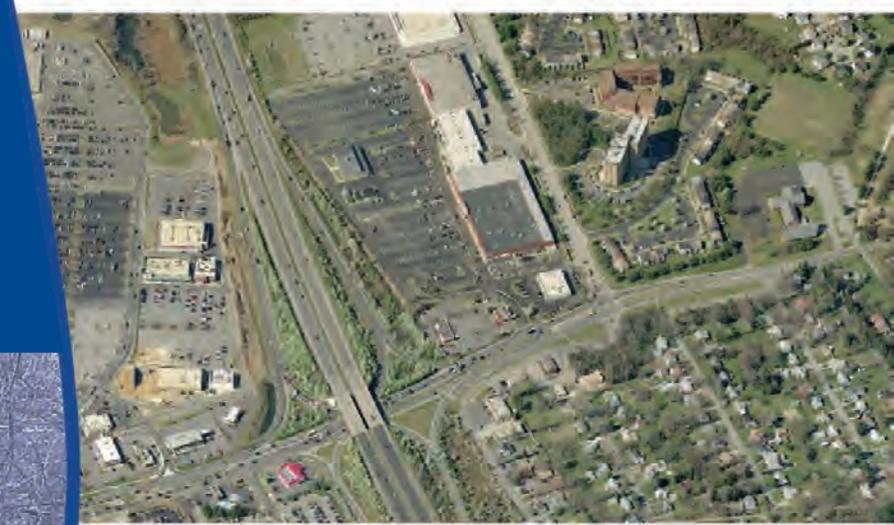




MD 223 CORRIDOR PLANNING STUDY FROM MD 4 TO STEED ROAD

AUGUST 2015







MD 223 CORRIDOR PLANNING STUDY

FROM MD 4 TO STEED ROAD | AUGUST 2015

MARYLAND STATE HIGHWAY ADMINISTRATION (SHA)

IN COOPERATION WITH

PRINCE GEORGE'S COUNTY

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION (DPW&T)

**THE MARYLAND-NATIONAL CAPITAL PARK
AND PLANNING COMMISSION (M-NCPPC)**

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EXECUTIVE SUMMARY

01

EXECUTIVE SUMMARY

INTRODUCTION

The Maryland State Highway Administration (SHA), working cooperatively with the Prince George's County Department of Public Works and Transportation (DPW&T) and the Maryland-National Capital Park and Planning Commission (M-NCPPC) has undertaken the MD 223 Corridor Planning Study to help best define the needs of the MD 223 Corridor for the short-, mid- and long-term transportation needs. This effort has built upon past public outreach and requests from local elected officials and continued as part of this process. The MD 223 Corridor Planning Study is focused on identifying a range of multi-modal solutions to improve mobility and advance the vision of the corridor for greater accessibility to corridor destinations and points beyond. Based on these considerations, a series of recommendations were developed to improve transportation network connectivity, convenience and safety for pedestrians, bicyclists, transit users, and motorists to create better access to community resources throughout the study area.

The MD 223 Corridor Planning Study is approximately 7.7 miles along MD 223 from MD 4 to Steed Road in Prince George's County, Maryland. The MD 223 Corridor Planning Study was conducted working with the FHWA Planning and Environmental Linkages (PEL) Guidelines. The PEL guidelines allow for the use of information from this study, including issues raised during public engagement, and identified during area inventories, to serve as elements as more detailed studies are prepared according to the National Environmental Policy Act (NEPA) requirements for use of federal funds. PEL represents a collaborative and integrated approach to transportation decision-making that considers environmental, community and economic goals early in the transportation planning process, and uses the information, analysis and products developed during planning to inform the environmental review processes.

RELATED STUDIES

The MD 223 Corridor has been a focal point of many studies in the past. These plans lay the groundwork under which the corridor vision is based. Environmental, land use, transit, development, pedestrian, and bicycle issues are discussed in detail in the report and goals for each are identified. Some of the recent plans and studies include the Southern Maryland Transit Corridor Preservation Study, Plan Prince George's 2035, Prince George's County Subregion 5 Master Plan, Joint Base Andrews Joint Land-Use Study, and the Central Branch Avenue Corridor Revitalization Sector Plan. A synthesis of these plans and studies revealed:

- A premium transit line is planned along Branch Avenue between Southern Maryland Hospital Center and the Branch Avenue Metro rail station, with a stop at the Branch Avenue/MD 223 interchange that is a more transit friendly development pattern.
- The desired development pattern in the County's Developing tier envisions compact, vibrant, mixed use concentrated in centers and along corridors while maintaining the character of the existing areas. Along MD 223, the appropriate centers includes walkable infill and low- to medium density development in downtown Clinton.
- There is considerable desire for more trails and recreational facilities along the corridor.
- Greater transportation network connectivity should be incorporated as future improvements and developments occur.
- Greater connectivity between Joint Base Andrews and the surrounding areas is needed including active transportation links, commercial revitalization, and increased economic/employment synergies.

PUBLIC PARTICIPATION

Residents, business owners, employees, and others in the study area provided their perspectives, concerns and desires for MD 223 and this input was an essential piece of the information gathering and the goal setting processes. It was collected in three ways:

- Postal Mail-In Surveys (2013-2014)
- Participant Interviews (April 2014 - July 2014)
- Public Information Workshop (June 11th, 2014)

A number of issues and concerns were identified by the public, and from the relevant plans and studies conducted previous to this study. The issues and concerns range from specific intersection traffic-related problems to corridor-wide pedestrian and vehicular safety and comfort. Previous studies identified major improvements, such as the proposed transit station at the MD 5/MD 223 interchange. In general, the greatest concerns had to do with traffic along the corridor, although pedestrian connectivity was also identified as a major concern. Residents were also concerned about the impact to the community's character, as evident by the concerns regarding homes and community resources.

EXISTING CONDITIONS REVIEW

The study area sits within the Piscataway Creek and the Western Branch Watersheds. The corridor’s topography naturally forms alternating valleys and ridges which are drained into several small creeks. MD 223 runs along the ridge, with land sloping on the northern and southern sides. The Pea Hill Branch Creek runs parallel to MD 223 on the northern side, while the Piscataway Creek and the Butler Branch Creek drain on the southern side of the corridor.

A synthesis of the environmental conditions, showing the environmentally sensitive areas and the developed areas are included in this study. Future development planned along the corridor may impact environmentally sensitive areas. Several cultural and historic sites are located along the corridor. These sites include structures that have been placed on the National Historic Register of Historic Places. These include the Surratt House Museum and His Lordship’s Kindness. The area also includes sites placed on the Maryland Historic Register such as the Clinton Rosenwald School (within the American Legion Building) and sites that are being considered for designation like the B.K. Miller Super Liquor Store. In addition to playing a major role in helping to create a story and special places in Clinton, these places also serve as gathering places for residents within the study area, as well as destinations for visitors living nearby, and well beyond.

The MD 223 corridor contains a diverse mix of allowable uses that are generally segregated by type. Over half of the corridor is zoned Rural Residential and Open Space. A large number of light industrial uses adjacent to Joint Base Andrews enhance the economic connection between the Base and the surrounding areas.

The core areas adjacent to MD 5 are the most concentrated in terms of density and allowable building area, which will support planned transit oriented development around the proposed new transit station at the interchange. The densest areas today are located around the MD 5 interchange. As the population increases in this area, more street network will be needed to adequately and efficiently disperse traffic and facilitate trips by all users to and from a concentration of destinations.

It is also important to understand how the corridor is being used for travel to and from work. According to the US Census, approximately 580 people live in the study area also work there. Over 16,000 people travel into the study area each day for work, while almost 13,000 of those living in the area commute out of the study area each day. The

distances traveled suggest that many of these commuters are being funneled to or from the highways via MD 223, adding to congestion along the road.

The study area has developed into a traditional suburban pattern, with many roads offering a single access point from the main line and local streets terminating within each respective housing development, restricting access to through movement. Because of this, only a limited number of streets exist to provide true network connections. Notably, MD 223 is the only east-west connection through the study area for all trips.

SAFETY ANALYSIS

A detailed safety analysis of the crash history of the corridor was completed by SHA. Left turn (16%) and other (7%) related collisions crash rates are higher than the statewide average. Rear end crashes were the most predominant collision types reported during the study period, accounting for 30% of the total crashes.

A common cause of left turn and rear end crashes are frequent driveways or intersections, where people tend to slow down to turn. In the segment of MD 223 between Mark Shapiro Drive and Hardesty Drive, the heat map shows there were both high driveway densities and high numbers of crashes. In this section, driveway consolidation or even elimination could be explored, as access to many of the land uses are already provided on cross streets. It will also be important to look for opportunities to balance the needs of vehicles, bicyclists, and pedestrians on MD 223.

TRAFFIC ANALYSIS

A detailed traffic analysis study was completed at the start of this Corridor Planning Study. This analysis included traffic counts along the corridor and modeling of current and future design year traffic projections. The Metropolitan Washington Council of Government (MWCOCG) and the Maryland Statewide model were used to determine the expected traffic growth on MD 223 and surrounding roads. The existing and forecasted peak hour data was used to develop intersection level of service. Critical Lane Volume (CLV) and SYNCRO/SimTraffic was used to analyze the corridor. In 2013, only the Brandywine/Old Branch intersection is failing (LOS E or F) in the PM and AM peak, both NB and SB directions. This delay causes the link between Brandywine/Old Branch and MD 5 to fail in the 2013 model.

In 2040, there are five failing intersections:

- **Temple Hill Road:** Fails in the SB direction (AM,PM)
- **Brandywine/Old Branch:** Fails in the NB and SB directions (AM,PM)
- **MD 223 at Clinton Plaza:** Fails in the SB direction (AM,PM)
- **Old Alexandria Ferry Road:** Fails in the SB direction (AM,PM)
- **Marlboro Pike:** Fails in the NB SB directions (AM,PM)

In addition, the following links fail in 2040:

MD 223 NB AM Peak:

1. Between Steed Road and Brandywine Road/Old Branch Road;
2. Between Rosaryville Road and Marlboro Pike;

MD 223 NB PM Peak:

3. Between Steed Road and Brandywine Road/Old Branch Road;

MD 223 SB AM Peak:

4. Between Marlboro Pike and Dower House Road;
5. Between Rosaryville Road and Old Alexandria Ferry/Dangerfield Road;
6. Between MD 5 and Brandywine Road/Old Branch Road;

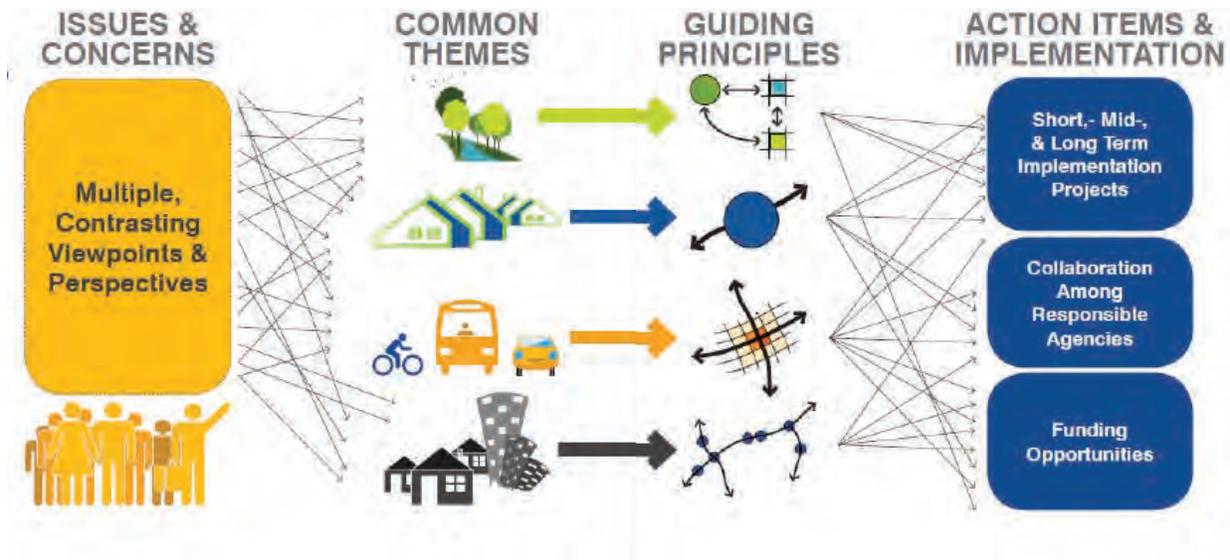
MD 223 SB PM Peak:

7. Between MD 5 and Brandywine Road/Old Branch Road.

CONCEPT DEVELOPMENT PROCESS

The concept development process for MD 223 began by analyzing existing conditions in the corridor and soliciting thoughts, concerns, and ideas from the general public, key stakeholders, and government agencies. The planning team grouped issues and concerns into a series of themes to take a holistic view of the corridor. They merged transportation and land use issues into larger corridor wide themes.

Following the creation of themes, the planning team conceptualized these themes into Guiding Principles that are meant to direct the proposed concepts as well as policy and planning recommendations. The recommended actions were then organized into short, mid, and long term alternatives, as well as, what partnerships would be needed to accomplish the recommended actions.



MATRIX OF IMPROVEMENT RECOMMENDATIONS

Based on the observations and ideas offered by surveyed residents and community participants in this study, the team prepared a Purpose and Need statement, and a series of recommendations to meet them. These recommendations include enhanced transportation solutions for pedestrians, bicyclists, transit riders, and motorists and include improvements to MD 223 as well as to the local network.

Purpose: Address long and short term safety, operational, and traffic issues for all modes that exist on the corridor today, and set a direction for both public and private infrastructure investment for the future.

Needs:

- Improve left-turn safety at residential and commercial access points and local streets.

- Improved pedestrian safety and sidewalk connectivity, particularly for seniors walking to area services and children walking to school and play.
- Preserve community history, character and natural features while accommodating planned growth.
- Address congestion particularly at intersections that causes mainline link failures during peak travel times.

From the outset of this PEL planning process, SHA was concerned that planning should help to advance longstanding needs identified along the corridor. The various offices responsible for system preservation and development decisions within the County and State participated at key study milestones to review findings, identify opportunities and ensure feasibility of concepts, especially for short term improvements. Within the report, the recommended improvements have been identified, based on location. For this Executive Summary, the

Lead Agency / Office: SHA – Office of Planning and Preliminary Engineering				
MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Next Steps	Target Date Range
Corridor-Wide Studies				
Downtown Clinton Area Corridor Study: Full NEPA study for the section from Old Branch Avenue/ Brandywine Road to Old Alexandria Ferry Road/ Dangerfield Road	<ul style="list-style-type: none"> ✓ Pedestrian safety ✓ Current and future capacity needs ✓ Preserve existing corridor characters ✓ Environmental resource stewardship 	TBD	Recommended Additional Study	TBD
MD 5 Interchange Improvement Study: Concept Alternative studies for the best approach to improvements at the connection points of MD 5 within the MD 223 corridor	<ul style="list-style-type: none"> ✓ Pedestrian safety ✓ Current and future capacity needs ✓ Environmental resource stewardship 	TBD	Recommended Additional Study	TBD
Interchange Improvement Study: Concept Alternative studies for the best approach to improvements at the connection points of MD 4 within the MD 223 corridor	<ul style="list-style-type: none"> ✓ Pedestrian safety ✓ Current and future capacity needs ✓ Environmental resource stewardship 	TBD	Recommended Additional Study	TBD
Non-signalized Intersection Improvements: Provide bypass lanes at residential areas, including Sweeney Drive, Clendinnen Drive, and Don Drive	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$1.3M ~ \$2.5M /ea (\$200k ~ 380k/ea)	Recommended Additional Study	3-10 years
Center Turning Lanes: Provide center turning lanes with multiple access points throughout the project	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$2.8M ~ \$17M (\$420k ~ \$2.6M)	Recommended Additional Study	5-15 years
Shoulder and Bicycle Safety Improvements: Construction and/or widening of shoulder for bicycle accessibility and improve corridor safety	<ul style="list-style-type: none"> ✓ Bicycle and Vehicular Safety 	\$3.2M ~ \$13M (\$480k ~ \$2.0M)	Recommended Additional Study	10-20 years
Location Specific Studies				
Protected Left-Turn Lane at Dixon Drive: Provide left-turn “pocket” lanes and bypass lanes at residential areas	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$1.5M ~ \$3.6M (\$230k ~ \$540k)	Recommended Additional Study	1-10 years
Protected Left-Turn at Canberra Drive and Denton Drive: Provide left-turn “pocket” lanes at residential areas	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$1.8M ~ \$2.5M (\$270k ~ \$380k)	Recommended Additional Study	1-10 years
Rosaryville Road Intersection Effectiveness Study: Evaluation on the effectiveness of the Rosaryville Road intersection	<ul style="list-style-type: none"> ✓ Future capacity needs ✓ Pedestrian safety ✓ Environmental resource stewardship 	TBD	Recommended Additional Study	5-15 years
Protected Left-Turn Lane at Victoria Drive to Sherwood Drive: Provide left-turn “pocket” lanes at residential areas	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$1.5M ~ \$3.6M (\$0.2M ~ \$0.5M)	Recommended Additional Study	1-10 years
Protected Left-Turn Lane at the Clinton Christian School: Provide left-turn “pocket” lanes and bypass lanes at residential areas	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$1.5M ~ \$3.6M (\$0.2M ~ \$0.5M)	Recommended Additional Study	1-10 years
Lead Agency / Office: SHA – District 3				
MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Next Steps	Target Date Range
Corridor-Wide Projects				
Pedestrian Safety Improvements: Construct accessible sidewalk throughout the corridor, and improve street lighting	<ul style="list-style-type: none"> ✓ Missing sidewalk and street lighting 	\$320K ~ \$900k (\$48k ~ \$135k)	Coordination and scoping	3-10 years
Location Specific Studies				
Steed Road Intersection Improvements: Roadway widening and sidewalk upgrades	<ul style="list-style-type: none"> ✓ Pedestrian and vehicular safety ✓ Future capacity needs 	\$2.9M ~ \$4.1M (\$435k ~ \$615k)	PE Funding	3-10 years
Temple Hill Road Intersection Improvements: Roadway widening and sidewalk upgrades	<ul style="list-style-type: none"> ✓ Future capacity needs 	\$2.6M ~ \$3.7M (\$390k ~ \$555k)	PE Funding	3-10 years
Old Branch Avenue/Brandywine Road Intersection Improvements: Short to Mid-term improvements to mainline MD 223 to add left-turn lanes	<ul style="list-style-type: none"> ✓ Pedestrian safety at intersection ✓ Current capacity needs ✓ Missing sidewalk 	\$4.7M ~ \$6.6M (\$705k ~ \$990k)	PE Funding	3-10 years
Old Alexandria Ferry Road/Dangerfield Road: Capacity improvements, sight distance improvements, and pedestrian safety improvements	<ul style="list-style-type: none"> ✓ Future capacity needs ✓ Pedestrian and vehicular safety 	\$4.3M ~ 4.6M (\$495k ~ \$690k)	PE Funding	3-10 years
Dower House Road Intersection Improvements: Capacity improvements, sight distance improvements, and sidewalk upgrades	<ul style="list-style-type: none"> ✓ Skewed geometry ✓ No sidewalk ✓ Sight distance deficiency 	\$2.0M ~ \$2.8M (\$300k ~ \$420k)	PE Funding	5-15 years
Marlboro Pike Intersection Improvements: Roadway widening and sidewalk upgrades	<ul style="list-style-type: none"> ✓ Skewed geometry ✓ Sight distance deficiency ✓ Future capacity needs 	\$1.8M ~ \$2.5M (\$270k ~ \$375k)	PE Funding	5-15 years
Signal Warrant Analysis at Dixon Drive: Signal warrant analysis need	<ul style="list-style-type: none"> ✓ Pedestrian and vehicular safety 	TBD	Recommended Additional Study	As needed
Signal Warrant Analysis at Gwynndale Drive: Signal warrant analysis need	<ul style="list-style-type: none"> ✓ Pedestrian and vehicular safety 	TBD	Recommended Additional Study	As needed
Signal Warrant Analysis at Hardesty Drive: Signal warrant analysis need	<ul style="list-style-type: none"> ✓ Pedestrian and vehicular safety 	TBD	Recommended Additional Study	As needed
Signal Warrant Analysis at Canberra Drive: Signal warrant analysis needs	<ul style="list-style-type: none"> ✓ Pedestrian and vehicular safety 	TBD	Recommended Additional Study	As needed

Lead Agency / Office: Prince George's County Department of Public Works			
MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Target Date Range
Local Street Network Traffic Calming Measures: Various traffic calming measures at connecting local streets to increase safety in local communities	✓ Pedestrian safety	\$50k ~ \$150k /ea (\$7.5k ~ \$22k/ea)	1-5 years
Bus Stop Improvements: Additional bus shelters and enhanced accessible waiting areas at existing bus stops throughout the corridor	✓ Pedestrian and transit riders safety	\$10k ~ \$100k /ea (\$1.5k ~ \$15k/ea)	1-5 years
Clinton Post Office/Surrattsville High School Access Road: Relocate post office entrance to the High School access road to eliminate intersection conflict, consolidate access and turns from MD 223	✓ Pedestrian and vehicular safety ✓ Access consolidation	\$500k ~ \$700k (\$75k ~ \$105k)	1-5 years
McCormick Road Access Improvements: Construct new and improve existing access to the McCormick Road Community	✓ Improve access to residential community	\$0.7M ~ \$1.1M (\$100k ~ \$170k)	3-10 years
Lead Agency / Office: Maryland-National Capital Park and Planning Commission			
MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Target Date Range
Clinton Commercial Core Connectivity Enhancement: Potential back entrance from Woodley Road to Woodyard Crossing Shopping Center, and pedestrian and vehicle bridge between Woodyard Crossing and Clinton Plaza over MD 5	✓ Future development and planning needs	\$1.2M ~ \$14M (\$0.2M ~ \$2.1M)	5-15 years

Notes:

¹ ROW Cost (if necessary) and environmental mitigations are not included in costs.

² Preliminary Engineering cost is 15% of the construction cost range, based on the SHA Cost Estimating Manual. See Appendix for Cost Estimate breakdowns.

recommended improvements are organized according to the anticipated responsible lead agency in the series of tables below. For more detailed information, please reference Figures 56 - 62 in Chapter 6.

The improvement recommendations have been designed as concepts and have not been studied with a full alternative analysis. Details within each concept show the main issues that the concept is meant to address, and indicate specific conditions that should inform the next phase of the work. Below is the list of recommendations that have been developed, to either implement, or investigate further to meet the following draft purpose and need for improvements in the corridor.

In addition to the recommended improvements, the Study Team also proposed network connections beyond MD 223 to promote safe and more direct travel within and between districts, and to reduce pressure on MD 223 intersections and links. Added lanes and reconfigured intersections meant to add intersection capacity can be mitigated for bicyclists, pedestrians and local traffic with these added network links to help relieve the traffic

burden on MD 223. These options should be evaluated particularly in constrained areas such as the historic Old Branch Avenue/ Brandywine Road intersection.

- The design of new network links should be informed by the character of areas and the trip types they will serve.
- Neighborhood routes anticipating pedestrians and bicyclists should be designed and operated to support slow speeds and maintain low traffic volumes.
- Traffic calming retrofits to existing streets can help. Routes requiring stream crossings will likely support only non-motorized users. Some routes help to bring more residents to a signalized intersection for safer ingress and egress to MD 223.
- The network of streets created around Branch Avenue (MD 5), including a proposed elevated crossing, permit the commercial area to function as a walkable mixed use district

CONCLUSION

The Maryland State Highway Administration, working cooperatively with the Prince George's County Department of Public Works and Transportation and the Maryland-National Capital Park and Planning Commission, have undertaken the MD 223 Corridor Plan Study to help best define the needs of the MD 223 Corridor, while identifying short-, mid- and long-term transportation improvement needs. The recommendations presented in this report are based on the corridor themes identified as part of the study. Each recommendation has been developed to meet the needs for the corridor. Several of the recommendations can be addressed on a case by case basis, eliminating the need for an end to end solution.

However, this report recommends that the core area of Clinton, Maryland requires a greater level of study than just what is presented in this report - a single recommendation will not meet the overall needs for this area. This effort should include mainline (MD 223) as well as secondary road improvements. In addition, an access management plan is needed to address the multiple driveways and entrances in this area.

This report will be used by the various departments within SHA and Prince George's County to help move these recommendations forward to improve the MD 223 Corridor. This may include, but is not limited to, incorporation of improvements in future development plans or access permits, SHA District level system preservation projects or safety improvement projects, County improvements as part of the County Capital Improvement Program (CIP), major corridor improvements for inclusion in the Statewide Consolidated Transportation Program (CTP) or other grant related programs. To assist in this effort, projects should also be included as part of the County recommendation letter to SHA based on the Counties transportation priorities for State facilities.

The recommendations presented in this report may be implemented through various funding programs. It is expected that smaller improvements will be considered and undertaken as funding becomes available. These improvements may be implemented over several years. The recommendations presented will also be re-evaluated at the time of funding availability, to ensure that the best transportation solution is developed based on any changes to land-use or traffic operations.

The MD 223 Corridor Planning Study considered the impacts and benefits of each conceptual design. Because of the substantial scale and amount of improvements needed to fully address the issues and needs of this corridor, the concepts were organized by types of projects. Each recommended concept was identified based on public concerns and issues addressed, and categorized by construction cost range, anticipated responsible office(s), target date range, and priority. Public concerns

and issues came from a previous survey where concerns from the residents and commuters for specific areas of the corridor were identified. Construction cost range is an estimated construction cost with contingency. Target date range provides the estimated time needed to complete construction for the specific recommended project from the time of funding availability. Finally, cost/benefit indicates the urgency of the improvements needed based on the traffic and safety analysis conducted for this study. The types of recommendations include MD 223 intersection improvements, MD 223 corridor wide-improvements, non-SHA improvements, and areas in need of additional study.

This report is intended to summarize the activities undertaken and recommendations for the MD 223 corridor. This report will be used by SHA and Prince George's County when looking at transportation priorities, funding opportunities as well as part of the development review process. As identified in the study, solutions to MD 223 corridor transportation needs are not an "end-to-end" large scale project, but a series of more modest steps addressed as part of new development or redevelopment, a County improvement, or series of SHA safety and operational improvements



INTRODUCTION, PURPOSE, AND PROCESS

02

INTRODUCTION

FOREWORD

The Maryland State Road 223 Corridor Planning Study (MD 223 Corridor) is focused on identifying a long term vision for the corridor and identifying a range of multi-modal solutions to improve mobility and advance the vision of the corridor. The study considers long- and short- term safety, operational, and traffic issues. Based on these considerations, a series of recommendations for improvements were developed to improve transportation network connectivity for pedestrian, bicyclist, transit, and vehicular realms to create better access to community resources throughout the study area.

PROJECT INTRODUCTION

In 2008, SHA evaluated potential improvements to safety and traffic operations along MD 223 from Steed Road to MD 5, but the study was put on hold. The study has been re-initiated as a corridor planning study, which will evaluate a longer section of MD 223 and provide a wider range of concepts to address traffic and safety concerns.

While it has grown in the past, the area is projected to experience an even greater amount of growth in the coming years. A number of developments are approved and currently under construction. Additionally, Prince George's County is making an effort to develop in a more multi-modal manner. Reflecting this, a new transit hub and associated transit-oriented development is planned

at the interchange of Branch Avenue and MD 223. These developments have the potential to change the character of the area. It is important to plan for these changes so that they reflect the desires and needs of the community and those who travel the corridor on a daily basis.

PROJECT BACKGROUND

MD 223, located in Prince George's County (PGC), is also known as Woodyard Road (east of Old Branch Avenue) and Piscataway Road (west of Old Branch Avenue) and is the primary east-west roadway serving the area of Clinton (formerly Surrattsville), Maryland. MD 223 also serves the adjacent US Naval Air Base: Joint Base Andrews (JBA) through two intersections that provide access to JBA's primary access gates. The roadway has evolved from a rural two-lane roadway that served 1950s and 1960s communities like Ballard and Sherwood Forest into a major roadway that supports commercial and residential growth in PGC. Large farms (including His Lordship's Kindness, an 18th-century historic plantation) and tobacco barns in the study area reflect the historic importance of the county's role in tobacco production.

The establishment of Andrews Air Force Base (now Joint Base Andrews) in the 1940s and Maryland State Highway Administration's (SHA) resulting improvements to MD 5 led to an increase in residential suburban development in and around Clinton. In the early 1990's, Branch Avenue was rebuilt as a limited access freeway

FIGURE 1 | 1861 MAP OF SURRATTSVILLE (CLINTON, MD)



between I-95 to Woodyard Road. While this physically divided the surrounding neighborhoods, the project also increased the ease of commuting to Washington DC. This allowed for greater suburbanization of the study area and encouraged population growth and associated development. Like much of the suburban development throughout the country, this development mainly occurred in an auto-centric manner, including strip malls and cul-de-sac communities. Pedestrian and bicycle facilities were not built throughout much of the study area, and the lack of a well-connected street network forced much of the traffic in the area on to MD 223.

Previous efforts to study the MD 223 Corridor include the *Preliminary Central Branch Avenue Corridor Revitalization Sector Plan*, which discusses the proposed transit oriented development around the MD 223 and Branch Avenue interchange; the *Southern Maryland Transit Corridor Preservation Study*, which focuses on the alignment of the proposed premium transit line on Branch Avenue; and several SHA efforts.

PROJECT METHODOLOGY

Recognizing the implications of the projected growth and growing need and desire for transportation alternatives the Maryland SHA, in conjunction with the Federal Highway Administration (FHWA) and PGC, initiated the MD 223 Corridor Planning Study to investigate transportation improvements along the

MD 223 Corridor. This study builds upon a number of previous studies and efforts that have been completed in the area by SHA, Maryland-National Capital Park and Planning Commission (M-NCPPC), and others agencies with an aim to help to establish a balanced approach to transportation in the area.

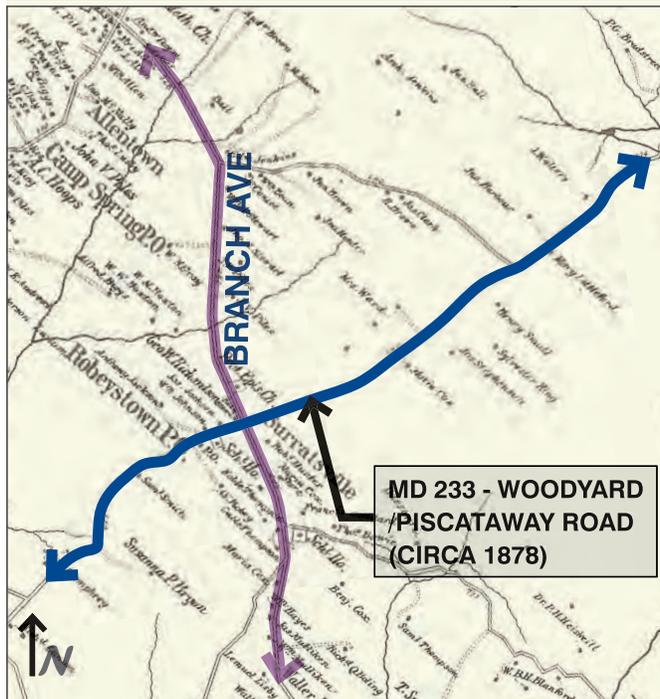
Prior to this study, SHA mailed a questionnaire to residents in the MD 223 corridor to request input on the issues and needs on MD 223. The questionnaire revealed that the residents viewed traffic congestion, pedestrian access, and crossing/making turns as the major issues within the corridor. It also highlighted the importance of preserving community resources such as places of worship and public parks.

Utilizing the previous studies and the results of the questionnaire, the team created a series of analyses maps and combined them into synthesis of issues and opportunities. The issues and opportunities were presented in a public open house. Based on the feedback from the public open house and further research, a strategic plan for change was developed for the MD 223 Corridor and recommended conceptual improvements were proposed. Each concept was developed to a level of detail to adequately quantify potential impacts. After preliminary engineering was completed for each of the concepts, the preliminary limits of disturbance were established 25 feet from the edge of hardscape work.

The areas falling within the limits of disturbance were considered impacted. Impacts are divided into three separate categories, corresponding to the environmental resources: Land Use Impacts, Cultural/Historic Resources Impacts, and Natural Environmental Resources Impacts. Although some of the impacts may be avoided in the next phase of design, the purpose of this study is to determine the worst case scenario as a result of the proposed improvements, and potential impacts moving forward.

Finally, the team met with SHA, M-NCPPC, DPW&T and developed a series of recommendations for coordination of future development within the MD 223 Corridor.

FIGURE 2 | 1878 MAP OF SURRATTSVILLE (CLINTON, MD)

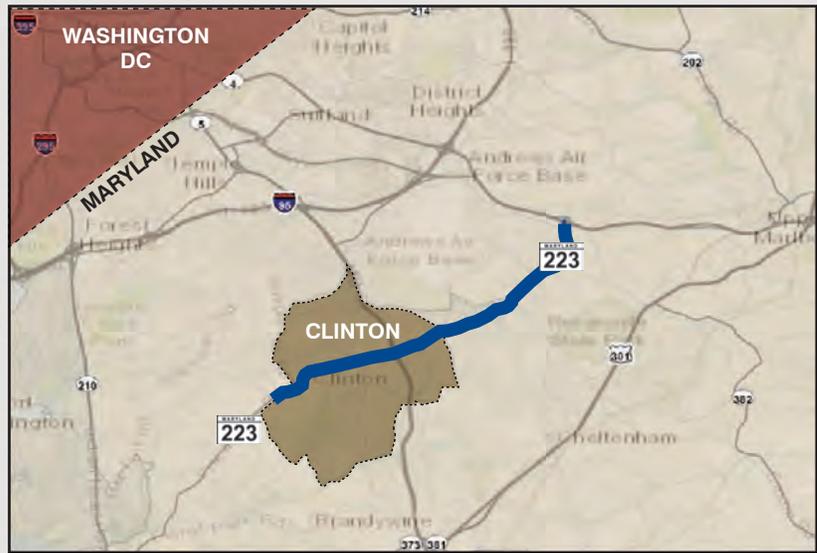


STUDY AREA

The MD 223 Corridor Planning Study extends approximately 7.7 miles along MD 223 from MD 4 to Steed Road in Prince George's County, Maryland (Figure 3) and one mile to the north and south of the corridor, as shown in Figure 4.

The corridor area focuses on MD 223 and influence areas that create demand for the road, support movement to and around it, and provide its historic, environmental, economic, and residential context.

FIGURE 3 | REGIONAL LOCATION MAP



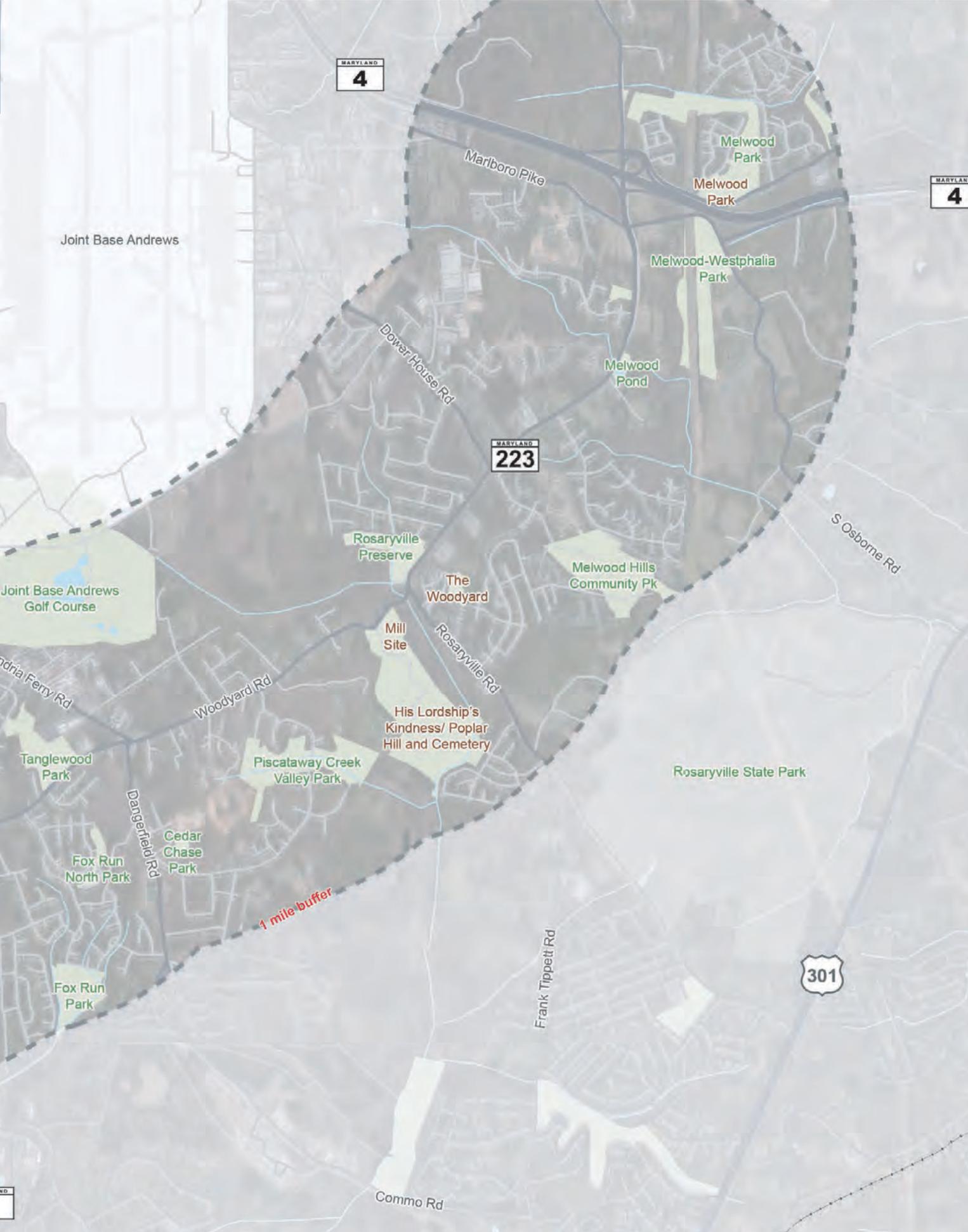
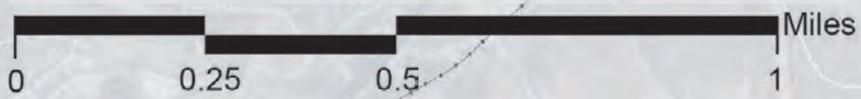


FIGURE 4 | STUDY AREA





PLANNING BACKGROUND AND PROCESS

03

BACKGROUND

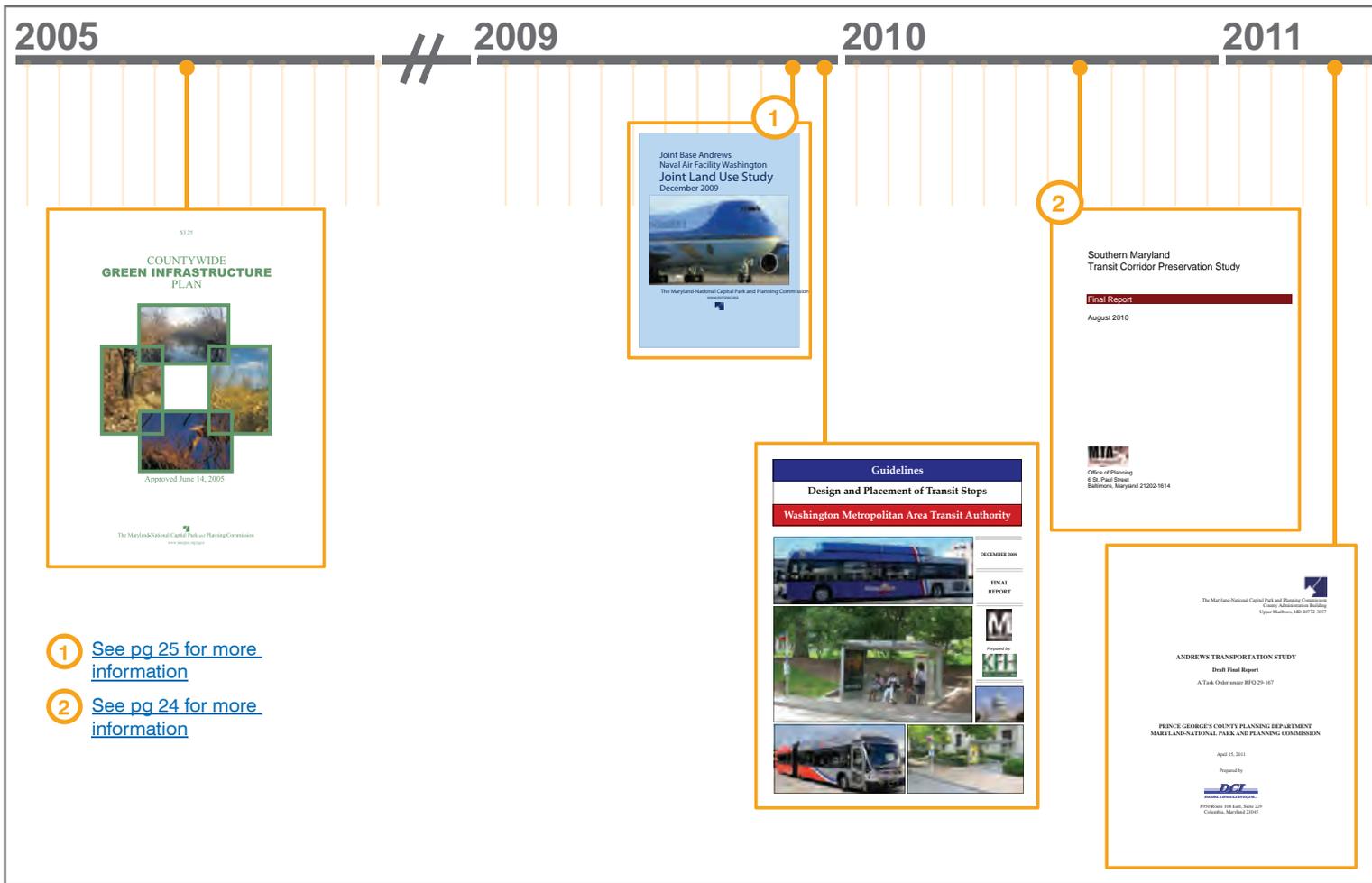


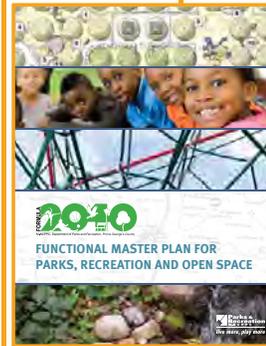
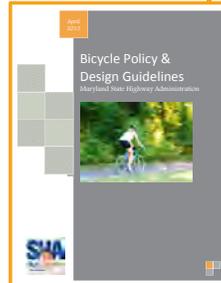
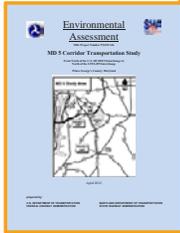
FIGURE 5 | PREVIOUS STUDIES

Study	Agency	Date
County-wide Green Infrastructure Plan	M-NCPPC	Jun-05
County-wide Master Plan of Transportation	M-NCPPC	Nov-09
Joint Base Andrews Joint Land Use Study	M-NCPPC	Dec-09
Southern Maryland Transit Corridor Preservation Study	MTA	Aug-10
Design and Placement of Transit Stops	WMATA	Aug-10
Andrews Transportation Study	M-NCPPC	Apr-11
MD 5 Final Environmental Assessment	SHA	Apr-12
Central Branch Avenue Corridor Revitalization Sector Plan	M-NCPPC	Sep-12
Prince George's County Transitways Systems Planning Study	PG Planning	Dec-12
M-NCPPC Subregion 5 Master Plan	PG Planning	Jul-13
M-NCPPC Subregion 6 Master Plan	PG Planning	Jul-13
Bicycle Policy and Design Guidelines	SHA	Jul-13
2040 Functional Master Plan for Parks, Recreation, and Open Space	M-NCPPC	Sep-13
Plan Prince George's 2035	PG Planning	Nov-13
Southern Maryland Rapid Transit Study	MTA	In Process

2012

2013

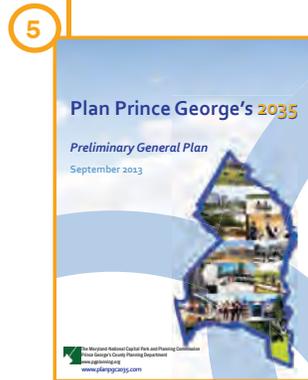
2014



3 See pg 26-27 for more information

4 See pg 25 for more information

5 See pg 24 for more information



The MD 223 Corridor has been a focal point of many studies in the past. The time line shown in Figure 5 shows the past studies reviewed as part of the MD 223 Corridor Planning Study. These plans lay the groundwork under which the corridor vision is based. Environmental, land use, transit, development, pedestrian, and bicycle issues are discussed in detail and goals for each are identified. The following important concepts were drawn from these studies:

- A premium transit line is planned along Branch Avenue between Southern Maryland Hospital Center and the Branch Avenue Metro rail station, with a stop at the Branch Avenue/ MD 223 interchange. A more transit friendly development pattern is desired and conceptual roadway cross sections and land use plans have been developed.
- The desired development pattern in this section of Prince George's County includes compact, vibrant, mixed use development concentrated in centers and along corridors while maintaining the character of the existing areas. Along MD 223, the appropriate development includes context

sensitive infill and low- to medium density development. It should be concentrated near the Branch Avenue (MD 5) interchange.

- There is a great desire for more trails and recreational facilities along the corridor and in the County as a whole.
- Greater transportation network connectivity should be incorporated as future improvements and develop occur.
- There are several planned and desired roadway projects that affect the study area, including widening projects on Branch Avenue and MD 223 as well as planned pedestrian and bicycle improvements along MD 223.
- There is a desire to create greater connectivity between Joint Base Andrews and the surrounding areas in a context sensitive manner. This includes greater multi-modal connectivity, economic revitalization, and employment attraction.

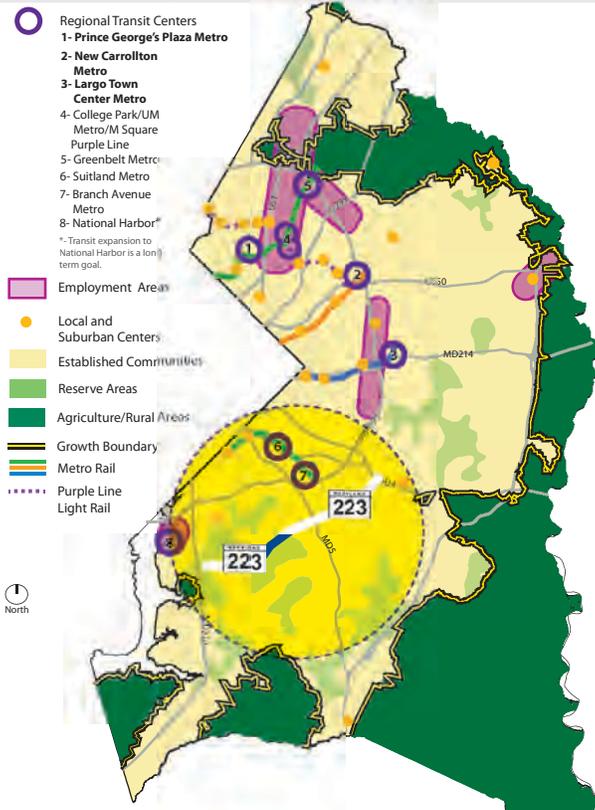
RELEVANT PLANS

PLAN PRINCE GEORGE'S 2035

Plan Prince George's 2035 (Plan 2035) is the County's comprehensive master plan. This guides the future development in the County. The plan focuses on multi-modal transportation as well as concentrating development in centers and corridors. To reinforce this, *Plan 2035* commits to improving mobility by building on the underutilized transit system, investing in transportation infrastructure (including building sidewalks and trails), focusing on a more connected, complete street network, coordinating land use and growth management with transportation improvements.

Figure 6 displays the Prince George's County Growth Policy Map. The majority of the MD 223 study area is located in the "Established Communities" designation, which is defined as "currently developed and served by public water and sewer and public transportation." This category is most appropriate for context-sensitive infill and low-to medium-density development. There are several types of "Centers" (the orange dots) identified, including the future Westphalia development adjacent to MD 4.

FIGURE 6 | GROWTH POLICY MAP



SOURCE: PLAN PRINCE GEORGE'S 2035 (2013)

FIGURE 7 | TRANSIT ALIGNMENT ALTERNATIVES



SOURCE: SOUTHERN MD TRANSIT CORRIDOR PRESERVATION STUDY (2010)

SOUTHERN MARYLAND TRANSIT CORRIDOR PRESERVATION STUDY

The *Southern Maryland Transit Corridor Preservation Study* identifies a future premium transit corridor along MD 5 that will run from the Southern Maryland Hospital Center in Charles County north to the Branch Avenue Metro Station in Prince George's County, where it will connect to the METRO and greater Washington DC. The study was undertaken with the understanding that as the population increases, the demand for a premium transit connection to the Washington DC area will increase as well. By preserving right of way along the corridor in advance of the need for the transit line, the counties involved are able to better coordinate land use decisions with the transit system so they complement each other. As seen in Figure 7, several alignments were considered for the transit line. The preferred alternative selected runs along the east side of MD 5. The MD 223 crossing includes an aerial station at the northwest corner of the interchange. The station would serve as a commuter station as well as a walk-up pedestrian station, utilizing the existing park and ride lot located in the southwest corner of the interchange. Plans also include a possible pedestrian overpass over MD 5 to ensure greater connectivity for pedestrians.

SUBREGION 5 MASTER PLAN

Prince George's County's Subregion 5 Master Plan covers Clinton and several surrounding communities. It is a comprehensive plan for the future development of the Subregion 5 planning areas. It echoes the desire for multi-modal transportation and supportive land uses found in *Plan Prince George's 2035*, envisioning an attractive and vital suburban and rural region. It provides guidelines for infill development in Clinton, stating that "the majority of the development in the subregion

should occur along the MD 5 corridor." The plan also recommends the surrounding areas remain mostly low-density as they are now.

Several recommendations in the Subregion plan affect the MD 223 study area, including the addition of pedestrian facilities on MD 223, the widening of MD 223 from 4-6 lanes, and the development of turn lanes at several intersections.

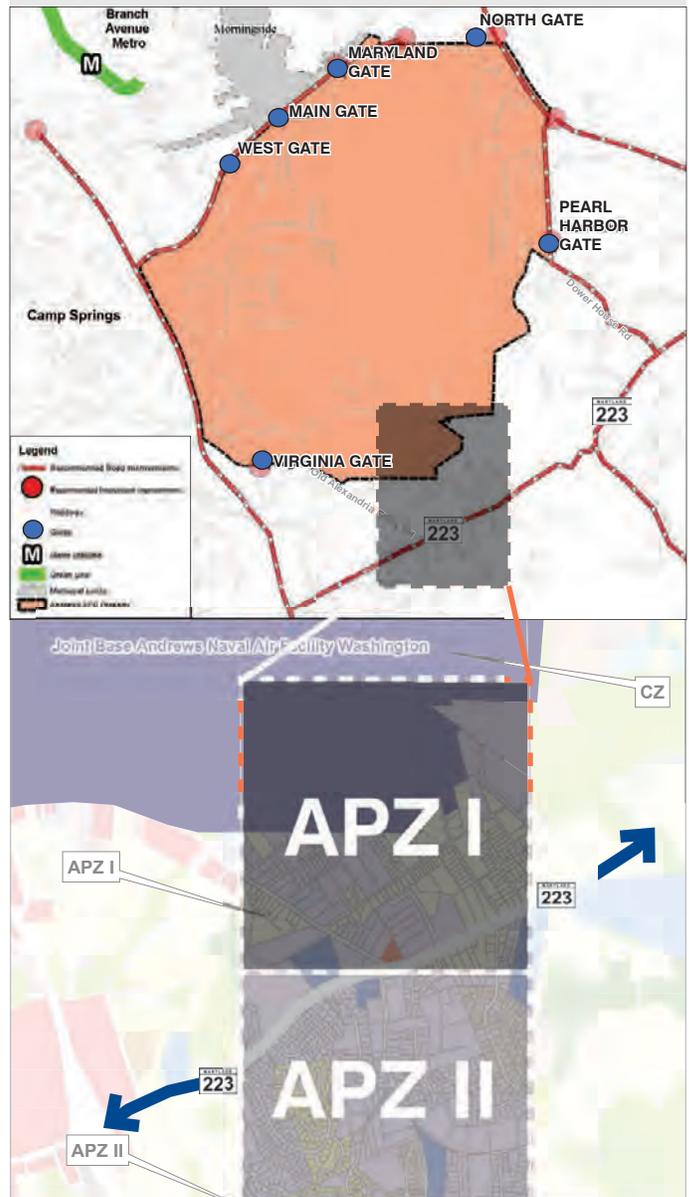
JOINT BASE ANDREWS JOINT LAND USE STUDY

The Joint Base Andrews (JBA) Joint Land Use Study plans for ways to address issues of encroachment in the vicinity of the base. It considers transportation, land use, and an overall vision for the future for the areas surrounding the base. The base is interconnected with the community economically and socially, and therefore supports the revitalization of the area to better suit personnel, and bring more contractors to work in the area. To further that goal, it supports greater transit, pedestrian, and bicycle connectivity to the base, as well as efforts to improve traffic flow to and from the area. The gates shown in Figure 8 (upper image) designate the access points to JBA. Main Gate serves nearly 50% of the traffic coming in and out of the base, while Virginia Gate serves the second most traffic - primarily personal vehicles of employees commuting to the base from home. Pearl Harbor Gate processes primarily commercial and large vehicle traffic. West Gate is closed (potentially planned as a pedestrian-only gate) and Maryland Gate is only available for national and foreign dignitaries. The study suggests road improvements on MD 5, Old Alexandria Ferry Road and MD 223 to support the high volumes at Virginia Gate and improvements to MD 223 and Dower House. There are no future gates planned.

Because of the nature of operations at the base, it does recommend certain restraints on land use in some areas. As shown in Figure 8 (lower image), these restraints are largely focused in the Accident Potential Zones (APZ I) and (APZ II). It is recommended in these two areas that land uses:

1. Not encourage the congregation of a large number of people;
2. Not specifically cater to workers unable to respond to an emergency situation;
3. Not encourage highly labor intensive uses, and;
4. Not create any hazards through the storage or use of explosive, flammable, or toxic material.

FIGURE 8 | JBA GATE LOCATION + ACCIDENT POTENTIAL ZONES



SOURCE: JOINT BASE ANDREWS LAND USE STUDY (2009)

RELEVANT PLANS

CENTRAL BRANCH AVENUE CORRIDOR REVITALIZATION SECTOR PLAN

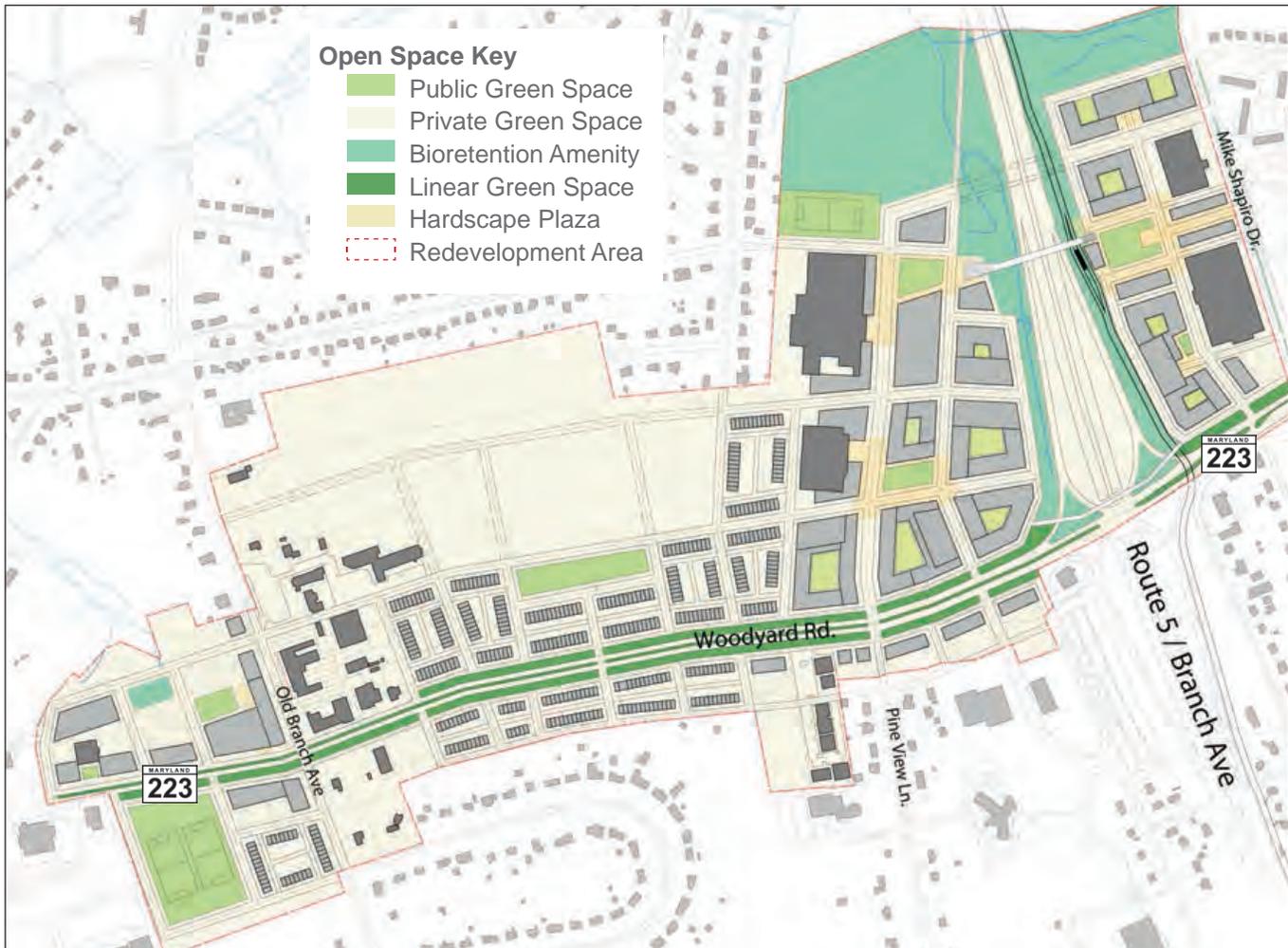
The *Central Branch Avenue Corridor Revitalization Sector Plan*, generated by M-NCPPC, builds on the planned premium transit line along MD 5. Focusing on the areas surrounding each proposed stop, the plan creates vibrant communities by redeveloping underutilized retail centers into moderate density, compact, pedestrian-friendly, transit-accessible, and unique places. The strategic goals include concentrating neighborhood-serving retail in centers; increasing employment opportunities in strategic areas; improving the transportation choices and connectivity; mitigating the impacts of industrial uses; enhancing streetscaping and creating unique public spaces; and protecting and strengthening existing neighborhoods.

As can be seen in Figure 9, the plan created for the MD 223 station area includes mixed use, medium density, multi-modal friendly development, new parallel and connecting roads, and better bicycle and pedestrian facilities. The plan redevelops existing homes and businesses in some

areas and builds around the existing development in other areas. This development may be more intensive than is supported by *Plan Prince George's 2035*, however its location at a premium transit stop provides incentive for higher intensity, transit oriented development.

Several new cross-sections were also developed for MD 223. Renderings of two cross-sections are shown in Figure 10. These cross sections include a multi-way boulevard with access lanes on the outside and 15' two-way cycle tracks on either side as well as a four lane section in more constrained areas. While these concepts help to solve some issues, such as the conflict between local and regional traffic and the high number of driveways on MD 223, the sections increase the total crossing distance for pedestrians by including access roads, multi-use paths, and landscaped median.

FIGURE 9 | CONCEPTUAL STATION AREA PLAN



SOURCE: CENTRAL BRANCH AVENUE CORRIDOR REVITALIZATION SECTOR PLAN (2012)

FIGURE 10 | CONCEPTUAL RENDERINGS FROM SECTOR PLAN



Clinton Shopping Center Visualization (MD 223 is not shown)
(SOURCE: CENTRAL BRANCH AVENUE CORRIDOR REVITALIZATION SECTOR PLAN (2012))



Woodyard Road Access Road Visualization (MD 223 is shown to the far right)
(SOURCE: CENTRAL BRANCH AVENUE CORRIDOR REVITALIZATION SECTOR PLAN (2012))

PUBLIC PARTICIPATION

FIGURE 11 | QUESTIONNAIRE RESPONDENT LOCATIONS

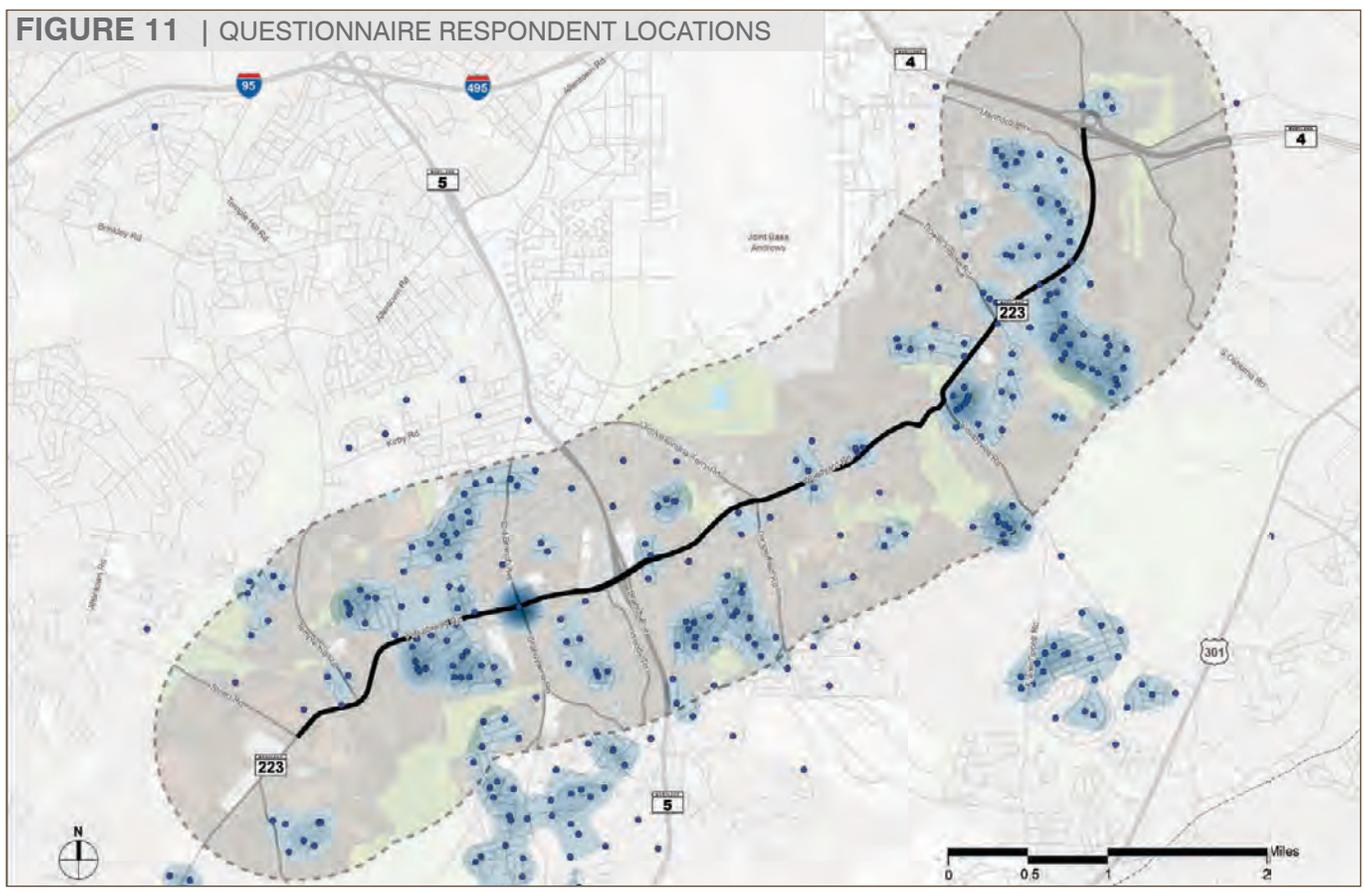


FIGURE 12 | QUESTIONNAIRE RESPONDENT ISSUES AND CONCERNS

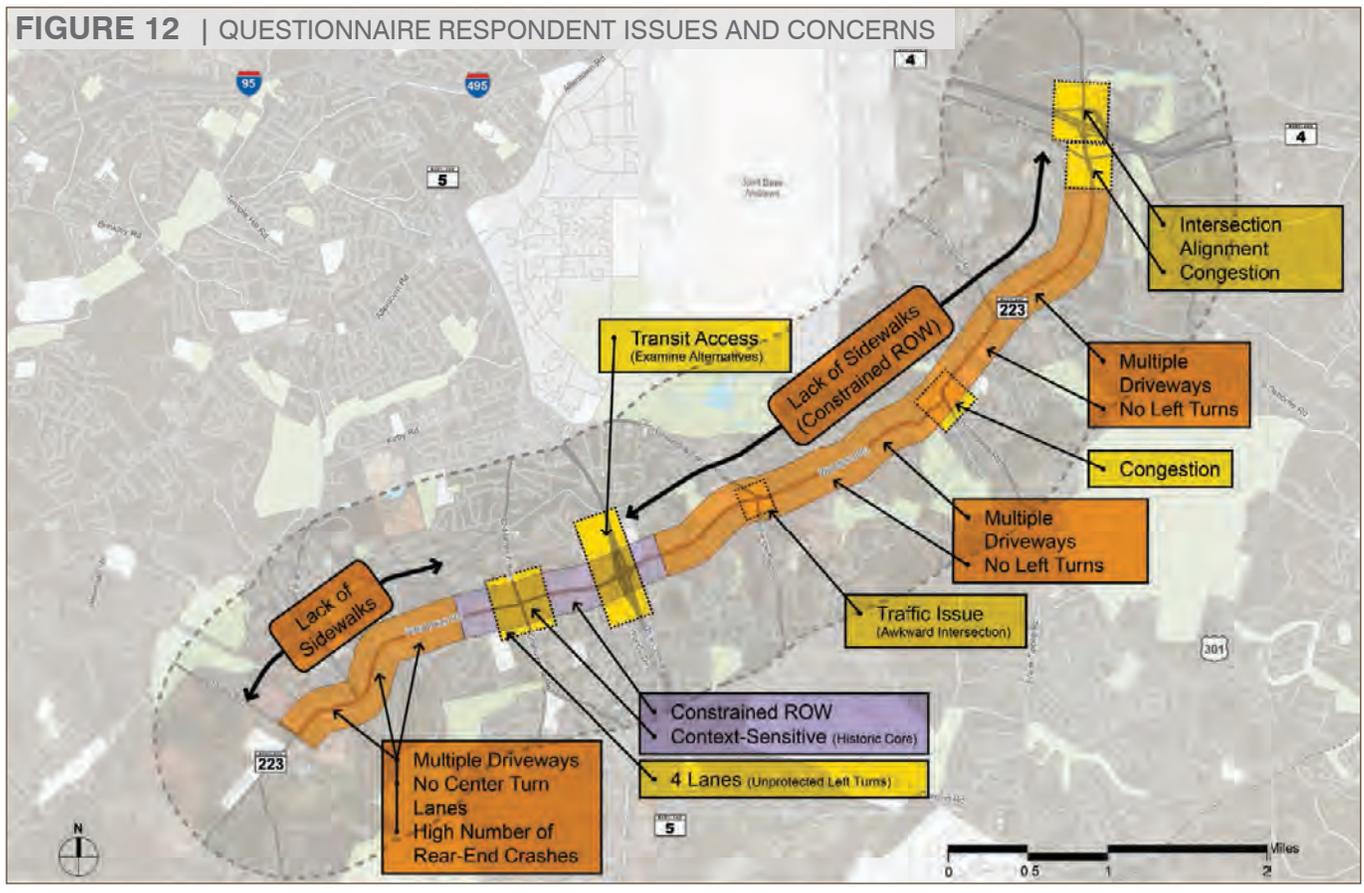


FIGURE 13 | SURVEY RESULTS*



* RESULTS SHOW PERCENTAGE OF RESPONDENTS THAT CITED THESE ISSUES, RESOURCES, AND CONCERNS

Input was gathered from residents, business owners, employees, and others in the study area to gain a better understanding of the concerns and desires of those who use MD 223. This input was an essential piece of the information gathering and goal setting process. It was collected in three ways:

- Postal Mail-In Surveys
- Participant Interviews
- Community Work Session

The following section provides a summary of the results of each of these processes.

Postal Mail-In Survey Results

Between the fall of 2013 and the spring of 2014, SHA mailed survey cards to residents living in and around the MD 223 study area. The survey collected information on where respondents live (Figure 11), how they use the corridor, what issues they saw within the corridor (Figure 12), and the types of improvements they would like to see in the corridor. Figure 13 is a graphic interpretation of the results. The greatest concern is traffic along the corridor, although pedestrian connectivity was also identified as a major concern. Residents were also concerned about the impact to the community’s character, as evident by the concerns regarding homes and community resources.

Participant Interview Summary

Between April 2014 and July 2014, participant interviews were conducted either in person or on the phone. Many of the participants had similar responses to the mail-in survey responses, and their concerns were more specific. Prince George’s County Commissioner, Mel Franklin, expressed an interest in

seeing MD 223 be expanded to four lanes throughout the study area to help solve the volume of calls he receives regarding traffic within the corridor. Lt. Joe Swisher, of the Clinton Volunteer Fire Department (VFD), also expressed concerns over the traffic volume on MD 223 and how it affects the Clinton VFD’s ability to respond to emergency calls. He requested that, at a minimum, MD 223 should have a center turning lane throughout the corridor to allow for vehicles to move for easier access for fire trucks to clear existing traffic when responding to an emergency.

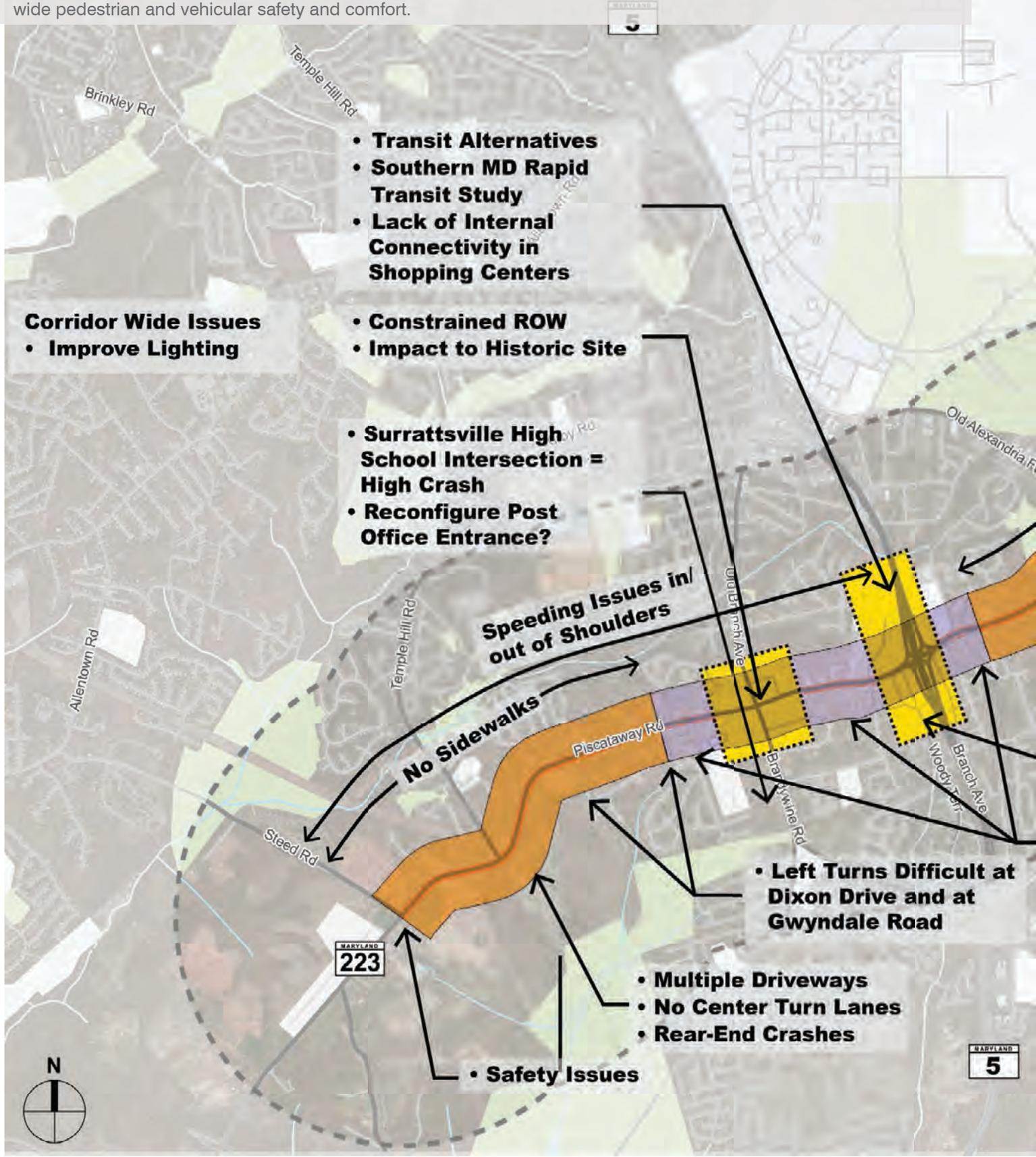
Community Work Session Results

SHA conducted a public meeting for the MD 223 Corridor Planning Study on June 11, 2014 at Surrattsville High School from 6-8pm. A total of 37 citizens attended. During the meeting, attendees were encouraged to ask questions, and give comments related to the project, which were recorded on flip charts. Attendees were also invited to use stickers to indicate and label on maps the locations associated with their comments. A total of 22 comments by attendees were recorded. A summary of those issues and concerns are represented on the map on the following page (Figure 14).

ISSUES & CONCERNS

A number of issues and concerns were identified by the public, and from the relevant plans and studies conducted previous to this study. The issues and concerns range from specific intersection traffic-related problems to corridor-wide pedestrian and vehicular safety and comfort.

Previous studies identified major improvements, such as the proposed transit station at the MD 5/ MD 223 interchange. These issues and concerns are represented graphically and spatially in Figure 14.



Corridor Wide Issues

- Improve Lighting

- Transit Alternatives
- Southern MD Rapid Transit Study
- Lack of Internal Connectivity in Shopping Centers

- Constrained ROW
- Impact to Historic Site

- Surrattsville High School Intersection = High Crash
- Reconfigure Post Office Entrance?

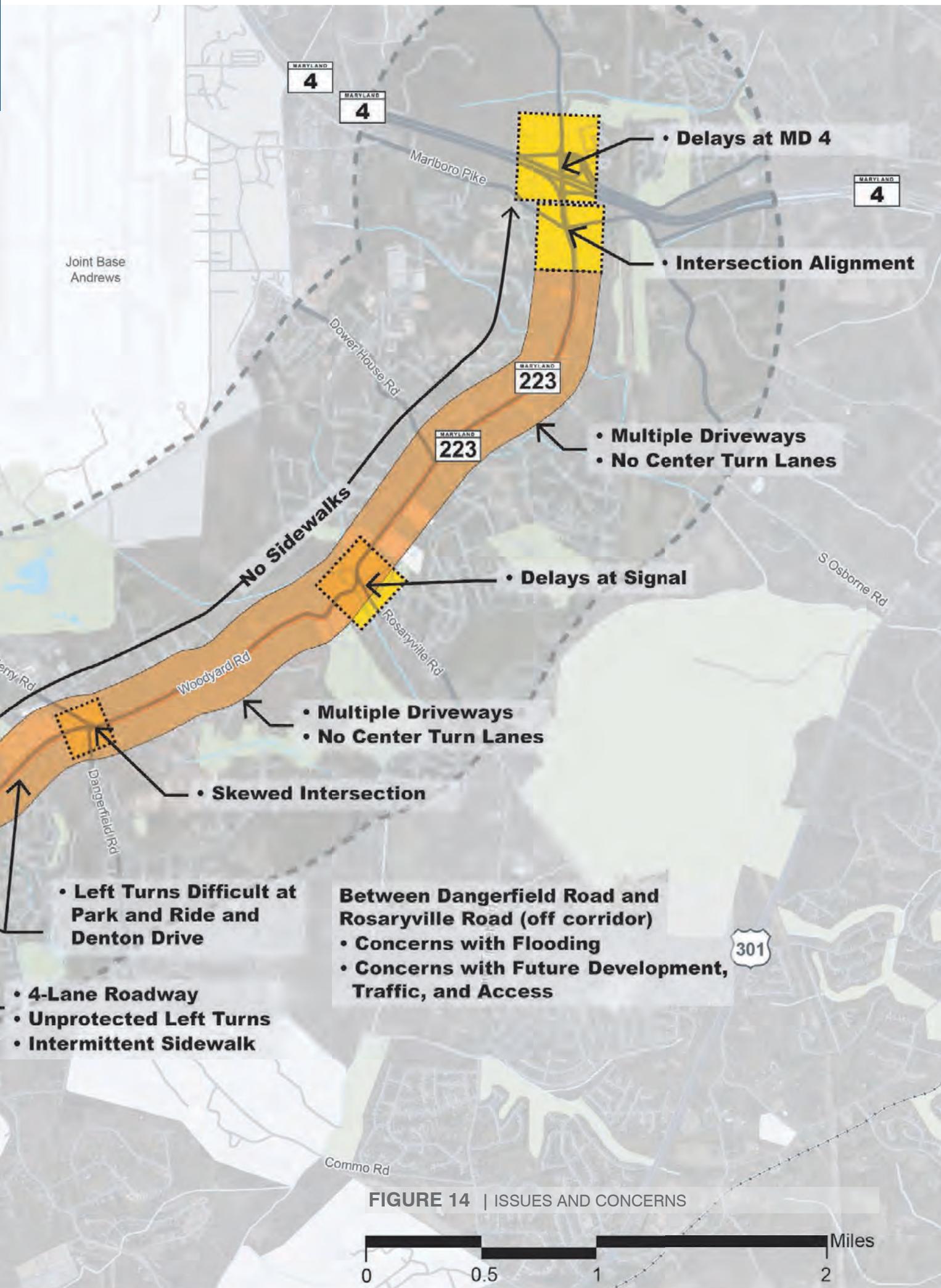
Speeding Issues in/out of Shoulders

No Sidewalks

Left Turns Difficult at Dixon Drive and at Gwyndale Road

- Multiple Driveways
- No Center Turn Lanes
- Rear-End Crashes

Safety Issues



Joint Base Andrews

MARYLAND
4

MARYLAND
4

MARYLAND
4

Marlboro Pike

Dower House Rd

MARYLAND
223

MARYLAND
223

- Multiple Driveways
- No Center Turn Lanes

No Sidewalks

- Delays at Signal

S Osborne Rd

Woodyard Rd

Rosaryville Rd

- Multiple Driveways
- No Center Turn Lanes

- Skewed Intersection

- Left Turns Difficult at Park and Ride and Denton Drive

Between Dangerfield Road and Rosaryville Road (off corridor)

- Concerns with Flooding
- Concerns with Future Development, Traffic, and Access

301

- 4-Lane Roadway
- Unprotected Left Turns
- Intermittent Sidewalk

Commo Rd

FIGURE 14 | ISSUES AND CONCERNS





**UNDERSTANDING THE MD 223 CORRIDOR
PLANNING STUDY AREA**

04

ENVIRONMENTAL CONTEXT

Environmental Context

Prince George's County has been proactive in preserving and protecting its natural and environmental resources. Figure 15 illustrates environmentally sensitive lands, the County's habitat conservation areas, and other environmental assets such as the fact that over 44 percent of the study area has tree coverage and nearly 95 percent of that tree coverage is preserved in habitat conservation areas. These areas may act as barriers for future development. They also help to create the unique places within the corridor.

Hydrology & Topography

The study area sits within the Piscataway Creek and the Western Branch Watersheds. The corridor's topography (Figure 16) naturally forms alternating valleys and ridges which are drained into several small creeks. MD 223 runs along the ridge, with land sloping on the northern and southern sides. The Pea Hill Branch Creek runs parallel to MD 223 on the northern side, while the Piscataway Creek and the Butler Branch Creek drain on the southern side of the corridor. The red circles show areas that are the most prone to flooding on MD 223.

Environmental Synthesis

Figure 17 presents a synthesis of the environmental conditions, showing the environmentally sensitive areas and the developed and developable areas. Future development will likely occur within the corridor in the developable areas, thereby increasing the existing density which may put pressure on environmentally sensitive areas. The County has stated in previous plans that development is preferred in previously developed areas, which will help to maintain the environmental assets currently found in the study area.

The red dots (Figure 17) on the synthesis drawing indicate environmentally "prone" areas on MD 223. This includes areas prone to flooding (especially where water crosses MD 223) and areas where MD 223 crosses dense areas of vegetation that are prone to wildlife movement/ migration, thereby increasing wildlife/vehicular incidents. These areas should be taken into special consideration as it relates to stormwater management, catchment areas, the size of culverts and/or bridges, and other implications of development.

FIGURE 15 | ENVIRONMENTALLY SENSITIVE LANDS

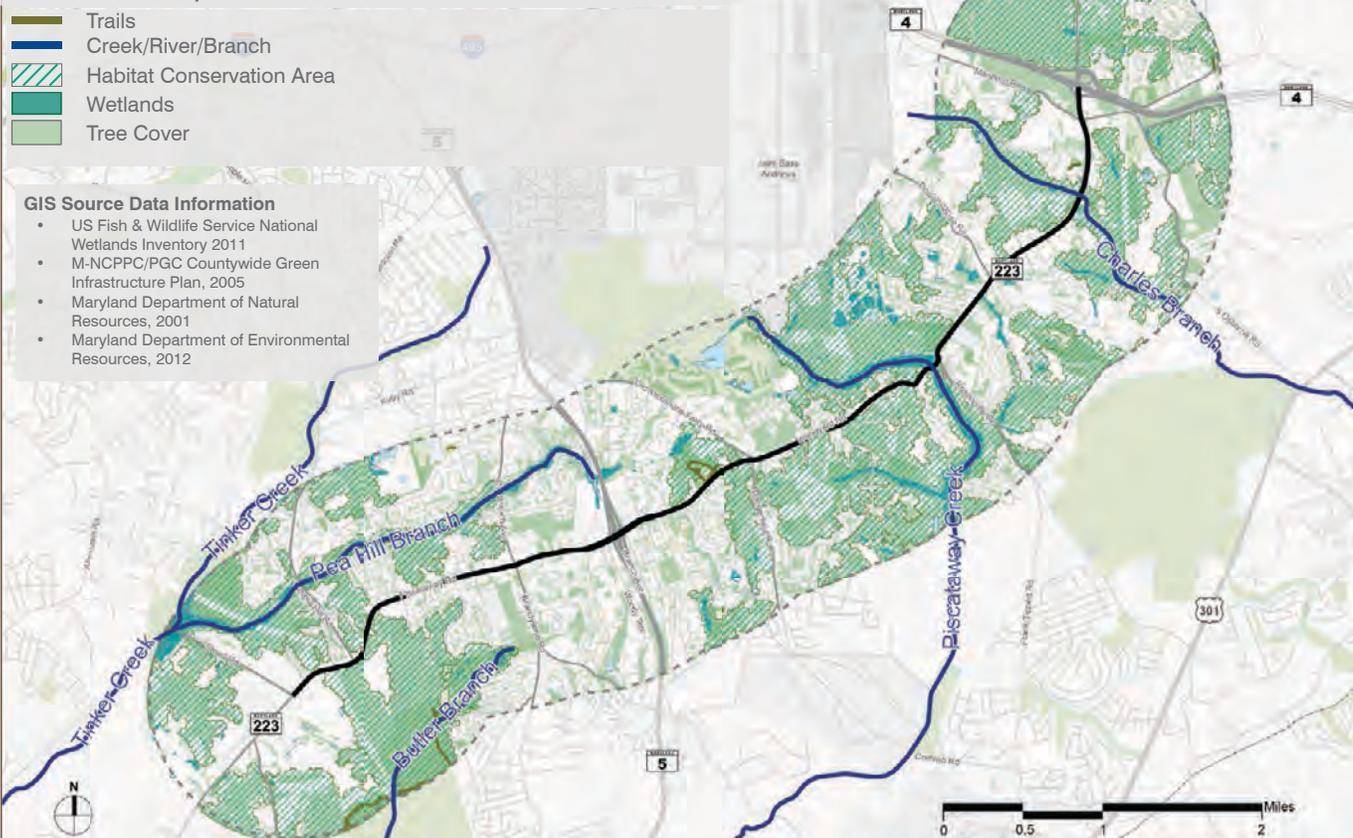


FIGURE 16 | FLOOD PLAINS AND TOPOGRAPHY

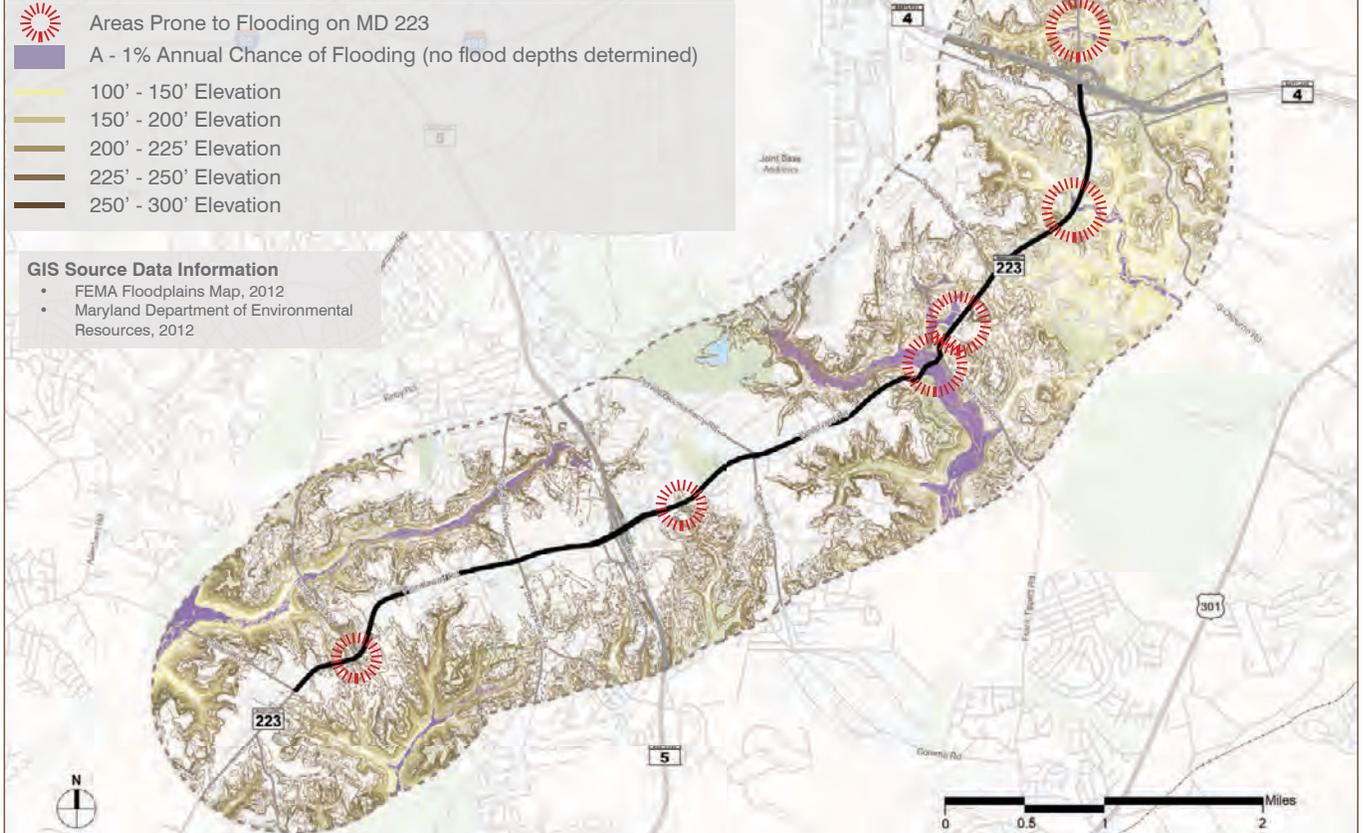
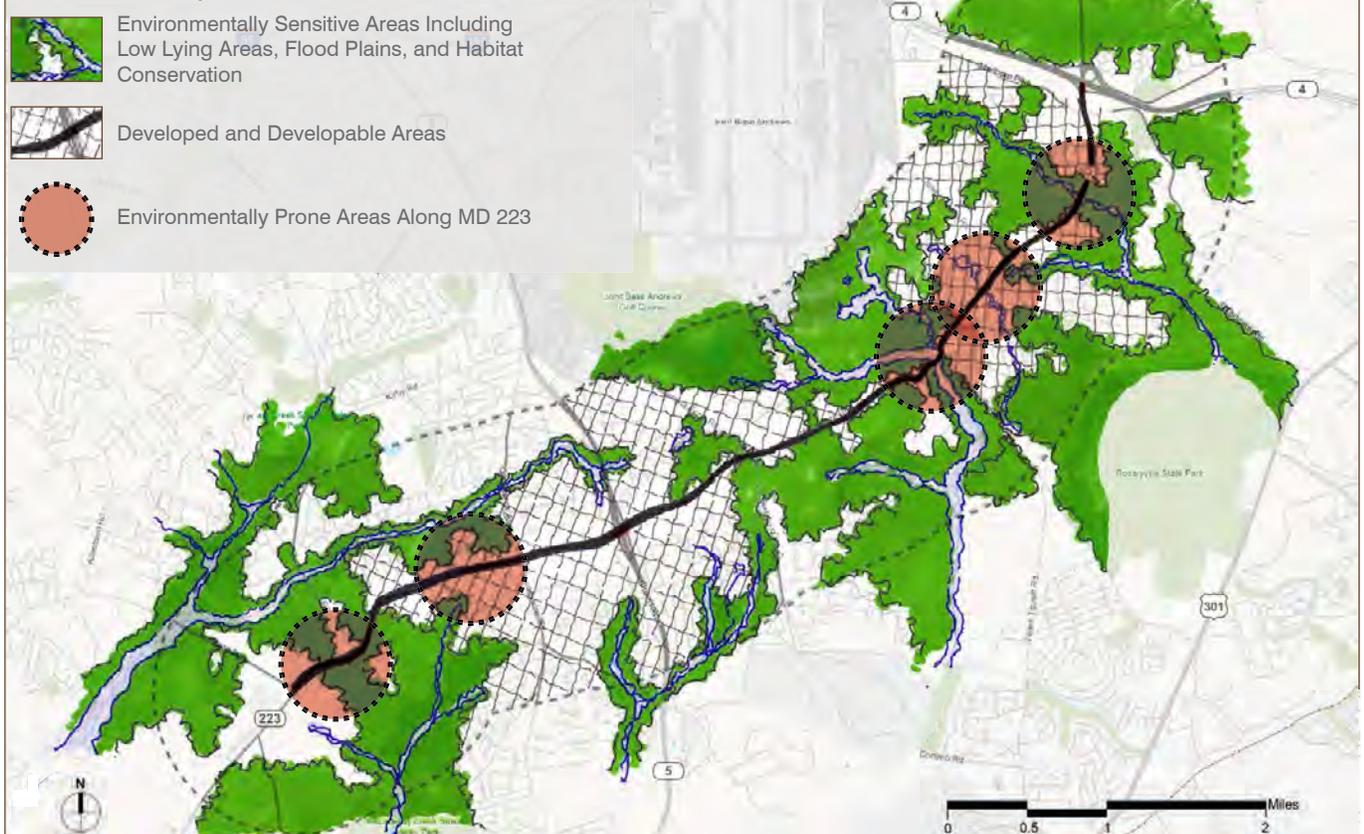


FIGURE 17 | ENVIRONMENTAL SYNTHESIS



HISTORIC & CULTURAL CONTEXT

Civic and Community Context

The MD 223 corridor is home to a number of diverse historical and cultural sites. Figure 18 shows the various civic, educational, religious, community, and recreational uses throughout the corridor. These places represent some of the primary destinations for travelers within the study area. Therefore, it is important to ensure that a number of transportation options are available to connect people to these principal places.

Cultural and Historic Context

Figure 19 displays cultural and historic sites along the corridor. These sites include structures that have been placed on the National Register of Historic Places including the Surratt House Museum, Melwood Park, and His Lordship's Kindness. The context also includes sites placed on the Maryland Historic Register such as the Clinton Rosenwald School (within the American Legion Building) and sites that are being considered for designation like the B.K. Miller Super Liquor Store. In addition to playing a major role in helping to create a story and special places in Clinton, these places also serve as destinations for residents within, and outside of the study area.

Cultural Clusters

Figure 20 shows an amalgamation of the civic, community, and cultural sites as a series of "cultural clusters." These clusters form a series of important places strung along the MD 223 corridor. The sense of place can be enhanced by finding ways to maximize connections between these destinations for all transportation users (pedestrian, bicycle, transit, and car). Connecting the cultural network can also help to maximize the ease of use within the corridor.

FIGURE 18 | CIVIC AND COMMUNITY USES

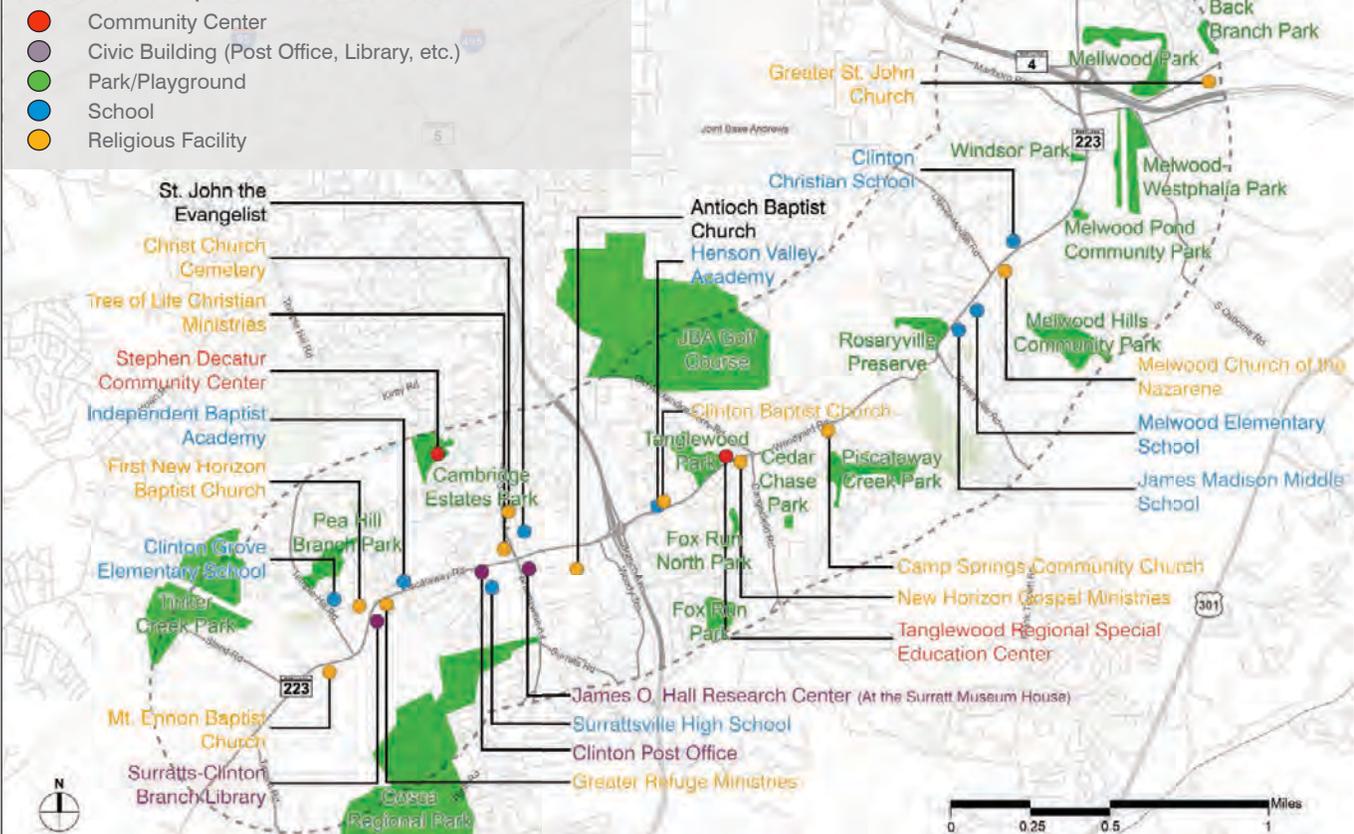


FIGURE 19 | CULTURAL AND HISTORIC SITES

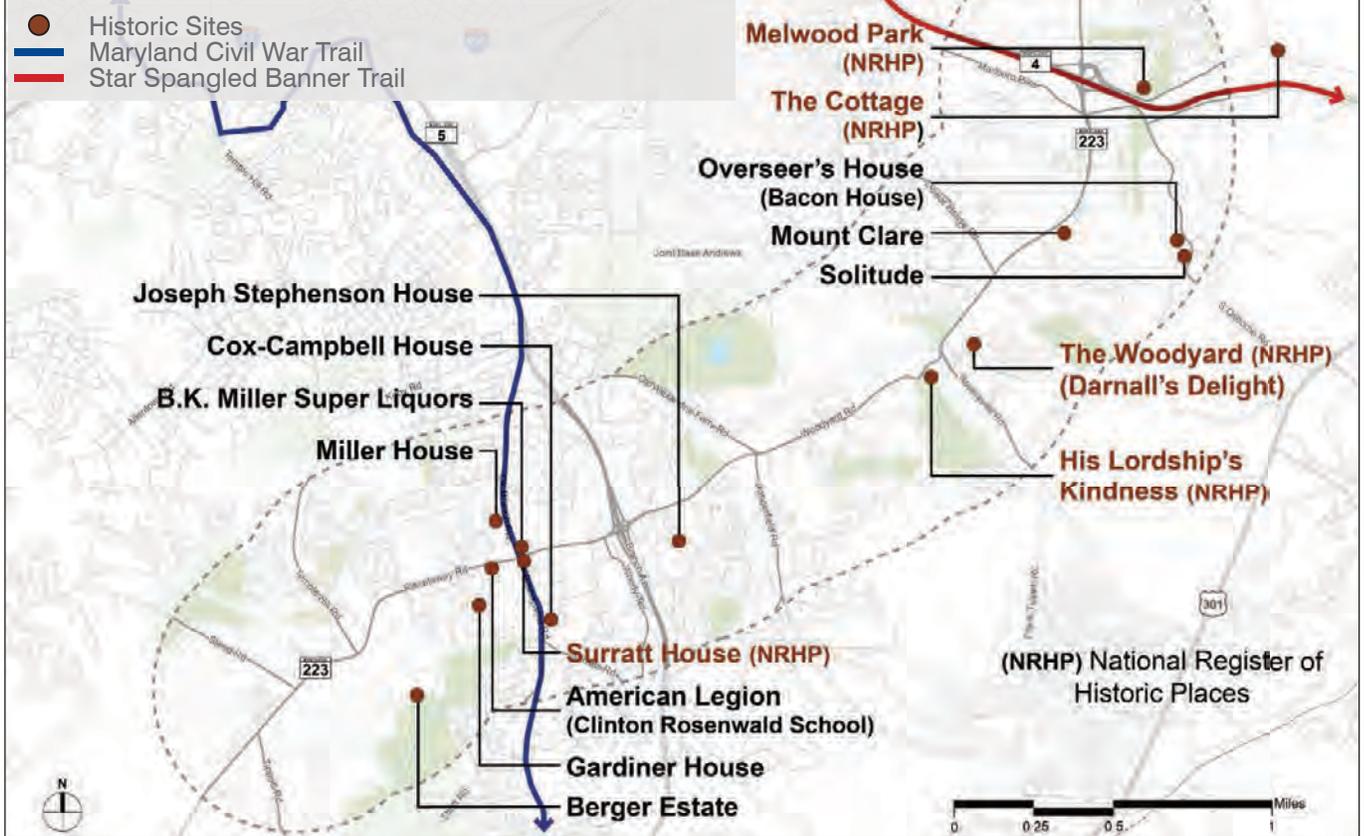
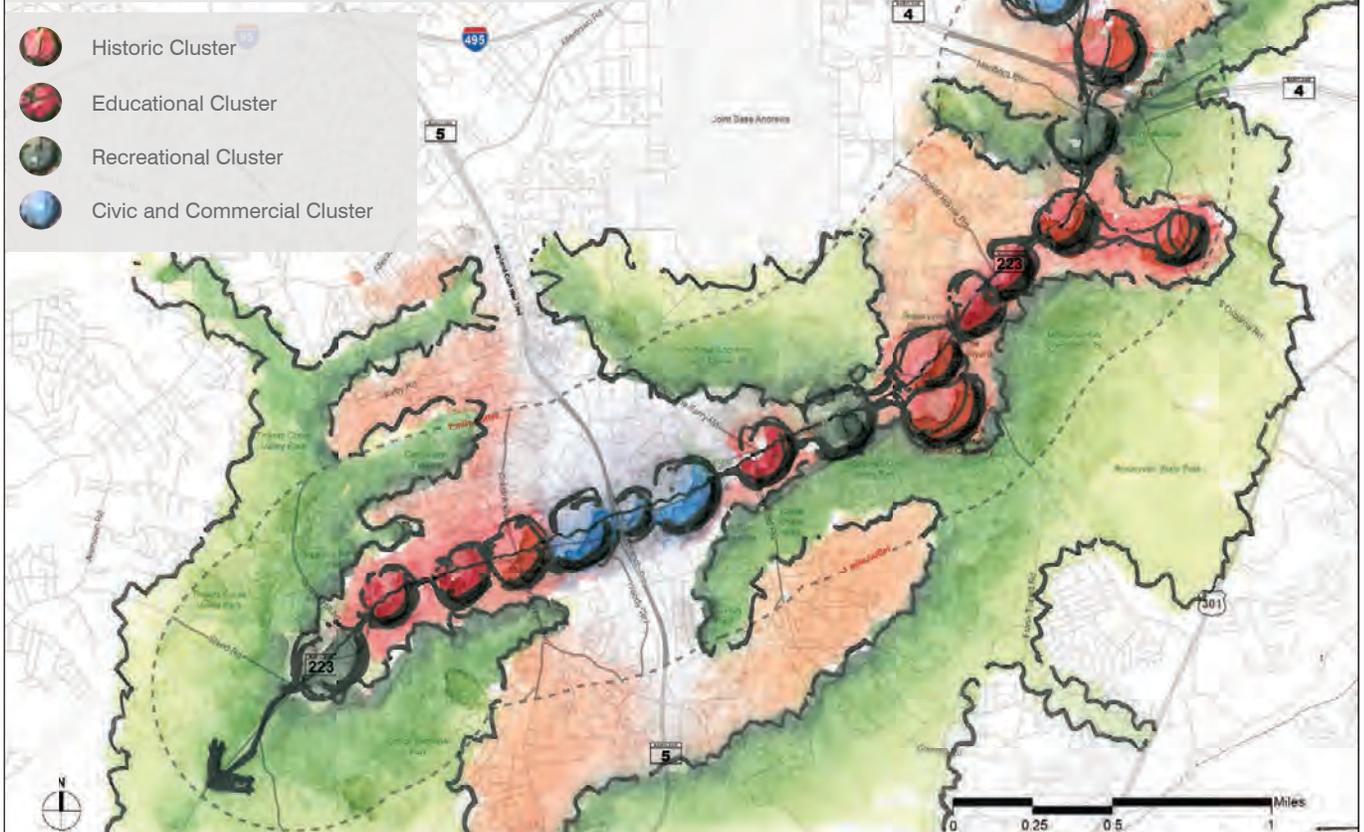


FIGURE 20 | CULTURAL CLUSTERS



DEMOGRAPHICS

Demographics and Land Use

According to the 2011 US Census (Figure 21), approximately 582 people living in the study area also work there. The top job type for both residents and employees in the study area is in the Public Administration (64.8%) sector. Each day, more than 16,000 employees travel into the study area, while nearly 13,000 residents commute out of the study area. Figure 22 shows that the majority of those residents are driving between 10-24 miles to work each day, with most of them commuting to Washington, DC. This illustrates the transportation trends and the distances traveled suggest that many of these people are being funneled to or from the highways, via MD 223, adding to congestion along the road.

The MD 223 corridor contains a diverse mix of allowable uses that are generally segregated by type. As seen in Figure 23, over half of the corridor is zoned Rural Residential and Open Space. The core areas adjacent to MD 5 are the most concentrated in terms of density and allowable building area, which will support transit oriented development around the new transit station at the interchange. Additionally, a large number of light industrial uses adjacent to Joint Base Andrews, enhance the economic connection between the Base and the surrounding areas. The population density, shown in Figure 24, reflects the zoning maps, with the densest areas being located around the MD 5 interchange. This is critical because as the population increases, more street network is needed to adequately disperse the traffic generated by the denser population.

FIGURE 22 | SOCIOECONOMIC TRENDS



Distance Employees in the Study Area Travel to Home

- 43% - Reside 10-24 miles away
- 25% - Reside less than 10 miles away
- 16% - Reside 25-50 miles away
- 6% - Reside more than 50 miles away

Distance Residents in the Study Area Travel to Work

- 61% - Work 10-24 miles away
- 21% - Work less than 10 miles away
- 13% - Work 25-50 miles away
- 5% - Work more than 50 miles away

FIGURE 21 | WORKER INFLOW & OUTFLOW

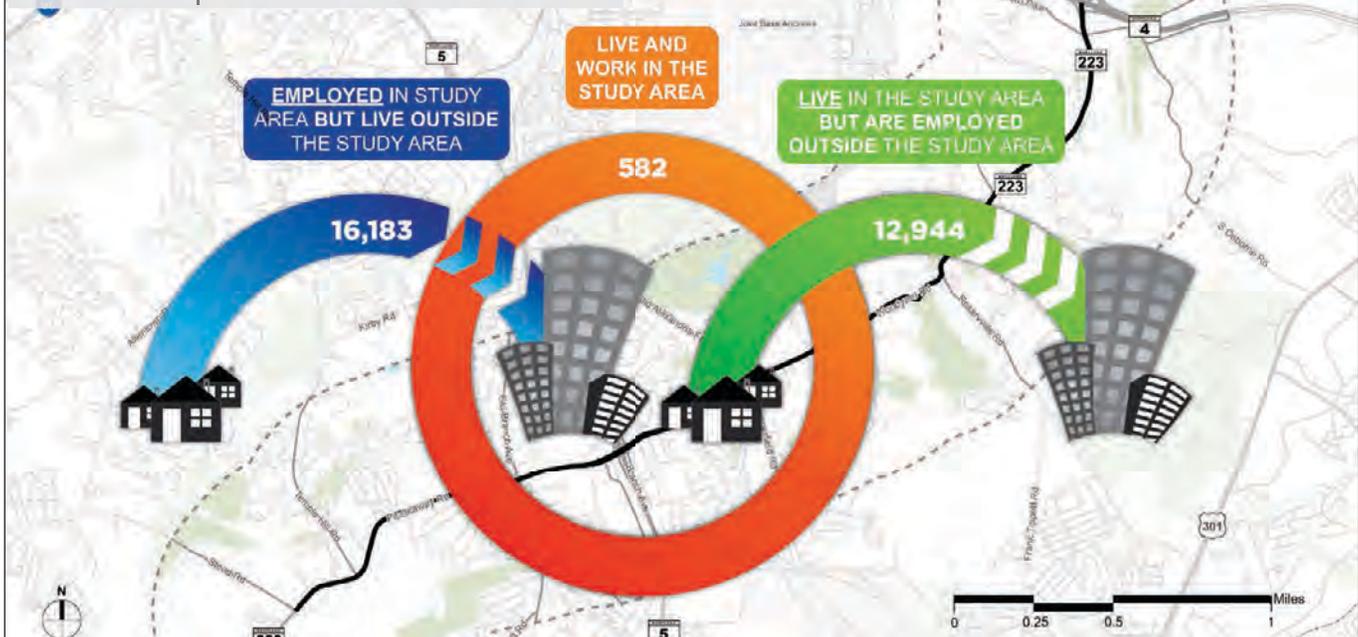


FIGURE 23 | ZONING

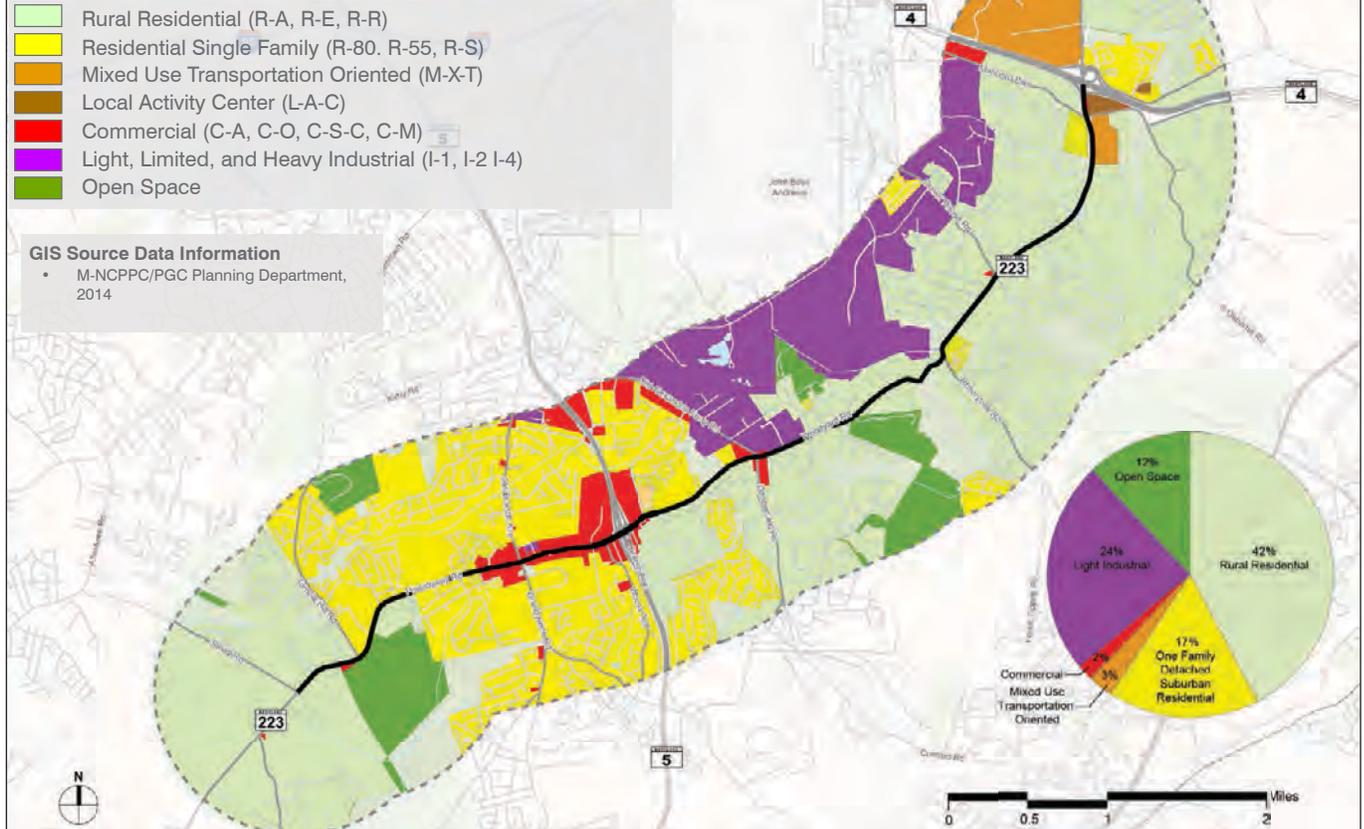
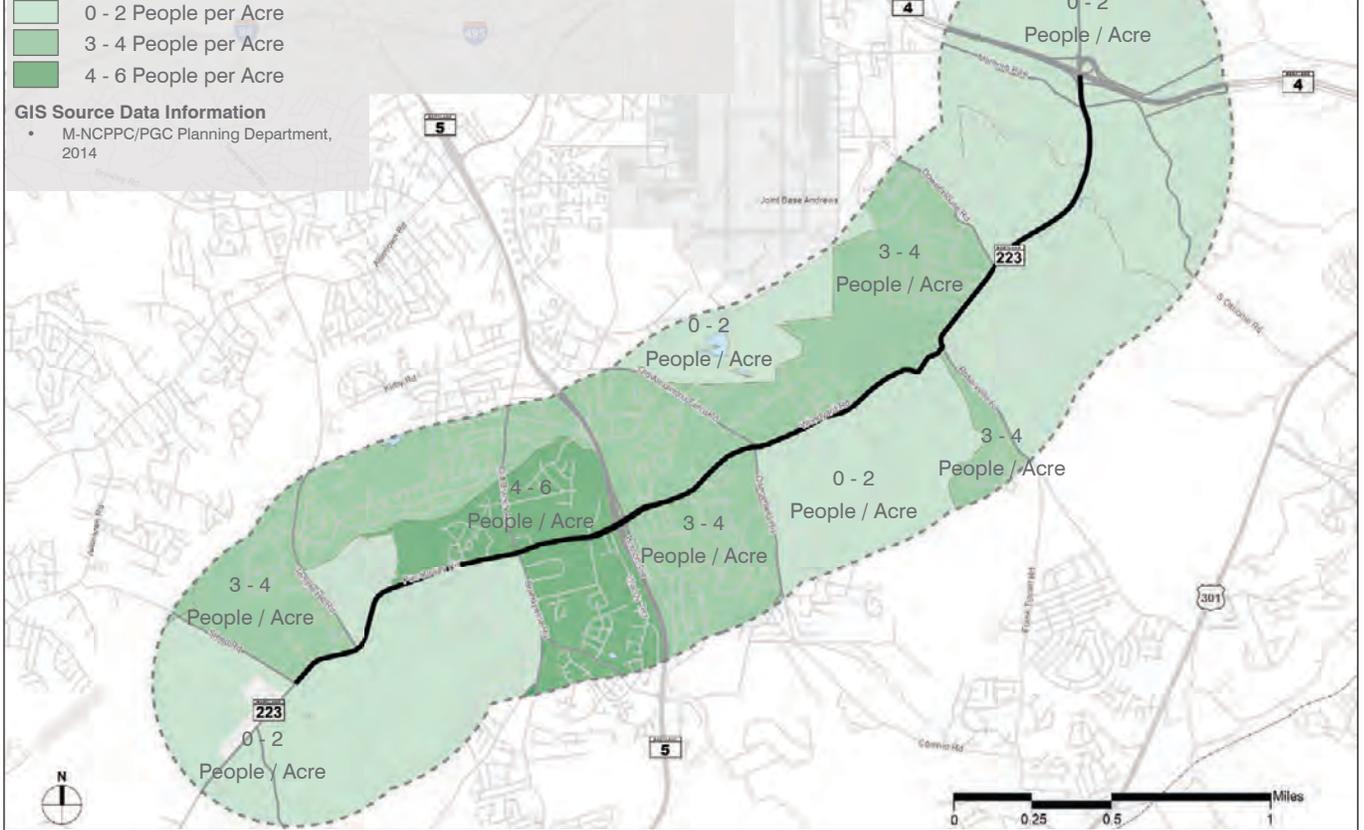


FIGURE 24 | POPULATION DENSITY



TRANSPORTATION CONTEXT

Roadway Network

Figure 25 shows the existing street network in the region. This area has developed in a traditional suburban pattern with many roads terminating at the end of housing developments impeding access. In Figure 26, the streets that are either dead end or do not connect to other streets have been removed to graphically show that there is limited network connectivity in the area. MD 223 is the only east-west connection through the study area, forcing users to use MD 223 for nearly all east-west trips. Some connections are prevented due to Joint Base Andrews (JBA) and Rosaryville State Park.

JBA is accessed through three gates (shown in Figure 26 as Main Gate, Virginia Gate, and Pearl Harbor Gate). Virginia Gate is the primary gate for employees and visitors from the west, south, and east. Pearl Harbor Gate is the primary gate for all heavy commercial vehicles and delivery services. Both of these gates directly impact traffic conditions on MD 223 through the intersections at Old Alexandria Ferry Road and Dower House Road.

FIGURE 25 | STREET NETWORK

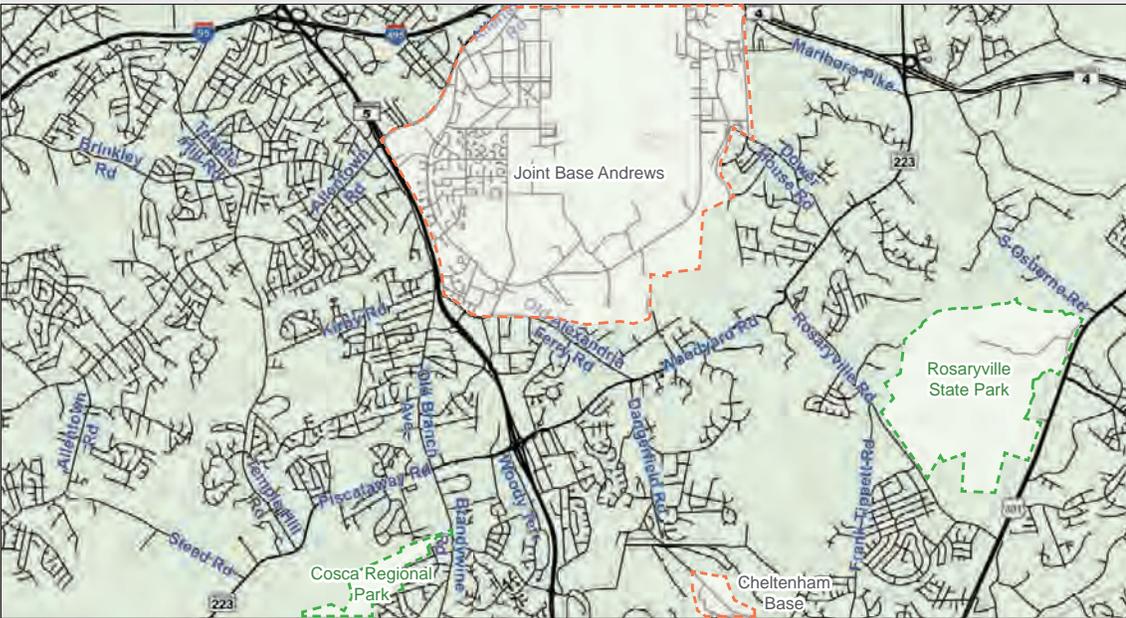
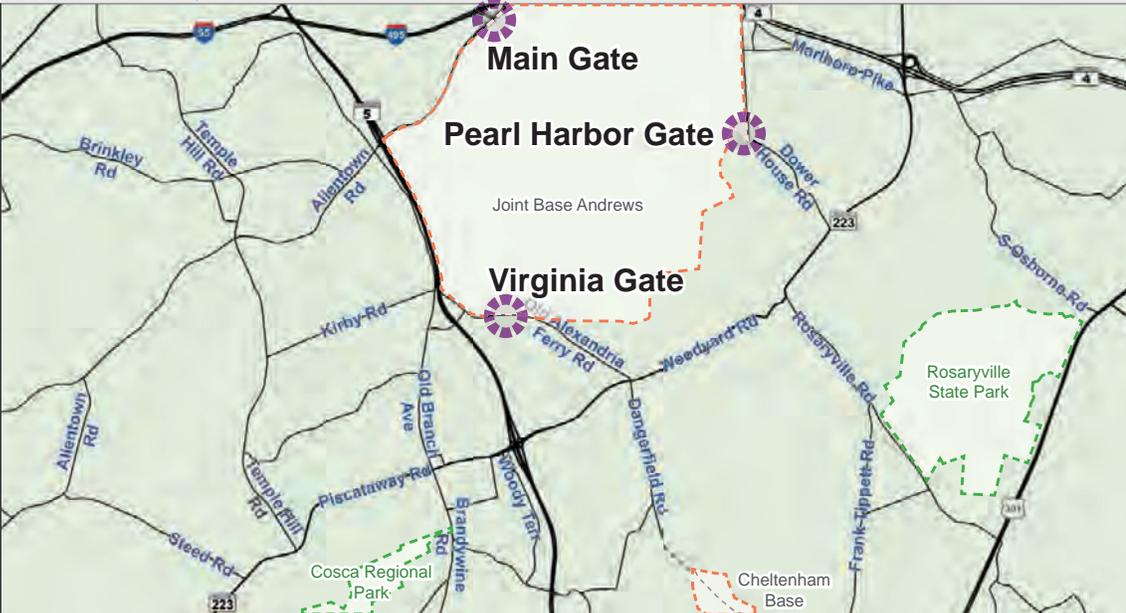


FIGURE 26 | CONNECTED STREET NETWORK



Existing Transit Routes

In the MD 223 study area, there are two transit providers: *TheBus* (operated by Prince George’s County) and Metrobus (operated by WMATA). *TheBus* generally provides bus service within Prince George’s County, while Metrobus provides service to and around Washington DC. Within the study area, there is a concentration of transit around the MD 5 Interchange. WMATA operates the Clinton Park and Ride Lot (CPRL) located to the south of MD 223 and west of MD 5. The stop at this location includes all transit routes, with the exception of The Bus Route 20. The majority of the transit service is provided within the highest density areas; however there is a lack of transit on MD 223 between Old Alexandria Ferry/Dangerfield Road and MD 4.

shown in Figure 27. The Woodyard Road (MD 223) stop is proposed in the northeast property of the MD 5/ MD 223 interchange known as the “Clinton Shopping Plaza Center.” The preferred alternative includes a pedestrian bridge crossing adjacent to the station linking to the Woodyard Crossing shopping area. Current plans do not address vehicular or pedestrian access to and from the CPRL.

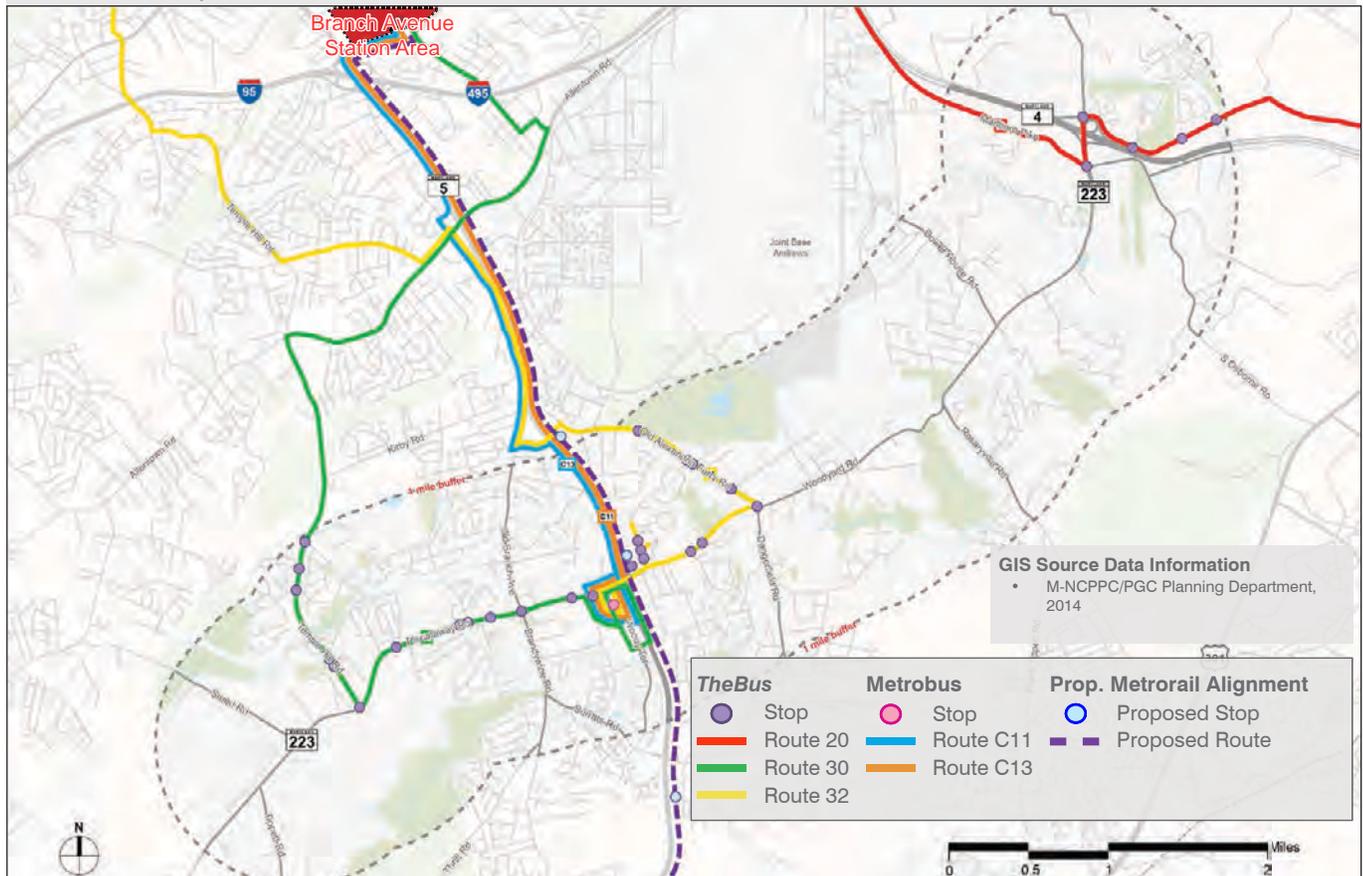
Proposed Transit Routes

As discussed in the previous studies section, a future premium transit route is planned along MD 5. This premium transit route will extend along MD 5 from White Plains in Charles County north to the Branch Avenue Metro rail station in Prince George’s County, where it will connect to the Metrorail system via the Green Line. The proposed alignment and stops are

Transit Synthesis

The *Central Branch Avenue Corridor Revitalization Sector Plan* addresses some vehicular and pedestrian access issues within the redevelopment of Woodyard Crossing with additional street network and realignments for both the *TheBus* and Metrobus routes. The plan only propose two connections across MD 223, which limits the access to the CPRL. Therefore, the portion of MD 223 that fronts both Woodyard Crossing and the Clinton Plaza Shopping Center (including the area under the overpass/intersection of MD 5 & MD 223) will require a future comprehensive design for access and circulation for transit users, motorists to the station area, and adjacent land uses.

FIGURE 27 | EXISTING TRANSIT ROUTES



SAFETY CONTEXT

Safety Analysis

A detailed safety analysis and the crash history of the corridor was completed by SHA. SHA reviewed the crash data reported during the three year period from January 1, 2009 to December 31, 2011 from Glenview Drive to MD 4. There were 427 crashes were reported along the corridor during this period, which is below the statewide average on similar corridors. However, left turn crashes (16%) and other related collisions crashes (7%) are higher than the statewide average. Additionally, two fatalities were reported during the study period and 41% of the crashes resulted in an injury. Rear-end crashes were the most predominant collision types reported during the study period, accounting for 30% of the total crashes. Figure 28 displays the statistical analysis of the crash types reported in the corridor.

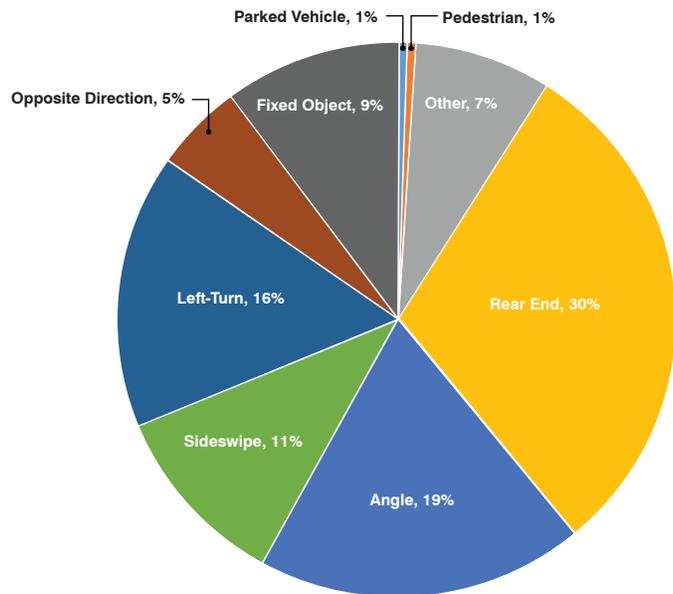
Frequent Driveways and Crash Rates

A common cause of left turn and rear end crashes can be frequent driveways or intersections, where motorists tend to slow down to turn. Figure 29 shows how the driveways/intersections are related to crashes. In the segment of MD 223, between Mark Shapiro Drive and Hardesty Drive, the heat map shows a correlation between high driveway densities and a high number of crashes. In this section, driveway consolidation or even elimination could be explored, as access to many of the land uses are already provided on cross streets. As driveways are eliminated and consolidated in this area, it will be important to look for opportunities to balance the needs of motorists, bicyclists, and pedestrians using MD 223.

Urban vs. Rural Road Configuration

Much of study area is transitioning from rural and suburban patterns of development to more urban patterns. MD 223 and intersecting roads are still transitioning to match this newer urban form. For instance, a contributing factor to crashes at the MD 5 interchange is the high-speed right turns coming off the MD 5 ramps onto MD 223. The large ramp radii on the NB and SB off-ramps of the interchange is inappropriate for the urban context and land use patterns present in downtown Clinton where interchange traffic meets pedestrians and low speed traffic on MD 223. A lower turning speed is recommended to ensure vehicular and pedestrian safety, and a narrower ramp configuration (diamond interchange for example) at the interchange could also improve safety. It is particularly important to improve safety in this area because of the current and proposed increases in pedestrian traffic from the future premium transit station and proposed redevelopments.

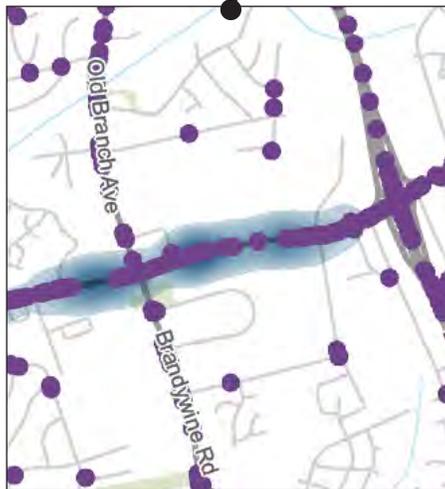
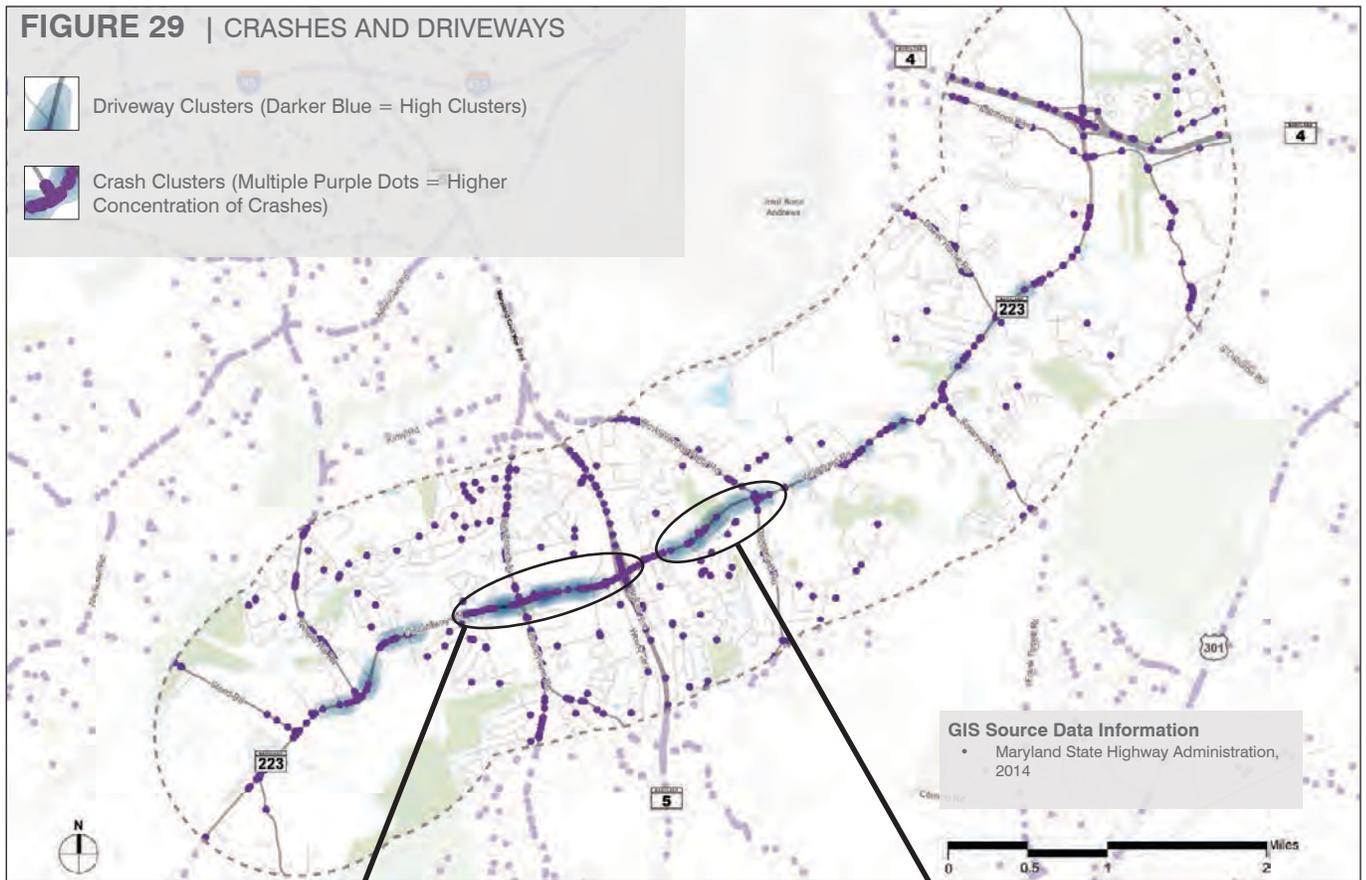
FIGURE 28 | CRASH TYPES



Channelized Right Turn Lanes

There are other areas within the corridor where a higher number of crashes occur - mostly around intersections. Two of these intersections, Dangerfield Road/Old Alexandria Ferry Road and Rosaryville Road, have channelized right-turn lanes. Channelized right-turn lanes provide vehicles with a free-flowing lane (not controlled by signals or stop signs). This creates a conflict with pedestrians and vehicles where pedestrians often have to wait for gaps in traffic if vehicles do not stop for them. Channelized right-turn lanes can also pose a conflict between vehicles turning right and other vehicles traveling through along the intersecting roadway.

FIGURE 29 | CRASHES AND DRIVEWAYS



**MD 223 at Old Branch Ave/Brandywine Road
Crash/Driveway Cluster**



**MD 223 at Old Alexandria Ferry Road/Dangerfield Road
Crash/Driveway Cluster**

TRAFFIC ANALYSIS

FIGURE 30 | 2013 AADT NORTHBOUND



FIGURE 31 | 2013 NORTHBOUND AM PEAK

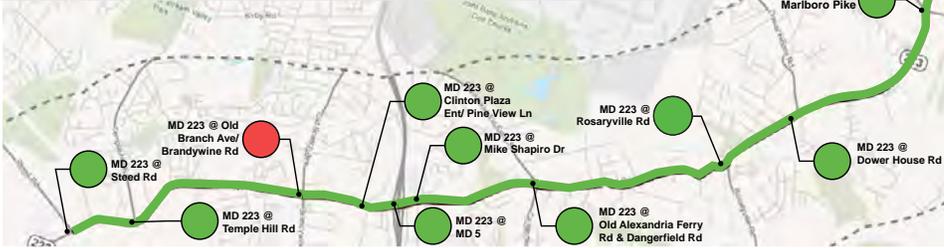


FIGURE 32 | 2013 NORTHBOUND PM PEAK



FIGURE 33 | 2013 AADT SOUTHBOUND

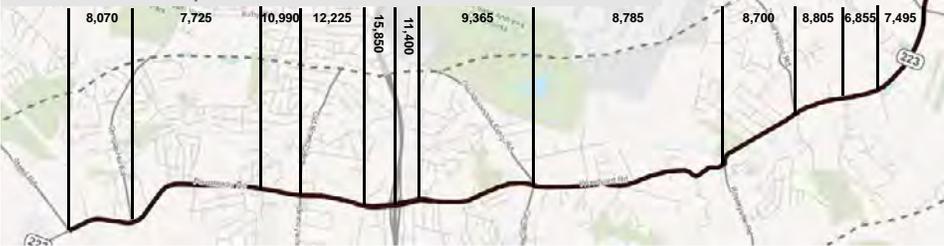


FIGURE 34 | 2013 SOUTHBOUND AM PEAK

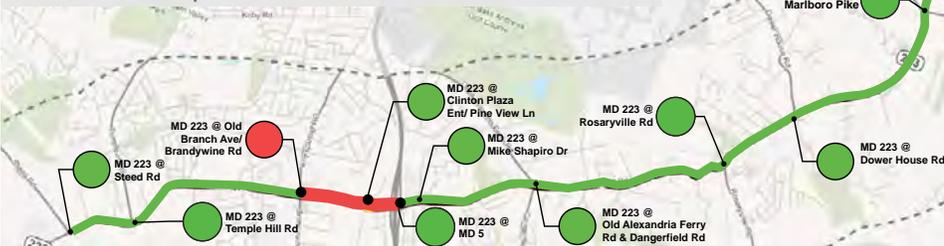
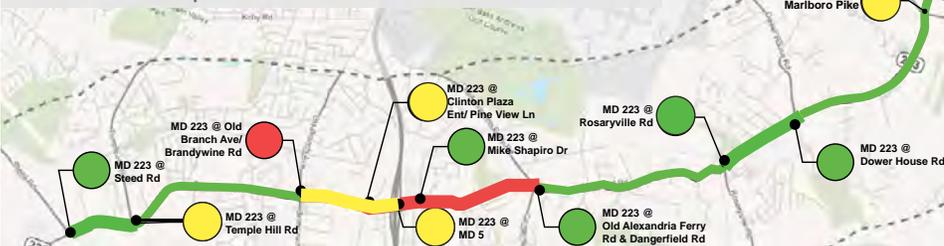


FIGURE 35 | 2013 SOUTHBOUND PM PEAK



Traffic Analysis

A detailed traffic study and analysis was completed at the start of this Corridor Planning Study. This analysis included traffic counts along the corridor, and modeled current and future design year traffic projections. The Metropolitan Washington Council of Government (MWCOG) and the Maryland Statewide model were used to determine the expected traffic growth on MD 223 and surrounding roads.

Using model outputs and NCHRP 255 post processing, the future 2040 volumes were developed. The data presented in Figures 30-41 includes current and future “No-Build” options. Traffic analysis of proposed improvements has been included with the descriptions of the projects in the report section “A Plan for Change.”

Annual Average Daily Traffic

These graphics illustrate the average daily traffic in the 2013 model (Figure 30 to Figure 35), and the 2040 design year model (Figure 36 to Figure 41). The traffic volumes along most of the corridor are fairly consistent. Slight variations occur between most segments, with the exception of the area between Brandywine/Old Branch and MD 5. This segment handles nearly twice as much traffic as all other segments. In addition, there is a substantial differential between the northbound (NB) and southbound (SB) volumes in this area, with the NB volumes approximately 40% higher than SB in 2013 as well as 2040.

Roadway Links	Intersection Links
■ LOS A-C (Desirable)	● LOS A-C (Desirable)
■ LOS D (Acceptable)	● LOS D (Acceptable)
■ LOS E-F (Failing)	● LOS E-F (Failing)

Level of Service

The existing and forecasted peak hour data was used to develop the intersection level of service. Critical Lane Volume (CLV) and SYNCRO/SimTraffic software was used to analyze the corridor. Figures 31, 32, 34, 35 and Figures 37, 38, 40, 41 illustrate the Level of Service for the intersections and links.

In 2013, only the Brandywine/ Old Branch intersection is failing in the AM and PM peak, in both NB and SB directions. This delay causes the link between Brandywine/Old Branch and MD 5 to fail in the SB PM peak in the 2013 model. In 2040, there are five failing intersections:

1. **Temple Hill Road:** Fails in the SB direction (AM, PM)
2. **Brandywine/Old Branch:** Fails in the NB and SB directions (AM, PM)
3. **MD 223 at Clinton Plaza:** Fails in the SB direction (AM, PM)
4. **Old Alexandria Ferry Road:** Fails in the SB direction (AM, PM)
5. **Marlboro Pike:** Fails in the NB SB directions (AM, PM)

In addition, the following links fail in 2040:

MD 223 NB AM Peak:

1. Between Steed Road and Brandywine Road/Old Branch Road;
2. Between Rosaryville Road and Marlboro Pike;

MD 223 NB PM Peak:

3. Between Steed Road and Brandywine Road/Old Branch Road;

MD 223 SB AM Peak:

4. Between Marlboro Pike and Dower House Road;
5. Between Rosaryville Road and Old Alexandria Ferry/ Dangerfield Road;
6. Between MD 5 and Brandywine Road/Old Branch Road;

MD 223 SB PM Peak:

7. Between MD 5 and Brandywine Road/Old Branch Road.

FIGURE 36 | 2040 AADT NORTHBOUND



FIGURE 37 | 2040 NORTHBOUND AM PEAK

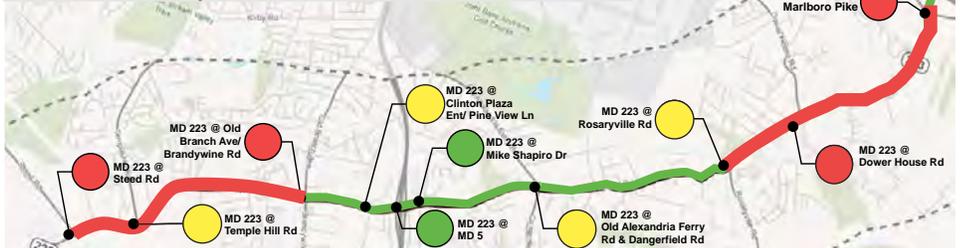


FIGURE 38 | 2040 NORTHBOUND PM PEAK



FIGURE 39 | 2040 AADT SOUTHBOUND

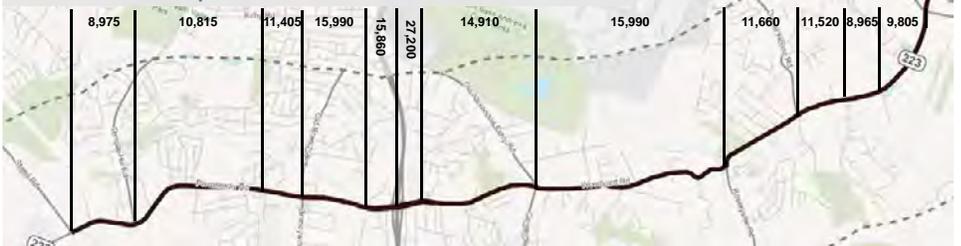


FIGURE 40 | 2040 SOUTHBOUND AM PEAK

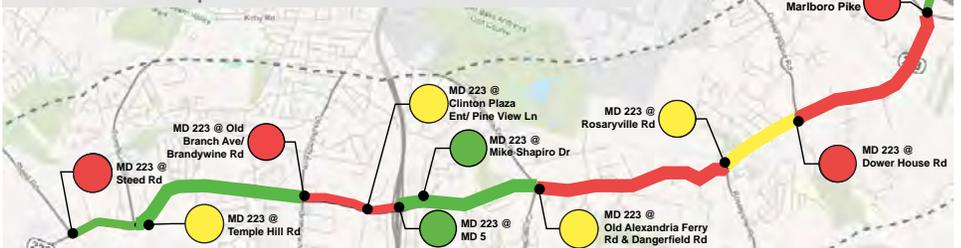


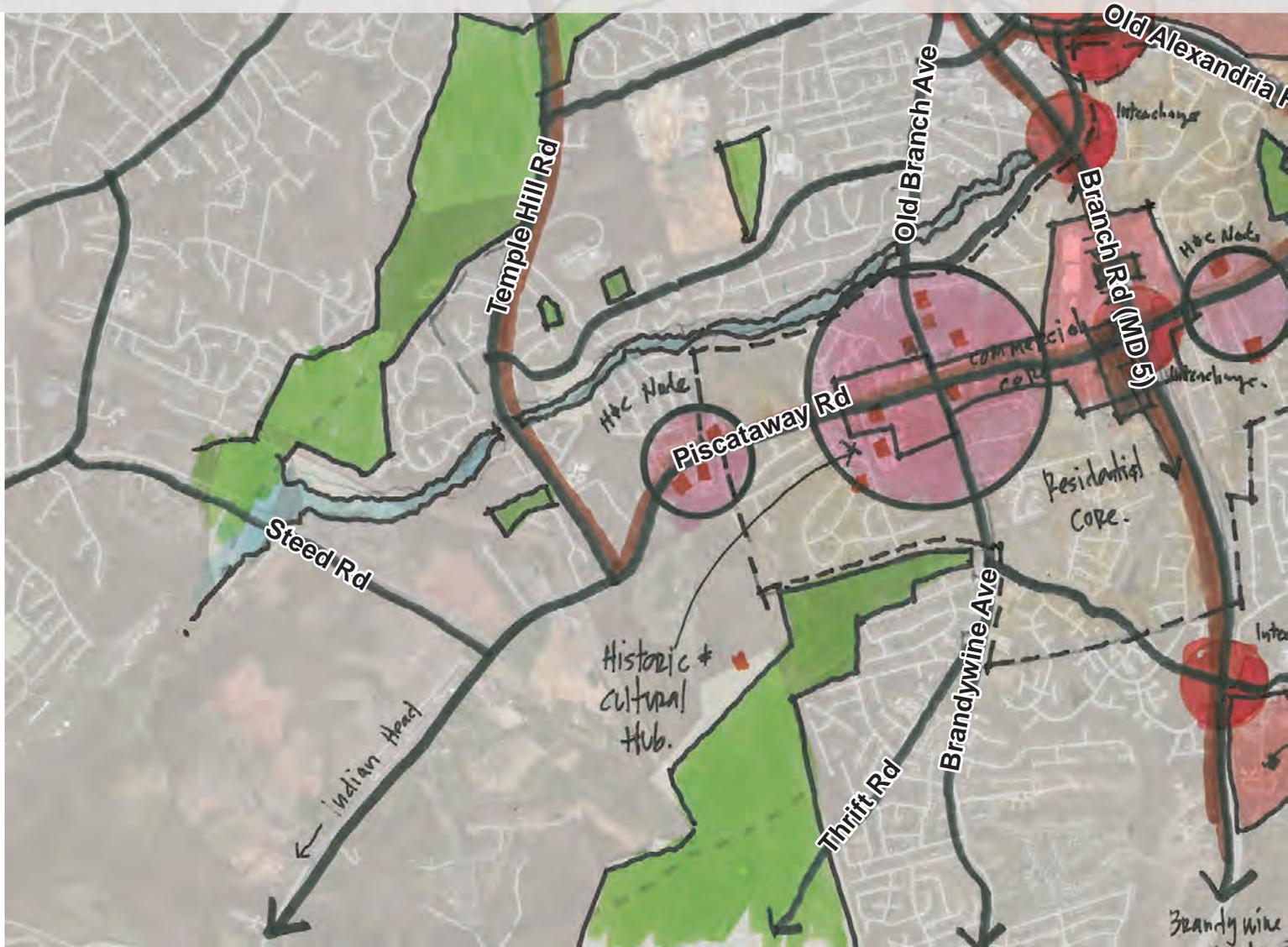
FIGURE 41 | 2040 SOUTHBOUND PM PEAK



CONTEXT SYNTHESIS

Synthesis is the process of combining of the constituent elements of separate materials (the previous “layers” of existing conditions) with abstract entities (like the public input and stakeholder comments) into a single or unified entity. When considering transportation and land use analysis as a whole, a synthesis (Figure 42) was developed that pointed to several conclusions regarding the study area:

- As Joint Base Andrews (JBA) grows, the properties in between JBA and MD 223 are redeveloping as industrial uses. While this redevelopment is helping to boost the economy and strengthen the connection to the Base, this change is threatening the existing rural character of the surrounding areas, and is creating congestion with truck and employee traffic.
- The MD 223 corridor is rich with historic and cultural resources. Clusters of these resources are connected by MD 223 and it will be important to ensure that any improvements to MD 223 would help strengthen these connections in the future.
- JBA has expressed a desire for greater multimodal options due to the volume of traffic received and the limited number of connections to it.
- There is a strong residential, historic, and commercial core at the intersection of MD 223 and MD 5. Along with the addition of a premium transit hub and the desire for transit oriented development, the density and increase in development will benefit from greater connectivity in the future.
- Green space and environmental assets are dispersed throughout the study area, providing recreational, environmental, and visual benefits. Protection from encroaching development in the future will be crucial, and where possible, they should be enhanced and connected.



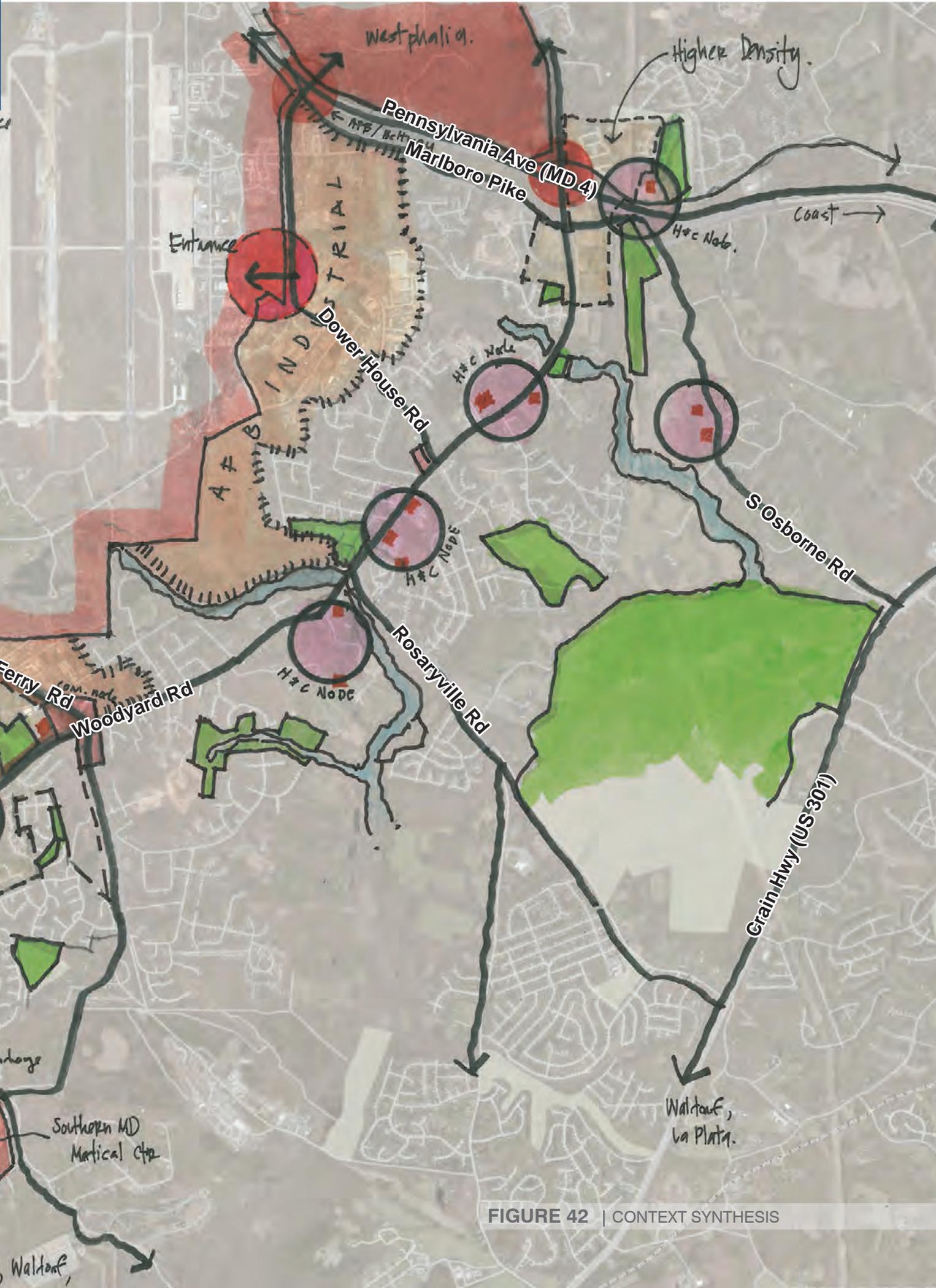


FIGURE 42 | CONTEXT SYNTHESIS

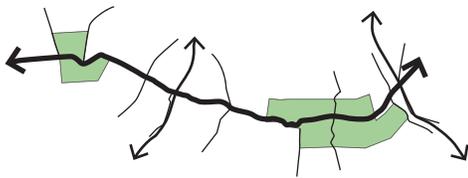
EXISTING TYPICAL SECTIONS

MD 223 can be characterized as an auto-oriented roadway, classified as a principle arterial. It lacks sidewalks and bike lanes throughout, but does not deter pedestrians or bicyclists from using the wide shoulders that exist through much of the corridor to walk and bike. This creates an unsafe condition for both pedestrians and bicyclists as they are forced to use only the street for automobiles.

Drainage is generally open, with wide drainage, grassed swales present in every district other than the Historic Core.

There is little tree cover near MD 223, and buildings are often set back from the roadway. The only exception to this is in the Historic Core, where buildings have remained relatively close to MD 223.

Lane widths vary between 12'-13' throughout the study area, with the exception of the Historic Core, where there are 11' lanes. The wide lanes and lack of visual barriers lend the road to faster vehicle speeds, and many residents commented that drivers often use the shoulders as "passing lanes" to get around left-turning vehicles in the two lane sections.



Rural Residential

48

MD 223 Corridor Planning Study

FIGURE 43 |
RURAL
RESIDENTIAL
CROSS SECTION 1

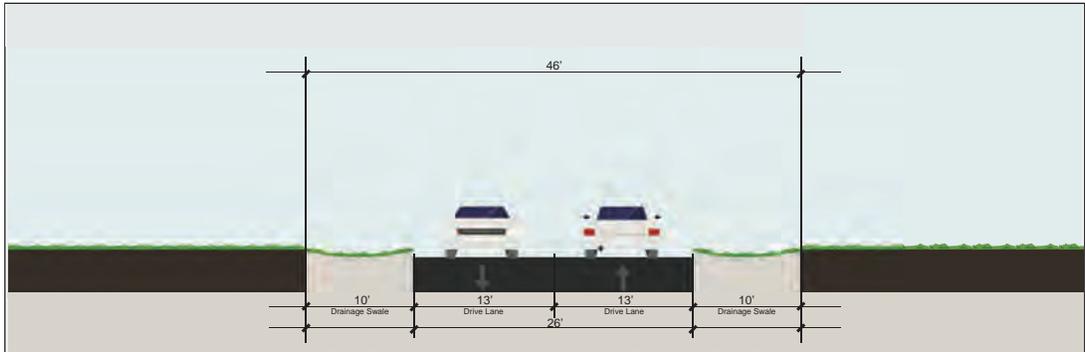


FIGURE 44 |
RURAL
RESIDENTIAL
CROSS SECTION 2

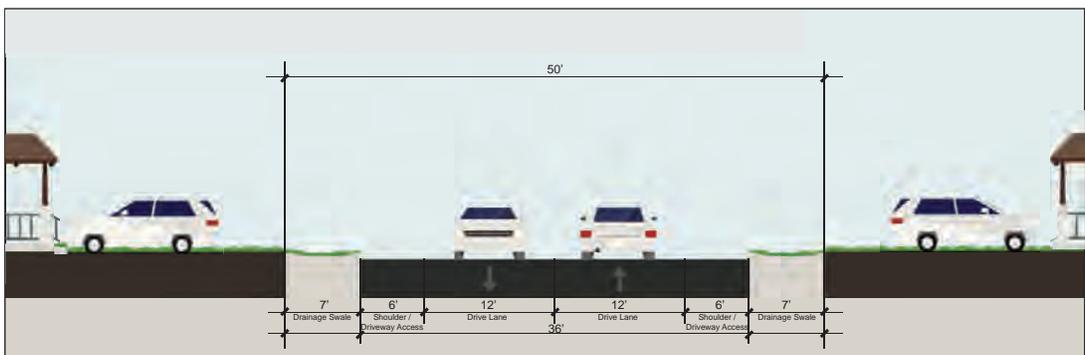
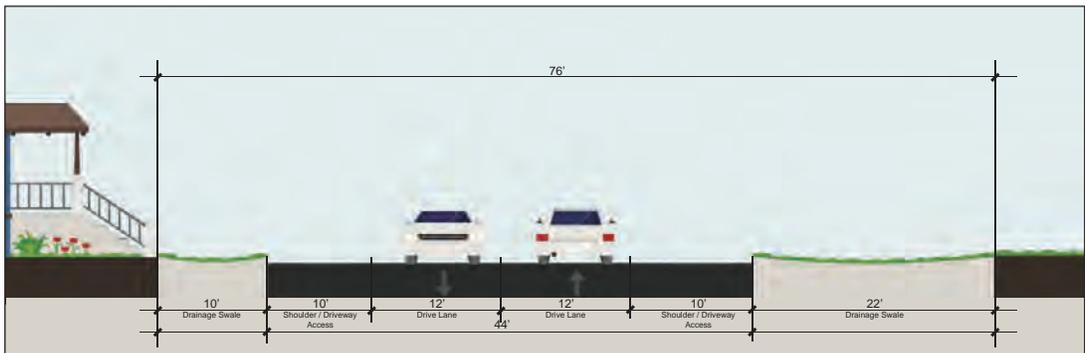
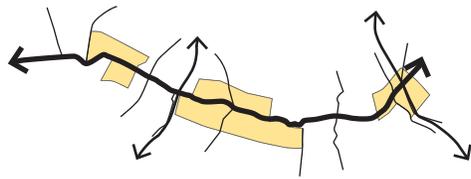


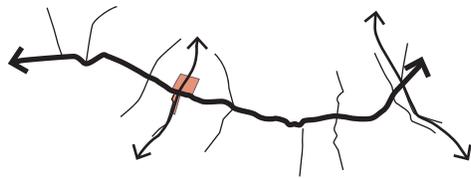
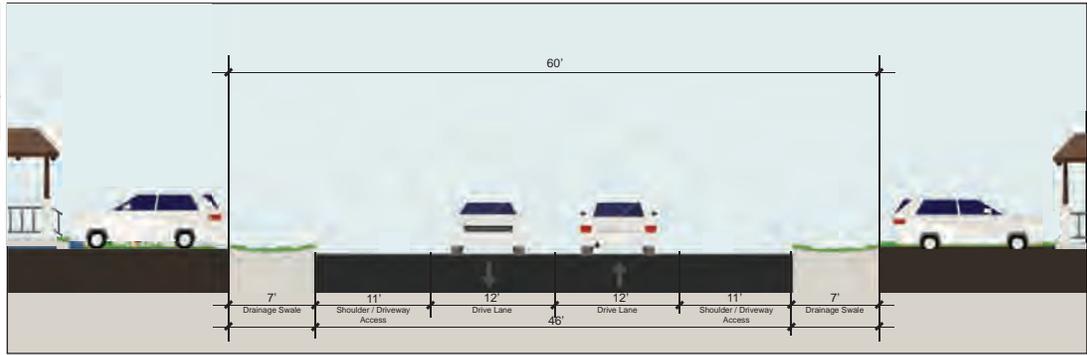
FIGURE 45 |
RURAL
RESIDENTIAL
CROSS SECTION 3





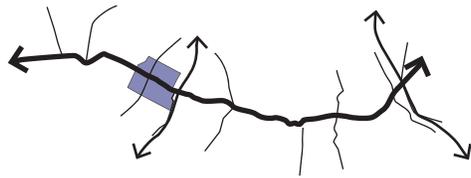
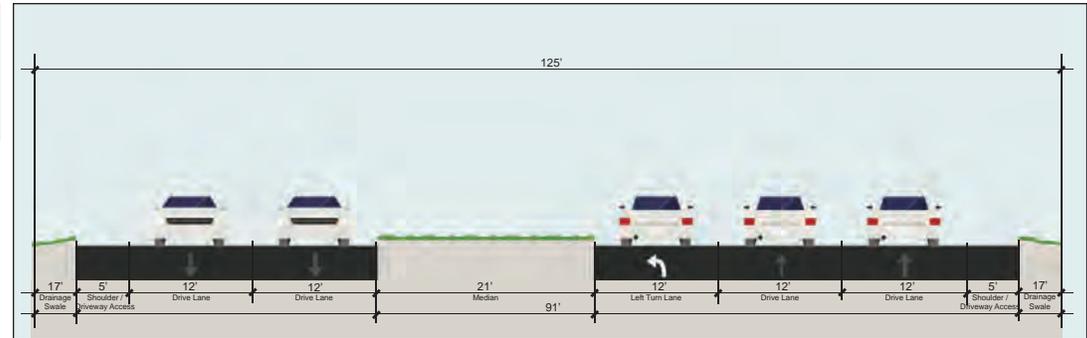
Transitioning Residential

FIGURE 46 |
TRANSITIONING
RESIDENTIAL
CROSS SECTION



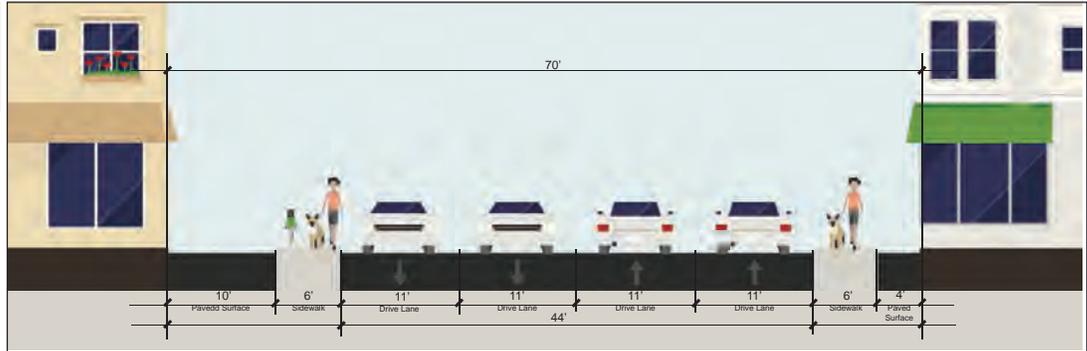
Suburban Commercial

FIGURE 47 |
SUBURBAN
COMMERCIAL
CROSS SECTION



Historic Core

FIGURE 48 |
HISTORIC CORE
CROSS SECTION



CORRIDOR CHARACTER

When considering the existing roadway conditions, character, and land uses, trends begin to emerge that tell the story of the corridor and its intended use. Certain areas, for example, are more rural and others are clearly commercial cores. Based on the previous analysis there are four character zones (Figure 43):

Rural Residential - This zone generally exists in the residential portions of the corridor and does not include higher intensity uses like retail.

Transitioning Residential - This includes suburban residential development that either has direct access from an entry road to MD 223 or direct driveway access to MD 223.

Suburban Commercial - This zone is focused around the MD 5 interchange and includes higher intensity commercial uses and tends to be somewhat heavier traveled.

Historic Core - This zone is unique and exists at the historic center of the corridor. It builds upon the historic assets, like the Surratt House, to potentially become an attractive, inviting, and exciting place for residents, and visitors alike.

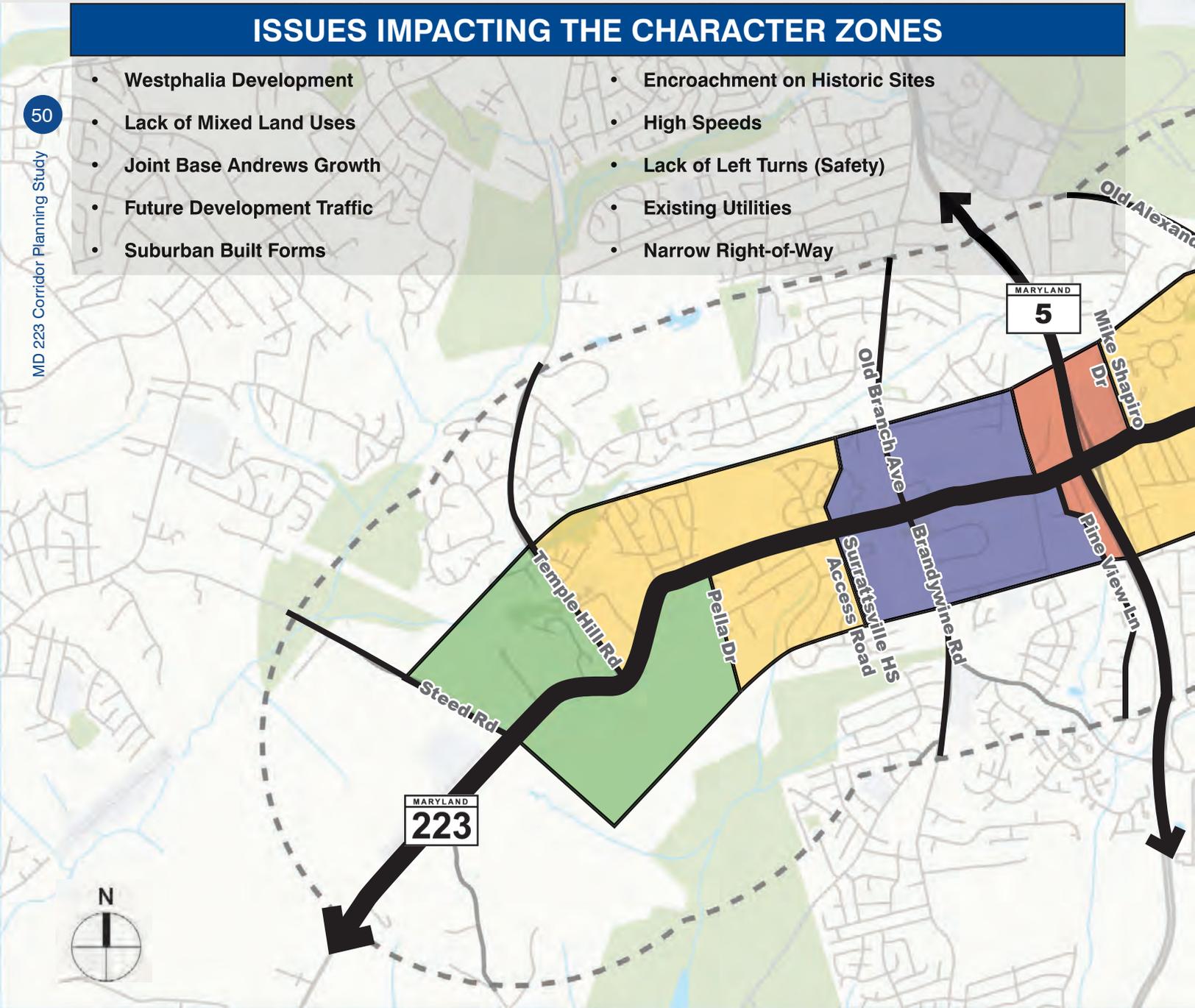
These character zones constitutes the current corridor conditions. They can be used to dictate the future land use and transportation form of the corridor in a context sensitive manner.

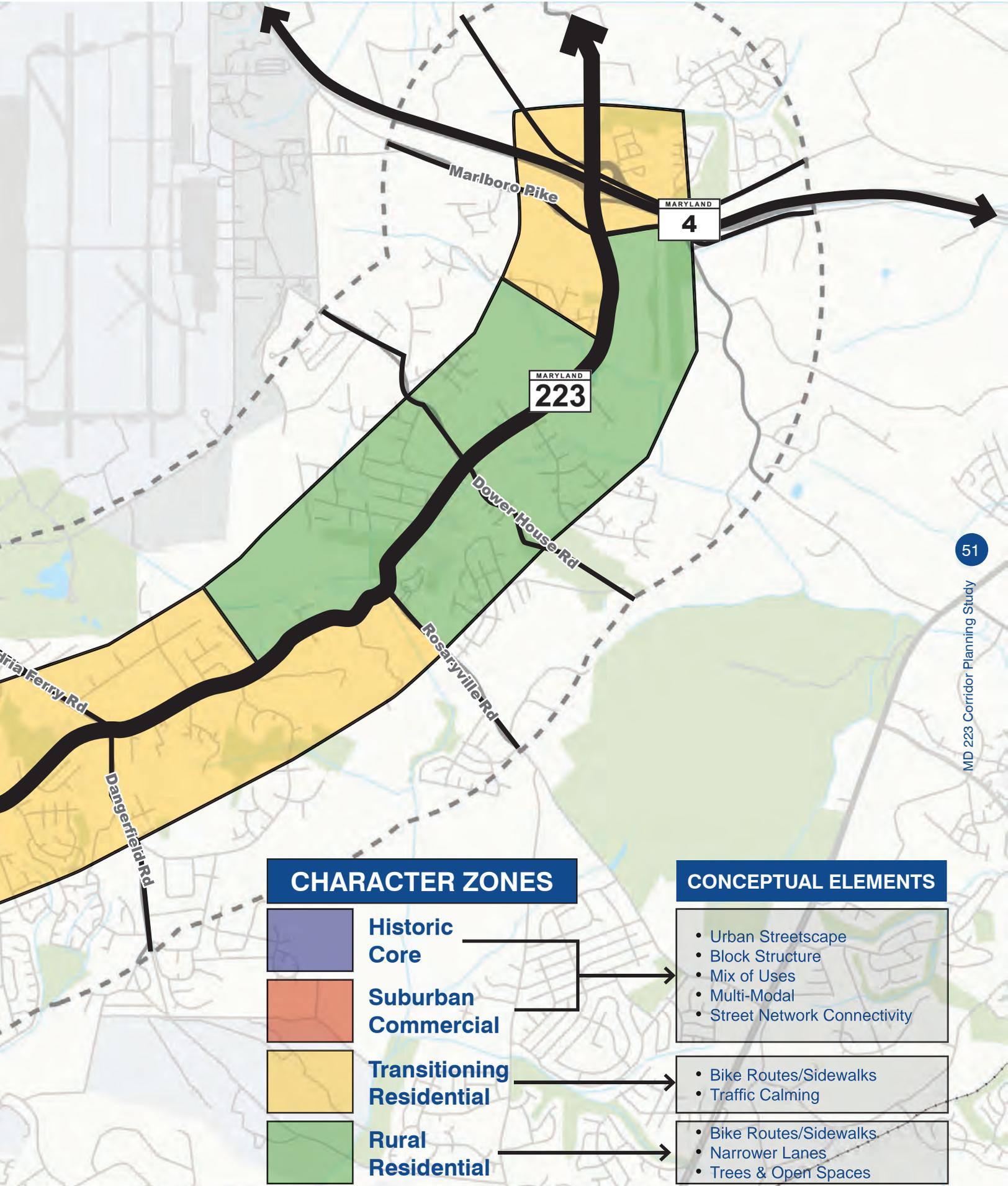
ISSUES IMPACTING THE CHARACTER ZONES

- Westphalia Development
- Lack of Mixed Land Uses
- Joint Base Andrews Growth
- Future Development Traffic
- Suburban Built Forms
- Encroachment on Historic Sites
- High Speeds
- Lack of Left Turns (Safety)
- Existing Utilities
- Narrow Right-of-Way

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MD 223 Corridor Planning Study





CHARACTER ZONES



Historic Core



Suburban Commercial



Transitioning Residential



Rural Residential

CONCEPTUAL ELEMENTS

- Urban Streetscape
- Block Structure
- Mix of Uses
- Multi-Modal
- Street Network Connectivity

- Bike Routes/Sidewalks
- Traffic Calming

- Bike Routes/Sidewalks
- Narrower Lanes
- Trees & Open Spaces

FIGURE 49 | CHARACTER ZONES





STRATEGIC PLAN

05

THEMES

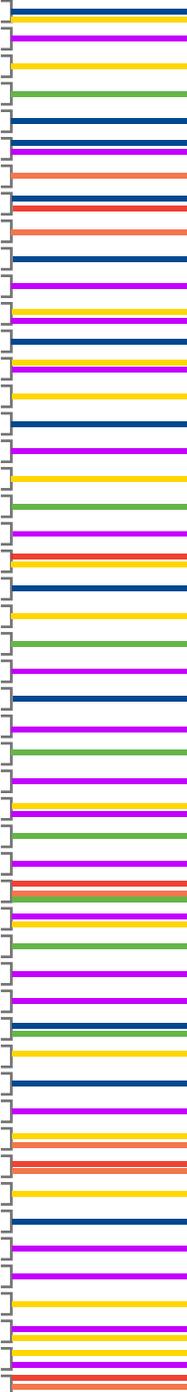
From information gathered during public involvement, the existing conditions analysis, and input received from the coordinating agencies, a synthesis resulted that formed the general approach to the strategic plan for the MD 223 Corridor. To begin, a series of common themes and desires for the future of the study area were developed. These themes and desires were organized into six overarching principles which created a framework for future decisions.

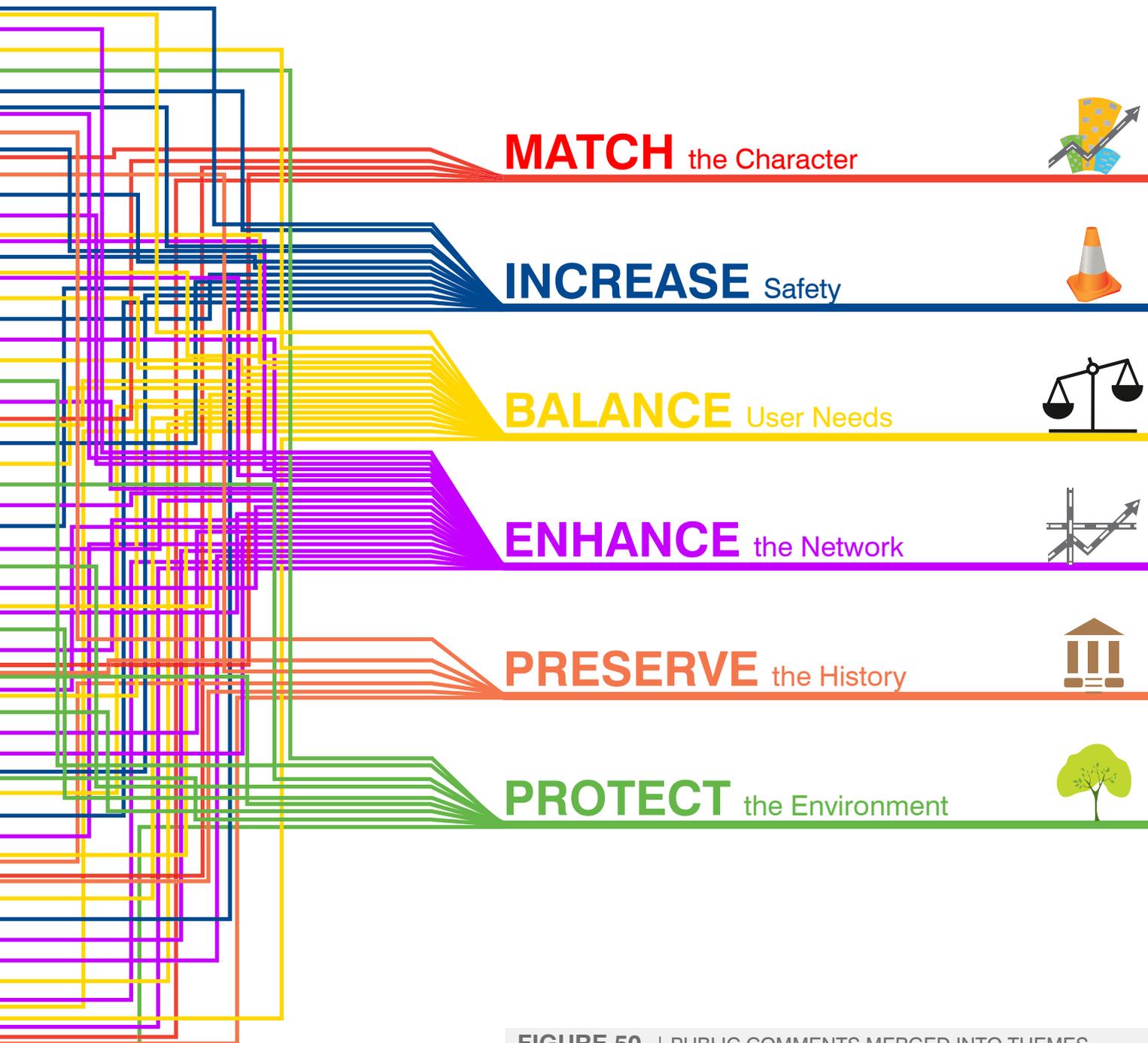
These guiding principles are intended to ensure that future plans and improvements to the corridor are context sensitive, and reflect the needs and desires of the community.

The public comments and general themes can be seen in Figure 50. On the following page, Figure 51 explains the guiding principles in detail.

PUBLIC COMMENTS

- Lighting should be improved, as there are a lot of pedestrians walking at night
- Complete the sidewalk network
- Increase bus service
- MD 223/Rosaryville Road floods when it rains
- Need traffic calming at the southern end of the corridor
- There are congestion and safety issues at Steed Road
- Connect the historic resources throughout the corridor to create a destination
- Traffic calming is needed in neighborhoods where drivers cut through
- Sidewalks should come to Surratt House to provide connectivity from the Civil War Trail
- People speed through the area around Gwynndale Drive
- There are not enough streets to support the connections needed to get to certain areas
- Metro access is limited and needs to be expanded
- People use shoulders as passing lanes to get around left-turning vehicles
- Need consistent sidewalks near old Branch Ave
- Pedestrian crossing signal needed at BK Miller Liquor store
- Neighborhood considers the Surrattville High School intersection a high accident area
- The entrance to the post office should be from the high school entrance
- More sidewalks are needed for kids and pedestrians
- Preserve environmentally sensitive areas
- The WalMart shopping center needs extra access points
- Provide shelters and benches at transit stops
- Left-turn lanes are needed throughout the corridor
- Need sidewalks at Dower House Road
- Connect the parks, trails, and environmental resources around the corridor
- Coordinate with agency that regulates building permits to project potential traffic issues in future
- Speed is an issue around Dower House Road
- Plan for traffic caused by future development between Dangerfield Rd and Rosaryville Rd
- Consider flooding patterns between Dangerfield Rd and Rosaryville Rd
- Consider how the Westphalia Development will impact traffic
- Fire trucks are delayed exiting the station because traffic on MD 223 cannot clear fast enough
- Look at the environmental impact of the project
- Woodyard Shopping Center should be more accessible
- Beautify and landscape as you develop
- Continue to monitor traffic to efficiently manage future traffic patterns
- There are maintenance issues with the landscaping
- Left turns are difficult into the library
- There is AM North & PM South traffic congestion south of Steed Rd
- There are potholes / flooding south of Steed Rd
- Pedestrian access under MD 5 should be enhanced
- Many accidents occur within Woodyard Crossing Shopping Center due to higher speeds and road alignment
- Need more roadway connectivity to support new development
- Desire for new bus stop with shelter at Surratt House
- Desire for the restoration of the historic sense of place of Clinton
- Desire for signal priority for emergency vehicles
- Center turn lanes could reduce left-turn/sideswipe issues
- Desire for greater street connectivity around the fire station
- Desire for second entrance to Mt. Ennon Baptist Church southern parking lot
- Students are crossing mid-block near the Four Roads Intersection causing issues with traffic
- Minor access roads to shopping centers off of MD 5 are getting congested
- Enhance connectivity to destinations along the corridor for all modes
- Preserve open space





MATCH the Character



INCREASE Safety



BALANCE User Needs



ENHANCE the Network



PRESERVE the History



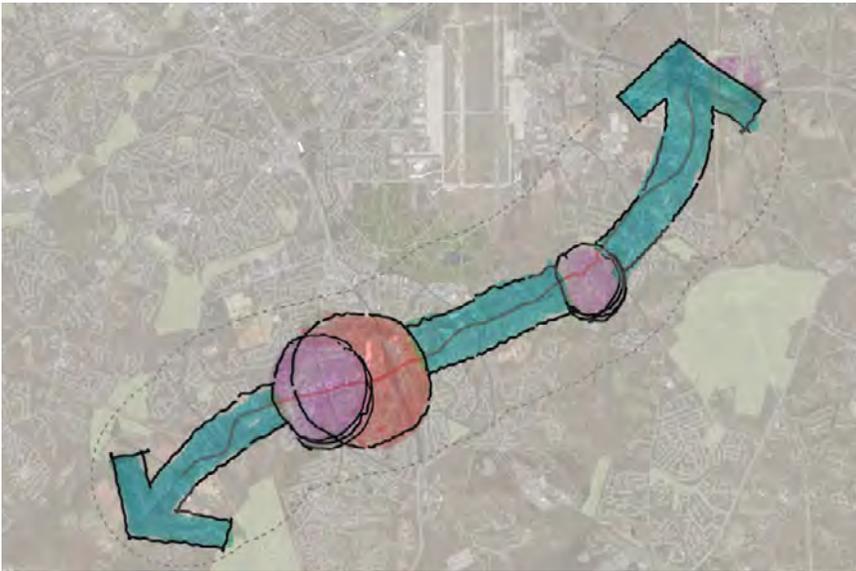
PROTECT the Environment



FIGURE 50 | PUBLIC COMMENTS MERGED INTO THEMES

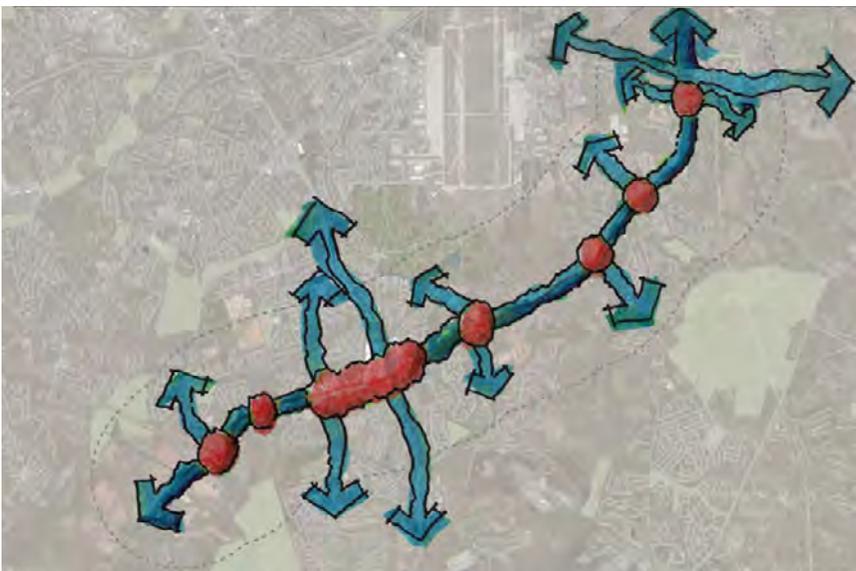
GUIDING PRINCIPLES

FIGURE 51 | GUIDING PRINCIPLES



Principle 1:
***MATCH* the Character**

Match future street improvements to the activities and characteristics of the surroundings. Existing character should be improved by roadway solutions.



Principle 2:
***INCREASE* Safety**

Use roadway improvements to increase the level of safety for motorists, pedestrians, transit users, bicyclists, and freight haulers. A number of areas along the corridor could benefit from safety improvements.



Principle 3:
***BALANCE* User Needs**

Create designs that balance the needs of all users and activities found along the corridor. This includes the needs for people traveling through the corridor to another destination as well as those making shorter, local trips via all modes.

Principle 4:
ENHANCE the Network

Use existing and future development to enhance the transportation network connections. This includes creating new roadway connections to help alleviate the traffic congestion on MD 223.



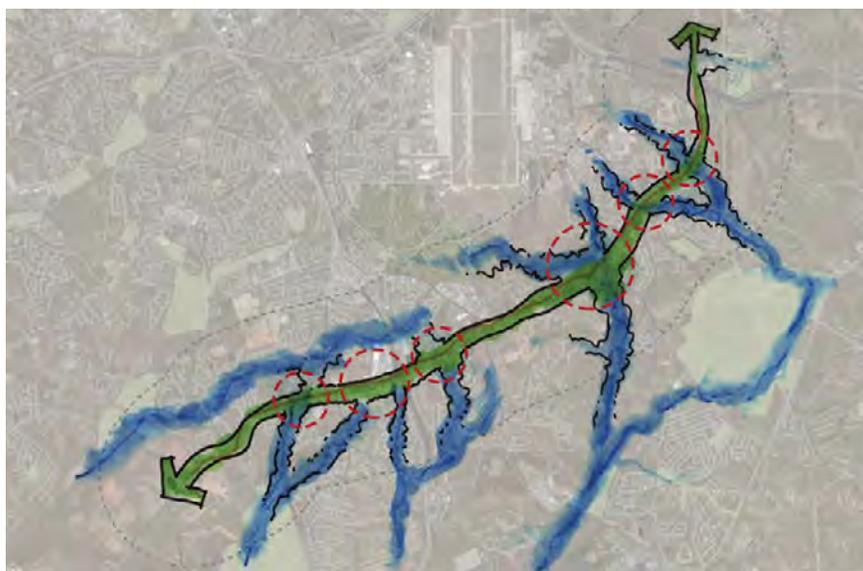
Principle 5:
PRESERVE the History

Protect and integrate historic and cultural elements found along the corridor in future plans and projects. These sites should be preserved and celebrated as community assets. New development that fronts these assets will help highlight and unite these features.



Principle 6:
PROTECT the Environment

Ensure integrated environmental protection and sustainable “green systems” practices with corridor improvements. These environmental assets add to the character of the corridor and future designs can help to protect and enhance them.





A PLAN FOR CHANGE

06

CONCEPT DEVELOPMENT PROCESS

The concept process followed for MD 223 is represented in Figure 52. The process began by analyzing existing conditions in the corridor and soliciting thoughts, concerns, and ideas from the general public, key stakeholders, and government agencies. This was summarized in Figure 14 on page 30. The planning team grouped issues and concerns into a series of themes to take a holistic view of the corridor, merging transportation and land uses issues into larger corridor-wide themes.

Following the creation of themes, the planning team conceptualized these themes into Guiding Principles that are meant to direct the proposed design, policy, and planning recommendations. The recommended actions were then organized into short, mid, and long term alternatives, as well as what partnerships would be needed to accomplish the recommended actions.

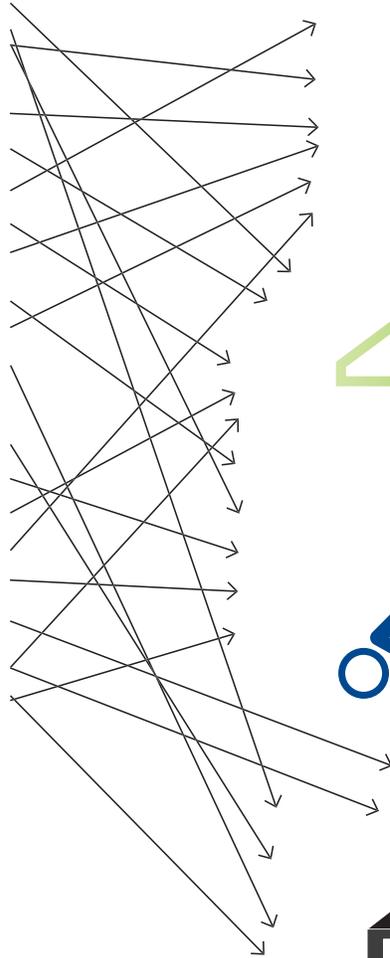
FIGURE 52 CONCEPT PROCESS

ISSUES & CONCERNS

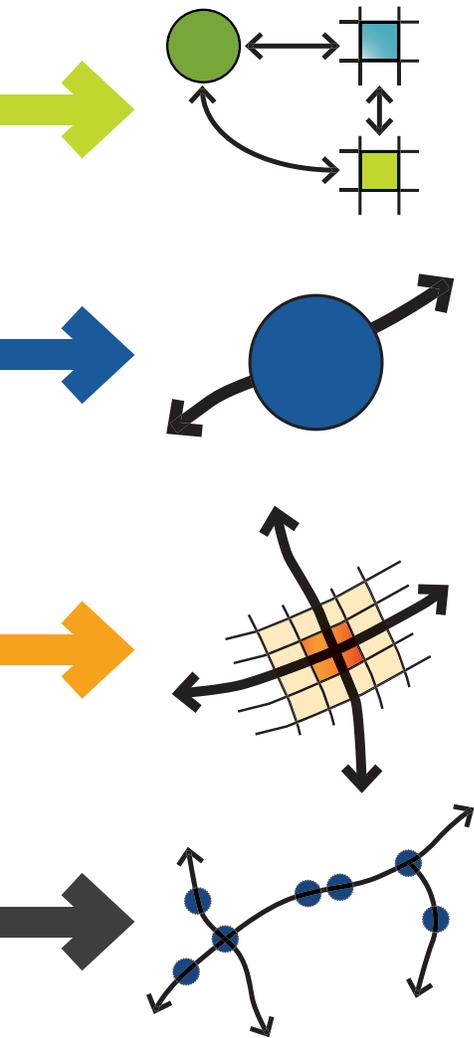
**Multiple,
Contrasting
Viewpoints &
Perspectives**



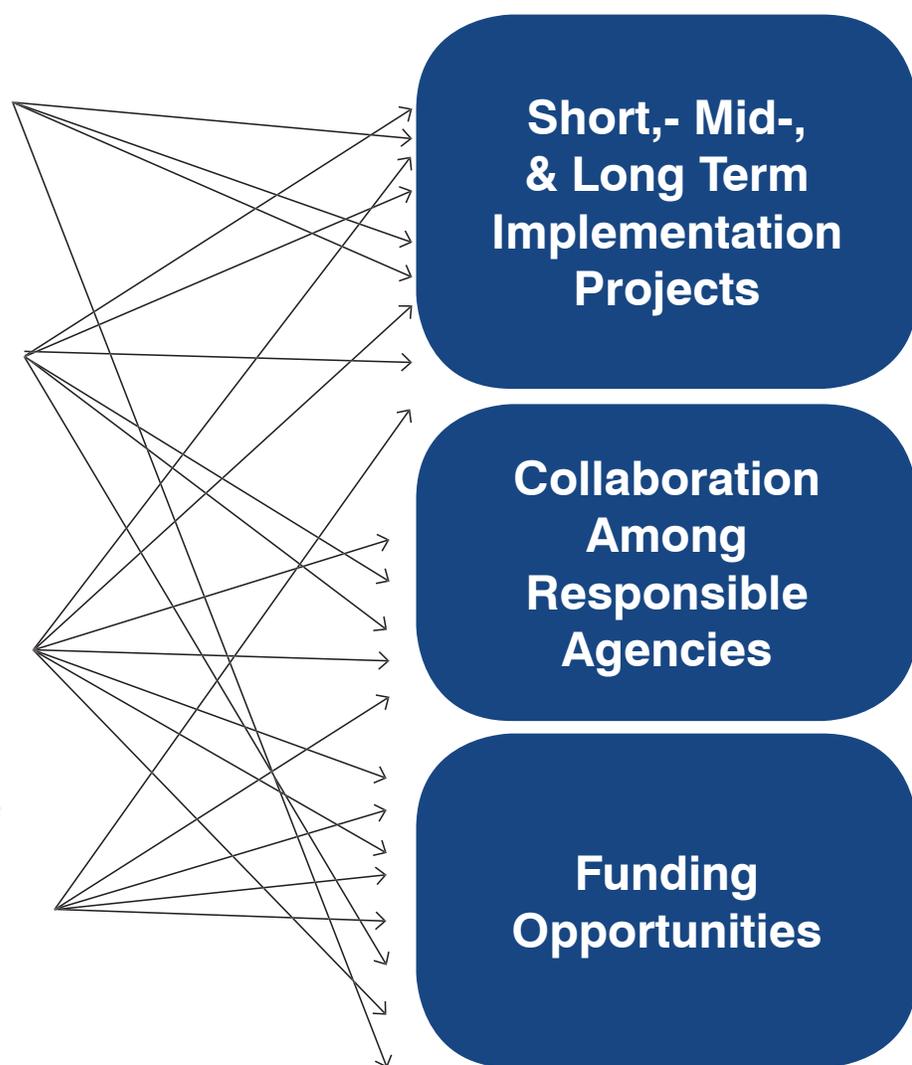
COMMON THEMES



GUIDING PRINCIPLES



ACTION ITEMS & IMPLEMENTATION



RECOMMENDED IMPROVEMENTS

Existing Conditions and Design Criteria for Conceptual Development

Based on the existing conditions and the needs of current and future developments, the following technical design criteria was established according to guidelines from AASHTO and SHA, including *A Policy on Geometric Design of Highways and Streets (2001 Edition)*, *Accessibility Policy & Guidelines for Pedestrian Facilities along State Highway (2010 Edition)*, *SHA's Bicycle Policy & Design Guidelines (2013 Edition)*, and the *State Highway Access Manual (2004 Edition)*.

All data on existing conditions and characteristics of the roadway were collected based on best available sources appropriate to a feasibility study, such as Geographic Information System (GIS) data from the Prince George's County, the State Highway Administration, Maryland Department of Natural Resources' online database (MERLIN Online), the Maryland Inventory of Historic Properties listing, and SHA Highway Location Reference.

1. **Roadway Classification:** MD 223 is classified as an Urban Other Principal Arterial (OPA) within the study area.
2. **Design Speed:** The current posted speed limit along MD 223, within the study area, is 40 mph. Observed travel speeds on some portions of the study area are higher, especially in the more rural zones, and may contribute to higher crash rates in these areas. Considering the crash history and the many access points throughout the corridor, (i.e. driveway access, entrance to shopping centers), it is reasonable to maintain a posted speed limit of 40 mph, with lower posted speed limits, 25 to 35 mph, through school, commercial, and fronting residential zones, for the safety of motorists, bicyclists, and pedestrians. The concepts developed for study used a design speed of 45 mph.
3. **Lane Widths:** The existing lane width in the majority of the corridor is 12', except for the historic core section of Clinton, where there are 11' lanes on MD 223. The Historic Core and Suburban Commercial Section are closed roadway sections

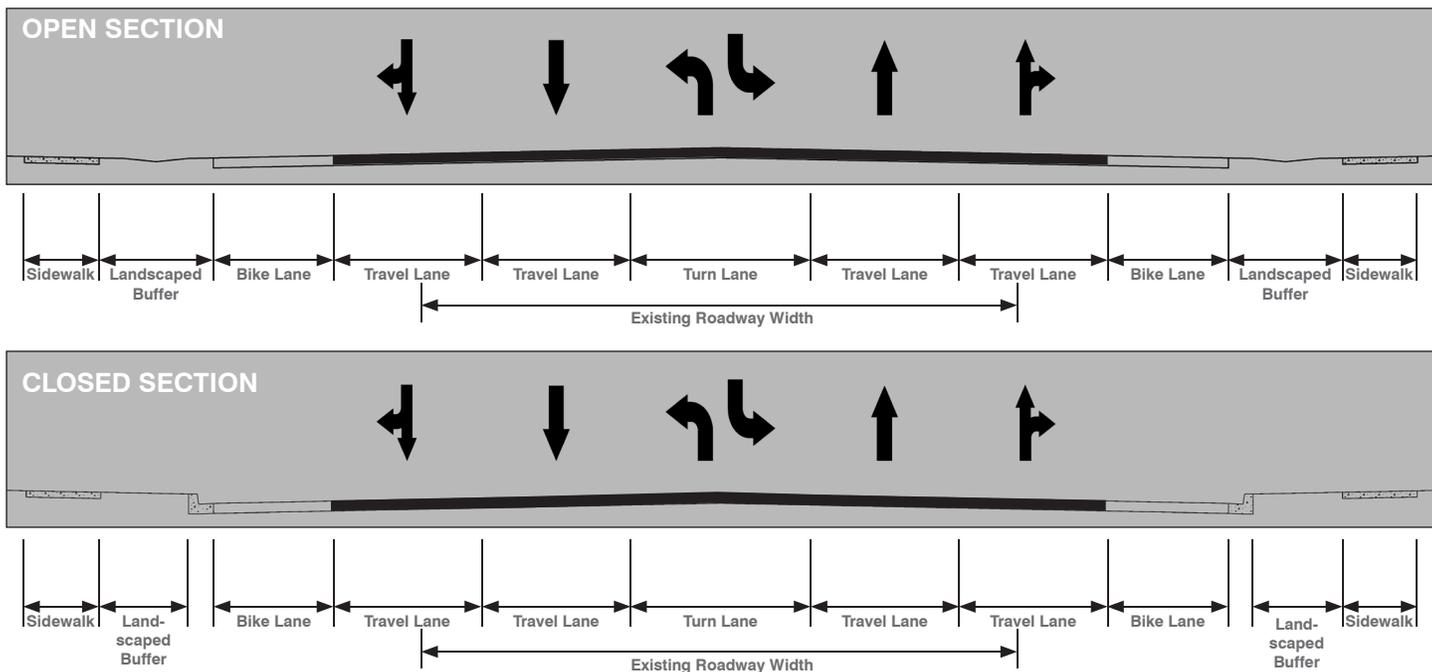
with curbs, while the rest of the corridor is mainly an open roadway section, without curbs.

On rural two-lane roads, 12' travel lanes with 10' shoulders provide more forgiving space for faster speeds, breakdowns, and emergency passing. Additionally, 11' lanes with 4' shoulders that are bicycle compatible in open section are also acceptable where right of way is restricted. A wider 6' shoulder, that can accommodate a marked buffer, also provides for both bicycle safety and added space for emergency use. For the purpose of this study, the full build-out condition has been considered to determine the worst case scenario in terms of impacts and cost; therefore, the concepts were designed with 12' lanes. In addition, a 10' to 12' center turn-lane is proposed in the sections with multiple access points for safer left turn movements, improved roadway capacity and traffic operation, and crash rate reduction. A raised median is also proposed in sections where applicable, and was included in the concepts where appropriate.

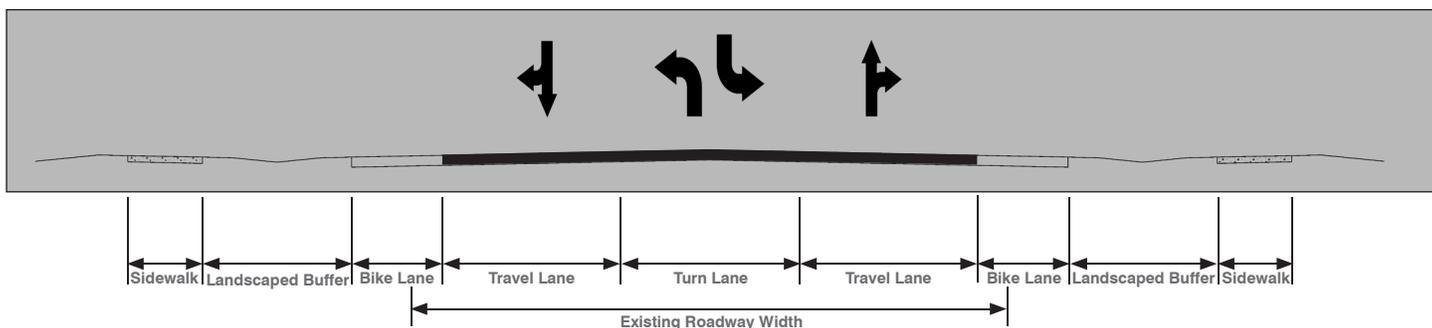
4. **Design Vehicles:** Based on the current traffic patterns, there are significant amounts of school bus and tractor trailers traveling through the study area. Therefore, a large school bus (S-BUS40) and an intermediate semi-trailer (WB-50) were used as design vehicles for the concept development according to AASHTO's guidelines. All conceptual alternatives can accommodate a large school bus' turning movements with passenger vehicle side by side on double lanes, while an intermediate semi-trailer can use two lanes and shoulders to complete turning movements. At major intersections, an interstate semi-trailer (WB-67) was used as the design vehicle for all movements.
5. **Pedestrian and Bicycle Accommodations:** All of the concepts developed as part of this study include a 5-foot sidewalk and ADA compliant curb ramps. The sidewalk was set back from the road edge with a varying width landscaped buffer. In order to accommodate bicycle users, a minimum of a 6' shoulder was included in all concepts.

FIGURE 53 | CONCEPTUAL MAINLINE TYPICAL SECTIONS (5-LANE AND 3-LANE)

1. 5-Lane Section with Center-Turn Lane, Open Section and Closed Section: This typical section provides the additional through-lanes in both directions of the corridor with a center turn lane for safe turning movements for access to residential and commercial areas within the corridor. The section from Gwynndale Drive to Old Branch Avenue / Brandywine Road was designed as a closed section with curbs.



2. 3-Lane Section with Center-Turn Lane, Open Section: This typical section is an alternative to the 5-lane section, where traffic volume does not require additional through-lanes on MD 223. It includes the additional center turn lanes for access to residential and commercial areas along the corridor. Generally, a 3-lane roadway increases pedestrian and vehicle safety when compared to a four or five lane roadway. The 3-lane roadway slows vehicles, partly due to increased traffic queues, and eliminates a conflict point for turning vehicles.



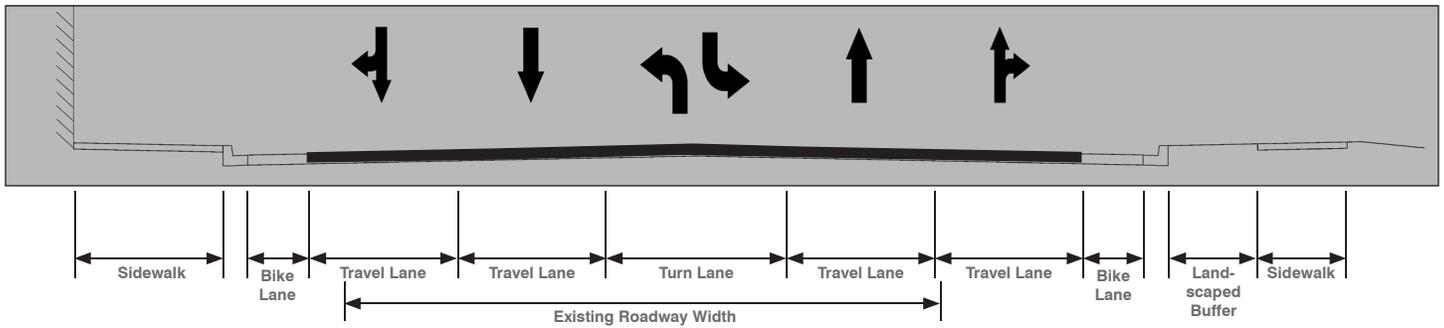
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RECOMMENDED IMPROVEMENTS

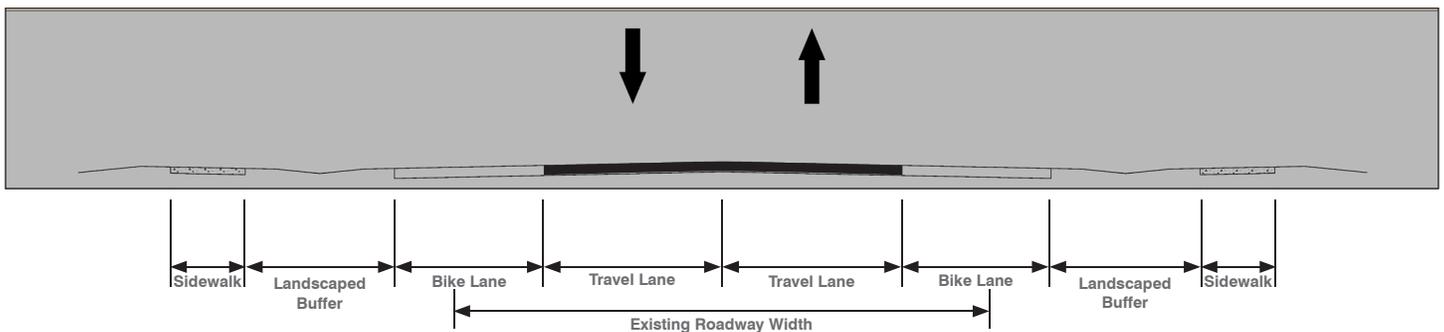
FIGURE 54 | CONCEPTUAL MAINLINE TYPICAL SECTIONS (HISTORIC CORE AND 2-LANE)

- Historic Core:** The historic area typical section would be applied from Old Branch Avenue/Brandywine Road to Pine View Lane. Similar to the existing condition in that area, a wide sidewalk would be constructed from the edge of the road to the face of the adjacent buildings. This section was designed with a center turn lane, but could be substituted with a raised median. This typical section proposes the preservation of the historic characteristics of the corridor while meeting the vehicular and pedestrian needs. This section also includes striped bike lanes in both directions.

This section conforms to The Preliminary Central Branch Avenue Corridor Revitalization Sector Plan, proposed by M-NCPPC for Downtown Clinton. The M-NCPPC proposed typical section is a multi-way boulevard with the roadway section proposed as part of this study, and includes service roads with street parking, and the section proposed by this study would include the central boulevard improvements only. Significant development would need to occur to realize the ultimate section described in the Sector Plan.



- 2-Lane Section with Full Shoulder:** This typical section applies to the rural sections within the corridor, where existing roadway configurations meets the demands of both existing and future traffic operations. This typical section would add 10' shoulders and 5' sidewalks.



IMPACT ANALYSIS

Methodology and Qualifications

Each of the concepts was developed to a level of detail to adequately quantify potential impacts. After preliminary engineering was completed for each of the concepts, the preliminary limits of disturbance were established 25 feet from the edge of hardscape work. The areas falling within the limits of disturbance were considered impacted. Impacts are divided into three separate categories, corresponding to the environmental resources: Land Use Impacts, Cultural/Historic Resources Impacts, and Natural Environmental Resources Impacts. Although some of the impacts may be avoided in the next phase of design, the purpose of this study is to determine the worst case scenario as a result of the proposed improvements, and potential impacts moving forward.

Land Use Impacts

Land uses are divided into seven different categories: commercial, residential, institutional, public land, industrial, agricultural, and parkland. Institutional land uses include colleges, churches, cemeteries, hospitals, etc. Public land uses include city halls and government building complexes, police and fire stations, libraries, prisons, post offices, schools, military installation, etc.

Commercial land use impacts range from three thousand square feet (3,000 SF) to two hundred fifty thousand square feet (250,000 SF), where the majority of the impacts are located at the Suburban Commercial Section of the corridor, from Old Branch Avenue/Brandywine Road to Mike Shapiro Drive. Approximately 24 commercial buildings may be directly impacted due to roadway widening, where the majority of them are located between Gwynndale Drive and Mike Shapiro Drive.

Residential land use impacts range from one thousand square feet (1,000 SF) to one hundred ninety thousand square feet (190,000 SF). The rural residential and transitional residential areas have the most residential land use impacts, located at the south and north portions of the study area. Approximately 12 residential houses may be potentially impacted due to roadway widening.

In terms of institutional land use impacts, the majority of institutional land uses are religious facilities within the study area. Impacts to this land use ranges from one thousand square feet (1,000 SF) to one hundred twenty thousand square feet (120,000 SF). One institutional building may be directly impacted as a result of proposed improvements.

Public land use within the study area includes schools, the Clinton Library, Prince George's County Health Department, Clinton Post Office, and Clinton Fire Station. Impacts to these land use range from one thousand two hundred square feet (1,200 SF) to fifty-five thousand square feet (55,000 SF). No potential displacements have been identified with any of these concepts.

Although several land uses within the study area are identified as agricultural land, the only impacts to this land use type are located at the Steed Road intersection. Several parks are located within the study area, such as the Clinton Sports Park for the Clinton Boys and Girls Club, Tanglewood Community Park, Melwood Pond Community Park, and Windsor Parish Community Park. Tanglewood Community Park and Melwood Pond Community Park may be impacted from roadway improvements and impacts range from fourteen thousand square feet (14,000 SF) to twenty-three thousand square feet (23,000 SF).

Natural Environmental Resources

Numerous types of natural environmental resources located within the study area require additional investigations for mitigation for improvement to the MD 223 corridor. They include: wetlands, flood plains, streams, forests, etc. Minimizing the impacts to these resources may require additional attention as the concepts move into the design phase, in order to fulfill any mitigation requirements.

Most of the conceptual designs would incur impacts to forested area within the study area. The Maryland Reforestation Law requires replacement of forest cleared as a result of highway improvements. Impacts range from 0.5 to 5.7 acres for the conceptual designs. The greatest impacts to the forested area are located within the sections that are considered Transitional Residential Section and Rural Residential Section, where forested areas have defined the characteristics of those sections. Context sensitive design and appropriate mitigation are necessary to conserve these forested areas and preserve the characteristics of the communities.

There are few wetlands located within the study area, most of which are located in the Rural Residential Section of the corridor, with the exception of the sizable stormwater management areas at the Woodyard Crossings Shopping Center. Associated with each wetland, a 25-foot wetland buffer from the edge of the wetland is also significant in determining impacts to this resource. Although impacts to wetlands and their

buffers are less than 0.2 acres for any improvements located along MD 223, it is necessary to minimize all impacts to wetlands where possible, and feasible. The proposed vehicle and pedestrian bridge over MD 5 would impact the existing wetlands substantially, with over 0.5 acres of impacts in the middle of the wetlands, which might permanently alter the rest of the wetlands. With the methodology established, determination of the extents of impacts to the natural habitats of the wetlands is not possible, and further investigation will be needed to determine the feasibility of the proposed vehicle, and pedestrian bridge.

Two streams, or Waters of the US, have been identified within the study area. Piscataway Creek is located adjacent to the intersection of MD 223 and Rosaryville Road, and Charles Branch is located adjacent to the Melwood Pond Community Park. Minimum impacts, if not complete avoidance, are expected at Piscataway Creek, since no major improvements have been proposed at the intersection. On the other hand, the section at Melwood Pond Community Park has proposed roadway widening for a shoulder lane and sidewalk, which may require replacement of the existing culvert and impacts Charles Branch within the limits of disturbance.

The majority of the study area is located with the Tier II Catchment Area, including the section from Steed Road to Sherwood Drive, which is close to Dower House Road. Potential impacts ranges from 5.7 acres to 24 acres. Although the Tier II stream itself is located further south from the limits of this study, stormwater runoff from the roadway might flow into the Tier II stream and affect the water quality. Stringent erosion and sediment controls, and stormwater management practices would be required to ensure water quality of the Tier II stream by the Maryland Department of Environment.

Designated by FEMA, the 100-year floodplains of Piscataway Creek and Charles Branch are located within the study area. Improvements and disturbance of the ground near these streams would result in floodplains impacts, namely the corridor section near the Rosaryville Road intersection and Melwood Pond Community Park, and ranges from 0.1 acres to 1.3 acres.

Cultural Resources Impacts

There are several historic properties located within the study area, as previously discussed. During the process of developing the conceptual designs, the potential worst case scenario has been considered, where the full built-out concepts were used. Two of the historic properties, His Lordship's Kindness and Surratt House and Tavern, are significant to the community. Impacts to these properties will have to be minimized, if not completely avoided.

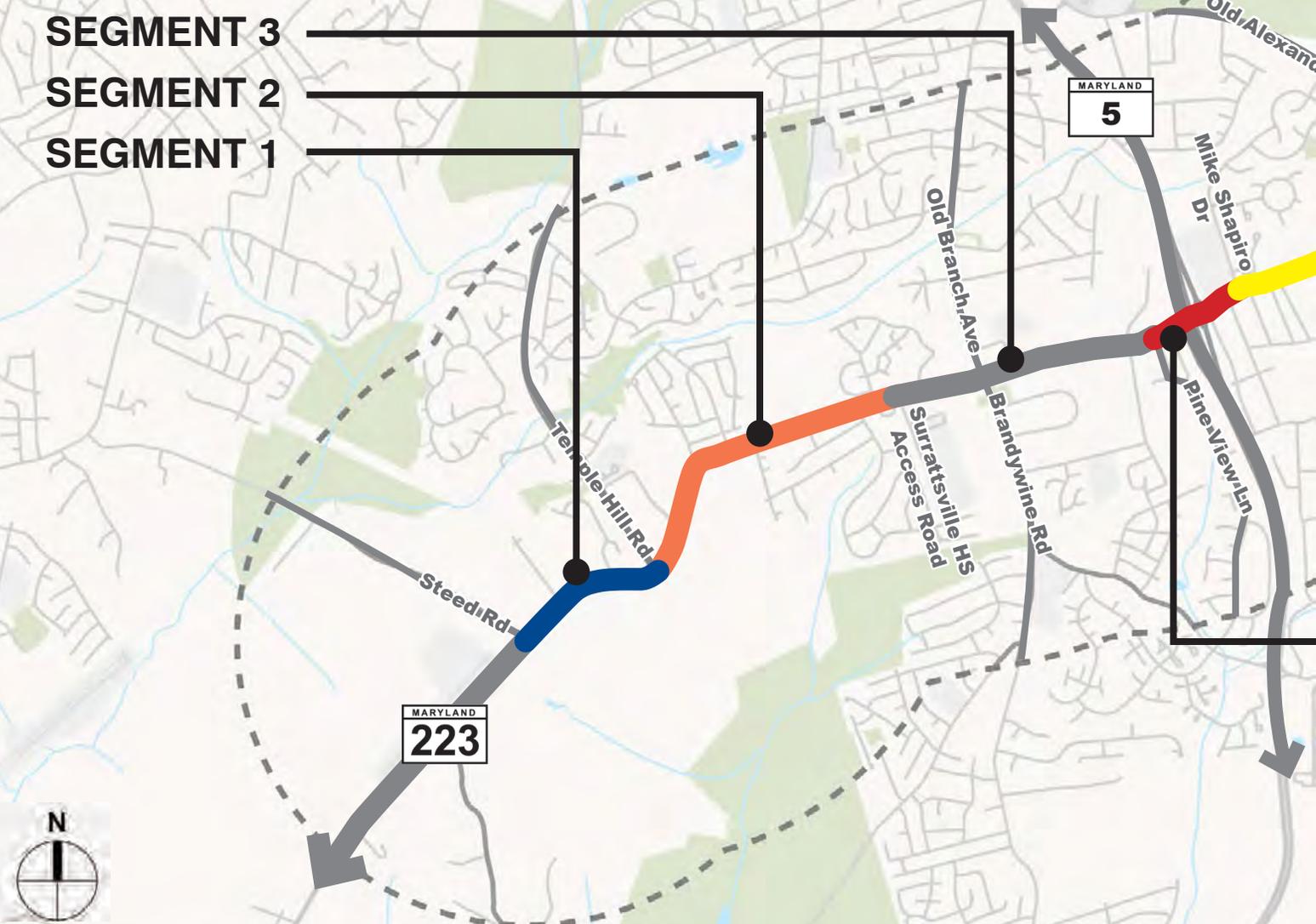
The conceptual intersection design at Old Branch Avenue/ Brandywine Road would incur minimum impacts to the historic property of the Mary Surratt House and Tavern. The main structure of the Mary Surratt House and Tavern is located on Brandywine Road, approximately 200 feet from the intersection of MD 223 and Old Branch Avenue. The proposed improvements to this intersection on Brandywine Road are based on the edge of the existing wooden fence of property in order to avoid any significant impacts to the original property. The 25-foot limit of disturbance from the edge of the concrete sidewalk falls within the property lines, where minimum impacts are expected.

The conceptual corridor design between Old Alexandria Ferry Road/Dangerfield Road and Rosaryville Road would impact His Lordship's Kindness, at approximately 1,000 feet from the intersection of MD 223 and Rosaryville Road. As a result of realigning the horizontal curves of the roadway, the potential impacts would be the extension of the access road to His Lordship's Kindness in the northwest corner of the property, and the new roadway section for realignment in the northeast corner of the property, adjacent to the Piscataway Creek.

MATRIX OF CORRIDOR IMPROVEMENTS LEGEND

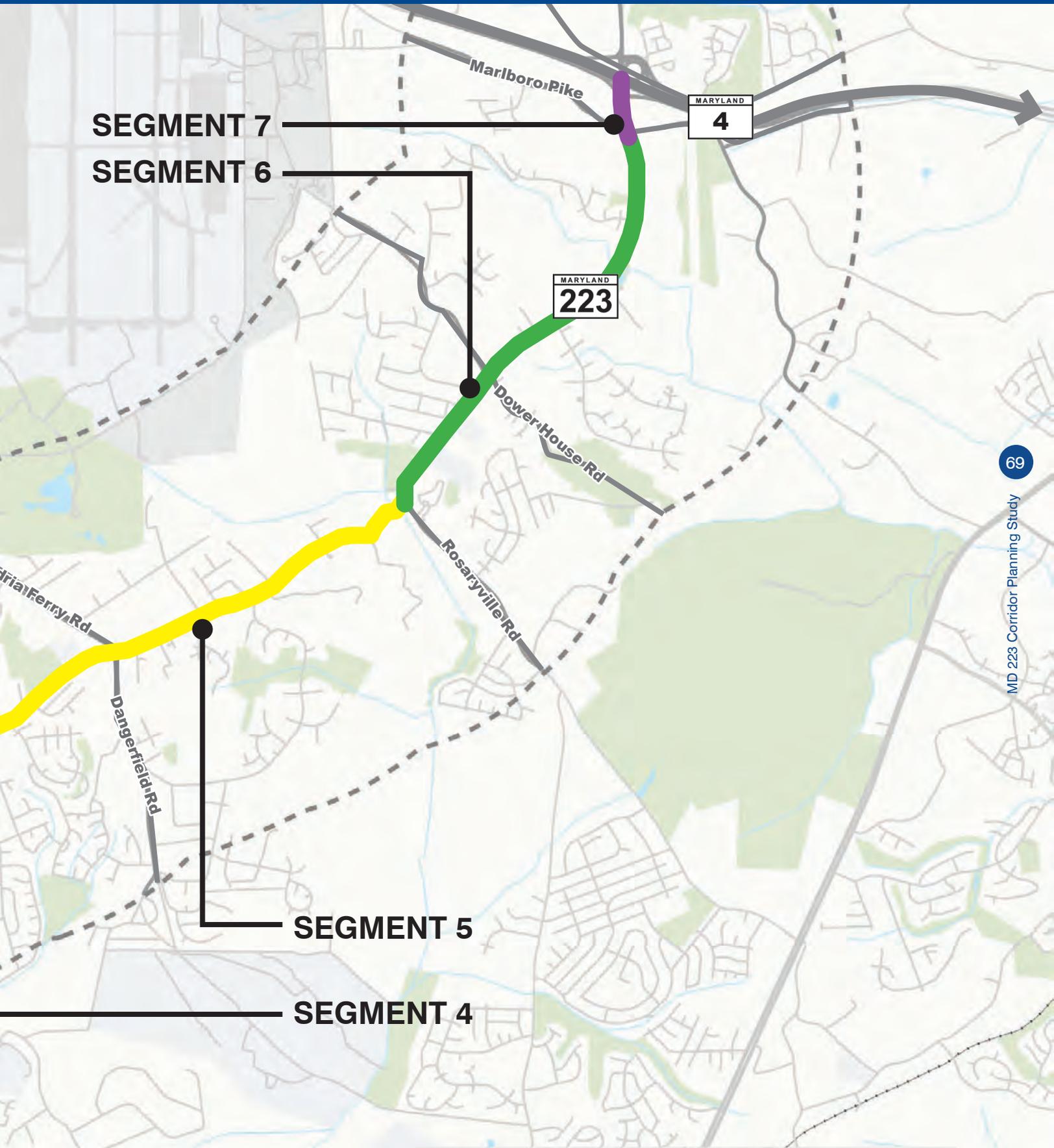
- SEGMENT 1** | Steed Road to Temple Hill Road
- SEGMENT 2** | Temple Hill Road to Surrattsville High School Access Road
- SEGMENT 3** | Surrattsville High School Access Road to Pine View Lane
- SEGMENT 4** | Pine View Lane to Mike Shapiro Drive
- SEGMENT 5** | Mike Shapiro Drive to Rosaryville Road
- SEGMENT 6** | Rosaryville Road to Marlboro Pike
- SEGMENT 7** | Marlboro Pike to Pennsylvania Avenue (MD 4)

SEGMENT 3
SEGMENT 2
SEGMENT 1



MARYLAND
223

MARYLAND
5



SEGMENT 7

SEGMENT 6

SEGMENT 5

SEGMENT 4

Marlboro Pike

MARYLAND
4

MARYLAND
223

Dower House Rd

Rosaryville Rd

Dangerfield Rd

Alfalfa Ferry Rd

FIGURE 55 | CORRIDOR IMPROVEMENTS LEGEND



MATRIX OF CORRIDOR IMPROVEMENTS

Based on the synthesis, themes, guiding principles and the concept development process, a series of concept improvements were developed to address the issues and concerns in the MD 223 Corridor. The concepts include both corridor-wide and segment-specific improvements. These improvements include enhanced transportation solutions for pedestrians and bicyclists,

transit riders, and vehicles. The improvements have been designed as “most likely” concept solutions, and have not been studied with a full alternative analysis.

Below is a list of items that have been developed to either implement or investigate further to meet the purpose and need within the corridor.

FIGURE 56 | SEGMENT 1: STEED ROAD TO TEMPLE HILL ROAD

MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Recommended Lead Agency & Office	Next Steps	Target Date Range
Steed Road to Temple Hill Road					
Mid-Term					
Pedestrian Safety Improvements: Construct accessible sidewalk throughout the segment, and improve street lighting	✓ Missing sidewalk and street lighting	\$320k – \$410k (\$48k – \$71k)	SHA – District 3 / OHD	Coordination and scoping	3-10 years
Steed Road Intersection Improvements: Roadway widening and sidewalk upgrades	✓ Pedestrian and vehicular safety ✓ Future capacity needs	\$2.9M – \$4.1M (\$435k – \$615k)	SHA – District 3 / OHD	PE Funding	3-10 years
Temple Hill Road Intersection Improvements: Roadway widening and sidewalk upgrades	✓ Future capacity needs	\$2.6M – \$3.7M (\$390k – \$555k)	SHA – District 3 / OHD	PE Funding	3-10 years

FIGURE 57 | SEGMENT 2: TEMPLE HILL ROAD TO SURRATTSVILLE HIGH SCHOOL ACCESS ROAD

MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Recommended Lead Agency & Office	Next Steps	Target Date Range
Temple Hill Road to Surrattsville High School Access Road					
Short-Term					
Protected Left-Turn Lane at Dixon Drive: Provide left-turn “pocket” lanes and bypass lanes at residential areas	✓ Vehicular safety ✓ Traffic operation	\$1.5M – \$3.6M (\$230k – \$540k)	OPPE / District 3	Recommended Additional Study	1-10 years
Local Street Network Traffic Calming Measures: Various traffic calming measures at connecting local streets to increase safety in local communities	✓ Pedestrian safety	\$50k – \$150k / ea (\$7.5k – \$22k/ea)	PG County DPW	Provide information to local jurisdiction	1-5 years
Bus Stop Improvements: Additional bus shelters and enhanced accessible waiting areas at existing bus stops throughout the corridor	✓ Pedestrian and transit riders safety	\$10k – \$100k / ea (\$1.5k – \$15k/ea)	PG County DPW - “The Bus”	Provide information to local jurisdiction	1-5 years
Clinton Post Office/Surrattsville High School Access Road: Relocate post office entrance to the High School access road to eliminate intersection conflict, consolidate access and turns from MD 223	✓ Pedestrian and vehicular safety ✓ Access consolidation	\$500k – \$700k (\$75k – \$105k)	PG County DPW	Provide information to local jurisdiction	1-5 years
Signal Warrant Analysis at Dixon Drive: Signal warrant analysis need	✓ Pedestrian and vehicular safety	TBD	SHA - District 3	Recommended Additional Study	As needed
Signal Warrant Analysis at Gwynndale Drive: Signal warrant analysis need	✓ Pedestrian and vehicular safety	TBD	SHA - District 3	Recommended Additional Study	As needed
Signal Warrant Analysis at Hardesty Drive: Signal warrant analysis need	✓ Pedestrian and vehicular safety	TBD	SHA - District 3	Recommended Additional Study	As needed
Mid-Term					
Pedestrian Safety Improvements: Construct accessible sidewalk throughout the segment, and improve street lighting	✓ Missing sidewalk and street lighting	\$320k – \$410k (\$48k – \$71k)	SHA – District 3 / OHD	Coordination and scoping	3-10 years
Long-Term					
Center Turning Lanes: Provide center turning lanes with multiple access points throughout the segment	✓ Vehicular safety ✓ Traffic operation	\$3.8M – \$7.9M (\$0.6M – \$1.2M)	SHA - OPPE	Recommended Additional Study	5-15 years
Shoulder and Bicycle Safety Improvements: Construction and/or widening of shoulder for bicycle accessibility and improve corridor safety	✓ Bicycle and Vehicular Safety	\$4.3M – \$5.9M (\$650k – \$890k)	SHA - OPPE	Recommended Additional Study	10-20 years

FIGURE 58 | SEGMENT 3: SURRATTSVILLE HIGH SCHOOL ACCESS ROAD TO PINE VIEW LANE

MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Recommended Lead Agency & Office	Next Steps	Target Date Range
Surrattsville High School Access Road to Pine View Lane					
Short-Term					
Bus Stop Improvements: Additional bus shelters and enhanced accessible waiting areas at existing bus stops throughout the corridor	✓ Pedestrian and transit riders safety	\$10k – \$100k /ea (\$1.5k – \$15k/ea)	PG County DPW - "The Bus"	Provide information to local jurisdiction	1-5 years
Mid-Term					
Old Branch Avenue/Brandywine Road Intersection Improvements: Short to Mid-term improvements to mainline MD 223 to add left-turn lanes	✓ Pedestrian safety at intersection ✓ Current capacity needs ✓ Missing sidewalk	\$4.7M – \$6.6M (\$705k – \$990k)	SHA - District 3 / OHD	PE Funding	3-10 years
Pedestrian Safety Improvements: Construct accessible sidewalk throughout the segment, and improve street lighting	✓ Missing sidewalk and street lighting	\$600k – \$900k (\$90k – \$135k)	SHA - District 3 / OHD	Coordination and scoping	3-10 years
Long-Term					
Clinton Commercial Core Connectivity Enhancement: Potential back entrance from Woodley Road to Woodyard Crossing Shopping Center, and pedestrian and vehicle bridge between Woodyard Crossing and Clinton Plaza over MD 5	✓ Future development and planning needs	\$1.2M – \$14M (\$0.2M – \$2.1M)	M NCPCC / PG County DPW	Provide information to local jurisdiction	5-15 years
Center Turning Lanes: Provide center turning lanes at areas with multiple access points throughout the segment	✓ Vehicular safety ✓ Traffic operation	\$2.8M – \$5.8M (\$420k – \$870k)	SHA - OPPE	Recommended Additional Study	5-15 years
Shoulder and Bicycle Safety Improvements: Construction and/or widening of shoulder for bicycle accessibility and improve corridor safety	✓ Bicycle and Vehicular Safety	\$3.2M – \$4.3M (\$480k – \$650k)	SHA - OPPE	Recommended Additional Study	10-20 years

FIGURE 59 | SEGMENT 4: PINE VIEW LANE TO MIKE SHAPIRO DRIVE

MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Recommended Lead Agency & Office	Next Steps	Target Date Range
Pine View Lane to Mike Shapiro Drive					
Short-Term					
Bus Stop Improvements: Additional bus shelters and enhanced accessible waiting areas at existing bus stops throughout the corridor	✓ Pedestrian and transit riders safety	\$10k – \$100k /ea (\$1.5k – \$15k/ea)	PG County DPW - "The Bus"	Provide information to local jurisdiction	1-5 years
Mid-Term					
Pedestrian Safety Improvements: Construct accessible sidewalk throughout the segment, and improve street lighting	✓ Missing sidewalk and street lighting	\$320k – \$470k (\$48k – \$70k)	SHA - District 3 / OHD	Coordination and scoping	3-10 years
Long-Term					
Downtown Clinton Area Corridor Study: Full NEPA study for the section from Old Branch Avenue/ Brandywine Road to Old Alexandria Ferry Road/ Dangerfield Road	✓ Pedestrian safety ✓ Current and future capacity needs ✓ Preserve existing corridor characters ✓ Environmental resource stewardship	TBD	SHA - OPPE	Recommended Additional Study	TBD
MD 5 Interchange Improvement Study: Concept Alternative studies for the best approach to improvements at the connection points of MD 5 within the MD 223 corridor	✓ Pedestrian safety ✓ Current and future capacity needs ✓ Environmental resource stewardship	TBD	SHA - OPPE	Recommended Additional Study	TBD

MATRIX OF CORRIDOR IMPROVEMENTS

FIGURE 60 | SEGMENT 5: MIKE SHAPIRO DRIVE TO ROSARYVILLE ROAD

MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Recommended Lead Agency & Office	Next Steps	Target Date Range
Mike Shapiro Drive to Rosaryville Road					
Short-Term					
Protected Left-Turn at Canberra Drive and Denton Drive: Provide left-turn "pocket" lanes at residential areas	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$1.8M – \$2.5M (\$270k – \$380k)	SHA - OPPE / District 3	Recommended Additional Study	1-10 years
Bus Stop Improvements: Additional bus shelters and enhanced accessible waiting areas at existing bus stops throughout the corridor	<ul style="list-style-type: none"> ✓ Pedestrian and transit riders safety 	\$10k – \$100k /ea (\$1.5k – \$15k/ea)	PG County DPW – "The Bus"	Provide information to local jurisdiction	1-5 years
Signal Warrant Analysis at Canberra Drive: Signal warrant analysis needs	<ul style="list-style-type: none"> ✓ Pedestrian and vehicular safety 	TBD	SHA - District 3	Recommended Additional Study	As needed
Mid-Term					
Pedestrian Safety Improvements: Construct accessible sidewalk throughout the segment, and improve street lighting	<ul style="list-style-type: none"> ✓ Missing sidewalk and street lighting 	\$320k – \$410k (\$48k – \$71k)	SHA - District 3 / OHD	Coordination and scoping	3-10 years
Old Alexandria Ferry Road/Dangerfield Road: Capacity improvements, sight distance improvements, and pedestrian safety improvements	<ul style="list-style-type: none"> ✓ Future capacity needs ✓ Pedestrian and vehicular safety 	\$4.3M – 4.6M (\$495k – \$690k)	SHA - District 3	PE Funding	3-10 years
Non-signalized Intersection Improvements: Provide bypass lanes at residential areas, including Sweeney Drive, Clendinnen Drive, and Don Drive	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$1.3M – \$2.5M /ea (\$200k – 380k/ea)	SHA - OPPE / District 3	Recommended Additional Study	3-10 years
Long-Term					
Center Turning Lanes: Provide center turning lanes at areas with multiple access points throughout the segment	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$8.4M – \$17M (\$1.3M – \$2.6M)	SHA - OPPE	Recommended Additional Study	5-15 years
Rosaryville Road Intersection Effectiveness Study: Evaluation on the effectiveness of the Rosaryville Road intersection	<ul style="list-style-type: none"> ✓ Future capacity needs ✓ Pedestrian safety ✓ Environmental resource stewardship 	TBD	SHA - OPPE	Recommended Additional Study	5-15 years
Shoulder and Bicycle Safety Improvements: Construction and/or widening of shoulder for bicycle accessibility and improve corridor safety	<ul style="list-style-type: none"> ✓ Bicycle and Vehicular Safety 	\$9.5M – \$13M (\$1.4M – \$2.0M)	SHA - OPPE	Recommended Additional Study	10-20 years

FIGURE 61 | SEGMENT 6: ROSARYVILLE ROAD TO MARLBORO PIKE

MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ (PE Cost Range ²)	Recommended Lead Agency & Office	Next Steps	Target Date Range
Rosaryville Road to Marlboro Pike					
Short-Term					
Protected Left-Turn Lane at Victoria Drive to Sherwood Drive: Provide left-turn "pocket" lanes at residential areas	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$1.5M – \$3.6M (\$0.2M – \$0.5M)	SHA - OPPE / District 3	Recommended Additional Study	1-10 years
Protected Left-Turn Lane at the Clinton Christian School: Provide left-turn "pocket" lanes and bypass lanes at residential areas	<ul style="list-style-type: none"> ✓ Vehicular safety ✓ Traffic operation 	\$1.5M – \$3.6M (\$0.2M – \$0.5M)	SHA - OPPE / District 3	Recommended Additional Study	1-10 years
Mid-Term					
McCormick Road Access Improvements: Construct new and improve existing access to the McCormick Road Community	<ul style="list-style-type: none"> ✓ Improve access to residential community 	\$0.7M – \$1.1M (\$100k – \$170k)	PG County DPW	Provide information to local jurisdiction	3-10 years
Pedestrian Safety Improvements: Construct accessible sidewalk throughout the segment, and improve street lighting	<ul style="list-style-type: none"> ✓ Missing sidewalk and street lighting 	\$320k – \$410k (\$48k – \$71k)	SHA - District 3 / OHD	Coordination and scoping	3-10 years
Long-Term					
Dower House Road Intersection Improvements: Capacity improvements, sight distance improvements, and sidewalk upgrades	<ul style="list-style-type: none"> ✓ Skewed geometry ✓ No sidewalk ✓ Sight distance deficiency 	\$2.0M – \$2.8M (\$300k – \$420k)	SHA - District 3	PE Funding	5-15 years

FIGURE 62 | SEGMENT 7: MARLBORO PIKE TO MD 4/ PENNSYLVANIA AVENUE

MD 223 Segment Improvements	Public Concerns/Issues	Construction Cost Range ¹ [PE Cost Range ²]	Recommended Lead Agency & Office	Next Steps	Target Date Range
Marlboro Pike to MD 4					
Mid-Term					
Pedestrian Safety Improvements: Construct accessible sidewalk throughout the segment, and improve street lighting	✓ Missing sidewalk and street lighting	\$320K – \$410K (\$48k – \$71k)	SHA - District 3 / OHD	Coordination and scoping	3-10 years
Long-Term					
Interchange Improvement Study: Concept Alternative studies for the best approach to improvements at the connection points of MD 4 within the MD 223 corridor	<ul style="list-style-type: none"> ✓ Pedestrian safety ✓ Current and future capacity needs ✓ Environmental resource stewardship 	TBD	SHA - OPPE	Recommended Additional Study	TBD
Marlboro Pike Intersection Improvements: Roadway widening and sidewalk upgrades	<ul style="list-style-type: none"> ✓ Skewed geometry ✓ Sight distance deficiency ✓ Future capacity needs 	\$1.8M – \$2.5M (\$270k – \$375k)	SHA - District 3	PE Funding	5-15 years
Notes:					
¹ ROW Cost (if necessary) and environmental mitigations are not included in costs.					
² Preliminary Engineering cost is 15% of the construction cost range, based on the SHA Cost Estimating Manual. See Appendix for Cost Estimate breakdowns.					

CORRIDOR-WIDE NETWORK IMPROVEMENTS

Network connections beyond MD 223 are identified here to allow for safe and more direct travel within and between districts, and to reduce pressure on MD 223 intersections, where possible. Added lanes and reconfigured intersections intended to add intersection capacity can be mitigated for bicyclists, pedestrians and local traffic with these added network links to help relieve the traffic burden on MD 223. These options should be evaluated particularly in constrained areas such as the historic Old Branch Avenue/ Brandywine Road intersection

The design of new network links should be informed by the character of areas and the trip types they will serve. Neighborhood routes anticipating pedestrians and

bicyclists should be designed, and operated to support slow speeds, and maintain low traffic volumes.

Traffic calming retrofits to existing streets can help. Routes requiring stream crossings will likely support non-motorized users only. Some routes help to bring more residents to a signalized intersection for safer ingress and egress to MD 223.

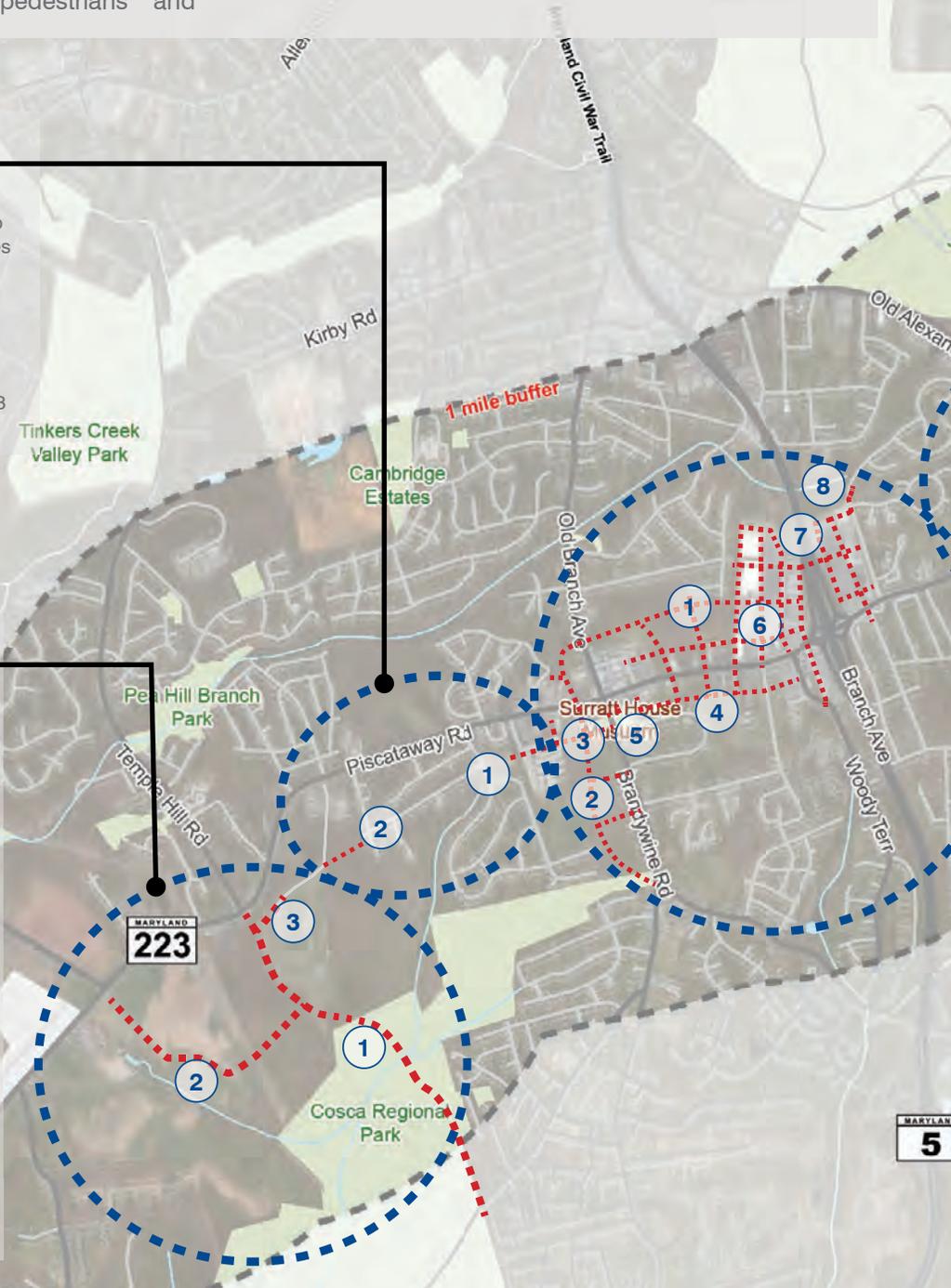
The network of streets created around Branch Avenue (MD 5), including a proposed elevated crossing, permit the commercial area to function as a walkable, mixed use district.

NETWORK CONNECTIONS

- Garden Drive to Boys & Girls Club Parking Road** - Provides parallel access to MD 223 and helps disperse traffic after games and events.
- Garden Drive to Surrattsville High School Access Road** - Provides parallel access to MD 223 for neighborhood and provides access to potential signal at MD 223 and Access Road.

NETWORK CONNECTIONS

- Temple Hill Road to Thrift Road**
Provides much needed connection to the south. This connection could travel adjacent to the power line easement, however, stream crossing may be costly to implement.
- Steed Road to Temple Hill Road**
Provides parallel access to Temple Hill Road which could help disperse traffic from Mt. Ennon Church events.
- Boys & Girls Club Parking Road to Temple Hill Road**
Provides parallel access for MD 223 for neighborhoods, churches, and events to Temple Hill Road Intersection. This connection could reduce overall volume during peak times.



NETWORK CONNECTIONS

- 1. Richmanor Terrace to Marlboro Pike**
Provides parallel access to MD 223 and Marlboro Pike for two neighborhoods.
- 2. New Road 1** - Provides perpendicular access to MD 223, Marlboro Pike, South Osborne Road, US 301, and William Beanes Road.
- 3. Welshire Drive to South Osborne Road**
Provides perpendicular access to MD 223 and connects to South Osborne Road and US 301.

Joint Base Andrews

Marlboro Pike



NETWORK CONNECTIONS

- 1. Extend Idlewood Drive to MD 223 (Intersecting with Canberra Drive)**
Provides parallel access to Mike Shapiro Drive to the east and connections for the neighborhood south of MD 223.
- 2. New Road 1** - Provides perpendicular access to MD 223 from Bellafonte Lane.

NETWORK CONNECTIONS

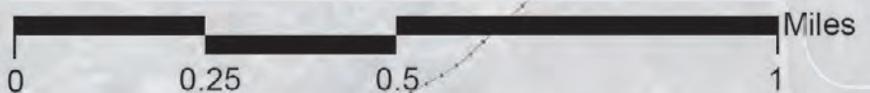
- 1. New Road 1** - Provides parallel access to MD 223 to the north, connecting the Clinton Shopping Center to Old Branch Avenue
- 2. New Road 2** - Provides parallel access to Old Branch Avenue/Brandywine Road and connects to Surratts Road. Similar road extension could be made on Clinton Manor Drive and Horseshoe Road to further distribute traffic.
- 3. Surrattville High School Access Road to Brandywine Road** - Provides parallel access to MD 223 for neighborhoods to connect to Brandywine Road.
- 4. New Road 3** - Provides parallel access to MD 223 to the south, connecting Pine View Lane to Kinney Place.

Rosaryville State Park

- 5. New Road 4** - Provides access for the Clinton VFD to access Brandywine Road directly and would allow the southeast corner parcel to become a green space or "town square."
- 6. New Roads** - The remaining network shown include new roads proposed as part of the Central Branch Avenue Corridor Revitalization Sector Plan approved in 2013.
- 7. New Road 5** - The street would bridge MD5 and provide parallel access to MD 223 adjacent to the proposed transit station
- 8. Connect Mike Shapiro Drive** - This connection would connect the portion of the northern end of Mike Shapiro Drive with the portion of Mike Shapiro Drive in the Highland Meadows Neighborhood that eventually connects to Old Alexandria Ferry Road.



FIGURE 63 | PROPOSED NETWORK IMPROVEMENTS



TRAFFIC CALMING MEASURES FOR LOCAL

Concerns/Opportunities:

Neighborhood residents' concerns related to cut through traffic and speeding on the local streets surrounding, and connecting to MD 223 can be addressed by traffic calming measures.

Concept Description:

The concept corridor plan suggests adding additional connections between neighborhoods and MD 223, which could increase vehicular volume on some local streets. All traffic should drive at a pace compatible with neighborhood streets. A thorough analysis of the local streets was not completed for this study so specific locations and treatments would be part of a broader range of alternatives.

Concept Considerations:

Traffic calming has the potential to improve pedestrian, bicyclist, and vehicular safety. Further traffic analysis, conditions inventory and public engagement should be help to determine the context and needs of impacted streets to determine which strategy (or combination of strategies) will be most effective in each situation.

Responsible Agency: (County Streets) Prince George's County DPW&T; (State Highways) SHA District 3 / OHD

Estimated Cost: \$50,000 to \$150,000 per measure

Target Date Range: 1-5 Yrs

Next Steps: Local jurisdiction coordination

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MD 223 Corridor Planning Study



Reduced Curb Radii: Short curb walls are used to better define the crossing area and allow for landscaping and lighting elements. *Image Credit: www.pedbikeimages.org/Burden*

REDUCED CURB RADII

Reconstructing a street corner with a smaller radius helps to reduce vehicle turning speeds. Reducing this radius also helps reduce the length of crossing for pedestrians, while better defining the crossing area. This curb reduction can also be done with a change in pavement, using a coarser textured material or even cobblestones to discourage general traffic vehicles, but still allow emergency vehicles to make the turn at higher speeds without "jumping" the curb area. (See image to the lower left)



Reduced Curb Radii: Coarse textured pavers help narrow the visual turning radii while maintaining the larger radii for emergency vehicles and larger trucks. *Image Credit: Dan Burden*

CHICANE

A series of fixed objects, usually extensions of the curb, which alter a straight roadway into a more serpentine path to help slow vehicles can also be created by alternating on-street parking between sides of street. Typically, chicanes can be easily retrofitted by maintaining the existing drainage channels by building a new curb as shown to the right.



Chicane: This chicane is "paired" with landscaped median island to alter the street just slightly to slow down approaching vehicles and increased pedestrian safety in the neighborhood. *Image Credit: Dan Burden*

STREET NETWORK



Raised Table Intersection: Note the paving patterns also help to distinguish travel lanes, pedestrian crosswalks, and drainage areas. *Image Credit: Dan Burden*

RAISED INTERSECTIONS

From crosswalk to crosswalk, the entire intersection is raised to height of the curb. The ramp up to the intersection occurs before the crosswalk, and site furnishing elements like bollards or planters are placed around the curve of the intersection turn to help vehicles visually negotiate the turning movements.

MINI-ROUNDBABOUT

A small circular, or oblong island used in the middle of intersections, is intended to force vehicular traffic to slow, and negotiate around it. When used in residential areas, they can be landscaped for aesthetic or barrier purposes, and may have mountable curbs to facilitate movement of emergency vehicles.



Neighborhood "Mini-Circle": Note the interior of the circle provides an opportunity for landscaping elements to help create a stronger sense of place for given neighborhood. *Image Credit: www.pedbikeimages.org/Burden*



Raised Crosswalk: This crosswalk uses pavers to help show differences in the ramp and the pedestrian crosswalk. *Image Credit: www.pedbikeimages.org/Burden*

SPEED HUMP WITH A LANE NECK-DOWN

A pedestrian crossing area is raised to give motorists and pedestrians a better view of the crossing area. It typically includes a "choker" bulb-out to narrow the travel lanes at the pedestrian crossing to typically 10' to help slow the moving vehicles, and increase safety for pedestrians. The bulb-outs provide an opportunity for landscaping that will help create a stronger sense of place.

PEDESTRIAN SAFETY IMPROVEMENTS (SIDEWALKS)

Concerns/Opportunities:

Survey respondents and community members expressed concern for pedestrian safety and access throughout most of the MD 223 Corridor.

Segment Concept Descriptions for MD 223

Steed Road to Temple Hill Road

There are no sidewalks along this section of MD 223. Improved pedestrian access is needed to provide walking access in this residential area. There are a number of destinations, including the Mt. Ennon Baptist Church, a convenience store, the nearby Clinton Library, the Clinton Boy's and Girl's Club, and the Clinton Sports Park.

This concept proposes to construct ADA compliant sidewalks on both sides of this section. Five-foot sidewalks would be provided, along with ADA compliant driveway entrances, curb ramps, and crosswalks at intersections. This project could include landscaped buffers to accommodate stormwater management with grass swales, and provide a safe separation from the road for pedestrians.

Temple Hill Road to Surrattsville HS Access Road

Pedestrian access is needed in this segment to provide walking access in this residential area. Surrattsville High School is at the north end of this segment, and sidewalks are only provided from Hardesty Drive to the north.

This concept proposes to construct ADA compliant sidewalks on both side of this section of MD 223. Five-foot sidewalks would be provided, along with ADA compliant driveway entrances, and curb ramps and crosswalks at intersections. This project would include landscaped buffers which could accommodate stormwater management with grass swales, and provide a safe separation from the road for pedestrians. Since existing right-of-way is at the edge of MD 223 for this section of corridor, additional right-of-way may be acquired, and coordination with property owners would be needed.

Surrattsville HS Access Road to Pine View Lane

This concept proposes to construct ADA compliant sidewalks on both sides of this section with landscape buffers, where space is available, as well as appropriate streetscaping to fit the historic characteristic of this section.

Currently, there are ADA compliant sidewalks on both sides of MD 223 from Hardesty Drive to Old Branch Ave/

Brandywine Road. At Old Branch/Brandywine, there are curb ramps on three quadrants of the intersection, where pedestrian signals are recommended.

From Old Branch/Brandywine to Pine View Lane, there are intermittent sidewalks with large gaps between them. Most of the sidewalks in this area are old, and need to be upgraded for ADA compliance and accessibility. In the historic area near Old Branch/Brandywine, a wide 10' sidewalk is recommended, with landscape pits for street trees. This streetscape treatment would fit the historic character, and fulfill the goals of the M-NCPPC approved Sector Plan for this area. Since existing right-of-way is at the edge of MD 223 for this section of corridor, additional right-of-way may need to be acquired, where coordination with property owners would be needed.

Pine View Lane to Mike Shapiro Drive

This concept proposes to construct ADA compliant sidewalks on both sides of this section with landscape buffers where space is available, as well as appropriate streetscaping to fit the historic characteristic of this section. Currently, there are ADA compliant sidewalks on both sides along this section, but sidewalks are not provided at certain key locations.

There is no sidewalk on the north side of MD 223 between Woody Terrace and the Clinton Plaza Shopping Center, on the east side of MD 5. Sidewalks are provided on the south side of MD 223 in this area. However, one block on the south side is missing sidewalks. There is a senior community near the Clinton Plaza Shopping Center, at Mike Shapiro Drive, and residents voiced concerns over the discontinuity of the sidewalks in this area. Additional sidewalks are recommended to provide continuity on both sides of Woody Terrace and Mike Shapiro Drive. Since existing right-of-way is at the edge for this section of corridor, additional right-of-way may need to be acquired, and coordination with property owners would be needed, particularly with the shopping centers. Special attention is needed during the next phase of this project for the portion of proposed sidewalk at the intersection of MD 5.

Mike Shapiro Drive to Rosaryville Road

This concept proposes to construct ADA compliant sidewalks on both sides of this section with landscape buffers where space is available. Currently, there are ADA compliant sidewalks in short sections in this area. The sidewalks end just to the east of Mike Shapiro Drive and are only available at two quadrants of Old Alexandria Ferry Road and Autumn Way.

This area is mostly residential with many houses

AND LIGHTING)

fronting and having individual driveway access on MD 223. Currently, pedestrians must use the shoulder, which is narrow in spots. Pedestrian destinations include convenience stores, a community park, and churches. Safe access to the Tanglewood Community Park and the Tanglewood Regional Center and School should be prioritized for this project. Since existing right-of-way is at the edge of MD 223, additional right-of-way may need to be acquired, and coordination with adjacent property owners will be needed.

Rosaryville Road to Marlboro Pike

Currently, this section has no ADA compliant sidewalks. This concept proposes to construct ADA compliant sidewalks on both sides with landscape buffers where space is available. There is a current project to add sidewalks between Victoria Lane and Sherwood Drive, and additional sidewalks are recommended.

This area is mostly residential, with many homes having frontage on MD 233, along with driveway access. Currently, pedestrians use the shoulder, which is narrow at spots. Pedestrian destinations in this segment include three schools and a community park. It is recommended that continuous sidewalks be provided throughout this area to improve pedestrian safety.

In the proximity of Johensu Drive and Melwood Pond Community Park, there are several environmental resources, such as the Charles Branch, 100-year floodplain, and wetlands that would require special attention. Since the road is improved up to the edge of existing right-of-way, additional right-of-way may need to be acquired, which will require coordination with property owners.

Marlboro Pike to MD4

This section of MD 223 has no ADA compliant sidewalks. This concept proposes to construct ADA compliant sidewalks on both sides of this section of the corridor with landscape buffers where space is available. Future development east and west of this segment of MD 223 should consider the need to add pedestrian access for MD 223. It is recommended that continuous sidewalks be provided throughout this area, to provide safe pedestrian access.

Segment Concept Considerations:

- The use of pedestrian lighting should also be considered during the design phase of each segment;
- Crosswalks should be considered since various

portions of the corridor have higher speed limit designations.

Responsible Agency:	SHA District 3 / OHD
Estimated Cost:	\$320,000 to \$470,000 per Segment; \$600,000 to \$900,000 for the Surrattsville HS Access Road to Pine View Lane Segment
Target Date Range:	3-10 years
Next Steps:	Additional Study, Coordination and Scoping

BICYCLE SAFETY IMPROVEMENTS

Concerns/Opportunities:

There is a lack of safe and adequate bicycle facilities throughout of the MD 223 Corridor.

Segment Concept Descriptions:

Temple Hill Road to Pine View Lane

This concept proposes widening the roadway to provide appropriate shoulder lanes that would also accommodate bicycle users. This section of the roadway would be widened, in both directions, to minimize impacts to private properties. The recommended concept includes 10' shoulders to accommodate bicyclists and provide a safe breakdown area for this two-lane section. The minimum shoulder width that would provide bicycle compatibility is 6'.

Mike Shapiro Drive to Rosaryville Road

This concept proposes widening the roadway to provide appropriate shoulder lanes that would also accommodate bicycle users of the corridor. This section of roadway would be widened in both directions to minimize impacts to private properties. The recommended concept includes 10' shoulders to accommodate bicyclists and provide a safe breakdown area for the recommended four-lane section of MD 223. The minimum shoulder width that would provide bicycle compatibility is 6'.

Project Considerations:

Since existing right of way is at the edge of MD 223 for these two segments along the corridor, additional right-of-way may need to be acquired, and coordination with property owners would be needed.

Responsible Agency:	SHA OPPE
Estimated Cost:	\$3,200,000 to \$13,000,000 per Segment
Target Date Range:	10-20 years
Next Steps:	Additional Study

BUS STOP/ SHELTER IMPROVEMENTS

Concerns/Opportunities:

Balance the needs of all users. The presence of bus service today and a premium transit station proposed in the future indicates the need for stops that are safe, attractive, comfortable, and accessible.

Concept Description:

Provide bus shelters at all stops along MD 223 for comfortable and safe waiting spaces. Bus stops should also include lighting for the shelter area and along sidewalk connections.

Concept Considerations:

Choose well designed shelters that complement and integrate into the surrounding community to reinforce area character. Plan for repairs and maintenance to ensure that they remain clean, safe, and comfortable. Bus shelter installation and maintenance should be considered as part of development permitting mitigation.

Responsible Agency: Prince George's County DPW&T Transit Division;

Estimated Cost: \$10,000 to \$100,000 per stop;

Target Date Range: 1-5 Yrs;

Next Steps: Provide information to local jurisdictions.

BUS SHELTERS

Loading and waiting areas, while functional, can also be thoughtfully designed to create attractive locations, and a sense of place. These facilities can be tailored to reflect the community's character, and identity.



Image Source: www.pedbikeimages.org/Burden



Image Source: www.pedbikeimages.org/Brown



Image Source: [Kittelson & Associates, Inc.](http://Kittelson.com)

CENTER TURNING LANES

Concerns/Opportunities:

Reduce the numbers of crashes, especially rear end and angle crashes occurring as a result of motorists turning into driveways and unsignalized local streets from the travel lane. The segment areas of MD 223 shown previously in Figure 29 had high concentrations of angle and left turn crashes during the years 2009 through 2011.

Concept Description:

The center turn lane is proposed in the rural and transitioning suburban segments of MD 223 due to the large number of uncontrolled access points. The proposed center turn lane would provide a safe refuge for left turning vehicles, and discourage passing or stopped vehicles on the shoulder. The addition of a center turn lane will reduce the probability of crashes related to vehicles turning from MD 223, and allow vehicles to wait for a sufficient gap in traffic to turn left without impacting through traffic flow.

Segment Concept Descriptions:

Temple Hill Road to Pine View Lane;

As seen on the following page, this concept proposes to construct a 12' center turning lane through these two roadway segments. This section of the roadway would remain on MD 223 in both directions to minimize impacts to private property, but be striped different to allow a wider bike lane. Further study may be required to determine additional impacts resulting from the widening of the roadway.

Mike Shapiro Drive to Rosaryville Road

As seen on the following page, this concept proposes to construct a 12' center turning lane through these two roadway segments. This section of the roadway would be widened on MD 223 in both directions to minimize impacts to private property. Further study may be required to determine additional impacts resulting from the widening of the roadway.

Concept Considerations:

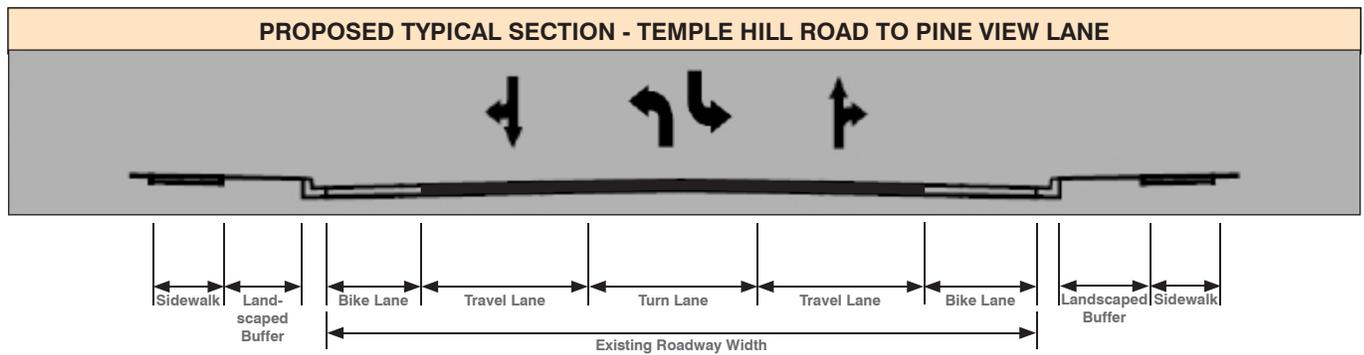
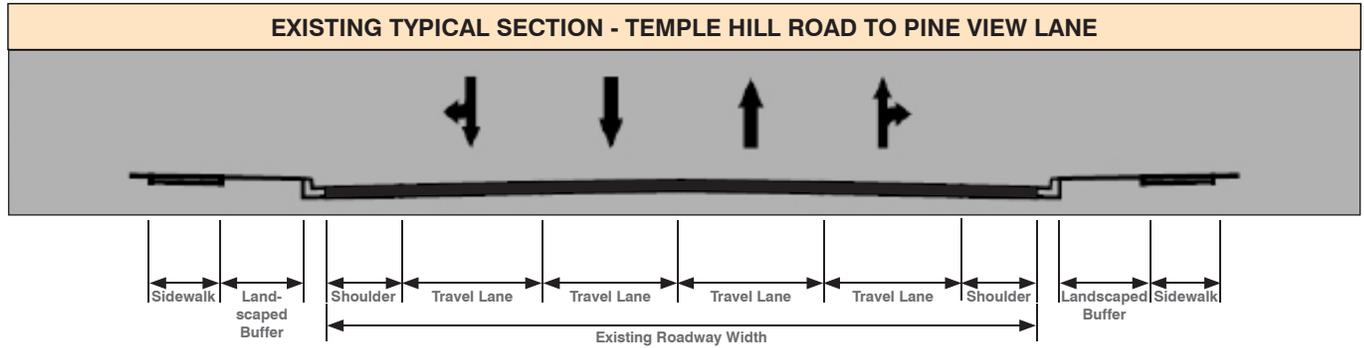
Since existing right of way is at the edge of MD 223 for these two segments of the corridor, additional right-of-way may need to be acquired, and coordination with property owners would be needed.

Additionally, many environmental resources exist between Mike Shapiro Drive and Rosaryville Road, including the Piscataway Creek, wetlands, 100-year floodplain, and His Lordship's Kindness, a historic estate listed on the National Registrar of Historic Places. Improvements should consider avoidance of

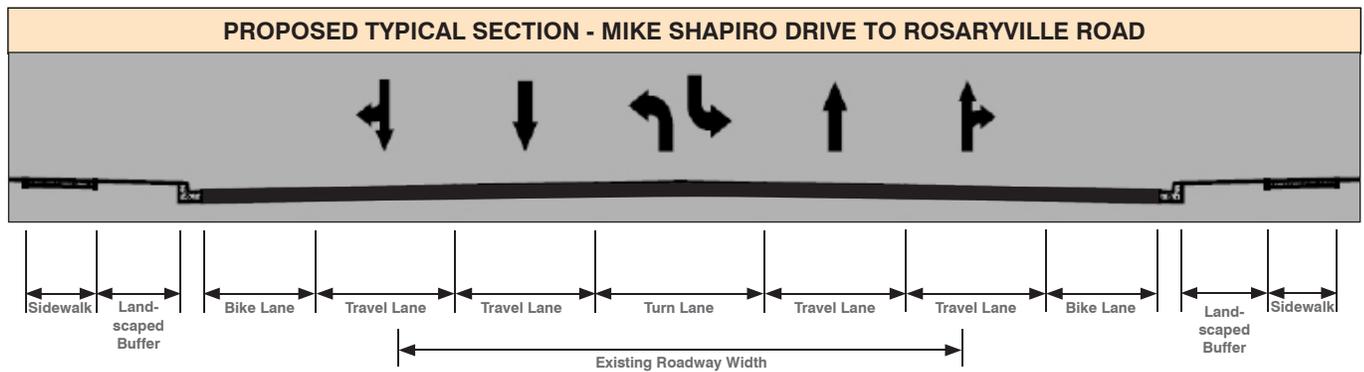
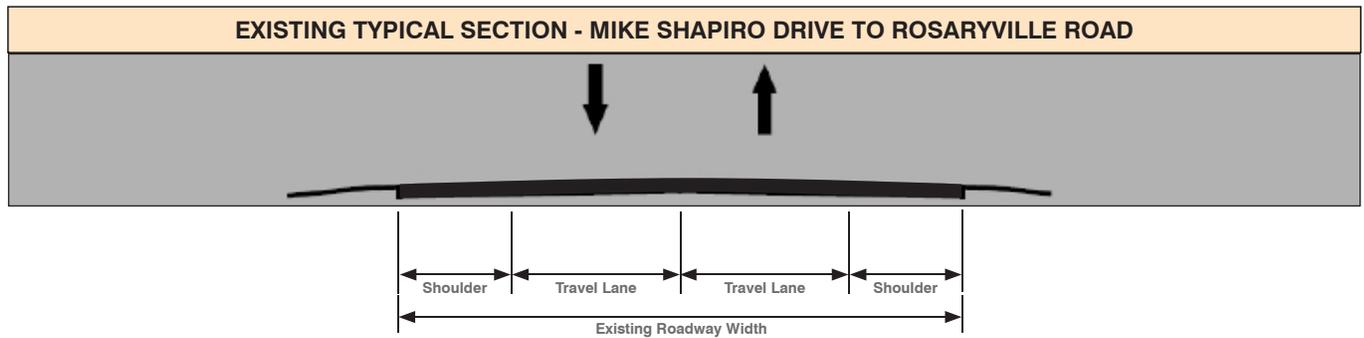
impacts to these resources, without compromising the needs of improving safety and providing adequate accommodations.

Responsible Agency:	SHA OPPE
Estimated Cost:	\$2,800,000 to \$7,900,000 (Temple Hill Road to Pine View Lane); \$9,500,000 to \$13,000,000 (Mike Shapiro Drive to Rosaryville Road)
Target Date Range:	5-15 years
Next Steps:	Additional Study

PROPOSED TYPICAL SECTION WITH CENTER TURN LANES



PROPOSED TYPICAL SECTION WITH CENTER TURN LANES



SEGMENT 1: STEED ROAD TO TEMPLE HILL ROAD

SEGMENT 1 | Steed Road to Temple Hill Road

Project Types

- S#** Short-Term Improvements
- M#** Mid-Term Improvements
- L#** Long-Term Improvements

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MD 223 Corridor Planning Study

M2

M1

MARYLAND
223

MARYLAND
5



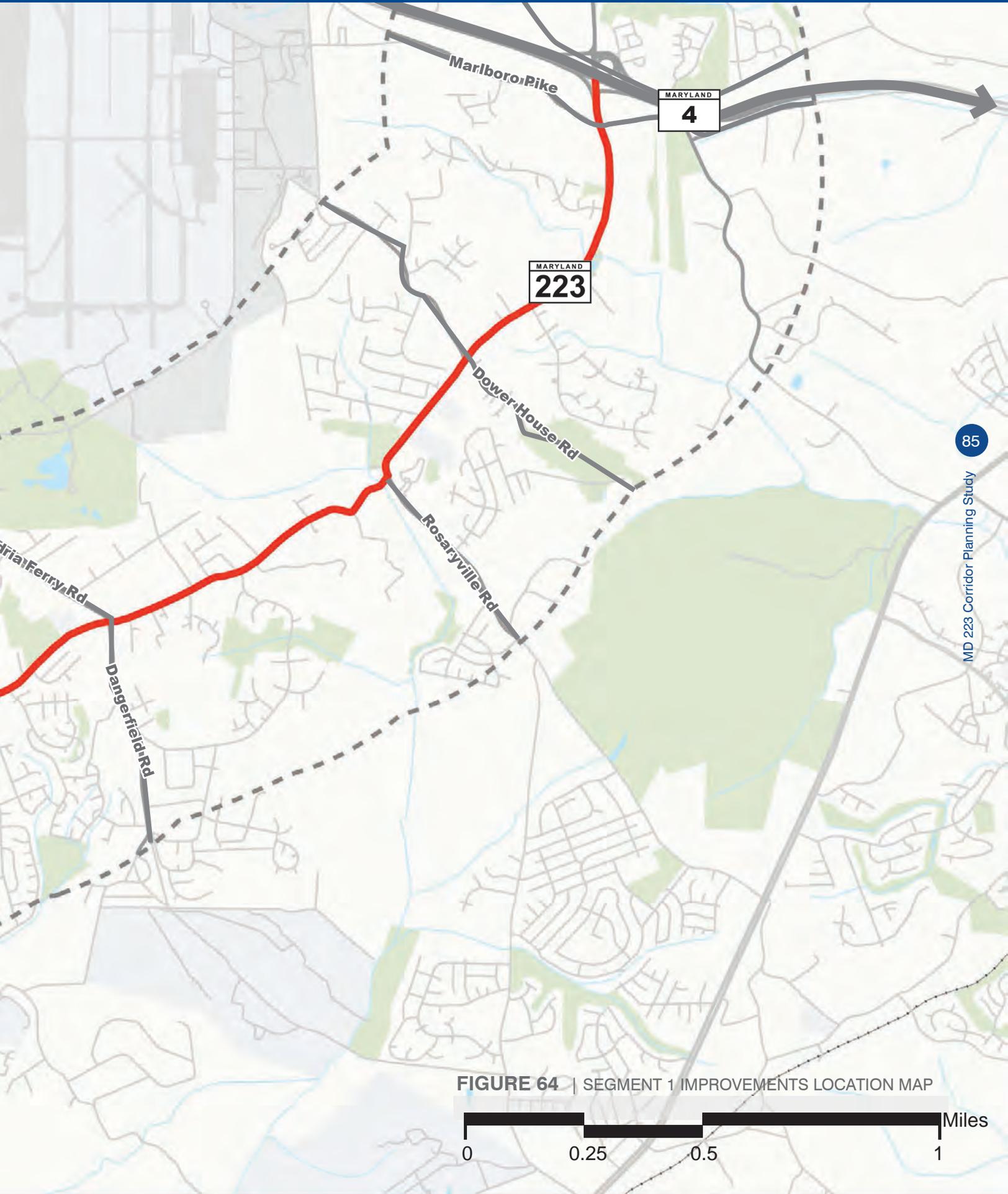
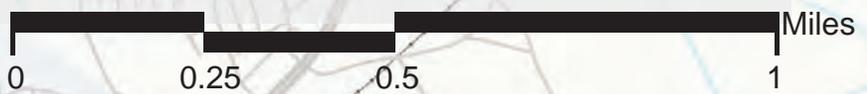


FIGURE 64 | SEGMENT 1 IMPROVEMENTS LOCATION MAP



STEED ROAD INTERSECTION IMPROVEMENTS

Concerns/Opportunities:

The Steed Road intersection was identified by many stakeholders speeding, safety, and congestion concerns. The crash data has identified a cluster of crashes in the vicinity of the intersection.

Concept Description:

Two concepts are shown below; however, a range of options may be appropriate for this intersection. Further study should be conducted to determine an ideal intersection configuration, taking into account all modes and the surrounding context.

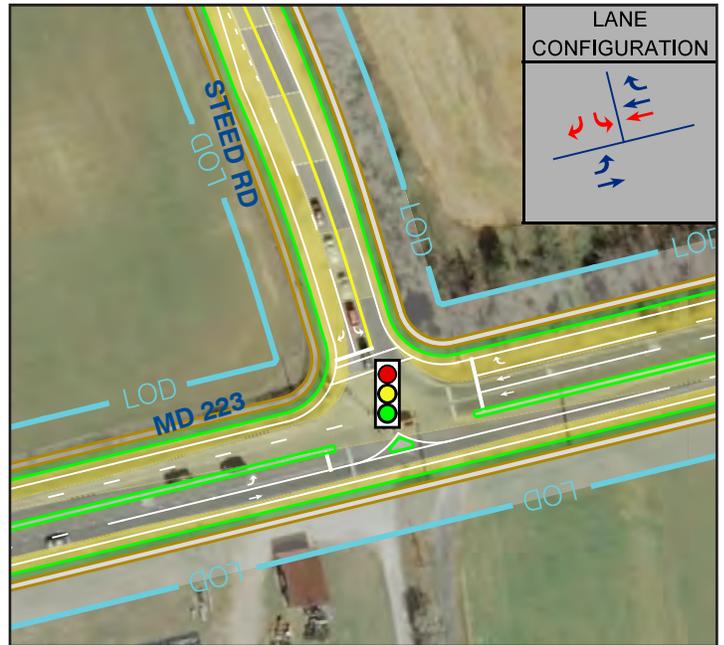
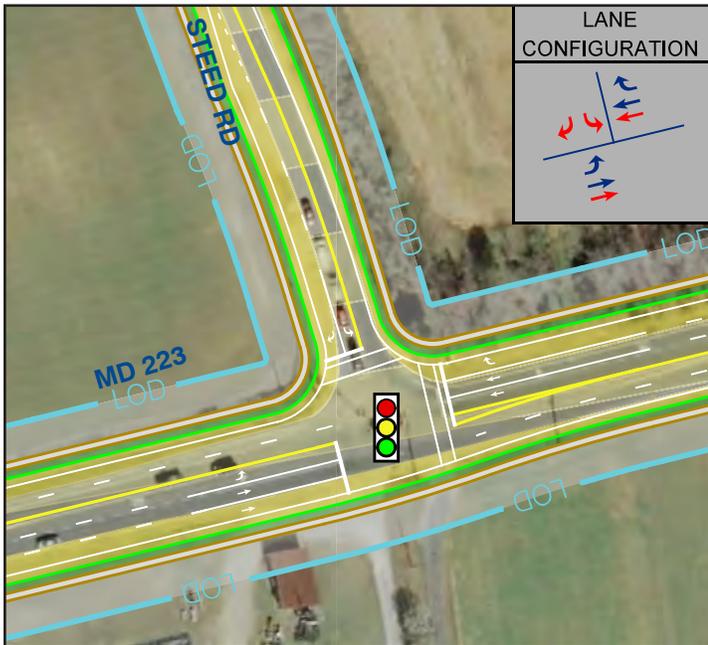
Design Considerations:

Access to Miller Farms needs to be maintained. Organizing access to the parking located directly to the southwest of the intersection, where open access allows vehicles to pull in and out near the intersection, needs to be included in the final solution. Designs may also consider traffic calming measures on Steed Road to reduce speeding reported by community residents.

Responsible Office: District 3 / OHD
Estimated Cost: \$2,900,000 to \$4,100,000
Target Date Range: 3-10 years
Next Steps: PE Funding

86 STEED RD AND MD 223 INTERSECTION CONCEPT 1:

STEED RD AND MD 223 INTERSECTION CONCEPT 2:



ADDITIONAL THROUGH LANES ON MD 223.

CONVERSION TO MARYLAND-T INTERSECTION;
 ADDITIONAL THROUGH-LANE ON WB MD 223.

TEMPLE HILL ROAD INTERSECTION IMPROVEMENTS

Concerns/Opportunities:

Temple Hill Road provides regional connectivity from MD 223 to Kirby Road, Allentown Road, and beyond. It was also identified as an intersection with safety and congestion concerns. The crash analysis supported this, showing a cluster of crashes around the intersection.

Concept Description:

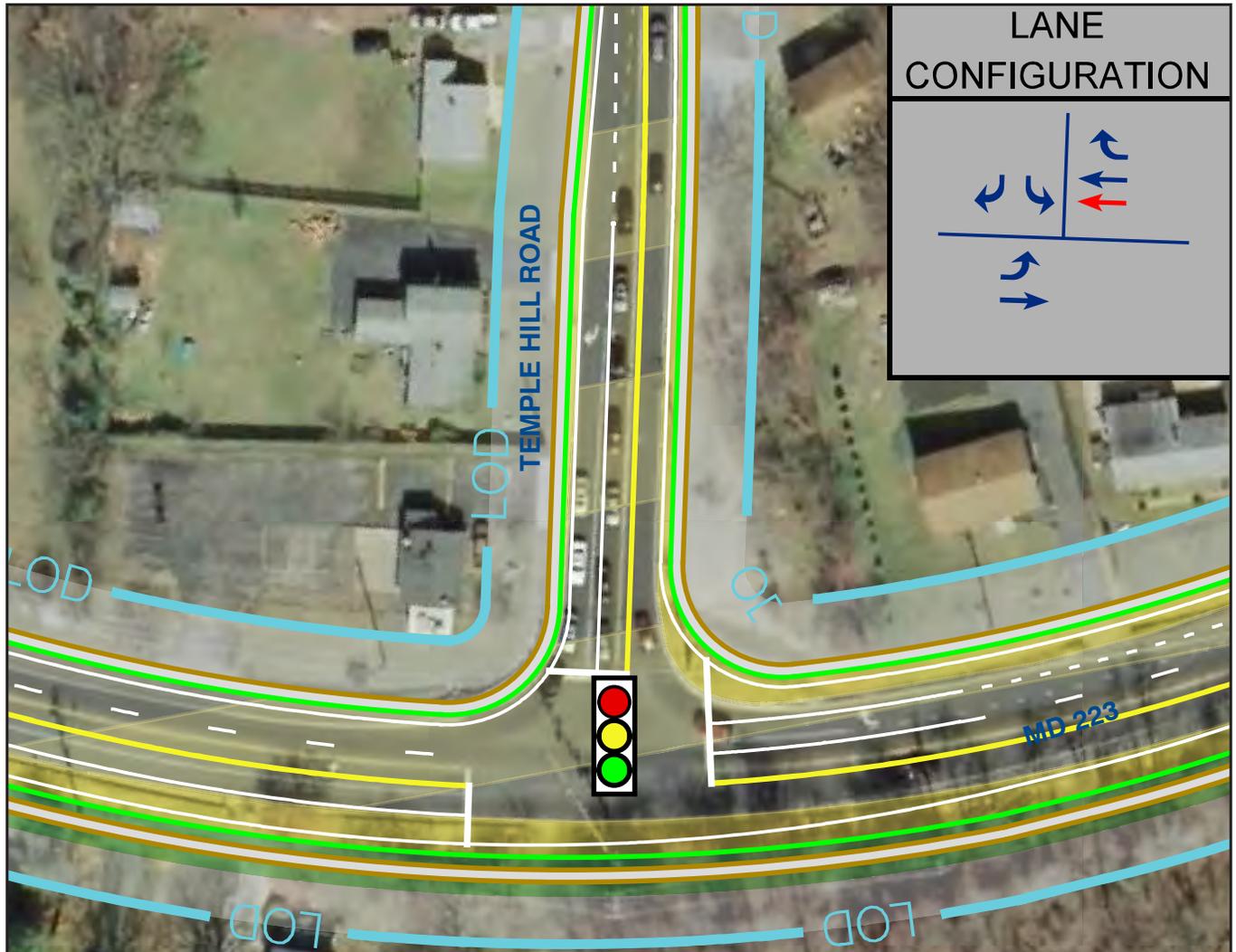
The following concept presents one option to add capacity to the intersection; however, further study should be conducted to determine an ideal intersection configuration that take into account all modes, and the surrounding context.

Design Considerations:

Proposed roadway widening will address capacity issues at the Temple Hill Road intersection. However, pedestrian and bicycle facilities, including lighting and crosswalks, should be evaluated to ensure their safety with the wider cross-section. Tightened curb radii and traffic calming treatments for slower turning speeds should be considered in final design to reduce pedestrian conflict exposure.

Responsible Office: District 3 / OHD
Estimated Cost: \$2,600,000 to \$3,700,000
Target Date Range: 3-10 years
Next Steps: PE Funding

TEMPLE HILL RD AND MD 223 INTERSECTION CONCEPT 1:



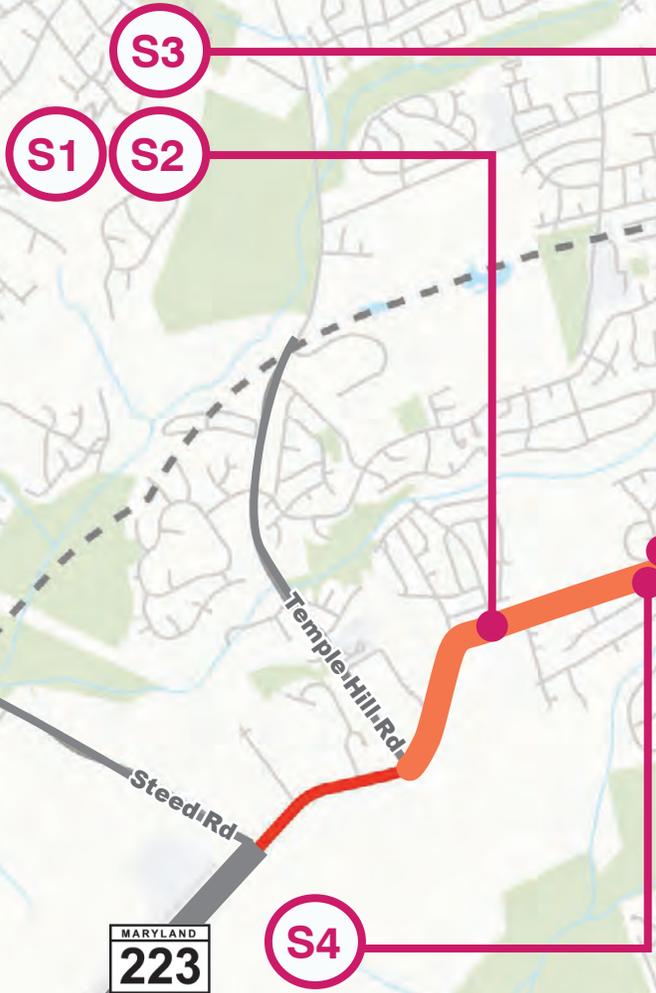
CONVERSION TO MARYLAND-T INTERSECTION; ADDITIONAL THROUGH-LANE ON WB MD 223.

SEGMENT 2: TEMPLE HILL ROAD TO SURRATTSVILLE

SEGMENT 2 | Temple Hill Road to Surrattsville High School Access Road

Project Types

- S#** Short-Term Improvements
- M#** Mid-Term Improvements
- L#** Long-Term Improvements



HIGH SCHOOL ACCESS ROAD

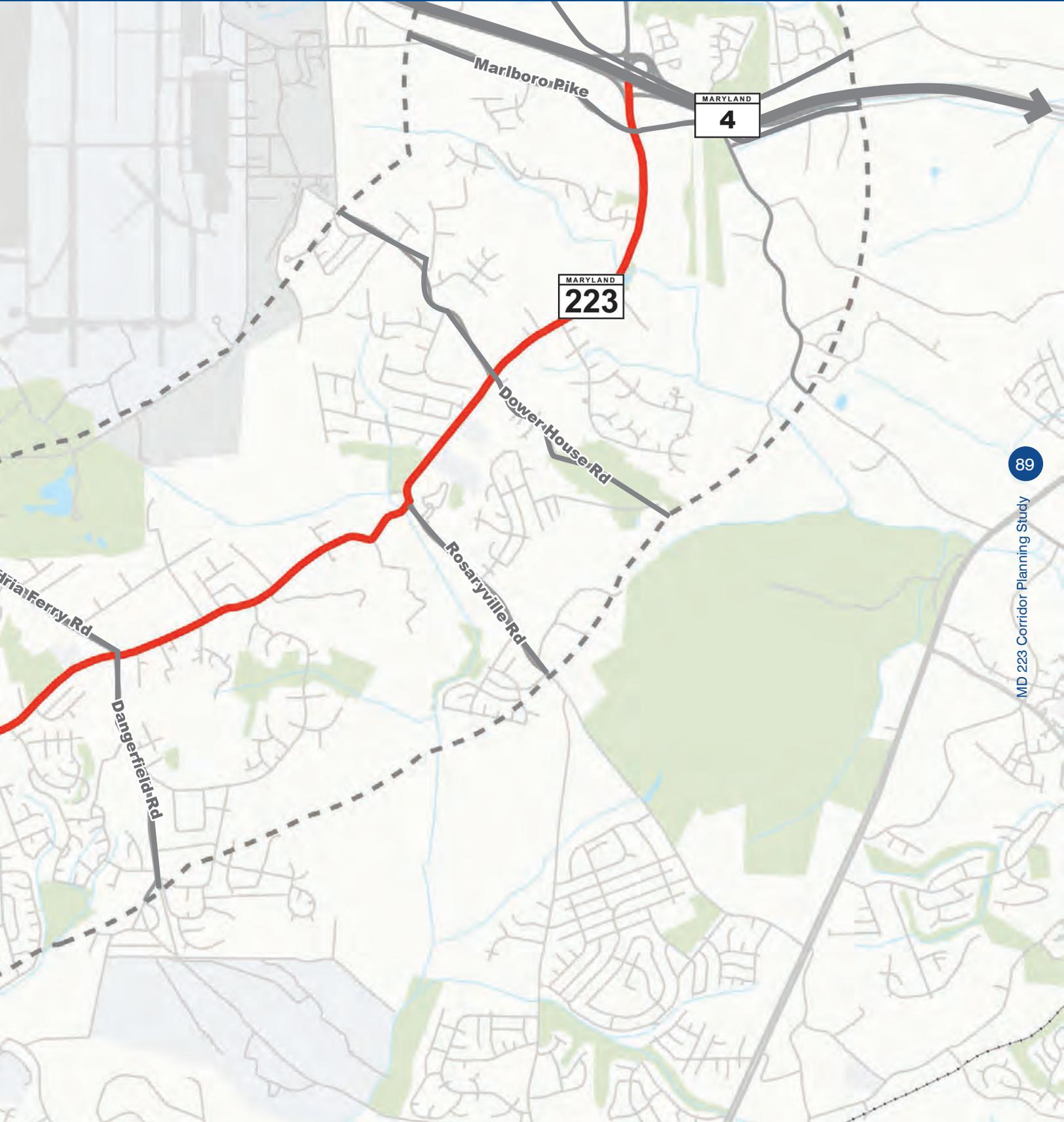
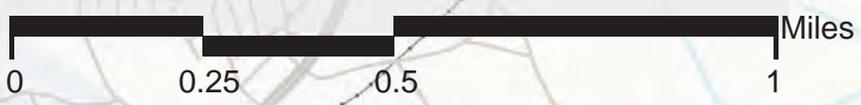


FIGURE 65 | SEGMENT 2 IMPROVEMENTS LOCATION MAP



PROTECTED LEFT-TURN LANE: DIXON DRIVE

Concerns/Opportunities:

Improve safety at the entrance to the Library, Health Department, and Sports Park.

Concept Description:

Protected left-turn lanes from MD 223 to Dixon Drive are proposed for access to the Clinton Library, the Prince George’s County Health Department, and the Clinton Sports Park. An existing protected left-turn lane to Dixon Drive lies to the west of this intersection. Left-turn lanes are also proposed at the intersection of Pella Place, which is north of Dixon Drive, based on the size of the neighborhood. A corresponding left turn lane can also be provided for the Independent Baptist Church opposite Pella Place.

Design Considerations:

A signal warrant analysis is recommended, (See Project Data Sheet S2).

Responsible Agency: SHA OPPE / District 3
Estimated Cost: \$1,500,000 - \$3,600,000 / per project
Target Date Range: 1-10 years
Next Steps: Additional Study

Dixon Drive Proposed Left-Turn Lane



Concerns/Opportunities:

Six crashes were reported at the Dixon Drive intersection during 2009, four of which were angle crashes. Crash data and MD 223 traffic volumes suggest a signal may be warranted. Dixon Drive serves a residential community of approximately 150 residences with no other entrance or exit. This intersection also serves the Clinton Library, the Prince George’s County Health Department, and the Clinton Sports Park, attracting many visitors daily.

Concept Description:

A signal warrant analysis is recommended for this intersection.

Design Considerations:

Protected left-turn lanes have been recommended. (See Project Data Sheet of S1). The two projects should be coordinated, and possibly combined for cost, and efficiency purposes. Site constraints should also be considered as a major factor where houses are close to MD 223, as signalization would need to acquire right-of-way and/or easement for construction and maintenance purposes.

- Responsible Agency:** SHA District 3
- Estimated Cost:** \$100,000 - \$150,000
- Target Date Range:** As needed
- Next Steps:** Additional study

MD 223 at Dixon Drive looking West



SIGNAL WARRANT ANALYSIS: HARDESTY DRIVE

Concerns/Opportunities:

Hardesty Drive serves a residential community of approximately 175 residences with no other entrance or exit. Directly across from Hardesty Drive is a small community of approximately 40 units. MD 223 in this area has two travel lanes in each direction, as well as right turn lanes onto Hardesty Drive. While the number of vehicles entering or exiting to Hardesty Drive is low, traffic volumes on MD 223 create occasions when gaps for turning vehicles seem inadequate.

Concept Description:

A signal warrant analysis is recommended for local street egress needs for this intersection.

Design Considerations:

Site constraints where houses are close to MD 223 should be considered, as signalization would potentially require right-of-way and/or easement for construction and maintenance purposes.

- Responsible Agency:** SHA District 3
- Estimated Cost:** \$100,000 - \$150,000
- Target Date Range:** As needed
- Next Steps:** Additional study

MD 223 at Hardesty Drive looking West



SIGNAL WARRANT ANALYSIS: GWYNNDALE DRIVE

Concerns/Opportunities:

Gwynndale Drive serves a residential community of approximately 250 residences with only one other entrance, Pella Place. While the number of vehicles entering or exiting Gwynndale Drive is low, the traffic volumes on MD 223 may not allow for adequate gaps for turning vehicles.

Concept Description:

A signal warrant analysis is recommended to address the issue of local street egress for this intersection.

Design Considerations:

Site constraints where houses are close to MD 223 should be considered, as signalization would potentially require right-of-way and/or easement for construction and maintenance purposes.

- Responsible Agency:** SHA District 3
- Estimated Cost:** \$100,000 - \$150,000
- Target Date Range:** As needed
- Next Steps:** Additional study

MD 223 at Gwynndale Drive looking West

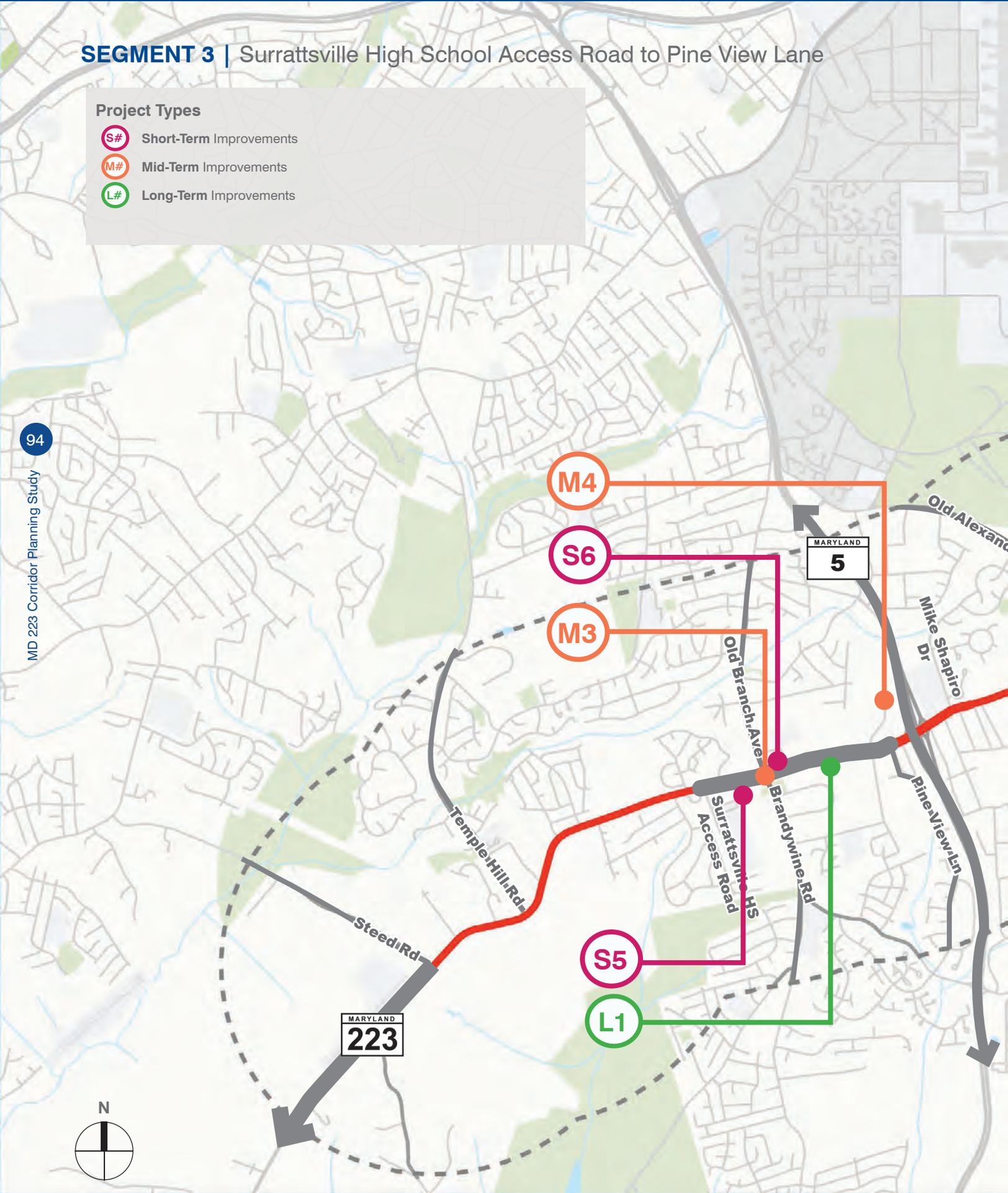


SEGMENT 3: SURRATTSVILLE HIGH SCHOOL

SEGMENT 3 | Surrattsville High School Access Road to Pine View Lane

Project Types

- S#** Short-Term Improvements
- M#** Mid-Term Improvements
- L#** Long-Term Improvements



ACCESS ROAD TO PINE VIEW LANE

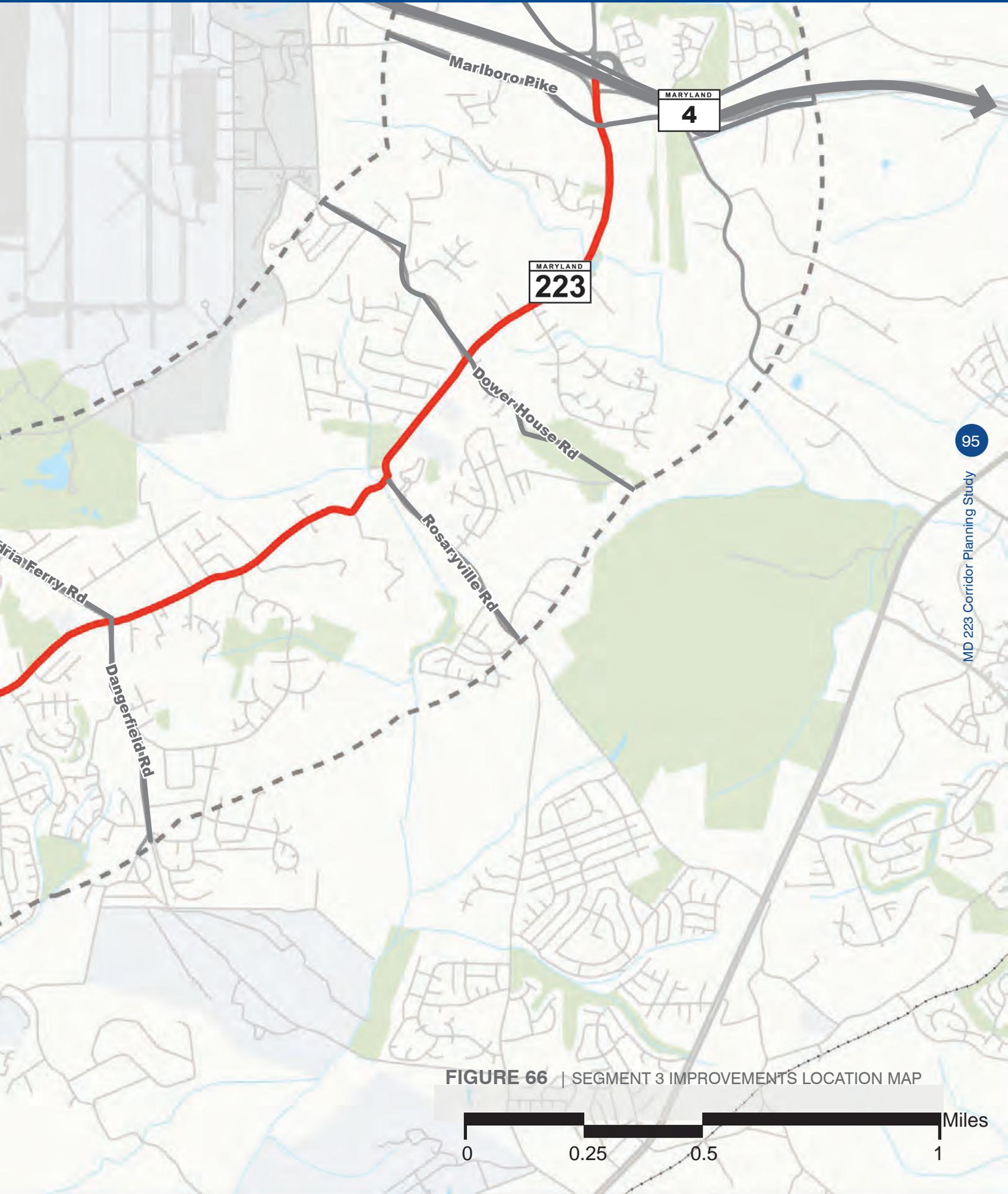


FIGURE 66 | SEGMENT 3 IMPROVEMENTS LOCATION MAP

0 0.25 0.5 1 Miles

CLINTON POST OFFICE/ SURREATTSVILLE HIGH SCHOOL ACCESS ROAD

Concerns/Opportunities:

The Clinton Post Office has two entrances located eastbound along MD 223. Stakeholders have expressed a desire for an alternate entrance to the post office that routes traffic through the existing traffic signal at MD 223 serving the Surrattsville High School.

Concept Description:

The concept shown below utilizes this access road while still allowing for two entrances to the Post Office. Removing one driveway from MD 223 reduces an un signaled conflict point along MD 223 for pedestrians, bicyclists, and vehicles.

Design Considerations:

Coordination will be required with the Post Office and Surrattsville High School to ensure that each user's operations are accommodated in final design. The traffic signal, currently operating only during school peak hours, will require a 24-hour timing plan modification.

- Responsible Agency:** District 3 / OHD
- Estimated Cost:** \$500,000 to \$700,000
- Target Date Range:** 1-5 years
- Next Steps:** Provide information to local jurisdictions

96 Conceptual Visualization of New Post Office Entrance



Concerns/Opportunities:

Downtown Clinton lies within the area bounded by Old Branch Avenue and Brandywine Road/Dangerfield Road. It is the historic heart of Clinton, and contains important historic and cultural resources, in particular the Mary Surratt House. While serving as the retail and entertainment hub of Clinton, MD 223 also provides area access to MD 5, contains a park and ride lot serving as a transit transfer hub, and is planned for greater density as a key stop on the proposed Southern Maryland Transit line. This section experiences the greatest amount of congestion and the greatest concentration of crashes. As redevelopment occurs, the demand in the area will only increase.

Concept Description:

The Central Branch Avenue Corridor Revitalization Sector Plan proposes concepts for a more urban downtown core. It also proposes a boulevard concept and crossing of MD 5, north of MD 223, with a pedestrian bridge between the retail centers. This study proposes a modest cross-section of MD 223, greater access management with more local streets, and a modest scaled vehicular crossing of MD 5 in the vicinity of the future transit station. A NEPA study is recommended to fully investigate the various alternative concepts, including their benefits, impacts, and feasibility. The currently approved Sector Plan should be amended to reflect a modest cross-section, provision of local right-of-way, and access management through reduced direct parcel access from/to MD 223 and inter-parcel connections.

Study and Design Considerations:

Proposed section(s) should preserve and enhance downtown Clinton and support(s) all modes of access including pedestrians and bicyclists.

Existing studies, such as the Central Branch Avenue Corridor Revitalization Sector Plan, and other recommended studies, such as the MD 5 Interchange Improvement Study and the Old Branch Avenue/Brandywine Road Intersection Improvements, should also be considered in the next phase of this project to maintain the character of the area.

Increasing transit use and premium transit options, described in the Southern Maryland Transit Study, and a planned mixed use core, will help this study and the Clinton Core Network Connectivity Enhancement Study to bring about capital projects and redevelopment to create more connections to emerging transit, and commercial centers.

- Responsible Agency:** SHA OPPE
- Estimated Cost:** TBD
- Target Date Range:** TBD
- Next Steps:** Additional Study

Potential Downtown Clinton Area Corridor Study (MD 223 from Brandywine Road to Old Alexandria Ferry Road)



SIGNAL WARRANT ANALYSIS: CLINTON VFD EMERGENCY ACCESS

Concerns/Opportunities:

A member of the Clinton Volunteer Fire Department (Clinton VFD) noted that the traffic volume on MD 223 often queues blocking the entrance to Clinton VFD's and affecting emergency responders' ability to respond to emergency calls.

Concept Description:

The current advisory warning signal at the fire house entrance should be evaluated for replacement with a signal that would permit a preemption call by emergency responders to address the issue of driveway egress, especially during emergency events.

Design Considerations:

This concept should work in conjunction with any lane modification and in coordination with signal timing of adjacent intersections to facilitate a faster path for the emergency vehicles to access the local and regional street network.

- Responsible Agency:** SHA District 3
- Estimated Cost:** \$100,000 - \$150,000
- Target Date Range:** As needed
- Next Steps:** Additional study

MD 223 at the Clinton VFD Emergency Access near the Old Branch Rd/Brandywine Rd Intersection looking West



Concerns/Opportunities:

This intersection marks the historic core of Clinton. The historic building pattern constrains right-of-way and congestion is a major issue for residents. The Clinton Volunteer Fire Department is unable to access MD223 during peak travel periods. This congestion is projected to increase as more development occurs.

Concept Description:

The diagrams below present two possible alternatives to reduce congestion at this intersection and improve pedestrian access. Both will require additional right-of-way and may have impacts to historic property. Plans for this area allow for greater development density and a more urban condition. This density will require more street connections which can reduce reliance on major roads to move people. The alternatives shown are appropriate for suburban areas with limited internal connectivity. They may be adjusted through local coordination that results in parallel and alternative routes. Further study is recommended to determine an ideal intersection configuration that takes into account all modes, the surrounding context, and a more robust level of local street connections, and travel options that mitigate traffic growth, and circulation patterns.

Due to the impacts to private property, cultural, and historic features, a NEPA study is recommended for this intersection.

Study and Design Considerations:

The congestion experienced at this intersection is a major concern for the residents. Maintaining Clinton’s historic small town feel is also a priority suggesting that any solution will need to preserve and enhance character while ensuring reasonable safety and efficiency for travelers.

This area has the potential become a more significant regional destination and should provide for all modes of travel as well as elevate the needs of pedestrians and bicyclists in the core.

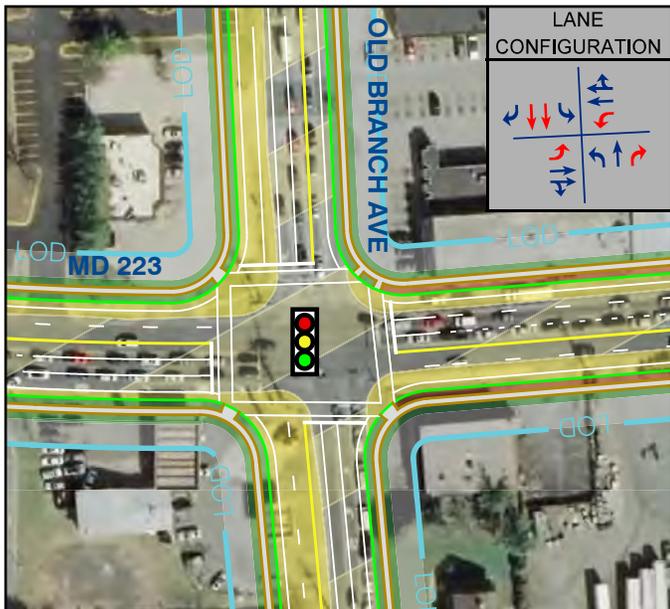
Intersection designs should consider residents’ visions for the area to enhance the cultural assets and historic features, namely the Mary Surratt House and Tavern, and the BK Miller Store.

Since existing right of way is at the edge of MD 223 for this section of the corridor, additional right-of-way will be needed.

Addressing the need for emergency access, by the Clinton Volunteered Fire Department, should also be included in proposed changes.

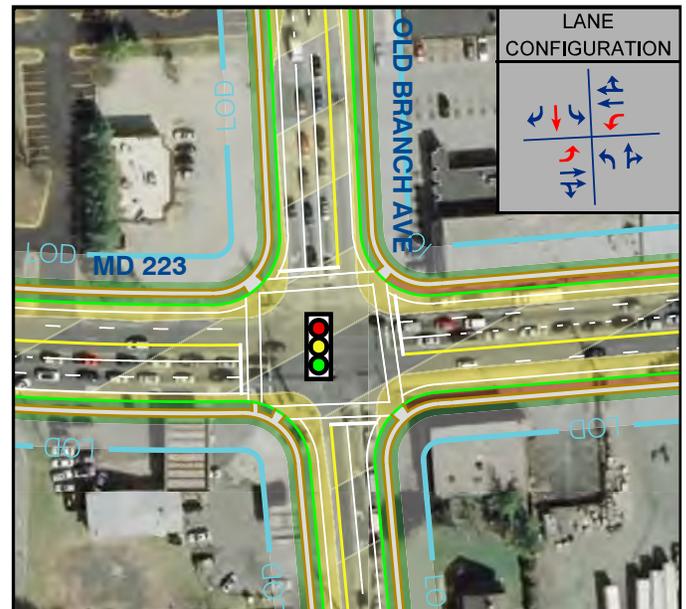
- Responsible Agency:** SHA OPPE
- Estimated Cost:** \$4,700,000 to \$6,600,000
- Target Date Range:** 3-10 years
- Next Steps:** PE Funding

ALTERNATIVE CONCEPT 1:



ADDITIONAL THROUGH-LANES AND RIGHT-TURN LANE ON OLD BRANCH AVENUE; ADDITIONAL LEFT-TURN LANES ON MD 223.

ALTERNATIVE CONCEPT 2:



ADDITIONAL THROUGH-LANES ON OLD BRANCH AVENUE; ADDITIONAL LEFT-TURN LANES ON MD 223.

Concerns/Opportunities:

Reinforce Clinton Commercial Core as the heart of the greater Clinton community. Consisting of the Woodyard Crossing and Clinton Plaza shopping center on the north side of MD 223, the area also includes a park-and-ride lot and a strip of commercial uses in shallow lots on the south side. The majority of Clinton area retail and entertainment options are located here. According to the Branch Avenue Sector Plan, land here is expected to be redeveloped with greater density and diversity of use in a more walkable pattern of connected streets.

A new premium transit station proposed in the Southern Maryland Transit Corridor Study at Clinton Plaza will help to reorient all modes to that area where transit is expected to concentrate.

Concept Description:

Investigate an elevated crossing of Branch Avenue (MD 5) to accommodate bicycle, pedestrian, transit, and motorist access that does not rely on MD 233. Increase connections and access to and from surrounding neighborhoods, between businesses and emerging transit nodes with new street and inter-parcel connections, including a link from Woodley Road to and through Woodyard Crossing. Study should support a local road network that permits access management of MD 223 and encourages local road access to businesses through downtown Clinton.

WOODLEY ROAD CONNECTION

One of many new connections proposed in the Clinton Commercial Core, Woodley Road is proposed to connect to the Woodyard Crossing and Walmart through the end of this road, shown in the picture below. This concept will need further study, as well as coordination with adjacent neighborhood residents to determine the appropriate streetscape and traffic calming response to maintain the residential character of local streets.

Woodley Road looking East



CONNECTIVITY ENHANCEMENT

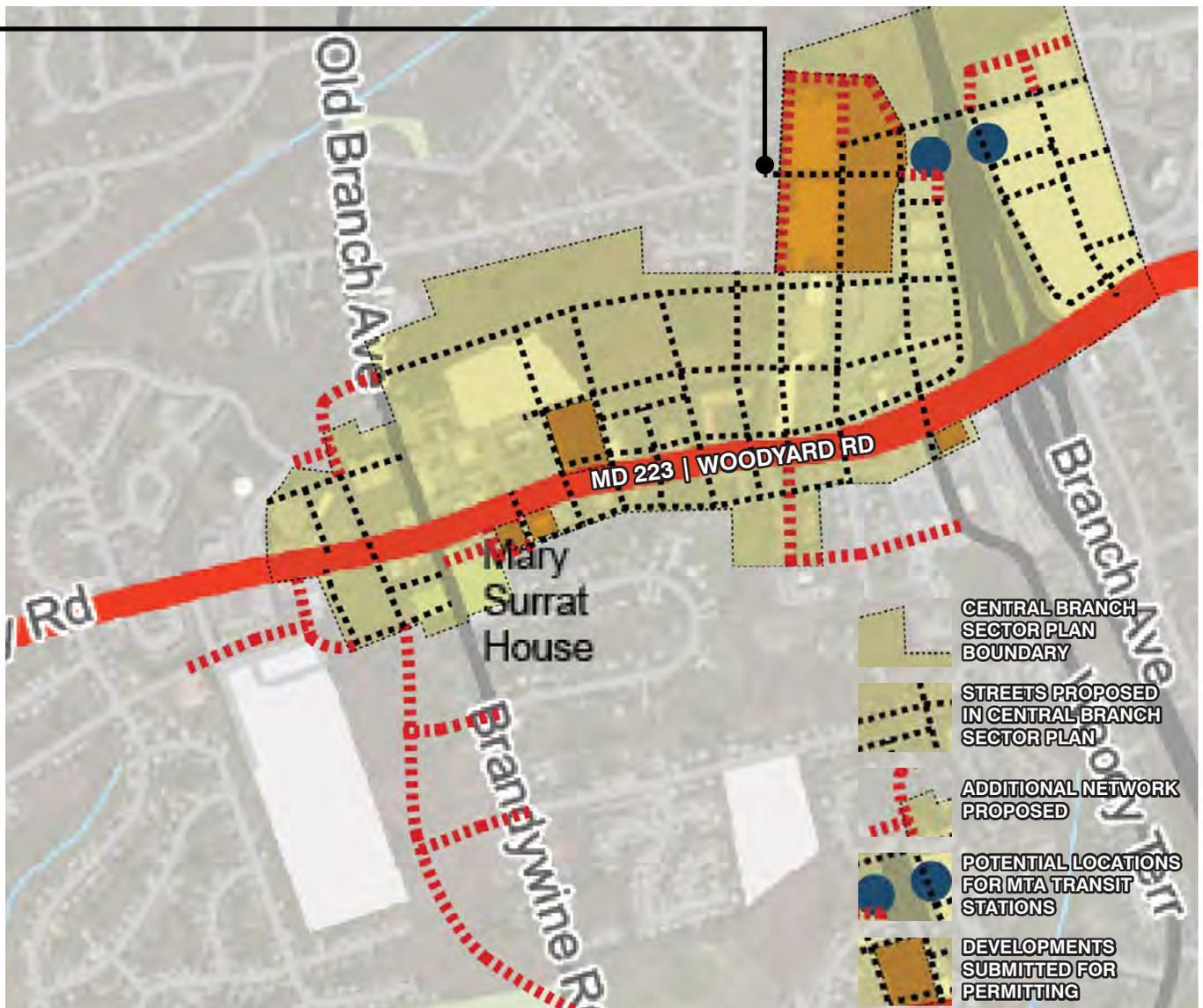
Study and Design Considerations:

Further study of the possible circulation patterns in this area, including the possible consolidation of transit connections at a new premium transit station, would be needed to determine feasibility and impacts of each option, and explore various link combination scenarios.

Future studies should assess the traffic and network benefits to MD 223 of providing more local streets to the overall street network, improving pedestrian and bicycle circulation, and building a bridge over MD 5 north of the current MD 5 interchange. These changes would provide users alternative routes and should improve safety and operations. However, measures may need to be put in place to calm and support any

additional traffic on these local roads. The impacts of these improvements should be assessed and mitigation strategies should be provided to protect and enhance natural resources located in the northeast quadrant of Woodyard Crossing.

- Responsible Agency:** M-NCPPC / Prince George's County DPW&T;
- Estimated Cost:** \$1,200,000 to \$14,000,000 / per project;
- Target Date Range:** 5-15 years;
- Next Steps:** Provide information to local jurisdictions



SEGMENT 4: PINE VIEW LANE TO

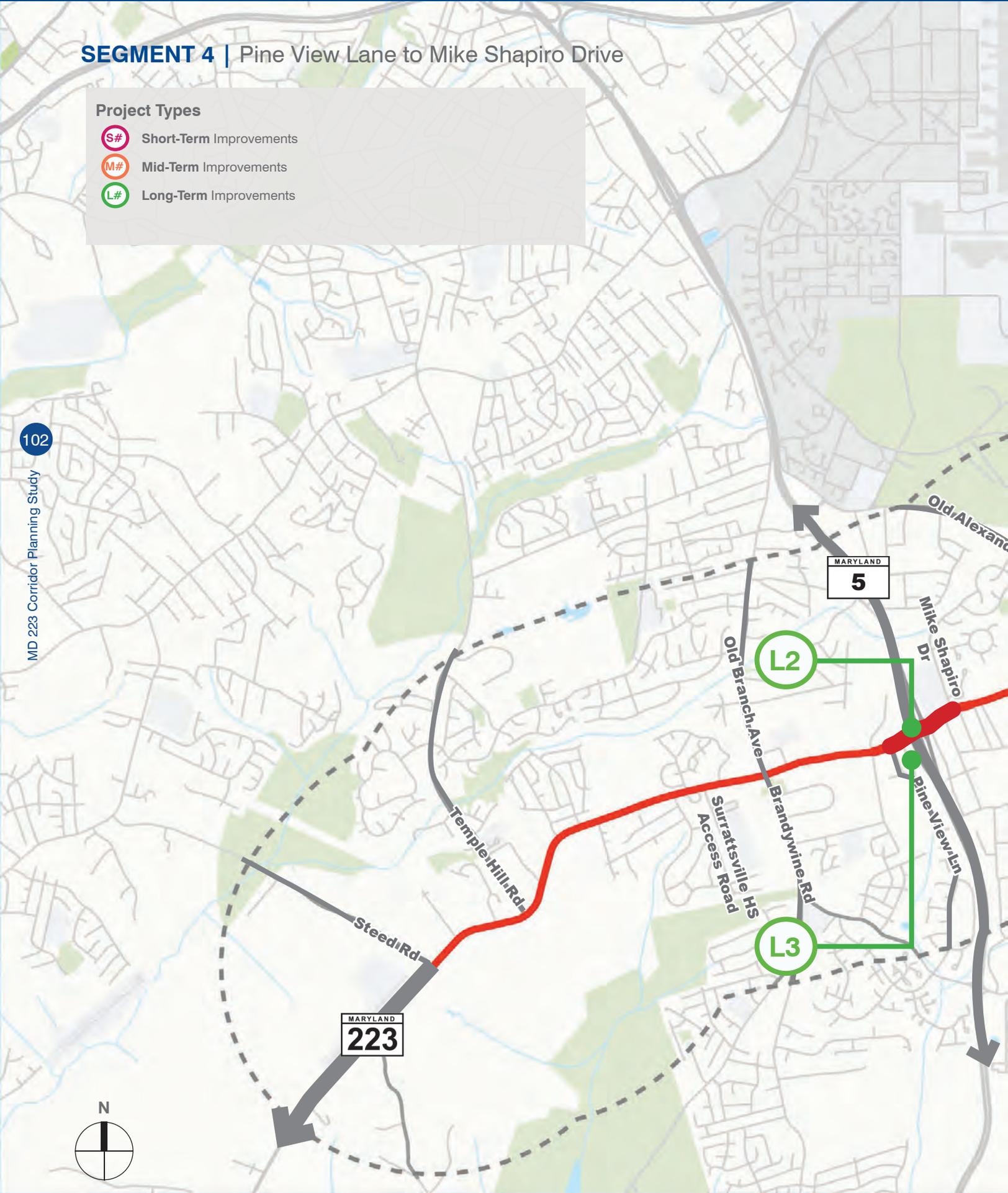
SEGMENT 4 | Pine View Lane to Mike Shapiro Drive

Project Types

- S#** Short-Term Improvements
- M#** Mid-Term Improvements
- L#** Long-Term Improvements

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MD 223 Corridor Planning Study



MIKE SHAPIRO DRIVE

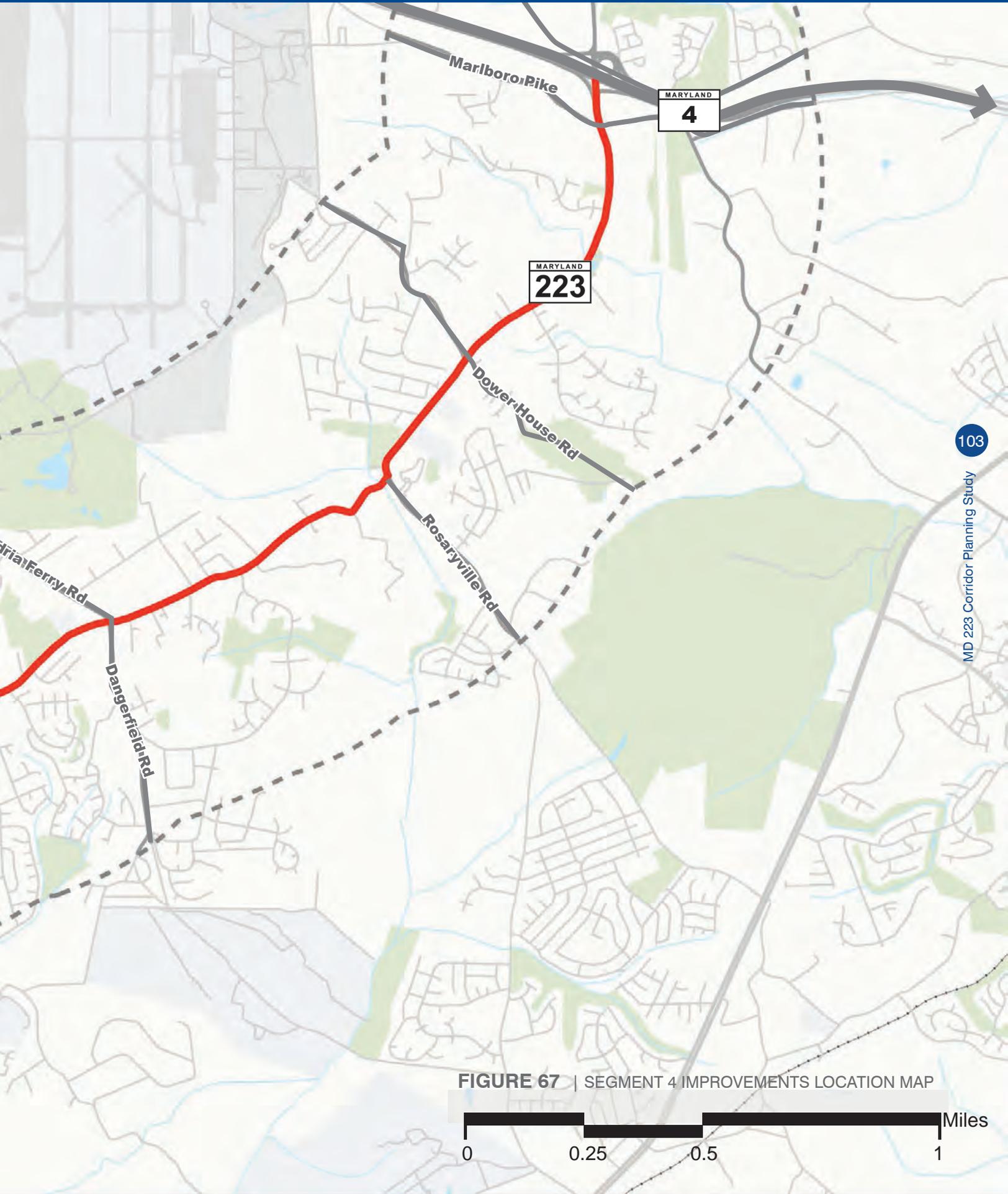
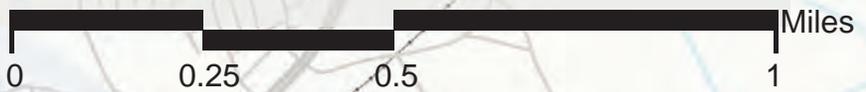


FIGURE 67 | SEGMENT 4 IMPROVEMENTS LOCATION MAP



L2 MD 5 INTERCHANGE IMPROVEMENT STUDY

Concerns/Opportunities:

MD 5 Interchange Study should support the goal of balancing all modes of transportation. The intersection is currently a barrier to bicycle and pedestrian use of MD 223; especially for senior residents living on the east side of the interchange who need services on the west side of the interchange.

Pedestrian connectivity is not provided on the north side of MD 223. Pedestrians walking along the south side of MD 223, through the interchange area, must cross a total of four ramp intersections. The two ramp intersections nearest the bridge provide pedestrian signal controls, however, the two outside ramps (EB-to-SB On, and NB-to-EB Off) are designed to be traversed at high speeds, with no signal or yield control to manage vehicle-pedestrian

conflicts. The speed differential between MD 5 traffic and MD 223 traffic making turns and travelling more slowly through downtown may be higher than acceptable. No bicycle facilities exist on MD 223.

A future transit line, (Figure 7) shown in the MTA Study: *Southern Maryland Rapid Transit Study*, could provide the catalyst to re-examine this interchange.

Concept Description:

The area around the MD 5 interchange has transitioned to an urban setting and further study is recommended to evaluate how the interchange can accommodate pedestrians, bicyclists, and motorists.

104 MD 5 AND MD 223 INTERCHANGE: PEDESTRIAN PERSPECTIVE



A PORTION OF THE PEDESTRIAN CONNECTIVITY ON THE SOUTH SIDE OF MD 223 IS SHOWN HERE AND OUTLINED IN THE DASHED YELLOW LINE.

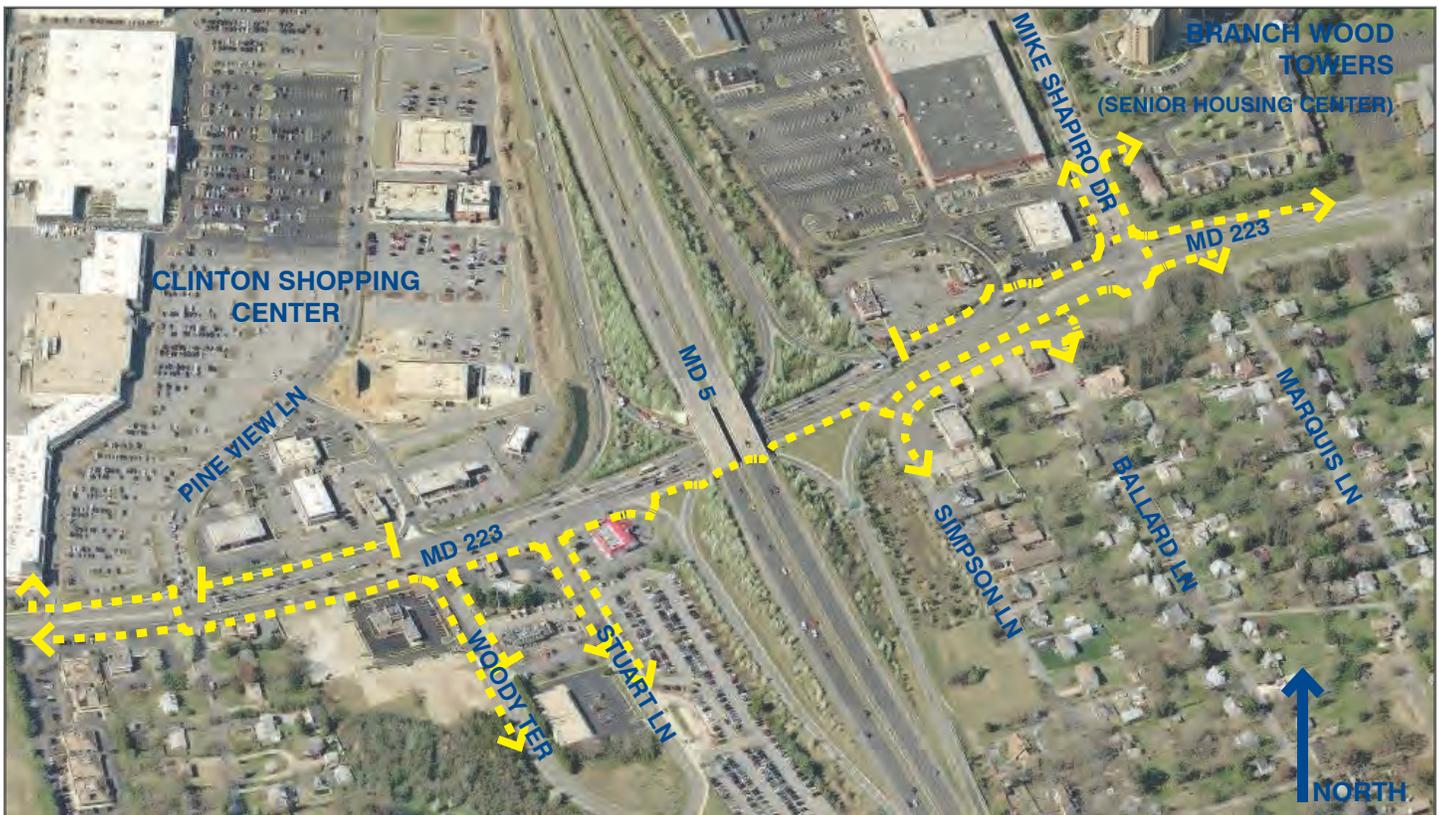
Design Considerations:

It is recommended that the interchange design alternatives support the goal of improving active transportation safety as it moves traffic safely and efficiently between MD 223 and MD 5.

In the more urban area around MD 5, vehicular delays may be more acceptable if pedestrian and bicyclists needs are met. The study should aim to reduce the barrier effect the interchange has created and help connect the two shopping centers.

Responsible Agency: SHA OPPE
Estimated Cost: TBD
Target Date Range: TBD
Next Steps: Additional Study

MD 5 AND MD 223 INTERCHANGE: AERIAL PERSPECTIVE



THE INTERCHANGE CONFIGURATION AT MD 5 AND MD 223 DOES NOT MATCH THE URBAN CHARACTER OF THE AREA AND LIMITS PEDESTRIAN AND BICYCLE ACCESS ACROSS MD 5. THE YELLOW DASHED LINE REPRESENTS THE EXTENT OF THE SIDEWALK NETWORK IN THE INTERCHANGE AREA.

SEGMENT 5: MIKE SHAPIRO DRIVE TO

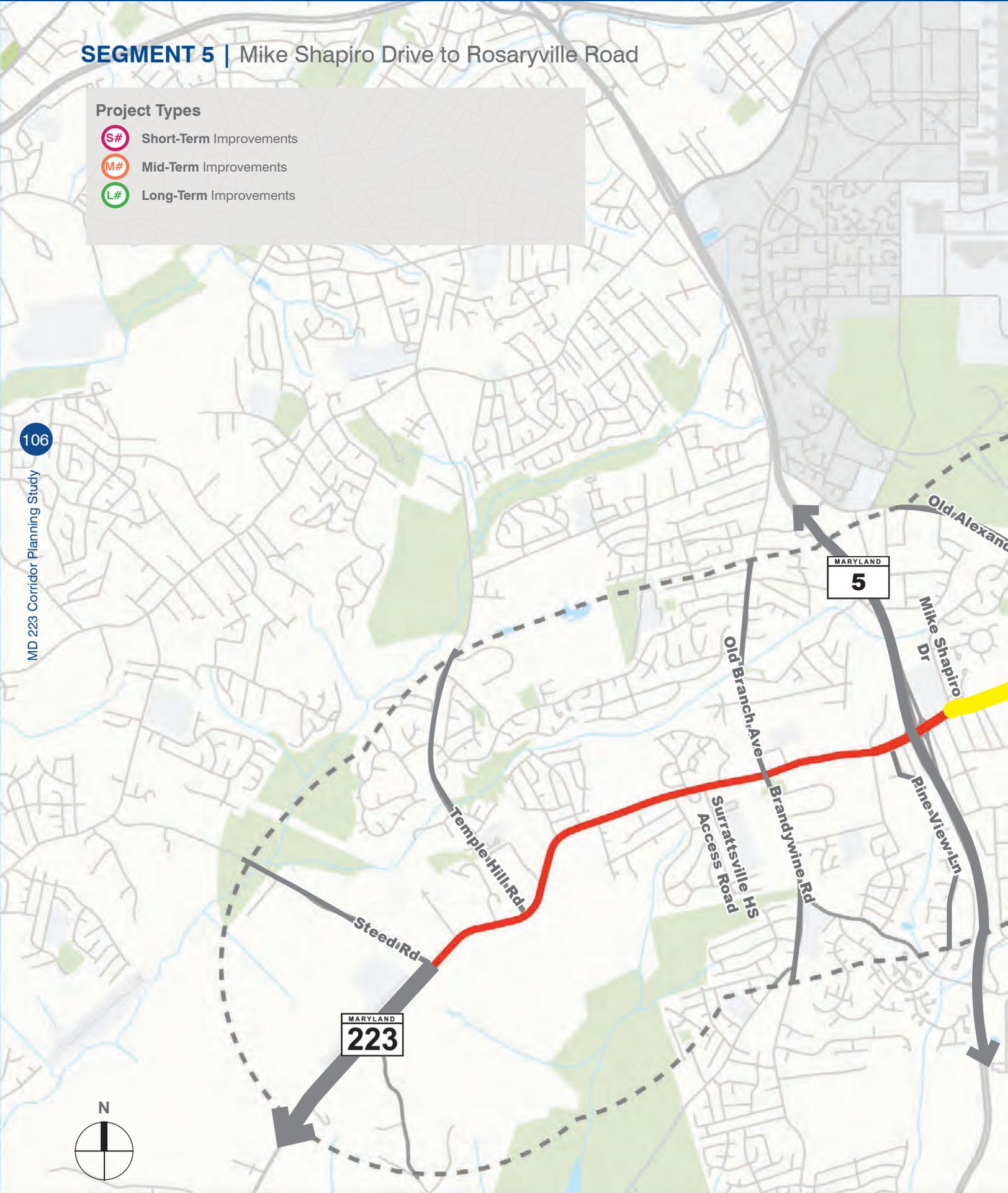
SEGMENT 5 | Mike Shapiro Drive to Rosaryville Road

Project Types

- S#** Short-Term Improvements
- M#** Mid-Term Improvements
- L#** Long-Term Improvements

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MD 223 Corridor Planning Study



ROSARYVILLE ROAD

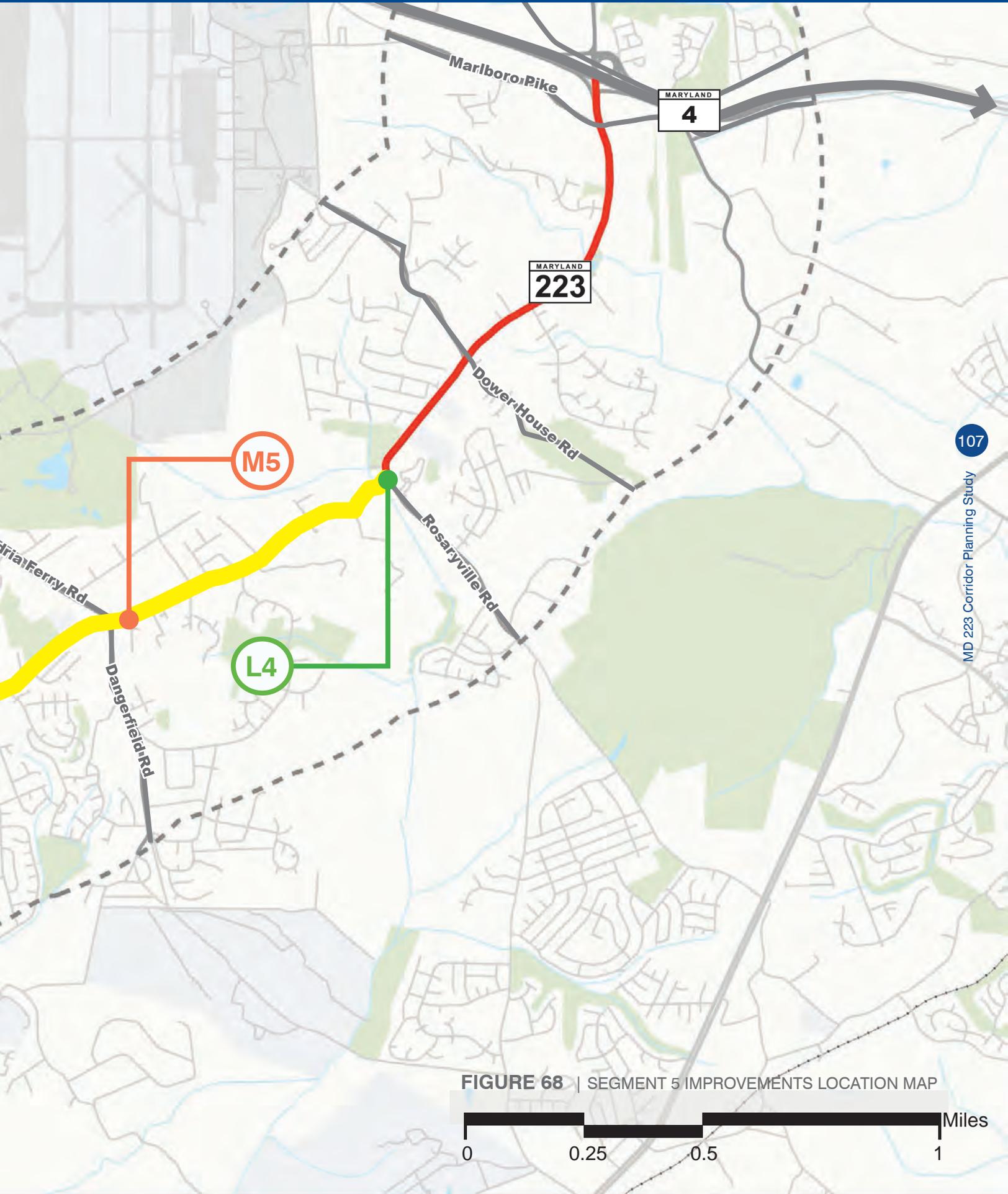
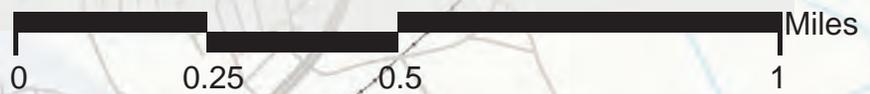


FIGURE 68 | SEGMENT 5 IMPROVEMENTS LOCATION MAP



OLD ALEXANDRIA FERRY ROAD/ DANGERFIELD ROAD INTERSECTION

Concerns/Opportunities:

Old Alexandria Ferry Road provides one of two southern connections to Joint Base Andrews, and to MD 5. Crashes are concentrated near this intersection. Pedestrian issues include the presence of high speed, channelized right turn lanes, and a lack of crosswalks. Old Alexandria Ferry Road also meets MD 223 at a skewed angle.

Concept Description:

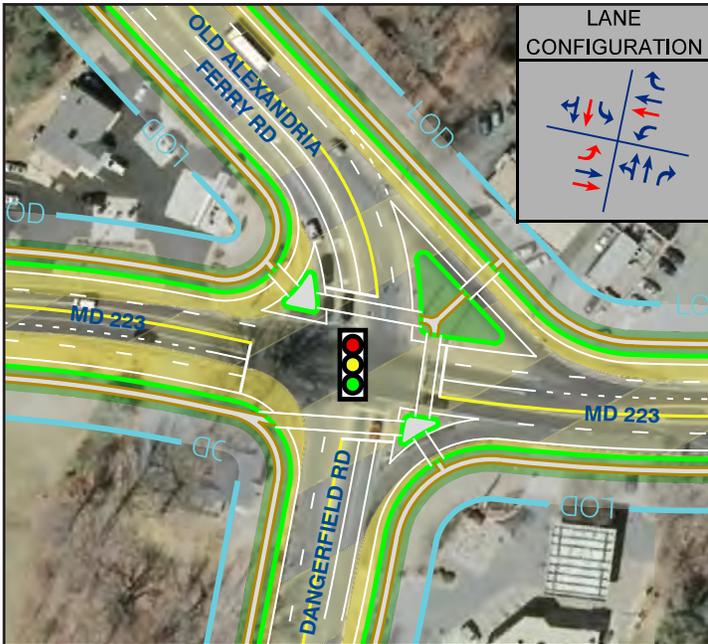
Alternative 1 (shown below) provides additional through-lanes on MD 223 and southbound of Old Alexandria Ferry Road. Alternative 2 (shown below) proposes a 2-lane roundabout with exclusive right-turn lanes at the east leg of the intersection.

Design Considerations:

This intersection marks the transition from the Transitional Residential to the Rural Residential Character Districts, identified in this study. A roundabout treatment could potentially calm traffic, improve traffic flow, and improve pedestrian and bicyclists safety due to slower intersection speeds. It could also create a gateway feature reinforcing the change in character and activity levels. A roundabout that transitions from two to one lane, may reduce right-of-way impacts. Potentially high impacts to the right-of-way for either alternative, will require a full NEPA study.

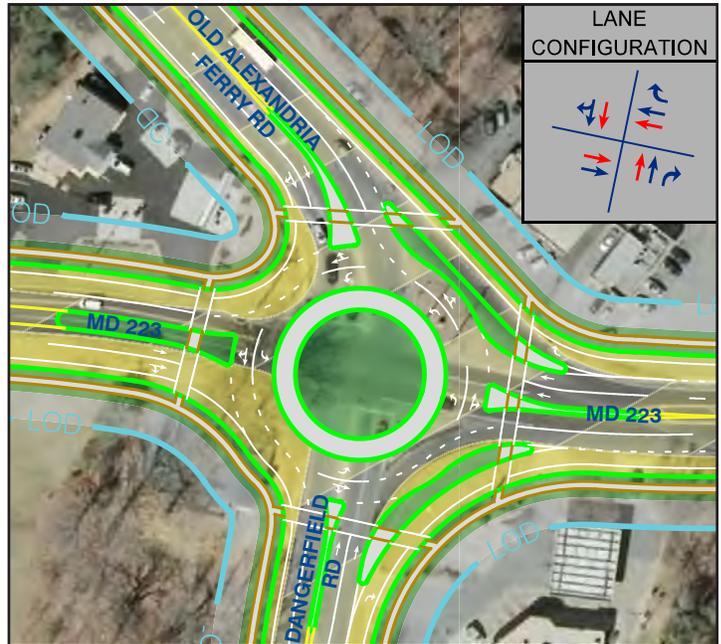
- Responsible Agency:** SHA District 3 / OHD / OOTS
- Estimated Cost:** \$4,300,000 to \$4,600,000
- Target Date Range:** 3-10 years
- Next Steps:** PE Funding

ALTERNATIVE CONCEPT 1



ADDITIONAL THROUGH-LANES AND CENTER-TURN LANE ON MD 223; ADDITIONAL THROUGH-LANE FOR SB TO DANGERFIELD ROAD.

ALTERNATIVE CONCEPT 2



2-LANE ROUNDABOUT WITH EXCLUSIVE RIGHT-TURN LANE AT EAST LEG OF INTERSECTION.

Concerns/Opportunities:

The Rosaryville Road intersection was recently reconstructed with channelized left turn lanes in all directions to improve safety and operations. Many residents said the intersection manages traffic better now than it had been. However, the intersection lacks pedestrian and bicycle accommodations; new channelized right turn lanes allow traffic to move at higher speeds through the intersection.

Concept Description:

A post-construction safety evaluation and investigation of multimodal retrofit is recommended to ensure designs are meeting user needs.

Project Benefits:

Post-construction evaluations should capture safety and service effectiveness for all travel modes.

- Responsible Agency:** SHA OPPE/OOTS
- Estimated Cost:** TBD
- Target Date Range:** 5-15 years
- Next Steps:** Additional study

MD 223 AND ROSARYVILLE ROAD INTERSECTION



NEW INTERSECTION DESIGN AT MD 223 AND ROSARYVILLE RD LACKS PEDESTRIAN AND BICYCLE CONNECTIONS (AREA SHOWN IN YELLOW DOTTED OUTLINE)

SEGMENT 6: ROSARYVILLE ROAD TO

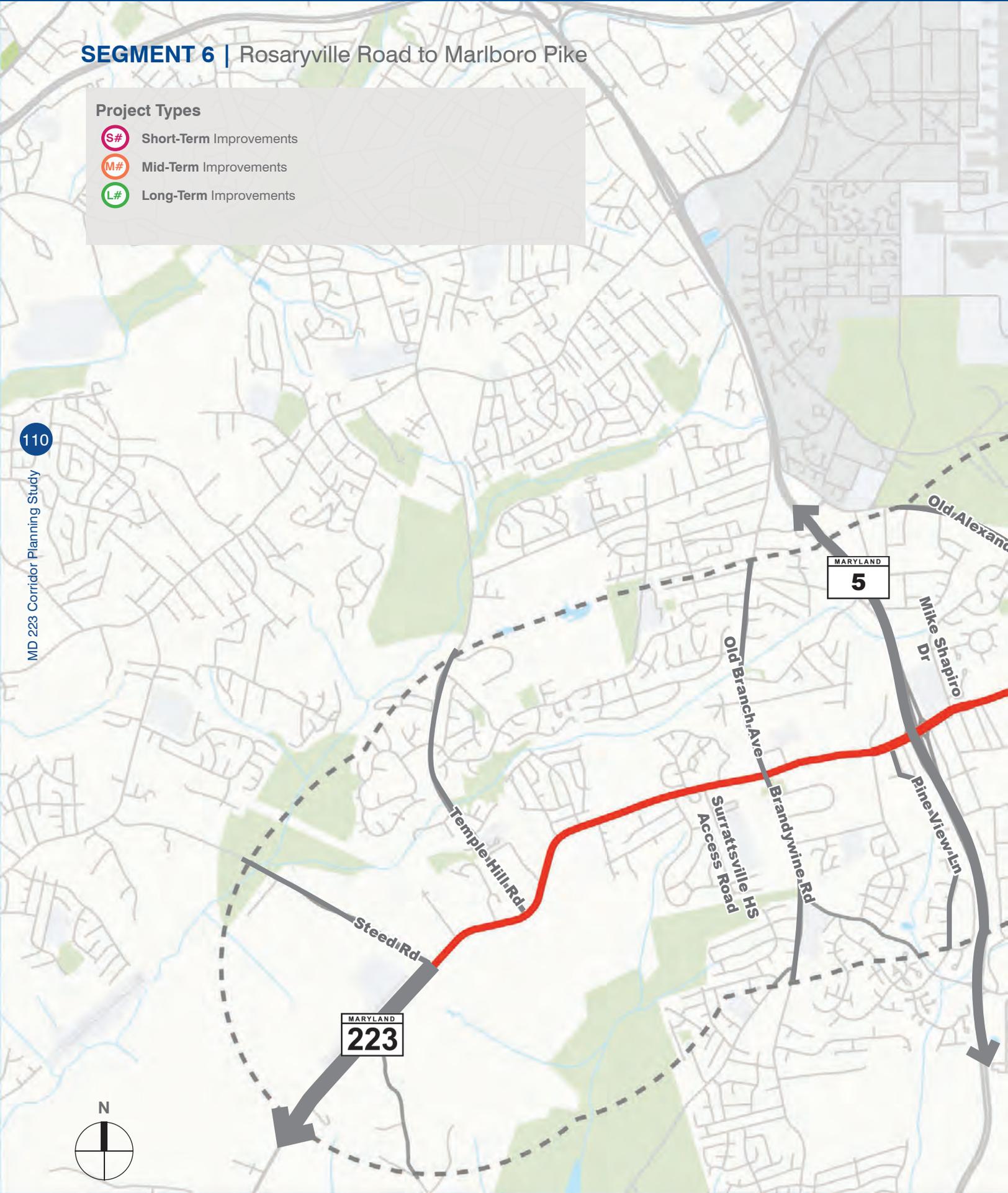
SEGMENT 6 | Rosaryville Road to Marlboro Pike

Project Types

- S#** Short-Term Improvements
- M#** Mid-Term Improvements
- L#** Long-Term Improvements

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MD 223 Corridor Planning Study



MARLBORO PIKE

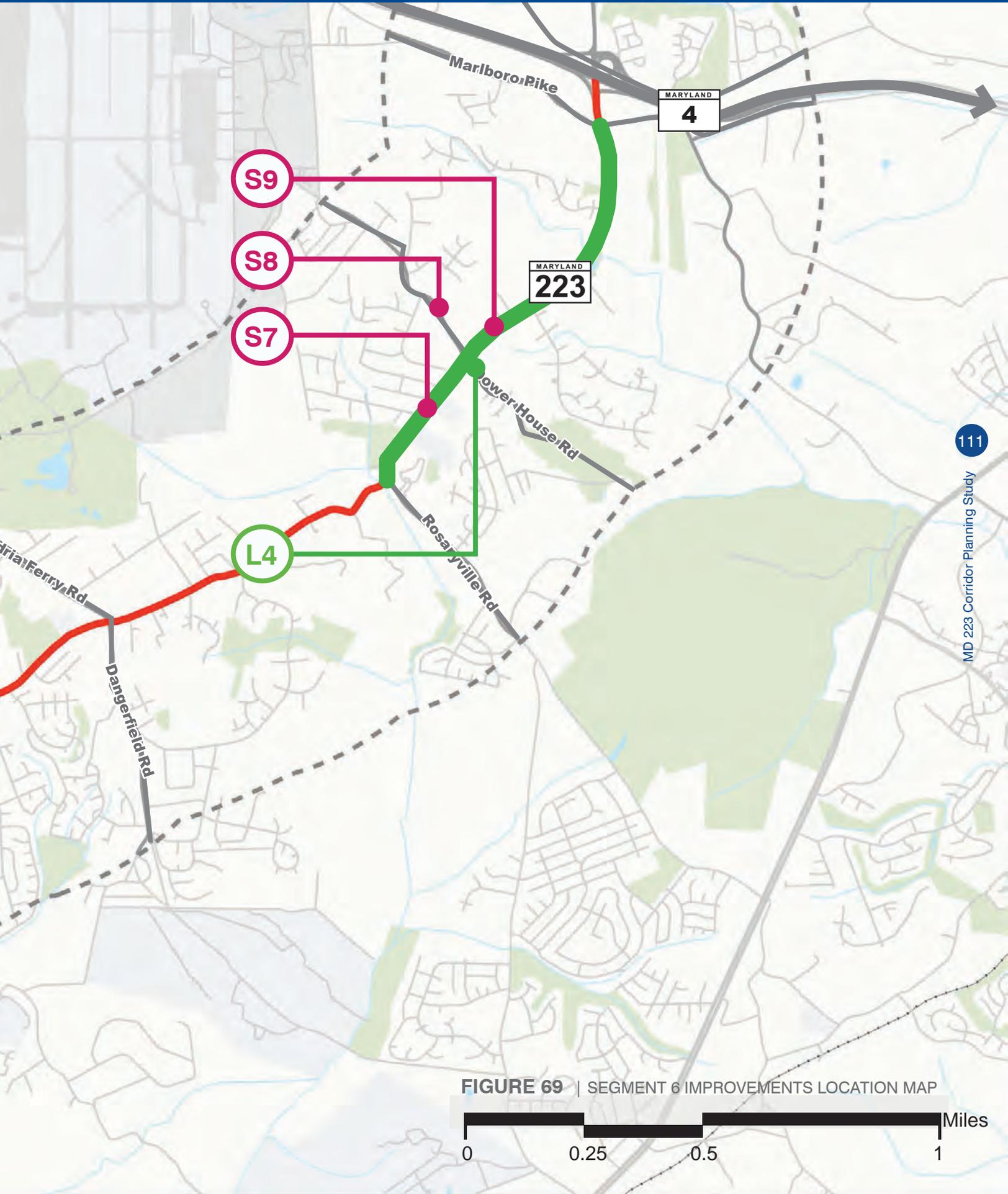
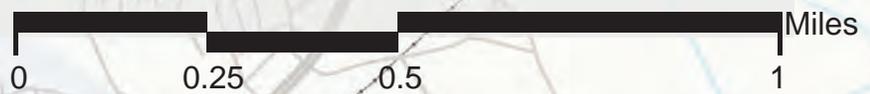


FIGURE 69 | SEGMENT 6 IMPROVEMENTS LOCATION MAP



PROTECTED LEFT-TURN LANES: VICTORIA DRIVE TO SHERWOOD DRIVE

Concerns/Opportunities:

Left turns on James Madison Middle and Melwood Elementary schools are required to be made from travel lanes; although there are marked crosswalks, sidewalks have gaps and are completely missing in some sections. Parking is provided on the shoulder of MD 223.

parking spaces on MD 223 may be removed to minimize impacts to residential properties.

Concept Description:

This concept proposes protected left-turn lanes at the school entrances and the corresponding side streets, Victoria Drive and Sherwood Drive. The option of only providing bypass lanes to Victoria Drive and Sherwood Drive would help to improve safety with reduced impacts. Refuge islands and flashing beacons are also proposed to raise awareness of school crossing zone. Some of the

Design Considerations:

SHA is currently in the final stages of construction document developments for installation of sidewalks and safety improvements. Given the scale of that project, it should include the provision of left turn lanes.

- Responsible Agency:** SHA District 3 / OHD
- Estimated Cost:** \$1,500,000 - \$3,600,000
- Target Date Range:** 1-10 years
- Next Steps:** Additional Study

PROTECTED LEFT-TURN LANES BETWEEN VICTORIA LANE AND SHERWOOD DRIVE (PART 1)



PROTECTED LEFT-TURN LANES BETWEEN VICTORIA LANE AND SHERWOOD DRIVE (PART 2)



McCORMICK ROAD ACCESS IMPROVEMENTS

Concerns/Opportunities:

Better access is needed for the community on McCormick Road; there is only southbound access from MD 223, which is a right-in-right-out access.

Concept Description:

A second point access to the community at a dead end along Dower House Road, north of the intersection of Dower House Road and MD 223, would provide the additional access needed. The existing access to MD 223 should be evaluated for a conventional full access design and the removal the existing landscape triangle.

Project Considerations:

The project will require coordination with the residents adjacent to, and directly on, McCormick Road. Additional right-of-way and/or easement may be needed for construction and future maintenance.

Responsible Agency: Prince George’s County DPW&T;

Estimated Cost: \$700,000 to \$1,100,000;

Target Date Range: 3-10 Yrs;

Next Steps: PGC DPW&T Concept Development Project

CONNECTING MCCORMICK ROAD: AERIAL VIEW



THIS GRAPHIC SHOWS THE AREA WHERE MCCORMICK ROAD COULD BE CONNECTED TO DOWER HOUSE ROAD IN THE FUTURE TO PROVIDE A SECONDARY ACCESS POINT FOR THE RESIDENTS LIVING ON MCCORMICK ROAD.

CONNECTING MCCORMICK ROAD: STREET VIEW



LOOKING SOUTHEAST FROM DOWER HOUSE ROAD WHERE THE POSSIBLE CONNECTION WOULD LINK TO THE DEAD END OF MCCORMICK ROAD. IMAGE SOURCE: GOOGLE STREETVIEW (2015)

PROTECTED LEFT-TURN LANES: CLINTON CHRISTIAN SCHOOL

Concerns/Opportunities:

Right turn lanes are available on the north side of MD 223 into the western entrance of Clinton Christian School near McCormick Road, and into Perrywood Road on the south side. Left turns to the school entrances are unprotected in the travel lane. Perrywood Road provides the only access to the Melwood Springs Neighborhood and it does not have a protected left turn lane or signal control on MD 223 which results in left-turning traffic stopped in the travel lane.

A left-turn lane may be more suitable for this location, and would require additional right-of-way. Another option would be to eliminate the existing right-turn lane on northbound MD 223 to construct the left-turn lane.

Design Considerations:

Coordination with the school administration would be needed to move this concept forward. Pedestrian access needs should also be considered.

Concept Description:

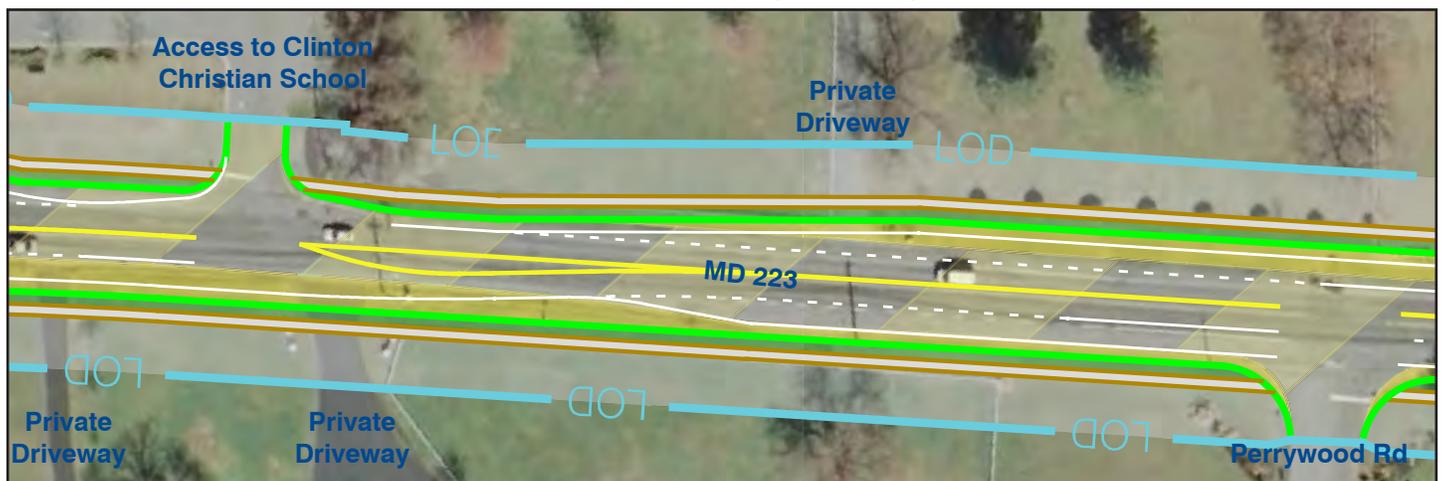
Safety at these locations can be improved by building protected left-turn lanes to the entrances of Clinton Christian School, and a bypass lane at Perrywood Road.

Responsible Agency: SHA OPPE/ District 3
Estimated Cost: \$1,500,000 - \$3,600,000
Target Date Range: 1-10 years
Next Steps: Additional Study

PERRYWOOD ROAD PROPOSED BYPASS/LEFT-TURN LANE (WEST END)



PERRYWOOD ROAD PROPOSED BYPASS/LEFT-TURN LANE (EAST END)



DOWER HOUSE ROAD INTERSECTION IMPROVEMENTS

Concerns/Opportunities:

Dower House Road connects the east entrance of Joint Base Andrews and MD 4. Traffic is expected to increase in the future and the intersection's skewed geometry contributes to high turning speeds.

Concept Description:

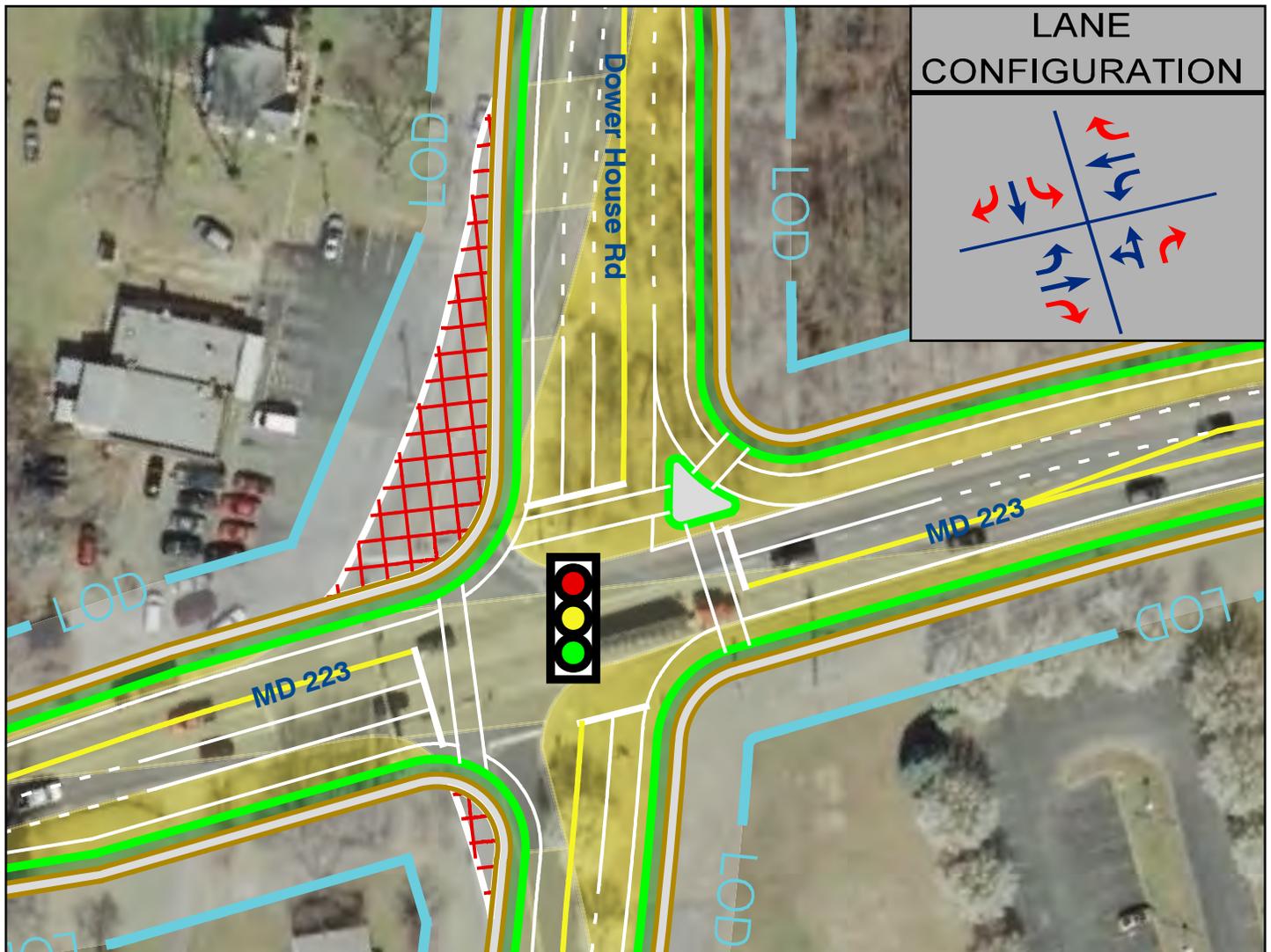
The alternative below adds capacity, realigns Dower House Road to reduce the skew, and adds sidewalks. It also introduces a channelized right turn lane with a refuge island. Further study is recommended to refine this conflict and ensure the intersection operates for all modes, and enhances the area overall.

Design Considerations:

This alternative requires significant additional right of way and coordination with property owners. Design of proposed right turn lanes should follow guidelines that slow down turning movements for maximum safety, particularly for crossing pedestrians. Joint Base Andrews' priority on non-motorized connectivity demonstrates the importance of pedestrian, and bicycle accommodation.

- Responsible Agency:** SHA District 3
- Estimated Cost:** \$2,000,000 to \$2,800,000
- Target Date Range:** 5-15 years
- Next Steps:** PE Funding

MD 223 AND DOWER HOUSE ROAD INTERSECTION



ADDITIONAL EXCLUSIVE TURN LANES AT ALL LEGS OF THE INTERSECTION

SEGMENT 7: MARLBORO PIKE TO MD 4

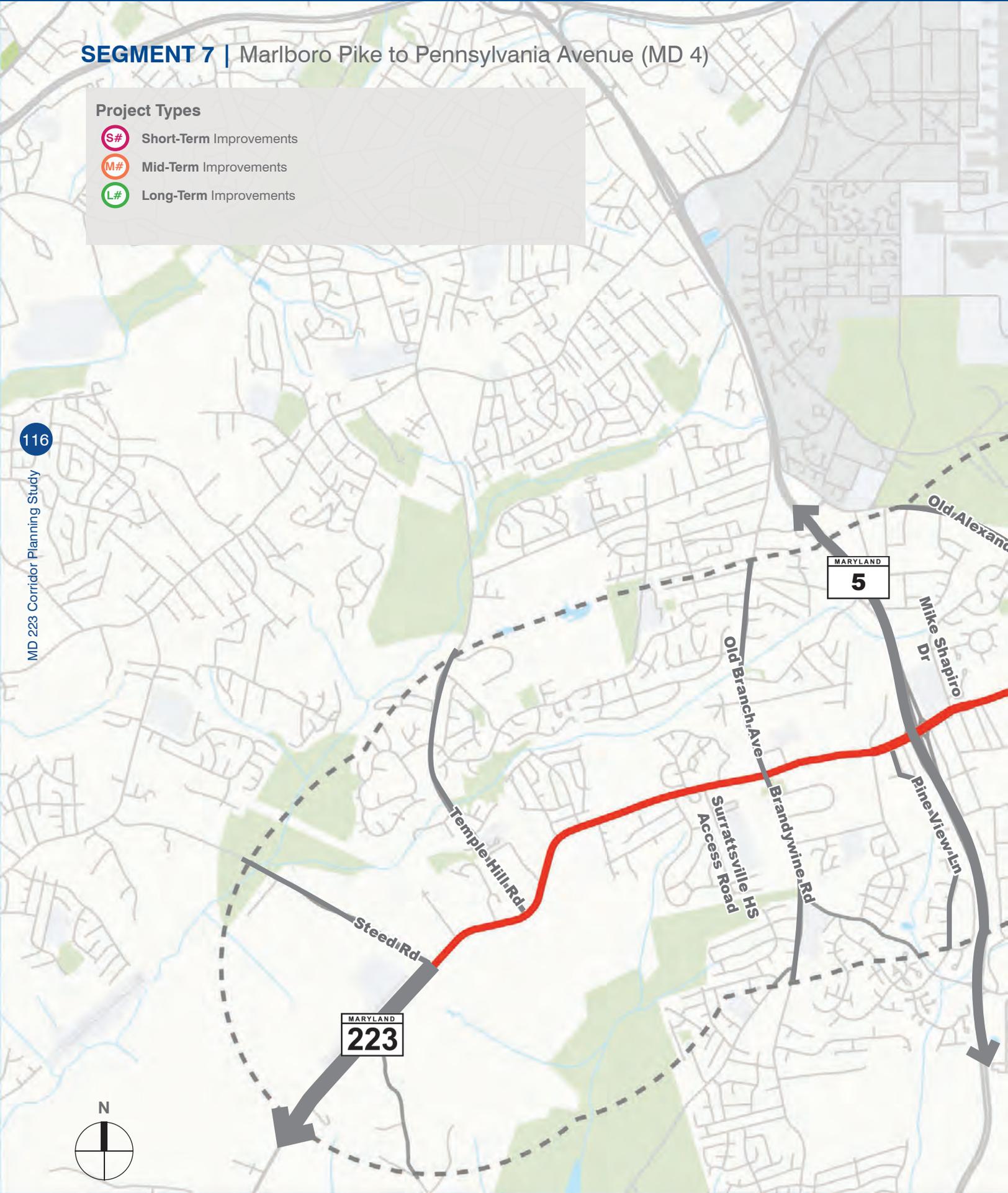
SEGMENT 7 | Marlboro Pike to Pennsylvania Avenue (MD 4)

Project Types

- S#** Short-Term Improvements
- M#** Mid-Term Improvements
- L#** Long-Term Improvements

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MD 223 Corridor Planning Study



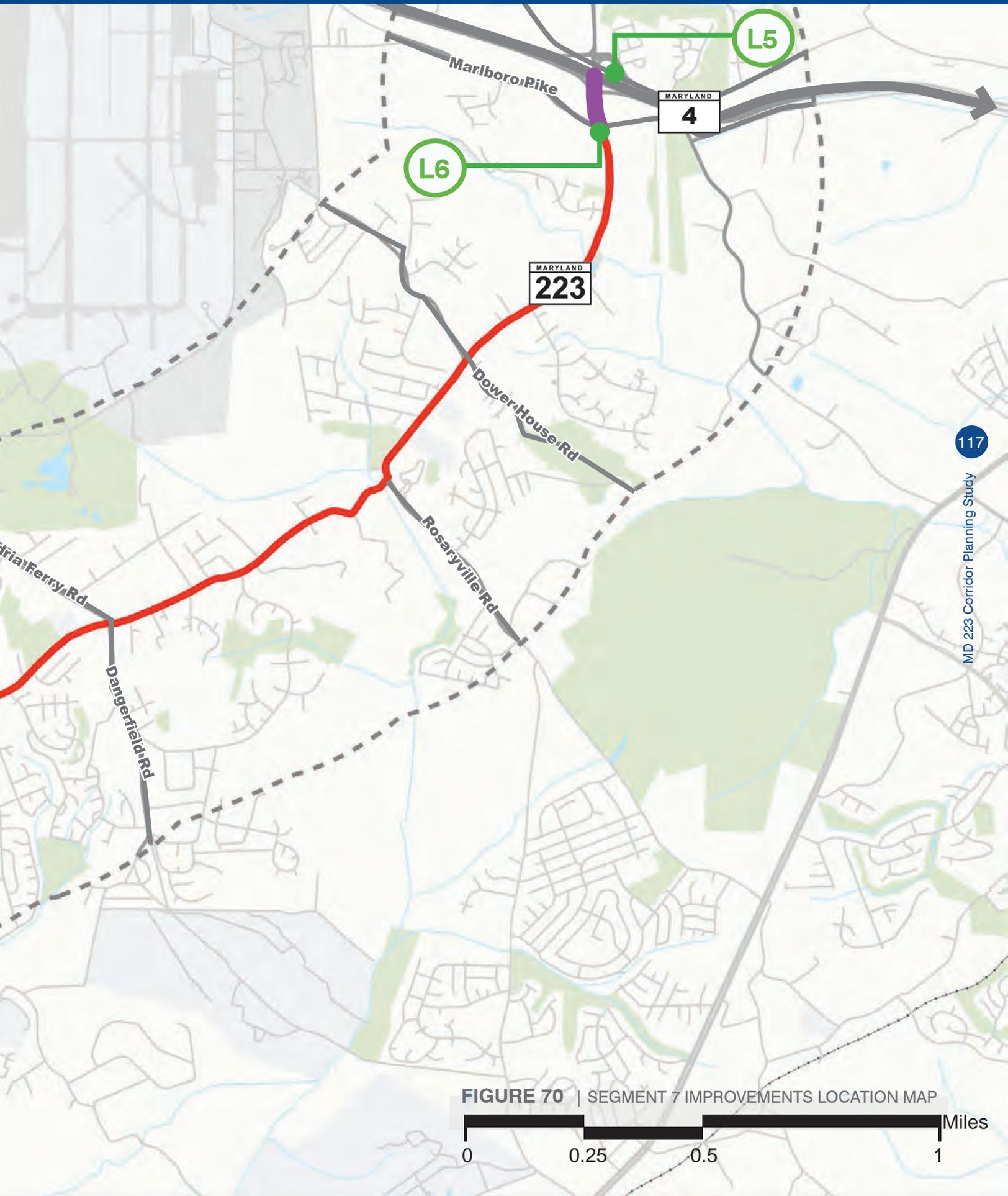
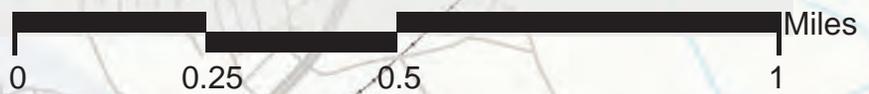


FIGURE 70 | SEGMENT 7 IMPROVEMENTS LOCATION MAP



Concerns/Opportunities:

The MD 4 interchange study should support the goal of balancing all modes of transportation. As constructed today, the intersection poses a barrier to bicycle and pedestrian use of MD 223. This will need to be addressed as demand for multimodal access changes as a result of new development.

Project Description:

As the area urbanizes and introduces more pedestrian, bicycle and transit trips, the MD 4 interchange should be evaluated to determine changes that can safely accommodate all users.

Study and Design Considerations:

The interchange study should consider designs that reduce speeds and manage interactions between modes in merge areas.

Coordination with the Westphalia Development will be needed to account for changing travel patterns, traffic demand over time, and new connections occurring through development.

Responsible Agency:
Estimated Cost:
Target Date Range:
Next Steps:

SHA OPPE
TBD
TBD
Additional Study

MD 223 AND MD 4 INTERCHANGE



THE INTERCHANGE CONFIGURATION AT MD 4 AND MD 223 IS RURAL IN NATURE. WITH DEVELOPMENTS OF VARYING INTENSITIES PLANNED AROUND THE INTERCHANGE, THE SUITABILITY OF THIS CONFIGURATION MAY NEED TO BE REASSESSED IN THE FUTURE.

MARLBORO PIKE INTERSECTION IMPROVEMENTS

Concerns/Opportunities:

Marlboro Pike provides a parallel connection to MD 4 and regional connectivity to Dower House Road and south to US 301. The intersection's skewed geometry, channelized right turn lanes and wide curb radii allow for high turning speeds in an area lacking pedestrian and bicycle accommodations.

Concept Description:

One studied alternative is shown below, proposing pedestrian features, intersection realignment to reduce the skew, and channelized right turn lanes with reduced curb radii.

Design Considerations:

This intersection today lies within a zone that is rural in character, and over time, planned redevelopment will make it more residential. The development of Westphalia at the east side of MD 4 will also change traffic demands on the intersection. Pedestrian and bicycle safety will need to be balanced with growing traffic capacity needs, resulting from the new development.

- Responsible Agency:** SHA OPPE
- Estimated Cost:** \$1,800,000 to \$2,500,000
- Target Date Range:** 5-15 years
- Next Steps:** PE Funding

MD 223 AND MARLBORO PIKE INTERSECTION



ADDITIONAL EXCLUSIVE TURN LANES ON MARLBORO PIKE

EXISTING MD 223 AND MARLBORO PIKE LOOKING SOUTH



CURRENTLY THERE ARE NO SIDEWALK OR PEDESTRIAN CROSSING FACILITIES; CONSIDERATIONS FOR THESE FACILITIES ARE PART OF THE STUDIED ALTERNATIVE TO THE LEFT.



COORDINATION OF FUTURE DEVELOPMENT

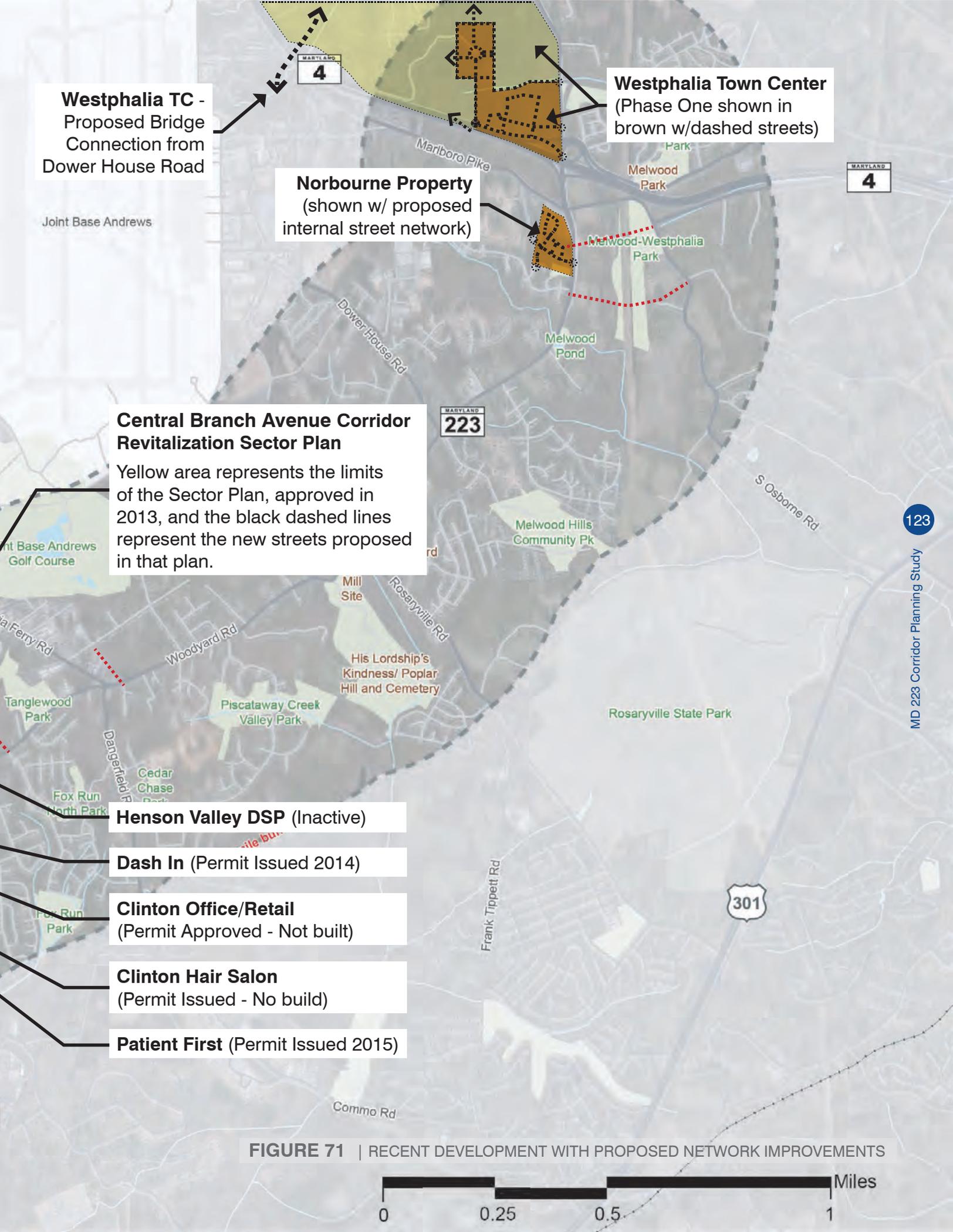
07

DEVELOPMENT PATTERNS

Development patterns emerging from market demand and design regulations of the past have created the fragmented pattern of access and circulation that contributes to congestion, poor safety performance, and few alternatives to driving for local trips.

Over time, development patterns and infrastructure investment will change the performance of MD 223. Cooperation and coordination can ensure changes to MD 223 and the broader network contribute to efficiently and safely moving people within, and beyond the area.





Westphalia TC - Proposed Bridge Connection from Dower House Road

Westphalia Town Center
(Phase One shown in brown w/dashed streets)

Norbourne Property
(shown w/ proposed internal street network)

Central Branch Avenue Corridor Revitalization Sector Plan
Yellow area represents the limits of the Sector Plan, approved in 2013, and the black dashed lines represent the new streets proposed in that plan.

Henson Valley DSP (Inactive)

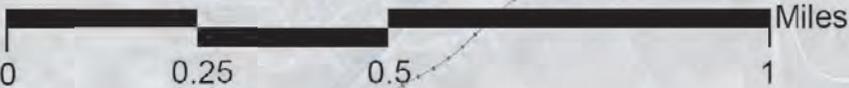
Dash In (Permit Issued 2014)

Clinton Office/Retail
(Permit Approved - Not built)

Clinton Hair Salon
(Permit Issued - No build)

Patient First (Permit Issued 2015)

FIGURE 71 | RECENT DEVELOPMENT WITH PROPOSED NETWORK IMPROVEMENTS



VALUE OF DEVELOPMENT PARTICIPATION

Value of Development Participation

Figure 71 on the previous page and the detailed plan shown in Figure 72 show inter-parcel and secondary street network connections that will be needed to build the place envisioned by community and Joint Base Andrews (JBA) plans. This is less congested and safe and offers greater access for transit patrons, pedestrians, bicyclists and motorists. Development applications active during the study period are also shown in this figure and were discussed with County and State development review staff. Offices with development review responsibility and approval/permit authority are:

County M-NCPPC County-Wide Planning:

- M-NCPPC staff are responsible for subdivision and site plan review processes on behalf of the Planning Board. These professional planners manage the data collection, studies, and regulatory compliance actions of the County's transportation system. Internally they technically support Community Planning study efforts and coordinate Prince Georges County's contributions to the regional travel demand model as a member of the Metropolitan Washington Council of Government (MWCOG) Technical Committee.

Prince Georges County's Department of Permitting, Inspections and Enforcement (DPIE):

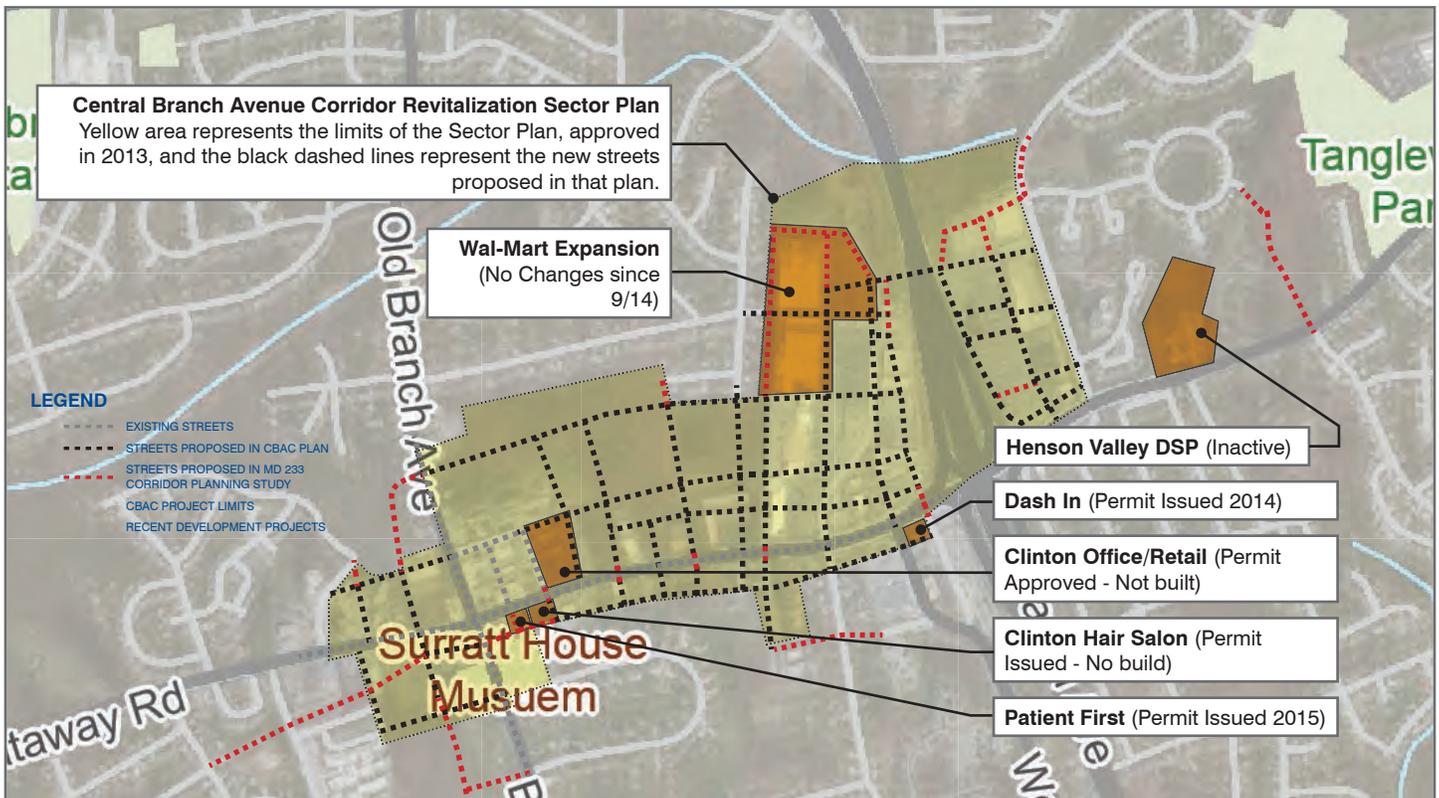
- DPIE staff is responsible for enforcing requirements established during entitlement phases as they review and permit environmental and construction applications, DPIE promotes economic and re-development within the county to protect the health and safety of its residents, businesses, investors and visitors, through integrated permitting, inspection and licensing services that ensure compliance with established building codes and property standards.

SHA's Access Management Division (AMD):

- SHA District Regional Engineers facilitate coordinated reviews of commercial, industrial and residential subdivision access permit applications to maintain the safety and integrity of the state highway system.

These inter-agency discussions helped to identify opportunities to improve administrative coordination and communication and identify measures that may be needed to facilitate and encourage transportation investment through private development.

FIGURE 72 | DETAIL OF RECENT DEVELOPMENT W/ RECENT PLANNING STUDIES



Recommendations:

Ensure projects identified in the entitlement phases are carried into the permitting phase of the project.

Figure 73 (following page) shows the various stages of development approvals and their interaction with area plans and infrastructure improvement regulations related to transportation facilities. Sector Plans help to guide future improvements but cannot ensure implementation without the effective development review and adequacy of public facilities regulation during zoning, permitting and enforcement. Projects must also be authorized in a County or State capital improvement program.

The Recorded Plat entitlement is the result of an M-NCPPC approval that specifies the details of the development's assumed number of daily peak trips and the negotiated improvements required by the developer to mitigate. These future trips become part of the background traffic for all area projects for the life of the subdivision approval (which does not expire in Prince George's County), or until it is built and is replaced with actual traffic and roadway network connections. It is critical that assumed improvements carry into the permitting phase.

Investigate the potential to limit the period of time a subdivision is valid.

Traffic studies required from developers must include all platted subdivisions in their background traffic assumptions. Because of the lack of time limits on entitlements, subdivisions that have been platted but not built can cause intersections that fall within the required traffic study to fail. Proposed new development that may contribute to needed new network connections cannot move forward because of failures to adequate public facilities caused by theoretical traffic.

Time limits on entitlements are in place in many jurisdictions to ensure that local real estate economies are not encumbered by land speculation. Further study and action to address this issue will be needed to reduce the unintended consequences of inactive subdivisions on infrastructure and redevelopment.

Change policy to require local street access in lieu of mainline access where possible.

Access management combined with inter-parcel connectivity is recommended to reduce the number of driveways, offset local streets, and single point access to disconnected local streets. Consolidating access to fewer locations also result in more signalized intersections, permitting more traffic to enter and exist MD 223 at signals.

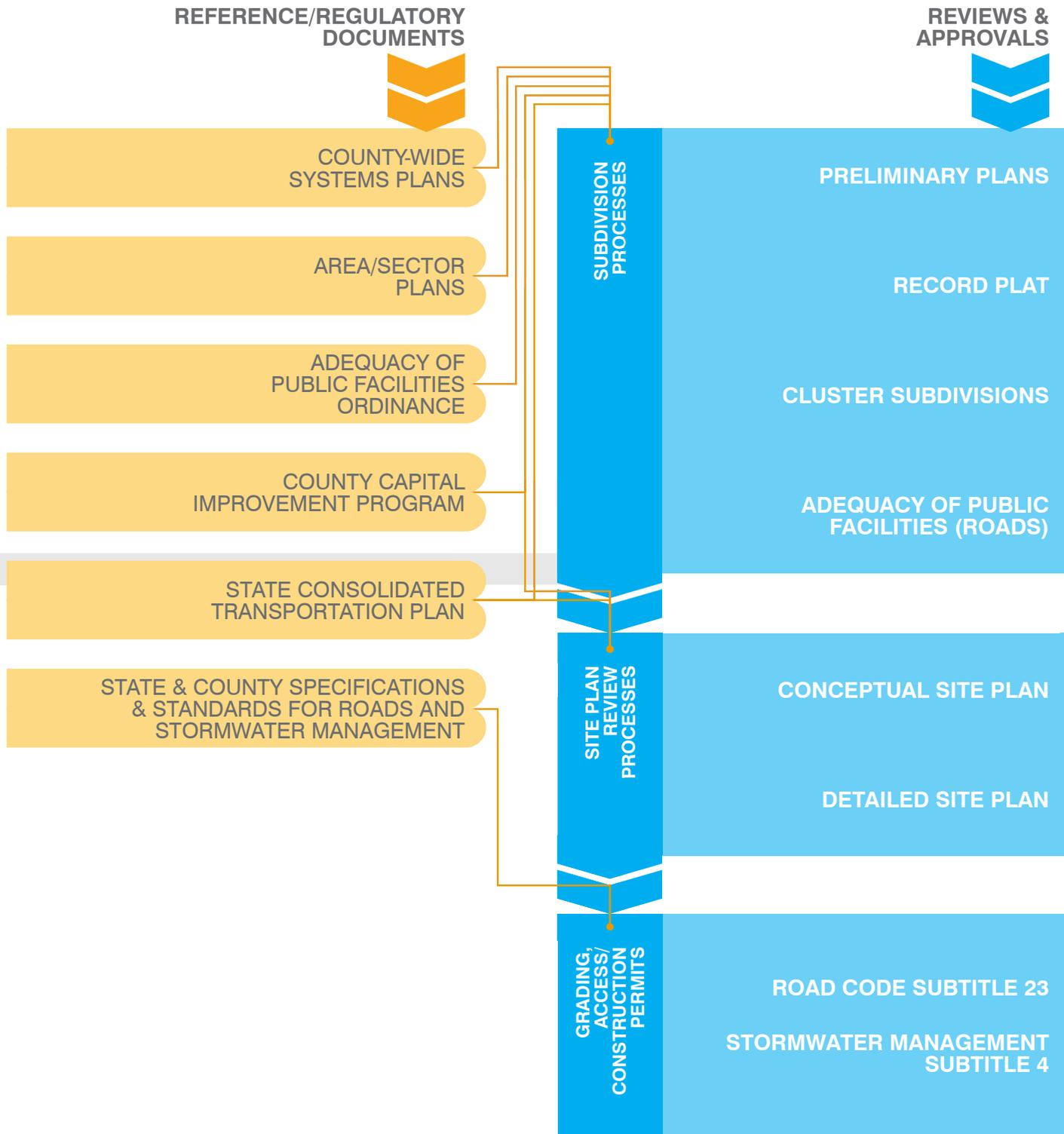
Access rules that have provided every parcel direct access to MD 223 have eroded both the safety and capacity of MD 223 over the years. These conditions, prevalent along the corridor today, create many locations where unprotected turns are made from the main line; these turning vehicles stop in the travel lane and force traffic to queue behind them or cause some drivers to swerve into the shoulder to pass them.

Drivers complain of difficult egress from their local street during peak travel times and the inability to exit their community where signals help to manage driver conflicts. The high number of property access points on MD 223 creates high numbers of conflict points for all modes, particularly reducing comfort for pedestrians and bicyclists.

The recent permit for a gas station between Woody Terrace and Stuart Lane is an example of inconsistency with the current adopted master plan regarding access and network connectivity, as all four access points were allowed to remain, with two on MD 223.

DEVELOPMENT DELIVERY PROCESS AND

FIGURE 73 | DEVELOPMENT DELIVERY PROCESS AND TRANSPORTATION PLANNING DIAGRAM



TRANSPORTATION PLANNING

APPLICATION CONTENT



GENERAL SCHEME: PROPERTY LOCATION, TOPOGRAPHY, UTILITIES ACCESS, STREETS LAYOUT, OPEN SPACE, STORMWATER MANAGEMENT

ENGINEERING DATA LOCATED: ROADS, STREETS, LOTS, BLOCKS, BOUNDARIES

RESIDENTIAL COMMUNITY DESIGNED WITH VARYING SHAPES & SIZES OF LOTS AND SETBACKS THAT REDUCE TOPOGRAPHIC IMPACTS AND CREATE AN OPEN SPACE SYSTEM

INFORMATION: ANALYSIS REQUIRED BY STATE AND LOCAL TRANSPORTATION DEPARTMENTS

GENERAL ARRANGEMENT OF USES ON LOTS, CIRCULATION SYSTEM & CONSERVATION AREAS

PROPOSED INTERNAL ROADS, PEDESTRIAN WALKS, PARKING AREAS, BUILDING RELATIONSHIPS, LANDSCAPING, PLAZAS & OPEN SPACES, RECREATION FACILITIES, LIGHTING, ETC.

REQUIRED PLANS ACCORDING TO CONSTRUCTION PLANS MEETING REQUIREMENTS SET FORTH IN PREVIOUS APPROVALS TO MEET GROWTH & CHARACTER PLANS AND TO MEET REQUIREMENTS FOR EFFICIENCY, SAFETY, AND MINIMAL PUBLIC MAINTENANCE COSTS

CONSIDERATIONS FOR PLANNING

Consider a change to Downtown Clinton's area type designation for the purpose of peak traffic congestion tolerance and traffic impact mitigations.

The traffic thresholds (Figure 74) featured in the Prince George's County Adequate Public Facilities (APF) requirements are based on traffic level of service (LOS), volume over capacity (V/C), and intersection critical lane volume (CLV). The standard that development must meet is based on the site's development tier. The chart in Figure 74 shows:

- LOS C is the standard in rural areas
- LOS D is the standard for the developing tier
- LOS E is the standard for the developed tier
- LOS E is the standard for all Metropolitan and Regional Centers

Peak congestion that reaches LOS E is considered acceptable in certain areas because high levels of commercial and employee activity will concentrate travel volume at peak arrival and departure times. This approach to APF recognizes that economically viable downtowns are busy places during peak commute hours. It designates certain areas where higher congestion is not only tolerated, but should be expected during periods of high activity. These designations further recognize that pedestrian and bicycle retrofit projects are important contributors to its vitality.

Most of the study area (shown in Figure 75) is in the developing tier (TSA 2) which is allowed a LOS D. Downtown Clinton is not considered a center, however the Westphalia area is identified as a suburban center and is allowed a LOS E. The designations should be revisited to determine whether or not the results intended can in fact be achieved.

FIGURE 75 | MAP OF TRANSPORTATION SERVICE AREA

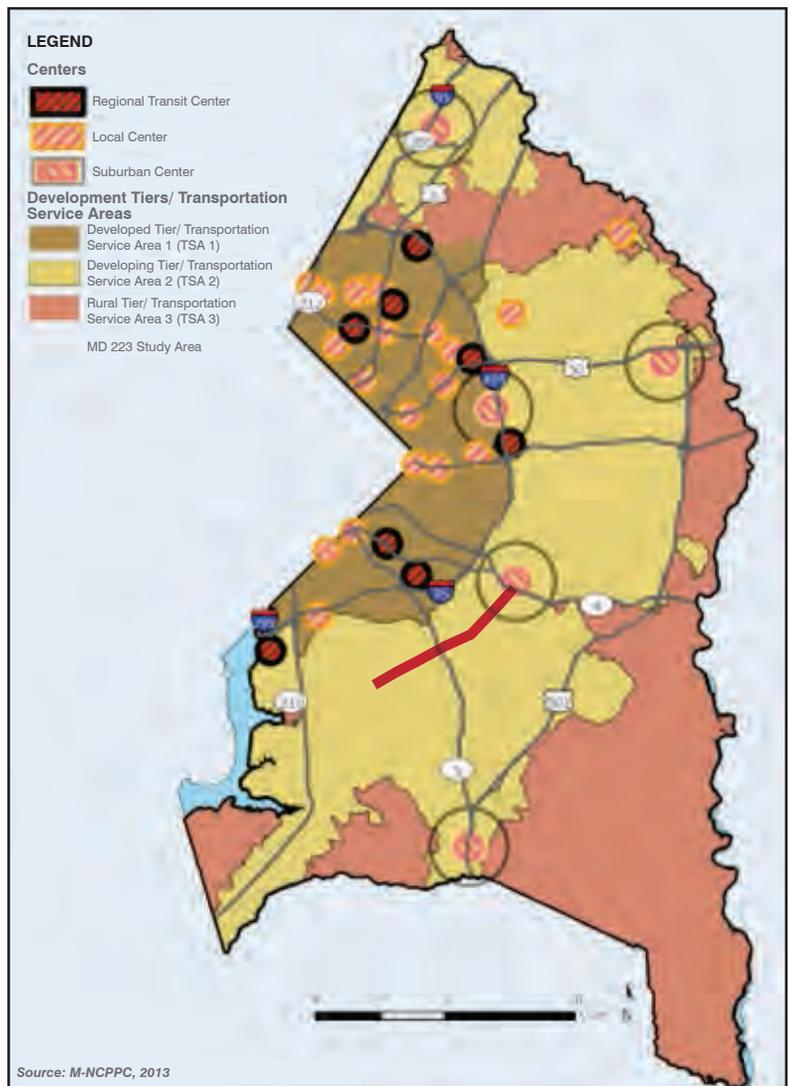


FIGURE 74 | TRAFFIC THRESHOLDS

Site Location	LOS Standard	Threshold Values		Exception
		CLV (intersection)	v/c (link)	
Tiers				
Developed Tier	E	1,600	1.000	Planning Board may allow developments to mitigate per 24124(a)(6) and CR-29-1994.
Developing Tier	D	1,450	0.845	Planning Board may allow developments to mitigate per 24124(a)(6) and CR-29-1994.
Rural Tier	C	1,300	0.650	Planning Board may allow developments to mitigate per 24124(a)(6) and CR-29-1994.
Metropolitan and Regional Centers				
All Tiers	E	1,600	1,000	Based on Tier
Community Centers, Corridors, and Revitalization Overlays				
	Based on Tier	Based on Tier	Based on Tier	Based on Tier

IN THE CORRIDOR

Consider transit, pedestrian and bicycle performance based development mitigation improvements.

Today, the County’s Adequate Public Facilities Ordinances (APFO) are triggered during preliminary plan or subdivision review when the applicant’s development is projected to produce 50 or more daily peak hour trips. Mixed use and comprehensive rezoning applications also require traffic review according to the ordinance. Limited traffic studies, focusing on safety, are also required for certain types of special exceptions.

To support non-vehicular improvements, the project’s trip generation calculation is adjusted based on “credits” that are earned through the provision of transit, bicycle and pedestrian accommodations (Figure 76). The current development applications do not provide a good indication that developers are using these “incentives.” The Clinton area may provide an opportunity to tie mitigation options to desired safety, and connectivity performance of the street system.

Where improvements have the potential to diminish pedestrian or bicycle safety performance, an improvement should be required of the impacting entity that improves pedestrian and bicycle connectivity, and safety in the vicinity of the traffic mitigating improvement.

FIGURE 77 | ADEQUATE PUBLIC FACILITIES DATA AND INFORMATION REQUIRED DIAGRAM

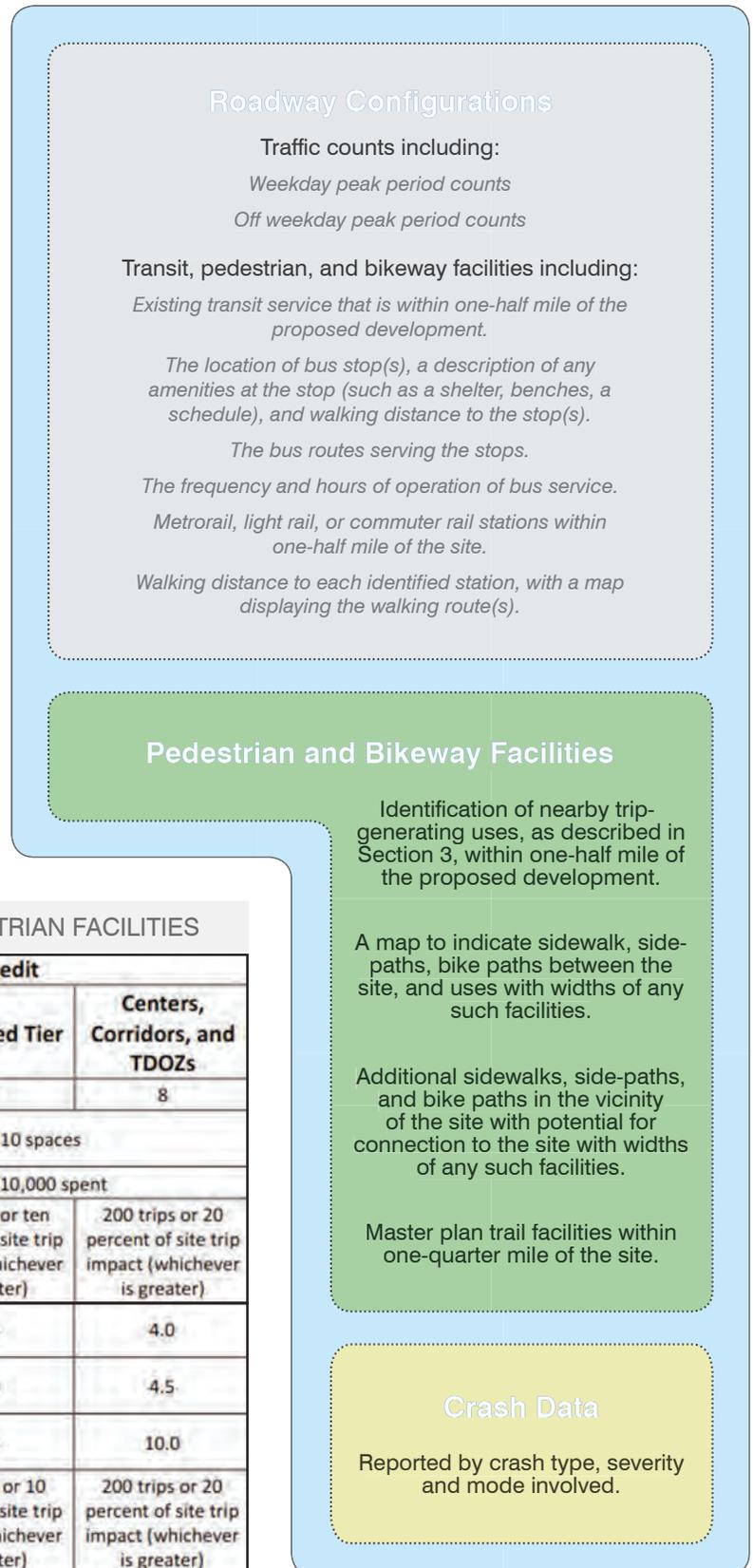


FIGURE 76 | TRIP CREDITS: BICYCLE & PEDESTRIAN FACILITIES

Bicycle or Pedestrian Facility	Trip Credit		
	Rural and Developing Tiers	Developed Tier	Centers, Corridors, and TDOZs
Bus shelter	2	4	8
Provision/designation of park-and-ride spaces	4 credits per 10 spaces		
Other transit enhancements	1.5 credits per \$10,000 spent		
Maximum trip credits for a development (total for transit and bicycle/pedestrian facilities)	75 trips or five percent of site trip impact (whichever is greater)	120 trips or ten percent of site trip impact (whichever is greater)	200 trips or 20 percent of site trip impact (whichever is greater)
100 linear feet of five-foot-wide sidewalk	1.5	2.5	4.0
100 linear feet of eight-foot-wide sidepath or bike path	2.0	3.0	4.5
Enhanced bicycle/pedestrian crossings of master plan roadways	3.0	7.5	10.0
Maximum trip credits for a development (total for transit and bicycle/pedestrian facilities)	75 trips or 5 percent of site trip impact (whichever is greater)	120 trips or 10 percent of site trip impact (whichever is greater)	200 trips or 20 percent of site trip impact (whichever is greater)



CONCLUSION

08

CONCLUSION

Overview

The Maryland State Highway Administration, working cooperatively with the Prince George's County Department of Public Works and Transportation, and the Maryland-National Capital Parks and Planning Commission, have undertaken the MD 223 Corridor Planning Study to help define the needs of the MD 223 Corridor, while identifying short-, mid- and long-term transportation improvement needs. This effort included public outreach as well as input from local elected officials. As stated in the report, the goal of this effort is to identify implementable solutions for improving the MD 223 Corridor.

The recommendations presented are based on the corridor themes identified as part of the study. Each recommendation has been developed to meet the needs of the corridor. Several of the recommendations can be addressed on a case by case basis, eliminating the need for an end to end solution. This report recommends the Clinton Commercial Core should be studied at a greater level of detail, because a single recommendation will not meet the overall needs for this area. This effort should include both mainline as well as secondary road improvements. In addition, an access management plan is needed to address the multiple driveways and entrances in this area.

Who Will Use This Report?

This study will be used by the various departments within SHA and Prince George's County to help move forward these recommendation to improve the MD 223 Corridor. This may include, but is not limited to, incorporation of improvements in future development plans or access permits, SHA District level system preservation projects or safety improvement projects, County improvements as part of the County Capital Improvement Program (CIP), major corridor improvements for inclusion in the Statewide Consolidated Transportation Program (CTP), or other grant related programs. To assist in this effort, projects should also be included as part of the County's recommendation letter to SHA based on the County's transportation priorities for State facilities.

Planning information and recommendations documented in this study will also be a public resource to community members, developers and others interested in transportation plans and how the area is expected to change. It will be used to track progress and follow up on recommendations made to address stated needs.

Implementation Options

The recommendations presented in this report may be implemented through various public funding programs and private investment. Funding programs include:

- Safe Routes to Schools;
- SHA system preservation, sidewalk and drainage retrofit, and safety improvement projects;
- FHWA Transportation Alternatives Program;
- FHWA TIGER Grants;
- Inclusion in CIP projects;
- CTP Grant opportunities.

Modest lower cost improvements may be considered and undertaken as funding becomes available. Recommendations that advance through private development will include right-of-way reservation, mitigation of traffic impacts of new development, and site design that incorporates local street and path connections, and other amenities, in support of bicycling, walking, and managing stormwater.

Most improvements will be implemented over several years. The recommendations presented will also be re-evaluated at the time of funding availability, to ensure that the best transportation solution is developed based on changes to land-use, traffic operations or prevailing best practice.

FHWA Planning and Environmental Linkages (PEL) Guidelines

The MD 223 Corridor Planning Study was conducted working with the FHWA Planning and Environmental Linkages (PEL) Guidelines. The PEL guidelines allow for the use of information from this study, including public outreach efforts to serve as elements, should a more detailed study be needed, as part of the National Environmental Policy Act requirements. PEL represents a collaborative and integrated approach to transportation decision-making that considers environmental, community, and economic goals early in the transportation planning process, and uses the information, analysis, and products developed during planning to inform the environmental review process.

Project Identification, Impacts, and Benefits

The MD 223 Corridor Planning Study considered the impacts and benefits of each conceptual design. Because of the substantial scale and amount of improvements needed to fully address the issues and needs of this corridor, the concepts were organized by types. The types of recommendations include MD 223 intersection improvements, MD 223 corridor wide-improvements, non-SHA improvements, and areas in need of additional study.

Each recommended concept was identified based on public concerns and issues addressed, and categorized by construction cost range, responsible lead office(s), target date range, and priority:

- Public concerns and issues came from a previous survey where concerns from the residents and commuters for specific areas of the corridor were identified.
- Construction cost range is an estimated construction cost with contingency.
- The project team also indicated offices likely to take the lead on the recommended concepts as a way to assist coordination and planning follow up.
- Target date range provides the estimated time needed to complete construction for the specific recommended concept from the time funding becomes available.

Conclusion

This report is intended to summarize the activities undertaken and provide recommendations for the MD 223 corridor. This report will be used by SHA and Prince George's County when looking at transportation priorities, funding opportunities, and as part of the development review process. As identified in the report, there is not one end to end solution for the MD 223 corridor transportation needs, but a series of needs to be addressed as part of a new development or redevelopment, a County improvement, or a series of SHA safety and operational improvements.



APPENDIX A
FHWA “PEL” COMPLETED QUESTIONNAIRE



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1. Background:

A. Who was the sponsor of the PEL study? (CDOT, Local Agency, Other)

1. The Maryland State Highway Administration Office of Planning and Preliminary Engineering, Project Management Division (PMD), initiated the PEL study.

B. What is the name of the PEL document and other identifying project information (e.g. sub-account or STIP numbers, long-range plan, or transportation improvement years)?

1. The name of the PEL document is the MD 223 Corridor Planning Study.

C. Who was included on the study team (Name and title of agency representatives, consultants, etc.)?

Representative	Agency / Organization	Title
Barrett Kiedrowski	Maryland State Highway Administration	Division Chief: PMD
Brandon Scott	Maryland State Highway Administration	Assist. Division Chief: PMD
Bill Carver	Maryland State Highway Administration	Project Manager: PMD
Rick Jenarine	Maryland State Highway Administration	Project Engineer: PMD
Railgul Obul	Maryland State Highway Administration	Project Engineer: PMD
Allison Grooms	Maryland State Highway Administration	Environmental Manager: EPLD
Claudine Myers	Maryland State Highway Administration	Chief: District 3 Engineering Systems
Tom Masog	M-NCPPC	Transportation Supervisor
Christina Pompa	M-NCPPC	Planner Coordinator
David Boston	M-NCPPC	Senior Planner
Teri Bond	M-NCPPC	Planning Supervisor
John Kaii-Ziegler	M-NCPPC	Planning Supervisor
Erv T. Beckert	Prince George's County: DPW&T	Chief: Highway & Bridge Design Division
André Issayans	Prince George's County: DPW&T	Deputy Director
Victor Weissberg	Prince George's County: DPW&T	Special Assistant to the Director
Kate Mazarra	Prince George's County: DPW&T	Associate Director
René Lord-Attivor	Prince George's County: DPW&T	Chief-Traffic Design & Planning
George Holmes	Prince George's County: DPIE	Central District Engineer
Sherif Elkabbani	Prince George's County: DPIE	Traffic Engineer
Mary C. Giles	Prince George's County: DPIE	Associate Director
Ray Moravec	Wallace Montgomery & Assoc. LLP	Project Manager
Seth Darlington	Wallace Montgomery & Assoc. LLP	Concept Engineering
John Rectanus	Wallace Montgomery & Assoc. LLP	Traffic Engineer
Tim Palmer	Wallace Montgomery & Assoc. LLP	GIS Technician
AJ Durham	Straughan Environmental Inc.	Environmental Planner
Yolanda Takesian	Kittelson & Associates, Inc.	Associate Planner
John Paul Weesner	Kittelson & Associates, Inc.	Senior Planner/Landscape Architect
Brandon Nevers	Kittelson & Associates, Inc.	Principal Engineer
Chris Romano	Kittelson & Associates, Inc.	Urban Planning Analyst

D. Provide a description of the existing transportation corridor, including project limits, modes, functional classification, number of lanes, shoulder width, access control and surrounding environment (urban vs. rural, residential vs. commercial, etc.)

1. The MD 223 Corridor Planning Study extends approximately 7.7 miles along MD 223 from MD 4 to Steed Road in Prince George's County, Maryland and one mile to the north and south of the corridor.
2. The MD 223 Corridor passes through the historic Clinton, Maryland area in a rural setting that has developed according to a traditional suburban style, with housing fronting directly onto the arterial and single point local streets feeding neighborhoods with dead end streets and cul-de-sacs. The study area is bordered to the north by Joint Base Andrews (formerly Andrews Air Force Base) and light industrial uses. It is intersected in two locations by limited access highways, MD 5 (Branch Avenue) and MD 4.
3. MD 223 contains a diverse mix of allowable uses that are generally segregated by type. Over half of the corridor is zoned Rural Residential and Open Space. The core areas adjacent to MD 5 are the most concentrated in terms of density and allowable building area, which will support transit oriented development around a planned premium service transit station at the interchange.
4. There is little tree cover near MD 223, and buildings are often set back from the roadway. The only exception to this is in the Historic Core, where buildings have remained relatively close to MD 223.
5. MD 223 can be characterized as an auto-oriented roadway, and is classified as a principle arterial. It has one lane in each direction, with 10' shoulders along most of its length. It lacks sidewalks and bike lanes throughout, but does not deter pedestrians from using the wide shoulders that exist through much of the corridor, to get around. Drainage is generally open, with wide drainage swales present in every district other than the Clinton Historic Core, where the road widens to two directional lanes with left turn lanes at intersections.
6. Lane widths vary between 12'-13' throughout the study area, with the exception in the Historic Core, where there are 11' lanes. The wide lanes and lack of visual barriers lend the road to faster vehicle speeds, and many residents commented that drivers often use the shoulders as passing lanes to get around left-turning vehicles in the two lane sections.

E. Provide a brief chronology of the planning activities (PEL study) including the year(s) the studies were conducted.

1. In 2008, SHA evaluated transportation safety and operations of a limited portion of the study corridor area.
2. In 2013, SHA mailed a questionnaire to 900 corridor residents, and 150 responses were received.
3. In June, 2014, SHA held a Public Information Workshop at the Surrattsville High School.
4. From January 2014 to June 2015, SHA conducted a PEL Corridor Study.

F. Are there recent, current, or near future planning studies or projects in the vicinity? What is the relationship of this project to those studies/projects?

1. The PEL study team reviewed all recent and current studies, and projects influencing the project area. The agencies involved were the Maryland-National Capital Park and Planning Commission (M-NCPPC), Maryland Transit Administration (MTA), Washington Metropolitan Area Transit Authority (WMATA),

FHWA Planning and Environmental Linkages (PEL) Questionnaire | MD 223 Corridor Planning Study

and the Maryland State Highway Administration (SHA). A summary of those documents and their relationship to the project is shown in the matrix below:

Study	Agency	Date of Study	Project Relationship
Approved Countywide Green Infrastructure Plan	M-NCPPC	Jun-05	Applies to Corridor
County-Wide Master Plan of Transportation Bikeways and Trails	M-NCPPC	Nov-09	Applies to Corridor
Joint Base Andrews Joint Land Use Study	M-NCPPC	Dec-09	Adjacent to Corridor
Southern Maryland Transit Corridor Preservation Study	MTA	Aug-10	Through Corridor
Design and Placement of Transit Stops	WMATA	Aug-10	Applies to Corridor
Andrews Transportation Study	M-NCPPC	Apr-11	Adjacent to Corridor
MD 5 Final Environmental Assessment	SHA	Apr-12	Within Corridor
Central Branch Avenue Corridor Revitalization Sector Plan	M-NCPPC	Sep-12	Within Corridor
Prince George’s County Transit-ways Systems Planning Study	M-NCPPC	Dec-12	Applies to Corridor
Preliminary Subregion 5 Master Plan and Proposed Sectional Map Amendment	M-NCPPC	Jul-13	Applies to Corridor
Subregion 6 Master Plan	M-NCPPC	Jul-13	Applies to Corridor
Bicycle Policy and Design Guidelines	SHA	Jul-13	Applies to Corridor
2040 Functional Master Plan for Parks, Recreation, and Open Space	M-NCPPC	Sep-13	Applies to Corridor
Plan Prince George’s 2035	M-NCPPC	Nov-13	Applies to Corridor
Southern Maryland Rapid Transit Study	MTA	In Process	Through Corridor

2. Methodology Used:

A. What was the scope of the PEL study and the reason for completing it?

1. Recognizing the implications of the projected growth and growing need and desire for travel mode alternatives, the Maryland State Highway Administration (SHA), Federal Highway Administration (FHWA), and Prince George’s County initiated the MD 223 Corridor Planning Study to investigate transportation improvements along the MD 223 corridor. The study builds upon previous studies completed in the area by SHA, Prince George’s County, the Maryland National Capital Planning Commission, the Maryland Transit Administration, and others agencies, with the objective to help to establish a balanced approach to transportation in the area.
2. In preparation for the study, SHA mailed a survey of transportation questions to residents and commuters, in and around the MD 223 corridor, to request input on the issues, concerns, and needs on MD 223. Questions included:
 - i. What transportation features along this section of MD 223 benefit you most?
 - ii. What are the top issues that should be addressed by this study?
 - iii. Please identify any important natural or community resources in the MD 223 area.
3. The survey revealed residents viewed traffic congestion, pedestrian access, and crossing/making turns as the major issues within the corridor. It also highlighted the importance of preserving community resources, such as places of worship and public parks. Previous plans, reports, and the questionnaire results formed the basis for what issues and concerns would be investigated during the study.
4. The process also recognized that many of the issues present could be addressed with small scale, short term projects, rather than a single large scale end-to-end project. The study was designed to identify and lay the groundwork for short-term

project implementation with the engagement of offices that could help move projects into their programs.

B. Did you use NEPA-like language? Why or why not?

1. The study used a mix of traditional land use and NEPA-like language during the study. The goal of the PEL was to understand the needs throughout the corridor and to identify potential solutions that could be considered and organized into a series of projects that would serve needs of the corridor, some of which would be area-specific (intersections), and some of which may be corridor-wide. The approach also recognized that solutions would not only come through transportation agency capital projects, but also include private development actions through public sector review and decision-making processes.

C. What were the actual terms used and how did you define them? (Provide examples or list)

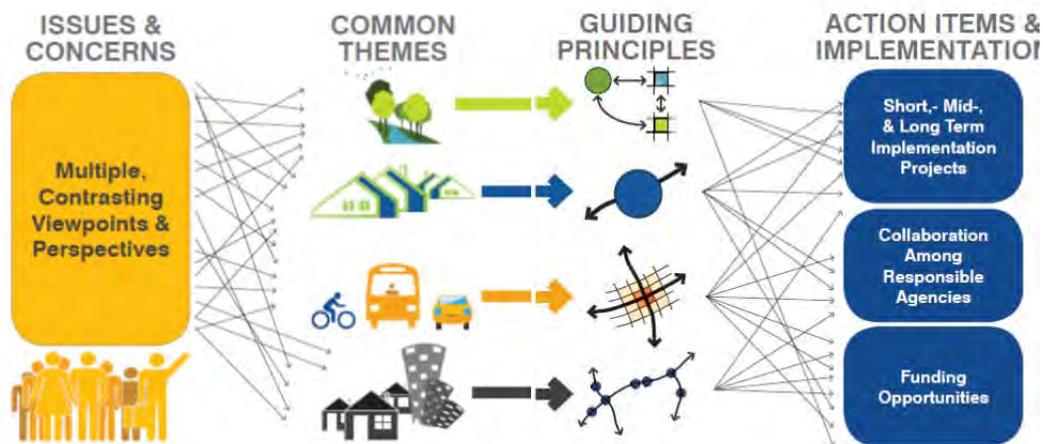
1. The planning team identified “issues and concerns” that occur corridor-wide as well as at key geographic locations. The team identified one or more alternatives as “concepts” to address identified issues and concerns. Needs included:
 - i. Safety: Speeding along rural sections
 - ii. Safety: Lack of multimodal access to schools
 - iii. Safety: Drivers using shoulders to pass stopped vehicles waiting to turn left
 - iv. Congestion: Long traffic queues due to intersection congestion

D. How do you see these terms being used in NEPA documents?

1. Issues and concerns will be the basis for the purpose and need for future NEPA documents. Alternatives responding to issues and concerns are identified as “concepts” and have been organized by concept type and lead agency according to short, mid, and long term concepts that can be advanced as individual projects. The project development process for each recommendation will need to identify how it will address the issues and concerns identified during PEL. As projects move into NEPA, especially the recommendation for a major study of downtown Clinton, the process should include specific performance measures that can be used to evaluate alternatives (e.g., “number of driveway entrances eliminated;” or “least impact on the Surratt House Museum and grounds”).

E. What were the key steps and coordination points in the PEL decision-making process? Who were the decision-makers and who else participated in those key steps?

1. Leading the PEL process, SHA made decisions guiding the content to be shared with the public; issues, and concerns to be analyzed by the team; and the concept alternatives that could be considered to address them. Prince George’s County provided support for those decisions and helped to inform on development related issues and possible solutions. Decisions were made at each stage of the PEL process shown in the graphic below. Coordination meetings with SHA, Prince George’s County, M-NCPPC, and DPW&T staff were held at project milestones. Community and environmental planning staff, from each agency, were involved at each stage of the visioning and decision-making process.



F. How should the PEL information be presented in NEPA?

1. The PEL study establishes a corridor-wide framework that can be referenced in subsequent NEPA documents for individual projects. The PEL final report should be a foundation document for NEPA, both in terms of scoping (with the identification of issues and concerns through the survey, public meetings, and interviews), and the potential complexities of the identified concepts. The issues and concerns identified will be the basis for the purpose and need in future NEPA documents, and the concepts identified will be included in the Alternatives section of NEPA documents.

3. Agency Coordination:

A. Provide a synopsis of coordination with Federal, tribal, state and local environmental, regulatory and resource agencies. Describe their level of participation and how you coordinated with them.

1. SHA environmental staff participated at each stage of the study to ensure the perspectives of resource protection agencies would be part of the process. The representative ensured that inventories of existing conditions were complete and documented within the study report.

B. What transportation agencies (e.g. for adjacent jurisdictions) did you coordinate with or were involved in the PEL study?

1. The coordinating agencies are: Maryland State Highway Administration, Maryland Transit Administration, M-NCPPC, Countywide Planning Division, Prince George’s County Department of Public Works and Transportation, and Joint Base Andrews. The project area does not affect adjacent jurisdictions. The Office of Transportation at DPW&T was able to provide coordination on behalf of the Washington Metropolitan Area Transit Authority (WMATA), which provides bus service to the area.

C. What steps will need to be taken with each agency during NEPA scoping?

1. Based on the unique nature of the needs in different places along the corridor, it is anticipated that smaller-scale solutions would meet the needs. The environmental resources were mapped to understand the potential magnitude of the alternatives on these resources. The concepts/alternatives are minor in impacts and level of controversy, and would most likely qualify as Categorical Exclusions under NEPA.

4. Public Coordination:

A. Provide a synopsis of your coordination efforts with the public and stakeholders.

1. Education - A public information workshop was held to allow citizens, business owners, and stakeholders to develop an understanding of the issues.
2. Feedback - A transportation-oriented questionnaire was sent to 900 households to solicit perspective on the impact of the regulations on their life and work. The SHA team also interviewed residents, businesses, community service workers, and volunteers of the police, fire, library, schools, churches, and historic/cultural sites. This feedback will be used to provide focus to the issues for further consideration and follow up.
3. Notification - A newsletter was sent to residents and other stakeholders (900 mailings). An updated newsletter will be sent at the conclusion of the study with study findings and the ways stakeholders can continue to participate.

5. Purpose and Need for the PEL Study:

A. What was the scope of the PEL study and the reason for completing it?

1. The scope of the study was a concept development analysis. The concept development process followed for MD 223 began by analyzing existing conditions along the corridor and soliciting thoughts, concerns, and ideas from the general public, key stakeholders, and government agencies. It included an initial review and documentation of all pertinent studies and plans, community comments, traffic, and safety analysis. Environmental inventories were mapped and a synthesis of existing conditions was created to show physical relationships, their influences on the character, safety, and operations of the corridor. Character zones helped to establish an understanding of design considerations that were used to develop concepts. Solutions were proposed and investigated at a planning level for feasibility. They were prepared as a set of recommendations for short-, mid-, and long-term action in an implementation strategy matrix that included cost ranges, impact level, and responsible office.
2. The reason for completing the PEL was to create a guiding document that would be comprehensive in its approach, recognize the various stakeholders and their coordination that would be needed to implement a set of comprehensive solutions, and ensure that smaller short term solutions would be identified so they could advance more quickly with the understanding that they would contribute to a larger vision.

B. Provide the purpose and need statement, or the corridor vision and transportation goals and objectives to realize that vision.

1. Purpose
 - a. Address long and short term safety, operations, and traffic capacity issues for all modes that currently exist within the corridor, and set a direction for both public and private infrastructure investment for the future. Include enhanced transportation solutions for pedestrians, bicyclists, transit riders, and motorists, and include improvements to MD 223 as well as to the local network.

2. Need
 - a. Improve left-turn safety at residential and commercial access points, and local streets.
 - b. Improved pedestrian safety and sidewalk connectivity, particularly for seniors walking to area services, and children walking to school, and play.
 - c. Preserve community history, character, and natural features while accommodating planned growth.
 - d. Address congestion, particularly at intersections, that causes mainline link failures during peak travel times.

C. What steps will be taken during the NEPA process to make this a project-level purpose and need statement?

1. Each project will require an identification of the problems and documentation of the specific conditions that should become a project level needs statement.
2. As individual projects are initiated, it will be necessary to coordinate, on a project-by-project basis, to determine the scope of the NEPA study, including level of study required, purpose and need, logical termini, and the extent to which the corridor study can be used to supplement or replace certain milestones in the NEPA process.

6. Range of Alternatives Considered Screening Criteria and Screening Process:

A. What types of alternatives were looked at? (Provide a one or two sentence summary and reference document.)

1. This study considered a range of concepts/alternatives to the various problems that were identified during the public participation and existing conditions synthesis. The solutions were organized according to concept type in both general categories, and as location specific, stand-alone concepts. Examples include:
 - a. Signal warrant analysis
 - b. Shoulder and bicycle safety improvements
 - c. Bus stop and shelter improvements
 - d. Steed Road intersection improvement
 - e. Temple Hill Road intersection improvement
 - f. Clinton Commercial Core network connectivity enhancement

B. How did you select the screening criteria and screening process?

1. LOS traffic analysis and a safety study were used to identify and screen concepts.

C. For alternative(s) that were screened out, briefly summarize the reasons for eliminating the alternative(s). (During the initial screenings, this generally will focus on fatal flaws)

1. Concepts were screened based on costs and impacts. Those with higher costs and impacts to historic resources or corridor character were identified. For example, the Branch Avenue Corridor Sector Plan through downtown Clinton shows a future widening of MD 223 from four to six lanes with service roads and left turn lanes. This alternative was eliminated due to impacts on existing historic structures.

D. Which alternatives should be brought forward into NEPA and why?

1. The most significant concept that may be brought into NEPA is the downtown Clinton area from west of Old Branch Avenue / Brandywine Road to east of Old Alexandria / Dangerfield Road. All other state road concepts identified in the MD 223 Corridor Study report may be subject to NEPA, due the use of federal funds in SHA's federal fund balance.

E. Did the public, stakeholders, and agencies have an opportunity to comment during this process?

1. Yes, public comments on the existing conditions and SHA concepts were gathered.

F. Were there unresolved issues with the public, stakeholders and/or agencies?

1. There were no unresolved issues. As each concept moves into project development, the public and stakeholders are expected to be given the opportunity to participate and provide comments.

7. Planning Assumptions and Analytical Methods:

A. What is the forecast year used in the PEL study?

1. The forecast year used in the PEL study is 2040.

B. What method was used for forecasting traffic volumes?

1. Working with data received from the Metropolitan Washington Council of Governments (MWCOC) regional transportation model, the SHA Data Services Engineering Division (DSED) used the National Cooperative Highway Research Program's (NCHRP) established post processing method to develop the 2040 volumes, specific to the MD 223 corridor's ADT volumes, and AM/PM Peak Hour Volumes.

C. Are the planning assumptions and the corridor vision/purpose and need statement consistent with each other and with the long-range transportation plan? Are the assumptions still valid?

1. Yes, the planning assumptions are consistent and still valid. They are based upon the latest MWCOC regional travel demand forecasting model, and were coordinated with both the SHA and M-NCPPC Prince George's County.

D. What were the future year policy and/or data assumptions used in the transportation planning process related to land use, economic development, transportation costs and network expansion?

1. No additional future year policy and/or data assumptions were used outside of the existing MWCOC model for this project. This data includes the 2040 land use data and information provided by the M-NCPPC Prince George's County.

8. Environmental Resources (wetlands, cultural, etc.) reviewed. For each resource or group of resources reviewed, provide the following:

A. In the PEL study, at what level of detail was the resource reviewed and what was the method of review?

1. The planning process incorporated the intent of the PEL through the consideration of natural, physical, and social effects, involved environmental resource agencies, documented the transportation planning process, and vetted the results through public involvement.
2. A literature review was completed for the cultural and historic resources, and a GIS evaluation of all environmental data was conducted as part of the PEL. The following resources were used in the resource identification, mapping, and assessment:
 - a. Cultural and Historic:
 - i. Maryland Historical Trust website
 - ii. Martenet's Map of Prince George's County, Maryland 1861
 - iii. Surratt House Museum Executive Director Interview
 - b. Environmental:
 - i. U.S. Fish & Wildlife Service – National Wetlands Inventory (NWI), 2011
 - ii. Federal Emergency Management Agency (FEMA) Floodplain Maps, 2012
 - iii. Maryland Department of Natural Resources (DNR), 2001
 - a. Sensitive Species Project Review Areas (SSPRA),
 - b. Forest Interior Dwelling Species (FIDS)
 - iv. Maryland Department of Environmental Resources (DER), 2012
 - v. Prince George's County – Countywide Green Infrastructure Plan (CGIP) 2005

B. Is this resource present in the area and what is the existing environmental condition for this resource?

1. Several cultural and historic sites are located along the corridor. These sites include structures that have been placed on the National Register of Historic Places including the Surratt House Museum, and His Lordship's Kindness. The context also includes sites placed on the Maryland Historic Trust, such as the Clinton (Rosenwald) School (within the American Legion Building), and sites that are being considered for designation such as the B.K. Miller Super Liquor Store.
2. As part of this planning level study, environmentally sensitive lands were identified which included: CGIP habitat conservation areas, tree cover, wetlands, and other environmental assets. More than 44 percent of the study area consists of tree canopy and approximately 95 percent of the tree coverage is preserved in the County's habitat conservation areas.
3. The study area sits within the Piscataway Creek and the Western Branch Watersheds. The corridor's topography naturally forms alternating valleys and ridges which are drained into several small creeks. MD 223 runs along the ridge, with land sloping on the northern and southern sides. The Pea Hill Branch Creek runs parallel to MD 223 on the northern side, while the Piscataway Creek and the Butler Branch Creek drain on the southern side of the corridor.

C. What are the issues that need to be considered during NEPA, including potential resource impacts and potential mitigation requirements (if known)?

1. All concepts were developed to a level of detail to adequately quantify potential impacts. After preliminary engineering was completed for each concept, the preliminary limits of disturbance were established 25 feet from the edge of hardscape work. The areas falling within the limits of disturbance were considered impacted. Impacts are divided into three separate categories, corresponding to the environmental resources: Land Use Impacts, Cultural/Historic Resources Impacts, and Natural Environmental Resources Impacts. Although some of the impacts may be avoided in the next phase of design, the purpose of this study is to determine the worst case scenario as a result of the proposed improvements and potential impacts moving forward.

D. How will the data provided need to be supplemented during NEPA?

1. Coordination meetings with each resource agency will be conducted at the beginning of NEPA. Maryland's clearinghouse process will be used to gather input from resource agencies.

9. List environmental resources that you were aware of that were not reviewed in the PEL study and why? Indicate whether or not they will need to be reviewed in NEPA and explain why.

1. All known environmental resources were reviewed during the PEL Study.

10. Were cumulative impacts considered in the PEL study? If yes, provide the information or reference where it can be found.

1. Although the comprehensive nature of the study recognizes the importance of identified resources' contribution to the whole, cumulative impacts were not specifically addressed. It is not anticipated that an EIS-level NEPA documentation would be required.

11. Describe any mitigation strategies discussed at the planning level that should be analyzed during NEPA.

1. As an example of mitigation strategy, the major arterial intersection of MD 223 at Old Branch Ave/Brandywine Road in downtown Clinton is the only failing intersection today. Several designated and eligible properties are located there. A vacant property adjoining the Surratt House Museum was identified for special treatment, as it could be designed with public open space that could support the character and story of the historic property. As alternatives are developed, it will be important to consider the land uses at the intersection and potentially consider acquisition or design guidance that can contribute to the overall and historic character of Clinton.
2. Changes to stormwater management in areas with open sections today should be addressed at a system level to ensure that bioswales remains in place or are replaced to manage water quality.

12. What needs to be done during NEPA to make information from the PEL study available to the agencies and the public? Are there PEL study products which can be used or provided to agencies or the public during the NEPA scoping process?

1. Project documents can be made available to agencies on SHA's website for use during NEPA.
2. The MD 223 Corridor Planning Study Report can be used and provided to agencies and the public during the NEPA scoping process to better understand the study area and the surrounding context.

13. Are there any other issues a future project team should be aware of? (Examples: Utility problems, access or ROW issues, encroachments into ROW, problematic land owners and/or groups, contact information for stakeholders, special or unique resources in the area, etc.)

1. The Surratt House Museum's Executive Director was explicit, given its location, that this organization should be a part of any design process.
2. Community members should be kept informed as projects move into NEPA, and before major investment is made in the preparation of solutions.
3. There are no other issues the project team is aware of at the time of this document.



APPENDIX B
TRAFFIC DEMAND AND OPERATIONS ANALYSIS

B

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MD 223 CORRIDOR PLANNING STUDY (MD 4 TO STEED ROAD)

Travel Demand and Traffic Operations Analysis

December 2014

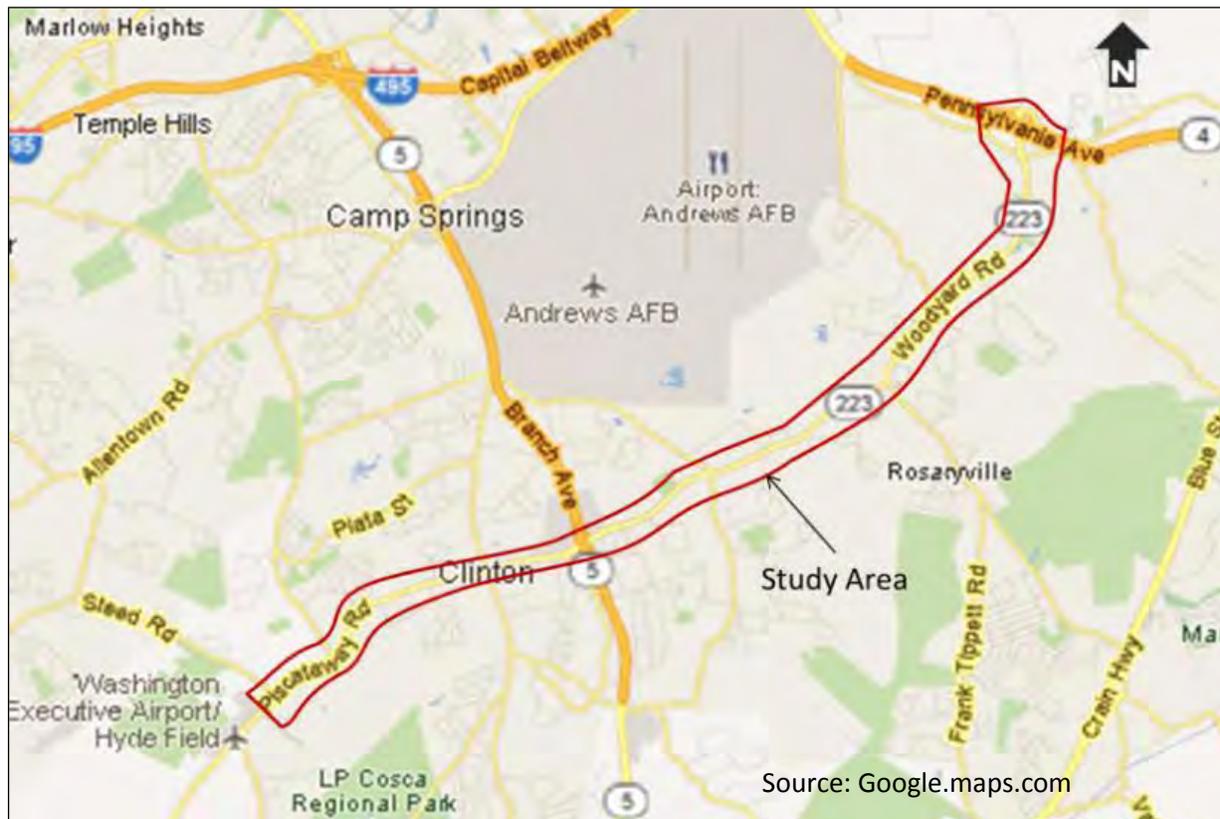


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Purpose/Background

The Maryland State Highway Administration (SHA) initiated a corridor planning study to assess the transportation improvement needs for MD 223 in Prince George's County, Maryland. The purpose of the study is to identify the existing and future traffic conditions in the study area, and to determine any necessary traffic management and infrastructure improvements to meet the following primary objectives:

- Enhance traffic and pedestrian safety
- Reduce traffic congestion, especially during peak morning and evening travel hours.

Several alternatives were generated that enhanced the traffic and pedestrian safety and reduce traffic congestion. A baseline for comparison was established by analyzing the Existing Conditions, which used existing signal timings (except at MD 223 and Rosaryville Road), road geometrics, and field observations. Analysis was performed for 2025 and 2040.

In 2025 there are three alternatives:

- 2025 No Build – This alternative uses the existing lane configuration and existing signal timings.
- 2025 Signals Optimized – This alternative uses the existing lane configuration and optimizes the signal timings.
- 2025 Scenario 6 – This is an interim concept design. Left-turn lanes are provided at Canberra Drive, Colonial Lane, Sherwood Drive and by-pass lanes are added at Colonial Lane and Sherwood Drive.

In 2040 there are seven alternatives:

- 2040 No Build – This alternative uses the existing lane configuration and existing signal timings.
- 2040 Signals Optimized – This alternative uses the existing lane configuration and optimizes the signal timings.
- 2040 Scenario 1 – This is the preferred ultimate design. There are proposed improvements to the typical section and to several intersections. The typical section from Temple Hill Road to Mike Shapiro Drive will add a left turn lane. The typical section from MD 5 to Old Rosaryville Road will add three additional lanes, one NB lane, one SB lane, and a left turn lane. The proposed improvements at several intersections included:
 - Adding an additional lane on Steed Road
 - Adding additional lanes at Old Branch Avenue
 - Extending the northbound left turn lanes at Mike Shapiro Drive and removing the unsignalized northbound left turn lane just south of the intersection
 - Adding additional lanes at Old Alexandria Ferry Road
 - Adding additional lanes at Dower House Road
 - Adding additional lanes at Old Marlboro Pike
- 2040 Scenario 2 – This scenario is based on Scenario 1, with the proposed improvement at Steed Road being a Maryland T.

MD 223 Corridor Planning Study (From MD 4 to Steed Road)

- 2040 Scenario 3 – This scenario is based on Scenario 1, with the proposed improvement at Brandywine Road/Old Branch Avenue being only half of what was considered in Scenario 1.
- 2040 Scenario 4 – This scenario is based on Scenario 1, with a roundabout proposed at MD 223 and Old Alexandria Ferry Road.
- 2040 Scenario 5 – This scenario is based on Scenario 1, with a bifurcation being proposed at Old Alexandria Ferry Road, creating two intersections of Old Alexandria Road with MD 223.

Study Area Limits

The study area is MD 223 from Steed Road to MD 4 as shown in Figure 1.

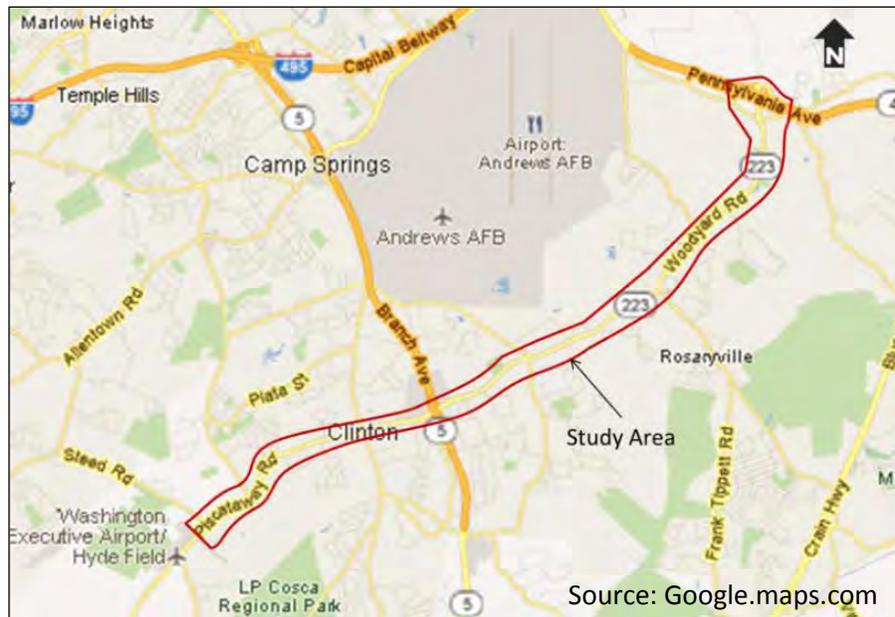


Figure 1: MD 223 from Steed Road to MD 4 Study Area

Existing Traffic

A rigorous data collection and subsequent analysis of the travel and traffic data has been performed to assess the existing conditions of the transportation system on MD 223 from Steed Road to MD 4. The segment of MD 223 in the study area is primarily a two (2) lane road that has sections that are 4 lanes near the ramps for MD 4 and MD 5. The existing lane configuration is provided in Appendix A. Turning movement and 24 hour volume counts have been collected along the corridor and the AADT and Peak Hour volumes for the corridor are provided in Appendix A.

Travel Demand Modeling and Forecasting

The Metropolitan Washington Council of Government (MWCOC) and the Maryland Statewide model were used to determine the expected traffic growth on MD 223 and surrounding roads. Using model outputs and NCHRP 255 post processing the future 2025 and 2040 volumes were developed and provided in Appendix B.

Traffic Operational Analysis

SYNCHRO/SimTraffic, a traffic simulation model, was developed to determine a baseline level of service. The models were calibrated based on existing travel time runs, which were taken during the AM and PM peak hours. Existing signal timings were also used to calibrate the model, the signal timings used for the models were provided by the Office of Traffic and Safety (OOTs). The existing conditions were calibrated based on the field data and the partial construction of MD 223 at Rosaryville Road. The existing analysis is based on the completed construction of MD 223 at Rosaryville Road and the signal timing at MD 223 and Rosaryville Road. The signal timing was optimized to account for adjustments that may occur upon completion of the construction.

The existing Synchro/SimTraffic files was updated with 2025 and 2040 volumes in which the existing lane configurations and existing signal timings were used to analyze the no build alternatives, which could be used for a base for comparison. The 2025 and 2040 No Build Synchro/SimTraffic files were updated so that the signals were optimized based on the forecasted future volumes. The base files were also used as a base for all the proposed alternatives. All proposed alternative models were updated based on the scenarios provided by the Project Management Division (PMD). See Appendix C.

Intersection levels of service (LOS) analysis were performed using Highway Capacity Manual (HCM) methodology. Synchro was used to determine the HCM 2000 Level of Service (LOS) and delay for the signalized intersections. The results are shown in Table 1 and Table 2. Appendix D provides detailed Synchro outputs for all scenarios.

Included below is a list of intersections that operate at a LOS F or E based on HCM analysis for each scenario:

- 2013 No build conditions
 - AM Peak
 - 1 LOS F: MD 223 at Old Branch Avenue/Brandywine Road
 - PM Peak
 - 1 LOS E: MD 223 at Old Branch Avenue/Brandywine Road
- 2025 No Build conditions
 - AM Peak –
 - 1 LOS F: MD 223 at Old Branch Avenue/Brandywine Road
 - PM Peak
 - 2 LOS F: MD 223 at Old Branch Avenue/Brandywine Road and MD 223 at Temple Hill Road
 - 3 LOS E: MD 223 at Malboro Pike, MD 223 at Rosaryville Road, and MD 223 at Clinton Plaza Shopping Entrance/Pine View Lane.
- 2025 Signals Optimized
 - AM Peak
 - 1 LOS F: MD 223 at Old Branch Avenue/Brandywine Road
 - PM Peak
 - 1 LOS F: MD 223 at Old Branch Avenue/Brandywine Road
 - 2 LOS E: MD 223 at Rosaryville Road and MD 223 at Temple Hill Road

Table 1: Synchro Measure of Effectiveness (MOEs) (2000 HCM) for AM Peak

Intersection LOS (Delay)	AM Peak										
	2013	2025 No Build	2025 Signals Optimized	2025 Scenario 6	2040 No Build	2040 Signals Optimized	2040 Scenario 1	2040 Scenario 2	2040 Scenario 3	2040 Scenario 4	2040 Scenario 5
MD 223 at Marlboro Pike	C (33.3)	D (51.7)	D (47.6)	D (47.6)	E (76.3)	E (71.0)	D (52.4)	D (41.6)	D (42.1)	D (52.6)	D (52.6)
MD 223 at Dower House Rd	C (30.7)	D (51.4)	D (36.0)	D (36.0)	E (78.0)	D (44.1)	D (45.6)	D (44.5)	D (46.0)	D (43.9)	D (43.7)
MD 223 at Rosaryville Rd*	C (24.6)	C (25.0)	C (22.6)	B (18.8)	D (35.8)	C (29.5)	C (26.9)	D (37.0)	C (24.3)	C (20.6)	B (18.2)
MD 223 at Old Alexandria Ferry Rd/Dangerfield Rd**	B (15.4)	C (22.3)	B (16.6)	C (20.7)	D (40.0)	C (29.0)	C (20.8)	C (22.0)	C (20.9)	A (7.0)	C (28.1)
MD 223 at Old Alexandria Ferry Rd extension											B (12.0)
MD 223 at Mike Shapiro Dr	B (11.4)	B (11.8)	A (9.0)	A (8.9)	B (12.4)	A (8.7)	B (11.5)	A (7.5)	A (9.4)	A (9.2)	A (9.2)
MD 223 at MD 5	C (29.9)	C (30.3)	C (20.0)	B (18.8)	C (31.0)	B (16.9)	C (25.9)	C (27.6)	B (18.7)	B (19.4)	B (19.1)
MD 223 at Clinton Plaza Shopping Ent / Woody Terr	B (10.7)	B (12.6)	B (12.5)	A (7.2)	B (14.4)	A (9.9)	A (8.0)	A (8.2)	A (8.5)	A (8.1)	A (8.1)
MD 223 at Clinton Plaza Shopping Ent / Pine View Ln	C (32.3)	C (39.7)	C (34.9)	C (27.1)	D (53.3)	C (29.4)	C (30.5)	C (27.8)	C (30.6)	C (22.8)	C (23.0)
MD 223 at Old Branch Ave / Brandywine Rd	F (104.3)	F (156.8)	F (147.8)	F (144.7)	F (>200)	F (>200)	D (41.1)	D (40.4)	E (69.1)	D (48.8)	D (46.6)
MD 223 at Temple Hill Rd	C (20.1)	C (26.4)	C (22.4)	C (21.2)	D (37.5)	B (19.4)	B (16.6)	B (17.7)	B (15.5)	B (13.6)	B (13.8)
MD 223 at Steed Rd	C (22.2)	D (41.6)	C (29.5)	C (29.8)	E (71.2)	F (85.2)	B (14.0)	B (18.2)	B (14.9)	B (14.9)	B (14.9)

* MD 223 at Rosaryville Rd is modeled based on completed design; for the existing conditions only Rossaryvill Road signal is optimized

** Scenario 4 analysis for the Roundabout at Old Alexandria Ferry Road/Dangerfield Rd was performed in Sidra

Table 2: Synchro Measure of Effectiveness (MOEs) (2000 HCM) for PM Peak

Intersection LOS (Delay)	PM Peak										
	2013	2025 No Build	2025 Signals Optimized	2025 Scenario 6	2040 No Build	2040 Signals Optimized	2040 Scenario 1	2040 Scenario 2	2040 Scenario 3	2040 Scenario 4	2040 Scenario 5
MD 223 at Marlboro Pike	D (42.6)	E (68.1)	D (51.9)	D (51.8)	F (96.0)	E (72.3)	D (37.8)	D (39.4)	D (48.2)	E (62.8)	E (61.6)
MD 223 at Dower House Rd	C (25.9)	C (33.1)	C (34.6)	C (31.8)	E (62.3)	D (46.2)	D (45.3)	D (46.5)	D (45.2)	E (57.2)	D (46.0)
MD 223 at Rosaryville Rd*	C (29.7)	E (70.3)	E (59.4)	B (19.2)	D (46.6)	E (57.4)	D (43.5)	D (49.8)	C (22.4)	C (22.3)	C (29.9)
MD 223 at Old Alexandria Ferry Rd/Dangerfield Rd**	C (26.4)	D (40.8)	D (42.3)	D (36.2)	E (61.4)	E (75.6)	C (27.8)	C (31.7)	C (25.6)	D (32.3)	C (29.1)
MD 223 at Old Alexandria Ferry Rd extension											B (14.5)
MD 223 at Mike Shapiro Dr	B (16.1)	B (16.6)	A (8.1)	B (11.8)	B (19.9)	A (9.0)	C (24.3)	A (8.7)	A (9.2)	A (9.2)	A (9.2)
MD 223 at MD 5	D (36.2)	D (39.8)	C (30.1)	C (23.8)	D (45.7)	D (37.7)	D (36.8)	D (37.9)	D (35.8)	D (35.8)	D (35.8)
MD 223 at Clinton Plaza Shopping Ent / Woody Terr	B (15.5)	C (25.7)	B (14.6)	C (20.6)	C (25.3)	B (14.6)	B (13.0)	B (13.8)	B (12.2)	B (12.3)	B (12.3)
MD 223 at Clinton Plaza Shopping Ent / Pine View Ln	D (42.2)	E (60.5)	D (36.5)	D (39.9)	F (80.5)	D (37.1)	D (39.4)	D (39.8)	D (41.1)	D (40.9)	D (40.9)
MD 223 at Old Branch Ave / Brandywine Rd	E (73.2)	F (115.0)	F (103.2)	F (103.2)	F (157.5)	F (157.0)	E (68.2)	E (67.9)	E (73.5)	E (67.1)	E (67.1)
MD 223 at Temple Hill Rd	D (48.2)	F (91.2)	E (70.9)	E (69.6)	F (131.4)	F (108.9)	C (28.6)	C (23.0)	C (28.6)	C (28.6)	C (28.6)
MD 223 at Steed Rd	B (19.5)	C (32.3)	B (18.0)	B (19.4)	D (534.3)	C (32.0)	B (11.9)	A (9.9)	B (11.9)	B (11.9)	B (11.9)

* MD 223 at Rosaryville Rd is modeled based on completed design; for the existing conditions only Rossaryvill Road signal is optimized

** Scenario 4 analysis for the Roundabout at Old Alexandria Ferry Road/Dangerfield Rd was performed in Sidra

MD 223 Corridor Planning Study (From MD 4 to Steed Road)

- 2025 Scenario 6
 - AM peak
 - 1 LOS F: MD 223 at Old Branch Avenue/Brandywine Road
 - PM Peak
 - 1 LOS F: MD 223 at Old Branch Avenue/Brandywine Road
 - 1 LOS E: MD 223 at Temple Hill Road
- 2040 No Build conditions
 - AM Peak
 - 1 LOS F: MD 223 at Old Branch Avenue/Brandywine Road
 - 3 LOS E: MD 223 at Malboro Pike, MD 223 at Dower House Road, MD 223 at Steed Road
 - PM Peak
 - 4 LOS F: MD 223 at Malboro Pike, MD 223 at Clinton Plaza Shopping Entrance/Pine View Lane, MD 223 at Old Branch Avenue/Brandywine Road, and MD 223 at Temple Hill Road
 - 2 LOS E: MD 223 at Dower House Road, and MD 223 at Old Alexandria Ferry Road/Dangerfield Road
- 2040 Signals Optimized
 - AM Peak
 - 2 LOS F: MD 223 at Old Branch Avenue/Brandywine Road and MD 223 at Steed Road. The failure of MD 223 at Steed Road occurs when signals are optimized because the entire network is being optimized, which is dependent upon the overall performance of the corridor, not individual intersections.
 - 1 LOS E: one intersection MD 223 at Malboro Pike
 - PM Peak
 - 2 LOS F: MD 223 at Old Branch Avenue/Brandywine Road, and MD 223 at Temple Hill Road
 - 3 LOS E: MD 223 at Malboro Pike, MD 223 at Rosaryville Road, and MD 223 at Old Alexandria Ferry Road/Dangerfield Road
- 2040 Scenario 1
 - PM Peak
 - 1 LOS E: MD 223 at Old Branch Avenue/Brandywine Road
- 2040 Scenario 2
 - PM Peak
 - 1 LOS E: MD 223 at Old Branch Avenue/Brandywine Road
- 2040 Scenario 3
 - AM Peak
 - 1 LOS E: MD 223 at Old Branch Avenue/Brandywine Road
 - PM Peak
 - 1 LOS E: MD 223 at Old Branch Avenue/Brandywine Road

MD 223 Corridor Planning Study (From MD 4 to Steed Road)

- 2040 Scenario 4
 - PM Peak
 - 3 LOS E: MD 223 at Malboro Pike, MD 223 at Dower House Road, and MD 223 at Old Branch Avenue/Brandywine Road
- 2040 Scenario 5
 - PM Peak
 - 2 LOS E: MD 223 at Malboro Pike and MD 223 at Old Branch Avenue/Brandywine Road

The system wide Measures of Effectiveness (MOEs) such as total delay, delay per vehicle, travel time, average speed, fuel consumed, and unserved vehicles were generated for all scenarios using SimTraffic.

Total Delay (hrs). This is equal to the simulated total travel time minus the travel time for the vehicle with no other vehicles or traffic control devices in the system.

Delay/veh (secs). This is the total delay divided by the total number of vehicles in the system.

Travel Time (hrs). This is the time each vehicle was present in the area. The travel time includes time spent by vehicles Denied Entry.

Average Speed (mph). This is total distance divided by total time and is weighted by volume and includes stopped time and denied entry time.

Fuel consumed (gal). This is the fuel used by the vehicles and is based on the speed and acceleration.

Unserved Vehicles (veh). This is the number of vehicles that are unable to enter due to congestion in the network. The value is useful to see if congestion is getting worse or better.

The system wide MOEs are shown in Tables 3 and 4 below. Appendix E provides detailed SimTraffic outputs for all scenarios.

Based on system wide MOEs, when compared to 2013 Existing conditions, the 2025 No Build exhibits the following:

- **During the AM Peak**, total delay is increased 90%, delay per vehicle increased by 69%, travel time increased by 66%, average speed is reduced by 20%, fuel consumed is increased by 28%, and unserved vehicles are increased by over 370 vehicles.
- **During the PM Peak**, total delay is increased by 58%, delay per vehicle is increased by 54%, travel time increased by 73%, average speed is reduced by 18%, fuel consumed is increased by 34%, and unserved vehicles are increased by over 1,100 vehicles.

Based on system wide MOEs, when compared to 2025 No Build, the 2025 Signals Optimized scenario exhibits the following:

- **During the AM Peak**, total delay is increased 18%, delay per vehicle increases by 17%, travel time increased by 4%, average speed is reduced by 13%, fuel consumed remains the same, and unserved vehicles decrease by over 60 vehicles. The optimization process increased the number of vehicles served that added to the delay, delay per vehicle, and travel time on MD 223.

Table 3: SimTraffic Measure of Effectiveness (MOEs) AM Peak

System	AM Peak										
	2013	2025 No Build	2025 Signals Optimized	2025 Scenario 6	2040 No Build	2040 Signals Optimized	2040 Scenario 1	2040 Scenario 2	2040 Scenario 3	2040 Scenario 4	2040 Scenario 5
Total Delay (hrs)	289	549	647	532	897	919	687	885	645	658	695
Delay/veh (secs)	85	143	168	137	218	222	160	212	154	155	163
Travel Time (hrs)	732	1,217	1,262	1,204	2,032	2,005	1,412	1,804	1,528	1,513	1,550
Average Speed (mph)	20	16	14	16	12	12	15	12	15	15	14
Fuel consumed (gal)	545	699	702	701	895	886	787	848	803	803	814
Unserved Vehicles (veh)	9	380	316	380	1,328	1,205	441	974	779	731	721

Table 4: SimTraffic Measure of Effectiveness (MOEs) PM Peak

System	PM Peak										
	2013	2025 No Build	2025 Signals Optimized	2025 Scenario 6	2040 No Build	2040 Signals Optimized	2040 Scenario 1	2040 Scenario 2	2040 Scenario 3	2040 Scenario 4	2040 Scenario 5
Total Delay (hrs)	416	659	716	540	648	737	514	594	651	581	611
Delay/veh (secs)	108	166	177	131	150	166	111	130	146	129	134
Travel Time (hrs)	1,167	2,016	1,924	1,678	2,601	2,408	1,781	1,975	2,138	2,102	1,977
Average Speed (mph)	17	14	13	16	15	14	17	16	15	16	16
Fuel consumed (gal)	643	860	848	810	1,041	1,003	896	930	953	948	929
Unserved Vehicles (veh)	799	1,941	1,629	1,343	2,939	2,379	1,473	1,748	2,144	2,090	1,789

MD 223 Corridor Planning Study (From MD 4 to Steed Road)

- **During the PM Peak**, total delay is increased by 9%, delay per vehicle increased by 7%, travel time decreased by 5%, average speed is reduced by 7%, fuel consumed is decreased by 1%, and unserved vehicles decrease by over 300 vehicles

Based on system wide MOEs, when compared to 2025 No Build, the 2025 Scenario 6 exhibits the following:

- **During the AM Peak**, total delay is decreased 3%, delay per vehicle decreased by 4%, travel time increased by 1%, average speed remains the same, fuel consumed remains the same, and unserved vehicles remain the same.
- **During the PM Peak**, total delay is decreased by 18%, delay per vehicle decreased by 21%, travel time decreased by 17%, average speed is increased by 14%, fuel consumed is decreased by 6%, and unserved vehicles decrease by almost 600 vehicles.

Based on system wide MOEs, when compared to 2013 Existing conditions, the 2040 No Build exhibits the following:

- **During the AM Peak**, total delay doubles, delay per vehicle increased by 157%, travel time increased by 178%, average speed is reduced by 40%, fuel consumed is increased by 64%, and unserved vehicles are increased by over 1300 vehicles.
- **During the PM Peak**, total delay is increased by 56%, delay per vehicle is increased by 39%, travel time increased by 123%, average speed is reduced by 12%, fuel consumed is increased by 62%, and unserved vehicles are increased by 2,140 vehicles.

Based on system wide MOEs, when compared to 2040 No Build, the 2040 Signals Optimized exhibits the following:

- **During the AM Peak**, total delay increased 2%, delay per vehicle increased by 2%, travel time decreased by 1%, average speed remains the same, fuel consumed is decreased by 1%, and unserved vehicles are decreased by over 120 vehicles.
- **During the PM Peak**, total delay increased 14%, delay per vehicle increased by 11%, travel time decreased by 7%, average speed is reduced by 7%, fuel consumed is decreased by 4%, and unserved vehicles are decreased by over 560 vehicles.

Based on system wide MOEs, when compared to 2040 No Build, the 2040 Scenario 1 exhibits the following:

- **During the AM Peak**, total delay decreased by 23%, delay per vehicle decreased by 27%, travel time decreased by 31%, average speed is increased by 25%, fuel consumed is decreased by 12%, and unserved vehicles are decreased by over 880 vehicles.
- **During the PM Peak**, total delay decreased by 21%, delay per vehicle decreased by 26%, travel time decreased by 32%, average speed is increased by 13%, fuel consumed is decreased by 14%, and unserved vehicles are increased by over 1460 vehicles.

Based on system wide MOEs, when compared to 2040 No Build, the 2040 Scenario 2 exhibits the following:

MD 223 Corridor Planning Study (From MD 4 to Steed Road)

- **During the AM Peak**, total delay decreased by 1%, delay per vehicle decreased by 3%, travel time decreased by 11%, average speed remained the same, fuel consumed is decreased by 5%, and unserved vehicles are decreased by over 350 vehicles.
- **During the PM Peak**, total delay decreased by 8%, delay per vehicle decreased by 13%, travel time decreased by 24%, average speed is increased by 7%, fuel consumed is decreased by 11%, and unserved vehicles are increased by over 1190 vehicles.

Based on system wide MOEs, when compared to 2040 No Build, the 2040 Scenario 3 exhibits the following:

- **During the AM Peak**, total delay decreased by 28%, delay per vehicle decreased by 29%, travel time decreased by 25%, average speed is increased by 25%, fuel consumed is decreased by 10%, and unserved vehicles are decreased by almost 550 vehicles.
- **During the PM Peak**, total delay remained the same, delay per vehicle decreased by 3%, travel time decreased by 18%, average speed remained the same, fuel consumed is decreased by 8%, and unserved vehicles are increased by almost 800 vehicles.

Based on system wide MOEs, when compared to 2040 No Build, the 2040 Scenario 4 exhibits the following:

- **During the AM Peak**, total delay decreased by 27%, delay per vehicle decreased by 29%, travel time decreased by 26%, average speed is increased by 25%, fuel consumed is decreased by 10%, and unserved vehicles are decreased by almost 600 vehicles.
- **During the PM Peak**, total delay decreased by 10%, delay per vehicle decreased by 14%, travel time decreased by 19%, average speed is increased by 7%, fuel consumed is decreased by 9%, and unserved vehicles are increased by almost 850 vehicles.

Based on system wide MOEs, when compared to 2040 No Build, the 2040 Scenario 5 exhibits the following:

- **During the AM Peak**, total delay decreased by 23%, delay per vehicle decreased by 25%, travel time decreased by 24%, average speed is increased by 17%, fuel consumed is decreased by 9%, and unserved vehicles are decreased by over 600 vehicles.
- **During the PM Peak**, total delay decreased by 6%, delay per vehicle decreased by 11%, travel time decreased by 24%, average speed is increased by 7%, fuel consumed is decreased by 11%, and unserved vehicles are increased by 1150 vehicles.

Arterial LOS for the MD 223 corridor was also generated for all scenarios using SimTraffic software. LOS was determined for segments between key intersections in both travel directions (northbound and southbound along MD 223). The Arterial LOS is shown in Tables 5 through 8. Arterial LOS compares modeled travel speeds to basic free flow speed.

Table 5: MD 223 Arterial LOS for MD 223 Northbound AM Peak

Arterial LOS - MD 223 Northbound	AM Peak										
	2013	2025 No Build	2025 Signals Optimized	2025 Scenario 6	2040 No Build	2040 Signals Optimized	2040 Scenario 1	2040 Scenario 2	2040 Scenario 3	2040 Scenario 4	2040 Scenario 5
Steed Road to Temple Hill Rd	B	B	B	B	B	B	C	C	C	C	C
Temple Hill Rd to Old Branch Ave	C	D	D	C	E	E	B	B	B	B	B
Old Branch Ave to MD 5	C	C	C	B	C	C	C	C	C	C	C
MD 5 to Old Alexandria Ferry Rd	B	D	D	C	B	E	C	C	C	C	C
Old Alexandria Ferry Rd to Rosaryville Rd	A	B	B	B	A	B	B	B	B	A	B
Rosaryville Rd to Dower House Rd	C	B	B	B	F	A	B	B	B	B	B
Dower House to Marlboro Pike	B	B	B	B	E	B	B	B	B	B	B

Table 6: MD 223 Arterial LOS for MD 223 Northbound PM Peak

Arterial LOS - MD 223 Northbound	PM Peak										
	2013	2025 No Build	2025 Signals Optimized	2025 Scenario 6	2040 No Build	2040 Signals Optimized	2040 Scenario 1	2040 Scenario 2	2040 Scenario 3	2040 Scenario 4	2040 Scenario 5
Steed Road to Temple Hill Rd	B	B	B	B	B	D	B	A	B	C	B
Temple Hill Rd to Old Branch Ave	B	E	D	C	E	D	D	D	C	C	C
Old Branch Ave to MD 5	D	D	F	D	D	E	D	F	F	F	F
MD 5 to Old Alexandria Ferry Rd	C	E	E	D	C	E	D	E	F	E	E
Old Alexandria Ferry Rd to Rosaryville Rd	A	C	D	C	B	D	B	C	C	C	C
Rosaryville Rd to Dower House Rd	C	A	A	A	C	B	A	A	A	B	B
Dower House to Marlboro Pike	B	B	C	B	B	C	B	B	B	B	B

Table 7: MD 223 Arterial LOS for MD 223 Southbound AM Peak

Arterial LOS - MD 223 Southbound	AM Peak										
	2013	2025 No Build	2025 Signals Optimized	2025 Scenario 6	2040 No Build	2040 Signals Optimized	2040 Scenario 1	2040 Scenario 2	2040 Scenario 3	2040 Scenario 4	2040 Scenario 5
Marlboro Pike to Dower House	B	C	C	C	E	D	C	C	C	C	C
Dower House to Rosaryville Rd	C	F	D	C	D	E	C	C	C	C	C
Rosaryville Rd to Old Alexandria Ferry Rd	B	E	C	C	F	D	C	C	C	C	C
Old Alexandria Ferry Rd to MD 5	C	C	F	C	C	F	B	F	B	A	D
MD 5 to Old Branch Ave	F	C	B	B	F	B	B	B	B	B	B
Old Branch Ave to Temple Hill Rd	B	C	D	B	B	E	B	F	B	A	C
Temple Hill Rd to Steed Rd	B	F	F	F	B	F	C	D	D	C	C

Table 8: MD 223 Arterial LOS for MD 223 Southbound PM Peak

Arterial LOS - MD 223 Southbound	PM Peak										
	2013	2025 No Build	2025 Signals Optimized	2025 Scenario 6	2040 No Build	2040 Signals Optimized	2040 Scenario 1	2040 Scenario 2	2040 Scenario 3	2040 Scenario 4	2040 Scenario 5
Marlboro Pike to Dower House	B	C	C	C	B	C	C	C	C	C	C
Dower House to Rosaryville Rd	C	F	F	C	C	C	C	C	C	C	C
Rosaryville Rd to Old Alexandria Ferry Rd	B	E	E	C	D	C	C	C	C	C	C
Old Alexandria Ferry Rd to MD 5	F	B	C	D	C	B	B	B	B	A	A
MD 5 to Old Branch Ave	D	F	F	C	F	C	D	C	C	C	C
Old Branch Ave to Temple Hill Rd	B	E	E	C	B	B	B	B	B	B	B
Temple Hill Rd to Steed Rd	B	F	E	E	B	F	C	D	D	C	C

Along MD 223 Northbound

- **During the AM Peak**, all scenarios maintain a LOS D or better, except for the 2040 No Build and 2040 Signal Optimized. The number of segments that operate at a LOS F or LOS on MD 223 Northbound is shown in Table 9.
- **During the PM Peak**, only the 2013, 2025 Scenario 6 and 2040 Scenario 1 alternatives do not have segments that operate at LOS F or E. The scenarios and the total number of segments that operate at a LOS F or LOS E on MD 223 Northbound are shown in Table 9. In 2040 Scenarios 2 through 5 the segment between Old Branch Avenue to MD 5 LOS is degraded because the signal timings optimization provides a longer green time to the side streets and therefore allows more vehicles to enter the network at Pine View Lane and Clinton Plaza; however, MD 223 northbound through movement becomes slower resulting in a lower LOS.

Table 9: Number of Failing Segments on MD 223 Northbound

Scenario Name	AM Peak Hour		PM Peak Hour	
	# of Failing Segments		# of Failing Segments	
	LOS F	LOS E	LOS F	LOS E
2013	0	0	0	0
2025 No Build	0	0	0	2
2025 Signals Optimized	0	0	1	1
2025 Scenario 6	0	0	0	0
2040 No Build	1	2	1	0
2040 Signals Optimized	0	2	0	2
2040 Scenario 1	0	0	0	0
2040 Scenario 2	0	0	1	1
2040 Scenario 3	0	0	2	0
2040 Scenario 4	0	0	1	1
2040 Scenario 5	0	0	1	1

Along MD 223 Southbound

- **During the AM Peak**, only the 2013, 2025 Scenario 6 and 2040 Scenario 1 alternatives do not have any segments that operate at LOS F or E. The scenarios and the total number of segments that operate at a LOS F or LOS E on MD 223 Southbound are shown in Table 10.
- **During the PM Peak**, only the 2040 Scenario 1 through 5 alternatives do not have segments that operate at LOS F or E. The scenarios and the total number of segments that operate at a LOS F or LOS on MD 223 Southbound are shown in Table 10.

Table 10: Number of Failing Segments on MD 223 Southbound

Scenario Name	AM Peak Hour		PM Peak Hour	
	# of Failing Segments		# of Failing Segments	
	LOS F	LOS E	LOS F	LOS E
2013	1	0	1	0
2025 No Build	2	1	3	2
2025 Signals Optimized	2	0	2	3
2025 Scenario 6	1	0	0	1
2040 No Build	2	1	1	0
2040 Signals Optimized	2	2	1	0
2040 Scenario 1	0	0	0	0
2040 Scenario 2	2	0	0	0
2040 Scenario 3	0	0	0	0
2040 Scenario 4	0	0	0	0
2040 Scenario 5	0	0	0	0

Conclusion

The analysis of the future alternatives indicate that overall all Alternatives system operations will operate better than the future no builds. However, 2040 Scenario 1 provides the most improvement to the corridor. This scenario’s link segment are all greater than LOS D and also has the fewest underserved vehicles.

We understand that several small spot improvements may occur in phases prior to 2040 based on Community needs and feedback. We recommend that the improvements build toward Scenario 1, the ultimate design.

MARYLAND
223 **MD 223**
CORRIDOR
PLANNING STUDY
FROM MD 4 TO STEED ROAD