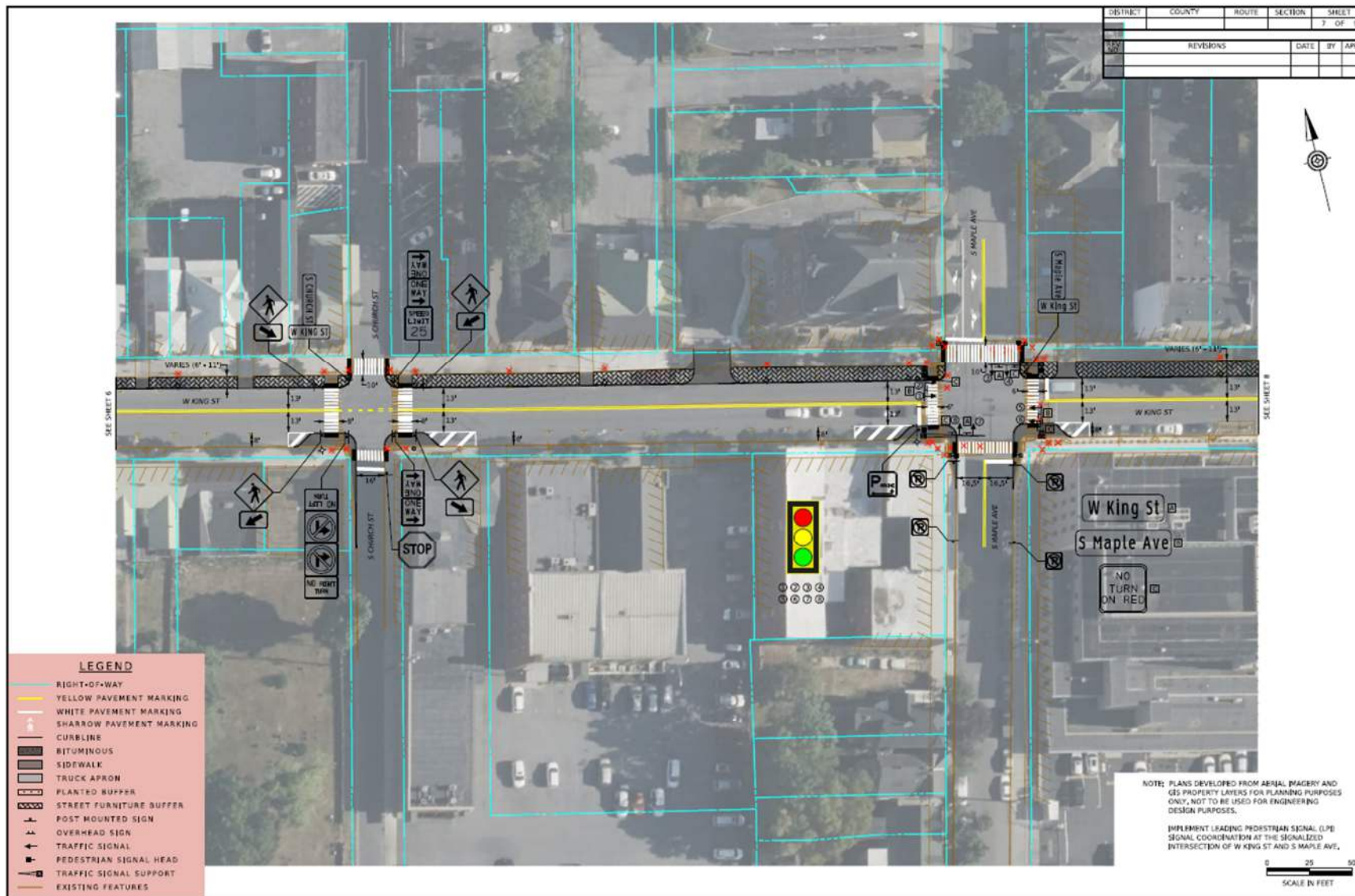














# Appendix B: Cost Estimates

IMPROVEMENT/TREATMENT	CORRIDOR-WIDE COST	MALL DRIVE SIGNAL COST	JOHN STREET SIGNAL COST	KING STREET SIGNAL COST	RALEIGH STREET SIGNAL COST	MAPLE AVENUE SIGNAL COST	QUEEN STREET SIGNAL COST
Signs and Pavement Markings	\$219,600.00	-	-	-	-	-	-
RRFB	\$60,000.00	-	-	-	-	-	-
Inlets and Drainage	\$84,000.00	-	-	-	-	-	-
Excavation/Grading and Soil/Seed	\$972,000.00	-	-	-	-	-	-
Driveway reconstruction	\$100,000.00	-	-	-	-	-	-
Sidewalk and Curb	\$2,837,500.00	-	-	-	-	-	-
ADA Ramps	\$910,000.00	-	-	-	-	-	-
Traffic Signal Modification	-	\$150,000.00	\$10,000.00	\$220,000.00	\$37,000.00	\$250,000.00	\$48,000.00
Light Pole Relocation	\$140,000.00	-	-	-	-	-	-
Project Items (Equipment Package, Surveying, Schedule, Pollution Control, Etc.)	\$14,000.00	-	-	-	-	-	-
Utility Relocations	\$540,000.00	-	-	-	-	-	-
<b>PERCENTAGE ITEMS</b>							
Mobilization (4%)	\$177,084.00	\$6,000.00	\$400.00	\$8,800.00	\$1,480.00	\$10,000.00	\$1,920.00
Maintenance and Protection of Traffic (10%)	\$442,710.00	\$15,000.00	\$1,000.00	\$22,000.00	\$3,700.00	\$25,000.00	\$4,800.00
Contingencies (25%)	\$1,106,775.00	\$37,500.00	\$2,500.00	\$55,000.00	\$9,250.00	\$62,500.00	\$12,000.00
Inspection (12%)	\$531,252.00	\$18,000.00	\$1,200.00	\$26,400.00	\$4,440.00	\$30,000.00	\$5,760.00
Engineering (25%)	\$1,106,775.00	\$37,500.00	\$2,500.00	\$55,000.00	\$9,250.00	\$62,500.00	\$12,000.00
<b>TOTAL</b>	<b>\$9,241,696.00</b>	<b>\$264,000.00</b>	<b>\$17,600.00</b>	<b>\$387,200.00</b>	<b>\$65,120.00</b>	<b>\$440,000.00</b>	<b>\$84,480.00</b>
<b>TOTAL (ROUNDED) - \$10,500,000</b>							

## **Appendix C: Combined Previous Study Recommendations**

## **Appendix D: HEPMPO SAP – Winchester Ave. Corridor Profile and Countermeasure Toolbox**



**Collision History (2018-2022)**



**Notable Collision Patterns**



**Planning References**

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

Table 10: HEPMPO - Road Safety Infrastructure Countermeasures for Winchester Avenue Safety Corridor

Location	Countermeasure	FHWA Proven Safety Countermeasure	Countermeasure Description	Implementation Horizon	2024 Planning Level Cost
<b>Length of Corridor (Winchester Ave and King St)</b>	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
<b>Length of Corridor (Winchester Ave)</b>	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

Location	Countermeasure	FHWA Proven Safety Countermeasure	Countermeasure Description	Implementation Horizon	2024 Planning Level Cost
	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
<b>All Signalized Intersections</b>	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

Location	Countermeasure	FHWA Proven Safety Countermeasure	Countermeasure Description	Implementation Horizon	2024 Planning Level Cost
<b>Mall Dr Intersection</b>	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
<b>Mall Dr Connector</b>	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. Does not appear to be a needed access or ROW. Adjacent properties all have other access points	Long Term	\$230,000 - \$290,000
<b>John St Intersection</b>	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	Long Term	\$85,000 - \$100,000

Location	Countermeasure	FHWA Proven Safety Countermeasure	Countermeasure Description	Implementation Horizon	2024 Planning Level Cost
			property as possible. If some portion of driveway remains within the 'intersection', it should be signalized		
	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
<b>Winchester Ave and King St Intersection</b>	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
<b>King St and Queen St Intersection</b>	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

Location	Countermeasure	FHWA Proven Safety Countermeasure	Countermeasure Description	Implementation Horizon	2024 Planning Level Cost
	High Visibility Crosswalks	Yes	Install high visibility crosswalks over ornamental brick crosswalks	Short Term	\$14,000 - \$18,000