



Indian Head Rail Trail Extension Feasibility Study

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December 2021

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Executive Summary

Executive Summary

Study Area

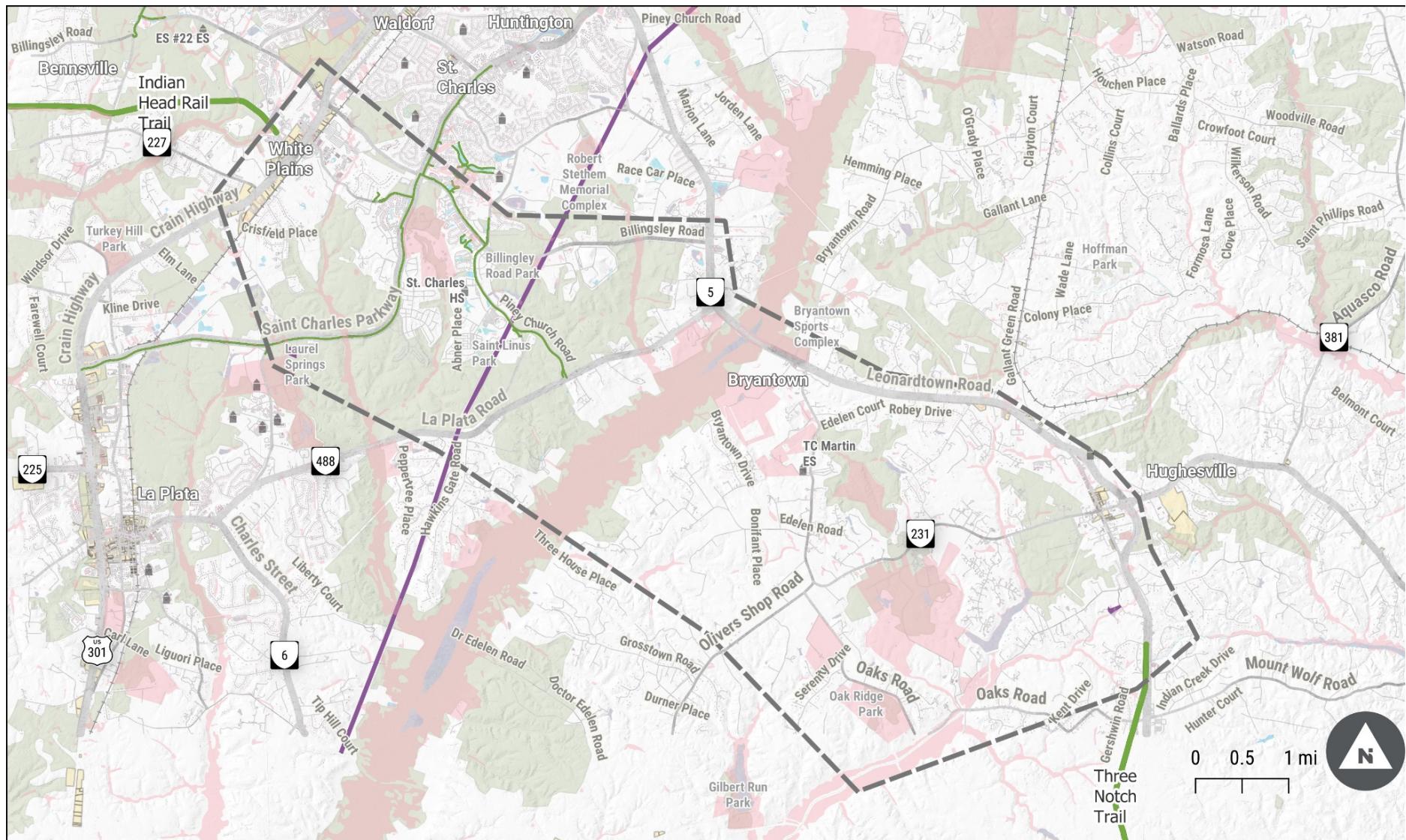
The project study area encompasses approximately 35 square miles in Charles County. It is bounded by Crain Highway/US-301 to the west, Billingsley Road and Leonardtown Road/MD-5 to the north, the border with St. Mary's County to the east, and an irregular border to the south, as shown in Figure 1.

Location and History

Indian Head Rail Trail (IHRT) was opened for public use in 2009 and the Three Notch Trail Phase I opened in 2006. A trail connection between these two trails was referenced in 2012 Charles County Bicycle and Pedestrian Plan. In 2019, Charles County was awarded a Maryland Bikeways Program grant from Maryland Department of Transportation to finance development of feasibility study to examine potential trail alignments to connect Indian Head Rail Trail and Three Notch Trail.

Project Purpose

Due to the popularity of the Indian Head Rail Trail and the desire to provide more opportunities to access healthy recreation and transportation options, Charles County undertook a project to explore an extension of the trail to meet up with the Three Notch Trail in St. Mary's County. The Indian Head Rail Trail Feasibility Study (Study) is intended to determine the feasibility of extending the existing 13-mile Indian Head Rail Trail (IHRT) from its current terminus in White Plains eastward to the northern terminus of the Three Notch Trail in Charlotte Hall. The Study provides an alternatives evaluation for the potential IHRT extension. The study considered impacts on adjacent land use, cost and feasibility of construction, ADA accessibility, and identifies options to maximize connections to existing pedestrian and bike facilities, existing and planned nearby retail and residential development, cultural and environmental resources, and other points of interest. This study provides sufficient detail and expert analysis to allow Charles County to make an informed decision to move forward with establishing budgets, seeking grants, or to begin the process of design and construction of the chosen alignment.



Indian Head Rail Trail Extension Feasibility Study Map



TOOLE
DESIGN

Hugh Kelley 2020-11-03

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November 2020

- Shared-use Path
- schools
- Railway
- Electrical Lines
- Project Study Area
- Protected Lands
- Commercial Land
- Parks and Open Green Space

Figure 1. Study Area

Project Goals

The goal of the study is to determine a recommended alignment for extension of the IHRT that:

- Provides an uninterrupted east-west cross-County shared-use trail connection
- Maintains a natural and scenic experience akin to the existing IHRT to the greatest extent possible
- Is safe, comfortable, and accessible for users of all ages and abilities
- Fills the existing gap between two important trails in Southern Maryland—the IHRT and the Three Notch Trail—resulting in a regional trail system that may lead to significant tourism and economic development potential

Approach

The project was initiated in Charles County Government in the spring of 2020 and completed in the fall of 2021, and included public engagement, consultation with neighboring jurisdictions, and other stakeholders including Maryland DOT and State Highways Administration.

This study provides an alternatives evaluation for the potential IHRT extension. The study considered impacts on adjacent land use, cost and feasibility of construction, and ADA accessibility. It also identifies options to maximize connections to existing pedestrian and bike facilities, existing and planned nearby retail and residential development, cultural and environmental resources, and other points of interest.

Recommended Routes

After developing and analyzing several alternatives and assessing public input, Charles County staff identified, as a final recommendation, a main “connector route” in the northern part of the study boundary, shown in Figure 2. This route crosses US-301/the Crain Highway, uses segments of existing sidepaths and proposed new sidepaths along Billingsley and Leonardtown Roads (Route 5) to the Three Notch trailhead. This is a direct route, the shortest of all segments examined, and one that provides connectivity to many existing destinations and development. The route is likely the more feasible option in that it will use primary roadway rights of ways and existing bridges and will not require potentially complicated coordination and land use negotiation with multiple stakeholders.

Two alternative routes would rely on the potential to use the CSX railroad rights of way (if it were to become inactive in the future), park lands, and PEPCO rights-of-way. These alternatives have the potential to provide a better user experience, consistent with the project goals, in that they use rights-of-way independent of busy roads. However, they would require coordination and negotiation with many other stakeholders, including CSX, PEPCO, Charles County Department of Recreation, Parks, and Tourism and developers. They are

thus, though attractive from a user experience standpoint, however comparably less feasible. An additional route was added during the planning process that was outside of the initial study area. This route is promising due to its clear alignment advantages, potential right-of-way access, and high value trail experience. This new route proposes use of the PEPCO right-of-way and a new sidepath along Route 6. Further analysis of this route will occur in a future project phase.

Next Steps

This study provides sufficient detail and expert analysis to allow Charles County to make an informed decision to move forward with selecting a preferred alternative, establishing budgets, seeking grants, or to begin the process of design and construction of either the main connector route or any of the alternatives.

An important next step will be to share the plan with partner agencies within Charles County government and at the state level to build momentum, excitement, and commitment toward implementation.

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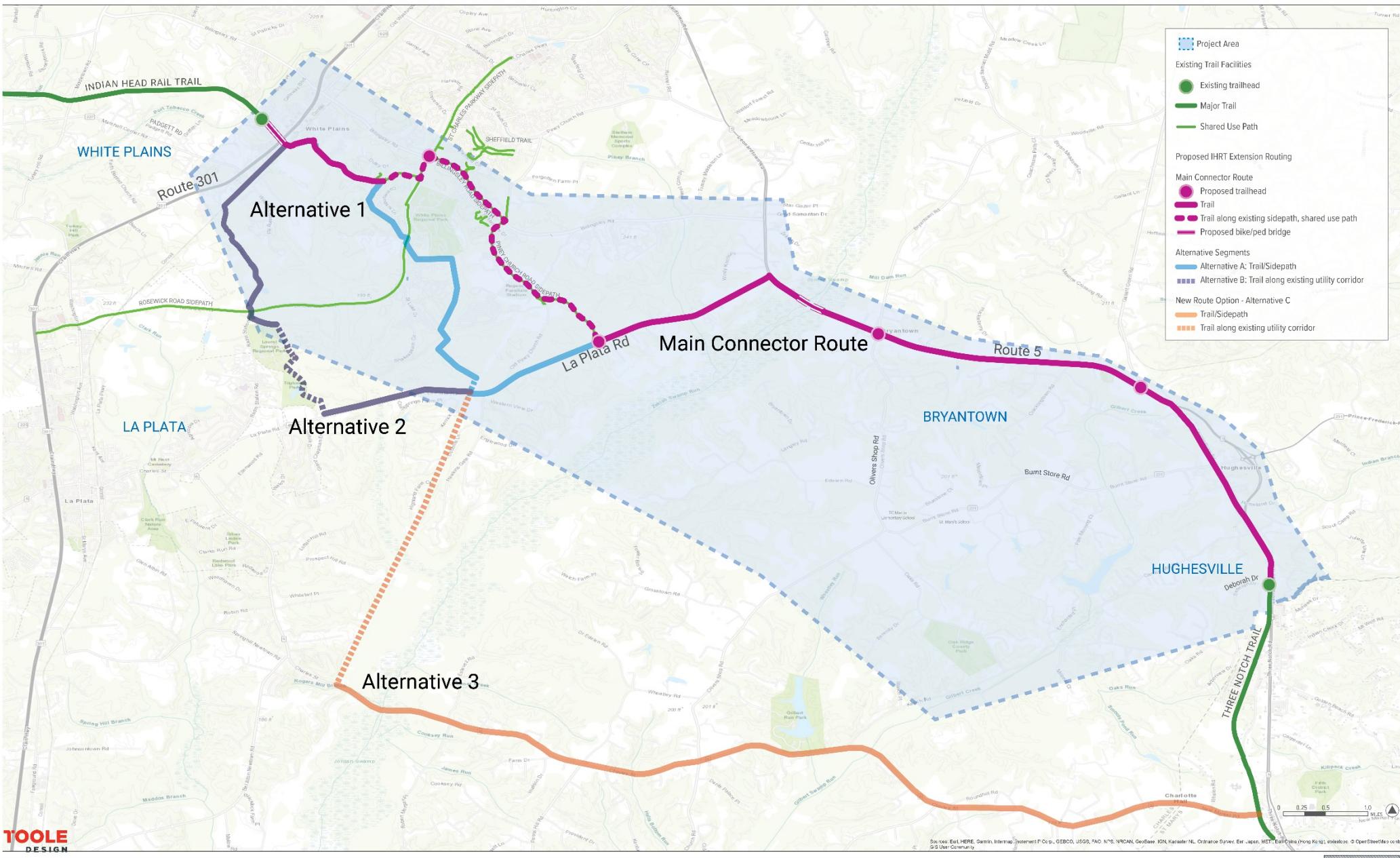


Figure 2. Final Recommended Routes



1.0 Context

1.0 Context

1.01 Setting

Charles County is a landscape of rivers, streams, wetlands, and forests that support a wide variety of plant and wildlife communities. The Indian Head Rail Trail Extension study area is located on the upland plateau of Charles County with steep slopes between level uplands and low stream valleys. Steep slopes near streams are protected through Resource Protection Zone Regulations, and most forms of development are prohibited.

The network of streams and wetlands that traverses the study area is of major importance to the County and Chesapeake Bay ecosystem. Forested buffers around streams maintain stream function and habitat, while floodplains moderate flashy hydrology and store floodwaters. The study area is bisected by the Zekiah Swamp, the largest nontidal wetland in Charles County and a Maryland Wetland of Special State Concern. Wetlands of special concern are noted for rare, threatened, and endangered species, or unique habitat, and require a 100-foot protective buffer.

While the western portion of the study area is urbanized, the bulk of the study area is dominated by natural woodlands and agricultural landscapes, and it features the scenic rural character that Charles County is known for. The County's Rural Legacy Area runs through the center of the study area, following the alignment of the Zekiah Swamp Run but with a broader cross section. The purpose of the statewide Rural Legacy Program is to protect Maryland's best remaining large contiguous tracts of rural and natural landscapes.

The topography and environmental assets of the study area are illustrated on the map in Figure 3.

The study area encompasses multiple stream valleys and wetland areas, along many steep slope areas, all of which require a high level of environmental sensitivity. Given these environmental challenges, however there are also multiple opportunities to connect a preferred alignment with the following assets;

- Existing shared use paths on Billingsley Road and Piney Church Road
- Existing parks and open space, as well as neighborhoods and local points of interest
- former rail right-of-way north of the current terminus of the Three Notch Trail,
- existing utility right-of-way corridors,

In order to connect to these community assets as well as link these two trails together, it will be critical to safely navigate the many high volume roads that crisscross or run close to these amenities.

1.02 Local Trail System

Both of the Indian Head Rail Trail and the Three Notch Trail are highly used trails that provide transportation and recreational opportunities for the local neighborhoods as well as the surrounding area and are part of the cultural and ecological richness of the region.

Indian Head Rail Trail (IHRT) is the centerpiece of Charles County's trail system. This abandoned U.S. Government Railroad corridor was acquired by Charles County through the Department of the Interior's Federal Lands to Parks Program. Opened in 2009, the 13-mile paved trail from Indian Head to White Plains meanders through an undeveloped portion of the Mattawoman floodplain and along Old Woman's Creek, protecting an important wildlife corridor and offering a wide variety of scenic views.

Three Notch Trail is built on a former railroad right-of-way that was active until the early 1960s. The paved shared-use trail runs approximately 11 miles from Deborah Drive in Charlotte Hall, south to John V. Baggett Park, in Laurel Grove, with future plans to extend the trail further south to Lexington Park.

The three municipalities in Charles County—Indian Head, La Plata and Port Tobacco—all fall outside of the study area, however they are in close proximity to the potential trail extension and would benefit from access to this regional system. The study area includes all or portions of several unincorporated communities, including White Plains, Saint Charles, Bryantown, and Hughesville. In addition, the Waldorf community is located to the immediate north of the study area along the US-301 corridor. A connection between these two trails would result in over 30 miles of continuous recreational trail creating a true regional tourism draw.

1.03 Existing Transportation, and Cultural Assets

The existing Indian Head Rail Trail terminates in the western boundary of the study area. Additional trails in the study area include shared-use paths along Saint Charles Parkway, Billingsley Road, and Piney Church Road. Existing trails, transportation, and cultural assets in the study area are illustrated on the map in Figure 3. As can be seen on the map (Figure 3), the beginnings of a trail network are starting to take shape within the study area. In addition, trails planned as part of Connect Waldorf will include connections within the study area on US-301 at Demarr Road and the existing IHRT terminus.

The existing roadway network offers potential right of way corridors for the IHRT extension, but at the same time presents challenges. There is presently no safe way for pedestrians or bicyclists to cross US-301, as will be required for the IHRT to extend eastward. Maryland Route 5 is the only existing crossing of the Zekiah Swamp within the study area, and the existing bridges have minimal shoulder area. In their current configuration, they are inadequate for high quality, protected bike lanes.

Cultural assets located within the study area include regional and local parks, schools, and sports complexes. Properties within the study area listed on the National Register of Historic Places include The Lindens, a historic Federal-style home, and the Bryantown Historic District. National Register designation is currently pending for the historic warehouse district in Hughesville.

Indian Head Rail Trail Extension Feasibility Study - Existing Trails and Cultural Assets

December 2020

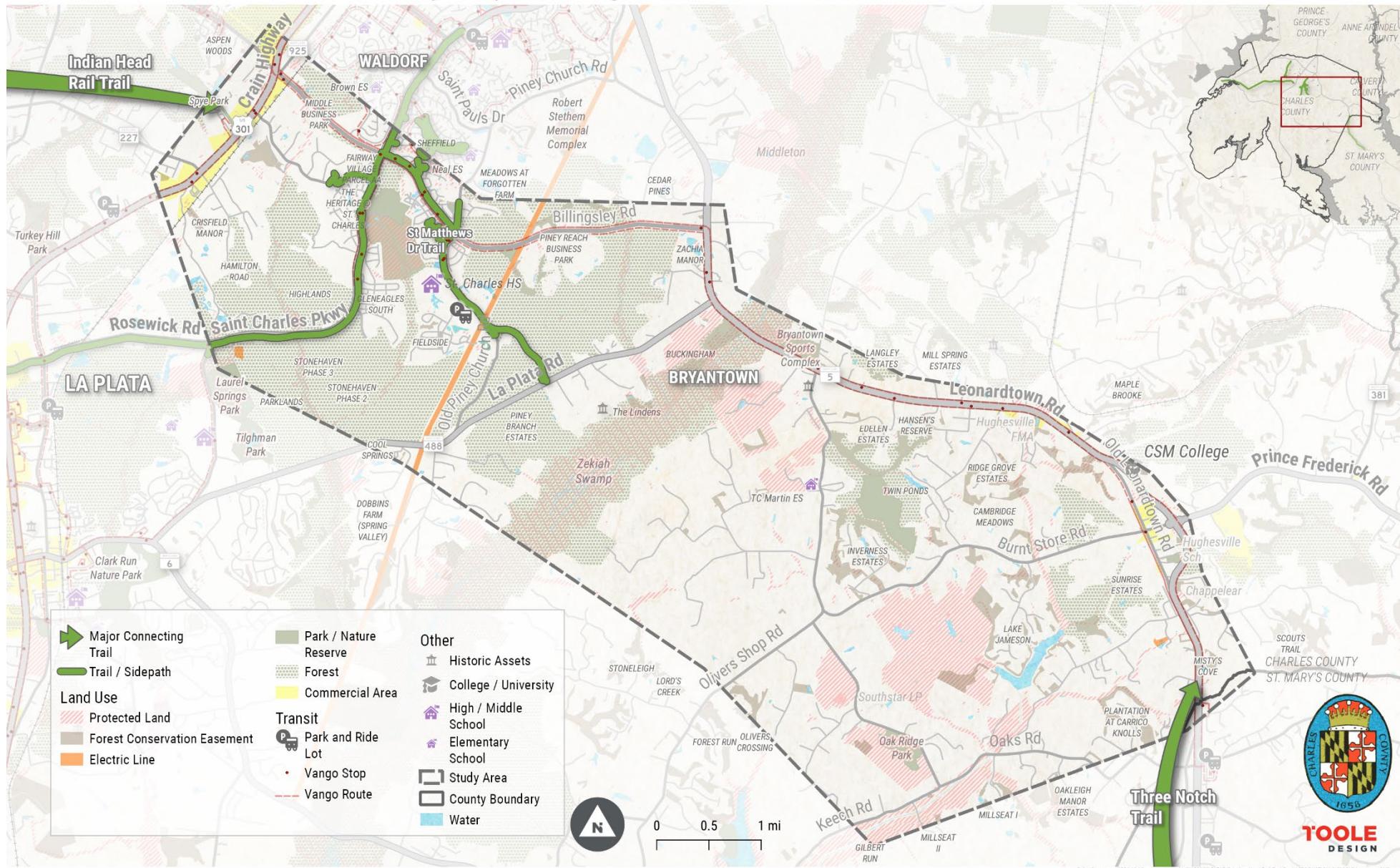


Figure 3. Existing Trail and Cultural Assets

1.04 Demographics, Population Growth and Development

Charles County is situated in southern Maryland, 18 miles south of Washington, D.C. The population is roughly 163,000 people over an area of 460 square miles. Many residents commute to Washington, D.C., with high ridership on Maryland Transit Administration commuter buses. The top employers within Charles County include the Indian Head Naval Surface Warfare Center, the Civista Medical Center, and the College of Southern Maryland, in addition to county education and government employees. Waldorf, including the large, planned community of St. Charles, is the County's largest population center, with 75,000 residents. The county's 2016 Comprehensive Plan anticipates a 1% growth rate, yielding approximately 37,000 new residents between 2016 and 2040. See Table 1 for additional comparative demographic data.

Table 1. Charles County Demographics

	CHARLES COUNTY	MARYLAND	UNITED STATES
FOREIGN BORN*	6%	15%	14%
WHITE ALONE, NOT HISPANIC OR LATINO*	37.2%	50.0%	60.1%
BLACK ALONE*	50.1%	31.1%	13.4%
AMERICAN INDIAN ALONE*	0.8%	0.6%	1.3%
ASIAN ALONE*	3.4%	6.7%	5.9%
TWO OR MORE RACES*	4.0%	2.9%	2.8%
HISPANIC OR LATINO*	6.3%	10.6%	18.5%
PERCENT WITH BACHELOR'S DEGREE OR HIGHER (PERCENT OF PERSONS AGE 25+)*	29%	40%	32%
MEDIAN HOUSEHOLD INCOME (IN 2019 DOLLARS)*	\$100,000	\$85,000	\$63,000
PERSONS UNDER 18*	24%	22%	22%
POPULATION PER SQUARE MILE**	320	595	87
MEAN TRAVEL TIME TO WORK (WORKERS AGE 16+)*	45 minutes	33 minutes	27 minutes

Source: *2019 ACS 5-year Estimates, **2010 Census¹

¹ Census data table:

<https://www.census.gov/quickfacts/fact/table/US,MD,charlescountymaryland/PST045219>

1.05 Planning Framework

As a precursor to the alternative analysis, a plan and policy review was conducted and included a review of the following documents:

- Charles County Bicycle and Pedestrian Master Plan (2012)
- Charles County Comprehensive Plan (2016)
- Charles County Land Preservation, Parks, and Recreation Plan (2017)
- Urban Land Institute Indian Head Rail Trail Technical Panel Assistance Report (2012)
- Connect Waldorf (2018)

All the documents reviewed confirm that it is the County's goal to build an interconnected system of trails and provide people opportunities to engage with the County's natural and cultural sources, and the extension of the Indian Head Rail Trail supports the intention to provide a full east-west connection across the County.

Charles County Bicycle and Pedestrian Master Plan, 2012

Charles County is envisioned as "a place where people have the safe and convenient option of walking and bicycling for transportation, recreation, and health..." within a "... seamless, balanced and barrier free network for all."

The plan calls for on and off-road recreation trails to showcase the County's natural and cultural resources.

Of particular importance is the Urban Land Institute Indian Head Rail Trail Technical Panel Assistance Report (2012). This report provides guidance for transforming the Indian Head Rail Trail from a trail that is well used and valued by the local community to a trail popular with a broader network of users from other counties and out-of-state. The report recommends linking the IHRT to existing neighborhoods and trails at the White Plains terminus, as well as making the IHRT part of a larger looped bike network in order to attract bike touring and road cyclists. The report also emphasizes the need to identify a series of metrics to track progress related to trail-related economic development. The report notes that other communities have found that documenting their accomplishments over time by collecting regular data on trails has been invaluable in seeking additional state and federal funding.

1.06 Summary of Opportunities and Challenges

Through the process of desk top review, field work, mapping analysis, and staff guidance, the following opportunities and challenges were identified (Table 2. Opportunities and Challenges. These characteristics were used to evaluate the route alternatives considered in the Alignment Alternatives section.

Table 2. Opportunities and Challenges

Opportunities	Challenges
<ul style="list-style-type: none">• The study area topography includes an abundance of level terrain suitable for trail development and providing opportunities for Americans with Disabilities Act (ADA) accessible trail connections.• The waterways, wetlands, woodlands, and farmland that punctuate the study area offer the potential to create a unique trail experience.• The natural, cultural, and historic features within the study area may serve as destinations to and/or from trail related improvements and provide multiple opportunities for environmental or historical interpretation.	<ul style="list-style-type: none">• Steep slopes where the level upland connects to stream valleys could pose barriers to trail development and limit options for trail routing to existing rights of way.• Zekiah Swamp bisects the study area creating a formidable natural barrier to an east-west trail connection.• Physical barriers created by existing transportation corridors pose challenges to developing a IHRT extension that is safe and comfortable for users of all ages and abilities.• Existing roadway rights-of-way may offer space for a continuous shared use trail, but the resulting trail may not offer the desired natural character provided by the existing IHRT alignment.

1.07 Public Engagement

The engagement effort for the study occurred during the COVID pandemic and thus was conducted virtually. Two online meetings were held, one at the beginning of the project and a second after the draft alternatives were developed.

Meeting #1, held December 17, 2020 was used to gather input from the public on the following:

- Trail facility type preferences
- Preferences for destinations that the trail could access (i.e. schools, parks, shopping centers, etc.)
- Potential trail alignments/routes

An interactive online map was developed to allow community members to provide location specific information and included a short survey about current and potential trail users.

Approximately 250 respondents took the survey and provided feedback. Demographics for the respondents:

- 56% white/16% Black
- 49% male/35% female
- Most respondents were in 45-54 and 55-64 age range
- The most prevalent zip codes for respondents were 20646, 20603, 20602, 20601, 20637, 20640

Figure 5. Interactive online map

Table 3. Walking and Biking Frequency

How often do you walk for exercise or recreation?		
	Number	%
Frequently	81	32%
Very Frequently	80	31%
Occasionally	67	26%
Very Rarely	5	2%
Rarely	7	3%
Never	1	0%
Prefer not to say	13	5%
Grand Total	254	

How often do you bike for exercise or recreation?		
	Number	%
Very Frequently	66	26%
Frequently	75	30%
Occasionally	65	26%
Rarely	11	4%
Very Rarely	9	4%
Never	16	6%
Prefer not to say	12	5%
Grand Total	254	

The following tables and charts show that, at least among respondents, there is both high current rates of walking and biking and even higher interest. Approximately 63% of respondents walk frequently or very frequently, and 48% would love to be able to walk for transportation (see Table 3 and Figure 6). Interest in walking and biking. Fifty-six percent of respondents bike frequently or very frequently and 67% would like to bike for transportation.

Of most value to this study was the response to the question about which shared use trail characteristics are most appreciated and what kind of biking environment respondents prefer, as shown in Figure 7 and Figure 8.

Would you like to bike for transportation such as for running errands or to work?

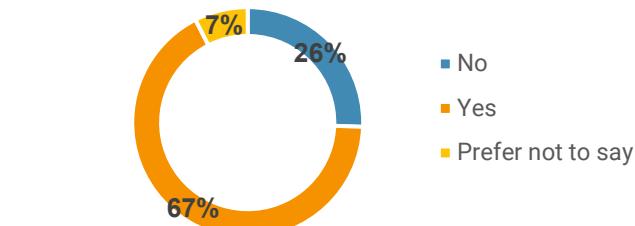


Figure 6. Interest in walking and biking

Would you like to walk for transportation such as for running errands or to work?

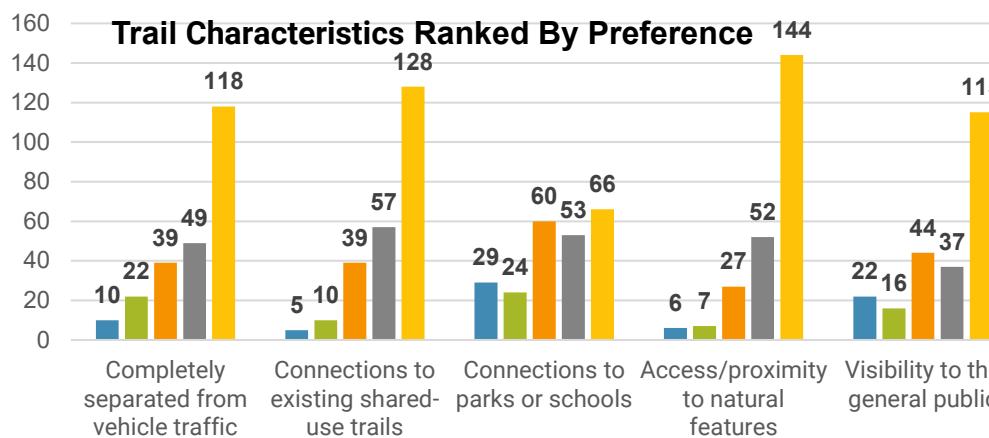
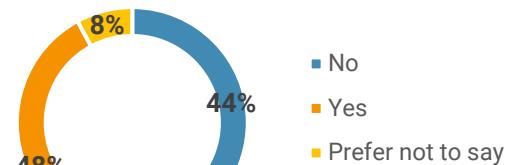


Figure 7. Trail characteristics preference

I am most comfortable riding my bike in the following environment

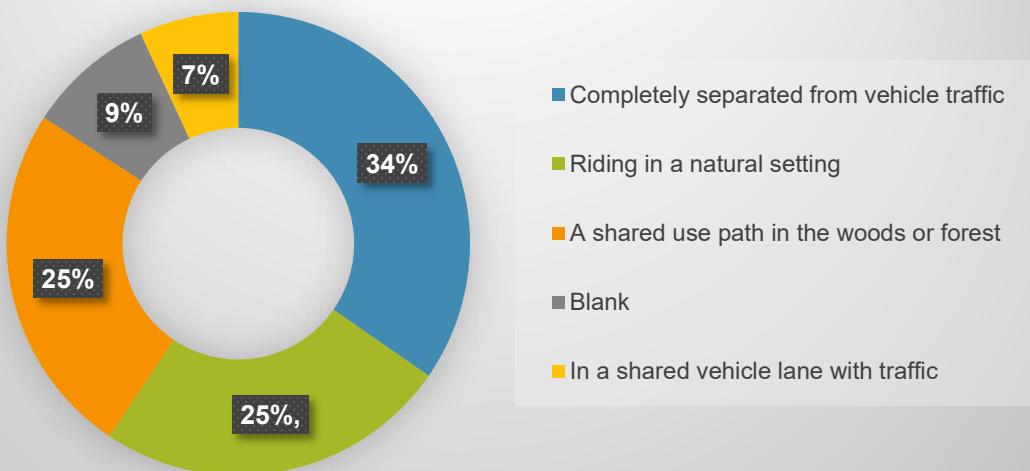


Figure 8. Biking environment preferences

Summary of Early Public Input

In addition to the survey and interactive online map input, the following is a high level summary of comments received at the first public meeting:

- Connecting the two trails is an exciting vision, but when you look at the map, with the amount of development along St. Charles Parkway and Billingsley Road location, there's a large population that has to drive to a trailhead. To give them direct access of the trail would greatly increase the utility of the trail.
- Trail extension should focus on transportation and recreational value to the community—the park and ride at Golden Beach [St. Mary's County] is an important destinations to connect to, as well as the other on Highway 925
- US 301 poses a big barrier to bicycle/pedestrian connectivity
- Lack of crosswalk across larger roadways is an issue across the county; trail should create safe crossings

Public Input on Initial Alignments

Public meeting #2 took place on April 22, 2021. Three draft alignments were presented for review and feedback. There was equal support for each of the alignments presented.

However, many attendees again voiced interest in alignments and facilities that provide separation from roadway traffic, especially along higher volume, higher speed roadways.



2.0 Alternatives Analysis

2.0 Alternatives Analysis

This section walks through the development of evaluation criteria, selecting and refining the initial alternatives, and evaluating the final alternatives.

2.01 Alternative Selection and Evaluation Criteria

A set of evaluation criteria was developed to guide the selection of alternatives, generated from the plan and policy review, existing conditions, the project goals, collaboration with county staff, and public input. The criteria are organized into four categories: transportation factors, user experience, environmental factors, and implementation, which are described in Table 4. These correspond to the project goals:

- Provide **an uninterrupted east-west cross-County shared-use trail** connection
- Maintain a **natural and scenic experience** akin to the existing IHRT to the greatest extent possible
- Is **safe, comfortable, and accessible** for users of all ages and abilities
- Fill the existing gap between two important trails in Southern Maryland—the IHRT and the Three Notch Trail—resulting in a **regional trail system that may lead to significant tourism and economic development** potential

Table 4. Alternative Selection and Evaluation Criteria

Connectivity and Transportation Network	
Address Regional Connectivity Gaps	Closes gaps between existing trails and creates desired links
Access to Services and Points of Interest	Provide links to services and other key destinations like parks and schools
Separation of Trail Users from Vehicular Traffic	Provides higher degree of separation from roadways and travel lanes
Crossings of high-stress roadways	Minimizes crossings of high-stress roadways
Right of Way Impacts	Minimizes the need for acquisition of private property
User Experience	
Perceived level of safety	Provides separation from busy roadways yet maintains visibility and connection to surrounding areas so as not to feel overly isolated
Accessible for all Ages, Abilities, and User Types	Creates an intuitive, easy to use trail experience by limiting contact with vehicular traffic
Buffering from Traffic Noise, Visuals	Provides separation from high-stress roadways physically and visually
Natural Experience Consistent with Existing IHRT	Alignment consists of more shared use path than sidepath segments
Environmental and Cultural Resource Protection	
Wetlands, RTE Species, Wildlife	Avoids impacts
Historic and Cultural Resources	Avoids impacts
Implementation	
Structural Considerations	Minimizes the need for structural modifications to existing bridges/overpasses or the need for new structures (retaining walls, bridge, etc.)
Ease of Construction	Has adequate access from existing roadways, will not require complex structures or construction methods
Ease of Maintenance	Has adequate access from existing roadways, will not require major drainage, vegetation, or other types of maintenance
Public Support	Supported by the community

2.02 Alternative Research

To develop the initial alternatives, a desktop reconnaissance was performed that was based on the opportunities and constraints discovered during the existing conditions analysis, discussions with county staff, and the established evaluation criteria. Identification of alternatives were guided by the selection and evaluation criteria described in Table 4 and focused on the following opportunities:

- Parcels owned by Charles County
- Available roadway rights-of-way
- Potential for use of railroad rights-of-way, via Railroad Valuation Map research, National Archives Website
- Potential for use of overhead power utility corridors
- Ability to use existing structures like bridges (with or without modifications)
- Natural resource protections and regulations
- Public input (see Figure 11. Suggested routes via public input in Dec. 2020) from the interactive online map

Corridor Opportunities

Given the distance between the two existing trail corridors, approximately 11 miles as the crow flies, and the amount of undeveloped land in the area, the initial alternatives development explored the potential for use of large contiguous areas: railroad, utility, and open space corridors, as described below.

Railroad Rights-of-Way

Rail corridors make ideal trail corridors because they typically have long, level alignments with gentle curves and minimal interruptions. Both the Indian Head Rail Trail and the Three Notch Trail follow former rail lines so rail corridors were included in the study.

A 1914 Railroad Valuation Atlas shows two active railroads in Charles County:

1. **The Philadelphia, Baltimore & Washington line** (Line #130 as identified in the 1914 Railroad Map Atlas MD-DE) running from Popes Creek northward through La Plata and Waldorf – essentially today's US-301 route. Today the **CSX freight corridor** runs parallel to MD-301/Crain Highway, east of the highway, from Morgantown to Huntington.
2. **The Washington, Potomac & Chesapeake line, also known as the Washington, Brandywine, and Point Lookout Railroad**, (Line #142 as identified in the 1914 Railroad Map Atlas MD-DE), running from Mechanicsville in St. Mary's County northward through Hughesville Brandywine, the current alignment of the Three Notch Trail alignment. It includes an abandoned railroad parcel in Hughesville west of Old Leonardtown Road.

Unfortunately, none of the lines or spurs follow an east-west alignment, so they would not provide a direct connection between the two trails.

Utility Corridors

Overhead powerline corridors were also examined (see 9; Southern Maryland Electric Cooperative (SMECO) is the main utility service in the area. PEPCO also operates in the area but does not have dedicated rights of way.

SMECO allows trail use on their properties and even has a regular trail-based event. Thus it appeared that several utility corridors provide promise for potential trail alignments.

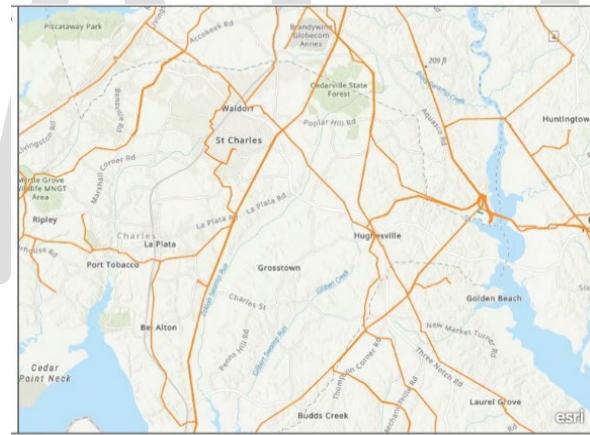


Figure 9. Electric Power Transmission Lines

Natural Resources

The Zekiah Swamp Run flows northeast to southwest through the middle of the project area, essentially dividing it in half. Figure 10 shows how hydrologic soils, protected wetlands, and slopes greater than 10% surround the stream and swamp, creating a formidable physical and regulatory barrier to bicycle and pedestrian connectivity through the area. A route through the swamp would provide the more direct connection between the two trails, so a crossing of the swamp via boardwalk was initially considered.

Indian Head Rail Trail Extension Feasibility Study

November 2020

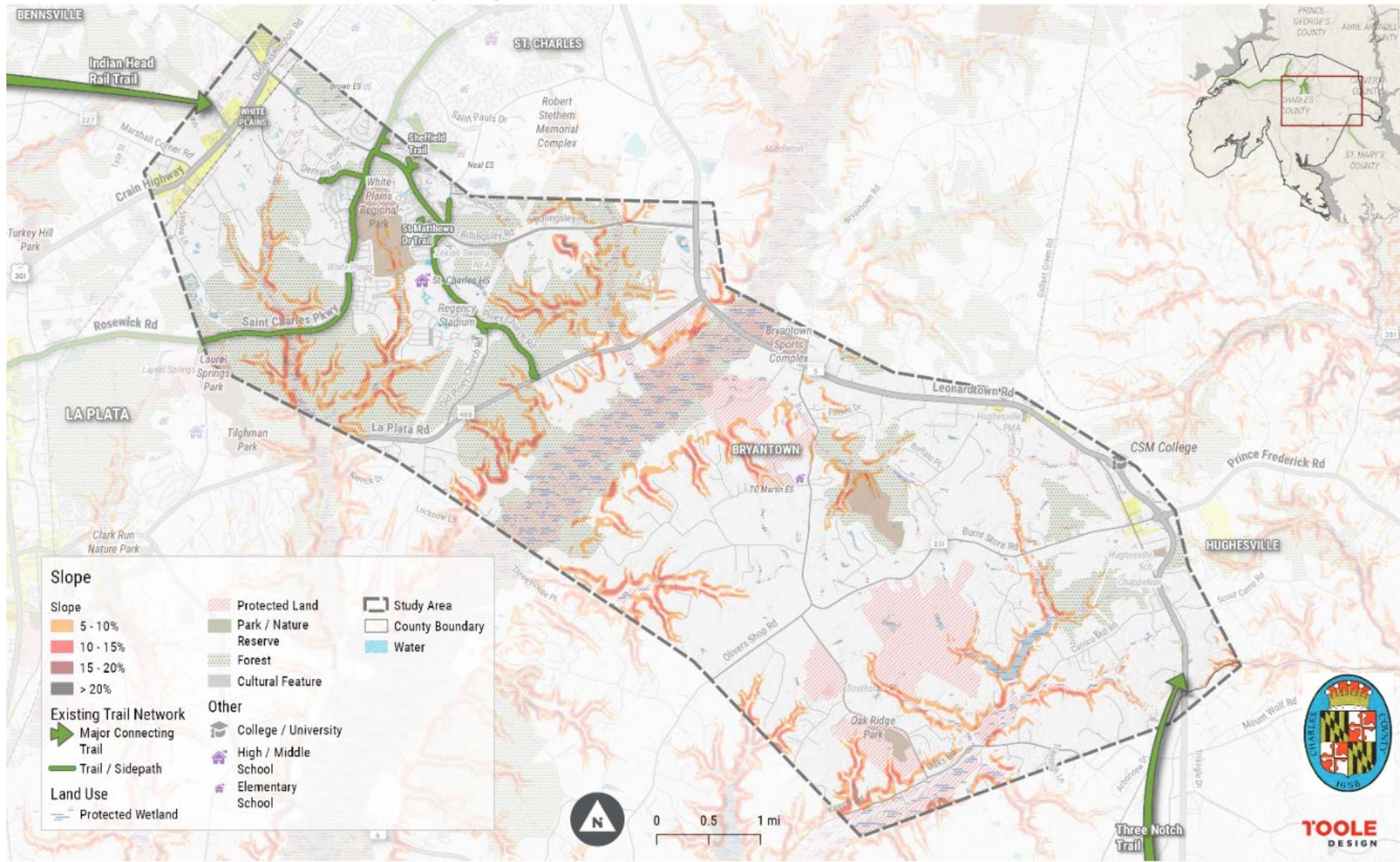


Figure 10. Feasibility Analysis: Topography

2.03 Initial Alternatives Selection

This section describes the three alignment approaches that emerged following the results of the desktop reconnaissance, field survey, collaboration with county staff, and public input (see Figure 11). The initial alternatives were vetted with Charles County staff and then refined. The boardwalk crossing of the Zekiah Swamp Run was eliminated as it crosses pending Maryland Agricultural Land Preservation Foundation (MALPF) and Rural Legacy Applications in the Zekiah Rural Legacy Area. It was determined that the existing recorded easements will not allow nor would owners likely support development of a boardwalk or bridge crossing. The revised alignments, as shown in Figure 12 and described below, were presented and discussed at the second public meeting.

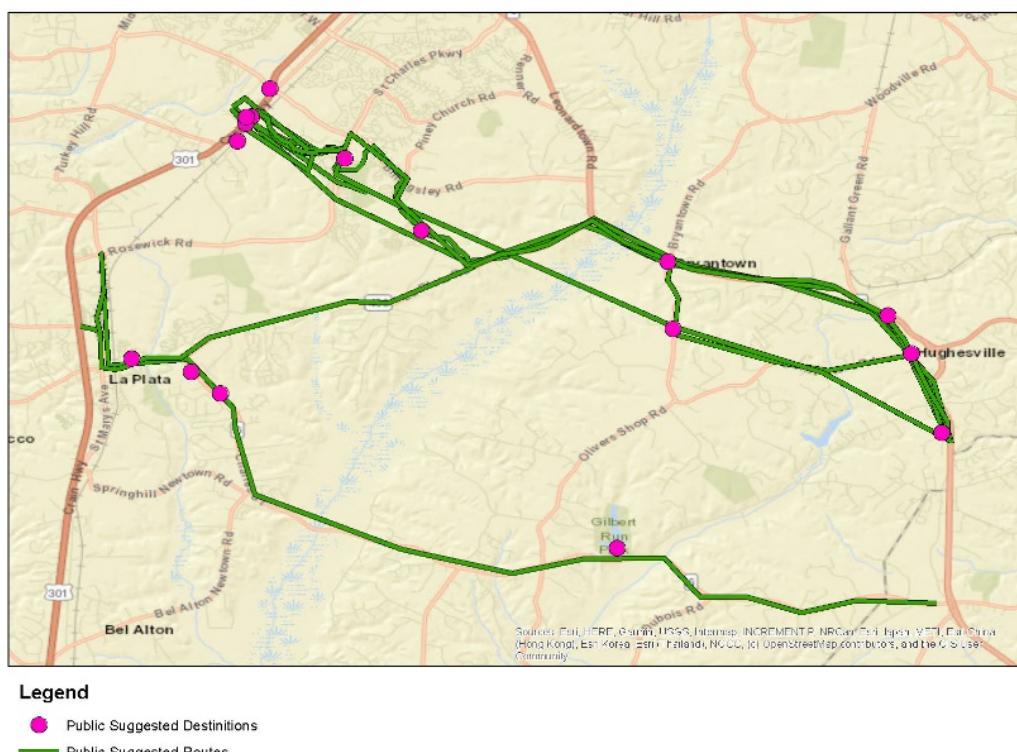


Figure 11. Suggested routes via public input in Dec. 2020

Alignment A: An alignment entirely within the existing publicly owned rights-of-way (along roadways), using existing bike infrastructure (trails) as much as possible.

Alignment B: An alignment that explores opportunities to use utility corridors, along with a bicycle/pedestrian bridge crossing of US-301.

Alignment C: An alignment that explores opportunities to use existing unpaved trails/roads.

See Figures 13-15 for full routing descriptions of each identified alignment option.

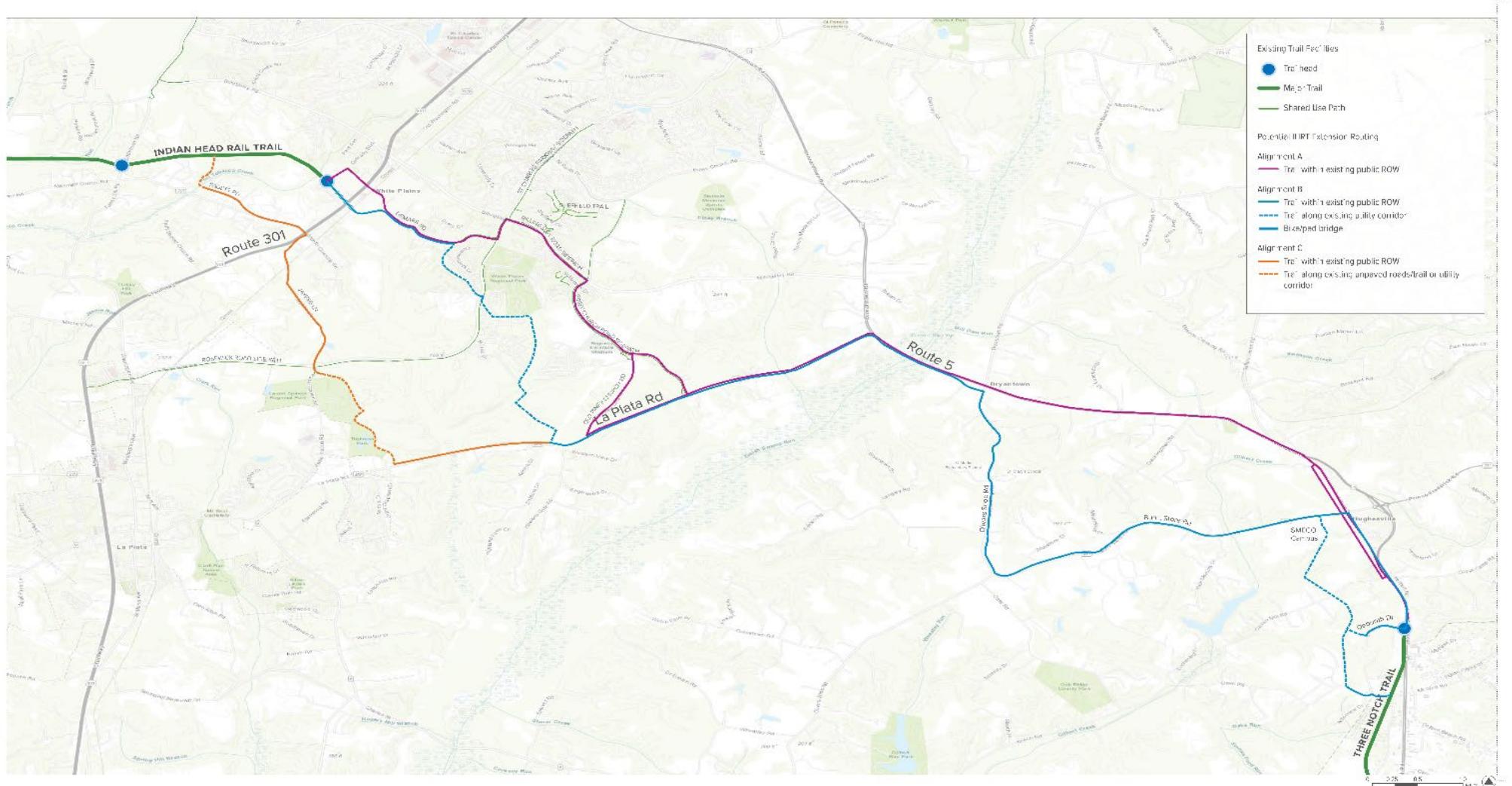


Figure 12. Initial alignment options

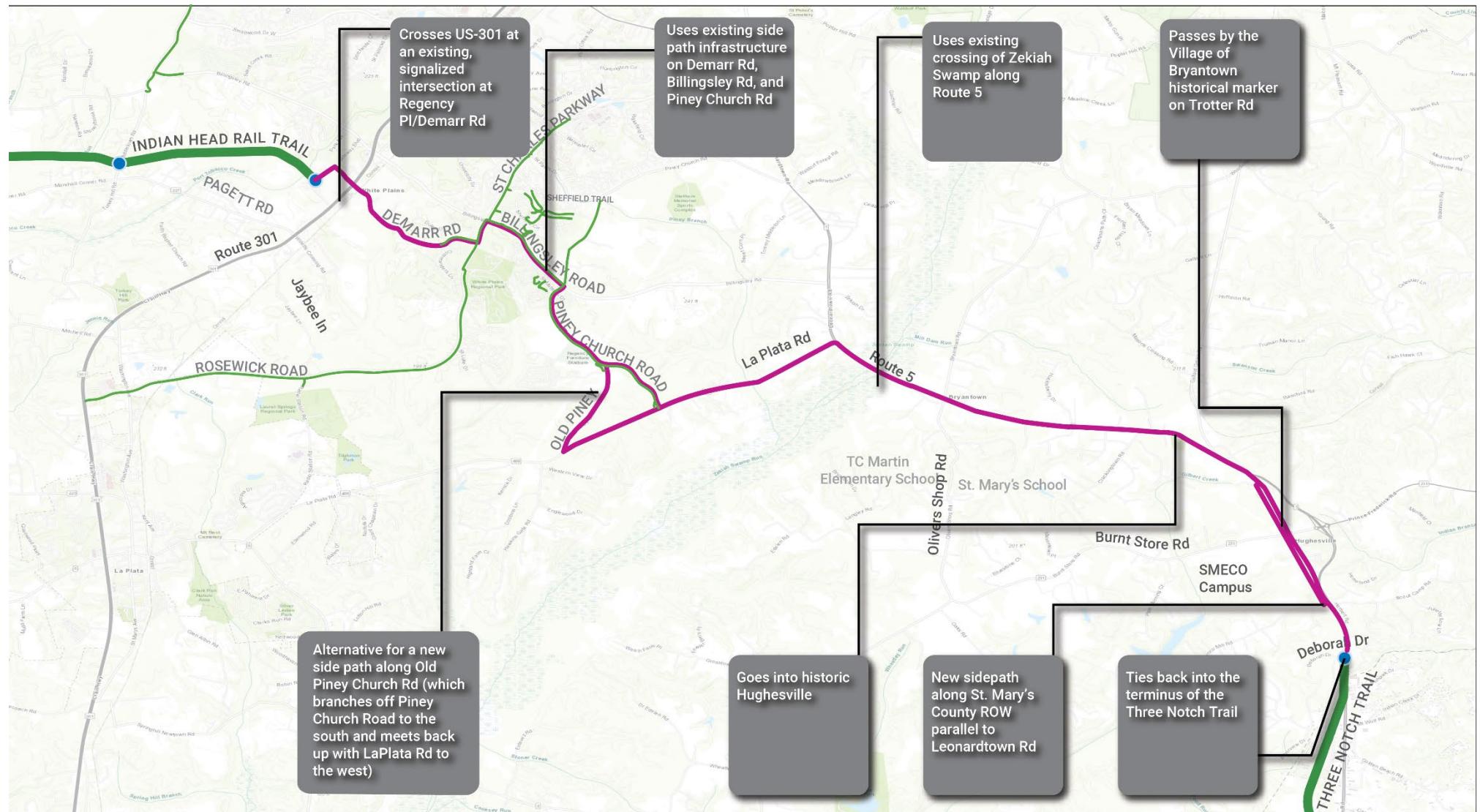


Figure 13. Draft Alignment A, with options

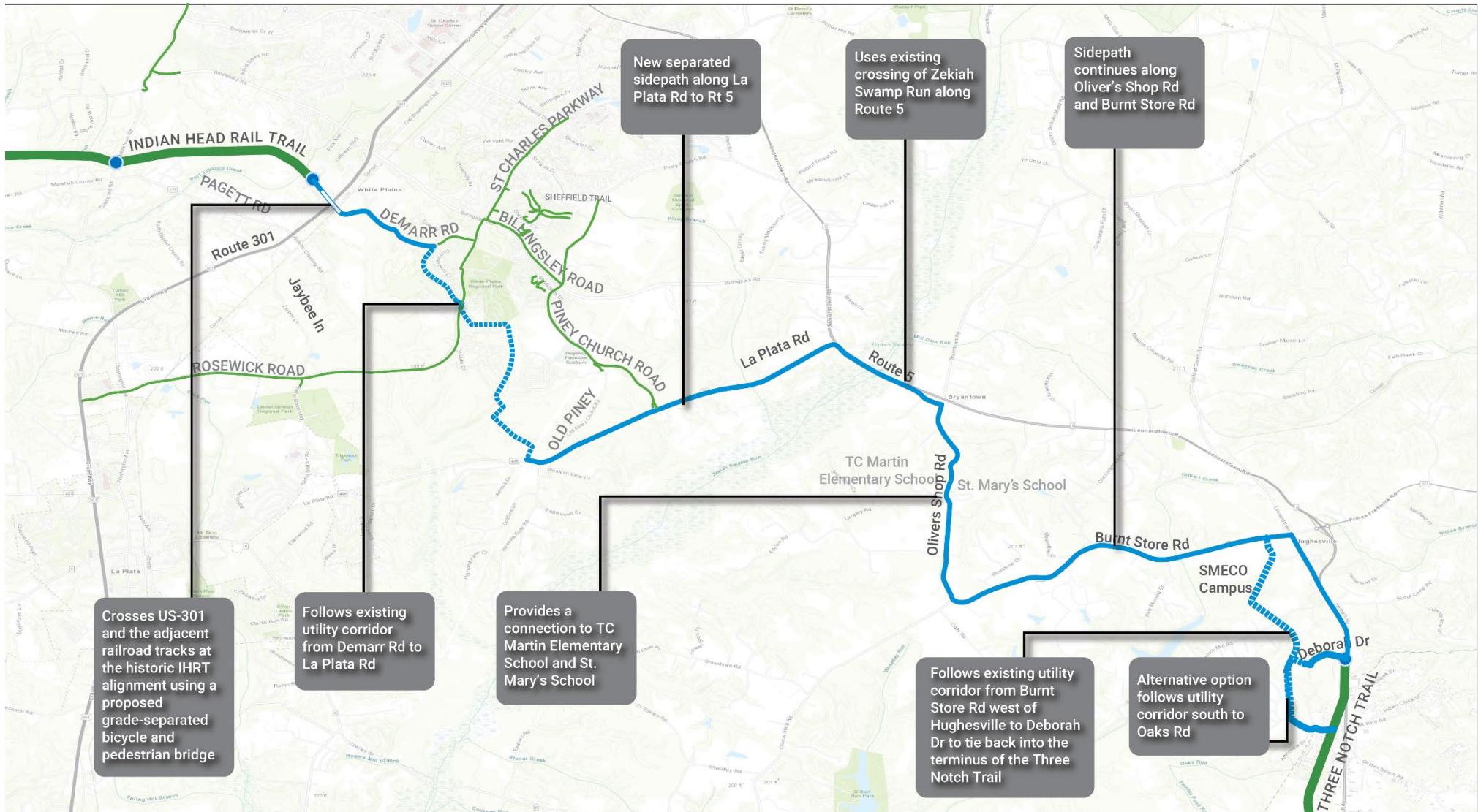


Figure 14. Draft Alignment B, with options

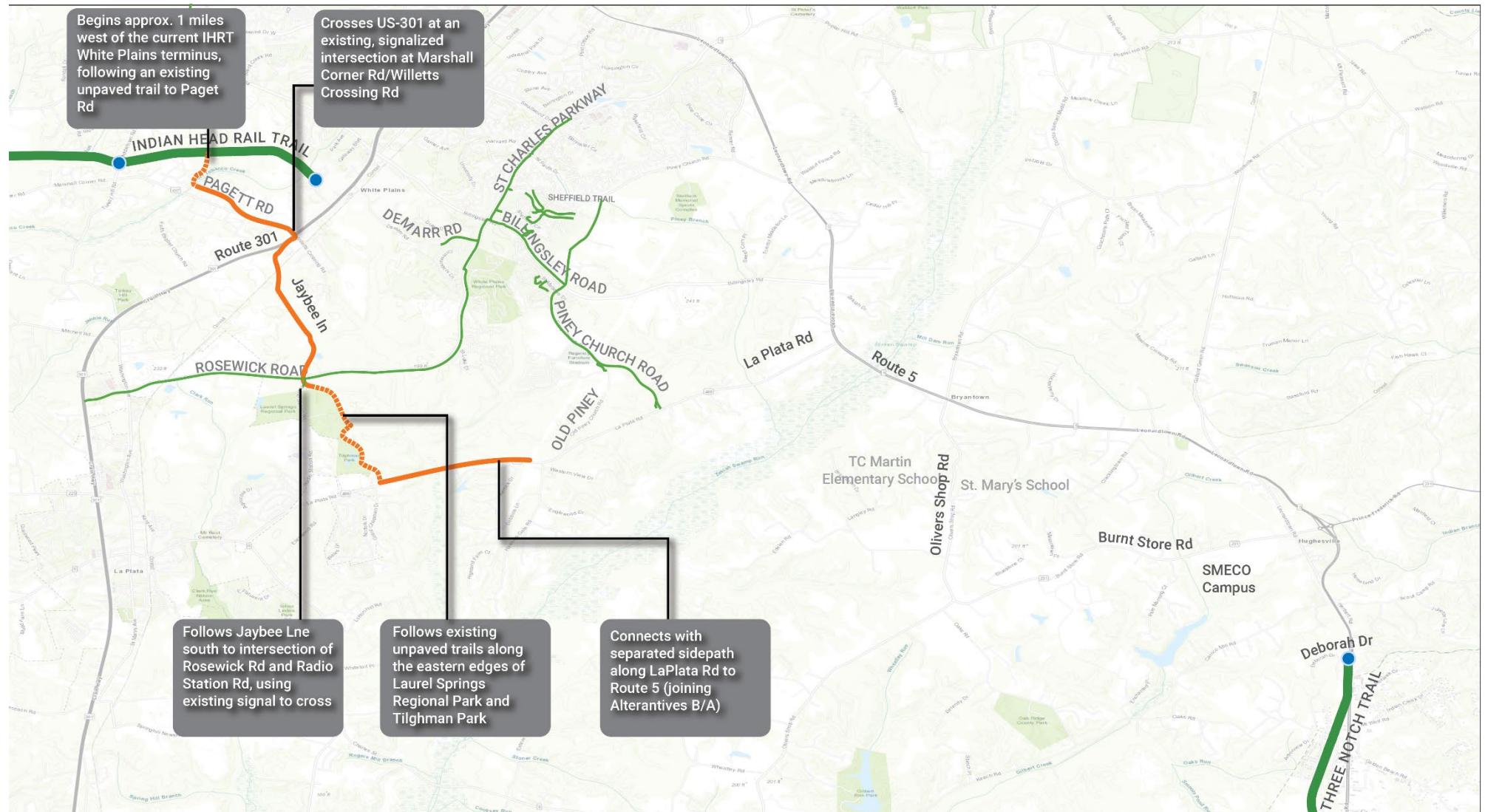


Figure 15. Draft Alignment C, with options

2.04 Evaluation of Initial Alternatives

Using the evaluation criteria in Table 4. Alternative Selection and Evaluation Criteria, each of the initial alternatives evaluated based on the following four categories, which align with the project goals:

- Connectivity and Transportation Network
- User Experience
- Environmental, Historical, and Cultural Resource Protection Analysis
- Implementation

Connectivity and Transportation Network Analysis

The overall length of each alternatives was calculated as a measure of directness, and the number of connections to parks and schools were counted to assess the connectivity, as shown in Table 5. Connectivity and Directness, below.

Table 5. Connectivity and Directness

Alternative	Number of Destinations (Existing Trails, Parks and Schools)	Length in Miles*
Alternative A	Sidepaths on Demarr Road, Charles Parkway, Billingsley Road, and Piney Church Road, Brown Elementary, Fairway Village Swimming Pool, Mary B. Neal Elementary, White Plains Park, St. Charles High, Regency Furniture Stadium, Bryantown Sports Complex, , Hughesville School, CSM College, Hughesville Pond	13.51
Alternative B	Sidepaths on Demarr Road, St. Charles Parkway, Billingsley Road, and Piney Church Road White Plains Park, St. Charles High, St. Matthews Dr Trail, Park & Ride, Regency Furniture Stadium, Bryantown Sports Complex, Hughesville Pond	18.85
Alternative C	Sidepath on St. Charles Parkway, Laurel Springs Regional Park, Tilghman Lake Park	18.91

*As compared to the as the crow flies distances of approximately 11 miles.

Overall, Alternative A is significantly shorter and provides more connections to trails, parks, and schools.

User Experience Analysis

The project goals include maintaining a natural and scenic experience consistent with the off-road experience of both the Indian Head Rail Trail and the Three Notch Trail. The goals also include creating facilities that are safe, comfortable, and accessible for users of all ages and abilities. Each of the alignments offers a differing level of separation from roadways and traffic—some segments are sidepaths and some segments are separated shared use trails. To further analyze how the initial alternatives align with the project goals, the roadway characteristics and user experience each segment of each alternative

was examined in detail. Level of traffic stress is proposed as a proxy for user experience. Level of traffic stress (LTS) is an approach that quantifies the amount of discomfort that people feel when they bicycle close to traffic. The methodology was developed in 2012 by the Mineta Transportation Institute and San Jose State University.

Sidepaths vs. Shared Use Paths

Sidepaths are paths located within an **existing roadway right-of-way**. They typically feature a vegetated buffer or some other kind of separation from vehicle travel lanes.

Shared use paths are typically located in an **independent right-of-way** and are thus completely separated from roadways.



Figure 16. Shared use paths and Sidepaths defined

The LTS analysis considered the proposed facility type for each alternative (shared use path in an independent right of way vs. a sidepath along a roadway right of way, as shown in Figure 17) vis a vis the volumes and vehicle speeds of adjacent roadways where the alternatives shared the right-of-way. For sidepaths, available right of way was considered for the potential to provide a generous buffer between travel lanes and the trail facility. The higher the roadway volumes and speeds, and the narrower the right of way, the higher potential trail user stress.

The summary tables below define LTS levels based on proposed trail facility types and roadway characteristics and highlight the LTS levels for each alternative. More in-depth analysis can be found in Appendix B.

Table 6. Potential Level of Traffic Stress

LTS LEVEL	PROPOSED TRAIL FACILITY TYPES	ROADWAY CHARACTERISTICS
LOWER STRESS POTENTIAL Most comfortable trail user experience	Shared use path in independent right of way Sidepath along low volume, low speed roadway	Average Daily Traffic (ADT) and Speed Under 10,000 ADT 25 mph
MEDIUM STRESS POTENTIAL Lower stress trail user experience	Sidepaths along medium speed and volume roadways	10,000 – 20,000 ADT 25-35 mph
HIGH STRESS POTENTIAL High stress trail user experience	Sidepath along high speed, high volume roadways	Over 20,000 ADT Over 35 mph



Figure 17. Examples of high speed, high volumes roadways, Billingsley Rd (left) and St. Charles Parkway (right)

Table 7. LTS Summary

SEGMENT	Low Stress Segments	Medium Stress Segments	High Stress Segments	% of High Stress Segment
ALTERNATIVE A	0	3	4	57%
ALTERNATIVE B	3	6	6	40%
ALTERNATIVE C	3	6	4	30%

Red denotes the highest number of either medium or high segments within an alternative

In summary Alternative A, which uses all roadway rights of way, many of which are busier roadways, may result in a higher stress trail experience, though it would be the most direct and shortest of the three alternatives, by as much as five miles.

Environmental, Historical, and Cultural Resource Protection Analysis

Wetlands, Streams, and Associated Buffers

As mentioned above, initial concepts involving a crossing of the Zekiah Swamp Run were eliminated, thus reducing the potential for significant environmental impacts (see Figure 20). Alternatives A, B, and C do, however, propose use of the existing bridge along Route 5 over the Zekiah Swamp, crossing both the Jordan Run and the Mill Dam Run, two separate waterways, and thus would pose some potential impacts, though much less than a full crossing. There are other wetland areas that cross Demarr Road, St. Charles Parkway, and LaPlata Road; also the Piney Branch crosses Billingsley Road. It is likely that any alternative may impact wetlands, potentially requiring special construction methods, permitting, and/or wetland and buffer mitigation.

Trees and Urban Forest

Proposed sidepaths along LaPlata Road, in Alternatives B and C, may require the removal of existing trees. Other undeveloped areas in each of those alternatives, may also involve tree removal.

Historic and Cultural Resources

There are several small and isolated areas throughout the study areas that are registered under the Maryland Inventory of Historic Properties or National Register of Historic Places. Most significant in size is the Forest Park subdivision, where Piney Church Road meets Leonardtown Road (in Waldorf). This could be impacted by Main Connector Route (Alternative A). All the alternatives are likely to go through the Bryantown Historic District along Leonardtown Road, but impacts to both areas may be minimal as they would be within the roadway right of way.

Indian Head Rail Trail Extension Feasibility Study -- Topography and Environmental Assets

December 2020

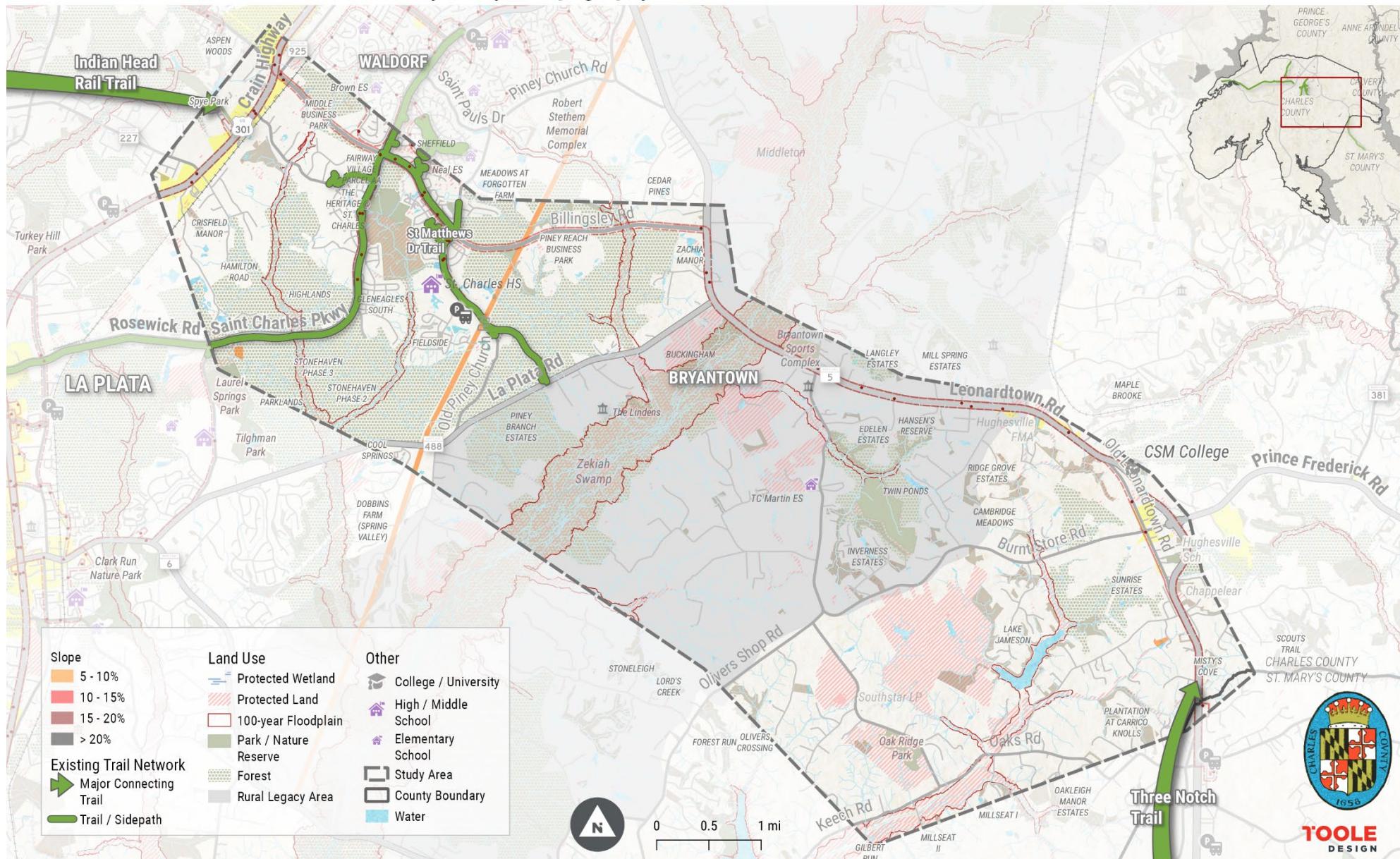


Figure 18. Natural Resources and Slope Analysis

Implementation Analysis

Structural Considerations

The alteration of existing structures as well as the proposal of new ones can have a large impact on a project, both in terms of cost to design and construct, as well as agency coordination and permitting. To address the potential for structural impacts, a structural engineer was retained to provide a high-level assessment to several existing and proposed structures within the project area.

Near the project starting point at the existing IHRT trail head, each alternative must cross the Crain Highway/US-301. Alternatives A and C propose using existing at-grade crossings, via the signalized intersections of Regency Place/Demarr Road (Main Connector Route (Alternative A)) and Marshall Corner Road/MD-227 and Willets Crossing Road (Alternative C).

Alternative B proposes a grade-separated crossing of US-301, and an analysis of that proposed crossing is provided below. Prior to the structural analysis, Maryland Department of Transportation State Highway Administration (MDOT/MDSHA) staff were consulted, and about the feasibility of bridging US-301, and most saw the value in providing a safe, accessible crossing for trail users and residents in the area. A full structural analysis can be found in Appendix C.

2.05 Alternatives Evaluation Matrix

Based on the research and the evaluation of the initial alternatives above, each of the initial alternatives (A, B, and C) were scored using the project evaluation criteria (see Table 3 in section 2.01). This evaluation (Table 8, below) is intended as a summary of the analysis, providing a snapshot of how the alternative score across the board.

Scoring

The alternatives are scored by category on a scale of 1 to 3, where:

- 3 = Best meets criteria
- 2 = Somewhat meets criteria
- 1 = Does not meet criteria or meets criteria minimally.

Table 8. Alternatives Evaluation Matrix

		ALTERNATIVE SCORES		
EVALUATION CRITERIA	DESCRIPTION	A	B	C
Connectivity and Transportation Network				
Closes regional connectivity gaps	Closes gaps between existing trails and creates desired links	2	1	1
Access to services, destinations	Provide links to services, key destinations like parks and schools	2	2	2
Separation of trail users from vehicular traffic	Provides more separation from roadways and travel lanes	1	2	3
Crossings of high-stress roadways	Minimizes crossings of high-stress roadways	1	2	3
Right of Way Impacts	Minimizes the need for acquisition of private property	3	2	1
Directness	Requires minimal out of direction travel	3	2	1
	SUBTOTAL	12	11	11
User Experience				
Perceived level of safety	Provides separation from busy roadways yet maintains visibility and connection to surrounding areas	1	2	3
Accessible for all Ages, Abilities, and User Types	Creates an intuitive, easy to use trail experience by limiting contact with vehicular traffic	1	2	3
Buffering from traffic noise	Provides separation from high-stress roadways	1	2	3
Natural experience consistent with existing IHRT	More shared use path than sidepath segments	1	2	3
	SUBTOTAL	4	8	12
Environmental				
Wetlands, Habitat, etc.	Avoids or minimizes impacts	2	3	3
Trees/Woodlands	Avoids or minimizes impacts	2	2	2
Historic and Cultural Resources	Avoids or minimizes impacts	2	2	2
	SUBTOTAL	6	5	7
Implementation				
Structural considerations	Assessment of need for structural modifications to existing bridges/overpasses, need for new structure	1	1	2
Ease of construction	Has adequate access from existing roadways and does not require complicated construction techniques	3	2	2
Ease of maintenance	Does not have high maintenance needs (cleaning of drainage structures, removal of copious vegetation)	3	3	1
Public support	Support voiced in public meeting and online map	3	3	3
	SUBTOTAL	10	9	8
	TOTALS	32	33	37

2.06 Key Takeaways from the Evaluation Matrix

Some key takeaways from the analysis:

Alternatives A, B, and C were all equally supported by the public, when presented in the second public meeting – no alternative was favored by the public over others.

Alternative A stands out as being more direct and potentially easy to construct, as it consists of sidepaths along existing roadways. However, it would not provide a separated, shared use path user experience consistent with either the Indian Head Rail Trail or the Three Notch Trail.

Alternative B provides a somewhat better user experience as it combines existing and new sidepaths along some less busy roads, and Alternative C potentially more so, but both are much longer/less direct than Alternative A.

Overall the scores for each alternative were fairly close, making the selection of a preferred alternative more complex.

2.07 Revised Alternatives

After consultation with county staff on the research, analysis, and summary above, the following revisions were proposed to the alternatives.

- Alternative A was renamed the Main Connector Route
- Alternative B became Alternative1 of the Main Connector Route
- Alternative C became Alternative 2 of the Main Connector Route
- An additional alignment opportunity, outside of the original study area, was identified as Alternative 3. At this time, there has been no additional analysis of this alternative.

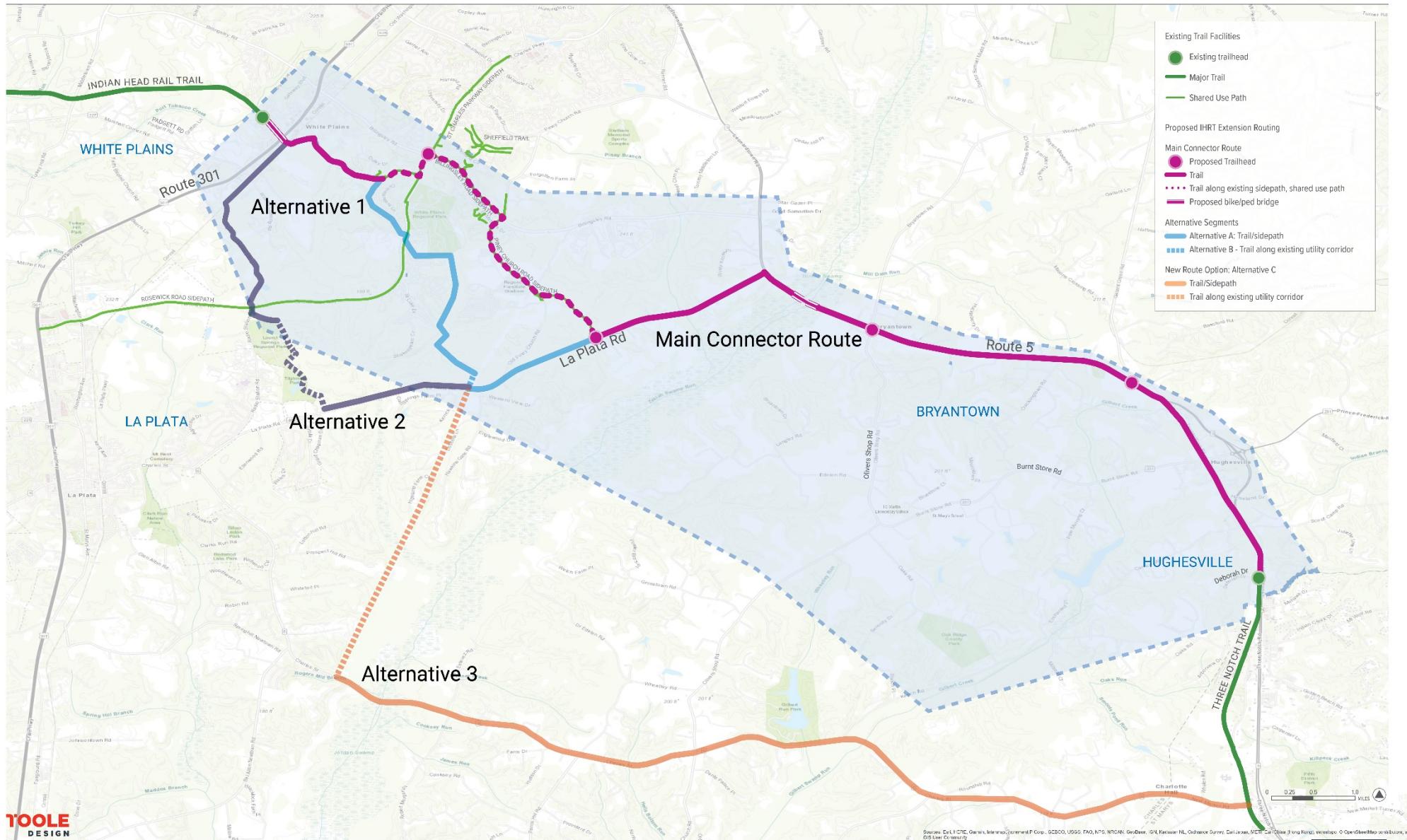


Figure 19. Final Alternatives

2.08 Description of Final Alternatives

This section provides more detail about the final alternatives

The Main Connector Route. Begins with a grade-separated crossing of US-301 (Figure 20).

Alternative 1 begins with the grade-separated crossing of US-301, one option uses Demarr Road to St. Charles Parkway using existing sidepath (see Figure 21) and around White Plains Regional Park southbound to LaPlata Road, as previously proposed.



Figure 20. Potential location of grade separated crossing of US-301



Figure 21. Existing trail along St. Charles Parkway

Alternative 2 would use the CSX rail corridor southward to connect to Jaybee Lane, behind Laurel Springs Regional Park (Figure 23) crossing Rosewick Road, traveling a short distance down Radio Station Road (see Figure 22), and then continuing down Jaybee Lane to a powerline corridor until it reaches LaPlata Road, and then continues along LaPlata until it connects with the Main Connector Route alignment.



Figure 23. Existing trail behind Laurel Springs Regional Park



Figure 22. St. Charles Parkway at Radio Station Rd.

Alternative 3 would cross US-301 on the Main Connector Route to Demarr Rd, then follow Alternative B to LaPlata Rd, then follow the utility right of way (Figure 25) southward to Route 6/New Market Road. The alignment would then follow Route 6 to where it meets the Three Notch Trail.



Figure 24. SMECO powerline/utility corridor from Hughesville to Deborah Drive

2.08 Uniform Design Standards

This section provides guidance on uniform design standards along the proposed Indian Head Rail Trail extension corridors. The goal is to identify common standards including trail and buffer widths, surface materials, intersection and railroad crossing treatments, regulatory and wayfinding signage, landscaping, lighting, call boxes, and site furnishing. The following publications were reviewed in the development of this chapter:

- *Guide for the Development of Bicycle Facilities by the American Association of State Highway and Transportation Officials (AASHTO)*
- *National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide*
- *Bicycle Policy and Design Guidelines from the Maryland State Highway Administration*
- *Maryland Manual on Uniform Traffic Control Devices (MMUTCD) from the Maryland State Highway Administration*
- *Maryland Bike Policy and Design Guide*
- *The MassDOT Separated Bike Lane Design Guide*
- *U.S. Department of Transportation Federal Highway Administration (FHWA) Rails-with-Trails Report*
- *America's Rails-with-Trails Report – Rails to Trails Conservancy*

Trail Design Standards

Trail Width Requirement

According to the 2012 AASHTO Bike Guide, typical widths for a shared use path range from 10 to 14 feet and is dependent on the context of a trail and its anticipated volume and mix of users. Wider paths of 11 to 14 feet are recommended where there are high user volumes and where pedestrians account for at least 30% of the trail users. This allows for safer passing movements and accounts for maintenance and emergency vehicle access (see 5. Typical Trail Cross Section, Maryland State Highway Administration Bike Policy and Design Guide, 2015)). The minimum width for a two-directional shared use path is 10 feet with 2 feet of horizontal clearance on either side. Given the user volume and mix of users on the existing Indian Head Rail Trail, an 11 foot minimum, trail width is recommended.

Trail Surface Material

According to the Maryland Bike Policy and Design Guide, some form of asphalt or concrete paving is recommended for paths and trails. A hard, non-slip pavement surface works well for a variety of trail users, requires less maintenance, and can sustain heavy loads such as maintenance or emergency vehicles. Flexpave should be considered in wooded areas to reduce impacts to tree roots. Permeable mixes are desirable to lessen the effect of stormwater runoff; however, the positive effects of these materials must be

balanced against their higher initial and long-term maintenance costs, as well as the underlying soil permeability.

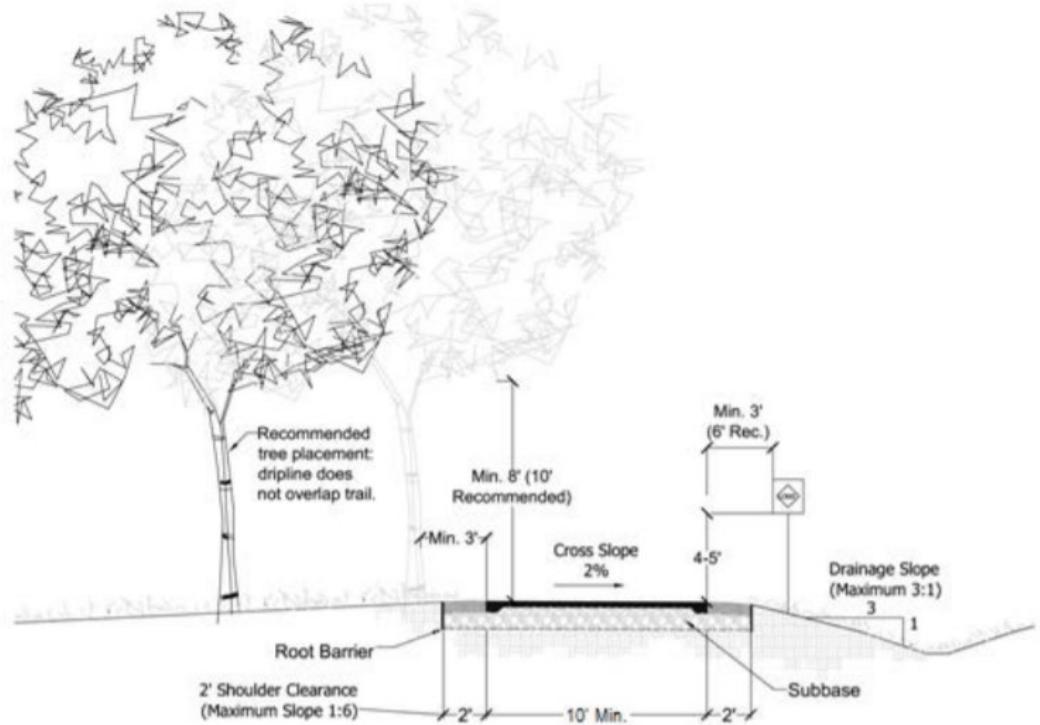


Figure 25. Typical Trail Cross-Section. Maryland State Highway Administration Bike Policy and Design Guide, 2015

SOURCE: https://www.roads.maryland.gov/ohd2/bike_policy_and_design_guide.pdf

Clearance and Buffers

Buffer Types for On-road Facilities

According to the MassDOT Separated Bike Lane Planning and Design Guide, the recommended buffer width of a street-level bicycle facility is 6 feet. Vertical objects such as flexible delineator posts, parking stops, planter boxes, concrete barriers, and rigid bollards should be considered to maximize safety and increase the level of comfort of trail users.

Clearance for Off-Road Facilities

The 2012 AASHTO Bike Guide recommends a 5-foot horizontal separation between a high-volume and high-speed roadway and sidepath. Where a 5-foot horizontal separation cannot be achieved, a 42" vertical separation is recommended. Future signs, mailboxes, and other side obstructions should be considered when designing separation between the shared use path (trail) and roadway.

Intersections and Crossings

Trail and Roadway Intersection

Intersections between paths and roadways often require the most consideration in trail design. The Massachusetts DOT Guide on Shared Use Paths and Greenways specifies some basic principles to be followed when designing intersections:

- Unusual conflicts should be avoided.
- Intersection design should create a path for bicyclists that is direct, logical, and as close to the path of motor vehicle traffic as possible.
- Bicyclists following the intended trajectory should be visible and their movements should be predictable.
- Potential safety problems associated with the difference between auto and bicycle speeds should be minimized.



Figure 26. Example of a well-design trail crossing

As the trail approaches the crossing it should be aligned with the destination of the crossing on the other side of the road. The crossing should also be as perpendicular as possible to the road being crossed. Refer to the MUTCD guide for appropriate signage and pavement markings.

Trail Signage

Trail signage orients trail users to their destination and provides guidance on appropriate trail behavior. Directional signs are important along the trail, especially in locations where decisions are to be made about direction of travel. These signs orient the users to upcoming destinations and their respective direction and distance. Regulatory signs are required in locations where traffic laws are to be enforced. For example, at an unsignalized intersection between the trail and a road, stop signs are installed



Figure 27. Example of trail wayfinding signs and markers

to regulate the flow of trail traffic. Warning signs are required ahead of possible hazards and conflict zones like narrowing of the trail.

Trail Amenities and Site Furnishings

Trailheads and Site Furnishings

There are opportunities along the proposed alignments for trail furnishing and amenities. These include trailheads and waysides where trail users can be expected to stop and rest. At a minimum, trailheads and waysides should include pedestrian signage and benches to accommodate trail users that may need to rest between destinations. Where appropriate, lighting, water fountains, bicycle repair stations, and trash and recycle receptacles should also be provided. The County's furnishing standards applied to the trail will provide a level of visual uniformity in street furnishings throughout the trail corridor.

Landscaping

Depending on the final alignment there may be landscaping opportunities the corridor. These could include areas along streets, railroad crossings, and property buffers as well as at trailheads and other available sites. Where the trail parallels a road, a minimum five-foot-wide planting strip is provided to accommodate street trees and potential bioretention facilities. Street trees provide a higher quality separation between trail and road users, enhance the streetscape character, and provides shade to trail and roadway users. Street trees should be limbed up to a height of 7 feet so as not to interfere with road and trail users. Plant heights should be limited to 2 feet tall at trail and roadway intersections and other conflict points to maximize sight distances. Maintenance requirements should be considered when selecting an appropriate plant palette for the corridor.



Figure 28. Trailhead with seating and bike parking



Figure 29. Landscaping along both sides of a trail

Lighting

Trail lighting is particularly important where nighttime trail use is anticipated. Lighting should also be considered through underpasses and highway intersections where nighttime security may be a concern. If Charles County chooses to illuminate remote sections of the trail, solar lighting may be an appropriate option to reduce wiring and installation costs. Unlit remote trail segments should be signed appropriately indicating trail closure after dark.



Figure 30. Example of trail lighting

Emergency Call Boxes

Emergency call boxes are a valuable component of trail safety as they facilitate an emergency response when needed, increase the trail user's perceived safety, and may deter crime. Call box placement should be frequent enough so that trail users can reach the call box relatively quickly. However, they can also be costly, and with the rise of cell phones, they may become increasingly unnecessary (this is not true in rural locations where cell service is unreliable). The number of call boxes and their distances apart depend on the length of the trail and various at-risk locations on the trail. Generally, they are placed at one mile or half mile intervals from each other as well as at the trail head.

Before committing to call boxes, it is important to consider all the options. One alternative to call boxes is a trail watch program, where volunteers and "friends of the trail" serve as extra eyes and ears for local police forces. Some trails have also implemented successful trail marker systems. The Upper Tampa Bay Trail uses an emergency response numbering system with bright yellow decals placed every 200 feet with individual trail numbers. This allows trail users to provide emergency responders with their precise location along a trail.



3.0 Implementation

3.0 Implementation

The Indian Head Rail Trail extension outlined in this plan will have a positive impact on the quality of life for the residents and visitors of Charles County. However, it will take considerable effort, collaboration, and funding to plan, design, and implement. The County must use its resources sensibly, while being mindful of its long-term goals.

In addition, the incremental development of the trail will require coordination between the County's Planning, Recreation, Parks, and Tourism, and Public Works Departments and other stakeholders, including the Maryland DOT, and private developers or property owners.

How should the County make the Indian Head Rail Trail a reality? This chapter discusses how to continue implementing the community's vision by examining the strategies, policies and partnerships that will provide the framework for a successful project. Detailed implementation components like cost estimates, project phasing, funding, and near/mid-term action items are outlined to realistically move the project towards construction.

3.01 Right-of-Way Acquisition

Many of the proposed alignment segments use public property. In some locations, right-of-way will need to be acquired on private property, or easements gained, in order to fully execute the vision. This occurs where the right-of-way along a public street is constrained or where the preferred route goes through private property. Locations where acquisitions are needed will be validated with a site survey as this project moves into the design phase.

There are many ways to secure and develop right-of-way for greenway systems. It will be necessary to work with some landowners to secure trail right-of-way when it does not exist. This section details a list of specific strategies and policies drawn from programs in the Portland, OR; Aberdeen, NC; Prince Georges County, MD; and non-profit sources including Rails-to-Trails Conservancy (RTC). The information provided includes partnerships and acquisition options to consider in developing the Indian Head Rail Trail extension.

Acquisition Partners

Charles County should pursue partnerships with land trusts and land managers to make more effective use of their land acquisition funds and strategies.

Land trusts. Land trust organizations are valuable partners when it comes to acquiring land and rights-of-way for greenways. These groups can work directly with landowners and conduct their business in private so that sensitive land transactions are handled in an appropriate manner and will often transfer land to the public agency once encumbered.

Private land managers. For example, utility companies that manage land throughout the region. Trails and greenways can be built on rights-of-ways that are either owned or leased by electric and natural gas companies. Electric utility companies have long recognized the value of partnering with local communities, non-profit trail organizations, and private landowners to permit their rights-of-ways to be used for trail development.

Charles County should establish and actively maintain relationships with private utility and land managers to ensure that the community wide greenway system can be accommodated within these rights-of-way. The County will need to demonstrate to these companies that maintenance will be addressed, liability will be reduced and minimized, and access to utility needs will be provided.

Acquisition Tools

As indicated in RTC's *Successful Strategies for Trail Development*, acquiring a right-of-way for a greenway is rarely a simple, straightforward task. The process often requires multiple stages of groundwork, including conducting corridor research to determine who owns the right-of-way, undertaking environmental assessments, negotiating with the landowner, figuring the cost, or value, of the corridor and securing financing or funding.

3.02 Permitting

The Indian Head Rail Trail extension may require a variety of local, state, and federal permits, partially depending on the route alternative chosen. Table 9 provides a high-level summary of potential permitting issues by segment, and the possible permitting agencies that may have jurisdiction over the project. Once a preferred alignment is selected and a concept design developed, this analysis should be revisited to develop a permitting strategy. More information about permits and jurisdictional agencies can be found in Appendix D.

Table 9. Trail Segment Analysis and Possible Jurisdictional Agencies

TRAIL ALIGNMENT	SEGMENT BY SEGMENT ANALYSIS of POTENTIAL PERMITTING ISSUES	POSSIBLE JURISDICTIONAL AGENCIES
Main Connector Route	<ul style="list-style-type: none">Grade-separated crossing of US-301 and sidepaths along MDSHA rights-of-way will require coordination and potentially easementsSidepaths along Charles County rights-of-way may require easementsSidepaths along Demarr Road and LaPlata Road may require tree removal, minor cut and fill or retaining walls	<ul style="list-style-type: none">MDSHA (Maryland Department of Transportation State Highway Administration)Charles County Department of Planning and Growth Management

TRAIL ALIGNMENT	SEGMENT BY SEGMENT ANALYSIS of POTENTIAL PERMITTING ISSUES	POSSIBLE JURISDICTIONAL AGENCIES
Alternative Segments	<ul style="list-style-type: none"> Widening/alteration of bridges over Zekiah and Jordan Runs will likely trigger environmental review Sidepath along Leonardtown Road/MD 5 passes through historic districts in Bryantown and Hughesville <p>Alternative Segment 1</p> <ul style="list-style-type: none"> Use of CSX railroad right-of-way between Demarr Road and Jaybee Lane; rail corridors use and status will dictate issues Sidepath along Demarr Road may require tree removal, minor cut and fill, or retaining walls Crossing of St. Charles Parkway will require a trail crossing design Short segment of sidepath along Radio Station Road may require tree removal, minor cut and fill, or retaining walls Path along perimeter of Laurel Springs Regional Park and Tilghman Park will require coordination with parks Sidepath along LaPlata Road may require tree removal, minor cut and fill or retaining walls <p>Alternative Segment 2</p> <ul style="list-style-type: none"> Use of right-of-way at west border of Heritage at St. Charles development and Demarr Homestead Drive will require easements or acquisition Crossing of St. Charles Parkway will require a trail crossing design likely a new traffic signal Path along perimeter of White Plains Regional Park will require coordination with parks Use of Gleneagles development right-of-way on east side of St. Charles Parkways 	<ul style="list-style-type: none"> Charles County Department of Public Works US Army Corps of Engineers (USACE) Maryland Department of Environment (MDE) Maryland State Historic Preservation Office (SHPO) <ul style="list-style-type: none"> CSX Railroad MDSHA (Maryland Department of Transportation State Highway Administration) Charles County Department of Planning and Growth Management Charles County Department of Recreation, Parks, and Tourism Department of Public Works Heritage Green Development Gleneagles Development PEPCO

TRAIL ALIGNMENT	SEGMENT BY SEGMENT ANALYSIS of POTENTIAL PERMITTING ISSUES	POSSIBLE JURISDICTIONAL AGENCIES
New Route	<p>will require coordination, and potentially easements or acquisition with developer</p> <ul style="list-style-type: none"> • Use of Charles County land between Gleneagles and PEPCO right-of-way may impact existing vegetation or natural resources • Use of PEPCO right-of-way will require coordination with landowner (if not PEPCO) • Sidepath along LaPlata Road may require tree removal, minor cut and fill or retaining walls • Widening/alteration of bridges over Zekiah and Jordan Runs will likely trigger environmental review • Sidepath along Leonardtown Road/MD 5 passes through historic districts in Bryantown and Hughesville 	<ul style="list-style-type: none"> • PEPCO • MDSHA • US Army Corps of Engineers (USACE) • Maryland Department of Environment (MDE)
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3.03 Opinions of Probable Cost

The following opinions of probable cost are planning-level estimates based on concept designs without a full survey. A 30% contingency has been added to account for potential unknowns. The full cost estimates can be found in the appendices.

Cost opinions for this project focused on the cost of the trail facility itself. The estimated costs for the proposed parks, art installations, and wayfinding signs are not included within the scope of this project. Costs for these items will be determined as the County refines the concepts for these project components.

Table 10. Opinion of Probable Cost

Alternative	Opinion of Probable Cost
Main Connector Route	
13.1 mile long sidepath with 0.4 mi. bridge	\$23,983,330
Alternative 1	
15 miles sidepath and trail with 0.4 mi bridge	\$25,924,800
Alternative 2	
14 miles sidepath and trail plus 0.4 mi bridge	\$24,937,300
New Route Option/Alternative 3	
17.3 mi sidepath	\$30,582,600
Trailheads	
	\$25,000

Disclaimer

Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2021 dollars and were assigned based on historical cost data. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; engineering, surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate

herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

3.04 Funding Opportunities

Multiple sources of funding can be combined to finance different aspects of the trail. Dedicated, recurring funding is the most reliable way to build out a robust trail network, including this project and other connecting segments in Charles County. The County should review alternative financing structures—such as reallocating existing funding, taking out an infrastructure bonds, or establishing development impact fees—to determine the approach that best fits with its financial strategy and will result in a sustainable revenue source. Because this project has both transportation and recreation benefits, funding sources from both domains may be considered.

The extension of Indian Head Rail Trail is an ideal project for several federal and state funding sources. Grant programs are available for the design work needed to develop construction-ready plans and for the construction itself. Signage for trail gateways, wayfinding and destinations, and for interpretive wayside rest areas is also available and should be considered concurrently with construction funding.

Programs that provide incentives for private property owners to donate land or enter into trail maintenance agreements with public agencies can also be pursued, especially where the trail would beautify or otherwise enhance the property. These incentives typically are a type of tax benefit, such as a tax credit. Techniques used include a land conservation trust or easements.

Table 11 matches funding sources with rail segments. These recommendations should be considered a starting place for funding trail development.

The funding sources included in this plan are current as of the plan's publication date. Charles County should update this list as part of developing a funding plan as work begins on implementing each trail segment.

Potential Funding Sources

Table 11. Potential Funding Sources

Program Name	Funding Source	Description
Charles County Tourism Grant	Local	Eligible 501c3 compliant organizations in Charles County may be awarded up to \$9,000 for this grant. Desired projects include enhancing county tourism objectives through recreational opportunities and improving trail experiences.

Program Name	Funding Source	Description
Maryland Bikeways Program	Maryland Department of Transportation	The Maryland Bikeways Program supports projects that maximize bicycle access and fill missing links in the state's bicycle system, focusing on connecting bicycle-friendly trails and roads and enhancing last-mile connections to work, school, shopping and transit. On-road bicycle projects, such as bike lane striping, shared lane markings, and wayfinding signage and off-road trails are eligible for funding. Eligible project types include feasibility and design studies; environmental impacts, right-of-way issues, ADA compatibility, outreach, and cost estimates; minor retrofit such as signing, pavement markings, parking, drainage grate replacement; construction.
Maryland Highway Safety Office Grants	Maryland Department of Transportation, Motor Vehicle Administration (MVA)	The purpose of the highway safety grant program is to fund activities aimed at reducing the number of motor vehicle-related crashes, deaths and injuries on Maryland roadways. Funding is available for education, enforcement, and engineering projects which address pedestrian and bicyclist safety.
Bicycle Retrofit (SHA Fund 88)	Maryland Department of Transportation, State Highway Administration (MDOT SHA)	This fund focuses on upgrading existing facilities along a state highway to promote connectivity to existing bicycle facilities and retrofitting areas along state highway where there is an established safety concern that affects bicyclist.
Recreational Trails Program (RTP)	Maryland Department of Transportation, State Highway Administration (MDOT SHA)	RTP funds are federal funds that are disbursed through the Maryland Department of Transportation. These funds can be used to construct and maintain trail facilities. RTP grants require a 20% local match and are administered on a reimbursement basis.
Bicycle Retrofit (Fund 88)	Maryland Department of Transportation, State Highway	This program funds bicycle facilities along the state highway system, including on-road and off-road facilities. Projects should promote connectivity or address safety. Eligible projects are at locations where no other roadway project

Program Name	Funding Source	Description
	Administration (MDOT SHA)	is currently planned. Applicants submit project requests to SHA's Bicycle and Pedestrian Coordinator on an on-going basis.
Program Open Space	Maryland Department of Natural Resources (DNR)	Program Open Space funds and provides technical assistance for the development of recreational land. Projects should provide general outdoor recreation and open space opportunities to the public. Charles County must submit an annual program to the Department of Natural Resources and the Maryland Department of Planning no later than July 1 st . This fund is administered on a reimbursement basis.
FAST ACT-Surface Transportation Block Grant	Federal Highway Administration (FHWA)	Under the FAST Act, the Surface Transportation Program (STP) was renamed the Surface Transportation Block Grant Program. Bicycle and pedestrian activities are broadly eligible under this large and flexible program. The Surface Transportation Block Grant program (STBG) provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.
Transportation Alternatives Program (TAP)	Federal Highway Administration (FHWA)	TAP funds projects that create bicycle and pedestrian facilities and convert abandoned railway corridors to pedestrian trails, among others. MDOT SHA controls a share of the funds to distribute locally through a competitive process. Eligible activities include pedestrian and bicycle facilities and educational programs, landscaping, rail-to-trail conversions, among others. All potential TAP projects require a sponsor for a minimum of 20% of the project costs.

Program Name	Funding Source	Description
RAISE Transportation Discretionary Grants	US Department of Transportation	Formerly known as Better Utilizing Investments to Leverage Development (BUILD), and TIGER grants, fund a broad array of road, rail, transit, and bicycle and pedestrian projects. Projects for RAISE funding will be evaluated based on merit criteria that include safety, environmental sustainability, quality of life, economic competitiveness, state of good repair, innovation, and partnership. Applications are submitted by Maryland DOT annually.
Highway Safety Improvement Program (HSIP)	Federal Highway Administration (FHWA)	HSIP funds are available for safety projects aimed at reducing traffic fatalities and serious injuries. Bike lanes, roadway shoulders, crosswalks, intersection improvements, underpasses and signs are examples of eligible projects. Projects in high-crash locations are most likely to receive funding. States that have identified bicycle safety and pedestrian safety as Emphasis Areas are more likely to fund bicycle and pedestrian safety projects.
Safe Routes to Schools	Federal Highway Administration (FHWA)	This program provides funding for education, enforcement, evaluations and infrastructure improvements near elementary and middle schools that promote students walking and cycling to school.

3.05 Next Steps

The feasibility of the potential alignment, Alternative 3, must be researched and analyzed before the preferred alternative can be selected. Once that work has been completed, that County may want to identify additional design or project goals to help select a preferred route. This may involve working more closely with interagency partners or other stakeholders to further assess long-term plans and feasibility, working with natural resources staff to further identify any permitting issues, or identifying specific funding scenarios.