SAFE STREETS & ROADS FOR ALL

ACTION PLAN

A VISION ZERO IMPROVEMENT PLAN

A plan to eliminate fatalities and serious injuries by 2040

City of Aberdeen
Town of Bel Air
City of Havre de Grace

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Appendices

Acknowledgements

Thank you to all of our partners who contributed their knowledge and expertise to the creation of this Action Plan:

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Commitment to Vision Zero

The municipalities of Aberdeen, Bel Air, and Havre de Grace pledge to incorporate the strategies, and recommendations in this Safe Streets and Roads for All Action Plan to reach zero traffic fatalities and severe injuries by 2040.

The Official City of Aberdeen MARYLAND

Bel Air MARYLAND

HAVRE DE GRACE 1785 1878 DEFENSOR PATRIAE MARYLAND

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SECTION 1 - OVERVIEW

Section 1 - Overview

In 2022, 42,514 lives were lost in crashes on US roadways, and an additional 7,500 people perished after being struck by vehicles while walking along or across US roadways[1]. Among all modes of transportation, bicycling and walking are the most vulnerable, with any crash involving a motor vehicle often resulting in severe injury for the non-motorist. Reflecting on the profound impact a single preventable death can have on countless lives, it becomes clear that change is not just necessary but imperative.

Safe Streets and Roads for All and Vision Zero

Safe Streets and Roads for All (SS4A)

The Bipartisan Infrastructure Law (BIL) established the Safe Streets and Roads for All (SS4A) discretionary program with $5 billion in appropriated funds over 5 years, 2022-2026. The SS4A program funds, approximately $1 billion per year, are allocated for Vision Zero Planning, Demonstration & Implementation of projects at the local, regional, and tribal levels to prevent roadway deaths and severe injuries. The Town of Bel Air has joined forces with the City of Aberdeen and City of Havre de Grace, as recipients of a Safe Streets and Roads for All (SS4A) grant to study how the three municipalities can make their streets safer for their most vulnerable users. These users are defined as non-motorists and include pedestrians, bicyclists, members of the community with disabilities who require mobility accommodations, and those using public transportation. Through this grant funding, twenty-three intersections were identified for further evaluation and analysis. A complete intersection list is depicted in Figure 1-1.

These evaluations and analyses, along with information obtained through the public outreach process are used to develop this SS4A Action Plan. This Plan will recommend short, mid, and long-term improvements for each selected intersection and provide the framework necessary for future multimodal transportation safety upgrades.

The SS4A Action Plan introduces proven safety countermeasures at each intersection, recommends updates to policies and standards that are not aligned with current vision zero goals, and increases equity by prioritizing those in neighborhoods that are impacted by existing conditions or lack of safe and convenient transportation options.

Figure 1-1: Selected Intersections

Vision Zero

Vision Zero aims to eliminate all traffic fatalities and severe injuries while enhancing safety, health, and equitable mobility for all. First implemented in Sweden in the 1990s, its success in Europe, marked by substantial reductions in serious and fatal traffic incidents, has spurred its adoption in major U.S. cities[2].

Central to Vision Zero is the integration of the safe systems approach (see Figure 1-2), which fundamentally alters the traditional paradigm in two key ways.

1. Vision Zero **acknowledges human fallibility** and emphasizes designing road systems and policies to mitigate the impact of inevitable errors, thereby reducing the likelihood of severe harm. This necessitates continuous improvement in roadway infrastructure, speed management protocols, and other related systems.
2. Vision Zero is a **multidisciplinary approach**, bringing together diverse and necessary stakeholders to address this critical problem: traffic fatalities and severe injuries. In the past, meaningful, cross-disciplinary collaboration among local traffic planners and engineers, policymakers, and public health professionals has not been present, but this needs to become the norm. Vision Zero acknowledges that many factors contribute to safe mobility -- roadway geometry, travel speeds, road user behaviors, technology, and policies -- and sets clear goals to achieve the shared goal of zero fatalities and severe injuries.

Figure 1-2: Safe System Approach

The SS4A Project Goals

- To take a proactive stance in designing roads that specifically address the needs of our most vulnerable users: pedestrians, bicyclists, people who use public transportation, and people with disabilities.

[1] *The National Highway Traffic Safety Administration (NHTSA)*

[2] Vision Zero Network - What is Vision Zero? | Vision Zero Network

- To support Vision Zero by recommending safety improvements to eliminate all severe crashes that result in severe injury or fatality.
- To follow the Safe Systems Approach which recognizes that humans make mistakes that can lead to crashes, that death and severe injuries on our roadways are unacceptable and that all stakeholders have a shared responsibility to ensure fatal and severe crashes do not occur.
- To perform safety analyses of the identified intersections noting the location and severity of crashes, as well as the contributing factors and crash types by road users (motorists, pedestrians, transit users, etc.).
- To ensure equitable investment in the safety needs of underserved communities.

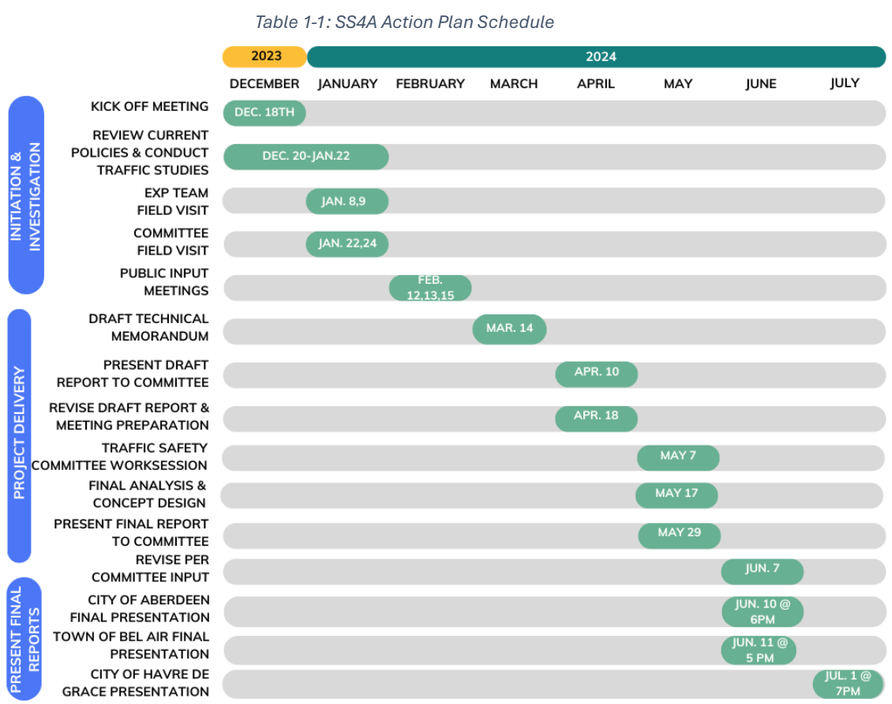
The Traffic Safety Committee

The SS4A Traffic Safety Committee was established by the three municipalities as a Steering Committee to oversee the development of the SS4A Action Plan. The Committee is comprised of representatives from the Town of Bel Air, the City of Aberdeen and the City of Havre de Grace Departments of Planning and Community Development, Public Works, and Police along with representatives from Harford County's Department of Planning and Director's Office, and the Maryland Department of Transportation, State Highway Administration, District 4. On December 18, 2023, an in-person kick-off meeting was held to review the scope of the safety analysis and set expectations, share information on existing plans and studies, develop a SharePoint site for project documents and discuss the project schedule. This Committee continued to meet bi-weekly through the end of March 2024 for a total of six times. The Committee's role was key in providing input throughout the action plan development process for reviews of project milestones such as the Technical Memorandum and the draft Action Plan. The project schedule (Table 1-1) was developed to set deliverable dates for the major milestones: the Public Workshops in February 2024, the Technical Memorandum in March 2024 and the Action Plan in May 2024 with Final Public Presentations to the elected Boards and Commissions in June and July 2024.

These municipalities are closely located along the I-95 and US 40 corridor in Harford County. Each municipality has unique characteristics and visions for the growth, development, and safety of their neighborhoods. However, these municipalities have State Roads that carry higher volumes of traffic crossing their local roads and follow both State and County Road design standards. In addition, transit routes connect these municipalities providing transportation opportunities to and from where residents live and work, attend college, or access healthcare.

Each municipality identified intersection locations that either had a prior crash history that involved a pedestrian fatality or severe injury or roadway characteristics that created safety challenges within their communities. They partnered together to achieve the goal of developing an Action Plan that will help them to improve safety and reduce traffic related deaths in their Town and Cities to zero. This Action Plan builds upon existing local, County, and State Master Plans and Traffic Safety initiatives and policies and integrates a comprehensive, equitable, and data-driven approach to achieving the goals of eliminating traffic related severe injuries and fatalities in the Town of Bel Air, the City of Aberdeen, and the City of Havre de Grace.

Table 1-1: SS4A Action Plan Schedule



The Purpose of this Action Plan

Within the State of Maryland, there were 566 traffic deaths on roadways, including 132 pedestrians and 11 bicyclists in 2022. There were also 2,595 pedestrians injured[3].

The State of Maryland enacted Vision Zero in 2019 and their goal for reaching zero fatalities and severe injuries is by 2030. Harford County's Strategic Highway Safety Plan (2021-2025) aligns with reaching the State's Vision Zero goals by 2030. Overall targets are:

1. Reduce fatalities from a five-year average of 19 in 2015-2019 to 18 or fewer in 2021-2025.
2. Reduce injuries from a five-year average of 1,429 in 2015-2019 to 1,087 or fewer in 2021-2025.
3. Reduce severe injuries from a five-year average of 107 in 2015-2019 to 51 or fewer in 2021-2025.

To achieve these goals the SS4A grant funding (F. Y. 2022-2026) supports local initiatives to prevent death and severe injury on roads and streets through a set of strategic action items developed as part of an SS4A Action Plan.

[3] MARYLAND DEPARTMENT OF TRANSPORTATION Highway Safety Office

Selected Intersection Locations

There are 23 intersections selected for improvement under this Safe Streets and Roads for All Action Plan. Figure 1-3 displays all intersections and their geographic orientation.

Each municipality had the opportunity to bring forward between 6 and 9 intersections using selection criteria based on:

- Crash History
- Functional Road Classification and Traffic Volumes
- Actual or Expected Speed
- Long Crossing Distances for Pedestrians
- Unsignalized Intersections
- Transit Corridors with Bus Stops
- Location of Nearby School Crossings
- A High Volume of Pedestrians or Cyclists
- Proximity to a Trail Crossing
- Lack of Pedestrian Infrastructure, including crosswalks or Pedestrian Refuge Islands
- Existing Non-ADA Compliance
- Lack Of Accessible Pedestrian Signals or Countdown Time Pedestrian Indicators
- Location of Underserved Communities

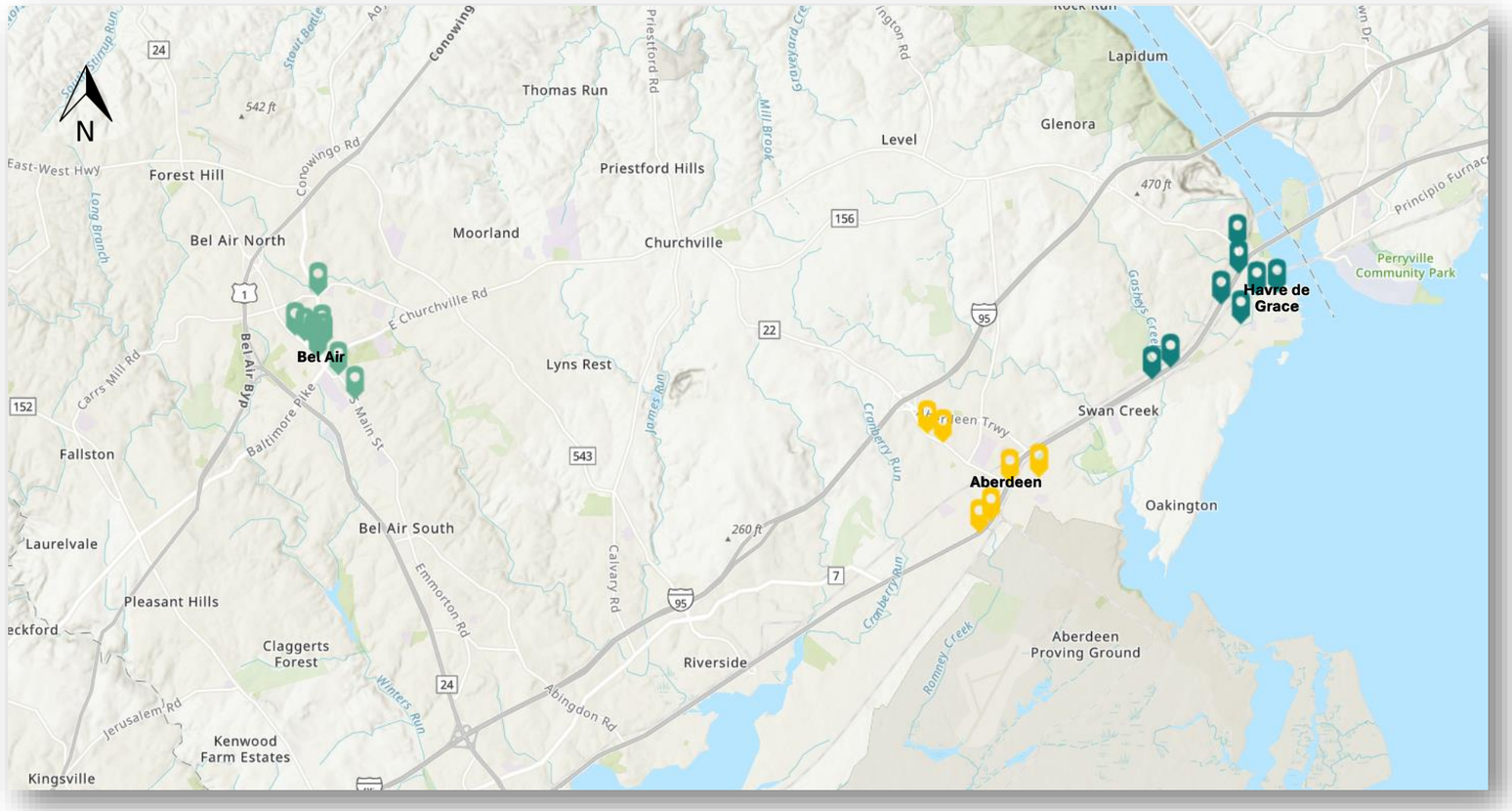


Figure 1-3: Map of Selected Intersections

These intersections have been prioritized for this grant to work towards reducing the number of fatalities and severe injuries from crashes involving pedestrians and cyclists to zero.

SECTION 2 - SAFETY ANALYSIS

Section 2 - Safety Analysis

The safety analysis for the selected intersections was conducted via evaluation metrics including adherence to standards and guidelines, vehicle speeds both perceived and observed, intersection level of service (LOS), signal warrant standards, and historical crash analysis. For each selected intersection location, the project team investigated the existing conditions, including crash history, signal timing (if relevant), daily traffic volumes, posted speed limit, traffic patterns, pedestrian and bicyclist facilities presence and geometry, pavement markings, and signage.

Historical Crash Analysis

The crash data presented in this section was acquired from the MDOT SHA Crash Data Sheets. These reports can be found in Appendix C.

MDOT SHA maintains a database derived from reports submitted to, processed, and approved by the Maryland State Police Official Crash Reporting System. Data are regularly updated and subject to change.

A complete summary of the recorded crashes in each municipality between 2018 and 2022[1] can be found in Appendix A. Figure 2-1, Figure 2-2, and Table 2-1 provide a brief overview of this crash data collected sorted by municipality.

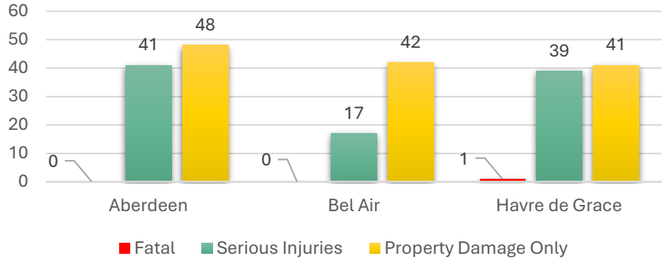


Figure 2-1: Total Crashes by Municipality

[1] Data for intersections A2.2, B9, H7 and H8 are from 2019-2023.

Table 2-1: Crash Types by Municipality

Crash Type	Municipality			Total
	Aberdeen	Bel Air	Havre de Grace	
Wrong-way Driving	1	0	1	**2**
Rear End	12	16	28	**56**
Sideswipe	1	4	4	**9**
Left Turn	33	8	14	**55**
Angle	22	13	17	**52**
Pedestrian	4	4	3	**11**
Parked Vehicle	0	1	0	**1**
Fixed Object	8	8	7	**23**
Other	7	0	3	**10**
Total	**88**	**54**	**77**	**219**

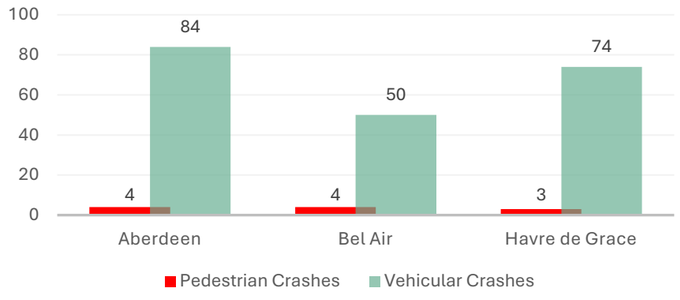


Figure 2-2: Pedestrian vs. Vehicular Crashes per Municipality

Further investigations into the crash data for each intersection can be found in the relevant municipal section in 6A, 6B, and 6C.

Data Limitations

The data presented does not capture near-misses or unreported crashes. Despite these limitations, it is the most complete data source available.

Crash Trends

The project team scrutinized crash records for every intersection, considering factors such as crash type, severity, lighting, road conditions, causes, day and time of occurrence, and yearly trends over five years. While each intersection possesses unique traits, some shared similarities allowed for joint analysis. Three such clusters were pinpointed among the selected intersections and are outlined in the following tables.

US Route 40 Corridor

Intersections A1&A4, A2.1, A2.2, H1, H2, H3, and H4 are along the US Route 40 corridor.

Table 2-2: Data Along US Route 40 Corridor

US 40 Corridor						
	2018	2019	2020	2021	2022	Note
Total Crashes	20	25	19	23	28	-
Fatalities	1	0	0	0	0	One fatality (pedestrian) in Jan 2024
Pedestrian-related	2	1	1	0	1	One fatality (pedestrian) in Jan 2024

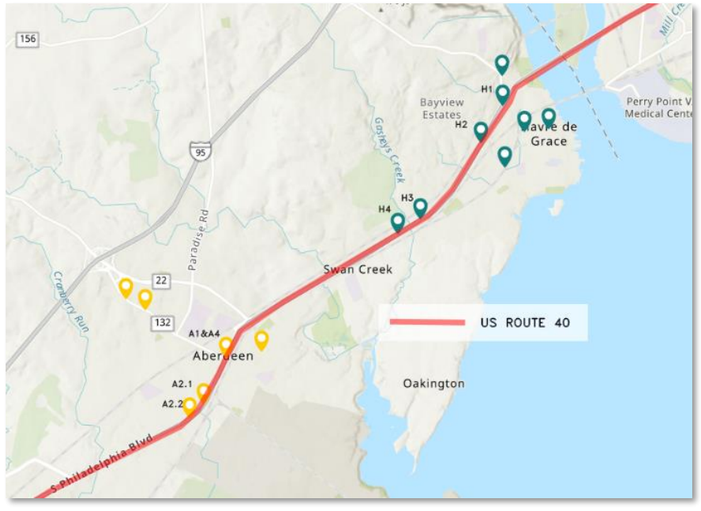


Figure 2-3: US Route 40 Corridor

Bel Air Downtown District

Bel Air's downtown district includes intersections B1, B2, B3, B5, B6, B7 and B8. See Figure 2-4 for the extent of this area. Although Aberdeen and Havre de Grace have downtown areas as well, these intersections were selected for analysis due to their concentration within the downtown district.

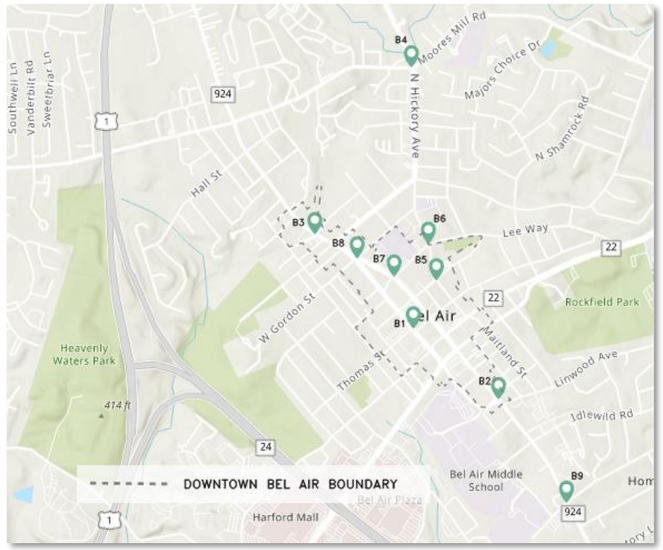


Figure 2-4: Map of Bel Air Downtown

Table 2-3: Bel Air Downtown District

Bel Air Downtown District						
	2018	2019	2020	2021	2022	Note
Total Crashes	10	10	5	4	10	-
Fatalities	0	0	0	0	0	One fatality (pedestrian) in Nov 2017
Pedestrian-related	1	2	0	0	1	One fatality (pedestrian) in Nov 2017

Signalized Intersections

There are signalized intersections at B1, B4, B5, B9, A1/A4, A3, A6, H1, H2, and H6.

Table 2-4: Summary of All Signalized Intersections in the Study Areas

Signalized Intersections						
	2018	2019	2020	2021	2022	Note
Total Crashes	30	20	22	23	34	-
Fatalities	1	0	0	0	0	One fatality (pedestrian) in Nov 2017
Pedestrian-related	2	1	1	0	2	One fatality (pedestrian) in Nov 2017

Other Evaluation Metrics & Criteria

Standards and Guidelines

The following reference manuals were used to develop the basis of design for this Action Plan:

- The Maryland Manual on Uniform Traffic Control Devices (MD-MUTCD)
- National Association of City Transportation Officials (NACTO) Urban Street Design Guide
- FHWA'a Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations
- FHWA's Separated Bike Lane Planning and Design Guide (2015)
- AASHTO Guide for the Development of Bicycle Facilities
- Highway Capacity Manual (HCM) by the Transportation Research Board of the National Academies of Sciences, Engineering, and Medicine
- Harford County Design Guidelines

Vehicle Speeds

The posted speed limit for each roadway at the selected intersections was identified and summarized in the Conclusion. Knowing the posted speed on the road is crucial for the following reasons:

Safety - Speed limits are set to ensure safe driving conditions. When drivers adhere to these limits, crashes are less likely to occur. Excessive speed can lead to loss of control, reduced reaction time, and more severe collisions.

Traffic Flow - Speed affects traffic flow. Consistent speeds help maintain a smooth flow, reduce congestion, and prevent sudden stops or slowdowns.

Design of Infrastructure - Road geometry and signage are influenced by speed limits. Properly designed roads will encourage safe speeds.

Legal Compliance - Speed limits are legally enforced. Violating them can result in fines, penalties, or even license suspension.

85th Percentile Speed - At intersections where speeding was previously identified as an item of concern and brought to the attention of the project, speed counts were taken to determine the roadway's 85th percentile. The 85th percentile speed is the speed at or below which 85% of drivers travel on a road segment. It represents the speed that most drivers perceive as safe under open road conditions and favorable circumstances.

Annual Average Daily Traffic (AADT)

Annual Average Daily Traffic (AADT) is a measure used primarily in transportation planning and engineering. It is the total volume of vehicle traffic of a segment of roadway for a year divided by the number of days (365). AADT is a measurement to describe how busy the roadway is daily. It is not relevant to Level of Service (LOS). All AADT data was collected using the MDOT SHA Annual Average Daily Traffic Online Web Tool[2].

[2] Maryland annual average daily traffic (SHA statewide AADT shapefiles). Maryland's GIS Data Catalog.

Level of Service (LOS)

As defined in the Highway Capacity Manual, level of service (LOS) is "a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience". In general, the following six levels are used to describe the traffic conditions:

A | Free flow, with low volumes and desirable speeds. For a signalized intersection, there is no congestion, and all queues clear in a single cycle.

B | Reasonably free flow, but speeds are beginning to be restricted by traffic conditions. For a signalized intersection, there is very light congestion, and an occasional approach phase is fully utilized.

C | Stable flow, but most drivers are restricted in the freedom to select their own speeds. For a signalized intersection, there are light congestion and occasional backups on critical approaches.

D | Approaching unstable flow; drivers have little freedom to select their own speeds. For a signalized intersection, there is significant congestion on critical approaches, but the intersection is functional. Cars are required to wait through more than one cycle during short peaks. No long-standing queues formed.

E | Unstable flow: there may be short stoppages. For a signalized intersection, there is severe congestion with some long-standing queues on critical approaches. Queues may block nearby intersection(s) upstream of critical approach(es).

F | Forced or breakdown flow; unacceptable congestion; stop-and-go. For a signalized intersection, there is total breakdown with stop-and-go on critical approaches.

Critical Lane Volumes analysis (CLV) and Highway Capacity Software (HCS) methods were used to calculate the LOS. CLV is a method commonly used by transportation planners and traffic engineers to calculate the volume/capacity ratio at an intersection and its level of service. The HCS is a software tool used for macroscopic traffic analysis based on the HCM methodologies.

Signalized vs. Unsignalized Intersections- Although their calculation methods for LOS and quantitative values are different, both signalized and unsignalized intersections use the same LOS scale (A-F), which is universal for all roadways/intersections.

Determining the "Acceptability" of the LOS – A level of service of D or better are acceptable for corridors and local streets. This means the congestion level is acceptable. In terms of safety improvements, this means there is room to reduce the capacity slightly to allow room for safety improvements.
Complete level of service calculations for each intersection can be found in Appendix B.
Disclaimer on LOS: The FHWA does not mandate specific minimum LOS values.

MUTCD Signal Warrants

As required by the MD-MUTCD, "The investigation of the need for a traffic control signal shall include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions". The MD-MUTCD has nine "Signal Warrants" that list applicable factors including traffic volumes, pedestrian volumes, school crossing, coordinated traffic signal system, crash experiences, roadway network, and an intersection near a grade crossing. Meeting one or multiple warrants would support (although not require) the installation of a traffic signal.

Traffic Volumes

Traffic volumes have a pivotal role in traffic and safety improvement studies. From a traffic congestion perspective, collecting and analyzing traffic volumes helps design measures that reduce delays, improve travel times, and enhance overall transportation efficiency. Reviewing traffic volumes properly helps to manage traffic movements, minimize conflicts, and provide clear guidance for maneuvering and improving overall safety. By analyzing traffic volumes and the capacity of an intersection, deficiencies and areas of concern can be identified and countermeasures can be properly developed to address congestion and improve safety for all road users.
Traffic volume data were collected from the following sources:

- MDOT INTERNET TRAFFIC MONITORING SYSTEM (I-TMS) - a web-based portal tool providing statewide traffic data was used to download available turning movements. These are generally 13-hour, from 6 AM to 7 PM turning movements counts at intersections on weekdays.
- TRAFFIC IMPACT STUDIES - for abutting properties or proposed site developments were provided by the municipalities. They generally provide AM and PM peak hour turning movement count data and LOS analysis results for pre-development conditions and anticipated post-development conditions considering the traffic volumes that would be generated by the development.
- FIELD SPOT COUNTS - For locations where traffic data was not available, field spot counts were conducted during the peak hours.

The traffic volumes were used in CLV analyses and HCS analyses to calculate the level of service of the study locations during the peak hours.

Field Observations, Driver Behavior, and Vicinity Investigations

During the data collection and analysis phase, site visits and field observations were necessary to understand the intersections and roadways' deficiencies and actual and perceived challenges. At each intersection, the project team documented the adjacent land uses, posted speed limits, adequacy of lighting available, and conditions of crosswalks, the type of intersection controls, lack of safe access routes, missing sidewalks and ADA-compliant ramps, and lack of bike lane networks. An existing conditions map illustrating challenges and deficiencies at each intersection has been developed with recommendations for short-, intermediate-, and long-term traffic safety improvements/countermeasures. Recommended countermeasures are shown on the intersection maps and in a matrix format to create an action plan prioritizing location, setting timelines, and providing planning level cost estimates.

Public Outreach

In addition to the field visits and site inventories, the project team conducted three public workshops and online surveys for each municipality and recorded concerns expressed by all participating stakeholders. An overview of these public outreach efforts is provided in Section 3, with further details presented in each municipality section.

SECTION 3 - PUBLIC OUTREACH

Section 3 - Public Outreach

In addition to technical analyses, a robust public outreach effort was initiated to hear from community representatives and residents of each municipality about improving safety, accessibility, and connectivity in their communities.

Safe Streets and Roads for all Action Plan Public Outreach Meetings

Three public workshops were held, one for each municipality, to gain insight into the safety concerns at each intersection. Public notices (Figure 3-1) were sent to the municipal representatives two weeks in advance to inform the stakeholders about the upcoming workshops.

Figure 3-1: Bel Air Public Workshop Flyer

These public notices contained a QR code to an online survey on safe streets and roadway improvements that were created for that specific municipality. Details on the contents of this survey are discussed later in this section.

Run of Show

The public workshops were interactive and allowed each participant to view an intersection location map on a table with one table for each intersection, or sometimes two intersections.

Each intersection map was accompanied by a series of stickers that represented countermeasures or solutions that could be implemented to enhance operations safety. These countermeasures were first presented to the participants in a booklet (see Figure 3-2) to inform them of the purpose the countermeasure may play in improving roadway safety. The countermeasures presented in the infographic are the same that are displayed at the beginning of Section 6.

Figure 3-2: Excerpt from Presented Countermeasure Booklet

Attendees were then asked to add a sticker if they preferred a certain countermeasure over another at various locations at and around the selected intersection.

If there were additional comments, those were made on sticky notes and placed on the map at the identified location. See Figure 3-3 for an example.

Town of Bel Air Public Workshop held on February 12, 2024

City of Aberdeen Public Workshop held on February 13, 2024

Havre de Grace Public Workshop held on February 15th, 2024.

Presented Material

In addition to the countermeasure booklet, a series of graphic display boards were also provided to explain the following key concepts:

1. The Safe System Approach
2. Vision Zero and the Safe Streets and Roads for All Action Plan
3. Complete Streets
4. Additional Guidance for Pedestrian and Bikeway Infrastructure

These display boards are available on the public workshop web application that is described in further detail below.

Figure 3-3: Example of Public Workshop Intersection Comments

Public Workshop Web Application

These infographics and the information obtained during the public workshop are available via an online Storymap. All the public comments that were made via stickers or sticky notes are recorded in this application. If individuals were unable to attend the public workshop, they had the opportunity to use this web app until the survey period closed on March 8th, 2024.

Links to:

ArcGIS Storymap

Aberdeen Project Page

Bel Air Project Page

Havre de Grace Project Page

Input and Outcome

Table 3-1 provides the total attendance by the municipality. Sections 6A, 6B, and 6C break out the responses provided during the public workshops by the municipality.

Table 3-1: Workshop Information

	Aberdeen	Bel Air	Havre de Grace
	February 13, 2024	February 12, 2024	February 15, 2024
	City Council Chambers	Bel Air Armory	Havre de Grace Community Center
#	**18** Attendees	**33** Attendees	**13** Attendees

SS4A Public Survey

A survey for public input was available that could be accessed via the QR code in the handout shown in Figure 3-1 and through a link on the SS4A Storymap online. The comment period on this survey was open before the public workshops and for two weeks after they were held. Bel Air received 126 responses, Aberdeen 97, and Havre de Grace 33.

The following questions were asked via the survey:

1. Name
2. Address
3. Email Address
4. How often do you use each mode of transportation in a typical week?

   Modes presented: Personal Vehicle, Public Transit, Walking, Biking, Rideshare
5. What are your concerns about traveling throughout the City of Havre de Grace (specific to each municipality)?
6. What would encourage you to walk more than you currently do?
7. What would encourage you to bike more than you currently do?
8. Is the pedestrian crossing time adequate to allow you to cross the streets safely?
9. Are there any other concerns you have regarding safe travel in Havre de Grace (specific to each municipality)? Explain.
10. Are there any other improvements or specific safety concerns you would like to see in the City of Havre de Grace (specific to each municipality) along certain corridors?
11. What characteristics about your community do you find unique that can be reflected in the proposed improvements?
12. Are there any transportation facilities in Havre de Grace (specific to each municipality) that you wish there were more of or that you really enjoy?

Three dashboards were created, one for each municipality, to summarize the survey results. The dashboards were made available to the public. Any personal information that was given in these surveys is not visible on these dashboards.

Safe Streets and Roads for All - City of Aberdeen (Survey Results)

Safe Streets and Roads for All - Town of Bel Air (Survey Results)

Safe Streets and Roads for All – City of Havre de Grace (Survey Results)

These survey results are also presented in each of the municipality subsections 6A, 6B and 6C. The complete list of the responses to questions 9 through 12, that allowed for write-in responses, is presented in the Appendix.

SECTION 4 - EQUITY CONSIDERATIONS

Section 4 - Equity Considerations

"Our Department (USDOT) is mindful of the importance of fair access to transportation, a powerful force for opportunity as Americans of all backgrounds in all kinds of communities seek safe and affordable means to get to work, school, and everywhere else we need to be. Ensuring equity and accessibility for every member of the traveling public is one of the Department of Transportation's highest priorities." – Secretary Pete Buttigieg

One of the intentions of this Action Plan is to ensure connectivity for the most vulnerable users. The Federal Highway Administration (FHWA) defines a vulnerable user as a non-motorist with a fatality analysis reporting system (FARS) person attribute code for pedestrian, bicyclist, other cyclists, and person on personal conveyance or an injured person that is, or is equivalent to, a pedestrian or pedal cyclist as defined in the ANSI D16[1]. Since community members who identify as vulnerable users due to their socioeconomic status do not have a way of traveling through the transportation network via a motorized vehicle, this plan focuses primarily on the impact the proposed improvements will have on these individuals. It is also necessary to evaluate general population dynamics to further understand the communities affected by the proposed work. Lack of affordable, safe, multimodal transportation options to employment and retail centers, schools, recreational and medical facilities, and places of worship can lead to social isolation, limited access to essential services, and reduced economic opportunities, exacerbating existing inequalities.

The data presented in the following section has been acquired using statistics from the United States Census Bureau and the US Census American Unity Community Survey.

Factors in Equity Considerations

This Action Plan places a strong emphasis on equity and will address any disproportionate burden of traffic fatalities and serious injuries on low-income households, older adults and youth, people with disabilities, and households with limited vehicle access. Those who cannot afford a car or are physically unable to drive due to age or disability rely on walking, biking, and public transportation to travel to their destinations.

One of the primary goals of this Action Plan is "to ensure equitable investment in the safety needs of underserved communities."

Area of Persistent Poverty

-The county consistently had greater than or equal to 20 percent of the population living in poverty in all three of the following datasets: (a) the 1990 decennial census; (b) the 2000 decennial census; and (c) the most recent (2021) Small Area Income Poverty Estimates; OR

-The Census Tract in which the project is located has a poverty rate of at least 20 percent as measured by the 2014-2018 5-year data series available from the American Community Survey of the Bureau of the Census; OR

-The project is in any territory or possession of the United States.

Historically Disadvantaged Community

1. any Census Tract identified as disadvantaged in the Climate & Economic Justice Screening Tool (CEJST), created by the Council on Environmental Quality (CEQ), which identifies such communities that have been marginalized by underinvestment and overburdened by pollution; or
2. any Federally Recognized Tribe or Tribal entity, whether they have land.

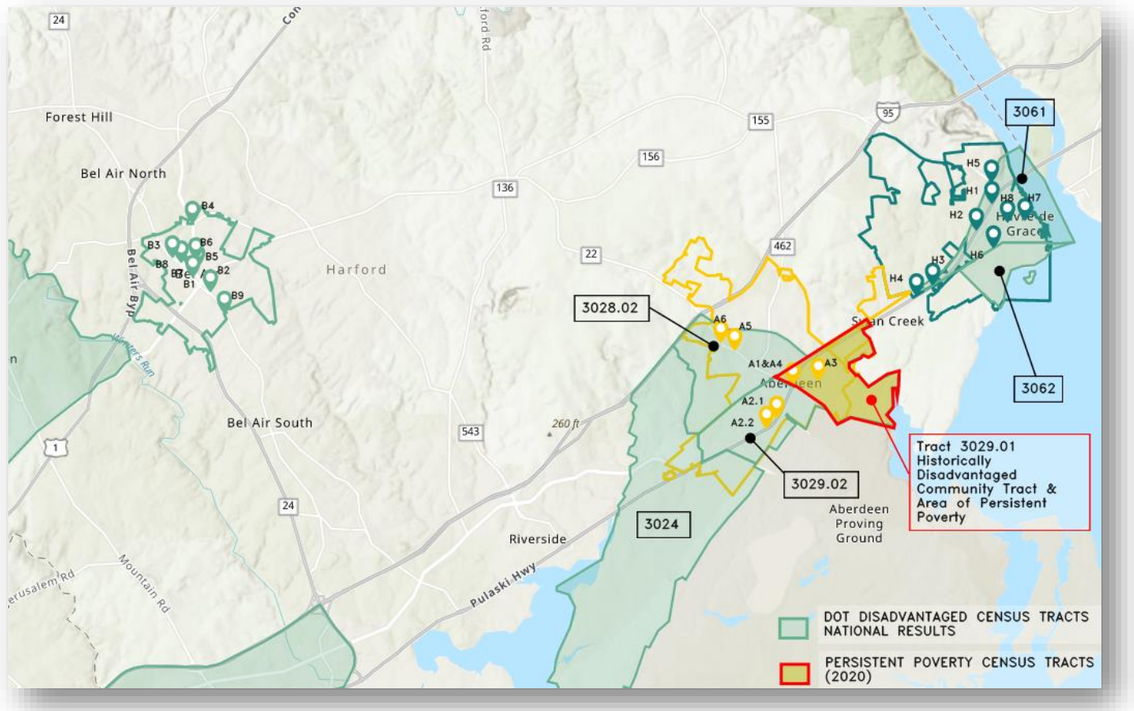


Figure 4-1: Disadvantaged Communities and Areas of Persistent Poverty

[1] Approved American National Standard – Manual on Classification of Motor Vehicle Traffic Crashes

An investigation was conducted to address this goal and assessed which areas of each municipality would be the most greatly impacted by safety and design enhancements for pedestrians, cyclists, and transit users. Figure 4-1 summarizes the areas of persistent poverty and designated disadvantaged community census tracts, two factors that the FHWA uses to ensure equitable design considerations.

Historically Disadvantaged Communities (HDCs) and Areas of Persistent Poverty (AoPP) are disproportionately impacted by severe and fatal crashes. This is due to a historic lack of infrastructure investment in these communities, coupled with high rates of walking, bicycling, and transit use. This action plan identifies the extent to which HDCs suffer disproportionate impacts of severe and fatal crashes in the Town of Bel Air, The City of Aberdeen, and the City of Havre de Grace and recommends prioritizing improvements within those areas. See the tables presented in Section 7 for more details.

Initial crash data collected for this action plan indicates that there are more frequent crashes and more serious crashes in low-income communities (see Figure 4-2).

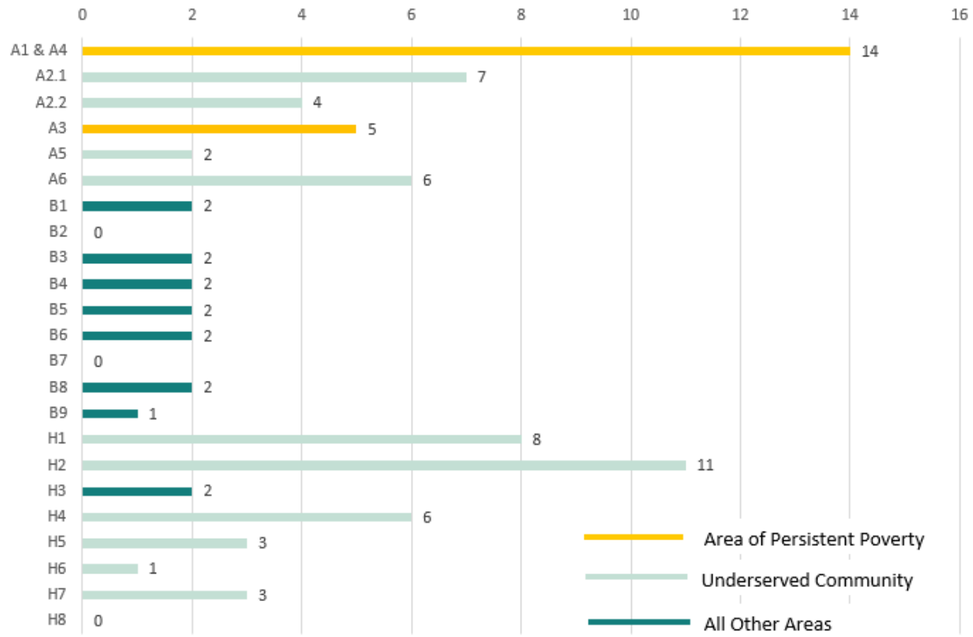


Figure 4-2: Total Crashes by Census Designation

It's crucial to understand that bicycle facilities are vital not just as a convenience for cyclists but also as a necessity for those with transportation challenges. This includes demographic groups often affected by such challenges, such as low-income households, households without vehicles, individuals who rely on transit, walking, or biking for commuting, as well as children and seniors.

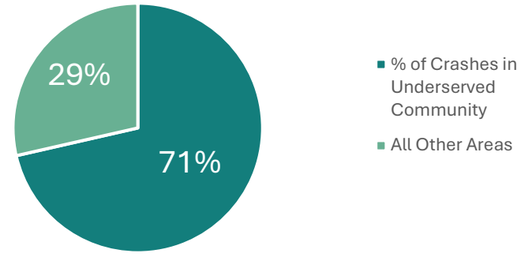


Figure 4-3: Crashes in Underserved Community

The city of Aberdeen is the only municipality that has a census tract within an area of persistent poverty. The intersections within this tract, A1& A4 and A3, account for a total of 39 crashes out of the 86 recorded in Aberdeen. Further research was conducted on these tracts and can be found in Section 6A.

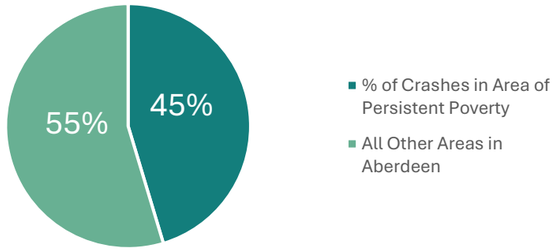


Figure 4-4: Persistent Poverty Statistics

Equitable Consideration and Municipal Demographics

It is not just income and poverty considerations that are necessary for ensuring an equitable design outcome but all other underserved populations including vulnerable road users, public transport transit users, senior citizens, people with disabilities, students, those without vehicles, and minority populations.

Demographic information provided by the American Community Survey is available in Sections 6A, 6B, and 6C on each specific municipality to ensure a holistic approach to equitable inclusion for the proposed improvements.

SECTION 5 - POLICY REVIEW & PROCESS

Section 5 - Policy Review and Processes

Each municipality has previously developed plans and studies emphasizing multimodal transportation objectives. State and County plans have established Strategic Highway Safety Plans, which align with the vision of achieving zero fatalities in the state of Maryland and Harford County. This Action Plan supports the goals and plans of each municipality, the county and the state, ensuring that individuals of all ages and abilities can travel safely and conveniently using any mode of transportation to access employment, parks, schools, and retail destinations.

Existing Plans & Studies

HarfordNEXT (County Master Plan)[1]

HarfordNEXT aims to strengthen communities and their connections by balancing land use, economic development, mobility, and environmental sustainability. It emphasizes integrating transportation and land use planning, improving bicycle and pedestrian facilities, enhancing transit services, and managing congestion. The plan also focuses on enhancing community vitality, economic prosperity, and environmental stewardship. Specific initiatives include expanding the trail network, promoting transportation demand management (TDM), and improving road safety. Additionally, it aims to promote healthy communities by ensuring access to services, developing recreational facilities, and encouraging active lifestyles.

Harford County Bike and Ped Plan[2]

The Bike and Ped plan for Harford County has many existing policies that can be implemented within the municipalities to accomplish the county's bike and ped goal to:
"Create an environment where people will choose to make riding a bicycle or walking part of their everyday life."
The following policies are highlighted in this plan and should be implemented at the municipal level as well.

- Improve bicycle and pedestrian mobility throughout the County by providing a system that is suitable for all users and offers access to major destination areas.
- Ensure that features and amenities that support bicycle and pedestrian activity are provided in a manner that sustains door-to-door travel.
- Assist bicyclists and pedestrians by offering signage and maps that clearly identify directions, destinations, and services while also promoting awareness of bicycle and pedestrian activity.
- Promote education and awareness about the value of bicycle and pedestrian travel and encourage safe bicycle, pedestrian, and motor vehicle interaction.

Harford County Highway Safety Plan (2021-2025)[3]

In 2013, the Harford County Council passed Bill 13-33 to establish the Traffic Safety Advisory Board (TSAB) and tasked that entity with developing and implementing a local Strategic Highway Safety Plan (SHSP). A plan, like the State SHSP, was developed to cover the years 2016-2020. A recent update to the Harford County SHSP is a five-year plan covering 2021-2025, covering the same timeframe as that of the State SHSP. The Board meets every other month to review the Harford County Highway Safety Plan and oversee the progress for advancing their vision zero goals by prioritizing programs and supporting strategies to decrease crash fatalities by 50% and a goal of zero deaths by 2030. The Harford County SHSP 2021-2025 states their goals and targets as follows:

- Reduce fatalities from a five-year average of 19 in 2015-2019 to 18 or fewer in 2021-2025.
- Reduce injuries from a five-year average of 1,429 in 2015-2019 to 1,087 or fewer in 2021-2025.
- Reduce severe injuries from a five-year average of 107 in 2015-2019 to 51 or fewer in 2021-2025.

2050 Maryland Statewide Bicycle and Pedestrian Master Plan[4]

The 2050 Maryland Statewide Bicycle and Pedestrian Master Plan provides trends in pedestrian and bicycle safety improvements and identifies strategies for improving active transportation access across the state, incorporating input from the public and setting specific goals. The development of this action plan followed the same procedures highlighted in this statewide master plan and aims to be in harmony with the goals established in Section 5 of the Maryland Statewide Bicycle and Pedestrian Master Plan.

[1] HarfordNEXT
[2] Harford County Bike and Ped Plan
[3] Harford County Highway Safety Plan (2021-2025)
[4] 2050 Maryland Statewide Bicycle and Pedestrian Mater Plan

Maryland Strategic Highway Safety Plan (SHSP) 2021-2025[5]

This Action Plan aligns with the goals and objectives of the Maryland Strategic Highway Safety Plan (SHSP) 2021-2025. Maryland has adopted a comprehensive approach to address highway safety in the State. According to the Maryland 2021-2025 SHSP, "The Zero Deaths Maryland strategy incorporates principles from Vision Zero and other proven safety programs to provide a broad systems perspective that considers the interaction of the road user with the road design as a necessary component to achieve zero deaths on our roads." The goal is zero deaths in Maryland by 2030. The Maryland Pedestrian Safety Action Plan (2023) complements and expands the Maryland 2021-20225 SHSP.

Zero Deaths Maryland[6]

The Zero Deaths Maryland[7] plan was used to estimate interim targets and used the following criteria:

- Number of Fatalities
- Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
- Number of Severe Injuries
- Rate of Severe Injuries per 100 million VMT
- Number of Non-motorized Fatalities and Nonmotorized Severe Injuries

Additional Policies Relating to Safe Travel

Reviews of policies that are currently implemented on the municipal level are available in Sections 6A, 6B, and 6C.

Policy Recommendations

Policies and resources at all levels of government must be aligned with Vision Zero goals. Safety is the number one priority for roadways, thus, after a comprehensive review of the existing plans, policies, and regulations, action items for policy implementation have been identified for each municipality and itemized in Table 5-1.

Table 5-1: Policy Recommendations

Action Item	Steps for Implementation
1. **Create and Implement Vision Zero Policy and Action Plan**	♦ Develop and Adopt a Vision Zero Policy and develop a Vision Zero Plan that is updated every five years. ♦ Aligning Vision Zero with the 2021-2025 Maryland Highway Safety Plan and the Harford County Strategic Highway Safety Plan. ♦ Establish a Vision Zero Strategy Committee to provide input on plan development, project implementation and public outreach. A plan monitoring process shall be developed once adopted. ♦ Establish a Vision Zero website for the safety campaign, utilizing social media and online tools to identify areas of concern, regularly updating crash data, and communicating progress through a report card to the community. ♦ Conduct before and after ped and bike counts at strategically selected locations. ♦ Encourage the School System to adopt a Safe Routes to School program.
2. **Create and Implement Complete Streets Policy and Design Guidelines**	♦ Develop and Adopt a Complete Streets Policy and Design Guidelines. ♦ Develop a development review checklist that aligns with complete street guidelines.
3. **Pedestrian and Bicycle or Multimodal Master Plans**	♦ Develop pedestrian and bicycle master plans or a multimodal master plan. ♦ Commit funding each year to new bike lane design and installation (ensure funds distributed within disadvantaged communities or areas where bikeway connectivity to destinations or public transit are needed) include costs for vertical post delineators and concrete bikeway median. ♦ Leverage town funds through the state's Kim Lamphier bikeways grant- funding is 80 (state)/20 (town) match. ♦ Apply for the State Kim Lamphier Bikeways Grant each year to continue to advance bikeway projects. ♦ Collaborate with the town & cities, county, and state resurfacing efforts to create a list of fiscal year resurfacing projects and provide bike lane designs in advance along roads identified in the bicycle master plan. ♦ Adopt green pavement policy for conflict areas, separated bike lanes and protected intersections. ♦ Develop educational materials, printed and videos demonstrating how to navigate with new facility types such as floating bus stops.

[5] Maryland Strategic Highway Safety Plan

[6] Zero Deaths Maryland

[7] See Appendix E for further information in this plan

These commitments to revising existing policies will help to improve roadway safety and contribute to the overall goals of Vision Zero. Shifting the focus from auto-centric design standards to a people-first approach with complete street guidelines and standards will change the level of comfort, safety, and access opportunities for the residents of each municipality. This holistic approach calls for changes such as reconfiguring lanes and using speed management plans to lower speeds, bolstering police enforcement and traffic safety education to make it safer for drivers, bicyclists, and pedestrians, and creating a multimodal transportation system to provide safe access for everyone regardless of where, when or by what mode they chose to travel, their demographic or economic background or their age and ability.

Specific guidelines to incorporate this frame of policy implementation are presented in Table 5-2.

Table 5-1: Policy Recommendations Cont.

Action Item	Steps for Implementation
3a. Update Existing Plans	♦ Aberdeen: Update Transportation Section of Plan Aberdeen Comprehensive Plan (April 10, 2023) to adhere to these recommended design improvements. ♦ Bel Air: update 2013 Town of Bel Air Bicycle and Pedestrian Plan per requirements stated in 2022 Town of Bel Air Comprehensive Plan. ♦ Havre de Grace: incorporate the presented material of this Action Plan into the ongoing Envision Havre de Grace Comprehensive Plan.
4. Adhere to the Most Recent National Design Standards	♦ Compare current municipal design standards with the latest applicable State and Federal guidelines and update as necessary. ♦ Adopt the 11th edition of the FHWA's MUTCD – will be required after January 18, 2026. ♦ Incorporate these standards into those already used in the Harford County Road Code (2008). Further details available in Appendix E
5. Enforce Existing Policies	♦ Deploy speed reader feedback trailers to use as messaging device. ♦ Determine if automated speed cameras are an option. ♦ Explore applying school zone speed limits to street segments near schools. ♦ Consider piloting a Twenty is Plenty Program that establishes a municipal-wide speed limit on local roadways to 20 MPH. ♦ Work with MDOT SHA on reducing speed, where needed. ♦ Collaborate with Police Department to update crash data.

Table 5-2: Updates to Existing Policies

Relevant Municipality	Recommended Action	Agency Responsible	Timeframe -years
Improve the Municipality's Internal Vision Zero Practices			
All	- Hire a Vision Zero Coordinator or assign staff to oversee that all Capital Projects comply with Vision Zero goals.	DPWT	1 to 2
	- Develop a Complete Streets Policy and Guidelines.	Planning & Community Development	3 to 5
	- Update roadway design standards to include Vision Zero elements including high visibility continental crosswalks, intersection daylighting, protected bike lanes, separated bike lanes, green pavement, intersection corner islands (protected intersections), adequate bicycle parking.	Traffic Safety Executive Committee	3 to 5
Bel Air	- Update to the 2013 Bicycle and Pedestrian Plan.	Planning & Community Development	3 to 5
Havre de Grace	- Continue to implement the recommendations from the HDG Bicycle Lane Project Feasibility Study and Design and the momentum of the Quick Build Project.	Planning	1 to 2
Aberdeen	- Develop a Pedestrian and Bicycle Master Plan within the City of Aberdeen as recommended in the April 10, 2023, plan Aberdeen (Ch. 7-Transportation).	Planning & Community Development	3 to 5
Coordinate Engineering Improvements with Education Campaigns			
All	- When new design treatments or signal upgrades (RRFB or HAWK) are installed develop on-site education campaigns or brochures and videos.	Planning, DPWT and Public Information	Ongoing
	- Coordinate countermeasure deployment with press releases, ribbon cuttings and social media announcements to bring awareness of Vision Zero efforts.	Planning, DPWT and Public Information	Ongoing
	- Partner with Parks and Recreation or Elementary Schools to develop Traffic Gardens where children begin to understand road safety in a safe environment such as a school site or park.	Planning, Parks and Recreation and Elementary School	Ongoing
	- Incorporate Vision Zero goals with Safe Routes to School Programs and funding opportunities.	Planning and School Board	Ongoing
Collaborate with Police Enforcement Strategies			
All	- Strategically deploy photo radar van along highspeed corridors where allowed by state law.	Planning and Police	1 to2 (Ongoing)
	- Coordinate with MDOT SHA speed reduction/management efforts on State Roads at high crash locations where speeding is a concern.	Planning and Police	Ongoing
	- Use of new technology safety cameras or videos to observe dangerous behaviors and collect data to support funding for new designs or programs.	Planning and Police	Ongoing
Equity Considerations			
All	- Establish a standing Executive Traffic Safety Committee or decide if the County's Existing Traffic Safety Advisory Board (TSAB) can be expanded to include a broader cross-section of the community.	Municipalities and Harford County Sheriff's Office	Ongoing
	- Ensure that a robust and equitable public engagement process is included in every project. Conduct in multiple languages (Spanish/English) if needed. Incorporate all users' viewpoints, bicyclists, transit users and people with disabilities.	Planning and Public Information	Ongoing
	- Prioritize Vision Zero Investments in Disadvantaged Areas including low-income and/or low-mobility communities.	Planning and DPWT	Ongoing
Grant Funding			
Harford County and Bel Air	- Pursue TAP funding and Maryland Kim Lamphier Bikeways Network Program grant funding to implement recommendations or phases of the proposed improvements identified in the March 2023 Bel Air to Harford Community College Bikeways Connector.	Planning	Ongoing
Aberdeen & Havre de Grace	- Pursue TAP funding and Maryland Kim Lamphier Bikeways Network Program grant funding for the US 40 Shared Use Path from Aberdeen to Havre de Grace.	Planning	Ongoing
All	- Pursue FHWA SS4A Supplemental Planning and Demonstration grant funding to perform additional signal warrant studies, feasibility studies, and demonstration projects based on the recommendations in this Action Plan. - MDOT Bicycle and Pedestrian Accessibility Funds (Fund 88 (Bicycle retrofit) and Fund 79 (new Sidewalk Construction for Pedestrian Access) on State Roads (75% State funded and 25% local jurisdiction funded)	Planning	Ongoing

SECTION 6 - RECOMMENDATIONS

Section 6 - Recommendations

The recommendations presented in the following sections were selected after thorough consideration of crash statistics, public concern, and physical characteristics. These considerations are provided on the intersection "snapshot."

Engineering Countermeasures

As mentioned in Section 3, a series of countermeasures were presented to the public to obtain their input on the type of improvements they might like to see installed within their communities. Descriptions and pictures for each of these countermeasures are provided in the Appendix.

Effectiveness of Countermeasures.

The countermeasures presented in the following sections have an associated crash modification factor (CMF). This CMF is provided via a range of variables from the Crash Modification Factor Clearinghouse used by the Federal Highway Administration to evaluate the effectiveness of an improvement. Per the CMF Clearinghouse, a Crash Modification Factor (CMF) is "a multiplicative factor that indicates the proportion of crashes that would be expected after implementing a countermeasure."

To determine the overall effectiveness of the countermeasure the following formula is used:

$$Expected\ \#\ of\ Crashes\ with\ Countermeasure = CMF \times Expected\ \#\ of\ Crashes\ without\ Countermeasure$$

For example: If the average number of crashes at an intersection is 10 per year, and a high visibility continental crosswalk is installed, which has a CMF of 0.63, the average crashes can be assumed to be reduced to 6.3 or approximately 6 crashes per year. A table of CMF's provided for each of the countermeasures proposed can be found in the Appendix.

Any improvement's success should also be measured by getting feedback from stakeholders and principally from the daily users of the transportation infrastructure and facilities.

Cost of Countermeasures

The cost presented has been calculated given a variety of factors, which can be found in the Appendix.

Timeline and Prioritization

The presented countermeasures in section 6A, 6B, and 6C have an associated "term" based on the amount of time a countermeasure will take to implement. They are:

Short-term: 0-3 Years

Intermediate-term: 4-5 Years

Long-term: More than 5 Years

The timeline also depends on the funding availability and stakeholder collaboration, policy enhancements and education when implemented in parallel.

Non-Engineering Countermeasures

The 5 E's are essential components in promoting safer walking and biking routes. These elements aim to create better conditions for vulnerable road users. "Engineering" has already been discussed and the remaining are described in further detail below:

Education: Teach students and community members about walking and biking safety. This can happen through in-school curriculum, bike/pedestrian safety assemblies, newsletters, and tips sheets. For example, a traffic garden is depicted in the photos to the right.

Encouragement: Get students and parents excited about walking and biking by hosting special events, walking school buses, bike trains, and schoolwide competitions.

Enforcement: Work with local law enforcement to reduce negative behaviors such as speeding, double parking, or disobeying traffic signals.

Traffic Gardens – Educating Children About Traffic Safety

Evaluation: Regularly assess the effectiveness of the implemented strategies. Record walking and biking rates, parent concerns, and traffic data to evaluate program success.

Additional Considerations for Countermeasure Recommendations

Effective engagement requires meeting communities where they are and addressing their specific needs. The following should be considered prior to the installation of any of the recommendations provided in the subsequent sections.

Legislative Action

Legislation at multiple levels — including at municipal, countywide, or statewide scale — can help address human behaviors that result in crashes which cause fatal or serious injuries.

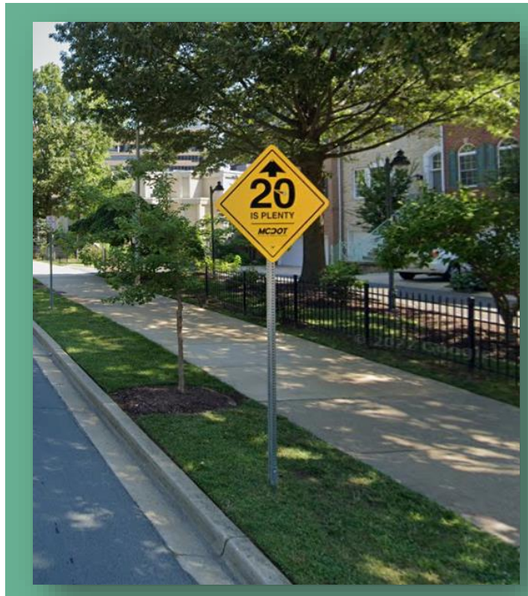


Figure 6-1: Twenty is Plenty Pilot Program in Montgomery County

Speed limit setting is one example of legislation used to influence behaviors that result in speeding. Some municipalities in the United States have recently adopted 20 mph residential speed limits through "Twenty is Plenty" campaigns.

Public Input and Engagement

- Further ongoing public engagement to reach disadvantaged communities.
- Public engagement must reach all stakeholders, particularly the disadvantaged communities, thus promoting equity.

Understanding Marginalized Communities

- Marginalized communities include those historically excluded from civic participation due to factors like race, wealth, immigration status, and sexual orientation.
- Local leaders must understand the unique needs of their community and tailor assistance programs accordingly.
- Areas of Persistent Poverty should be considered at the forefront of all design implementation to ensure the communities here are provided the necessary resources,

Inclusive Infrastructure Investment

- Engaging communities is crucial for infrastructure investments.
- Partnering with trusted local organizations can facilitate meaningful engagement with marginalized communities.

SECTION 6B - TOWN OF BEL AIR RECOMMENDATIONS

Section 6B - Town of Bel Air

The Town of Bel Air is characterized by a rich downtown area with one-way boulevards running east and west. The surrounding suburbs have a variety of trails and parks that residents can explore.

Existing Policies and Regulations

Bel Air Comprehensive Plan (2022)

The Town of Bel Air's Comprehensive Plan has been a valuable resource to extract the pre-established desires of the town to continue its efforts to create a pedestrian and bicycle-friendly environment for its residents. Many proposed improvements mentioned in this plan are called out in the individual intersections that are presented later in this section. The Transportation Chapter of the Comprehensive Plan contained insights into Bel Air's intentions as they relate to this action plan and include a desire to follow the Complete Streets design model for upgrading its infrastructure as well as the following transportation goals:

1. Improve the existing road network to address safe and efficient vehicle movement.
2. Encourage the use of alternative modes of transportation.
3. Address the need for appropriate commercial and residential parking.
4. Improve the infrastructure for Town, County, and State roads and associated right-of-way improvements.

Vision - Provide a safe, efficient, and well-maintained travel network for all modes of transportation and enhance the transit, bicycle, and pedestrian-friendly assets of the community.

Town of Bel Air's Bicycle and Pedestrian Plan (2013)

This plan borrows development from the Harford County Bike and Ped Plan that is reviewed in Section 5. The following goals from the plan align with the desired outcomes of this Action Plan:

- Establish a "Pedestrian Zone" in Downtown
- Infill gaps in the sidewalk system.
- Incorporate cycling improvements into infrastructure.
- Provide more opportunities for bike parking.
- Improve the overall pedestrian environment along US Route 1 and MD Route 22
- Improve amenities and access at existing transit stops.

Several of the improvements outlined in this plan are demarcated on the individual intersections presented in the section below.

2023 Annual Report

The Town of Bel Air Planning Commission and Department of Planning & Community Development created a report that outlines development and performance standards for the town. In the report, several relevant implementation programs were described that should be incorporated into any further measures proposed in this action plan.

Bel Air Downtown Pedestrian Safety Study

In October 2014 a pedestrian safety study was prepared for MD 924 (Main Street and Bond Street) from Baltimore Pike to Lee Street. Intersections B1 and B7 are within the study's zone of influence and some information displayed in the following section are based on similar observations found here.

The following traffic observations were found regarding the downtown's area of study:

- The peak pedestrian traffic occurred from 2:00 to 3:30 PM during school dismissal. The highest pedestrian activity along Main Street occurred between Churchville Road and Pennsylvania Avenue, with the highest number of pedestrians crossing Main Street along the north leg at Courtland Street
- The results of the analysis indicate that all the study intersections currently operate at an acceptable level of service.
- The results of the analysis indicate that all the study intersections would continue to operate at an acceptable level of service with the right-turns restricted to red.
- The analysis indicates that the 85th percentile speed as vehicles leave the signalized corridor was above the 25-mph posted speed limit at 30-mph.

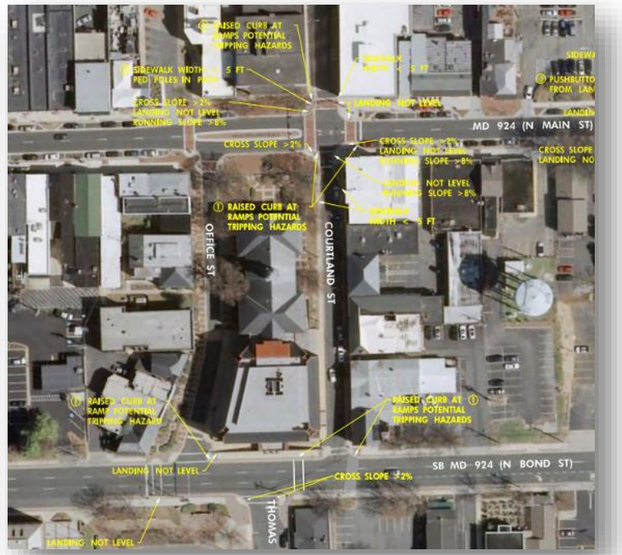


Figure 6-1: Excerpt from Pedestrian Safety Study

Ongoing Developments

Bel Air to Harford Community College Connector

Recently published in March 2023, this study sought to identify a bike route that would connect Harford County Community College (HCC) to the Town of Bel Air. This report contains information on Level of Traffic Stress (LTS) analysis for measuring a corridor's "bikeability." This methodology for determining bikeway paths should be used in further explorations that intend to upgrade Bel Air's bike network. As the intentions of this Action Plan are focused on intersections this analysis was not conducted. However, the improvements suggested in this report contain insights into the type of bike facilities that Bel Air is looking to implement, as well as recommendations for upgrading wayfinding and crosswalk visibility enhancements at intersections. The B5 intersection at N Hickory Ave and Pennsylvania Ave, specifically has proposed upgrades that are incorporated into the design improvements below.

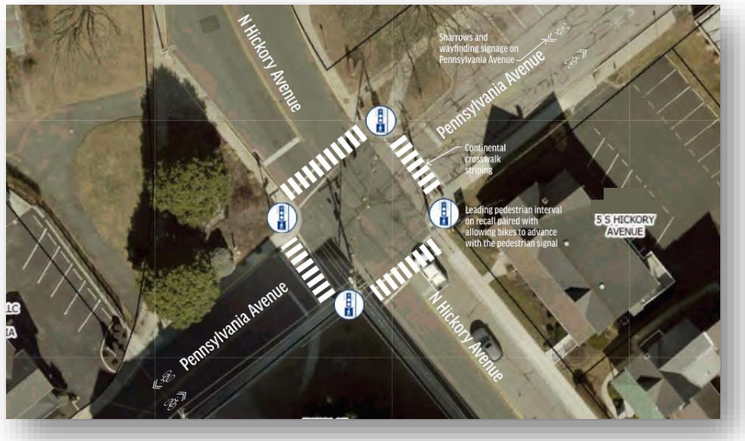


Figure 6-2: Excerpt from HCC

Courthouse Square

The Courthouse Square improvements shown in Figure 6-3, as well as design documentation from the Department of Planning and Public Works for street improvements on Office Street and Courtland Street have been incorporated into the suggestions for the B1 intersection.

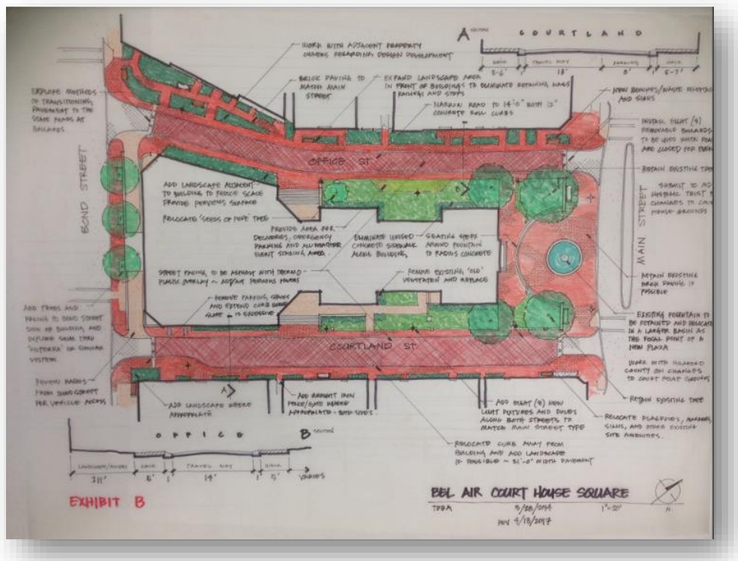


Figure 6-3: Courthouse Square

Ma & Pa Trail Extension

The Ma & Pa Heritage Trail is located on portions of the former Maryland & Pennsylvania Railroad Corridor in Bel Air and Forest Hill, Md. The trail currently consists of a 0.8±-mile section in Bel Air. The Ma & Pa Trail expansion, when completed, will provide an 8.3-mile link between Edgeley Grove Park and Friends Park in Forest Hill.

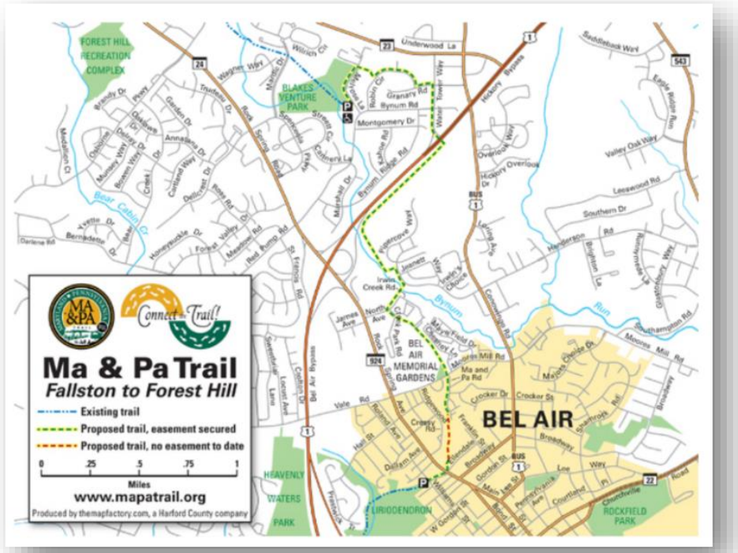


Figure 6-4: Ma & Pa Trail Extension

Thomas St Improvements

Design enhancements for Thomas St and George St improve the pedestrian experience with bulb outs and sidewalk improvements. The Thomas St improvements impact the B1 intersection and proposed bulb outs. See Figure 6-5.

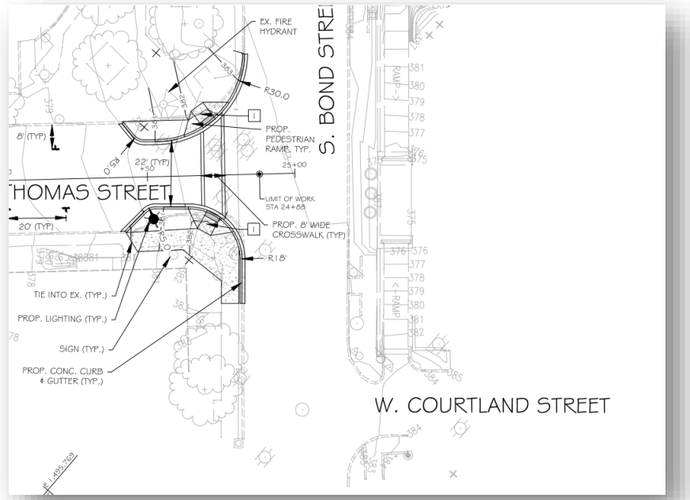


Figure 6-5: Excerpt from Thomas St Improvement Plans

[Complete Streets Leadership Academy]

MDOT and State Highway Administration (SHA) partnered with Smart Growth America (SGA) and selected intersection B8, Gordon Street at North Main & N. Bond Streets (MD 924) in the Town of Bel Air to deploy a temporary Complete Streets demonstration project. A Field Walk and Workshop were held on June 20 & 21, 2024 to evaluate intersection B8 and develop a quick build design to improve traffic safety.

Selected Intersections in Bel Air

The intersections in Bel Air were selected based on the criteria identified in Section 1 and consist of the following:

B1 - COURT HOUSE SQUARE (OFFICE/COURTLAND STREETS) AT SOUTH BOND STREET (MD 924)

B2 - KENMORE ROAD AT SOUTH MAIN STREET (MD 924)

B3 - ELLENDALE STREET (MA & PA TRAIL) AT N MAIN STREET (MD 924)

B4 - MOORE'S MILL ROAD AT NORTH HICKORY AVENUE/ CONOWINGO RD (US 1 BUS)

B5 - PENNSYLVANIA AVENUE AT HICKORY AVENUE

B6 - LEE STREET AT HICKORY AVENUE

B7 - LEE STREET AT N MAIN STREET (MD 924)

B8 - GORDON STREET AT NORTH MAIN & NORTH BOND STREETS (MD 924)

B9 - MACPHAIL ROAD AT SOUTH MAIN STREET (MD 824)

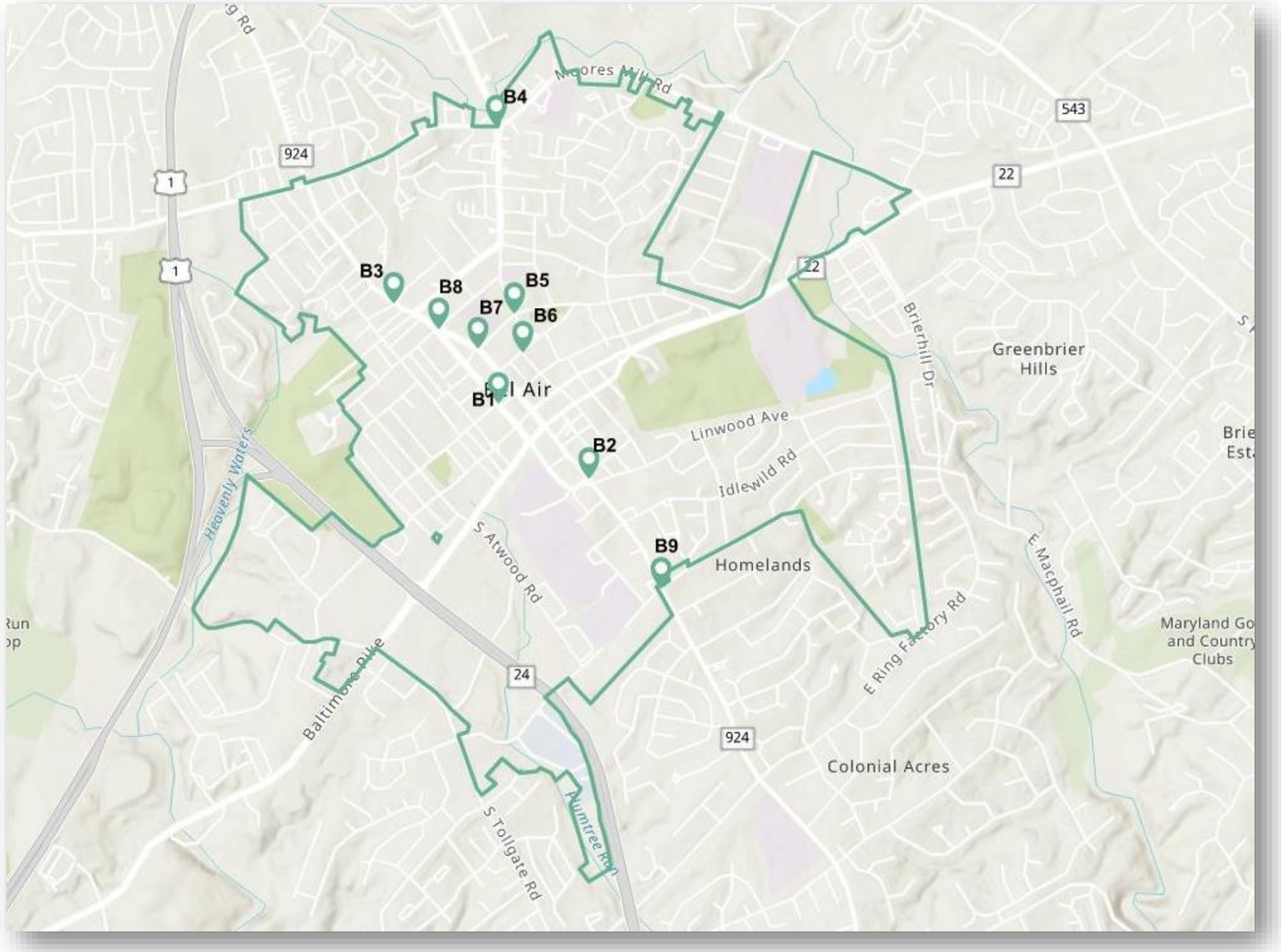


Figure 6-6: Selected Intersections in Bel Air

Historical Crash Analysis

Of the total 217 reported crashes in this study, 55 of them occurred in Bel Air. The most common collision was rear end crash which accounted for 29% of all crashes. Although no fatalities were recorded, 29% of the crashes involved a serious injury either to the driver of the vehicle or to a nearby pedestrian. 4 of the 55 crashes involved a pedestrian, with two of them occurring at the B5 intersection. With most crashes occurring during dry conditions and on Tuesdays.

Crashes Involving Impairment

Within the nine selected intersection areas, about **9%** of crashes were due to the driver being under the influence of alcohol or a controlled substance.

Table 6-1: Crashes by Severity

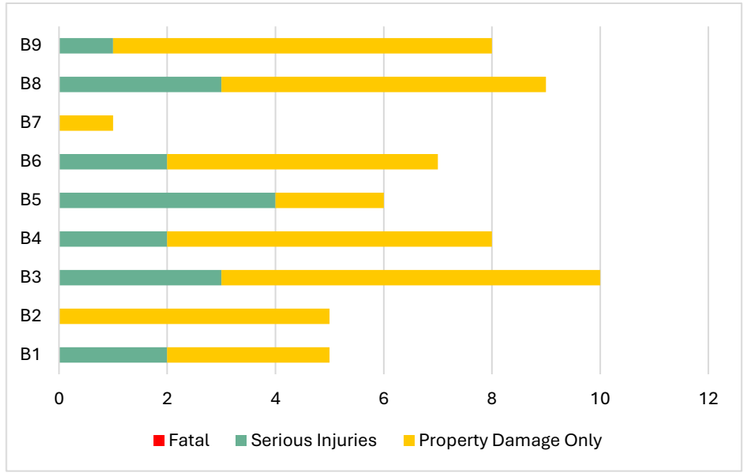


Table 6-2: Crash Summary by Collision Type

Crash Type	Intersection ID									
	B1	B2	B3	B4	B5	B6	B7	B8	B9	Total
Driving in Wrong Direction	0	0	0	0	0	0	0	0	0	0
Rear End	3	0	3	3	1	1	0	2	3	16
Sideswipe	2	1	0	0	0	0	0	0	1	4
Left Turn	0	1	0	4	1	0	0	1	1	8
Angle	0	0	3	0	0	6	1	1	3	14
Pedestrian	0	0	1	0	2	0	0	1	0	4
Parked Vehicle	0	0	0	0	0	0	0	1	0	1
Fixed Object	0	3	2	1	0	0	0	2	0	8
Other	0	0	0	0	0	0	0	0	0	0

Table 6-3: Crashes by Lighting Available

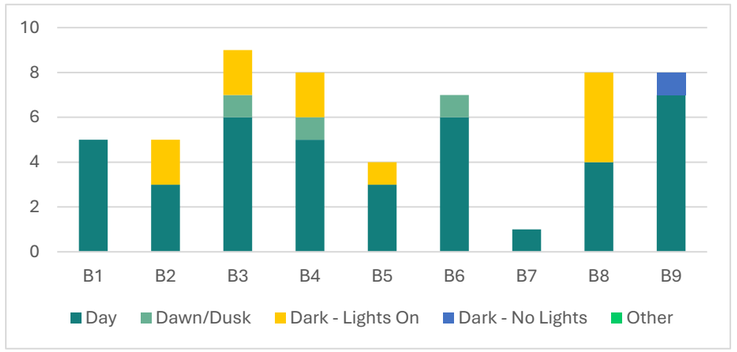


Table 6-4: Crashes by Surface Conditions

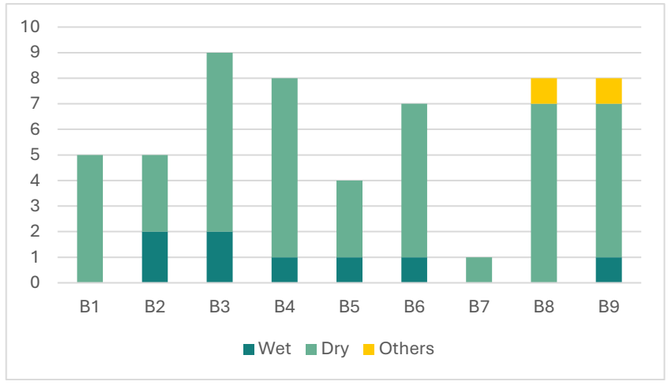


Table 6-5: Crashes by Day of the Week

Day of the Week	Intersection ID									
	B1	B2	B3	B4	B5	B6	B7	B8	B9	Total
SUN	0	1	1	0	0	1	0	2	1	6
MON	1	0	0	1	1	1	0	0	0	4
TUE	2	2	4	1	0	2	0	2	2	15
WED	0	2	1	1	1	1	0	0	0	6
THU	0	0	1	0	0	0	0	1	3	5
FRI	1	0	2	2	2	1	0	2	0	10
SAT	1	0	0	3	0	1	1	1	2	9

Top 3 Probable Causes of Crashes in Bel Air

- Fail to Give Full Attention – **20**%
- Failure to Yield to Right-of-Way - **13**%
- Influence of Alcohol or Controlled Substances – **7**%

Table 6-6: Crashes by # of Vehicles Involved

# of Vehicles Involved	Intersection ID								
	B1	B2	B3	B4	B5	B6	B7	B8	B9
Single	0	3	3	1	2	0	0	4	0
Two	5	2	6	6	2	6	1	4	7
3 +	0	0	0	1	0	1	0	0	1

Table 6-7: Alcohol or Drug Involvement

Alcohol or Controlled Substance Involvement	Intersection ID									
	B1	B2	B3	B4	B5	B6	B7	B8	B9	Total
Yes	0	0	1	1	0	0	0	2	1	5
No	5	5	8	7	4	7	1	6	7	50

Demographics

A 40-minute drive from Baltimore off US 1, Bel Air is characterized by a small-town aesthetic with a vibrant downtown area surrounded by residential communities. With popular outdoor destinations like the Ma & Pa trail and the Bel Air Farmer's market, Bel Air attracts outsiders to its downtown area. The main thoroughfare is divided between two one-way roads with Main St heading northwest towards Route 1 and Bond St to the southeast. MD 22 splits the downtown into east and west sides, allowing townspeople to travel south to the Harford Mall.

<table>
<tr><th colspan="2">KEY FACTS</th><th>INCOME & POVERTY</th></tr>
<tr><td>10,661
Total Population</td><td>41.4
Median Age</td><td rowspan="2">$66,950
Median Household Income

Poverty by Age
65 years and over 21.6%
18 to 64 years 16.6%
Under 18 years 17.8%
0.0% 5.0% 10.0% 15.0% 20.0% 25.0%

Poverty Rate
17.9%</td></tr>
<tr><td>4,921
Housing Units</td><td>59.8%
Employment Rate</td></tr>
<tr><th colspan="2">EDUCATION</th><th>POPULATION</th></tr>
<tr><td>No High School Diploma
7.4</td><td>37%
Bachelor's Degree or Higher</td><td>5.7%
Without Health Care Coverage

Total Households
4,897

800
Hispanic or Latino (of any race)</td></tr>
</table>

Equitable Considerations

With a poverty rate of 17.9%, which is significantly larger than the State's 9.1%, Bel Air's low-income population must be more heavily considered in the intersection improvement upgrades. A focus on improving pedestrian, cyclist, and transit user infrastructure will ensure equitable consideration for those who cannot afford the luxury of a personal vehicle. The largest population of those experiencing poverty in Bel Air are those above the age of 65, which can be interpreted to mean a higher degree of care should be made when making improvements around senior living facilities and keeping to standards for ADA compliance. Figure 6-7 shows that no areas in the Town of Bel Air are in persistent poverty or historically underserved communities. The highlighted portions in this figure indicate the value attributed to each census tracts' "Disadvantaged Communities Index Score" which are all below the threshold and ultimately mean the indicator of each is Zero.

Additional indicators of vulnerable communities are shown on the next page.

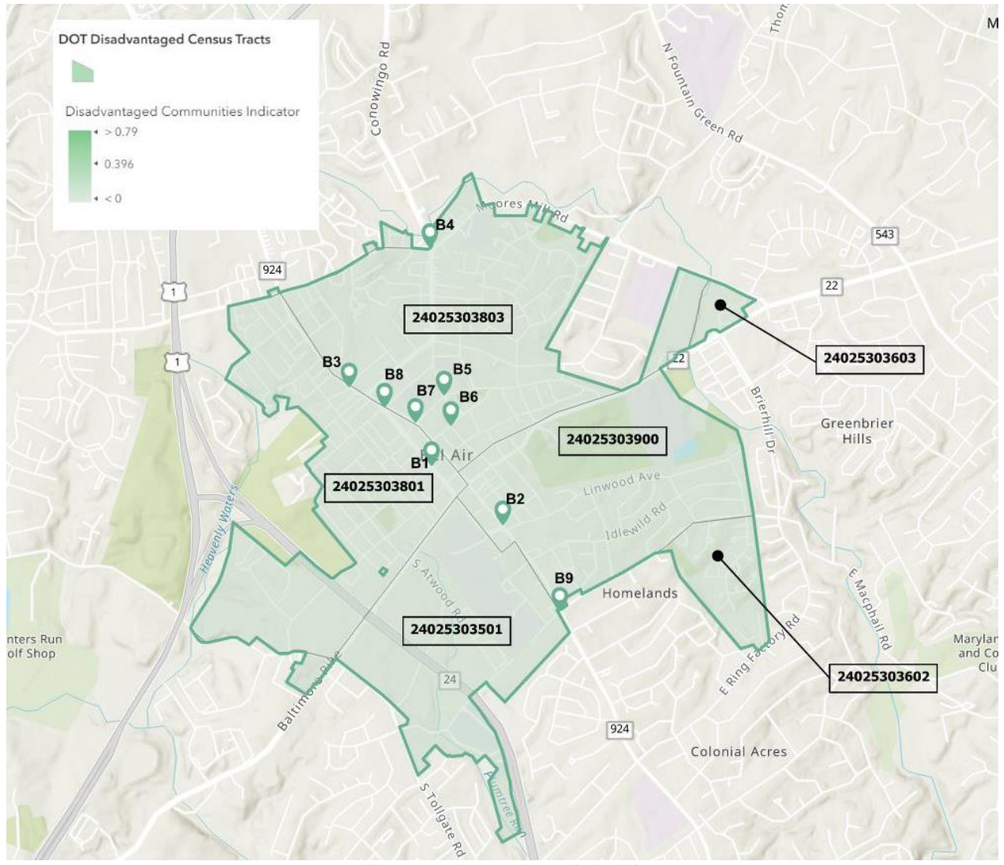


Figure 6-7: Census Tracts in Bel Air

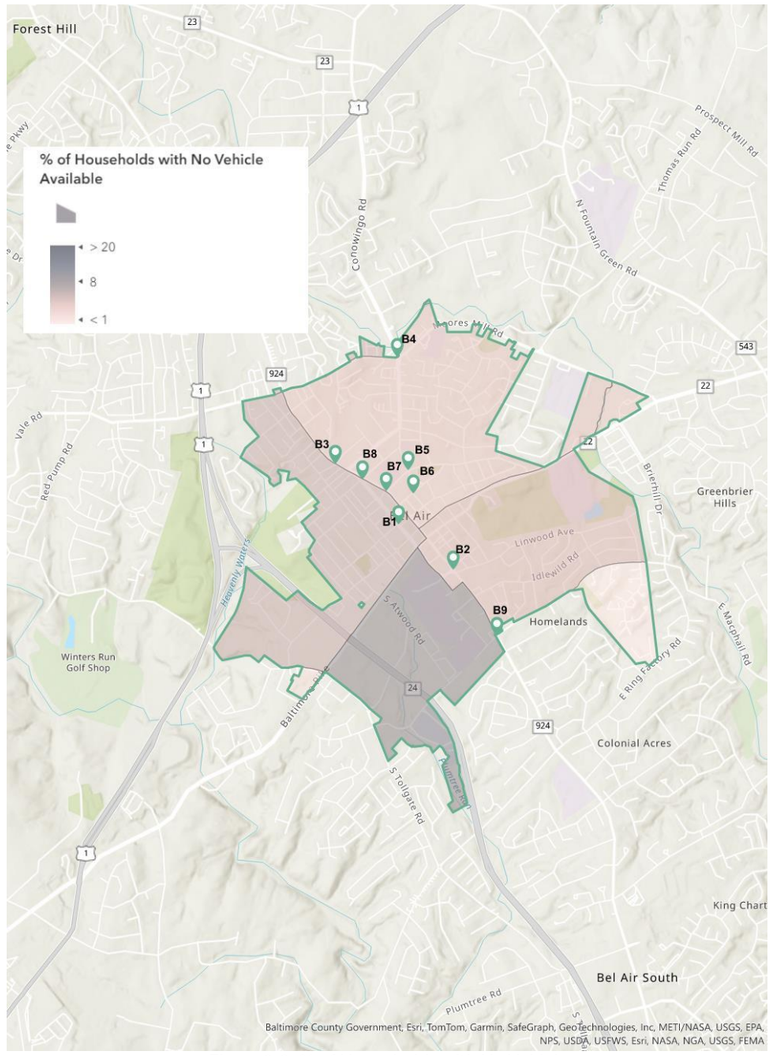


Figure 6-8: % of Households with No Vehicle

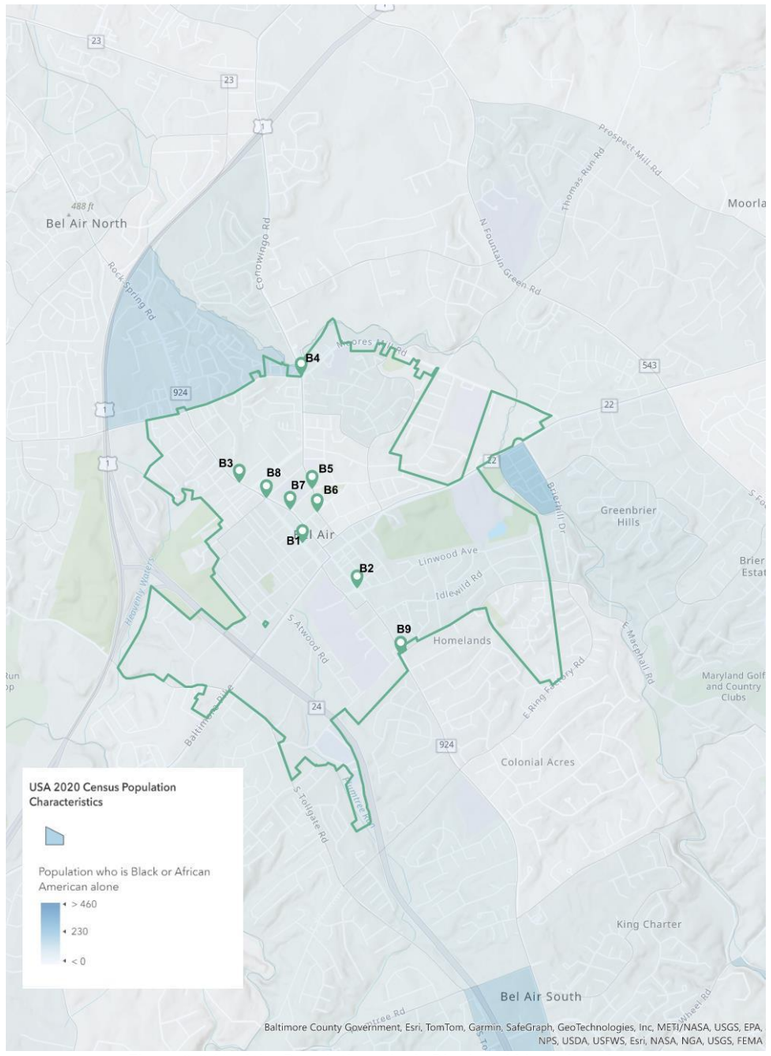


Figure 6-9 % of the Population who is Black or African American:

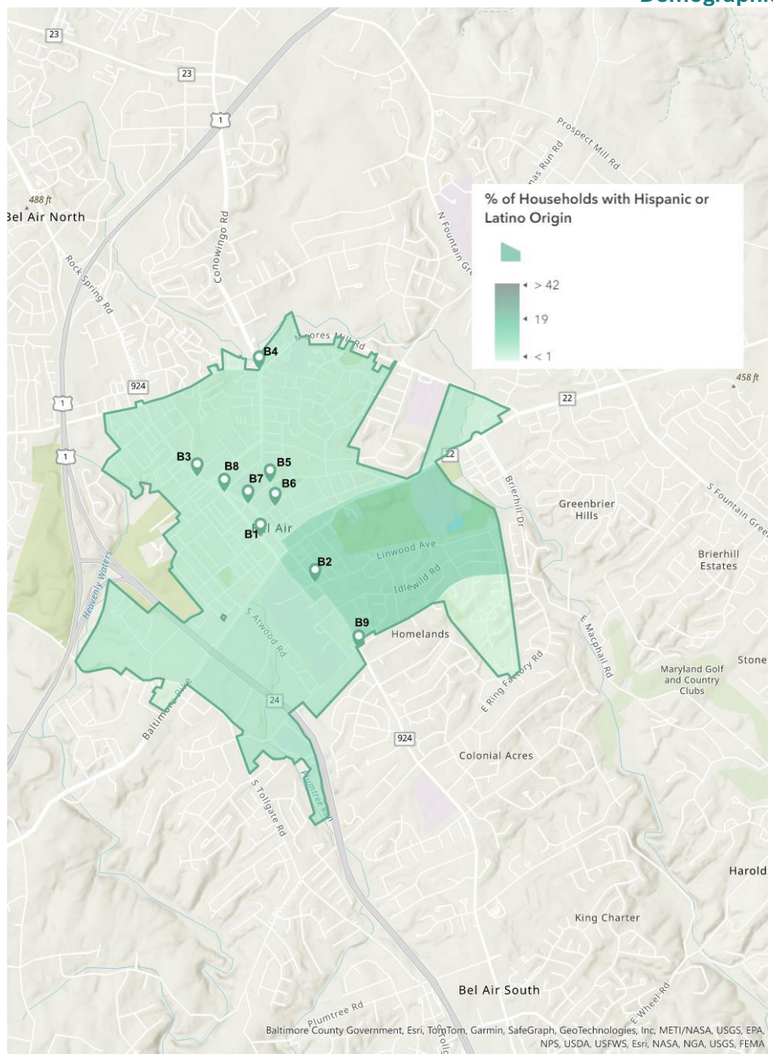
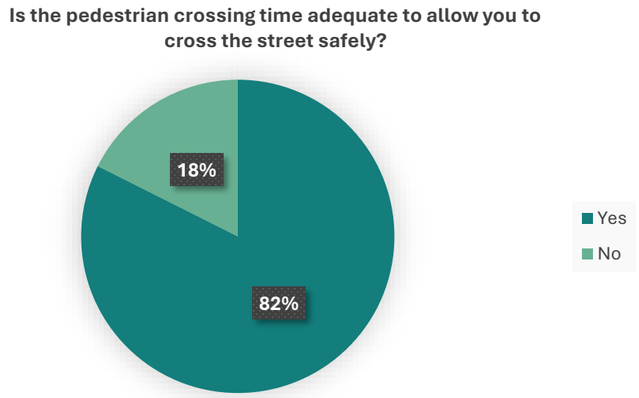


Figure 6-10: % of Households with Hispanic or Latino Origin

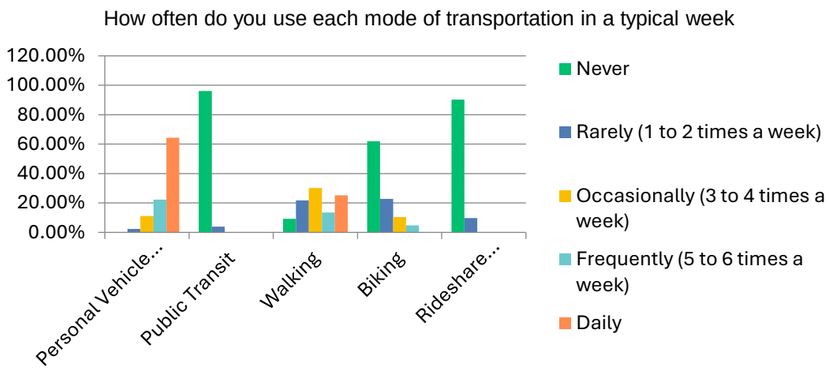
Public Input

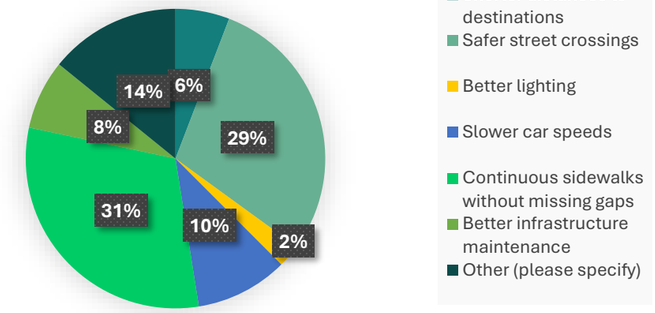
The following information provides a summary of the survey results that are described in Section 3: Public Engagement. All 126 responses were provided by Bel Air residents. For write-in questions, the results have been condensed based on the relevance of this project, but a complete list of the answers provided can be found in the Appendix. For input that was received in the public workshops, this information can be found in the individual analyses of each intersection in the following sections.



Are there any other concerns you have regarding safe travel in the Town of Bel Air?

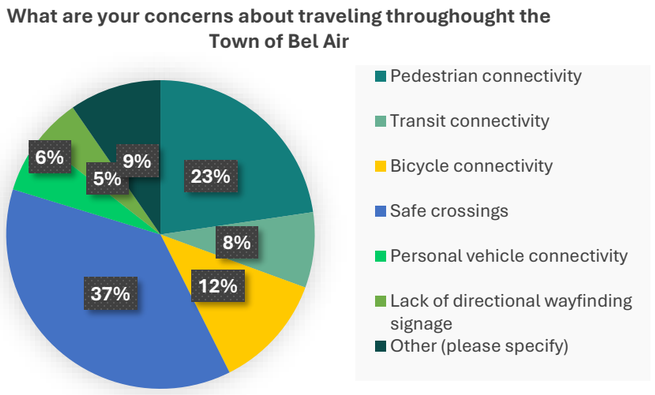
- Lack of Sidewalks, Lighting, and Crosswalks (Particularly Bond & Main St.)
- Concerns about traffic speed near schools and libraries.
- Speeding cars and unsafe conditions for pedestrians.
- Intersection Safety
  - > Visibility of crosswalks concerns
  - > Pedestrian Right of Way enforcement at crosswalks such as Main & Gordon & Hickory and Pennsylvania

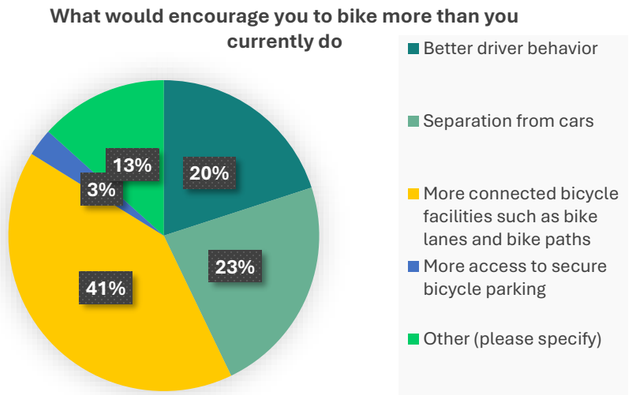




Are there any other improvements or specific safety concerns you would like to see in the Town of Bel Air along certain corridors?

- Improve bike safety with dedicated lanes
- Requests for enhanced crosswalks with flashing lights. Currently have narrow sidewalks and inadequate lighting.
- Add traffic cameras and emergency call boxes
- Hickory is difficult to cross
- Intersection at Rock Springs Rd and Red pump is too busy.
- No way to safely cross at Hickory/Business Rt1 and Moores Mill Rd





Are there any transportation facilities in Bel Air that you wish there were more of or that you really enjoy?

- More bus stops, better bus routes, enhanced connectivity like MARC.
- Safer bike lanes, dedicated pedestrian only streets, more trails.
- Hickory and Churchville Rd should be looked at.
- More Raised Crosswalks.
- Buffered Bike lanes on Main St.
- Ped Crossing enhancements at Main St and Courtland

INTERSECTION ANALYSIS

B1 - Court House Square (Office/Courtland Streets) at South Bond Street (MD 924[1])

Existing Conditions & Site Visit Observations

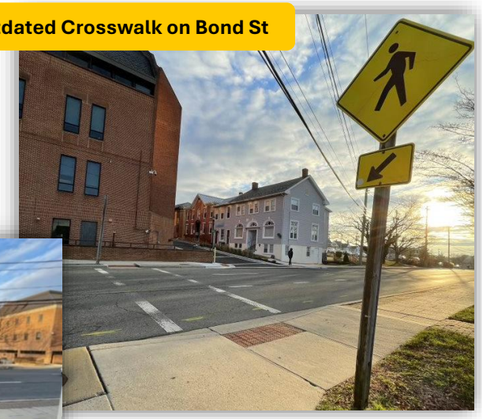
B1 Court House Square is the center of Harford County District Courthouse in the downtown, pedestrian-designated zone. Bond Street (MD 924) is a one-way southbound urban arterial that transitions from a two-lane at Alice Ann Street to a three-lane road. Office and Courtland Streets are local roads that intersect S. Bond Street at the Harford County Circuit Court building. Many pedestrians walk within this Bel Air Courthouse Historic District between the courthouses, attorney and supporting offices, and parking lots. Concrete sidewalks with brick edging, ADA-compliant handicap ramps, streetscaping design elements such as benches, Historic Bel Air wayfinding signs and bike racks have been installed along S. Bond Street.

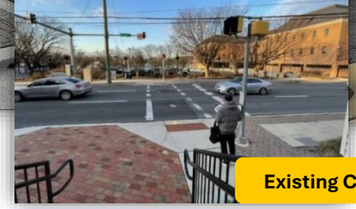
Identified Deficiencies

1. Lack of visibility of the Courtland St pedestrian crossing for left turn vehicles.
2. The unsignalized crosswalk at Courtland St is only 150' downstream of the signalized crosswalk. This can be unexpected for drivers who are unfamiliar with the surroundings.
3. Pavement markings of existing pedestrian crosswalks are outdated. (See Photos below)
4. Existing pushbutton signs are faded and unreadable.

- *(Citizen complaint) Speeding is common at this location and creates unsafe crossings of three travel lanes.*
- *Several jaywalkers were observed during the visit period crossing Bond St near the existing crosswalks. (See Photo below)*
- *Kevin Small commented that the crosswalk location on the south is awkward, and people cross everywhere.*
- *No speed limit signs on S Bond St near the intersection.*


Jaywalker on Bond St


Outdated Crosswalk on Bond St


Existing Crossing at S Bond and Office St

Intersection Qualities

Speed Limit

- Bond St – **25** mph (Posted)
- Office & Courtland St – **25** mph (Posted)
- Bond St ~**30** mph (85th Percentile)

Roadway Classification

- Bond St (MD 924) – **Urban Arterial**
- Office & Courtland St – **Local**

AADT

- Bond St (MD 924) – **10,291**
- Office & Courtland St - **<5000** (Est.)

LOS

- Level **A** for AM Peak
- Level **A** for PM Peak

Public Input

Countermeasures Requested

- Rectangular Rapid Flashing Beacon
- Crosswalk Visibility Enhancements
- Road Diet
- Conventional bike lane
- Countdown Pedestrian Signal
- Raised crosswalks.

Concerns

- Either eliminate or make more visible to drivers on Thomas looking left (and not at pedestrians)
- Remove crosswalk. People turning right on Bond from Thomas don't look.
- Two crosswalks so close together aren't necessary.

[1] MD 924 is assumed to run in a north-south direction, per MDOT SHA.

Crash Analysis

Key Findings of Reported Crashes

- 5 reported crashes in 5 years.
- No recorded fatal crash.
- 1 Pedestrian fatality in 2017 (report unavailable).
- 0 crash involved pedestrian/cyclist.
- **Observed Crash Pattern**: None found.

Interpretation of Data

- Pedestrian safety improvements (pavement marking, signing, signal equipment, ADA-compliant facilities) are needed at/near the intersection.
- Un-signalized crosswalk at Courtland St is unsafe and needs mitigation.
- Installation of bike facilities should be evaluated.

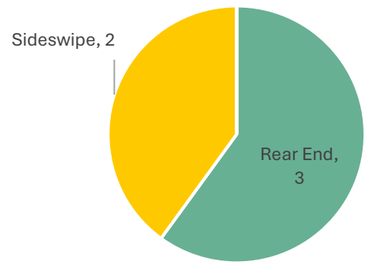


Figure 6-11: B1 Crashes by Type

Recommendations

Table 6-8: B1 Recommendations

		Countermeasure	Cost	Notes
Short Term (0-3 Years)	S1	Install bicycle racks at selected locations in downtown area, including here.	**$1,300**	
	S2	Move two existing signal heads on the mast arm facing Office St to the left, for better alignment.	**$2,600**	
	S3	Not used	**--**	
	S4	Upgrade crosswalks to high visibility (continental style)	**$12,900**	
	S5	Not used	**--**	
	S6	Not used	**--**	
Intermediate Term (4-5 years)	M1	Update traffic signal at Office St, to add full signal control at Courtland St (including ped signals for crosswalks at Courtland St) and incorporate into the same controller.	**$325,000**	This will not need a Signal Warrant Study.
	M2	Build curb extensions near intersections, reduce Bond St down to 2 thru lanes, up to just east of Courtland St.	**$231,600**	
	M3	Build curb extensions further away between W Lee St and W Pennsylvania Ave to leave 2 thru lanes on Bond St. Use the shoulder space for bike facilities.	**TBD**	
Long Term (5+)	L1	Add a bike lane on Bond St corridor, may be a combination of sharrows (on two-lane-only sections) and dedicated bike lane (where space is available)	**TBD**	Cost pending for future bike lane study results.


LEGEND
S# SHORT-TERM IMPROVEMENT
M# INTERMEDIATE-TERM IMPROVEMENT
L# LONG-TERM IMPROVEMENT
OFFICE ST
COURTLAND AVE
S BOND ST
THOMAS ST
UPGRADE CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE) S4
M1 UPDATE TRAFFIC SIGNAL AT OFFICE ST, TO ADD FULL SIGNAL CONTROL AT COURTLAND ST (INCLUDING PED SIGNALS FOR CROSSWALKS AT COURTLAND ST) AND INCORPORATE INTO THE SAME CONTROLLER. THIS WILL NOT NEED A SIGNAL WARRANT STUDY.
L1 ADD A BIKE LANE ON BOND ST CORRIDOR, MAY BE A COMBINATION OF SHARROWS (ON TWO-LANE-ONLY SECTIONS) AND DEDICATED BIKE LANE (WHERE SPACE IS AVAILABLE)
BUILD CURB EXTENSIONS NEAR INTERSECTIONS, REDUCE BOND ST DOWN TO 2 THRU LANES, UP TO JUST EAST OF COURTLAND ST. M2
S1 INSTALL BICYCLE RACKS AT SELECTED LOCATIONS IN DOWNTOWN AREA, INCLUDING HERE.
BUILD CURB EXTENSIONS FURTHER AWAY BETWEEN W LEE ST AND W PENNSYLVANIA AVE TO LEAVE 2 THRU LANES ON BOND ST. USE THE SHOULDER SPACE FOR BIKE FACILITIES. M3
S2 MOVE TWO EXISTING SIGNAL HEADS ON THE MAST ARM FACING OFFICE ST TO THE LEFT, FOR BETTER ALIGNMENT.
UPGRADE CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE) S4
0
40'
80'
B1
COURTHOUSE SQUARE
(OFFICE & COURTLAND ST)
& S BOND ST
TOWN OF BEL AIR
SAFE STREETS AND ROADS FOR ALL

B2 – Kenmore Road at South Main Street (MD 924[2]*)

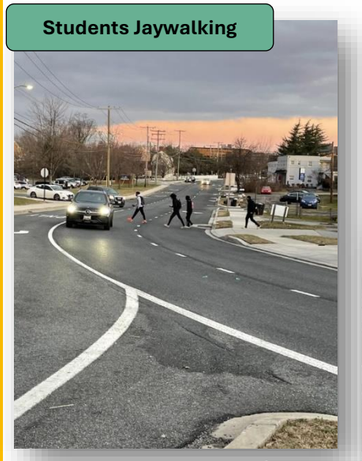
Existing Conditions & Site Visit Observations

The B2 intersection sits at the entrance to the main street for downtown Bel Air and the egress point of Bel Air High School. Heavy pedestrian traffic utilizes this intersection for access to the school yet B2's current orientation proves to be unfriendly for these walkers and cyclists as many were observed jaywalking or cutting through non-pedestrian zones to navigate their way to school. Since Kenmore Ave and the northern portion of S Main St past the intersection are both one-way, B2 also acts as a conversion point for traffic traveling through Bel Air. This intersection has been mentioned in the 2013 Bel Air Bike and Ped plan as requiring upgrades and several public comments (made before the initiation of this Action Plan) have been made regarding difficulties in navigating the intersection properly.

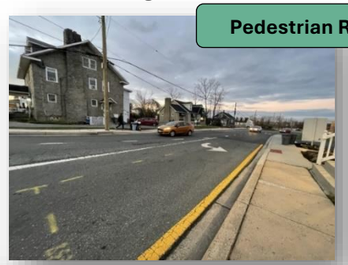
Identified Deficiencies

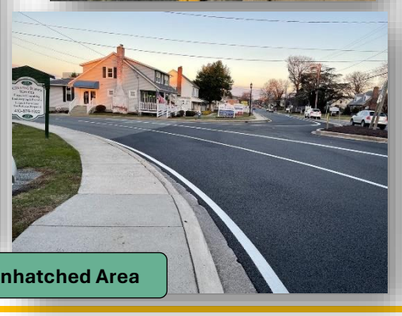
1. Students jaywalking across Kenmore Ave during the AM observation (around 7 AM), who parked at the office parking lot.
2. Lighting seems to be insufficient at the intersection of Main St and Linwood Ave.
3. Existing crosswalk markings north of raised median at Main St and Linwood Ave are outdated.
4. A pair of pedestrian ramps were installed without marked crosswalks.
5. Pedestrian warning signs are missing facing the southbound traffic.
6. Crosswalks at Eastern Ave are missing pavement markings.
7. Pedestrian crossing warning signs are hard to see by southbound turning traffic.
8. Existing parking signs block the Yield sign.
9. The large unhatched pavement can cause motorist confusion and the space can be used at pedestrian crossings or refuge areas – currently there is no crosswalk connecting the west side of the intersection to the rest.
10. With only two lanes coming in, the existing 3-lane section seems unnecessary and can be reduced to two lanes.

Students Jaywalking

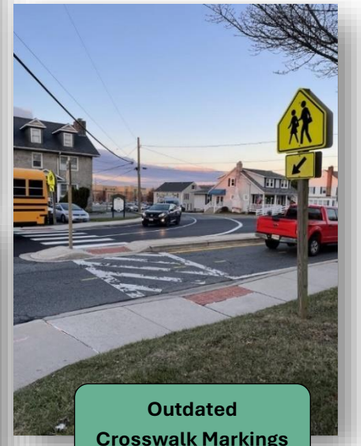


Pedestrian Ramps with No Crosswalk





Large Unhatched Area



Outdated Crosswalk Markings

Intersection Qualities

Speed Limit
- Kenmore Ave – **30** mph (Posted)
- S Main St – **30** mph (Posted)

Roadway Classification
- Kenmore Ave – **Principal Urban Arterial**
- S Main St – **Principal Urban Arterial**

AADT
- Kenmore Ave – **10,291**
- S Main St – **10,700**

LOS
- Level **A** for AM Peak
- Level **A** for PM Peak

Public Input

Countermeasures Requested
- Road diet
- Pedestrian hybrid beacon at existing crosswalk on south leg of Main St
- Roundabout
- RRFB
- Speed Management

Concerns
- The roads are very "highway-like" and difficult for pedestrians and encourage cars to speed.
- The sidewalks on north side of Main St are uncomfortable because there's no buffer.
- Left turn from Linwood onto S Main St is difficult because of right turning traffic from Heighe St that doesn't stop.
- Cars leaving town are picking up speed and do not see crosswalk. Needs a signal (flashing). Affects students parking off site or walking

[2] MD 924 is assumed to run in a north-south direction, per MDOT SHA.

Crash Analysis

Key Findings of Reported Crashes

- 5 reported crashes in 5 years.
- No fatal crashes.
- Less than 5 reported crashes in a 12-month period. Signal warrant 7 not met.
- 0 crashes involving pedestrians or cyclists.
- **Observed crash pattern**: All crashes occurred within the curved section between Heighe St and Main St and involved 3 fixed-objects.

Interpretation of Data

- Pedestrian (mostly high school students) safety improvements (pavement marking, signing) are needed at/near the intersection.
- Confusing traffic movements including pedestrian crossing at the intersection need mitigation.
- Speed management near the school zone is needed.
- Installation of bike facilities should be evaluated.
- The roadway horizontal curve may have caused all crashes and needs mitigation.

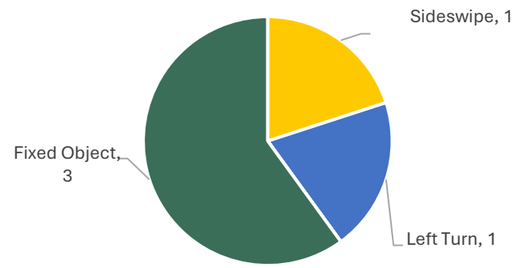


Figure 6-12: B2 Crash by Type

Recommendations

Table 6-9: B2 Recommendations

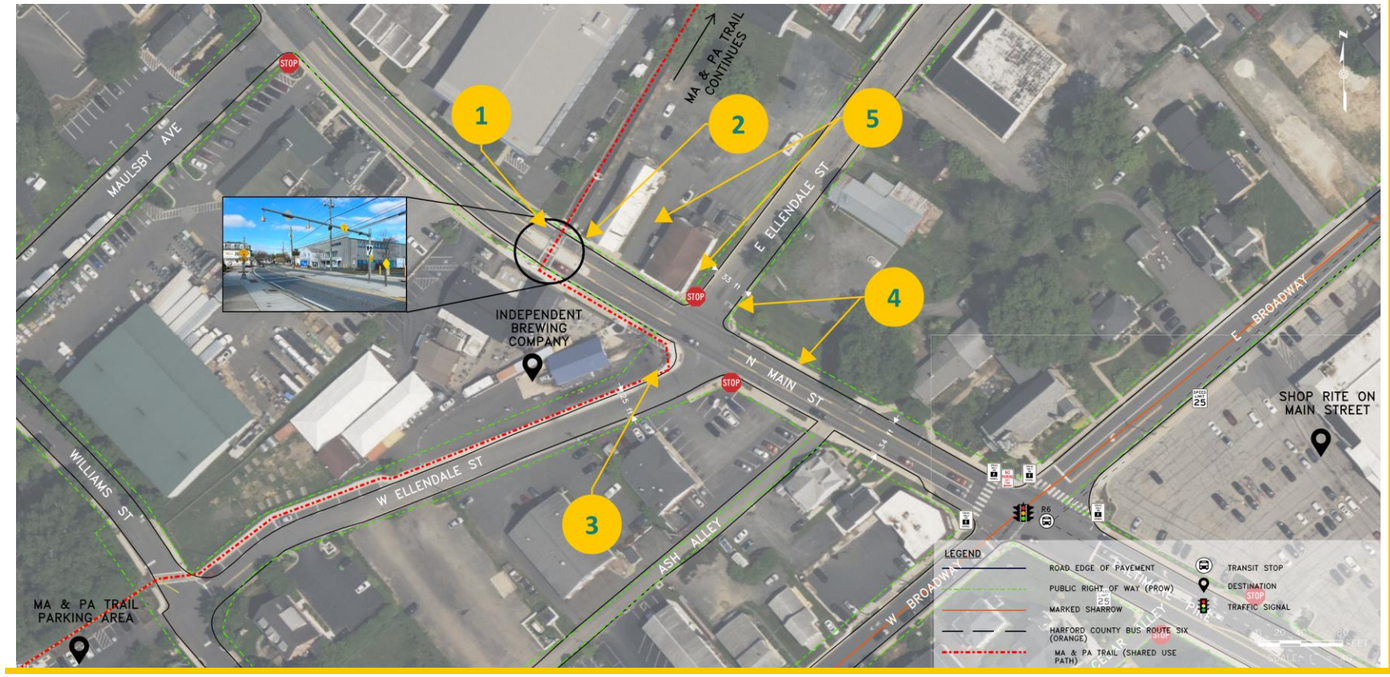
		Countermeasure	Cost	Notes
Short Term (0-3 Years)	S1	Install S5-1 & S4-4(1)"SCHOOL SPEED LIMIT 20 WHEN FLASHING, FINES DOUBLE" sign assembly, with flashing beacons. Install Speed camera with S5-1(1) sign	**$74,700**	
	S2	Upgrade crosswalks to high visibility (continental style)	**$10,600**	
	S3	Move the current sign assembly (School crossing S1-1 and W16-7p) from north curb to the median to enhance visibility for northbound vehicles.	**$800**	
	S4	Remove unused ex. ADA ramps (without crosswalk) at unsafe locations	**$5,000**	MDOT SHA Estimate
	S5	Install S5-2 "END SCHOOL ZONE" sign	**$800**	
	S6	Install 1 object marker sign (OM3-C) on island and 3 chevron signs (W1-8L) along the curve.	**$3,200**	
	S7	Install School crossing (S1-1 and W16-7p) sign assembly.	**$1,600**	
	S8	Install driver speed feedback sign at proper location.	**$7,800**	
Intermediate Term (4-5 years)	M1	Remove one thru lane, use the space to: > extend curbs on both sides to add grass buffers b/t crosswalks and traffic. > if needed, add short term parking spaces b/t bulbouts.	**TBD**	Need a traffic study. Cost pending on the results.
	M2	Convert Linwood Ave to Right-In-Right-Out only. Add curb/landscape. Add S1-1 School crossing sign assembly.	**$350,000**	MDOT SHA Estimate Need a traffic study.
Long Term (5+)	L1	Evaluate the possibility of adding a bike lane on the corridor.	**TBD**	Cost pending for future bike lane study results.
	L2	Evaluate feasibility of a roundabout. Significantly constrained by Right-Of-Way.	**$2,000,000**	MDOT SHA Estimate Need a traffic study.


LEGEND
S# SHORT–TERM IMPROVEMENT
M# INTERMEDIATE–TERM IMPROVEMENT
L# LONG–TERM IMPROVEMENT
M2 CONVERT LINWOOD AVE TO RIGHT–IN–RIGHT–OUT ONLY. ADD CURB/LANDSCAPE. ADD S1–1 SCHOOL CROSSING SIGN ASSEMBLY.
S3 MOVE THE CURRENT SIGN ASSEMBLY (SCHOOL CROSSING S1–1 AND W16–7P) FROM NORTH CURB TO THE MEDIAN TO ENHANCE VISIBILITY FOR NORTHBOUND VEHICLES.
S2 UPGRADE CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE)
EASTERN AVE
LINWOOD AVE
S MAIN ST
HEIGHTE ST
END SCHOOL ZONE
UPGRADE CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE) S2
M1
REMOVE ONE THRU LANE, USE THE SPACE TO:
• EXTEND CURBS ON BOTH SIDES TO ADD GRASS BUFFERS B/T CROSSWALKS AND TRAFFIC.
• IF NEEDED, ADD SHORT TERM PARKING SPACES B/T BULBOUTS.
S4 REMOVE UNUSED EX. ADA RAMPS (WITHOUT CROSSWALK) AT UNSAFE LOCATIONS
INSTALL S5–2 "END SCHOOL ZONE" SIGN S5
L1
EVALUATE POSSIBILITY OF ADDING A BIKE LANE ON THE CORRIDOR.
EVALUATE FEASIBILITY OF A ROUNDABOUT. SIGNIFICANTLY CONSTRAINED BY RIGHT–OF–WAY. SHOWN HERE IS ~120' OUTSIDE DIAMETER FOOTPRINT FOR A SINGLE LANE ROUNDABOUT. L2
INSTALL S5–1 & S4–4(1)"SCHOOL SPEED LIMIT 20 WHEN FLASHING, FINES DOUBLE" SIGN ASSEMBLY, WITH FLASHING BEACONS.
INSTALL SPEED CAMERA WITH S5–1(1) SIGN S1
S6
INSTALL 1 OBJECT MARKER SIGN (OM3–C) ON ISLAND AND 3 CHEVRON SIGNS (W1–8L) ALONG THE CURVE.
INSTALL SCHOOL CROSSING (S1–1 AND W16–7P) SIGN ASSEMBLY. S7
KENMORE AVE
INSTALL DRIVER SPEED FEEDBACK SIGN AT PROPER LOCATION. S8
0 60' 120'
B2
KENMORE AVE & S MAIN ST
TOWN OF BEL AIR
SAFE STREETS AND ROADS FOR ALL

B3 – Ellendale Street (Ma & Pa Trail) at North Main Street (MD 924[3])

Existing Conditions & Site Visit Observations

The current trailhead for the southern section of the Ma & Pa is located at Williams Street near the intersection with Ellendale Street. Ellendale, a commercial collector, has two lanes, one in each direction, and has parking along half of the block on the north side adjacent to the car wash and brewery. West Ellendale Street has a continuation of the trail to N. Main Street via a 510-foot sidewalk. To continue onto the trail, people walk along the North Main Street sidewalk adjacent to the car wash and brewery and use the crosswalk with flashing yellow beacons. West and East Ellendale Streets are offset by approximately 30 feet. Since Ellendale Street has a mix of industrial and commercial uses, many trucks use North Main Street to turn onto Ellendale Street. The car wash driveway exits at the intersection, and the pizza and barber shop parking lot create challenges and conflicts with the trail users. The vacant two-story commercial building on the northeast corner will be demolished in summer 2024.

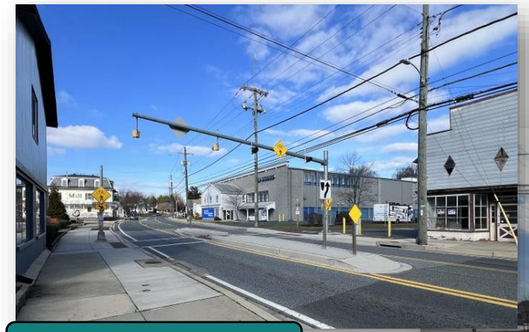


Identified Deficiencies

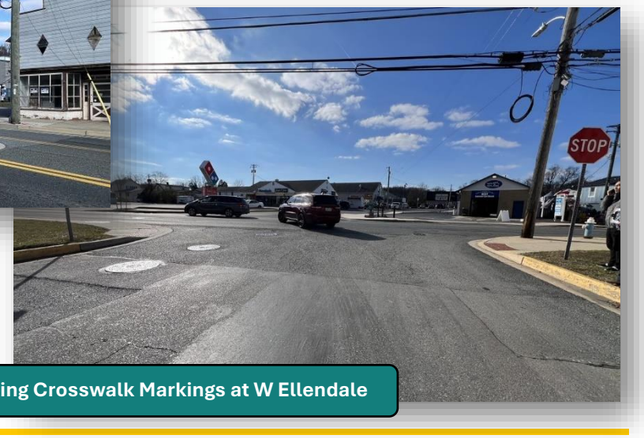
1. Existing crosswalk markings are outdated.
2. Missing any yield-to-pedestrian signs. Sometimes even when the beacons are flashing, vehicles do not stop or slow down for pedestrians.
3. The curb return in the northwest quadrant is too abrupt for bicyclists to turn safely, risking rolling over to the road. A trail wayfinding sign should be added at this location.
4. Stop signs and curb ramps are present on Ellendale St (both approaches) with no accompanied stop bars and marked crosswalks.
5. (According to the Independent Brewing Company staff) 411 and 421 N Main St, property of Independent Brewing Company, will be demolished and converted to a parking lot in the future. Pedestrian volume is expected to increase.

- (Citizen complaint) Current APS message ("Yellow lights are flashing") is confusing to pedestrians. Modify the message to indicate the desired action ("to cross with caution") for pedestrians.

- Kevin Small commented that vehicles do not slow down at the pedestrian crossing and the layout of the intersection feels awkward



Existing Flashing Beacon



Missing Crosswalk Markings at W Ellendale

Intersection Qualities

Speed Limit

- Ellendale St – **25** mph (Posted)
- N Main St – **30** mph (Posted)

Roadway Classification

- Ellendale St – **Commercial Collector**
- N Main St – **Principal Urban Arterial**

AADT

- Ellendale St – **<5000** (Est.)
- N Main St – **15,430**

LOS

- Level **A** for AM Peak
- Level **A** for PM Peak

Public Input

Countermeasures Requested

- RRFB at trail crossing
- Walkways on Ellendale St
- Bike lanes on Ellendale from the trail at Williams and Ellendale
- Lighting on Ma & Pa Trail
- Curb extension at intersection
- Crosswalk visibility enhancements
- Raised crosswalk.

Concerns

- No way to cross at the intersection (Ellendale at Main St)
- The crossing light at trail are too high
- Wayfinding from the trail is needed.
- No sidewalk on the south side of Ellendale St

[3] MD 924 is assumed to run in a north-south direction, per MDOT SHA

Crash Analysis

Key Findings of Reported Crashes

- 9 reported crashes in 5 years.
- Less than 5 reported crashes in 12 months. Signal warrant 7 not met.
- No fatal crashes.
- 1 crash involved cyclist: SBT vehicle hit cyclist crossing the mid-block crossing.
- **Observed crash pattern**: 2 NB rear-ended crashes at the trail crossing.

Interpretation of Data

- Pedestrian safety improvements (pavement marking, signing) are needed at/near the intersection.
- The existing flashing beacons at the pedestrian crossing are ineffective and need improvement.
- Safe pedestrian crossing and ADA-compliant facilities are needed at Ellendale St.
- Installation of bike facilities should be evaluated.
- The flashing yellow beacons and signs do not provide clear direction for drivers and may have caused the crashes at the trail crossing and need mitigation.

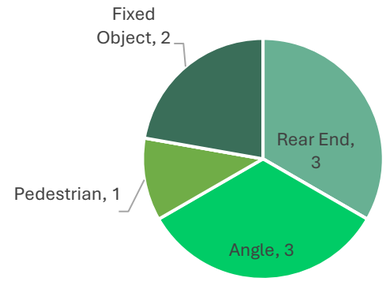


Figure 6-13: B3 Crashes by Type

Recommendations

Table 6-10: B3 Recommendations

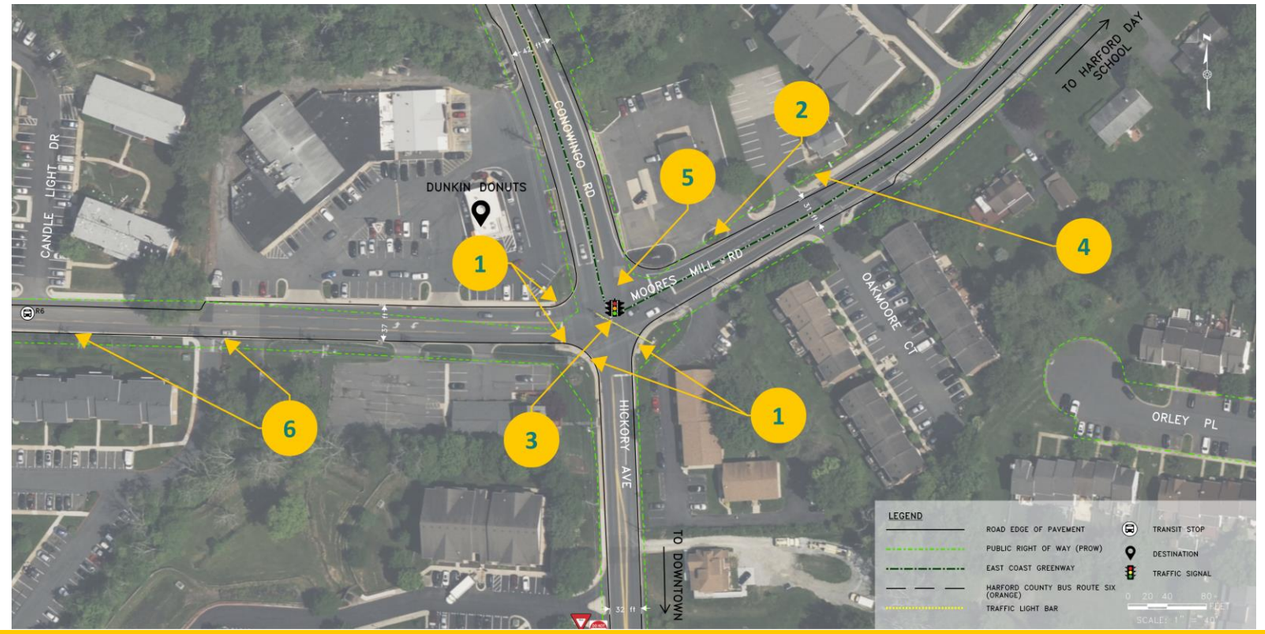
		Countermeasure	Cost	Notes
Short Term (0-3 Years)	S1	Revise the current APS message "Yellow lights are flashing" to be standard MDOT SHA APS messages - when pressed and waiting: "WAIT TO CROSS MAIN STREET, WAIT"; when yellow lights are flashing: rapid ticking.	**$0**	
	S2	Remove existing Crosswalk signs and replace with R1-6a(2) / R1-9a signs. Install Stop lines. Install high visibility (continental style) crosswalks	**$3,200**	
	S3	Modify ex. depressed curb to full-height curb.	**$20,000**	MDOT SHA Estimate
	S4	Install high visibility (continental style) crosswalks	**$4,700**	
	S5	Install new stop lines at the stop signs.	**$1,100**	
	S6	Install pavement marking on asphalt within public ROW and correct the sharp turn of ped/bike trail.	**$400**	
	S7	Remove street parking spaces and use for widening bike/ped trail.	**$6,900**	
	S8	Install additional flashing lights (pole-mounted or in-pavement) to supplement those existing mast-arm mounted beacons.	**$13,000**	
Intermediate Term (4-5 years)	M1	Upgrade ex. Flashing-Yellow beacons to full-color signals ("Maryland Pedestrian Signal")	**$243,800**	
	M2	For the planned building demolition and new parking lot (by the Brewery): > Install new sidewalks along Main St and Ellendale St > Install curb extensions on Ellendale St	**$180,400**	If part of it can be done by the developer, then the cost would reduce.
	M3	Convert Ellendale St to One-Way southbound. Narrow street to one-lane; use space for widening bike/ped trail with buffer (raised concrete or grass landscape)	**TBD**	Need a traffic study. Cost pending on the results.
Long Term (5+)	L1	Evaluate feasibility to incorporate bike lanes, including a potential bike lane on Main St b/t the Ma-Pa Trail to E/W Broadway	**TBD**	Cost pending for future bike lane study results.
	L2	Reconfigure the south side of Ellendale St to align with the north side.	**TBD**	


LEGEND
S# SHORT–TERM IMPROVEMENT
M# INTERMEDIATE–TERM IMPROVEMENT
L# LONG–TERM IMPROVEMENT
S8 INSTALL ADDITIONAL FLASHING LIGHTS (POLE–MOUNTED OR IN–PAVEMENT) TO SUPPLEMENT THOSE EXISTING MAST–ARM MOUNTED BEACONS.
M1 UPGRADE EX. FLASHING–YELLOW BEACONS TO FULL–COLOR SIGNALS ("MARYLAND PEDESTRIAN SIGNAL")
S1 REVISE THE CURRENT APS MESSAGE "YELLOW LIGHTS ARE FLASHING" TO BE STANDARD MDOT SHA APS MESSAGES – WHEN PRESSED AND WAITING: "WAIT TO CROSS MAIN STREET, WAIT"; WHEN YELLOW LIGHTS ARE FLASHING: RAPID TICKING.
MA & PA TRAIL
S2 REMOVE EXISTING XX SIGNS. INSTALL NEW R1–6A(2) / R1–9A SIGNS. INSTALL STOP LINES. INSTALL HIGH VISIBILITY (CONTINENTAL STYLE) CROSSWALKS OR ADA–COMPLIANT SPECIAL DESIGN PAVEMENT SURFACE/MARKING.
M2 FOR THE PLANNED BUILDING DEMOLITION AND NEW PARKING LOT (BY THE BREWERY):
> INSTALL NEW SIDEWALKS ALONG MAIN ST AND ELLENDALE ST. MAIN ST SIDEWALK SHOULD BE 10' WIDE FOR POTENTIAL USE AS MA–PA TRAIL.
> INSTALL CURB EXTENSIONS (USING MOUNTABLE CURBS FOR TURNING WB–50 TRUCKS) ON ELLENDALE ST
S5 INSTALL NEW STOP LINES AT THE STOP SIGNS.
N MAIN ST
L2 RECONFIGURE THE SOUTH SIDE OF ELLENDALE ST TO ALIGN WITH THE NORTH SIDE.
S3 MODIFY EX. DEPRESSED CURB TO FULL–HEIGHT CURB.
S4 INSTALL HIGH VISIBILITY (CONTINENTAL STYLE) CROSSWALKS
L1 EVALUATE FEASIBILITY TO INCORPORATE BIKE LANES, INCLUDING A POTENTIAL BIKE LANE ON MAIN ST B/T THE MA–PA TRAIL TO E/W BROADWAY
W ELLENDALE ST
M3 CONVERT ELLENDALE ST TO ONE–WAY SOUTHBOUND. NARROW STREET TO ONE–LANE; USE SPACE FOR WIDENING BIKE/PED TRAIL WITH BUFFER (RAISED CONCRETE OR GRASS LANDSCAPE)
S6 INSTALL PAVEMENT MARKING ON ASPHALT WITHIN PUBLIC ROW AND CORRECT THE SHARP TURN OF PED/BIKE TRAIL.
S7 REMOVE STREET PARKING SPACES AND USE FOR WIDENING BIKE/PED TRAIL.
0 60' 120'
B3
ELLENDALE ST (MA & PA TRAIL) & N MAIN ST
TOWN OF BEL AIR
SAFE STREETS AND ROADS FOR ALL

B4 – Moore's Mill Road at North Hickory Avenue/Conowingo Rd (US 1 BUS[4])

Existing Conditions & Site Visit Observations

B4 is a signalized intersection characterized by commercial land uses with numerous access driveways, limited street lighting and lack of pedestrian crosswalks and ADA-compliant handicap ramps. Moore's Mill Road, a two-lane road with a center turning lane has sidewalks and ADA improvements in the eastbound direction on both sides of the road up to Heritage Woods Apartments then only along the south side. In the westbound direction of Moore's Mill Road, sidewalks and ADA improvements also exist on the north side. Hickory Avenue, south of Moore's Mill Road is a closed section two-lane road with a sidewalk on the west side. This section is residential with a lower posted speed. Once the road changes names from Hickory Avenue to Conowingo Road, the character of the roadway is an open section with variable-width shoulders and then a closed section just past Irwin Road. The posted speed is higher on Conowingo Road.

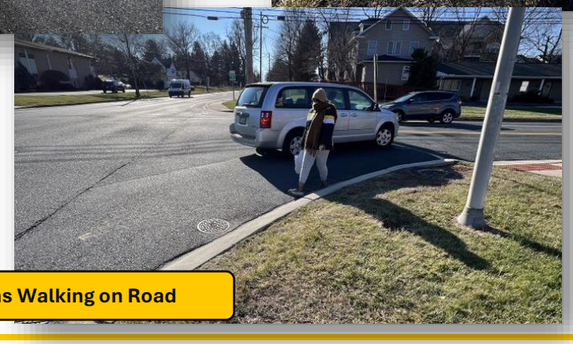


Identified Deficiencies

1. Pedestrian ramps are installed at this intersection without marked crosswalks or pedestrian signals.
2. Disconnected sidewalk along Moore's Mill Rd between Hickory Ave to 120' east of the intersection.
3. Signals are less visible with background glares.
4. An ECG (East Coast Greenway) bike route sign is located ~180' east of the intersection. The arrow sign should be a forward right arrow instead of the right arrow.
5. Missing crosswalks to access NE quadrant.
6. Missing sidewalk on Moore's Mill Rd.


No Crosswalk Markings


Excessive Curb Cuts to Enter Nearby Businesses


Pedestrians Walking on Road

Intersection Qualities

Speed Limit

- Moore's Mill Rd – **30** mph (Posted)
- Hickory Ave – **30** mph (Posted)
- Conowingo Rd – **40** mph (Posted)

Roadway Classification

- Moore's Mill Rd – **Urban Collector**
- Hickory Ave – Principal Urban

AADT

- Moore's Mill Rd – **8,701**
- Hickory Ave – **11,002**

LOS

- Level **A** for AM Peak
- Level **B** for PM Peak

Recent and Planned Projects

MDOT SHA has recently completed enhancements to this intersection on the NW ramp.


Before

After

[4] US 1 BUS is assumed to run in a north-south direction, per MDOT SHA.

Public Input

Countermeasures Requested

- Crosswalk visibility enhancements
- Buffered Bike lanes
- CPS or APS
- Walkways

Concerns

- No sidewalks near Dunkin Plaza
- If a traffic circle is placed here please make sure it accommodates cyclists
- Crosswalks on all sides are needed and timed lights for pedestrians
- Disconnected sidewalks along Conowingo Rd

Crash Analysis

Key Findings of Reported Crashes

- 8 reported crashes in 5 years.
- No fatal crashes.
- 0 crashes involving pedestrians or cyclist.
- **Observed crash pattern**: 7 crashes were rear-ended (3) or left turning (4) at signal.

Interpretation of Data

- Pedestrian safety improvements (pavement marking, signing, signal equipment, lighting) are needed at/near the intersection.
- Accesses to the stores on the northwest and northeast corners are excessive and too close to the intersection and need mitigation.
- Installation of bike facilities should be evaluated.
- The observed crash pattern indicates a need to check yellow/all-red clearances

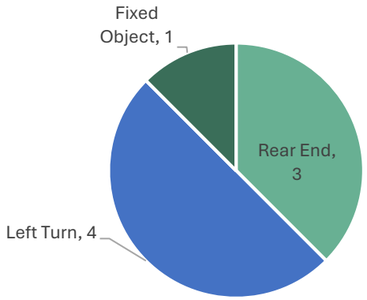


Figure 6-14: B4 Crashes by Type

Recommendations

Table 6-11: B4 Recommendations

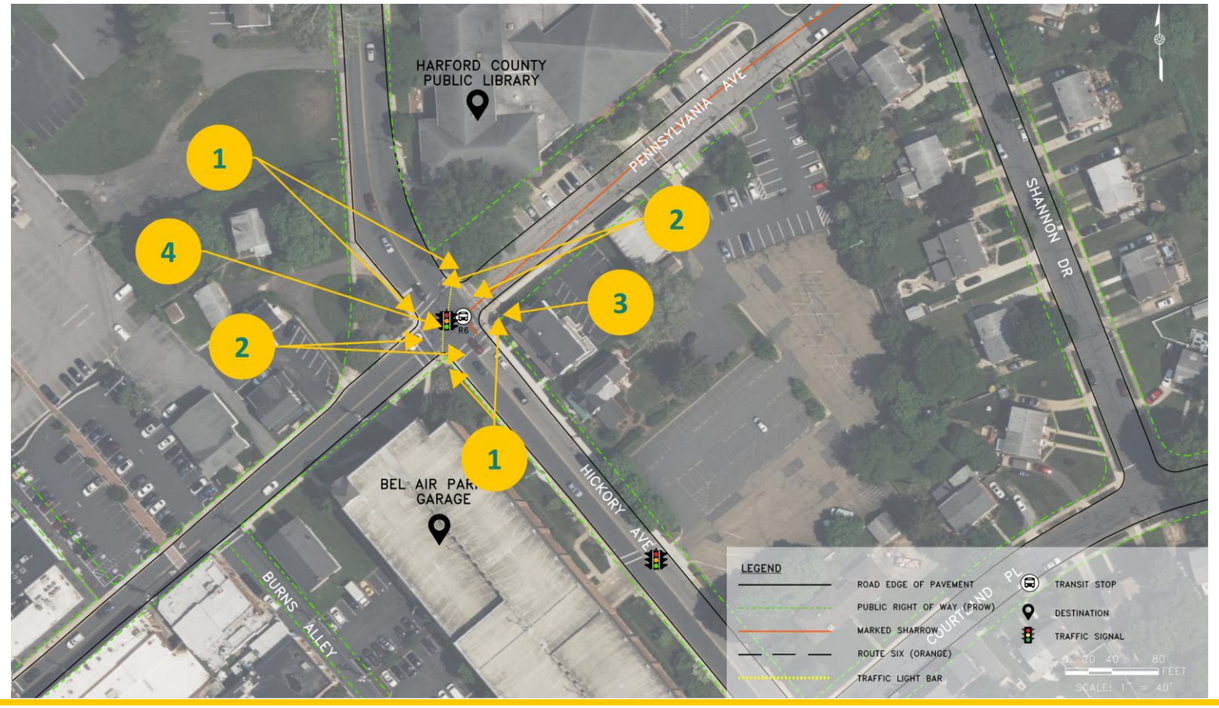
		Countermeasure	Cost	Notes
Short Term (0-3 Years)	S1	Install new sidewalks and ADA ramps to the intersection.	**$44,000**	MDOT SHA Estimate
	S2	Install bike rack(s) within public ROW, for cyclists who use the convenience store. If private owner allows, may consider to install near shops.	**$1,300**	
	S3	Not used	**--**	
	S4	Evaluate and update as needed signal yellow and all-red clearance intervals.	**$0**	
Intermediate Term (4-5 years)	M1	Upgrade traffic signal to add APS/CPS pedestrian signals, and add four crosswalks (and necessary ADA ramps) for all legs.	**$325,000**	
	M2	Install additional intersection lighting for intersection and crosswalks. [citizen observation: children often cross this intersection to reach the 7-11 during the night.]	**$10,400**	
Long Term (5+)	L1	Close these excessive accesses. Remove street parking spaces and use for expanding bike/ped trail.	**$86,300**	
	L2	Evaluate feasibility to incorporate planned bike lanes	**TBD**	Cost pending for future bike lane study results.


LEGEND
S# SHORT-TERM IMPROVEMENT
M# INTERMEDIATE-TERM IMPROVEMENT
L# LONG-TERM IMPROVEMENT
CONOWINGO RD
L1 CLOSE THESE EXCESSIVE ACCESSES. REMOVE STREET PARKING SPACES AND USE FOR EXPANDING BIKE/PED TRAIL.
L2 EVALUATE FEASIBILITY TO INCORPORATE PLANNED BIKE LANES
M1 UPGRADE TRAFFIC SIGNAL TO ADD APS/CPS PEDESTRIAN SIGNALS, AND ADD FOUR CROSSWALKS (AND NECESSARY ADA RAMPS) FOR ALL LEGS.
S1 INSTALL NEW SIDEWALKS AND ADA RAMPS TO THE INTERSECTION.
S4 EVALUATE AND UPDATE AS NEEDED SIGNAL YELLOW AND ALL-RED CLEARANCE INTERVALS.
MOORE'S MILL RD
S2 INSTALL BIKE RACK(S) WITHIN PUBLIC ROW, FOR CYCLISTS WHO USE THE CONVENIENCE STORE. IF PRIVATE OWNER ALLOWS, MAY CONSIDER TO INSTALL NEAR SHOPS.
M2 INSTALL ADDITIONAL INTERSECTION LIGHTING FOR INTERSECTION AND CROSSWALKS. [CITIZEN OBSERVATION: CHILDREN OFTEN CROSS THIS INTERSECTION TO REACH THE 7-11 DURING THE NIGHT.]
N HICKORY AVE
0 40' 80'
B4
MOORE'S MILL RD & HICKORY AVE
TOWN OF BEL AIR
SAFE STREETS AND ROADS FOR ALL

B5 – Pennsylvania Avenue at Hickory Avenue[5]

Existing Conditions & Site Visit Observations

The intersection at Pennsylvania and Hickory Avenue is a four-way signalized intersection that controls vehicular traffic traveling to various destinations in downtown Bel Air. Just adjacent to B5 is a large parking garage and the Harford County Public Library. A new entrance to the library that faces the intersection has been discussed where pedestrian bulb-outs were a possibility in the reconfiguration, but the design is currently on hold. A newly installed sharrow runs on the east side of the intersection along Pennsylvania Avenue while a bus stop at the intersection accommodates Route Six bus riders. Vehicular traffic through the intersection is expected to increase due to a proposed development on the western side of Hickory Avenue.



Identified Deficiencies

1. Existing pedestrian pushbuttons are not APS. Existing pedestrian signals appear to be CPS type but do not count down "flashing don't walk" time.
2. Existing crosswalk markings are outdated.
3. The pushbutton on the southeast corner is damaged.
4. Signals are less visible with background glares.

Intersection Qualities

Speed Limit
- Pennsylvania Ave – **25** mph (Posted)
- Hickory Ave – **30** mph (Posted)
- Hickory Ave ~**27** mph (85th Percentile)

Roadway Classification
- Pennsylvania Ave - **Local**
- Hickory Ave – **Principal Urban Arterial**

AADT
- Pennsylvania Ave – **<5,000 (Est.)**
- Hickory Ave – **11,002**

LOS
- Level **B** for AM Peak
- Level **B** for PM Peak

Public Input

Countermeasures Requested
- Raised crosswalks.
- Conventional bike lanes
- Countdown Pedestrian Signal and Crosswalk Visibility Enhancements

Concerns
- Residents stated that they have not had concerns as pedestrians at this intersection and inquired why another location would not be better to do upgrades at.

[5] Hickory Avenue is assumed to run in a north-south direction.

Crash Analysis

Key Findings of Reported Crashes

- 4 reported crashes in 5 years.
- 1 crash involved a pedestrian.
- 1 crash involved a cyclist.
- No fatal crashes.
- **Observed crash pattern**: None found.

Interpretation of Data

- Pedestrian safety improvements (pavement marking, signing, signal equipment) are needed at/near the intersection.
- The exiting traffic from the parking garage needs management.
- Installation of bike facilities should be evaluated.

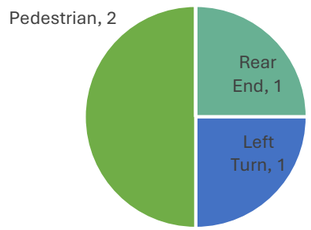
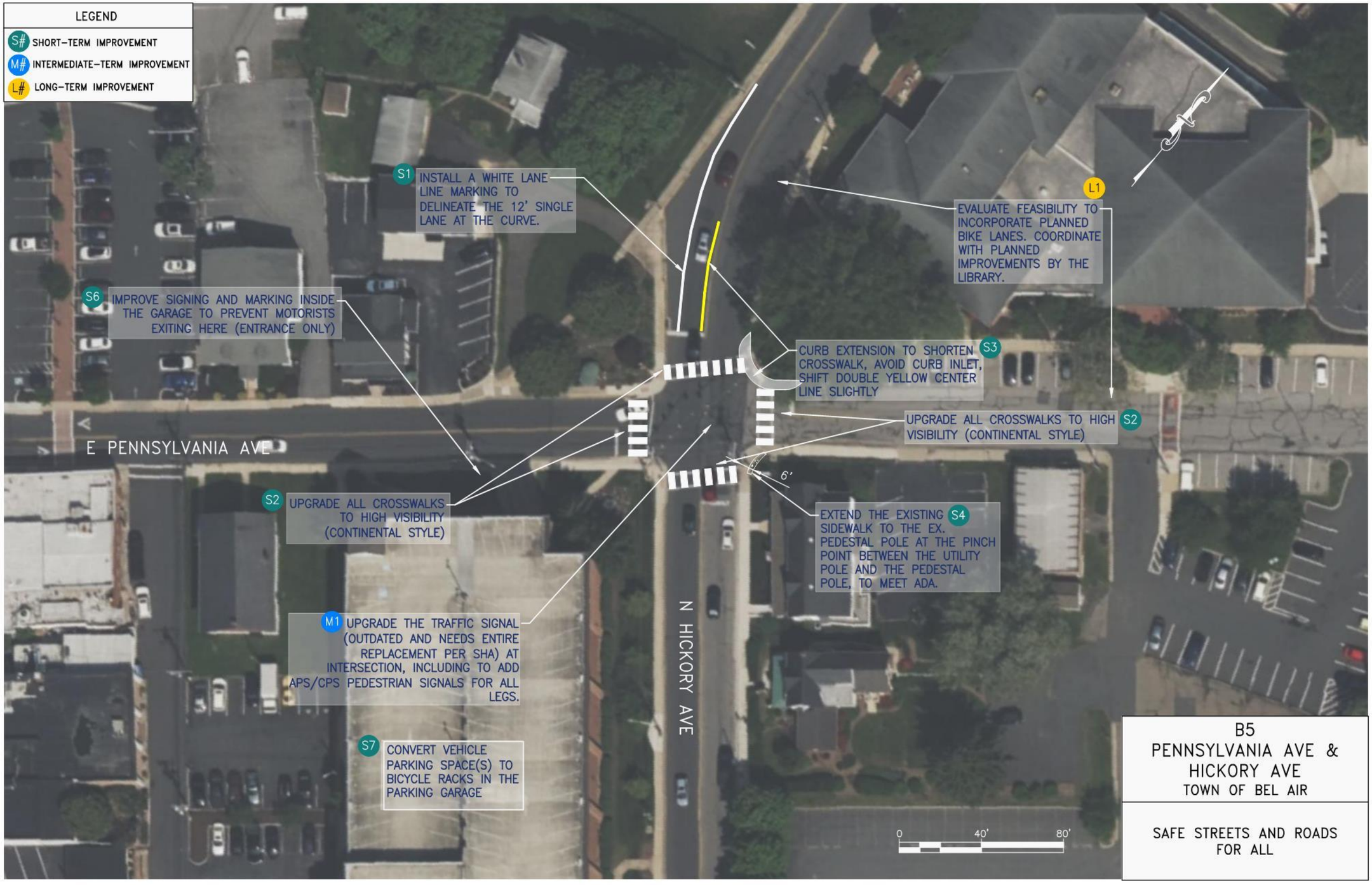


Figure 6-15: B5 Crashes by Type

Recommendations

Table 6-12: B5 Recommendations

		Countermeasure	Cost	Notes
Short Term (0-3 Years)	S1	Install a white lane line marking to delineate the 12' single lane at the curve.	**$900**	
	S2	Upgrade all crosswalks to high visibility (continental style)	**$10,600**	
	S3	Curb extension to shorten crosswalk, avoid curb inlet, shift double yellow center line slightly	**$8,900**	
	S4	Extend the existing sidewalk to the ex. pedestal pole at the pinch point between the utility pole and the pedestal pole, to meet ADA.	**$1,300**	
	S5	Not used	**--**	
	S6	Improve signing and marking inside the garage to prevent motorists exiting here (entrance only)	**$2,500**	
	S7	Convert vehicle parking space(s) to bicycle racks in the parking garage	**$2,600**	
Intermediate Term (4-5 years)	M1	Upgrade the traffic signal (outdated and needs entire replacement per SHA) at intersection, including to add APS/CPS pedestrian signals for all legs.	**$325,000**	
Long Term (5+)	L1	Evaluate feasibility to incorporate planned bike lanes. Coordinate with planned improvements by the library.	**TBD**	Cost pending for future bike lane study results.


LEGEND
S# SHORT-TERM IMPROVEMENT
M# INTERMEDIATE-TERM IMPROVEMENT
L# LONG-TERM IMPROVEMENT
S1 INSTALL A WHITE LANE LINE MARKING TO DELINEATE THE 12' SINGLE LANE AT THE CURVE.
L1 EVALUATE FEASIBILITY TO INCORPORATE PLANNED BIKE LANES. COORDINATE WITH PLANNED IMPROVEMENTS BY THE LIBRARY.
S6 IMPROVE SIGNING AND MARKING INSIDE THE GARAGE TO PREVENT MOTORISTS EXITING HERE (ENTRANCE ONLY)
S3 CURB EXTENSION TO SHORTEN CROSSWALK, AVOID CURB INLET, SHIFT DOUBLE YELLOW CENTER LINE SLIGHTLY
S2 UPGRADE ALL CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE)
E PENNSYLVANIA AVE
6'
S2 UPGRADE ALL CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE)
S4 EXTEND THE EXISTING SIDEWALK TO THE EX. PEDESTAL POLE AT THE PINCH POINT BETWEEN THE UTILITY POLE AND THE PEDESTAL POLE, TO MEET ADA.
M1 UPGRADE THE TRAFFIC SIGNAL (OUTDATED AND NEEDS ENTIRE REPLACEMENT PER SHA) AT INTERSECTION, INCLUDING TO ADD APS/CPS PEDESTRIAN SIGNALS FOR ALL LEGS.
N HICKORY AVE
S7 CONVERT VEHICLE PARKING SPACE(S) TO BICYCLE RACKS IN THE PARKING GARAGE
0 40' 80'
B5
PENNSYLVANIA AVE & HICKORY AVE
TOWN OF BEL AIR
SAFE STREETS AND ROADS FOR ALL

B6 – Lee Street at Hickory Avenue[6]

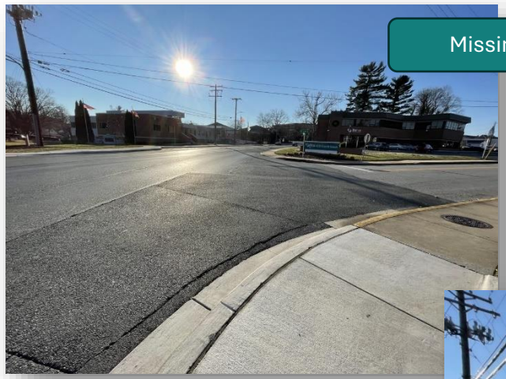
Existing Conditions & Site Visit Observations

This is an unsignalized, four-way intersection with stop signs on Lee St while the through movements on Hickory do not stop. Nearby destinations include the Bel Air Police Station, St. Margaret Church which hosts a day school, and Bel Air Elementary School which sees heavy pedestrian traffic during arrival and dismissal times. The intersection was upgraded with pedestrian bulb-outs on the eastern side less than 5 years ago. Bel Air Planning previously researched the installation of a traffic island on the north side but has tabled the design due to the queuing on Hickory Avenue by attendees of the Catholic school. B6 was identified in the 2016 Bel Air Comprehensive Plan for a desired connection to the Ma & Pa Trail along Hickory Avenue. Also mentioned in the plan was a potential large annexation nearby that will likely increase vehicular traffic.

Identified Deficiencies

1. Existing crosswalk markings are outdated.
2. There is a non-ADA-compliant pedestrian ramp on the SW corner with no receiving ramp.
3. ~21' wide space for one lane of traffic without lane marking.

- *Kevin Small mentioned poor sight lines from the EB approach.*



Missing ADA Ramps

Outdated Crosswalks

Intersection Qualities

Speed Limit

- Lee St – **25** mph (Posted)
- Hickory Ave – **25** mph (Posted)
- Hickory Ave ~**35** mph (85th Percentile)

Roadway Classification

- Lee St – **Commercial Collector**
- Hickory Ave – **Principal Urban Arterial**

AADT

- Lee St – **<5,000** (Est.)
- Hickory Ave – **11,002**

LOS

- Level **A** for AM Peak
- Level **A** for PM Peak

Public Input

Countermeasures Requested

- Accessible Pedestrian Signal
- Countdown Pedestrian Signal
- Crosswalk Visibility Enhancements
- Buffered bike lanes

Concerns

- Incomplete walkways
- The SW to NW crossing distance feels long.
- No crosswalks or curb ramps to cross LEE St and Hickory Ave on southern and western quadrants
- Speeding along Hickory Ave

[6] Hickory Avenue is assumed to run in a north-south direction.

Crash Analysis

Key Findings of Reported Crashes

- 7 reported crashes in 5 years.
- Less than 5 reported crashes in 12 months → Signal warrant 7 not met.
- 0 crashes involving pedestrians or cyclists.
- No fatal crashes.
- No reported crashes in 2021 & 2022 – likely due to bulb-out improvements.
- Observed crash pattern: High number of right-angle crashes.

Interpretation of Data

- Pedestrian safety improvements (pavement marking, signing, signal equipment) are needed at/near the intersection.
- The wide pavement on Hickory Ave needs better lane marking delineation.
- Installation of bike facilities should be evaluated.
- No crashes were reported in 2021 and 2022, maybe due to the bulb-out improvements.

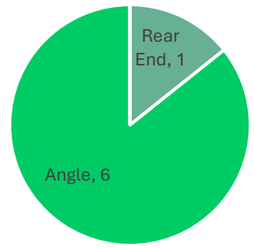


Figure 6-16: B6 Crashes by Type

Recommendations

Table 6-13: B6 Recommendations

		Countermeasure	Cost	Notes
Short Term (0-3 Years)	S1	Install pavement marking to delineate only one 12' wide thru lane, up to ex. No Parking sign.	**$2,400**	This shoulder space is used by school drop-off/pick-up traffic, difficult to add curb extension which could cause traffic queuing
	S2	Remove ex. school crossing sign assembly (yellow); install new school crossing sign assembly (fluorescent yellow-green) in the grass area to eliminate the sidewalk pinch point	**$800**	
	S3	Upgrade all crosswalks to high visibility (continental style)	**$11,700**	
	S4	Change ex. "T" parking space markings to continuous white line marking, to better delineate travel lane.	**$3,900**	
	S5	Use pavement marking for curb extension.	**$800**	
	S6	Coordinate with the Harford County Credit Union to relocate the sign which blocks motorist's sight line from E Lee St.	**$0**	Assuming the property owner will relocate the sign
Intermediate Term (4-5 years)	M1	Install curb extension. Install two new high visibility (continental style) crosswalks with school crossing sign assemblies (S1-1 and W16-7p) and ADA ramps. Will impact the existing curb inlet.	**$23,400**	
Long Term (5+)	L1	Evaluate feasibility of adding bike lane along the corridor.	**TBD**	Cost pending for future bike lane study results.


LEGEND
S# SHORT–TERM IMPROVEMENT
M# INTERMEDIATE–TERM IMPROVEMENT
L# LONG–TERM IMPROVEMENT
S1 INSTALL PAVEMENT MARKING TO DELINEATE ONLY ONE 12' WIDE THRU LANE, UP TO EX. NO PARKING SIGN.
S2 REMOVE EX. SCHOOL CROSSING SIGN ASSEMBLY (YELLOW); INSTALL NEW SCHOOL CROSSING SIGN ASSEMBLY (FLUORESCENT YELLOW–GREEN) IN THE GRASS AREA TO ELIMINATE THE SIDEWALK PINCH POINT
S3 UPGRADE ALL CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE)
EVALUATE FEASIBILITY OF ADDING BIKE LANE ALONG THE CORRIDOR. L1
E LEE ST
S6 COORDINATE WITH THE HAR–CO CREDIT UNION TO RELOCATE THE SIGN WHICH BLOCKS MOTORIST'S SIGHT LINE FROM E LEE ST.
M1 INSTALL CURB EXTENSION. INSTALL TWO NEW HIGH VISIBILITY (CONTINENTAL STYLE) CROSSWALKS WITH SCHOOL CROSSING SIGN ASSEMBLIES (S1–1 AND W16–7P) AND ADA RAMPS. WILL IMPACT THE EXISTING CURB INLET.
8.00'
20.00' TYPICAL FOR END SPACE
22.00' TO 26.00'
LEE WAY
N HICKORY AVE
CHANGE EX. "T" PARKING SPACE MARKINGS TO CONTINOUS WHITE LINE MARKING, TO BETTER DELINEATE TRAVEL LANE. S4
S5 USE PAVEMENT MARKING FOR CURB EXTENSION.
0 40' 80'
B6
LEE ST & HICKORY AVE
TOWN OF BEL AIR
SAFE STREETS AND ROADS FOR ALL

B7 – Lee Street at North Main Street (MD 924[7])

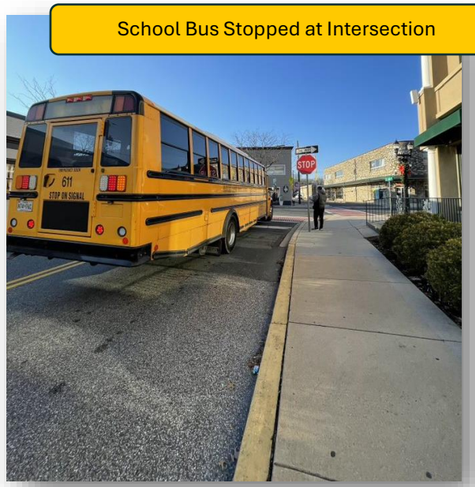
Existing Conditions & Site Visit Observations

Lee St. at N. Main Street is within Bel Air's downtown business district. N. Main Street (MD 924) is a one-way street (northbound) with two travel lanes and on-street parking. The uncontrolled marked crossing at Lee Street is located on the north leg between East and West Lee Streets. Bel Air Elementary School entrance is approximately 200' northeast of the intersection on East Lee Street. Parents and elementary school-age children were observed crossing N. Main Street during school arrival and afternoon dismissal. Children were also riding bikes on the sidewalk since there were no bike lanes. Intersection offset and sight distance concerns with parked cars south of the intersection along N. Main Street are of particular concern for right-turning vehicles not stopping for pedestrians.

Identified Deficiencies

1. NB vehicles tend to speed and not properly yield to pedestrians. The downhill profile may contribute to this.
2. Northbound left-turning vehicles may have difficulties to see pedestrians crossing W Lee St due to existing tree and signposts.
3. The pedestrian crossing sign on the southwest quadrant is blocked by vegetations and other signs.
4. The "45 The Streett Building" sign on the southeast quadrant and the first two parked vehicles block the WB vehicles sight of view when looking left, forcing them to encroach the crosswalk when checking traffic on Main Street.
5. During the AM peak, an extended queue was observed on WB E Lee St, blocking the exit of Bel Air Elementary School
6. Stop bar marking at E Lee Street incorrectly crosses both directions.
7. This zigzag WB thru movement of Lee St is difficult when a ped is crossing W Lee St - the vehicles either won't yield to ped but blocking Main St traffic.

Parent with Child Crossing



School Bus Stopped at Intersection

Intersection Qualities

Speed Limit
- Lee Street – **25** mph (Posted)
- N Main St – **30** mph (Posted)
- N Main St ~**30** mph (85th Percentile)

Roadway Classification
- Lee Street – **Commercial Collector**
- N Main St – **Principal Urban Arterial**

AADT
- Lee Street – **<5,000** (Est.)
- N Main St – **10,700**

LOS
- Level **A** for AM Peak

Level **A** for PM Peak

Public Input

Countermeasures Requested
- Rectangular Rapid Flashing Beacon
- Pedestrian Hybrid Beacon

Concerns
- Cars seem to gain speed when they come down N Main St.
- Move the crosswalk to cross Main St as its confusing for both pedestrians and drivers.
- There should be a signal for pedestrians

[7] MD 924 is assumed to run in a north-south direction, per MDOT SHA.

Crash Analysis

Key Findings of Reported Crashes

- 1 reported crash in 5 years.
- No fatal crashes.
- 0 crashes involved pedestrians or cyclists.
- **Observed crash pattern**: None found.

Interpretation of Data

- Pedestrian (especially for elementary school children and parents) safety improvements (pavement marking, signing) are needed at/near the intersection.
- Sightline blockage of traffic signs needs mitigation.
- Installation of bike facilities should be evaluated.
- Although only one 1 crash was reported in 5 years, safety concerns were identified and should be addressed.

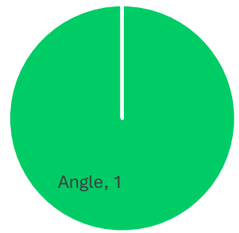
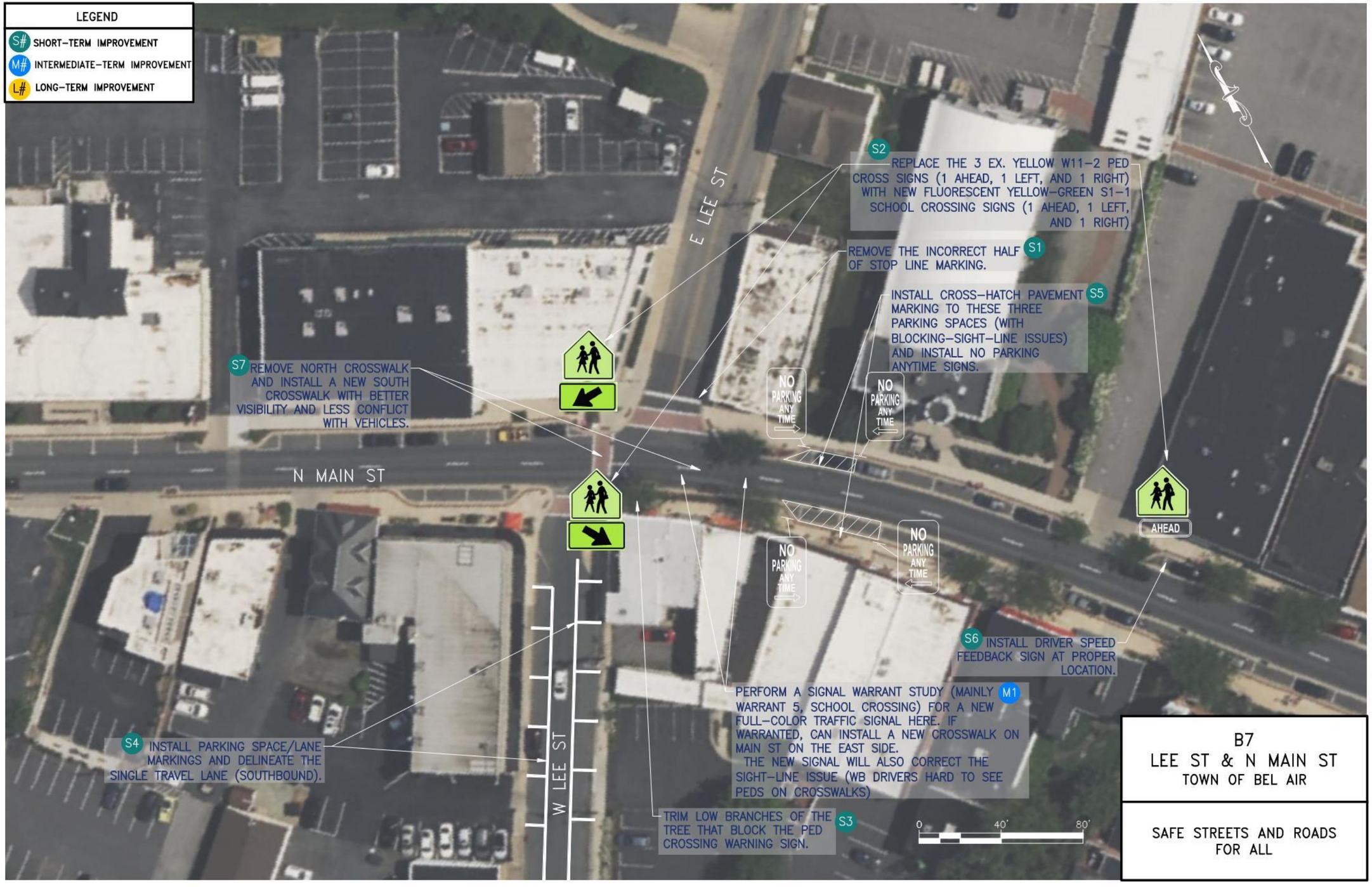


Figure 6-17: B7 Crashes by Type

Recommendations

Table 6-14: B7 Recommendations

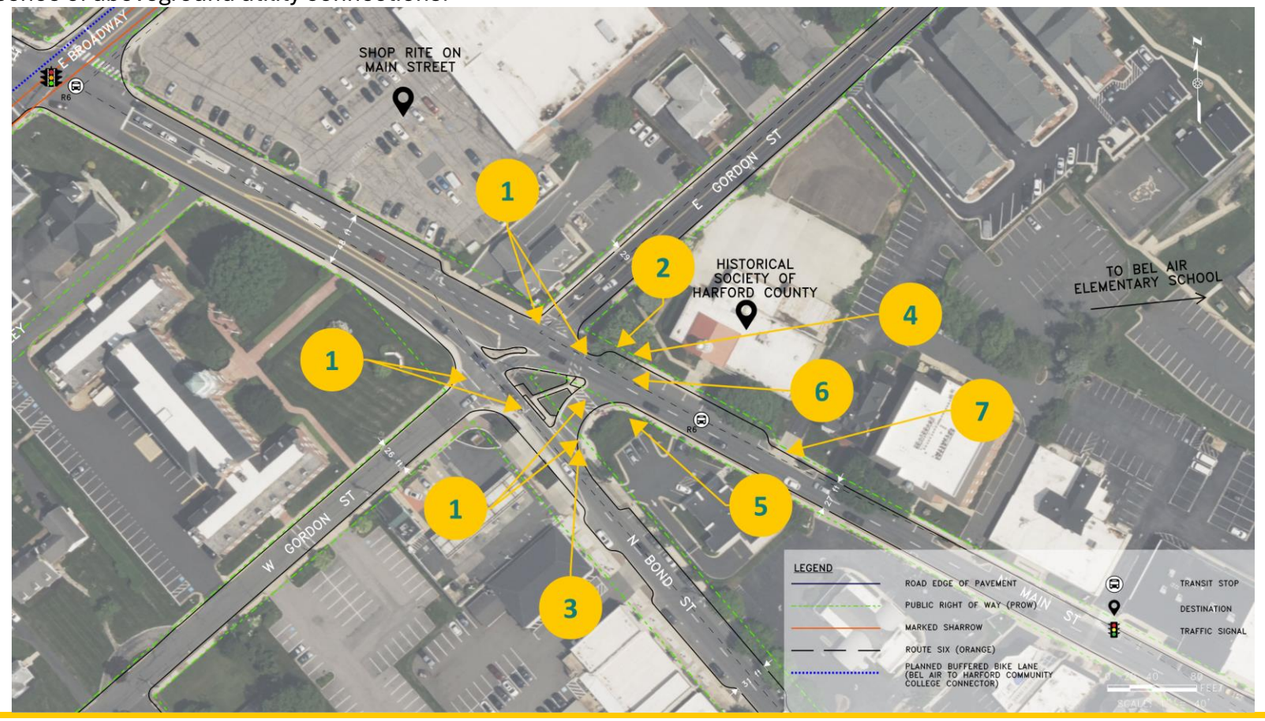
		Countermeasure	Cost	Notes
Short Term (0-3 Years)	S1	Remove the incorrect half of stop line marking.	**$350**	MDOT SHA Estimate
	S2	Replace the 3-ex. yellow W11-2 ped cross signs (1 Ahead, 1 Left, and 1 Right) with new fluorescent yellow green S1-1 School crossing signs (1 Ahead, 1 Left, and 1 Right)	**$2,400**	
	S3	Trim low branches of the tree that block the ped crossing warning sign.	**$700**	
	S4	Install parking space/lane markings and delineate the single travel lane (southbound).	**$3,900**	
	S5	Install crosshatch pavement marking to these three parking spaces (with blocking-sight-line issues) and install No Parking Anytime signs.	**$3,100**	
	S6	Install driver speed feedback sign at proper location.		
	S7	Remove north crosswalk and install a new south crosswalk with better visibility and less conflict with vehicles.		
Intermediate Term (4-5 years)	M1	Perform a Signal Warrant Study (mainly Warrant 5, School Crossing) for a new full-color traffic signal here. If warranted, can install a new crosswalk on Main St on the east side.	**$325,000**	Need a full signal warrant study


LEGEND
S# SHORT-TERM IMPROVEMENT
M# INTERMEDIATE-TERM IMPROVEMENT
L# LONG-TERM IMPROVEMENT
E LEE ST
N MAIN ST
W LEE ST
S2 REPLACE THE 3 EX. YELLOW W11-2 PED CROSS SIGNS (1 AHEAD, 1 LEFT, AND 1 RIGHT) WITH NEW FLUORESCENT YELLOW-GREEN S1-1 SCHOOL CROSSING SIGNS (1 AHEAD, 1 LEFT, AND 1 RIGHT)
S1 REMOVE THE INCORRECT HALF OF STOP LINE MARKING.
S5 INSTALL CROSS-HATCH PAVEMENT MARKING TO THESE THREE PARKING SPACES (WITH BLOCKING-SIGHT-LINE ISSUES) AND INSTALL NO PARKING ANYTIME SIGNS.
S7 REMOVE NORTH CROSSWALK AND INSTALL A NEW SOUTH CROSSWALK WITH BETTER VISIBILITY AND LESS CONFLICT WITH VEHICLES.
NO PARKING ANY TIME
AHEAD
S6 INSTALL DRIVER SPEED FEEDBACK SIGN AT PROPER LOCATION.
S4 INSTALL PARKING SPACE/LANE MARKINGS AND DELINEATE THE SINGLE TRAVEL LANE (SOUTHBOUND).
PERFORM A SIGNAL WARRANT STUDY (MAINLY WARRANT 5, SCHOOL CROSSING) FOR A NEW FULL-COLOR TRAFFIC SIGNAL HERE. IF WARRANTED, CAN INSTALL A NEW CROSSWALK ON MAIN ST ON THE EAST SIDE.
THE NEW SIGNAL WILL ALSO CORRECT THE SIGHT-LINE ISSUE (WB DRIVERS HARD TO SEE PEDS ON CROSSWALKS)
M1
TRIM LOW BRANCHES OF THE TREE THAT BLOCK THE PED CROSSING WARNING SIGN.
S3
0 40' 80'
B7
LEE ST & N MAIN ST
TOWN OF BEL AIR
SAFE STREETS AND ROADS FOR ALL

B8 – Gordon Street at North Main & North Bond Streets (MD 924[8])

Existing Conditions & Site Visit Observations

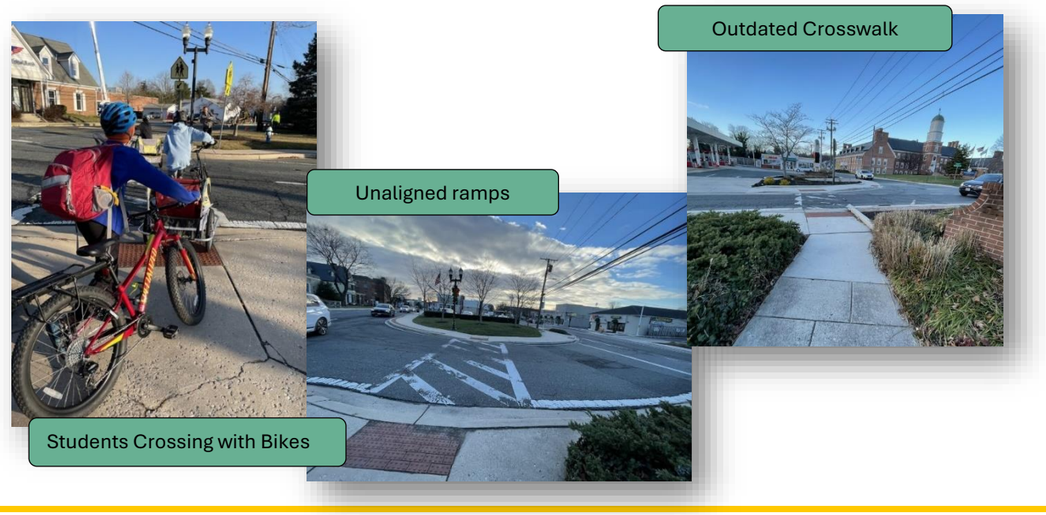
The intersection at Gordon St and N Main / N Bond Street is a diverging point for drivers traveling south into the downtown area of Bel Air and a converging point for those coming out of downtown traveling to the north. Gordon St provides pedestrian access to Bel Air Elementary School and children and parents often use this intersection on the way to school. Nearby there is a marked sharrow to the west on Broadway as well as several bus stops. One of the town's main grocery stores sits just to the north of the intersection. Any reconfigurations of the irregular geometric condition of B8 may be complicated due to the presence of aboveground utility connections.



Identified Deficiencies

1. Pedestrian crossing markings are outdated.
2. The pedestrian ramp on the southeast corner is not aligned with the crosswalks.
3. Pedestrian ramps of the SW crosswalk are not aligned and may be unsafe for pedestrians with visual impairment.
4. Parked vehicles (especially trucks) in front of the building on N Main St block sight line of WB left-turning vehicles.
5. The U-turn Lane seems wider than necessary.
6. The east corner of the channelizing island is damaged and is missing an object marker.
7. Vehicles do not stop or slow down for pedestrians.

- Awkward intersection – many motorists end up going into the wrong turning lane. (Kevin Small)
- Existing pedestrian crossing markings are not visible enough. (Citizen complaint)



Intersection Qualities

Speed Limit
- Gordon St – **25** mph (Posted)
- N Main & N Bond St – **30** mph (Posted)

Roadway Classification
- Gordon St – **Commercial Collector**
- N Main & N Bond St – **Principal Urban Arterial**

AADT
- Gordon St – **<5,000** (Est.)
- N Main – **15,430**
- N Bond St – **10,291**

LOS
- Level **B** for AM Peak

Level **A** for PM Peak

Public Input

Countermeasures Requested
- RRFB
- Bike lanes
- In-text paint on E Gordon St leading up to the intersection
- Speed reduction measures

Existing & Proposed Planning Effort

Complete Streets Leadership Academy Field Walk & Workshop were held on June 20 & 21, 2024 to evaluate this intersection for a quick build.

Concerns
- Congestion – can a roundabout be added here?
- Hispanic or Latino population coming from the NE part of the city will ride their bikes or walk through this intersection presumably to get down to the shopping centers and its currently unsafe for them to do so through the intersection.
- Unsafe for pedestrians to cross at this location.

Crash Analysis

Key Findings of Reported Crashes

- 8 reported crashes in 5 years.
- Less than 5 reported crashes in 12 months → Signal warrant 7 not met.
- 1 crash involved "other pedal cycle" and a NB thru vehicle.
- No fatal crashes.
- **Observed crash pattern:** NB thru vehicle involved in all types of crashes → speed reduction; sight line. 2 fixed-object on traffic island (DUI).

Interpretation of Data

- Pedestrian safety improvements (pavement marking, signing) are needed at/near the intersection.
- The confusing vehicular traffic involving five legs needs mitigation.
- Installation of bike facilities should be evaluated.
- The complex multi-leg intersection geometry may have contributed to all reported crashes and needs mitigation.

Figure 6-18: B8 Crashes by Type

Recommendations

Table 6-15 : B8 Recommendations

		Countermeasure	Cost	Notes
Short Term (0-3 Years)	S1	Install another new ADA ramp and align the crosswalk perpendicular to Main St.	**$7,000**	MDOT SHA Estimate
	S2	Install curb extension (or flex posts), marking, and signs, make left lane to be left-turn-only. On the west leg, hatch center space, move EB left turn stop bar closer.	**$41,000**	
	S3	Upgrade crosswalks to high visibility (continental style)	**$12,900**	
Intermediate Term (4-5 years)	M1	Evaluate to remove the left turns in both directions and make necessary modifications to curb/gutter, signing, marking, and landscape. Will require traffic study and public outreach	**TBD**	Cost pending for traffic study results.
Long Term (5+)	L1	Evaluate feasibility of adding bike lane along the corridor.	**TBD**	Cost pending for future bike lane study results.
	L2	Evaluate feasibility of a roundabout. Significantly constrained by Right-Of-Way, above- and under-ground utilities, and existing buildings. Shown here is ~120' outside diameter footprint for a single lane full-size roundabout. W. Gordon St will need to be reconfigured.	**$2,400,000**	MDOT SHA Estimate Need a traffic study.

[8] MD 924 is assumed to run in a north-south direction, per MDOT SHA.


LEGEND
S# SHORT–TERM IMPROVEMENT
M# INTERMEDIATE–TERM IMPROVEMENT
L# LONG–TERM IMPROVEMENT
M1 EVALUATE TO REMOVE THE LEFT TURNS IN BOTH DIRECTIONS AND MAKE NECESSARY MODIFICATIONS TO CURB/GUTTER, SIGNING, MARKING, AND LANDSCAPE. WILL REQUIRE TRAFFIC STUDY AND PUBLIC OUTREACH
L1 EVALUATE FEASIBILITY OF ADDING BIKE LANE ALONG THE CORRIDOR.
L2 EVALUATE FEASIBILITY OF A ROUNDABOUT. SIGNIFICANTLY CONSTRAINED BY RIGHT–OF–WAY, ABOVE– AND UNDER–GROUND UTILITIES, AND EXISTING BUILDINGS. SHOWN HERE IS ~120' OUTSIDE DIAMETER FOOTPRINT FOR A SINGLE LANE FULL–SIZE ROUNDABOUT. W. GORDON ST WILL NEED TO BE RECONFIGURED.
INSTALL ANOTHER NEW ADA RAMP AND ALIGN THE CROSSWALK PERPENDICULAR TO MAIN ST. S1
UPGRADE CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE) S3
INSTALL CURB EXTENSION (OR FLEX POSTS), MARKING, AND SIGNS, MAKE LEFT LANE TO BE LEFT–TURN–ONLY. ON THE WEST LEG, HATCH CENTER SPACE, MOVE EB LEFT TURN STOP BAR CLOSER. S2
UPGRADE CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE) S3
E GORDON ST
N MAIN ST
N BOND ST
W GORDON ST
0
40'
80'
B8
GORDON ST AT N MAIN & N BOND STREETS
TOWN OF BEL AIR
SAFE STREETS AND ROADS FOR ALL

B9 – MacPhail Road at South Main Street (MD 924[9])

Existing Conditions & Site Visit Observations

The intersection at MacPhail Road and S Main St serves as an entry point to the Homestead Wakefield Elementary and Bel Air Middle schools to the west. 350' east of the intersection, MacPhail has a wide shoulder with a sidewalk on the north that may be able to accommodate the proposed shared-use path in the Harford County Bike and Ped improvement plan. The Town of Bel Air has existing sidewalk improvements proposed down E MacPhail Road to tie this intersection to the eastern neighborhoods.

Identified Deficiencies

1. Existing crosswalks are outdated.
2. The lane drop is missing marking and signage.
3. Pedestrian ramps at the entrance 200' south of the intersection are not ADA-compliant.
4. The existing stop bar is faded.

Outdated Crosswalk

No Sidewalk on MacPhail – Planned Improvements at this Location

Intersection Qualities

Speed Limit
- MacPhail St – **30** mph (Posted)
- S Main St – **30** mph (Posted)

Roadway Classification
- MacPhail St -**Urban Collector**
- S Main St – **Principal Urban Arterial**

AADT
- MacPhail St – **6,761**
- S Main St – **18,670**

LOS
- Level **D** for AM Peak
- Level **D** for PM Peak

Public Input

Countermeasures Requested
- Walkways
- Bike lanes on Macphail Rd
- Add a raised crosswalk for pedestrians

Concerns
- Students are unsafe crossing at this intersection
- There are no sidewalks on the south side of Macphail on west leg and no sidewalk on either side on east leg
- Sidewalks should be on both sides of Main St
- Students should be able to ride their bikes for those that live up Macphail

[9] MD 924 is assumed to run in a north-south direction, per MDOT SHA.

Crash Analysis

Key Findings of Reported Crashes

- 8 reported crashes in 5 years.
- No reported fatal crashes from 2018-2022.
- 0 crashes involved pedestrians or cyclists.
- **Observed crash pattern**: Left turn and rear-end crashes involving NBT vehicles.

Interpretation of Data

- Pedestrian safety improvements (pavement marking, signing, signal equipment) are needed at/near the intersection.
- Installation of bike facilities should be evaluated.
- The observed crash pattern indicates a need to check yellow/all-red clearances.

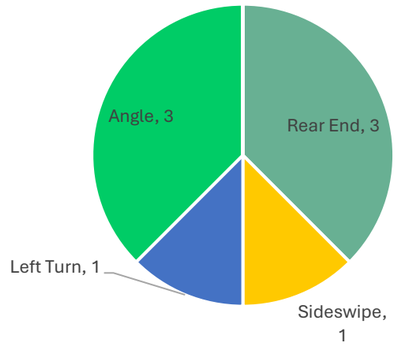
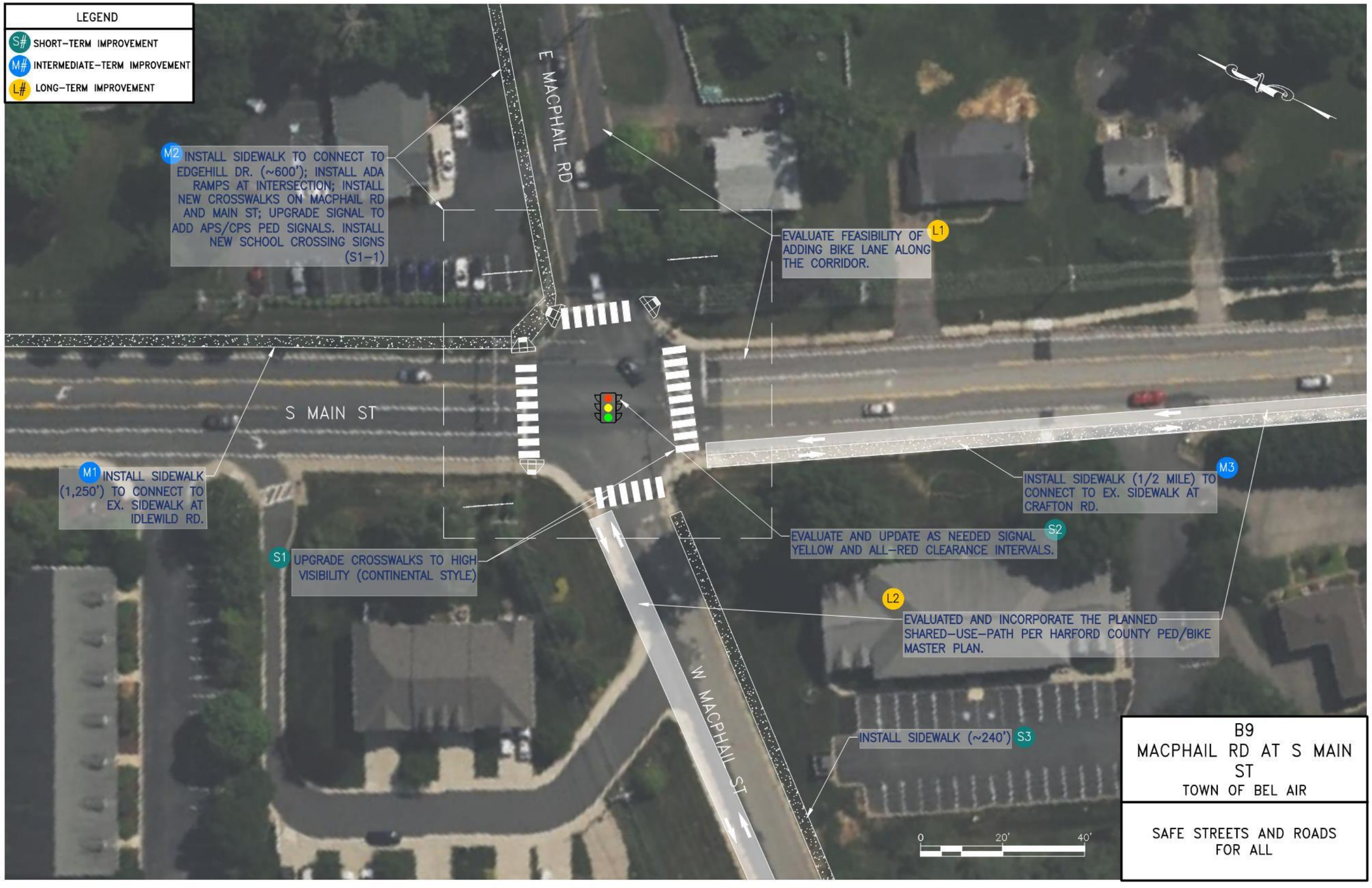


Figure 6-19: B9 Crashes by Type

Recommendations

Table 6-16: B9 Recommendations

		Countermeasure	Cost	Notes
Short Term (0-3 Years)	S1	Upgrade crosswalks to high visibility (continental style)	**$18,800**	
	S2	Evaluate and update as needed signal yellow and all-red clearance intervals.	**$0**	
	S3	Install sidewalk (~240')	**$93,600**	
Intermediate Term (4-5 years)	M1	Install sidewalk (1,250') to connect to ex. sidewalk at Idlewild Rd.	**$487,500**	
	M2	Install sidewalk to connect to Edgehill Dr. (~600'); install ADA ramps at intersection; install new crosswalks on Macphail Rd and Main St; upgrade signal to add APS/CPS ped signals.	**$500,000**	MDOT SHA Estimate
	M3	Install sidewalk (1/2 mile) to connect to ex. sidewalk at Crafton Rd.	**$2,600,000**	MDOT SHA Estimate
Long Term (5+)	L1	Evaluate feasibility of adding bike lane along the corridor.	**TBD**	Cost pending for future bike lane study results.
	L2	Evaluate and incorporate the planned Shared-Use-Path per Harford County ped/bike master plan.	**TBD**	


LEGEND
S# SHORT–TERM IMPROVEMENT
M# INTERMEDIATE–TERM IMPROVEMENT
L# LONG–TERM IMPROVEMENT
E MACPHAIL RD
S MAIN ST
W MACPHAIL ST
M2 INSTALL SIDEWALK TO CONNECT TO EDGEHILL DR. (~600'); INSTALL ADA RAMPS AT INTERSECTION; INSTALL NEW CROSSWALKS ON MACPHAIL RD AND MAIN ST; UPGRADE SIGNAL TO ADD APS/CPS PED SIGNALS. INSTALL NEW SCHOOL CROSSING SIGNS (S1–1)
L1 EVALUATE FEASIBILITY OF ADDING BIKE LANE ALONG THE CORRIDOR.
M1 INSTALL SIDEWALK (1,250') TO CONNECT TO EX. SIDEWALK AT IDLEWILD RD.
M3 INSTALL SIDEWALK (1/2 MILE) TO CONNECT TO EX. SIDEWALK AT CRAFTON RD.
S1 UPGRADE CROSSWALKS TO HIGH VISIBILITY (CONTINENTAL STYLE)
S2 EVALUATE AND UPDATE AS NEEDED SIGNAL YELLOW AND ALL–RED CLEARANCE INTERVALS.
L2 EVALUATED AND INCORPORATE THE PLANNED SHARED–USE–PATH PER HARFORD COUNTY PED/BIKE MASTER PLAN.
S3 INSTALL SIDEWALK (~240')
0 20' 40'
B9
MACPHAIL RD AT S MAIN ST
TOWN OF BEL AIR
SAFE STREETS AND ROADS FOR ALL

SECTION 7 - PROJECT PRIORITIZATION AND PROGRESS

Section 7 - Project Prioritization and Progress

The Action Plan serves as a living document that provides a variety of crash countermeasure projects and strategies that can be implemented to reduce fatal and serious injury crashes within the Town of Bel Air, the City of Aberdeen, and the City of Havre de Grace. The plan can be used in coordination with partner agencies and long-range planning efforts, such as those conducted by Harford County and Maryland Department of Transportation (MDOT), State Highway Administration (SHA) to identify priority projects. Clear, measurable short-term, intermediate-term goals, and long-term goals combined with timelines and accountability by agencies responsible for implementation will create a framework that is transparent so progress can be measured year to year.

Assessing the Recommendations' Effectiveness

This Action Plan provides the necessary countermeasures to the identified issues at the selected intersections. A significant amount of data was collected, analyzed and results incorporated in the proposed countermeasures categorized based on estimated cost and implementation duration.

The short-term measures can be implemented within one to three years and estimated costs vary between $0 for interagency coordination and $170,000 for more complex measures including sidewalks and raised concrete medians.

The intermediate-term measures can be implemented within four to five years, may require various levels of design and costs can vary between $15,000 for short sections of sidewalk and pavement markings to $1,000,000 and over for more complex countermeasures.

The long-term measures require further studies and county-wide and even statewide coordination to interlace the envisioned countermeasures into the larger vision of each municipality, the county, and the state. These measures may take five years and longer to be implemented and the estimated costs will vary widely.

Assessment of the effectiveness of the implemented countermeasures provides information that will help the municipalities decide if the investment reduced crash frequency or severity. Such assessment can be performed one to three years after the implementation for enough data to be collected at each location. The new data will then be compared with the data before implementation.

There are several methods at different effort levels to conduct the evaluation that can be implemented:

1. Collect public data.
2. Conduct a comparative assessment of before and after crash data and traffic volumes.
3. Conduct a before/after study.
4. Conduct a rigorous before/after analysis.

The municipalities can use the baseline data collected with this Project when developing the evaluation. The FHWA Highway Safety Manual, Chapter 6, Table 6.1 provides a comparison of data inputs required for the possible analysis methods.

Roadway Infrastructure Upgrades

- Upgrades with responsibility, and cost, are provided in Section VI and the Appendices.
- Equity considerations in the upgrade process are discussed in detail in Section IV.
- Documenting recommendations for each jurisdiction are covered in detail in Section VI.
- Strategies to address common challenges and opportunities are also covered in detail in Section VI.

By implementing the proposed countermeasures alone may result in reduction of roadway crashes and fatalities, especially those involving pedestrians, bicyclists and citizens with disabilities and could result in elimination when combined with other strategies. Such strategies include stakeholder collaboration, policy enhancements and education and when implemented in parallel will enhance the efficiency of proposed countermeasures and contribute to reaching the objectives of Vision Zero.

Guidance by the Vision Zero Network[1] indicates that many cities use a 10-year time frame as their baseline to achieve zero deaths. This Action Plan follows that approach by identifying short, intermediate, and long-term goals to track progress and meet a target date of zero deaths by 2034. Adjustments to this goal will need to be made once progress reports are reviewed.

Project Prioritization

To prioritize the suggested recommendations, a series of factors have been considered, including crash analysis findings, equity considerations, the built environment and public engagement. Based on these factors, scoring criteria were developed to rank the prioritization of each selected intersection improvement while ensuring equitable consideration to each factor. This criterion is in Table 7-1.

[1] Vision Zero Action Plan

Table 7-1: Prioritization Considerations for Improvements

Criteria	Requirements
Equity	1. The intersection is within: a) An area of persistent poverty and/or b) A disadvantaged community tract
	2. The population around the intersection: a) Is largely non-white (at least 20%) b) Is largely without access to vehicles
Safety	1. Serious injuries or fatalities have occurred to pedestrians at or around the intersections
	2. The intersection study area: a) Lacks safe bicycle facilities. b) Lacks safe pedestrian facilities.
Complete Streets	The intersection requires the implementation of Complete Streets principles and safe bicycle and pedestrian access to transit, schools, health care facilities, retail & other destinations
Public Outreach	The intersection was identified as needing improvement by the community during the public workshops or in the survey responses.

Table 7-2: Prioritization by Intersection

ID	Intersection	Equity 1a	Equity 1b	Equity 2a	Equity 2b	Safety 1	Safety 2a	Safety 2b	Complete Streets	Public Outreach	Total
A1 & A4	US 40 & W. Bel Air Ave. and US 40 Shared Use Path from Aberdeen Train Station to Havre de Grace	★		★	★	★	★	★	★	★	8
A2.1	James Ave. & US 40		★	★		★	★	★	★	★	8
A2.2	Carol Avenue & US 40		★	★			★	★	★	★	6
A3	MD 22 @ Old Post and Post Road	★		★	★		★	★	★	★	7
A5	Middelton Road @ West Bel Air Avenue (MD-132)		★	★	★		★	★	★	★	7
A6	MD 132 @ Bush Chapel Road		★	★	★		★	★	★		6
B1	Court House Square (Office/Courtland Streets) at S Bond Street (MD 924)					★	★	★	★	★	5
B2	Kenmore Avenue at S Main Street (MD 924)			★			★	★	★	★	5
B3	Ellendale Street (Ma & Pa Trail) at N Main Street (MD 924)					★	★	★	★	★	5
B4	Moore's Mill Road at Hickory Avenue						★	★	★	★	4
B5	Pennsylvania Avenue at Hickory Avenue					★	★	★	★	★	5
B6	Lee Street at Hickory Avenue						★	★	★	★	4
B7	Lee Street at N Main Street						★	★	★	★	4
B8	Gordon Street at N Main/N Bond Streets					★	★	★	★	★	5
B9	MacPhail Road at S Main Street			★			★	★	★	★	5
H1	US 40 at Otsego/Ohio Streets		★	★	★	★	★	★	★	★	8
H2	US 40 at Lewis Lane		★	★	★	★	★	★	★	★	8
H3	US 40 at Martha Lewis Blvd		★	★	★		★	★	★	★	7
H4	US 40 at Blenheim Lane						★	★	★	★	4
H5	MD Route 155 at Ohio Street		★	★	★		★	★	★	★	7
H6	Revolution Street at Lewis Lane		★	★	★		★	★	★	★	7
H7	Pennington Avenue at N. Union Avenue		★	★	★	★	★	★	★		7
H8	Pennington Avenue at N. Juniata Street		★	★	★		★	★	★		6

Tracking Progress

To track progress toward achieving plan goals an Executive Traffic Safety Committee can consider tracking annual performance measures such as:

1. Continuously update data and assess fatal and severe injury crashes involving vulnerable users (bicycles and pedestrians).
2. Create a progress schedule for short-term and intermediate-term projects implemented and evaluate several long-term projects initiated.
3. Inventory of supplemental studies or new designs begun.
4. Document miles of sidewalks constructed or repaired.
5. Document miles of new bicycle infrastructure installed.
6. Document number of speed management programs initiated.
7. Document new intersection ADA accessibility upgrades and high visibility crosswalks were installed.
8. Document new, upgraded, and modified signals.

Prioritizing and growing a robust Vision Zero program requires ongoing monitoring and continuous refinement to city processes, strategic partnerships, community engagement, and resources. Strengthening existing relationships with County and State agencies and working strategically towards meeting the same goals will create a successful cultural shift.