Augustine Cut Off
Multimodal Improvements Study, Phase 2

Final Draft- September 2025

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Acknowledgements

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Study Overview

The *Augustine Cut Off Multimodal Improvements Study, Phase 2* (Phase 2 Study) follows the completion of the Augustine Cut of Bicycle and Pedestrian Corridor Study, Phase 1 (Phase 1 Study) by the Delaware Department of Transportation (DelDOT) in 2022. DelDOT requested that Wilmington Area Metropolitan Planning Council (WILMAPCO) administer the Phase 2 Study due to significant resident concerns about the impact of potential improvements along the corridor north of Cantera Road. This effort will build on the transportation-related planning priorities and goals identified through previous public outreach along the corridor.

Background

The *New Castle County Bicycle Plan* (2020) and *City of Wilmington Bike Plan* (2019) identified improved bicycle facilities on Augustine Cut Off as a priority. In 2020, Wilmington Area Planning Council (WILMAPCO) submitted an Augustine Cut Off Bicycle/Pedestrian Improvements project to DelDOT to be prioritized for funding under DelDOT's Statewide Bicycle and Pedestrian Program (Bike/Ped Pool). Of the seven New Castle County bicycle/pedestrian projects prioritized for the Bike/Ped Pool in 2020, Augustine Cut Off ranked the highest in terms of the results of DelDOT's Bicycle Mobility Modeling analysis. DelDOT selected the project to move forward to the study phase, which began in 2021. The Phase 1 Study explored options for bicycle and pedestrian improvements along Augustine Cut Off between Lovering Avenue and Edgewood Road. Due to resident feedback, DelDOT elected to advance the design of bicycle and pedestrian safety improvements between Lovering Avenue and Cantera Road. Phase 1 improvements that are advancing to design and construction are included in Appendix A.

The Phase 1 Study revealed some points of consensus among all community members as well as some suggestions for the next phase of study including:

- Build in the consensus that high speeds are a problem and designing a beautiful street is important
- Include multiple perspectives on the Advisory Committee
- Collaborate with the Advisory Committee to develop goals for phase 2
- Communicate engagement opportunities early, often, and via multiple avenues
- Establish a clear project purpose and schedule and publish it on the project website
- Document all public involvement efforts and results in a timely fashion

Context

Located in northwest Wilmington, Augustine Cut Off (ACO) is a 1.2-mile-long arterial roadway that connects Lovering Avenue/the City of Wilmington to US 202/the Brandywine Hundred as shown in Figure 1.

The Average Annual Daily Traffic (AADT) ranges from approximately 7,300 to 8,400, with the highest volumes on the roadway segment between W. 18th street and Alapocas Drive. There are four signalized intersections along the corridor: at Lovering Avenue, W. 18th Street, Alapocas Drive, and Concord Pike/202.

The northern part of the corridor is primarily residential. South of Cantera Road the predominant land use is commercial. The largest landowner along ACO is the pharmaceutical company Incyte which has its headquarters on the southbound side of the corridor opposite the W 18th Street intersection. There are also two schools in the vicinity. Wilmington Friends School is located just west of ACO on Alapocas Drive, while the Salesianum School campus is located to the east of ACO straddling West 18th Street. ACO is also adjacent to two parks – Alapocas Run State Park at the northern end of the corridor, and Brandywine Park located at the southern end.

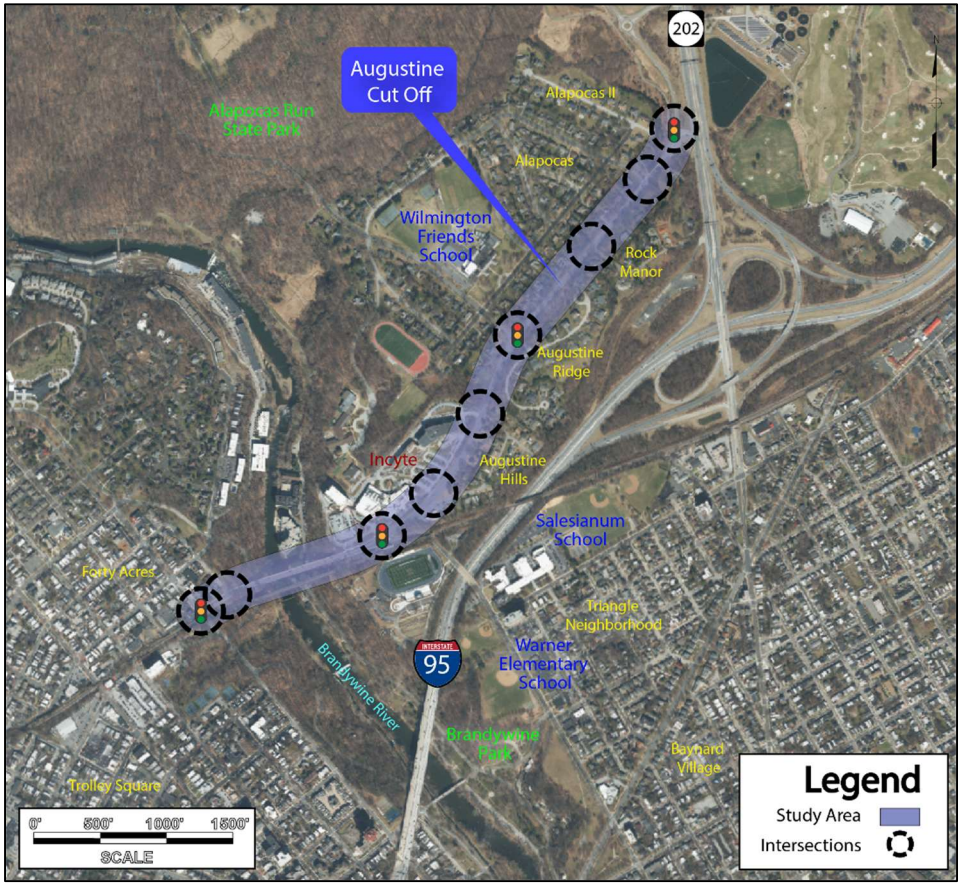


Figure 1. Augustine Cut Off study area

Goals

Based on feedback from agency partners and feedback from the Advisory Committee, the goals for this study are as follows:

- Create an attractive and cohesive transportation plan that creates a safer environment for residents and the broader community
- Develop a holistic program of improvements that addresses all modes of transportation
- Foster public involvement to build consensus and establish stakeholder support
- Determine most effective traffic calming methods to reduce traffic speeds
- Provide safe access to transit facilities and ensure improvements address transit operations
- Consider environmental, community, and economic issues through the PEL process to inform decision making and NEPA

Requirements

Two DelDOT policies were integrated into the existing conditions assessment, analysis, alternatives development, and alternatives evaluation for this study: the Safe System Approach and Complete Streets.

Safe System Approach

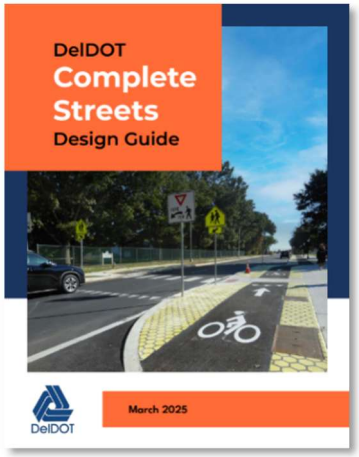
The United States Department of Transportation (USDOT) has adopted a Safe System Approach as the guiding paradigm to address roadway safety. It functions by building and reinforcing multiple layers of protection to both prevent crashes from ever happening and minimizing the effects of those that cannot be prevented. This approach is a paradigm shift, reflecting a more proactive than reactive approach to roadway safety. The Safe System Approach focuses on both human mistakes and human vulnerability and as a result, designs a system with layered redundancies to protect all road users. The principles upheld by this approach can be seen on the outside of the wheel shown in Figure 2 while the objectives are in the wedges of the wheel.

Per DelDOT's Safe System Approach Policy, implemented in February 2025, the Department's goal is to reduce fatal and serious injury crashes to ultimately reach zero fatalities and serious injuries on the transportation system. To achieve this, DelDOT has taken a proactive approach to address the contributing factors and crash types that lead to fatal and serious crashes, the installation of systems that minimize the impact of crashes (such as roadside safety systems, roundabouts, and target speeds), and changes in design practices to consider context and modal priority on the state highway system. This reinforces DelDOT's principle that all road users are considered equitable in the decision process for the given roadway context.

Figure 2. DelDOT Safe System Approach principles and objectives

Complete Streets Policy

A street developed within the Complete Streets framework provides facilities for roadway users of all ages and abilities – improving safety for everyone using the street. DelDOT adopted a Complete Streets Policy in 2009, and in 2025 approved the *Complete Streets Design Guide* intended to provide guidance for project development and decision-making.



The primary objective of Complete Streets is to offer an equitable, comfortable, connected, and safe transportation network that serves and supports the following road users:

- Pedestrians
- Bicyclists
- Public transportation users / ride sharing
- Children
- Older individuals
- Individuals with disabilities
- Motorists
- Freight operators and their vehicles

What a Complete Street looks like in practice will vary depending on community context and needs. Complete Streets is a key component of FHWA's implementation of the Safe System Approach described above.

The Complete Streets Guide also includes bicycle facility selection guidance from the American Association of State Highway and Transportation Officials (AASHTO). As shown in Figure 3, the higher the roadway speed and volume, the greater the need for a separated bike lane or shared use path.

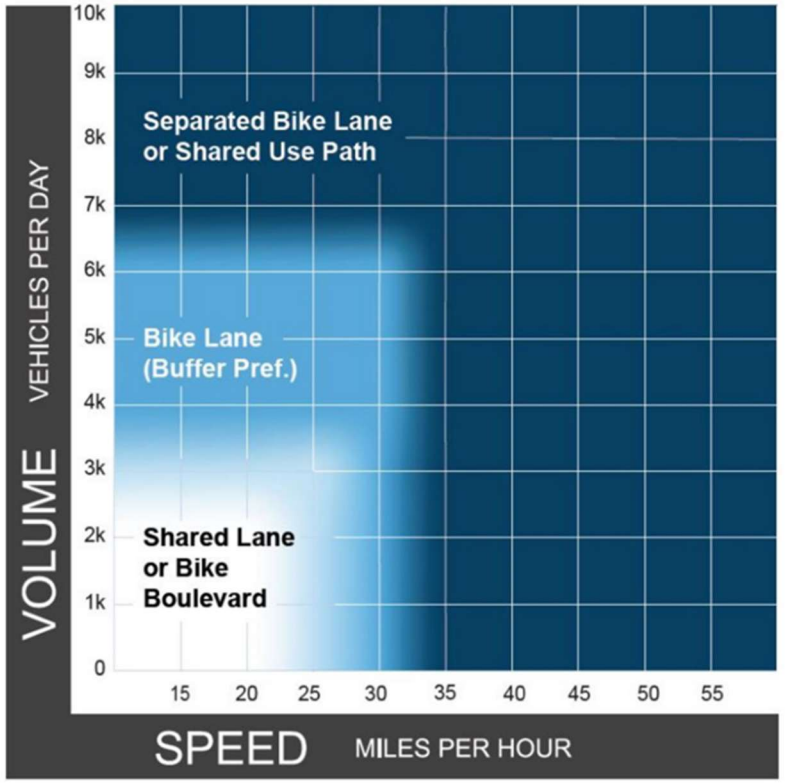


Figure 3. Bicycle Facility Selection Chart. Source: AASHTO

Purpose and Need

PURPOSE: *The purpose of the project is to improve safety and mobility options for all road users along the Augustine Cut Off Corridor by implementing traffic calming measures and providing a low-stress pedestrian and bicycle connection between the state's two largest population centers, Wilmington and Brandywine Hundred, connecting the greater Blue Ball/US 202 pathway system to the Brandywine Park Trail network and Trolley Square.*

NEED: *There is a documented speeding issue and vulnerable road user fatalities along Augustine Cut Off in Wilmington, Delaware. There are no designated bike or pedestrian facilities along the corridor between Cantera Road and Edgewood Road. Transportation improvements are needed to improve safety for all road users by calming traffic and separating vulnerable road users from motor vehicle traffic, thereby increasing multimodal mobility and connectivity.*

Speeding was voiced as an issue by residents, which was confirmed by an analysis of speeds using StreetLight, which showed 85th perecentile speeds were 9 to 10 mph above the posted speed limit as shown in Figure 4. A crash analysis for the portion of the corridor north of W. 18th Street where residential speeding concerns were greatest revealed 19 reported crashes between November 1, 2019 through November 1, 2024 as shown in Figure 5. One of those crashes was a pedestrian fatality. Another pedestrian fatality occurred on April 4, 2025 on the edge of the road south of the Alapocas Drive traffic signal which is still under investigation.

Currently, the only low-stress bicycle/pedestrian connection between the City of Wilmington and the shared use path network in north Wilmington is along the East Coast Greenway via Brandywine Park and Alapocas Run State Park. This route requires traversing steep grades through a park that is inaccessible after dark when the park is closed. A low-stress bike/pedestrian facility along Augustine Cut Off between the existing shared use path along the Incyte frontage, shown in Figure 6, and Edgewood Road, would provide a direct transportation and recreation facility between the City and north Wilmington.

This study included the completion of a Planning and Environmental Linkages (PEL) questionnaire which formally documents the environmental constraints, development of alternatives, and how each alternative meets the purpose and need of the project. This questionnaire allows for early agency and public coordination, resulting in reduced efforts when moving into the National Environmental Protection Act (NEPA) and/or permitting stage further described in the "Next Steps" section of this study. The PEL questionnaire is included in Appendix B.

Figure 4. 85th Percentile Speeds vs. Speed limit. Source: StreetLight data for 2022.

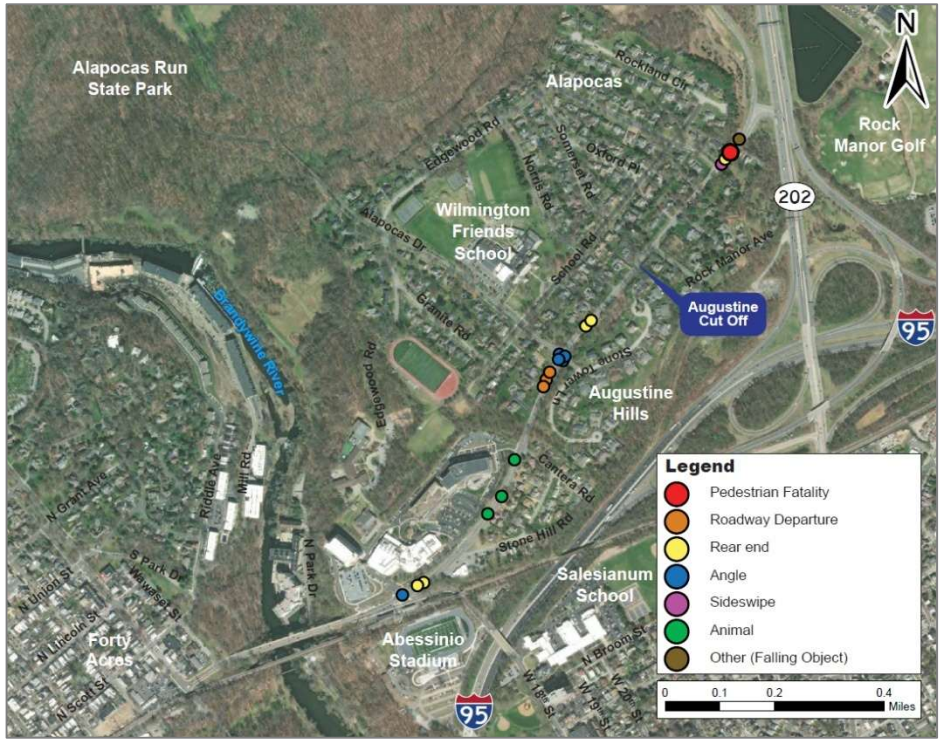


Figure 5. Crash data for ACO north of 18th Street from 11/1/19-11/1/24. Source: Delaware State Police Crash Data.

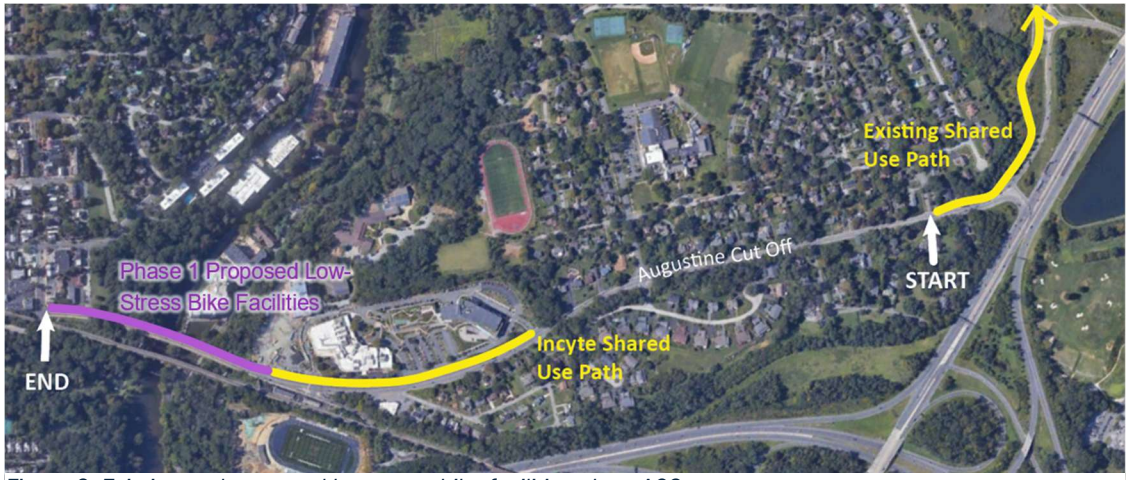


Figure 6. Existing and proposed low-stress bike facilities along ACO.

Existing Conditions

ACO is a two-lane arterial roadway that connects northwest Wilmington with Brandywine Hundred. There is a significant grade differential along the corridor, climbing approximately 150 feet over 1.2 miles from south to north. As noted in the Purpose and Need Section, roadway features change significantly along the corridor, resulting in non-contiguous facilities for people walking and biking. The right of way varies along the corridor, but in general is at least 80 feet wide based on GIS parcel data. Survey to establish the limits of the right of way will be necessary should this project advance to final design.

For the purpose of describing the existing conditions, ACO is considered a north-south roadway with the northbound lane heading uphill/towards 202 and southbound lane heading downhill/towards the City of Wilmington. This section provides a brief overview of existing conditions along ACO. For a full overview of issues, opportunities, and constraints along the corridor, see Appendix C.

Lovering Avenue to W. 18th Street

The segment of ACO between Lovering Avenue and W. 18th Street is located within the City of Wilmington and is primarily commercial with some open space. There are two travel lanes with designated left and right turn lanes at Lovering Avenue, W. 18th Street, and the southern Incyte entrances. There are sidewalks on both sides of the street, but the only marked crosswalk across ACO is at the W. 18th Street intersection. There are 8' shoulders with bike lane markings on the bridge over Brandywine Creek, but not between the bridge over Brandywine Creek and Lovering Avenue or between the bridge and W. 18th Street. There is a small section of a bike lane on the southbound frontage of the Incyte facility. The posted speed limit on this portion of Augustine Cut Off is 25 mph, but 85th percentile speeds are between 9-10mph higher.

Figure 7. ACO looking south from the bridge showing the Wawaset Street and Lovering Avenue intersections. Source: Google Earth.

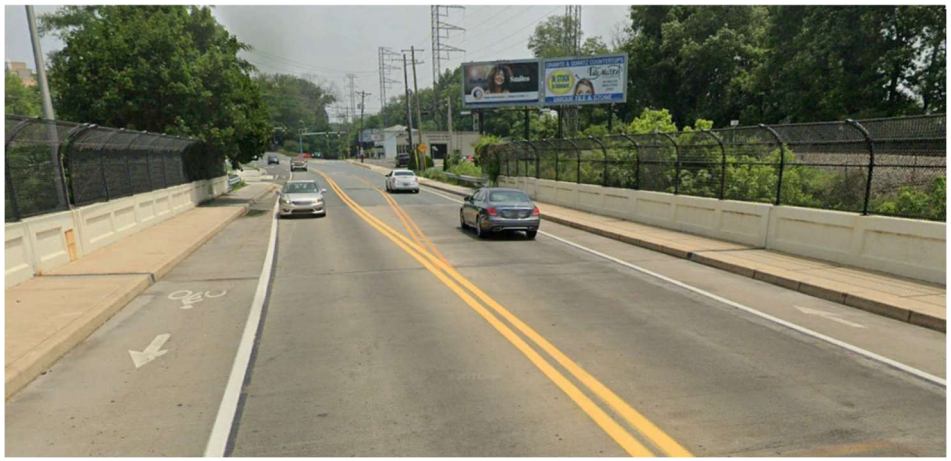


Figure 8. ACO looking north from the bridge showing existing bike lanes and the W. 18th intersection in the distance. Source: Google Earth.

W. 18th Street to Cantera Road

The segment of ACO between W. 18th Street and Cantera Road is commercial along the entire southbound side and northbound side through Stone Hill Road; the northbound side north of Stone Hill Road is residential. There are two travel lanes with designated left turn and right turn lanes at the two northernmost Incyte driveways. There is a shared use path and standard bike lane on the southbound side of the street along the Incyte frontage. There is a 10' bikeable shoulder with signage prohibiting stopping or parking on the northbound side of the road between W. 18th Street and Stone Hill Road. Despite the signage, the shoulder is frequently used for parking, which forces cyclists into the motor vehicle travel lane. There is frequent on-street parking in front of the residences between Stone Hill Road and Cantera Road; however, the shoulder is over 15 feet wide which allows sufficient space for parking and biking. The posted speed limit on this portion of ACO is 35 mph, but 85th percentile speeds are between 9-10mph higher.

Figure 9. ACO looking south showing the Incyte shared use path and the W. 18th Street intersection. Source: Google Earth

Figure 10. ACO looking north showing the Cantera Road intersection and northernmost Incyte entrance. Source: Google Earth

Cantera Road to Alapocas Drive

The segment of ACO between Cantera Road and Edgewood Drive is residential in character with homes on the southbound side and wooded property owned by the Augustine Ridge Service Corporation on the northbound side. There are two travel lanes with wide shoulders and a designated right turn lane in the southbound direction at the northmost entrance to Incyte. There are designated left and right turn lanes in the northbound direction at the Alapocas Drive intersection. In locations where right turn lanes are present, there are no shoulders, which causes people walking and biking in the shoulder to be forced into the travel lane or adjacent yards. The posted speed limit on this portion of ACO is 35 mph, but 85th percentile speeds are between 9-10mph higher.

Figure 11. ACO looking south showing the Cantera Road intersection and northernmost entrance to Incyte. Source: Google Earth

Figure 12. ACO looking north showing the Alapocas Drive intersection. Source: Google Earth

Alapocas Drive to Edgewood Road

The segment of ACO between Alapocas Drive and Edgewood Road is residential in character with homes along the entire southbound side. The northbound side is wooded between Alapocas Drive and Rock Manor Avenue and residential between Rock Manor Avenue and 202. There are two travel lanes with wide shoulders that are regularly used by people walking and biking, as well as deliveries, trash and recycling pickup, landscaping trucks, and occasional on-street parking. There are two pairs of concrete islands intended to calm traffic just north of the Alapocas Drive and Rock Manor Avenue, although there is no evidence that they have been effective. There are designated left and right turn lanes at the Alapocas Drive intersection and at the Edgewood Road intersection. In locations where right turn lanes are present, there are no shoulders, which causes people walking and biking in the shoulder to be forced into the travel lane or adjacent yards.

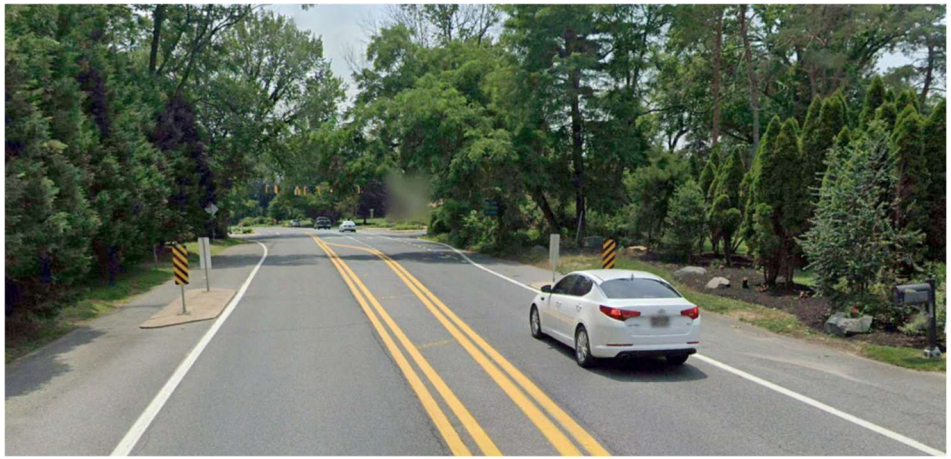


Figure 14. ACO looking south showing the Alapocas Drive intersection. Source: Google Earth

Figure 13. ACO looking north showing the Edgewood Road intersection. Source: Google Earth

Motor Vehicle Travel Patterns

Although the northern portion of the roadway is primarily residential in character, it serves as a major connection between Brandywine Hundred and destinations on the north side of the City including the Highlands, Forty Acres, Trolley Square, and the Triangle neighborhoods. As shown in Figure 15, of the approximately 5,300 vehicles heading south on an average day, 70% continue over the ACO bridge into the City of Wilmington. The northbound travel patterns, shown in Figure 16, are substantially different, with almost 40% of traffic heading east on W. 18th Street, and only 60% continuing north on ACO. Traffic analysis of specific intersections was completed as part of the alternatives analysis process, detailed later in this study.

Figure 15. Southbound traffic destinations by volume. Source: StreetLight

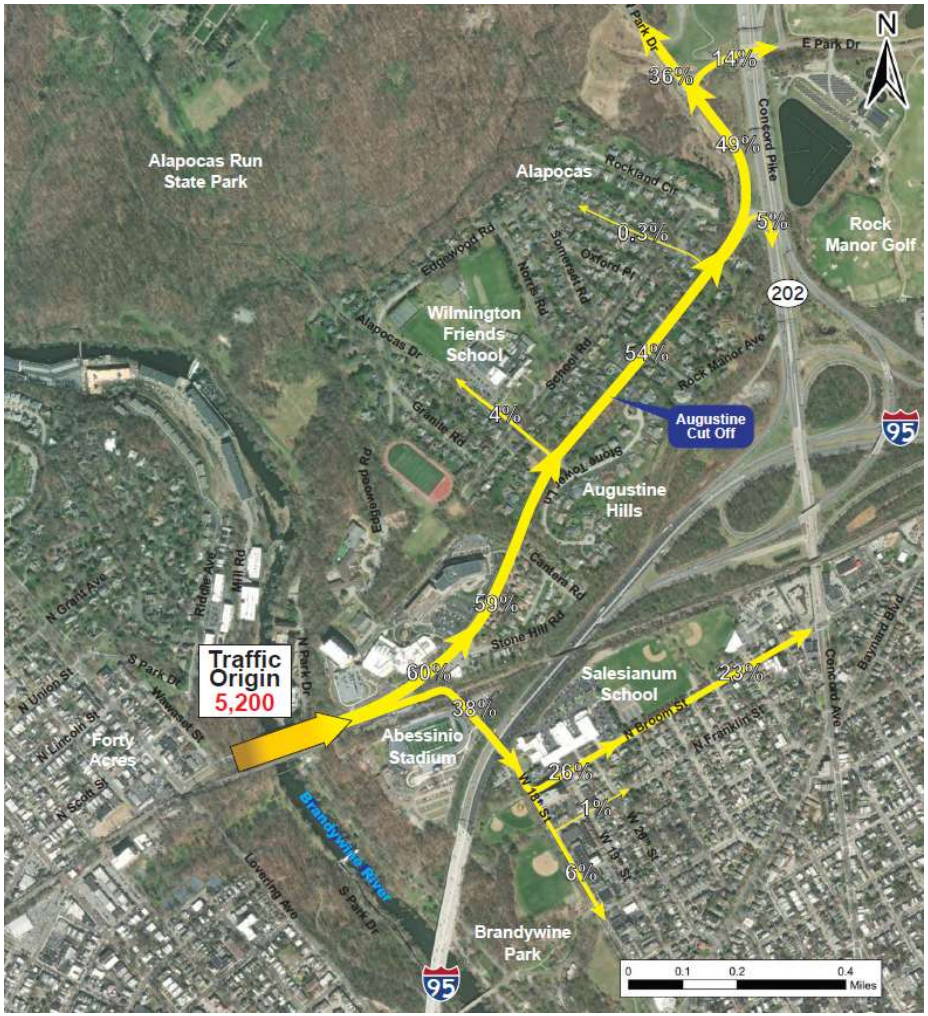


Figure 16. Northbound ACO traffic destinations by volume. Source: StreetLight.

Public Involvement

This study was a one-year effort that kicked off in September 2024. Throughout the study process, the project team coordinated with an Advisory Committee tasked with 1) providing insight into their experiences and issues traveling the corridor, 2) asking questions and providing feedback, and 3) assisting with the public involvement process. The project team worked with the Advisory Committee to ensure the public process was comprehensive, collaborative, inclusive, fair, and credible. Although the Advisory Committee guided the project, they were not responsible for decision-making. Key public milestones and study tasks are illustrated in Figure 17. A more detailed outreach summary is available in Appendix D.

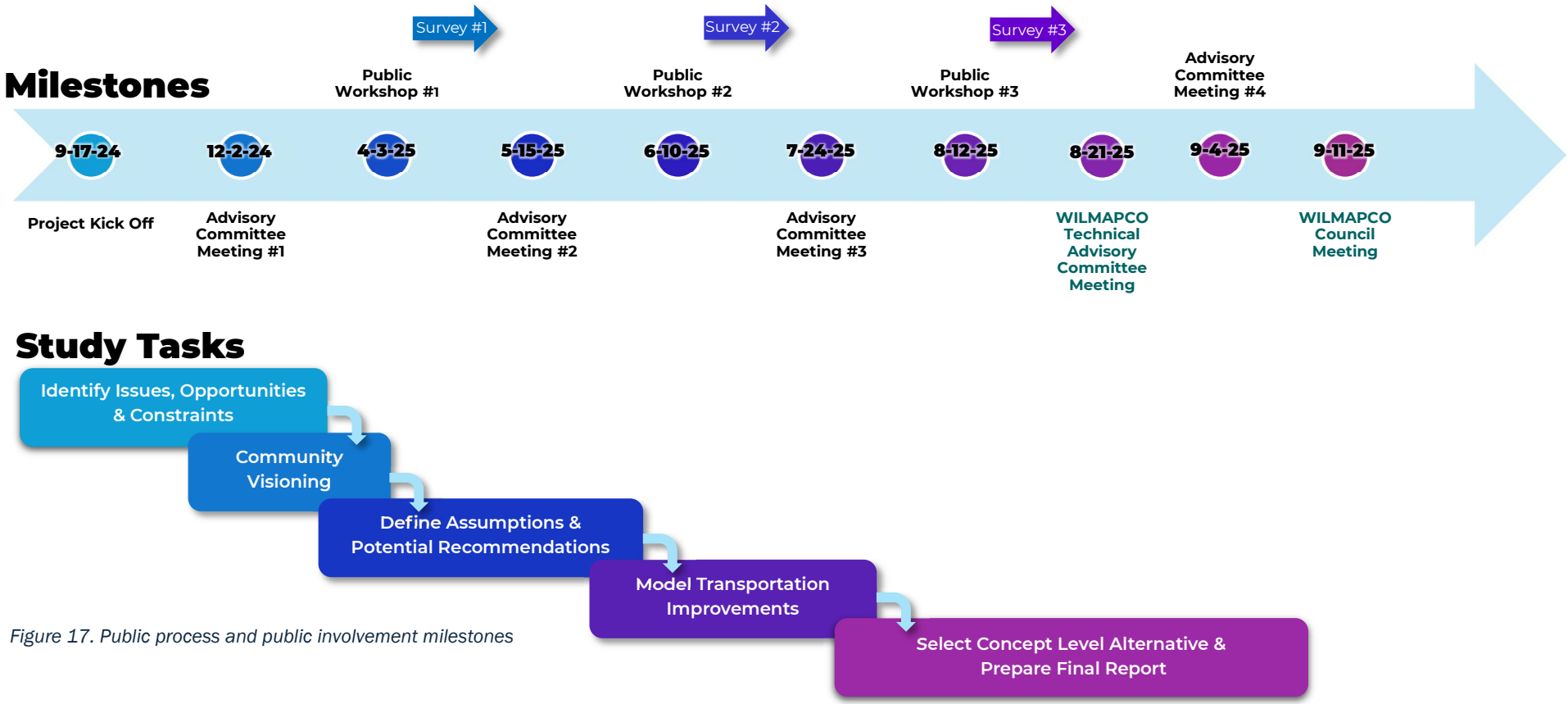


Figure 17. Public process and public involvement milestones

Alternatives

For the purposes of describing potential improvements, ACO is described as a north-south roadway with the northbound lane heading uphill/towards 202 and southbound lanes heading downhill/towards the City of Wilmington. Improvements were focused on the portion of the corridor north of W. 18th Street, as improvements south of W. 18th Street are being addressed by the Phase 1 DelDOT Project.

All alternatives were developed in consideration of the following principles:

- Improve safety for all modes, providing dedicated facilities as appropriate
- Address community issues/concerns
- Integrate alternatives with existing and proposed transportation infrastructure
- Design improvements in consideration of future stormwater infrastructure
- Protect environmental resources
- Stay within the existing public right of way to the extent possible

Each of the alternatives incorporates design elements that are proven to slow down, or calm, motor vehicle traffic. Determining which traffic calming facilities are appropriate for ACO was based on the 2025 DelDOT Traffic Calming Manual and include:

- Median islands
- Curb bumpouts
- Lane narrowing
- Shoulder width reduction
- Vertical curbs

Consideration was also given to aesthetics including:

- Landscape preservation and enhancement, including the preservation of mature trees
- Residential frontage/curb appeal
- Gateway treatments
- Wayfinding signage

For all alternatives, a closed (curbed) drainage system would be necessary. Green stormwater technologies should be incorporated to reduce impacts to the Brandywine River watershed.

Alternative 1 –Shared Use Path on Southbound Side w/ Continuous Median

Alternative 1 was introduced at the May 2025 Public Workshop. A plan view of this alternative is included in Appendix E.

Features:

- 12’ wide shared use path (southbound) with grass buffer between path and travel lane
- 5’ wide sidewalk (northbound) with grass buffer between sidewalk and travel lane
- 11’ travel lanes
- 11’ wide median
- Multiple ped/bike crossings
- Alapocas Drive intersection improvements
- Roadside landscaping
- Pedestrian lighting

Pros:

- Shared use path would tie into shared use paths in Alapocas State Park and along the Incyte frontage
- Center median provides landscaping opportunity

Cons:

- People walking and biking on the southbound side of the road use the same facility

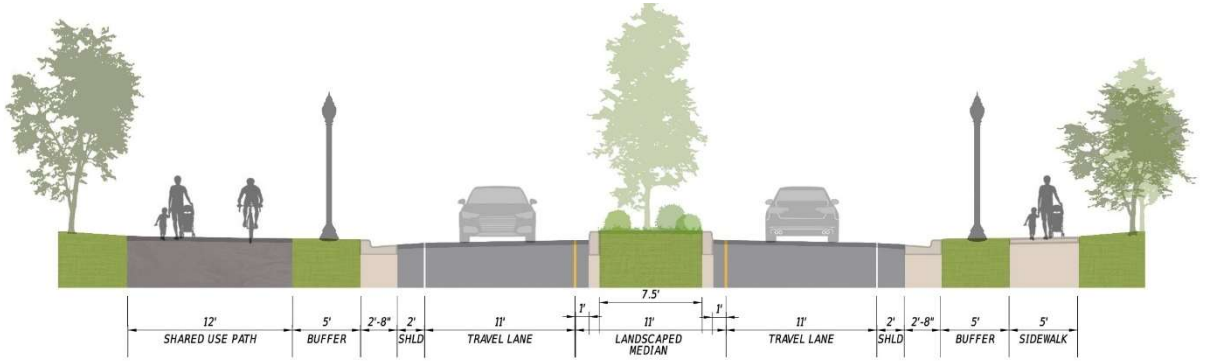


Figure 18. Section view of shared use path between W. 18th Street and Alapocas Drive showing a raised landscape median

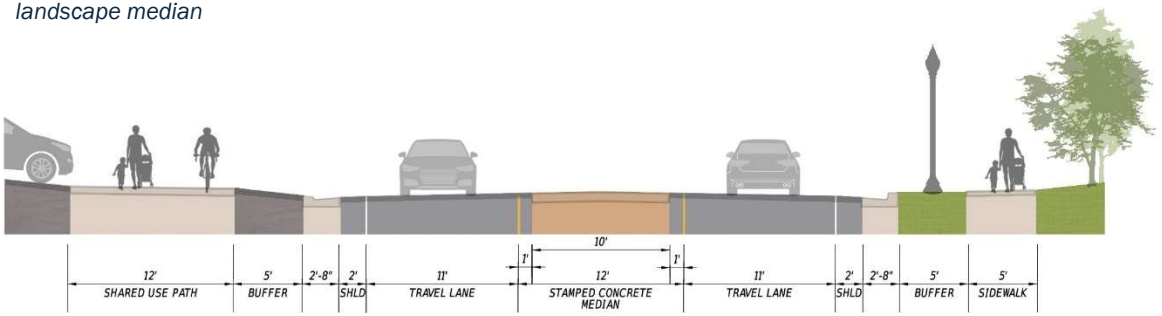


Figure 19. Section view of shared use path at driveway crossings showing flush median to allow residents to access their driveways from northbound or southbound direction

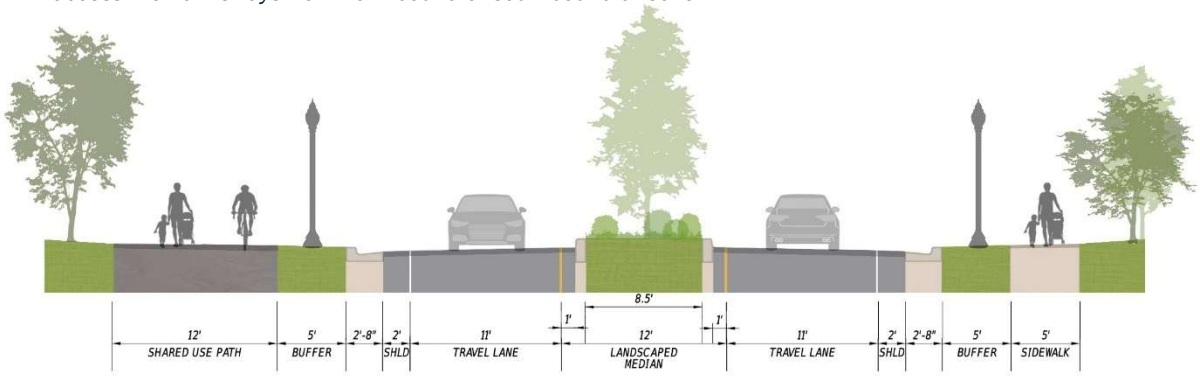


Figure 20. Section view of shared use path between Alapocas Drive and Edgewood Road showing a raised landscape median

Alapocas Drive Intersection Options – Shared Use Path

A shared use path could be integrated with a roundabout or a signalized intersection at Alapocas Drive. Some features of both options are listed below.

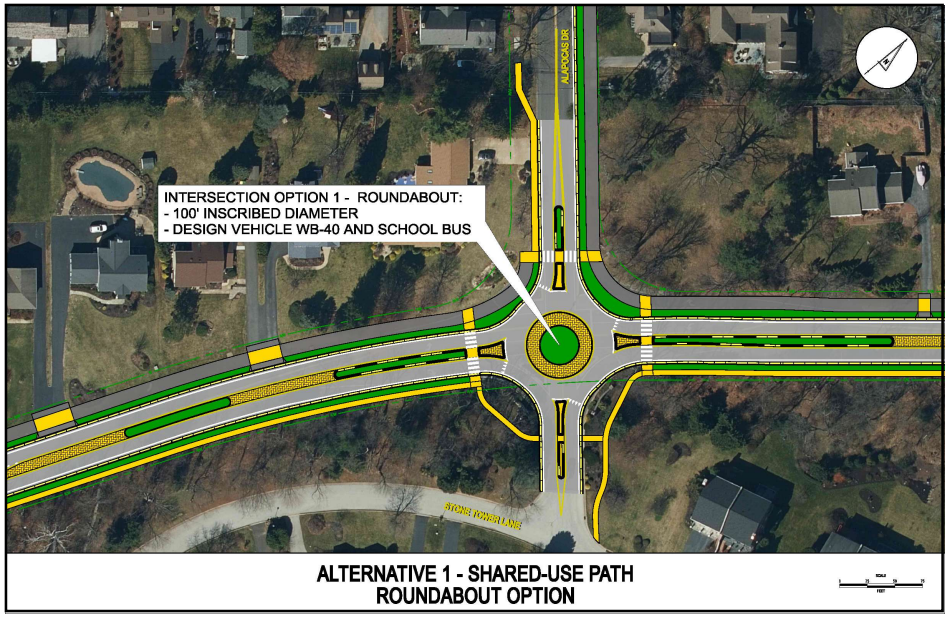


Figure 21. Alternative 1 - Shared Use Path with a roundabout at the Alapocas Drive intersection

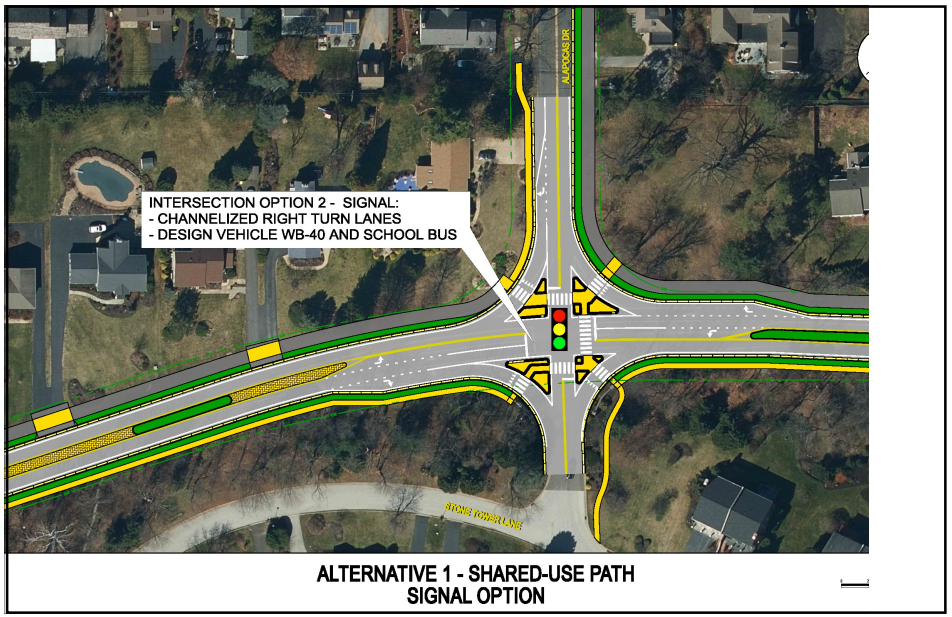


Figure 22. Alternative 1 - Shared use path with a signal at the Alapocas Drive intersection

Shared-Use Path with Roundabout

- 100’ Diameter
- Reduces severe crashes
- Reduces pedestrian and vehicle conflict points
- Refuge islands allow pedestrians and bikes to cross a single travel lane at a time
- Mountable inside truck apron to accommodate trucks
- Provides traffic calming
- Opportunities for landscaping
- Reduced long-term maintenance

Shared-Use Path with Signal

- Modification of current intersection to accommodate shared-use path on southbound side, sidewalks on northbound side, and crosswalks
- Signal controlled multi-staged crossing for pedestrians and bikes
- Stays within the right of way but requires slightly more space than the roundabout alternative
- Does not provide traffic calming
- Does not provide opportunities for landscaping

Other Potential Linear Improvements

In an effort to better address concerns about speeding, a second option incorporating tapered medians as opposed to continuous medians was explored, as shown below in Figure 23. The tapered medians would introduce a traffic calming measure called vertical deflection, which essentially means that cars could no longer travel a straight path down the corridor, they would have to steer around the medians. It also provides the opportunity for pedestrian refuge islands at crosswalks. The below example is shown with a shared use path, but it could also be utilized with Alternative 2, Two-Way Separated Bike Lane. While 81% of survey takers supported some sort of center median, there was not a clear preference for a continuous median as opposed to the median taper option.

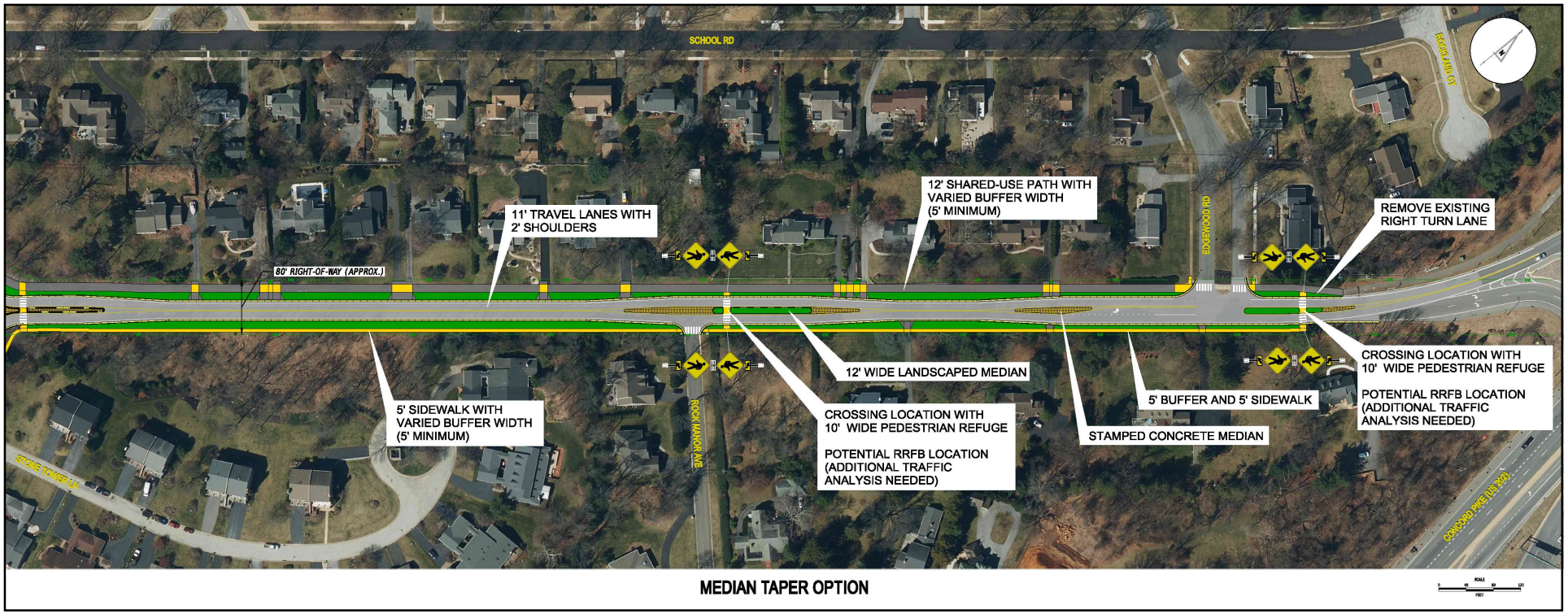


Figure 23. Median taper option

Alternative 2 – Sidewalks and Two-Way Separated Bike Lane on Southbound Side

Alternative 2 was introduced at the May 2025 Public Workshop. A plan view of this alternative is included in Appendix E.

Features

- 10’ wide two-way separated bike lane with grass buffer between bike lane and travel lane (southbound)
- 5’ wide sidewalks (both sides) with grass buffer between sidewalk and travel lane
- 11’ travel lanes
- 11’ wide median
- Multiple ped/bike crossings
- Alapocas Drive intersection improvements
- Pedestrian lighting along sidewalk

Pros

- Separates people walking and biking which would prevent conflicts, especially south of Alapocas Drive where steep grades result in high cyclist speeds
- Center median provides landscaping opportunity

Cons

- Requires the most right of way of the three alternatives

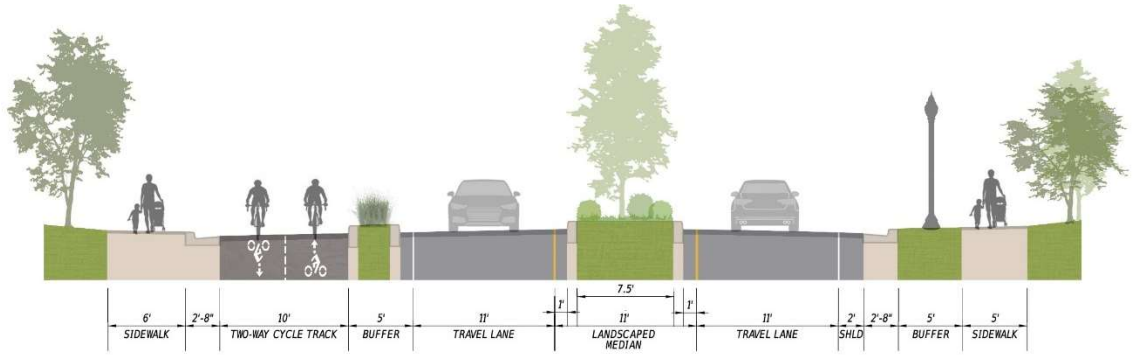


Figure 24. Section view of two-way separated bike lane and sidewalk between W. 18th Street and Alapocas Drive showing a raised landscaped median

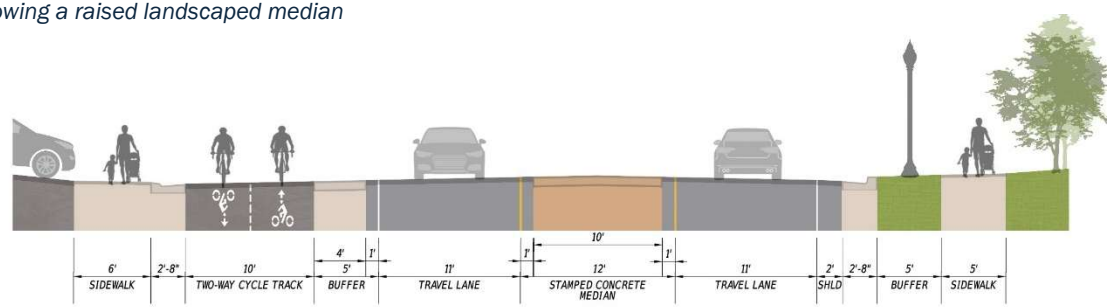


Figure 25. Section view of two-way separated bike lane at driveway crossings showing flush median to allow residents to access their driveways from northbound or southbound direction

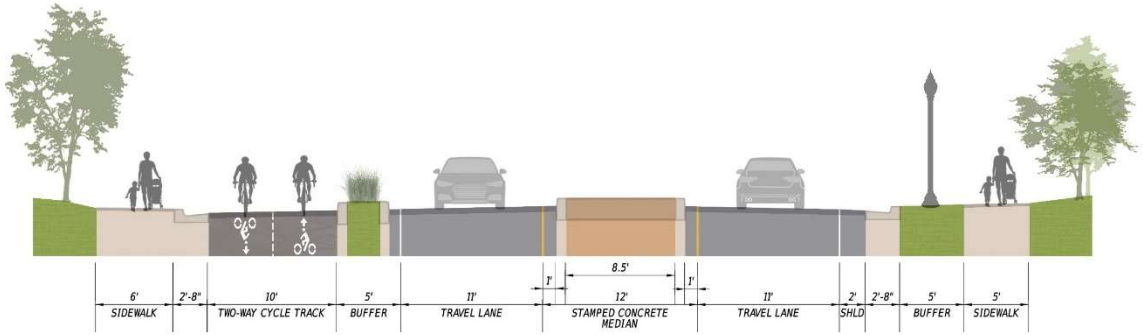


Figure 26. Section view of two-way separated bike lane between Alapocas Drive and Edgewood Road showing a raised stamped concrete median

Alapocas Drive Intersection Options – Two-Way Separated Bike Lane

A two-way separated bike lane and sidewalk could be integrated with a roundabout or a signalized intersection at Alapocas Drive. Some features of both options are listed below.

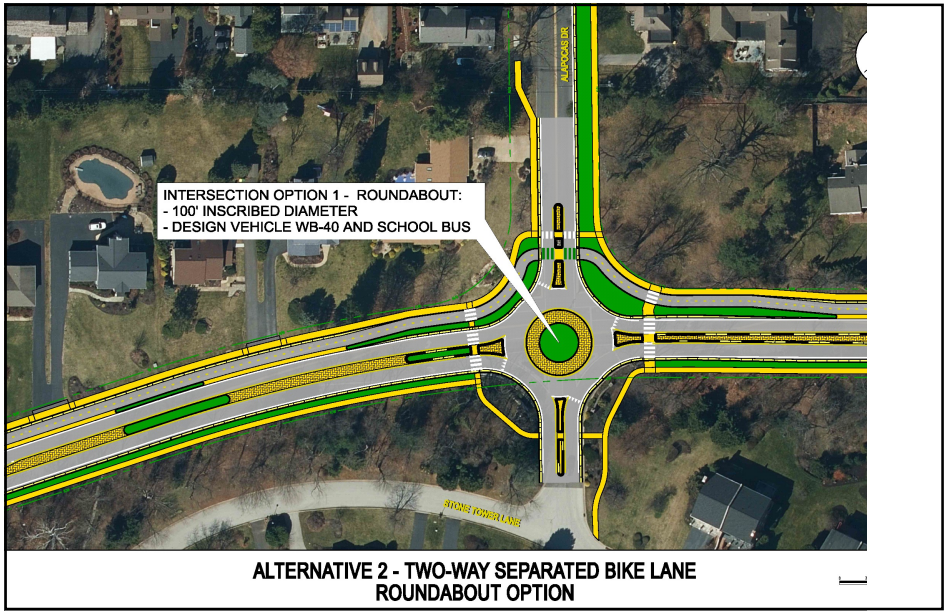


Figure 27. Alternative 2 - Two-Way Separated Bike Lane with a roundabout at the Alapocas Drive intersection

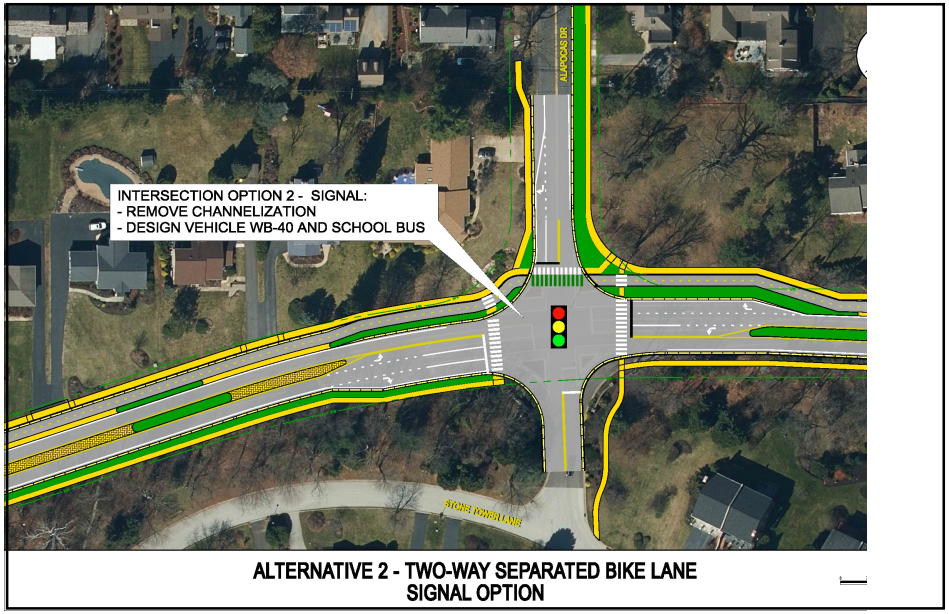


Figure 28. Alternative 2 - Two-Way Separated Bike Lane with a signal at the Alapocas Drive intersection

Two-Way Separated Bike Lane and Sidewalk with Roundabout

- 100’ Diameter
- Reduces severe crashes
- Reduces pedestrian and vehicle conflict points
- Refuge islands allow pedestrians and bikes to cross a single travel lane at a time
- Mountable inside truck apron to accommodate trucks
- Provides traffic calming
- Opportunities for landscaping
- Reduced long-term maintenance

Two-Way Separated Bike Lane and Sidewalk with Signal

- Signal controlled crossing for pedestrians and bikes
- Increased crossing distances and number of travel lanes
- Requires more space than the roundabout alternative
- Right of way impacts
- Does not provide traffic calming
- Does not provide opportunities for landscaping

Alternative 3 –Shared Use Path on Southbound Side w/ Limited On-Street Parking

Alternative 3 was introduced at the August 2025 Public Workshop in response to feedback received at the May Public Workshop. This alternative could also be integrated with a roundabout or a signalized intersection at Alapocas Drive. A plan view of this alternative is included in Appendix E.

Features

- 12’ wide shared use path (southbound) with grass buffer between path and travel lane
- 5’ wide sidewalk (northbound) only where necessary to connect homes to nearby crosswalks/southbound shared use path
- 10’ travel lanes
- Multiple ped/bike crossings
- Median refuge island at crosswalks to calm traffic and improve pedestrian safety
- No continuous center median
- Requires 6’ centerline shift to stay mostly within the existing pavement box
- Southbound parallel parking/pull off provided in select locations
- Alapocas Drive intersection improvements

Pros

- Lower impact alternative – uses 48’ to 56’ of approximately 80’ of right of way

Cons

- Fewer opportunities for landscaping and beautification than Alternative 1 or 2

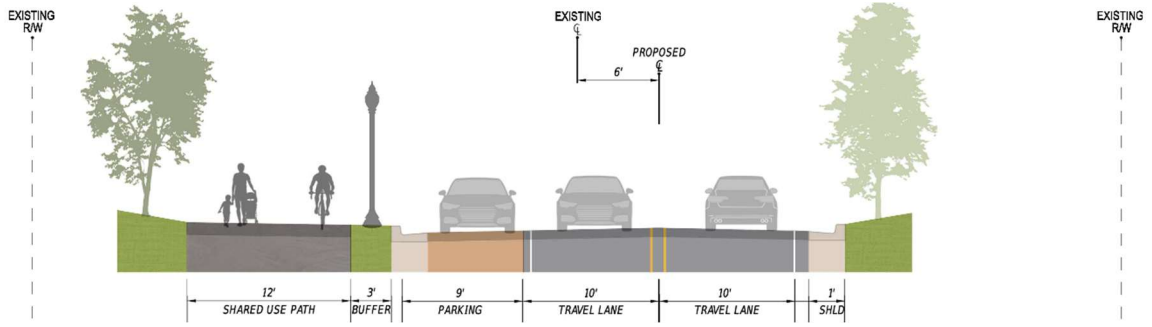


Figure 29. Section view of shared use path north and south of Alapocas Drive where on-street parking is located

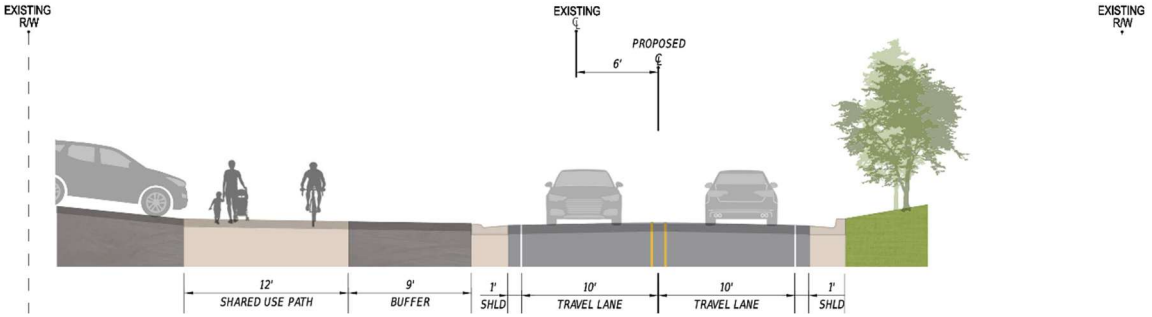


Figure 30. Section view of shared use path at driveway crossings

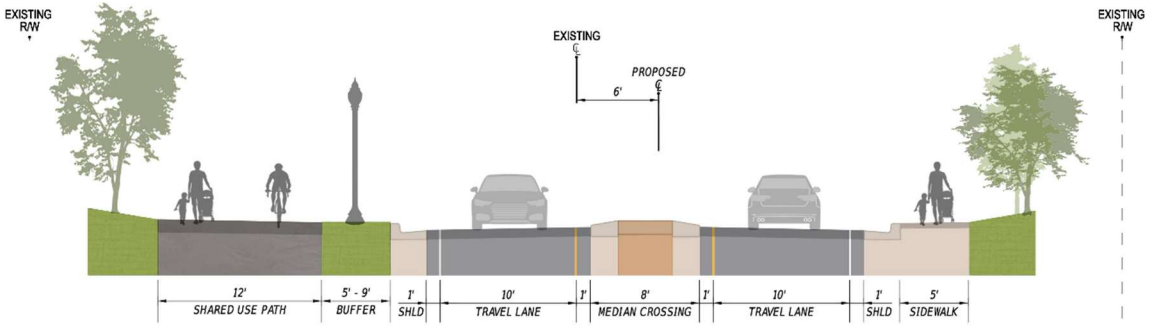


Figure 31. Section view of shared use path north of Alapocas Drive showing median refuge islands and northbound sidewalk

Potential Intersection Improvements

18th Street Intersection

Survey results indicated frequent safety concerns at the 18th Street/ACO intersection, including regular instances of southbound ACO traffic turning left into the outbound travel lane of W. 18th Street. While the existing geometry cannot change due to severe grades and requirements to fit larger vehicles (i.e. buses), potential short- and long-term improvements were explored as part of the study process.

Short Term

Short-term signing and pavement marking improvements to address stakeholder concerns as shown in Figure 32. Improvements include:

- Shifting the southbound ACO stop bar to the south so it better aligns with the W. 18th Street receiving lane
- Adding “elephant tracks” to indicate the preferred left-turning vehicle path
- Restriping the receiving lane of W. 18th Street to show a smooth turning radius instead of a sharp angle
- Adding a “DO NOT ENTER” sign at the corner of the median island facing vehicles attempting to enter the outbound lane

Shifting the intersection to the south may allow for reconfiguring this intersection as a roundabout, however this would require full property acquisitions and significant utility and drainage impacts.

PAVEMENT MARKINGS LEGEND		
SYM	ITEM	QUANTITY
A	ALKYD-THERMOPLASTIC PERMANENT PAVEMENT STRIPING, WHITE SYMBOL (ITEM 817002)	27 SF
B	ALKYD-THERMOPLASTIC PERMANENT PAVEMENT STRIPING, WHITE 16" (ITEM 817002)	89 SF
C	ALKYD-THERMOPLASTIC PERMANENT PAVEMENT STRIPING, YELLOW 12" 2' LINE/6' GAP (ITEM 817006)	12 LF
D	EPOXY RESIN PAINT PERMANENT PAVEMENT STRIPING, YELLOW 6" SINGLE (ITEM 817042)	33 LF
E	EPOXY RESIN PAINT PERMANENT PAVEMENT STRIPING, YELLOW 6" DOUBLE (ITEM 817042)	50 LF
F	EPOXY RESIN PAINT PERMANENT PAVEMENT STRIPING, WHITE 6" (ITEM 817042)	25 LF
X	REMOVE EXISTING PAVEMENT STRIPING (ITEM 817031)	52 SF

Figure 32. Proposed short-term striping and signage improvements at the ACO and W. 18th Street intersection.

Long-Term

Utilizing the recently published *DelDOT Design Guidance Memorandum 1-26, Roundabouts*, the feasibility of a roundabout at the ACO/W. 18th Street intersection was assessed and found to be feasible, although there would be substantial private property impacts as shown in Figure 33. To accommodate a roundabout, the intersection would be shifted to the south to avoid the steep grades at the current intersection location. The W. 18th Street approach would need to be modified to achieve the required alignment with the roundabout, requiring a full property take of the salon parcel at 1702 Augustine Cut Off and impacting the Incyte Main Entrance resulting in the loss of multiple parking spots (highlighted in green in the image below). The version of the concept shown below reflects the shared use path alternative.

This concept was reviewed at Advisory Committee Meeting #3 and Public Workshop #3. Both representatives from Incyte and the 1702 Augustine Cut Off parcels have substantial concerns about the concept.

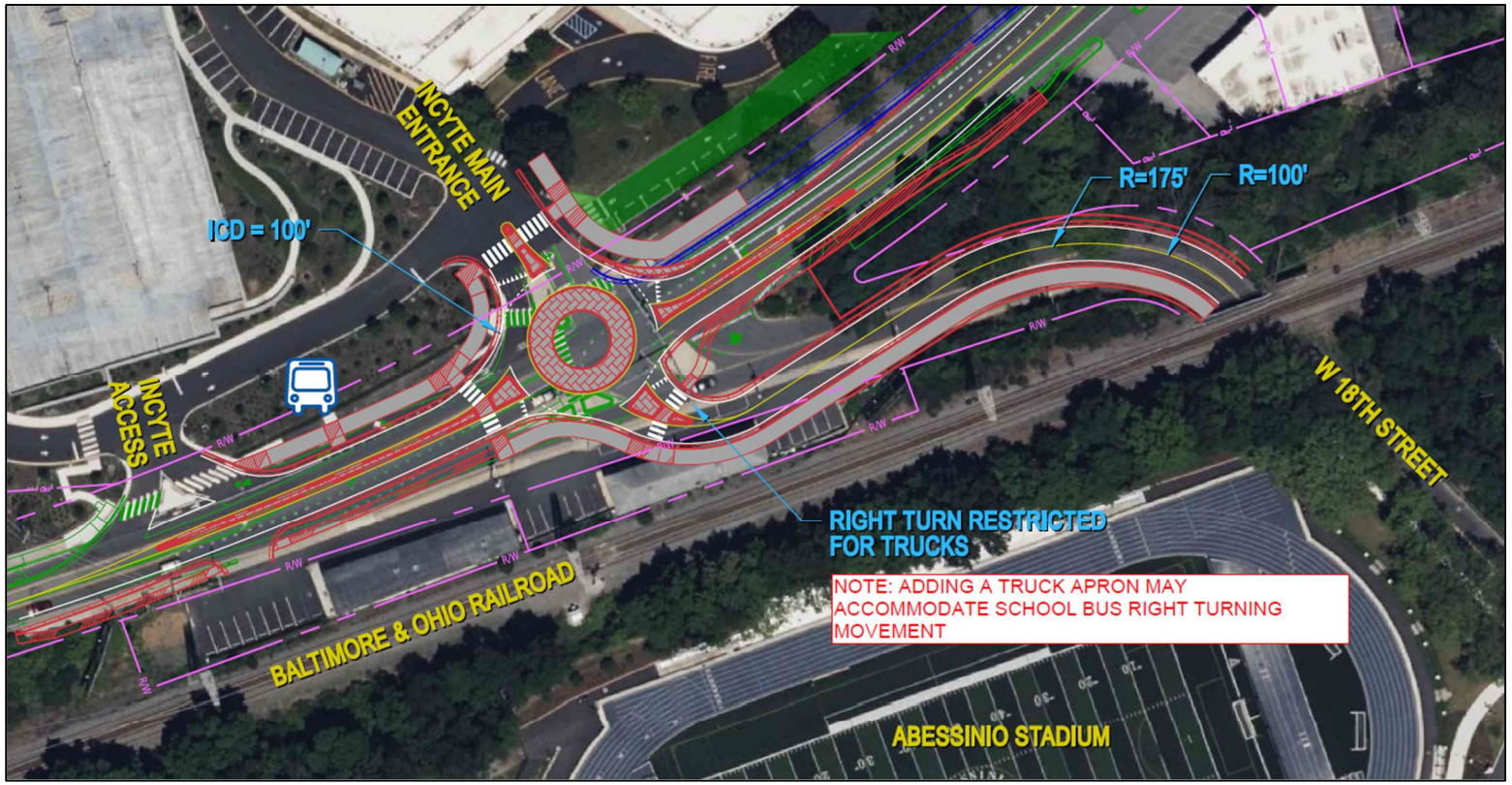


Figure 33. Potential roundabout at ACO and W. 18th Street intersection

Stone Hill Road

Residents shared there were frequent conflicts with vehicles turning left onto ACO from Incyte's northmost driveway. In order to better control lefts out of the site, the team explored the feasibility of a new signalized intersection at ACO/Stone Hill Road, with the thought that northbound Incyte traffic could depart the site at this location. This concept was previously proposed by Incyte for their expansion. The concept shown in Figure 34 incorporates a slight realignment of Stone Hill Road and the addition of a traffic signal and crosswalk. The signal would allow for a crossover closure at the northmost driveway opposite Cantera Road. Both the Cantera Road and Incyte entrance would be right-in and right-out only. Residents with driveways fronting on Augustine Cut Off would have to make a U-turn for ingress/egress.

While over 50% of survey takers supported this realignment, during the Advisory Committee Meeting, the Incyte representative shared that there is no queueing space at the driveway opposite Stone Hill Road, and this configuration would not work for their site operations.

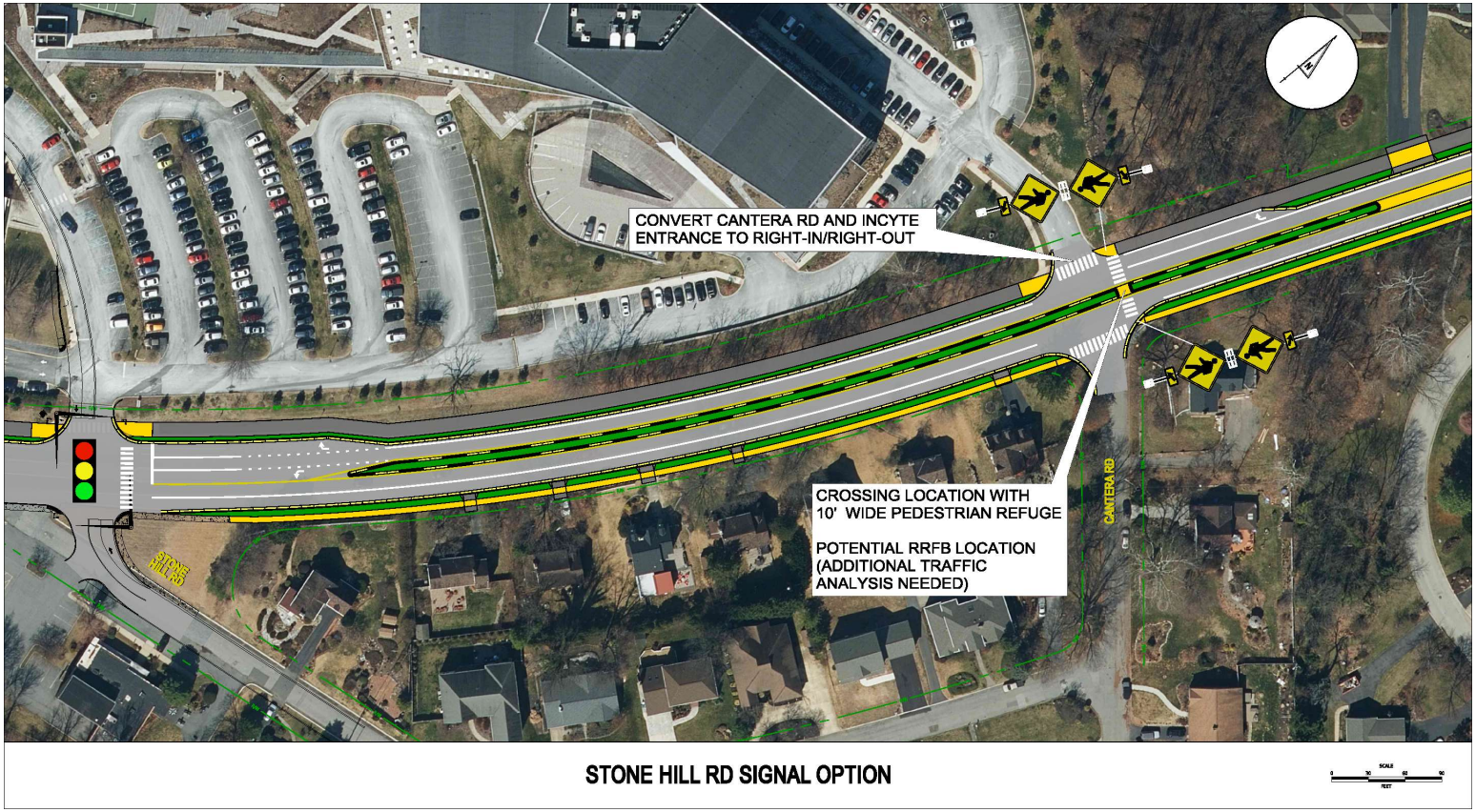


Figure 34. Stone Hill Road intersection realignment and signal option

Feedback

A survey and public comment period followed each public workshop. Some highlights are included below. Survey results and public comments are included in their entirety in Appendix F.

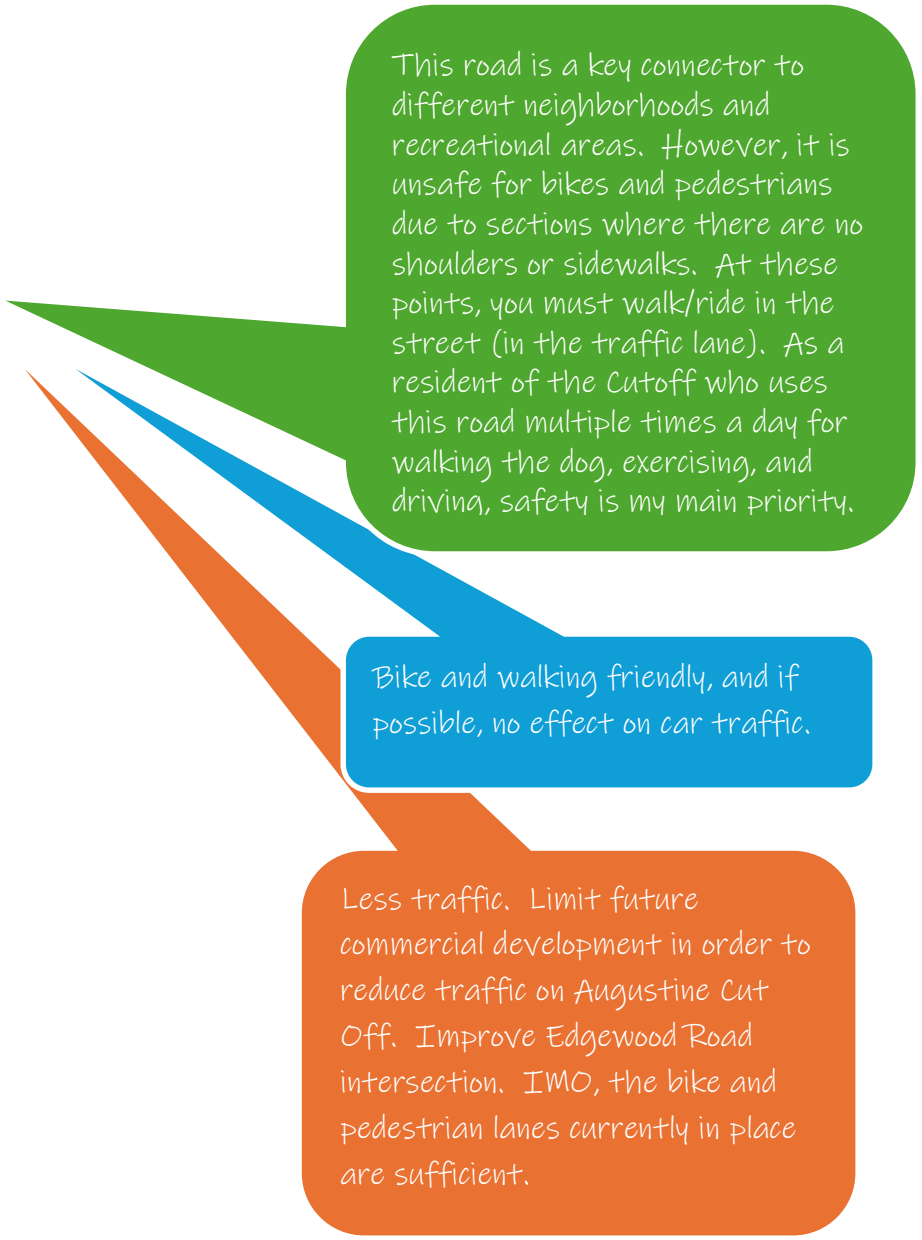
Public Survey #1: Vision for the Augustine Cut Off Corridor

Of the 44 individuals who provided a vision statement following the first public workshop:

- 34 were supportive of traffic calming and providing facilities for people walking and biking
- 4 were not supportive of the study
- 5 were neutral

Major issues identified include:

- The **18th Street intersection** is difficult to navigate for all road users
- Turning left at the **Edgewood Road intersection** is a challenge due to poor visibility/motor vehicle speeds
- **Speeding** is a problem – suggestions to address included
    - Increased enforcement (patrol, cameras)
    - Traffic Calming
        - Narrower lanes
        - Roundabouts
        - Speed humps
- **Lack of continuous, dedicated, safe space for people walking and biking** – both along and across corridor
- Concern about people walking and biking using the same space due to speed differential



Public Survey #2: Preliminary Preferred Alternatives

Alternative 1 and 2 were presented at the June 2025 public workshop. Members of the public were asked to indicate their preference *for Alternative 1 – Shared Use Path* or *Alternative 2 – Sidewalk and Two Way Separated Bike Lane*. 122 individuals answered the question. As shown in Figure 35, almost half of respondents preferred Alternative 1, the shared use path, but a significant percentage also supported Alternative 2, the two-way separated bike lane and sidewalk. Combined with those with no preference, that represents 88% of respondents that support changes along the corridor. Only 5% of respondents were not in favor of any improvements. 7% selected other, the majority of which were supportive of some changes along the roadway.

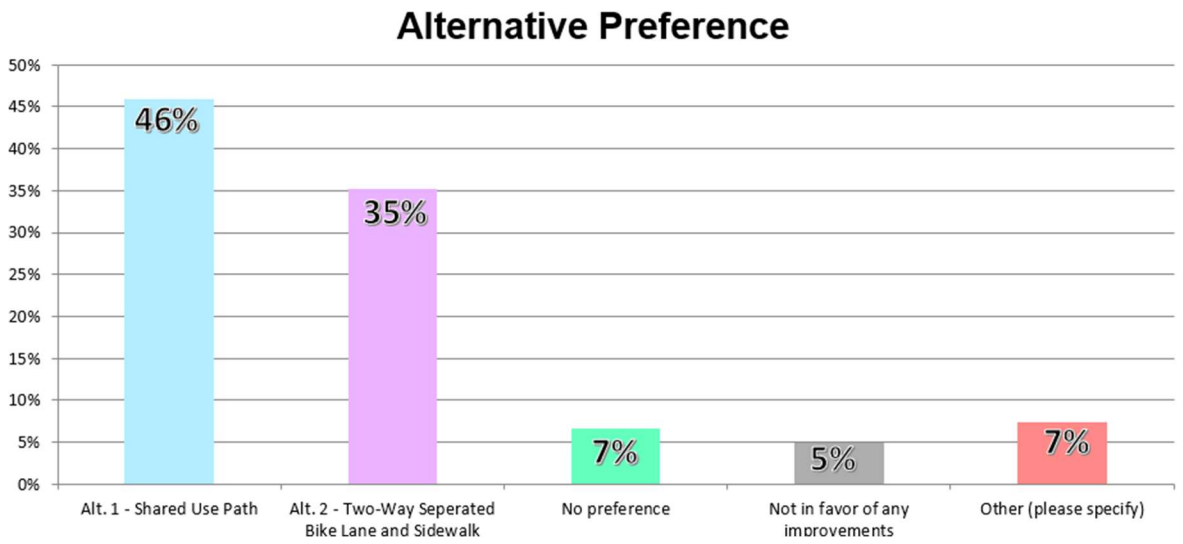


Figure 35. Chart depicting the preferred corridor alternative following the June 2025 public workshop

121 individuals replied to a question asking about the preferred intersection treatment at the intersection of ACO and Alapocas Drive. As shown in Figure 36, the vast majority preferred a single-lane roundabout.

Although feedback was generally positive, multiple open-ended comments were provided requesting that the project team develop an alternative that did not require as much space in the public right of way. Based on this feedback, Alternative 3 was developed for the third and final workshop held in August 2025.

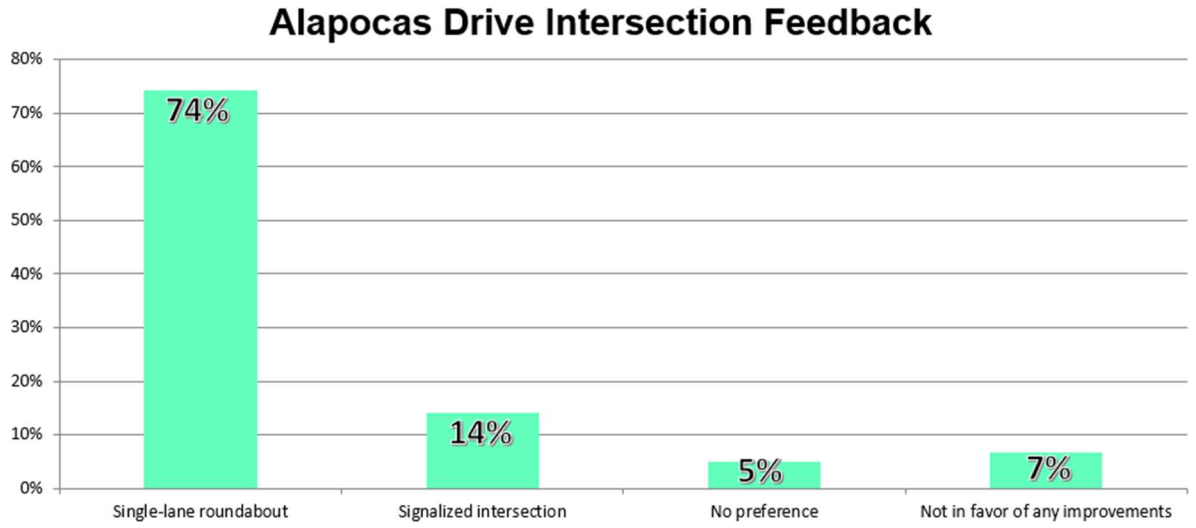


Figure 36. Chart depicting the preferred intersection type at Alapocas Drive following the June 2025 public workshop

Public Survey #3: Final Preferred Alternative

Alternative 1, 2, and 3 were presented at the August 2025 public workshop. Members of the public were asked to indicate their preference *for Alternative 1 – Shared Use Path*, *Alternative 2 – Sidewalk and Two Way Separated Bike Lane*, or *Alternative 3 – Shared Use Path w/ On-Street Parking.*

106 individuals answered the question. As shown in Figure 37, 37% of respondents preferred *Alternative 3 – Shared Use Path w/ On-Street Parking* and 27% supported *Alternative 1 – Shared Use Path*. This means that a substantial majority of 64% of respondents support a shared use path as opposed to *Alternative 2 – Sidewalk and Two Way Separated Bike Lane* which only received 20% of votes. Combined with those with no preference between the alternatives, 88% of respondents support change along the corridor. 6% of respondents are not in favor of any improvements.

When asked if they support further study of a single-lane roundabout at the W. 18th Street intersection, 76% of 85 respondents did, while 14% did not as shown in Figure 38. However, there is substantial concern about a roundabout in this location from adjacent business owners.

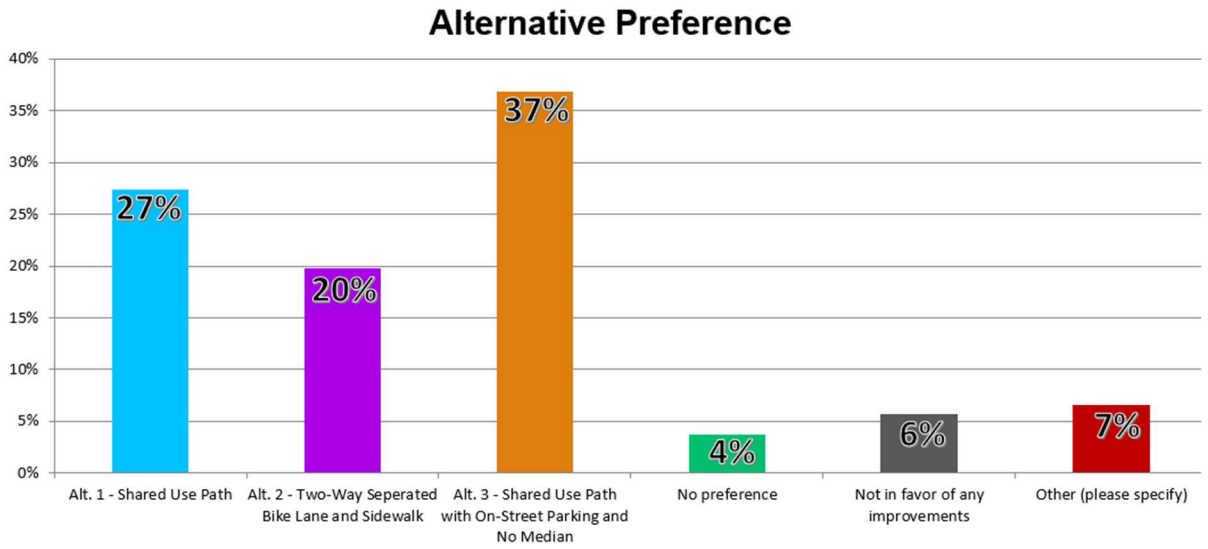


Figure 37. Chart depicting the preferred alternative following the August 2025 Public Workshop

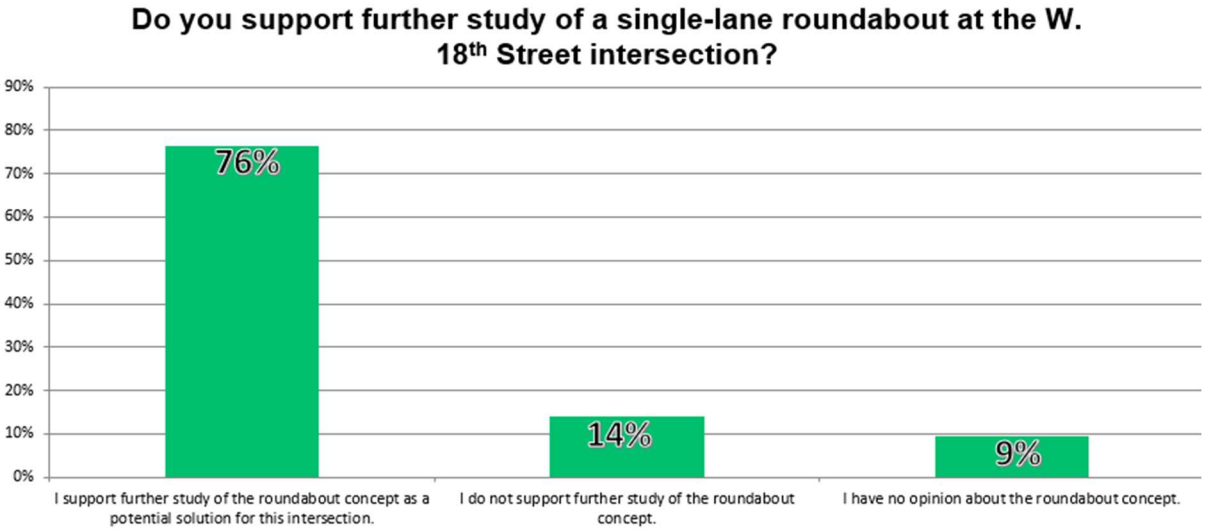


Figure 38. Chart depicting whether there is support for further study of a single-lane roundabout at the W. 18th Street intersection following the August 2025 public workshop

Alternative Analysis

Each of the three alternatives shown in Figure 39 was assessed utilizing a variety of performance measure criteria selected to reflect study goals with a primary aim of improving safety for all road users.

For the corridor, criteria were organized into five categories:

- Roadway features
- Opportunities
- Impacts
- Maintenance/Operations
- Construction Cost

See Table 1 to review the results of the comparative analysis for the corridor

Potential intersection improvements are also a key part of this study. Table 2 is intended to show the features of a roundabout as compared to a traditional signalized intersection.

For intersections, criteria were organized into four categories:

- Safey
- Bike/Pedestrian Design
- Motor Vehicle Operations
- Additional Considerations

These tables were used by the project team to evaluate each alternative. Additional supporting analysis is included as Appendix G. Planning level cost estimates are included in Appendix H.

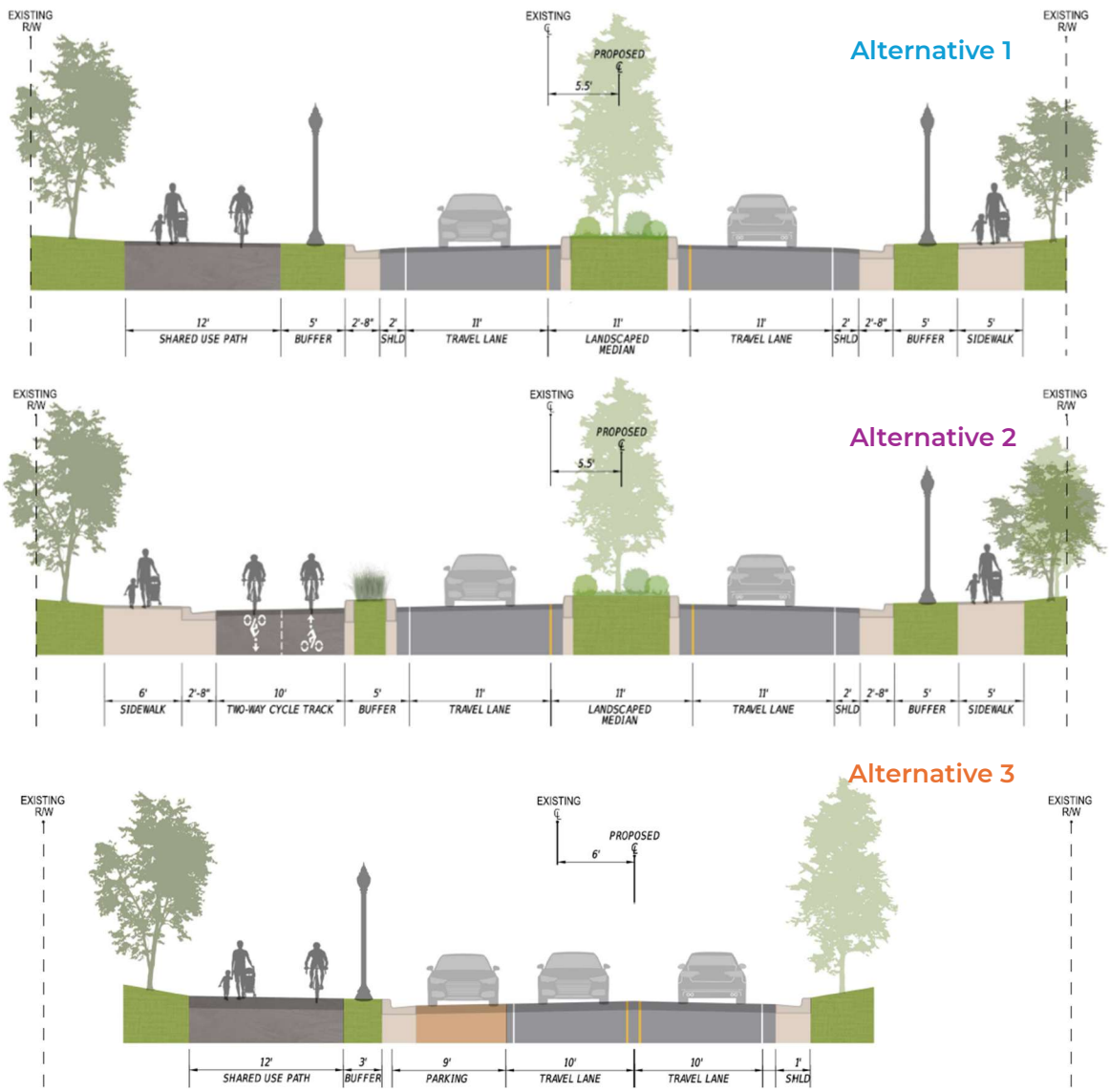


Figure 39. Section view of Alternatives 1, 2, and 3

Table 1. Corridor alternatives comparison chart

Criteria	Existing/No Build	Alternative 1 - Continuous Shared Use Path w/ Continuous Center Median	Alternative 2 - Continuous Two-Way Separated Bike Lane w/ Sidewalks	Alternative 3 - Continuous Shared Use Path w/o Continuous Center Median
		Roadway Features		
Pedestrian facility type	Varies: • Sidewalk • Shared use path • Shoulder • None	• Continuous shared use path on southbound side • Continuous sidewalk on northbound side • Walkers comingled with bike traffic along SUP • Walkers separate from bike traffic along northbound sidewalk • Median refuge islands at crosswalks	• Continuous sidewalks both sides • Walkers separate from bike traffic • Median refuge islands at crosswalks	• Continuous shared use path on southbound side • No sidewalk on northbound side - potential to provide intermittent sidewalk on northbound side to connect east side residents to shared use path, but there would be tree impacts • Walkers comingled with bike traffic along SUP • Walkers separate from bike traffic along northbound sidewalk
Bicycle facility type	• Partial shared use path/shoulder/on-road • High-stress	• Continuous shared use path on southbound side • Low-stress	• Continuous 2-way separated bike lane on southbound side • Low-stress	• Continuous shared use path on southbound side • Low-stress
Travel lane width	12'	10'	10'	10'
Shoulder width	varies 0-15'	2'	varies 1'-5'	1'
On-street parking	• Both sides north of Alapocas Drive • Legal parking northbound between Stone Hill Road and Cantera Road • Regular illegal parking northbound between 18th Street and Stone Hill Road	• No parking north of Alapocas Drive • Legal parking northbound between 18th Street and Cantera Road	• No parking north of Alapocas Drive • Legal parking northbound between 18th Street and Cantera Road	• Intermittent parking north of Alapocas Drive, locations TBD • Legal parking northbound between 18th Street and Cantera Road
		Opportunities		
Traffic calming (potential speed reduction)	• N/A	• Lane narrowing • Roadside landscaping in median • Roadside landscaping in buffer	• Lane narrowing • Horizontal deflection (if median taper option selected) • Roadside landscaping in median • Roadside landscaping in buffer (optional)	• Lane narrowing • On-street parking • Horizontal deflection at median crossing islands • Roadside landscaping in buffer (optional)
Beautification/ landscaping	• N/A	• Landscaped center median • Landscaped roadside buffer	• Landscaped center median • Landscaped roadside buffer (optional)	• Landscaped roadside buffer (optional)
Pedestrian lighting	• N/A	• yes	• Yes	• yes

Criteria	Existing/No Build	Alternative 1 - Continuous Shared Use Path w/ Continuous Center Median	Alternative 2 - Continuous Two-Way Separated Bike Lane	Alternative 3 - Continuous Shared Use Path w/o Continuous Center Median
		Impacts		
Approximate space requirements	N/A	70’	72’	50’-55’
Temporary construction impacts	N/A	Minor	Moderate	Minor
Permanent private property impacts	N/A	Minor	Moderate	Minor
Stormwater management/ drainage	N/A	Yes – closed section	Yes – closed section	Yes – closed section
Utilities	N/A	Minor	Minor	Minor
Environmental	N/A	None	None	None
		Maintenance/Operations		
Shared Use Path/ Sidewalk/ Lighting Maintenance	N/A	DelDOT	DelDOT	DelDOT
Landscaping Maintenance	N/A	Third party maintenance agreement required	Third party maintenance agreement required	Third party maintenance agreement required if buffer landscaped
Emergency Access	Drivers pull into shoulder	Drivers pull into median	Drivers pull into median	Drivers stop, emergency vehicle passes in oncoming traffic lane
Mail/Trash Pickup	Accommodated in shoulder	Pull to right side of lane	Would block motor vehicle traffic	Would block motor vehicle traffic
On-Street Parking	Accommodated in shoulder	Not accommodated	Not Accommodated	Available in select southbound locations
		Construction Cost		
Planning Level Cost Estimate	N/A	High	Highest	Moderate

Table 2. Single lane roundabout vs. signalized intersection comparative chart

	Single-Lane Roundabout	***Signalized Intersection***
Safety		
Conflict Points	*8 vehicle conflict points* *8 pedestrian conflict points*	*32 vehicle conflict points* *24 pedestrian conflict points*
Crash Severity	*Eliminates most dangerous crash types*	*Does not eliminate most dangerous crash types*
Traffic Calming Benefit	*Yes*	*No*
Bike/Pedestrian Design		
Bike/Pedestrian Crossing Distance	*Shorter*	*Longer*
Median Refuge Islands	*Yes*	*No*
Signal Controlled Crossing	*No*	*Yes*
Motor Vehicle Operations		
Delay	*Lower*	*Higher*
Queue Length	*Shorter*	*Longer*
Additional Considerations		
Space Required	*Lower*	*Higher*
Long-Term Operational Costs	*Lower*	*Higher*
Long-Term Landscaping Costs	*Higher*	*Lower*

Preferred Alternative

Preferred alternatives were selected based on the alternative analysis detailed in the previous section and feedback from the public for the entire corridor and Alapocas Drive intersection.

Corridor Wide

Alternative 3: Shared Use Path on Southbound Side w/o Continuous Median is the preferred alternative for corridor wide improvements. This alternative provides a continuous shared use path along the southbound side of ACO and incorporates a variety of traffic calming measures. It requires substantially less space than Alternatives 1 and 2 which reduces construction impacts and costs. Further agency coordination will be necessary to establish the limits and configuration of the sidewalk on the northbound side of the street.

Alapocas Drive Intersection

A **roundabout is the preferred intersection improvement at the Alapocas Drive and ACO intersection**. A roundabout in this location will accommodate all modes of travel while providing substantial traffic calming and safety benefits.

W. 18th Street Intersection

A **preferred intersection improvement at W. 18th Street and ACO has not been determined by this effort**. While a roundabout is technically feasible, additional public outreach and a further understanding of the costs and benefits of a roundabout at this location is necessary before a preferred alternative is established.

Short Term Improvements

In addition to Phase 1 improvements that will be completed by DelDOT as detailed in Appendix A, additional Short/Mid-Term Improvements proposed by the project team include:

- WILMAPCO to request that DelDOT study a speed limit reduction between Edgewood Road and 18th Street to achieve a consistent 25MPH speed limit for the entire corridor
- Provide additional paving/shoulder along Augustine Cut Off in the southbound lane south of Alapocas Drive to create an area for people walking that is outside the travel lane
- Relocate the stop bar and provide other striping improvements for southbound traffic turning left onto 18th Street to minimize confusion (see Figure 32)
- Restripe southbound shoulder south of Incyte to provide continuous bike lane at the bridge approach

The WILMAPCO Process

The below steps are necessary to advance the recommendations of this study. The Concord Pike Monitoring Committee, administered by WILMAPCO, will serve to oversee the process. There are opportunities to provide public comment during each step of the project development process.

1. **Review and endorsement by the WILMAPCO, Technical Advisory Committee (TAC), and Council**

   The WILMAPCO TAC met to review and endorse this study on August 21, 2025.

   The WILMAPCO Council met to review and endorse this study on September 11, 2025.

2. **Add project to WILMAPCO Regional Transportation Plan (RTP)**

   According to the WILMAPCO website, the RTP is a transportation planning document that identifies the region's (defined as New Castle County, DE and Cecil County, MD) long-term transportation needs and the project and activities that seek to address them. The RTP includes projects anticipated for at least the next two decades. Projects included must be financially reasonable (based on anticipated revenues) and meet air quality standards. Inclusion on the RTP is necessary for a project to be eligible for federal funding. The plan is revised every four years, and the next update is scheduled for 2027. During the RTP revision process, there are multiple opportunities to provide public comment. For more information on the RTP, visit wilmapco.org/rtp.

3. **Add project to DelDOT Capital Transportation Program (CTP)**

   According to the DelDOT website, the CTP is a 6-year program detailing anticipated capital investments that is developed every two years. The CTP is developed in cooperation with WILMAPCO, Dover/Kent County Metropolitan Planning Organization, Salisbury-Wicomico Metropolitan Planning Organization, and Sussex County. The CTP includes information on both capital and maintenance programs, as well as phasing, estimated schedule, and estimated costs for capital projects. The FY25-FY30 CTP is currently in effect, and the FY27-FY32 CTP is currently under development. During the CTP development process, there are multiple opportunities to review the draft document and provide public comment, including during a workshop held in each county. For more information on the CTP, visit deldot.gov/Publications/reports/CTP.

4. **Identify funding source**

   Funding for environmental review, final design, and construction is only identified once the project is included in the CTP.

5. **Environmental review**

   An environmental review process is required to determine whether this project qualifies as a Categorical Exclusion (CE) or a more detailed review process is necessary.

6. **Final design and construction**

   Only after steps 1-5 are completed can final design and construction move forward. The final design process would be coordinated by DelDOT, and per the DelDOT *Project Development Manual* requires additional public involvement opportunities for the public to review the plans and provide comment before the design is finalized.