

A light blue background featuring a faint, white, stylized street map of the Waldorf Urban Area. The map shows a network of roads and streets, with some areas highlighted in a darker shade of blue.

C O N N E C T

W A L D O R F

WALDORF URBAN AREA

Bicycle + Pedestrian Connectivity Analysis

Hey, Thanks Everyone!

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Connect Waldorf



Introduction

What's Pedestrian + Bicycle Planning?

Pedestrian and bicycle planning - often referred to as "active transportation" - is the process of assessing and addressing the needs of a community in the area of bicycle and pedestrian infrastructure, programs, and policies. It involves taking an inventory of the community's existing walking and bicycling facilities, and identifying strategies and tactics to build upon those resources to create safe and accessible streets for all people. Active transportation planning means consulting with the citizens of the community to facilitate their vision of future transportation networks - understanding their concerns, addressing their needs, and charting a way forward so that a more pedestrian and bicyclist-friendly community can be built over time.

Ultimately, active transportation planning is about providing viable transportation choices that create lively streetscapes, a healthy population, and a more livable and sustainable environment that attracts human talent and economic investment for generations to come.

Why Plan?

Walking and bicycling offer an incredibly simple solution to some of our society's most vexing social, public health, economic, and mobility challenges. After decades of being pushed to the margins of society - and our roadways - people are increasingly returning to walking and bicycling in locations where safe and attractive infrastructure is provided.

This exciting trend may be attributed to any number of related factors, but mostly demonstrates the fundamental need to accommodate active transport into a communities' physical and social fabric. Indeed, by almost every measure, those towns and cities that accommodate walking and cycling are our country's most healthy, economically competitive, and desirable places in which to live, work, and visit. Thus, planning for walkability and bikeability also means planning for safer and more livable community.

Connecting Waldorf

The Connect Waldorf Pedestrian + Connectivity Analysis (Connect Waldorf) is the first of many steps Charles County and its partners need to take to transform the Waldorf Urban Area into a place where walking and bicycling can be considered safe and viable daily activities. That said, Waldorf does not exist in isolation. It must also look outward to connect to adjacent communities and an increasingly dynamic Washington D.C. metro region. In doing so, Charles County can do its part to enhance the overall economic and environmental sustainability of the State of Maryland. As the county's main population center, the Waldorf Urban Area is the most important and resource efficient place to start.

Connect Waldorf was commissioned by the Metropolitan Washington Council of Government's Transportation-Land Use Connections (TLC) program. The TLC program supports planning for vibrant and accessible communities. Since 2007, TLC technical assistance has provided short-term consultant assistance to local jurisdictions, such as Charles County, working on creating plans and projects that enhance the region's livability.

Connect Waldorf is comprised of three chapters:

1. Background and Existing Conditions Analysis

This chapter describes and graphically illustrates Waldorf's current conditions for walking / cycling.

2. Network Connectivity Analysis + Recommendations

This chapter puts forth a graphic vision for linking the Waldorf Urban Area with better walking / cycling infrastructure. It's aspirational in its breadth but also realistic in proposing basic interventions that can be applied to common conditions found throughout the study area. To this end, eleven paradigmatic locations were drawn along select arterial routes, each with proposals illustrating a scalable and replicable approach to retrofitting some of Waldorf's most dangerous streets. In some examples you'll note a change in built form. While such changes do take time to realize, depicting a holistic vision that supports walkability is an important element of this study.

3. Implementation

This chapter includes a prioritization matrix, applied to all of the major corridor projects within the study area, typical cost estimates for each project element, and a targeted number of policy recommendations that should be advanced in the near-term, as better software (policy) will lead to hardware (infrastructure) that supports walking and bicycling.

Study Goals

The goal of this Connect Waldorf document is to help Charles County and its partners achieve a balanced and complete transportation system, one that accommodates people of all ages and abilities, no matter their chosen mode or distance of travel. However, the realization of the physical planning and policy goals set forth in this document will require Charles County to reconsider how it allocates local and regional transportation investments. It also mandates that the investments of public funds are more closely coordinated with land use policy. In the end, streets and public right-of-ways are corridors that enable accessibility to jobs, transportation, recreation, and social opportunities. Better balancing Waldorf's streets to perform this function will yield a more prosperous, safe, and dynamic community for all who call Waldorf home. The remainder of this introductory chapter includes basic guidance for doing so.

Project Principles: Access | Safety | Equity



Access

Moving away from auto-centric planning and the incorporation of Complete Streets requires a transition away from prioritizing the single transportation metric that has permeated town planning for three generations: mobility.

According to Todd Litman of the Victoria Transport Policy Institute, "Accessibility (or just access) refers to the ability to reach desired goods, services, activities and destinations..." In other words, access, rather than mobility, is the point of most transportation systems. Shifting to this perspective underscores that there are multiple ways to improve the transportation system, and therefore our communities. These include changing land use patterns so that daily destinations are closer together and improving overall mobility choices with the provision of reliable public transport and safe walking and bicycling infrastructure.



Safety

No matter the mode of travel, safety must be the top priority for any mode of travel within the transportation system. Yet, each year, more than 36,000+ people – a population just over half the size of Waldorf – are killed on America's streets, with thousands upon thousands more injured.

In Waldorf, there are far too many crashes happening each year. Most of these are occurring where jobs and commercial destinations are clustered, but where no safe walking or cycling facilities exist. These crashes cause property damage, serious injuries, and even fatalities.

This study serves as a call to action: building low-stress, safe, and complete streets for all roadway users will save lives and improve access for people of all ages, abilities, and incomes.



Equity

Communities across the country are putting policies and procedures in place to ensure that underserved populations are included in the creation of transportation networks. Charles County should do the same in the Waldorf Urban Area by paying special attention to the disabled, women, children, elderly, communities of color, and the poor. This last group – the poor – includes all of these groups. Part of this financial burden is the high cost of private transportation. Transportation costs are considered affordable if they are 15% or less of household income. According to Center for Neighborhood Technology's Housing + Transportation (H+T®) Affordability Index, the estimated driving costs for an average household in Waldorf is \$14,040/yr, or 110% more than what is considered affordable given Waldorf's median family income of \$84,809. The further below this relatively high income threshold, the greater the burden transportation costs put on individuals and families.

Sustainable Transport: 9 Design Principles

The recommendations in this Study are based on best practices for safe street design, which are summarized in the 9 principles described below.

1. Access and Mobility for Everyone

Streets should allow people to travel in a safe, dignified, and efficient manner no matter their age, gender, or level of ability. The focus of this Study is to not only improve the conditions for walking and biking generally, but to also prioritize the safety of people driving. Indeed, all of Waldorf's streets should seek harmony between multiple modes of travel while allowing for safe and efficient movement of trucks, public transit, and emergency response vehicles.



2. Environmental Sustainability

Sustainable streets protect and enhance natural ecosystems with tools like rain gardens, pervious pavement, and bioswales that mitigate stormwater impacts. Street trees are a vital part of sustainable streets: they provide shade, filter the air, slow traffic, and provide aesthetic value for businesses. Indeed, street trees have been associated with lower crime rates and higher household income, and also increase home values. Integrating ecological considerations into street design can also ease maintenance costs, as uncontrolled stormwater can damage street surfaces over time.



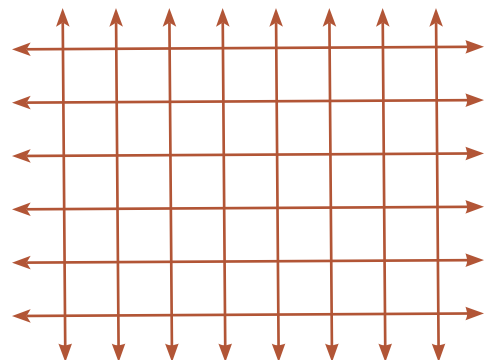
3. Safety + Security

Streets should be designed to reduce or eliminate traffic-related fatalities or serious injuries. Vehicle speed is one of the most significant factors in crash severity, so controlling speed through design has a big impact on street safety for everyone. Personal safety is also closely connected to an increase in public life – well-lit streets that encourage walking and biking throughout all hours of the day provide more "eyes on the street," and increase people's sense of security and connection to their community.



Connectivity

A connected street network helps make walking and biking viable and disperses traffic across the network, obviating the need for frequent road widening. Thus, intersection density is one of the most important ways to create slower, safer streets; higher ratios of intersection per sq. mile are associated with fewer fatalities. Where existing and proximate streets cannot be connected to the street grid, multi-use paths should be used to improve connectivity for people walking and biking.



Compact Land Use

A great land use plan is also a great transportation plan. Indeed, good street design is inherently connected to land use – compact land use patterns and connected multi-modal streets support transportation options and reduce demand for drive-alone trips, easing parking pressure and traffic congestion. Any / all transportation planning in Waldorf should also include land use strategies that provide essential services within walking distances of people’s homes and/or jobs.



Climate Considerations

All transportation plans should respond to local environmental factors such as regional climate. Recommendations for improving walking and biking conditions in Waldorf must embrace the city’s four seasons and integrate best practices for providing safe and comfortable walking and biking options year-round. This will surely include seasonal maintenance, landscaping enhancements, and bus stop amenities.



Comfort

When creating new walk and bike infrastructure, comfort is a very important consideration. For example, sidewalks should be made as wide as practical and retrofitted to be fully ADA accessible. They should feature amenities such as benches and street trees. Bikeways and shared use paths (hiker-biker trails) should allow people to be separated from passing motor vehicles, and be designed to allow people to pass each other safely and ride two abreast wherever possible.



Economic Development

Well-designed streets have been shown to generate higher revenues for businesses, and increase home values. Waldorf’s streets should be designed to support a mix of commercial and cultural activities, and be leveraged to attract economic opportunities and talent to St. Charles County. If this approach is realized, Waldorf has the chance to stand out from its suburban peers as a viable alternative to the increasingly expensive core and inner ring communities across Metro D.C.



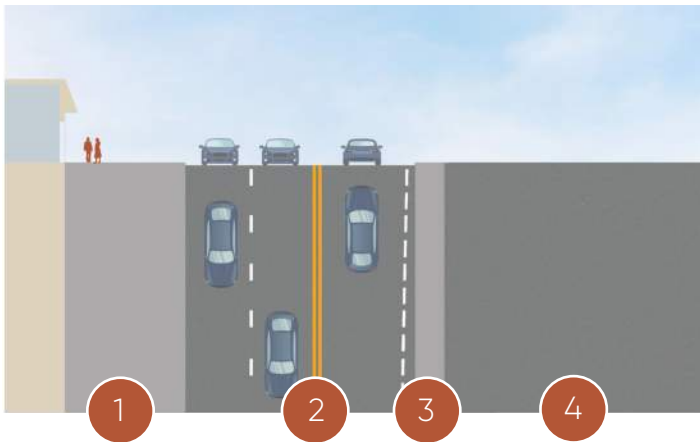
Action!

Waldorf can start improving safety now with low-cost materials. Indeed, transportation safety and neighborhood enhancement projects like curb extensions, high-visibility crosswalks, bike lanes, and pedestrian refuges may be implemented quickly, with little else than paint. For large projects that require capital planning and investment, Waldorf may look for opportunities to use demonstration and/or “pilot” projects to test options and inform public decision-making before committing to big ticket infrastructure investments.



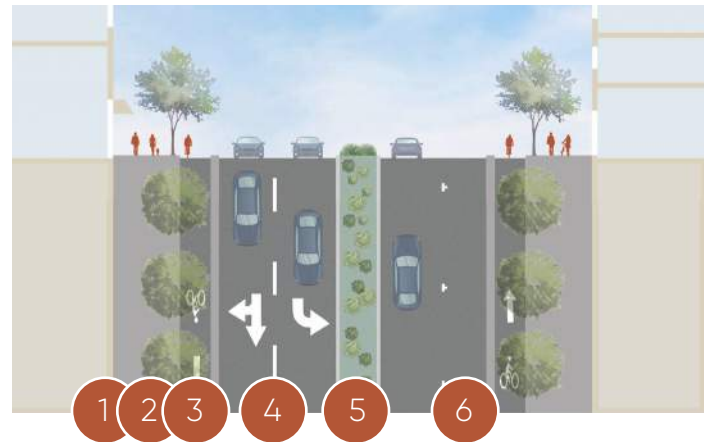
Creating Complete Streets

Incomplete Street



- 1 Frontage Surface Parking Lot
- 2 Vehicular Movement-Only Travelways
- 3 Narrow, Unlandscaped Sidewalk
- 4 Vacant Lot / Surface Parking Lot

Complete Street



- 1 Active, Pedestrian-Oriented Frontage
- 2 Landscaped, Wide Sidewalk
- 3 Protected Bike Lane
- 4 Vehicular Travel Lane
- 5 Stormwater Median / Pedestrian Island
- 6 On-Street Parking

What's a Complete Street?

Complete Streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists, and transit riders of all ages and abilities must be able to move safely along and across the transportation network. Complete Streets policies, such as the one passed by Maryland's State Highway Administration in 2011, are intended to ensure that transportation agencies and municipal officials routinely design and operate the entire right-of-way to enable safe access for all users.

The fundamentals of Complete Streets policy, as defined by Smart Growth America, focus on safety and inclusion of all thoroughfare users regardless of age and ability. There is no specific formula for Complete Streets design, as so many complex decisions must be made in response to built, social, and economic context. Thus, Complete Streets does not mean simply adding a bicycle lane or a crosswalk where previously there was none. Instead, Complete Street policies seek to provide meaningful transportation choices for all people while also emphasizing outcomes that lead to a healthy and active public realm.

The Complete Streets approach elevates all users of the street onto an equitable playing field and changes the way transportation projects are conceived and delivered, ultimately creating a safer community and a more efficient transportation system for everyone.



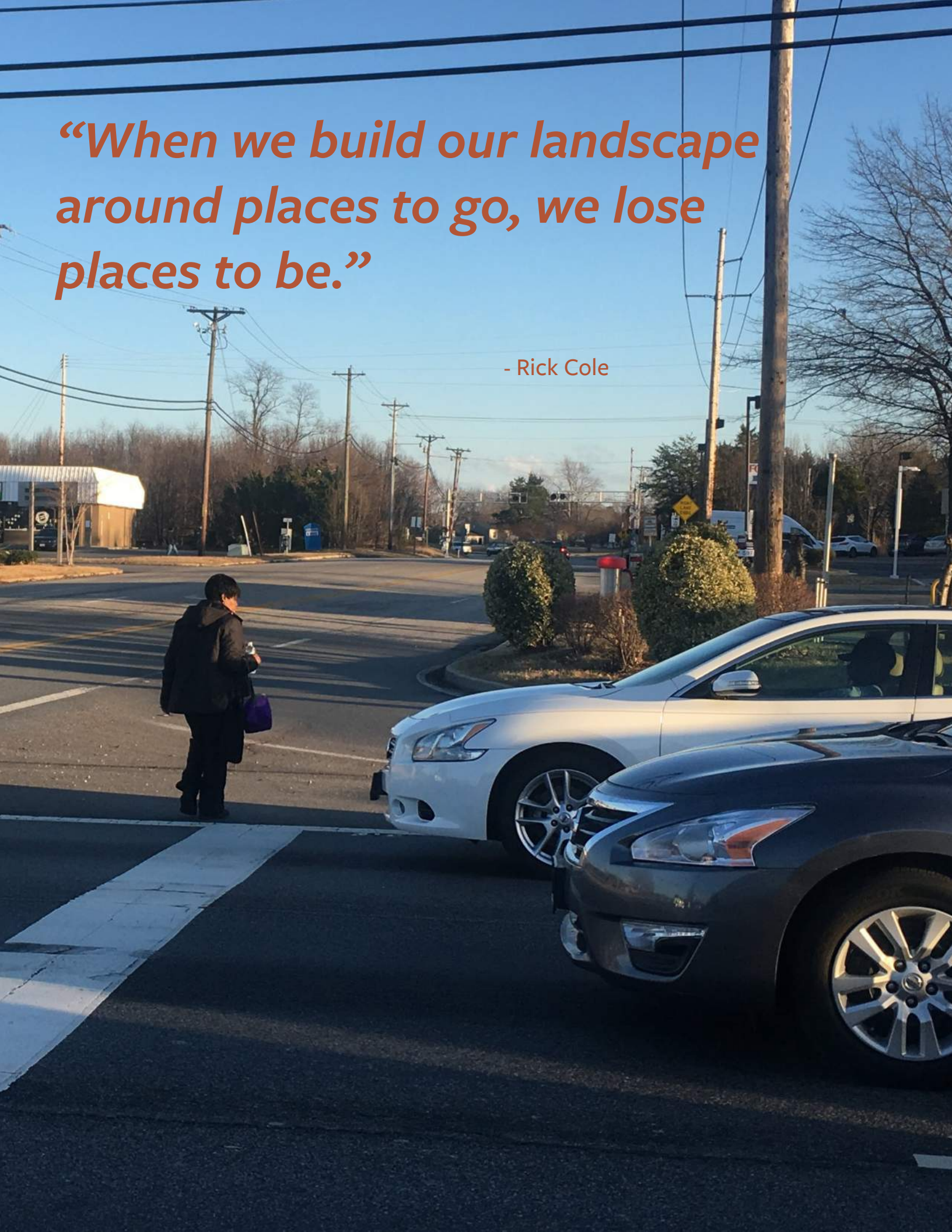
Complete Streets Characteristics

Complete Streets may be further by their ability to accomplish the following 11 outcomes:

- ① Ensure thoroughfares create a safe environment for all users, recognizing that there are different needs for various transportation modes (walking, cycling, transit, driving, freight etc.);
- ② Provide pedestrians with a contiguous network of sidewalks that are wide enough, landscaped, and safe to cross at all intersections;
- ③ Include a network of physically separated or otherwise low-stress bicycle network that allows people to safely access a full range of community destinations;
- ④ Provide public spaces where people can gather to enjoy social and physical activity;
- ⑤ Mitigate the negative social, economic, and health impacts caused by traffic congestion;
- ⑥ Provide safe routes to school for kids and safe routes for older adult populations;
- ⑦ Create physically active communities where public health is valued;
- ⑧ Develop a multi-modal transportation system;
- ⑨ Allow greater route choice for pedestrians and bicyclists;
- ⑩ Place a renewed focus on access, safety, and equity, no matter the chosen mode of transportation

*“When we build our landscape
around places to go, we lose
places to be.”*

- Rick Cole



EXISTING CONDITIONS

Introduction

To become familiar with the study area, the planning team reviewed all relevant county plans and data sets. This included the Charles County Bicycle and Pedestrian Master Plan (2012), which established a vision that this planning study supports and expands within the Waldorf Urban Area. Existing conditions were also documented and reviewed by surveying the study area multiple times with County staff. Finally, a key stakeholder meeting and public workshop helped the planning team better understand the challenges and opportunities to improve walking and cycling across Waldorf, while also obtaining draft recommendation feedback.

Summary

Whether for transportation or recreation, the Waldorf Urban Area is a challenging place to walk. The broad scale of arterial roadways, lack of linked sidewalks, and a disconnected street network make walking inconvenient, unsafe, and unappealing for many residents. Existing sidewalk links vary in quality and width, reflecting several generations of development standards and maintenance practices, and the presence of pedestrian ramps, crosswalks, and pedestrian signals are inconsistent at best, or at worst completely absent at many intersections.

If walking is challenging, then cycling is even more so. The facilities that exist - mainly shared use paths - are disconnected, feature few safe and predictable intersection crossings, and feature little to no wayfinding. Beyond the patchy off-street network, Charles County has not actively pursued the implementation of an on-street bikeway network, which would ideally link residential neighborhood, schools, and open space amenities with the commercial, entertainment, and employment destinations along Waldorf's arterial and collector streets.

Fortunately, Waldorf is not starting from scratch. The newest generation of subdivisions increasingly feature connected sidewalks of adequate width, off-street walking paths link neighborhood homes with schools, and a growing network of off-street shared use paths (often referred to locally as "hiker biker trails") provide comfortable and safe facilities along some segments of high-speed arterials. The popularity of the Indian Head Rail Trail also demonstrates how well-designed facilities attract a wide user-base. These recent advancements provide a base from which to expand and improve the walking and cycling network.



The popularity of the Indian Head Rail Trail demonstrates how well-designed, safe facilities attract a wide user-base.



Waldorf's newer subdivisions provide better internal connectivity for people on foot, but often lack external connections to key destinations.



Improving safe access to transit is a key reason to invest in walking and bicycling infrastructure.



Relying on property developers to complete the pedestrian network leads to many gaps and "crosswalks to nowhere," such as at St. Patrick's Drive and Smallwood Drive.

Connect Waldorf

- Existing Pedestrian Network -



Existing Walking Network Analysis

The existing walking network includes four basic types of facilities, which are mapped on the previous page. They are:

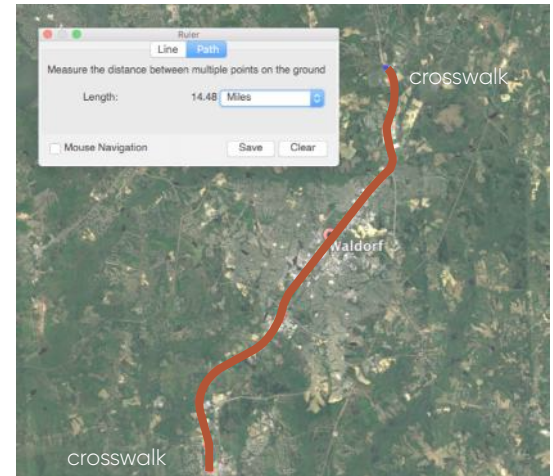
- Sidewalks of inadequate width (less than 5' wide)
- Sidewalks of adequate width (more than 5' wide)
- Walking paths (generally paved, less than 8' in width)
- Shared use paths (8' or wider, intended to be shared with other user types (cyclists, rollerbladers, etc.)

In addition, a 5th "facility" was observed, which are the informal pedestrian paths worn into the grass. These "buffalo paths" are found in locations where sidewalks do not exist. They should be considered a great indicator for where investments in the sidewalk network are needed

Mapping pedestrian connectivity revealed four basic findings:

- 1 The neighborhood's in Waldorf's southeast and southwest quadrants feature decent connectivity internally, but often have sub-standard sidewalks or shared use paths. However, few quality connections exist between neighborhoods, which effectively limits walking as an alternative to driving (see image in lower right of this page)
- 2 The northern half of the study area is largely devoid of pedestrian connectivity. These "sidewalk deserts" need to be linked with much better walking facilities east-west and north-south.
- 3 Despite being lined by bus stops, jobs, and a diversity of commercial and entertainment destinations, Crain Highway cleaves the study area into two distinct separate halves, as no walking or cycling facilities exist along or across this critically important regional corridor.
- 4 In order to meet basic ADA and general safety standards, many intersections need to be retrofitted with tactile curb ramps, high-visibility crosswalks, and other safety features.

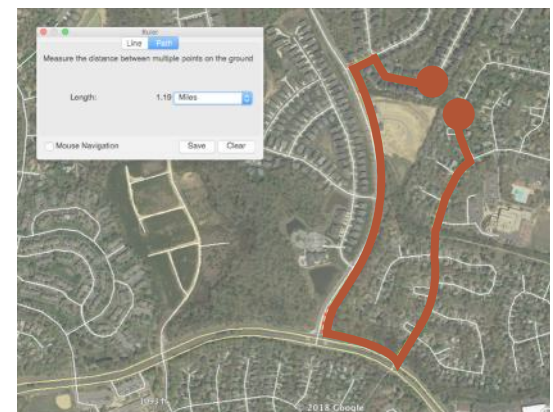
Everyone living, working, or visiting Waldorf deserves better and more places to walk. The next two sections in this report (recommendations + implementation) identify how Charles County and its many partners can begin retrofitting Waldorf's streets to welcome everyone.



Despite all of the bus stop, employment, and commercial activity, there is a 14.5-mile gap between marked / signalized crosswalks across Crain Highway.



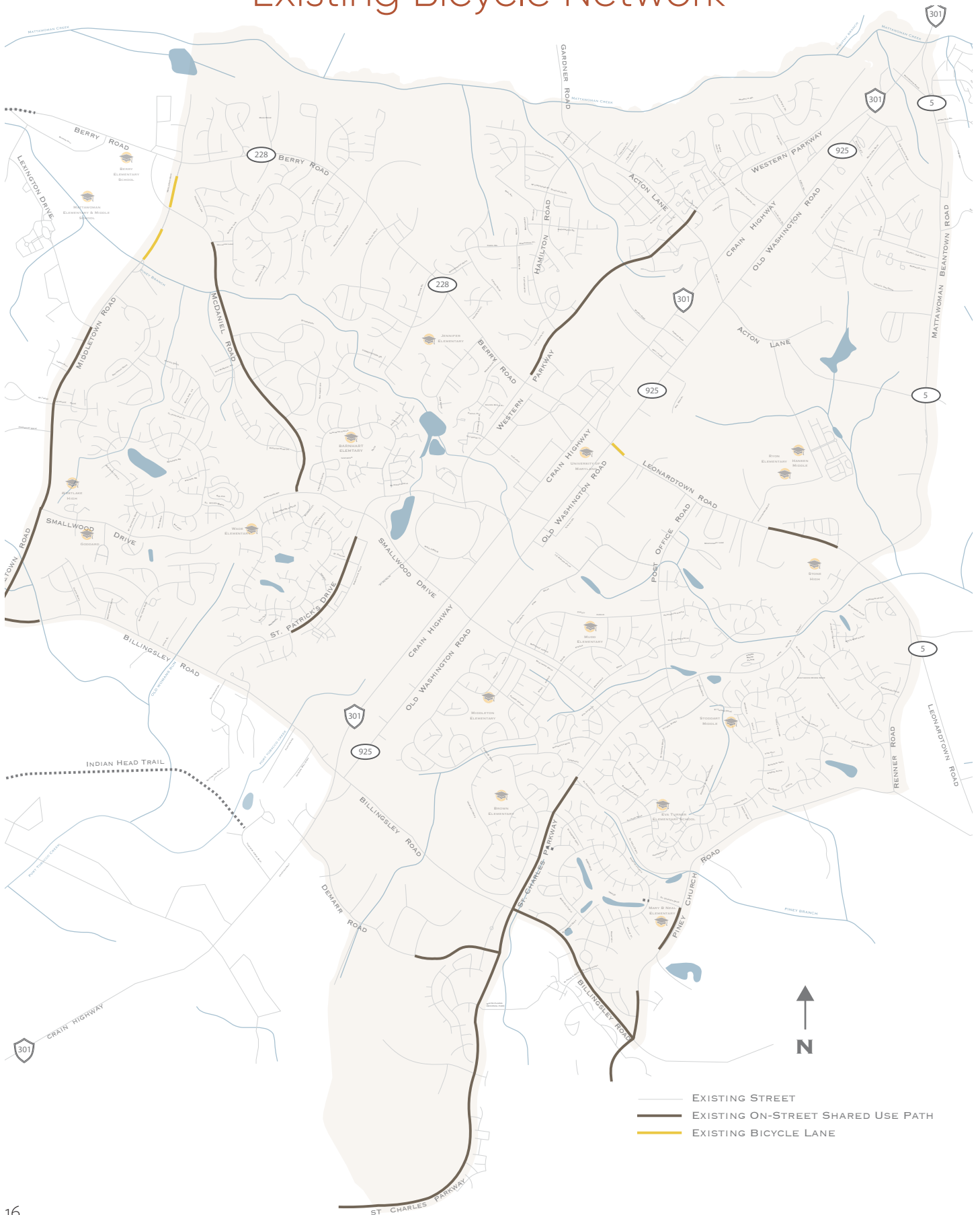
Using a scale of 1 - 100, the real estate site Walkscore helps users measure proximity to public transit, daily destinations, and other recreational amenities. This analysis tool revealed that Waldorf is indeed a very car-dependent environment.



Intersection density is one of the most common ways to evaluate connectivity and is also a strong predictor for whether people walk or not. For example, even though sidewalks exist along the route above, walking between the two homes requires a 1.2-mile walk, even though the homes are only 120 feet apart. Multiply this condition across all of Waldorf and it becomes clear that a lot of vehicle trips could be replaced by walking (or biking!), if only the streets were more well-connected.

Connect Waldorf

- Existing Bicycle Network -



Existing Bicycle Network Analysis

The existing bicycle network includes two basic types of facilities, which are mapped on the previous page. They are:

- Shared use paths
- Bicycle lanes

There are approximately 21 miles of shared use paths available for cycling in Waldorf. Most of these links are disconnected from each other and therefore provide little utility to people who would like to bicycle for transportation or utility purposes. Additionally, only three small segments of on-street bike lanes exist, which together comprise about a third of a mile. These short segments are not well-designed and are located along high-speed, high-volume roadways. The lack of physical protection, to say nothing of their short length, make their use unappealing for the vast majority of existing or would-be bicyclists.

In short, mapping Waldorf's bicycle facilities revealed three basic findings:

- 1 Whether paved or concrete, few shared use paths feature design details (wayfinding, striping, markings, intersection treatments, signals) that support the intended, safe use of the system
- 2 A more complex palette of contextually-appropriate bikeways will be needed to form a coherent and safe network. Facilities may include on-street, traffic-calmed Neighborhood Greenways; conventional, buffered, and protected bicycle lanes; and an improved shared use path system that serves as the system's backbone. Many links in this system already exist but exist as narrow sidewalks that if widened would become true multimodal assets for the Waldorf community.

- 3 Well-designed bicycle parking facilities are almost non-existent and will need to be implemented at key commercial, recreational, transit, employment locations.

Everyone living, working, or visiting Waldorf deserves better and more places to bicycle. The next two sections in this report (recommendations + implementation) identify how Charles County and its many partners can start retrofitting Waldorf's streets to encourage more people to bike more often.



Even if facilities exist, few people will choose to bicycle if they are required to do so adjacent to high-speed traffic.



Widening and detailing existing paths along arterials would help attract a more diverse audience of users.

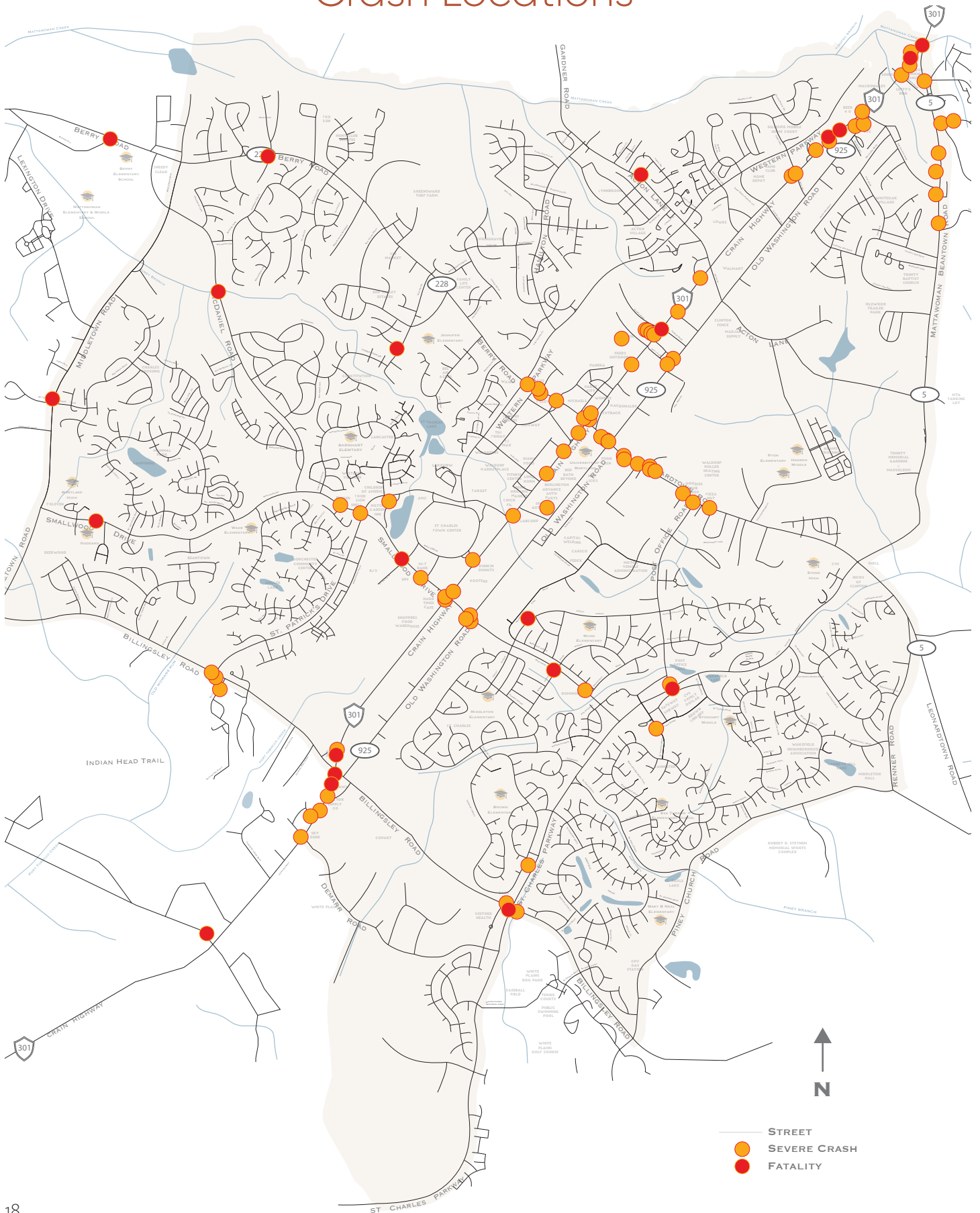


The Indian Head Rail Trail provides an excellent local model for how other links in the network can be designed.



This location is one of the only links in the existing shared use path system to feature signage.

Connect Waldorf - Crash Locations -



Crash Analysis

Introductions

A crash location analysis was undertaken using data provided by the the Washington College Tri-County Crash Map, which displays 2015, 2016, and Q1 2017 ACRS (Automated Crash Reporting System) Crash Data.

Two layers from the map were analysed; Incident locations for serious and fatal crashes, and Incident locations for pedestrian incidents of all injury severity (crash data involving people bicycling was not available).

Crash Zones

The data was analyzed, mapped (see map at on previous page), and tallied (see table below) across the study area. The results high concentrations of serious and / or fatal crashes along most of Waldorf's high-speed 'Principal' and 'Intermediate arterial' corridors. This includes Crain Highway, the 'Principal Arterial' through the study area, and Berry Road, Leonardtown Road, Billingsley Road and Mattawoman Beantown Road. These corridors feature higher volumes of use as well as designs that encourage higher speeds. This results in higher chance for crash incidents, which tend to be more serious, and even fatal due to the higher rates of speed.



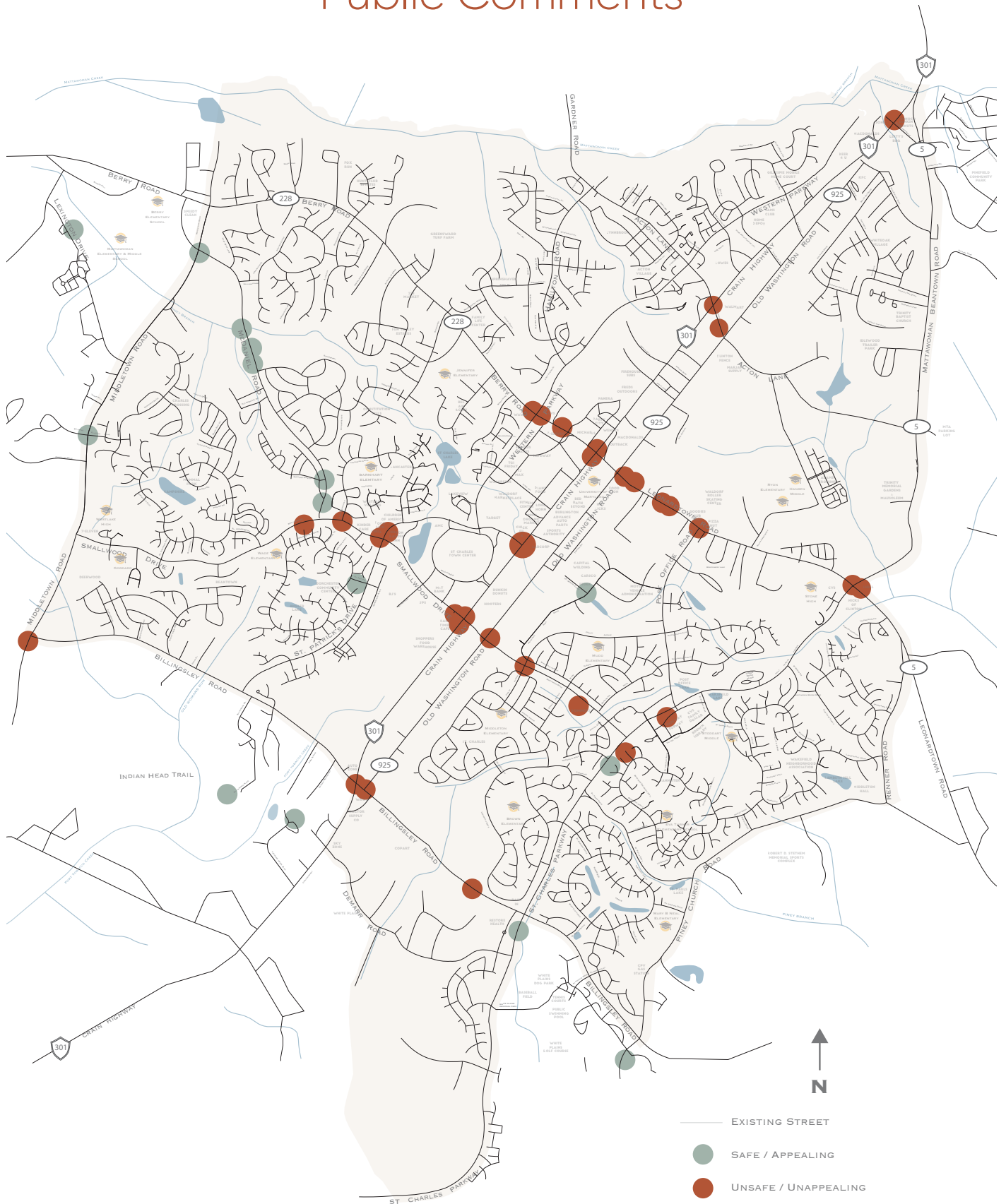
The vast majority of Waldorf's crashes, many of which involve pedestrians, are occurring in seven cluster zones. The Crain Highway and Leonardtown Road cluster is of particular concern, as there is essentially no bicycle or pedestrian accomodations in this important commercial node.

Crash Corridor	Serious	Fatal	Total
Crain Highway (North)	10	4	14
Mattawoman Beantown	6	0	6
Crain Highway (Central)	21	1	22
Berry Road	4	0	4
Leonardtown Road	9	0	9
Post Office Road / St. Charles Parkway	2	1	3
Smallwood Road	13	3	16
Billingsley Road / Crain Highway	11	4	15
Total	76	13	89

Crash Clusters

Crash clusters were then mapped where there were more than one crash of any severity at the same intersection, or within 50' of each other. The result is a serious of crash 'hot spots' that should be considered for safety improvements.

Connect Waldorf - Public Comments -

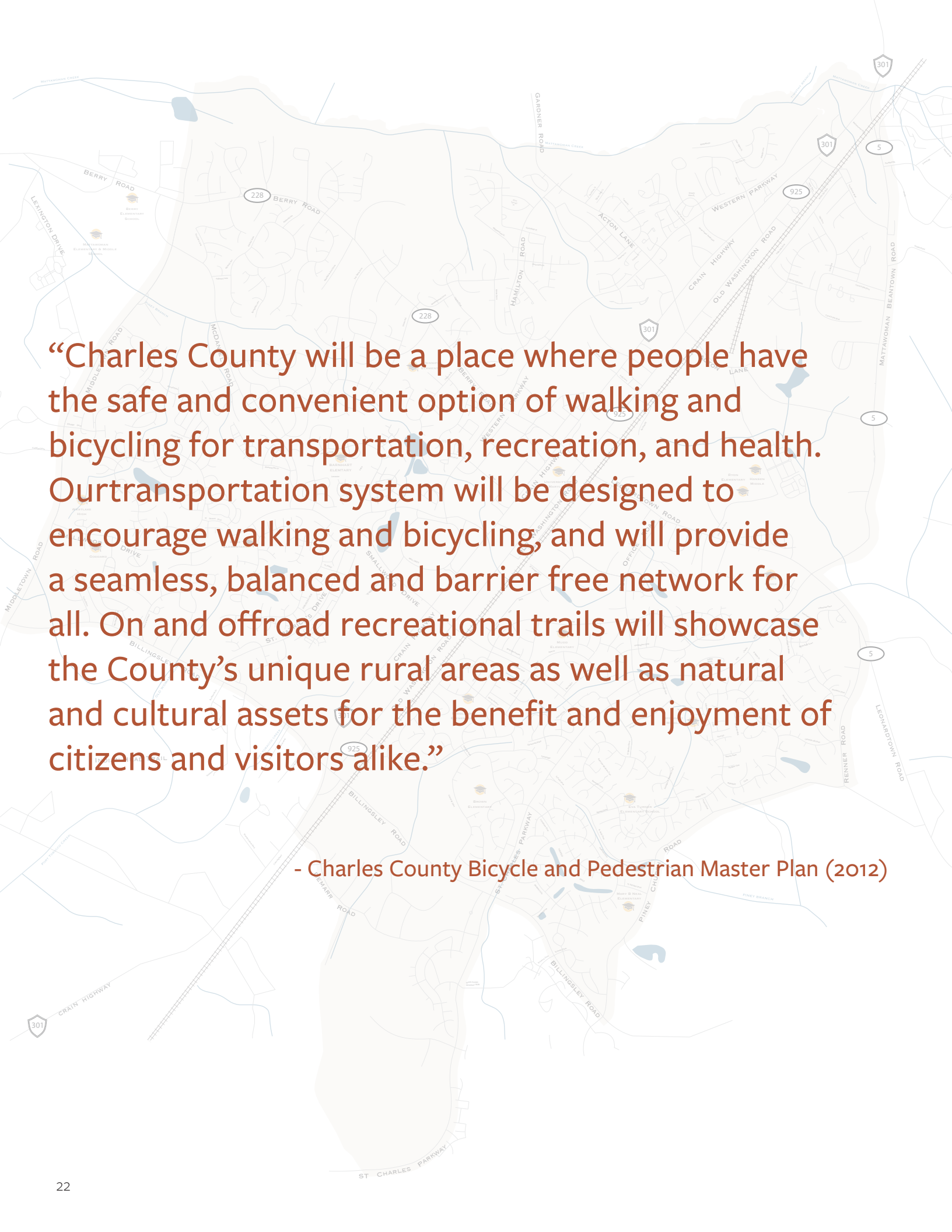




Public Input

A key stakeholder meeting as well as an open community workshop was held on April 4th, 2018. A presentation of draft concepts was shared at both meetings for feedback, which was generally quite positive. Stakeholder and workshop participants also had the opportunity to provide location-specific feedback for places that are safe and appealing (green dots) and those that are unsafe and unappealing (red dots). A few corridors really stood out as being in need of improvement, including Leonardtown Road, Smallwood Drive, and Crain Highway. All of these locations showed up as clusters in our crash analysis. Unsurprisingly, the green dots were mostly placed along existing path segments or quieter residential streets.



A detailed map of Charles County, Virginia, showing a network of roads, including major highways like 301, 925, and 228. The map also indicates the locations of various schools and parks. The text is overlaid on the map in a brown, serif font.

“Charles County will be a place where people have the safe and convenient option of walking and bicycling for transportation, recreation, and health. Our transportation system will be designed to encourage walking and bicycling, and will provide a seamless, balanced and barrier free network for all. On and offroad recreational trails will showcase the County’s unique rural areas as well as natural and cultural assets for the benefit and enjoyment of citizens and visitors alike.”

- Charles County Bicycle and Pedestrian Master Plan (2012)

RECOMMENDATIONS

The recommendations contained herein are informed by the consultant team's data collection, existing conditions analysis, key stakeholder and public input process, and a best practices approach to pedestrian and bicycle connectivity. This resulted in a 16-point priority plan for general physical design and policy recommendations as well as more detailed proposals for walking and bicycling connectivity at eleven representative locations found across the study area. In general, these recommendations are intended to further advance the goals, policies, and objectives outlined in the 2012 Charles County Bicycle and Pedestrian Master Plan.

GENERAL PHYSICAL DESIGN RECOMMENDATIONS

- 1 Retrofit collector and arterial streets with new or wider sidewalks and/or shared use paths; implement a range of intersection crossing improvements including crosswalks, signals, refuge islands, raised crossings etc.
- 2 Introduce traffic-calming, wayfinding, and other pedestrian and bicycle amenities within a network of "neighborhood greenways" along residential streets.
- 3 Undertake lane re-assignments wherever possible to allow for protected bike lanes, wider sidewalks, shorter crossing distances;
- 4 Utilize stream corridors for soft-surface or paved shared use paths linking neighborhoods and commercial areas with quality and accessible open space.
- 5 Redesign Old Washington Road as model complete streets project for Charles County, setting the stage for more walkable, transit-oriented development in the heart of Waldorf.
- 6 Connect the bicycle and pedestrian network to the Indian Head Trail.
- 7 Ensure all schools have safe, low-stress bicycle and walking connections.
- 8 When in need of replacement, require HOA's to retrofit all existing sidewalks to be a minimum of 5' in width, and existing shared use paths to be at least 8' in width.
- 9 Transition all existing and require new sidewalks/paths to be ADA-compliant; Ensure ADA compliance at all VanGO stops.

GENERAL WALKING AND BICYCLING POLICY RECOMMENDATIONS

- 1 Adopt a Complete Streets policy and incorporate it into the Chapter 276 Streets, Roads, and Sidewalks ordinance; specifically within the Urban Roads Standards District;
- 2 Install a moratorium on all street or road widenings until a County complete streets policy is passed, thereby creating more options for walking and cycling connectivity in Waldorf.
- 3 Follow through on the Comp Plan Transportation Element policy recommendation to continue developing a connected network of local streets to mitigate travel demand along regional thoroughfares.
- 4 Develop minimum intersection density / connectivity sub-division standards for all zoning code designations, except: IH, RC, WCD, RR, and RL; Consider adopting a mandatory or incentivized form-based code to replace the current use-based, Euclidean zoning code to ensure land use is more closely regulated with desired transportation outcomes.
- 5 Develop a Safe Routes to School program focused on further improving bicycling and walking connections between residential neighborhoods and schools.
- 6 Adopt a Vision Zero policy framework, outlining strategies to reduce traffic fatalities to zero.
- 7 Replace conventional LOS metrics with Multi-Modal LOS and pedestrian delay metrics.



Walking Network Recommendations

The proposed Waldorf Walking Network focuses on improving existing sidewalks, as well as building new sidewalk links in areas where the infrastructure is currently lacking. Additionally, this network plan seeks to improve on and off-street shared use paths that take advantage of generous arterial right-of-ways and existing stream/riparian corridors.

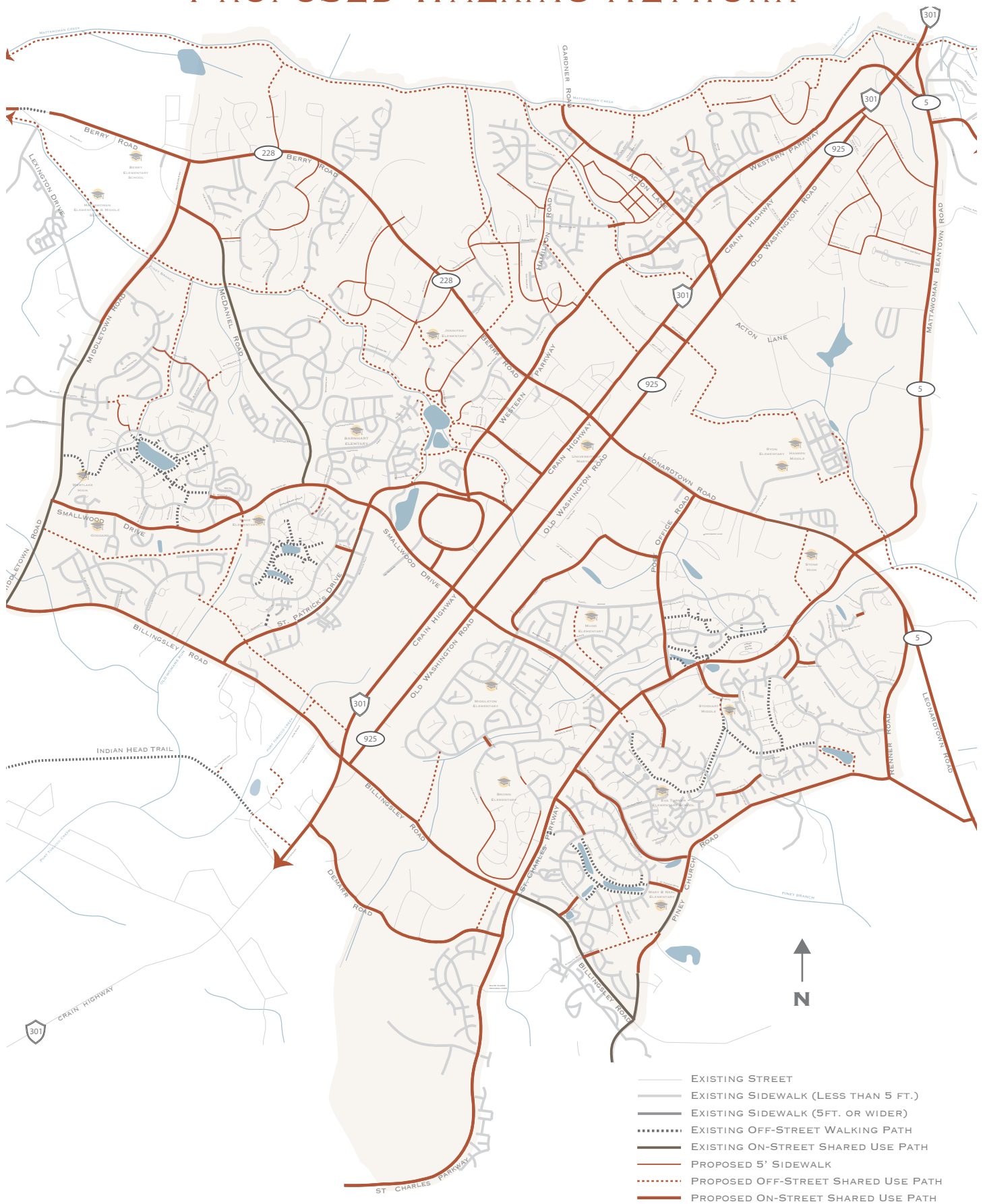
The Map at right depicts three types of network improvements:

- 1 5' or wider sidewalks for all new residential sidewalks; retrofit sub-standard sidewalks over time
- 2 8' or wider off-street shared use paths (gravel or paved/concrete)
- 3 8' or wider on-street shared use paths

Together, this approach will help knit Waldorf's pedestrian system into a more complete network of standardized and safe walking routes. To accomplish this outcome, Charles County zoning regulations, ordinances, and policies (see previous page) will have to be updated so that safer, more accessible streets are built or reconstructed for all users. The County should focus on building these new or reconstructed links with the following methods: dedicating capital funding stream for such improvements; pursuing federal/state grants to fund eligible infrastructure projects; requiring new standards for HOA's as neighborhood networks need to be rebuilt/resurfaced; and simply adding improvements as local streets are up for repaving/resurfacing (especially intersection treatments).

CONNECT WALDORF

- PROPOSED WALKING NETWORK -





Bicycle Network Recommendations

The proposed Waldorf Bicycling Network focuses on improving existing streets and shared use paths, as well as building new bicycling links in areas where the infrastructure currently doesn't exist. Because it overlaps with the walking network, the Waldorf bicycle connectivity plan also seeks to improve on and off-street shared use paths that take advantage of generous arterial right-of-ways and existing stream/riparian corridors.

The map at right depicts six contextually-appropriate bikeway types. They are:

Class I

- ① On-street shared use paths
- ② Off-street shared use paths
- ③ On-street protected bike lanes

Class II

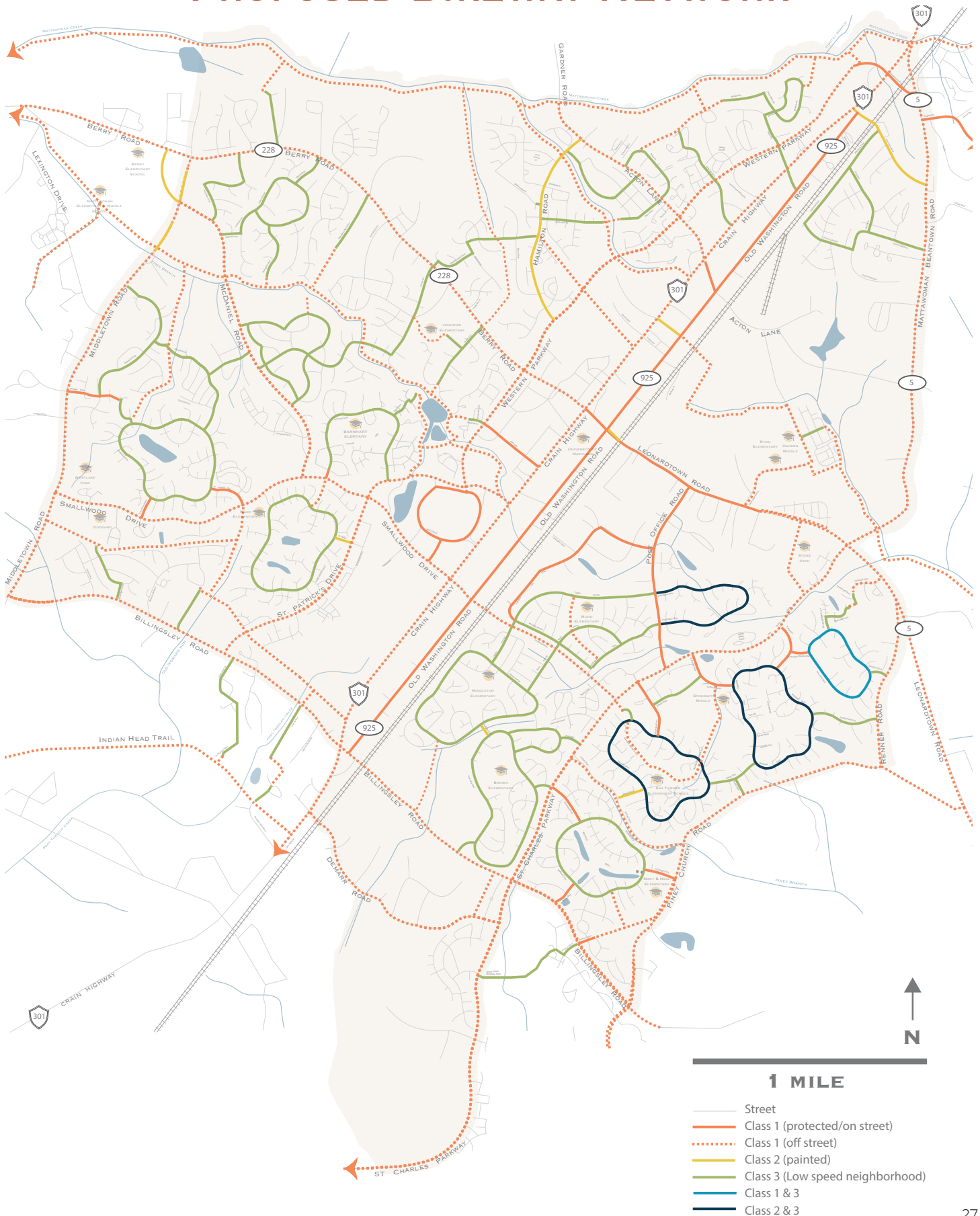
- ④ Conventional bike lanes
- ⑤ Buffered bike lanes

Class III

- ⑥ Neighborhood Greenways

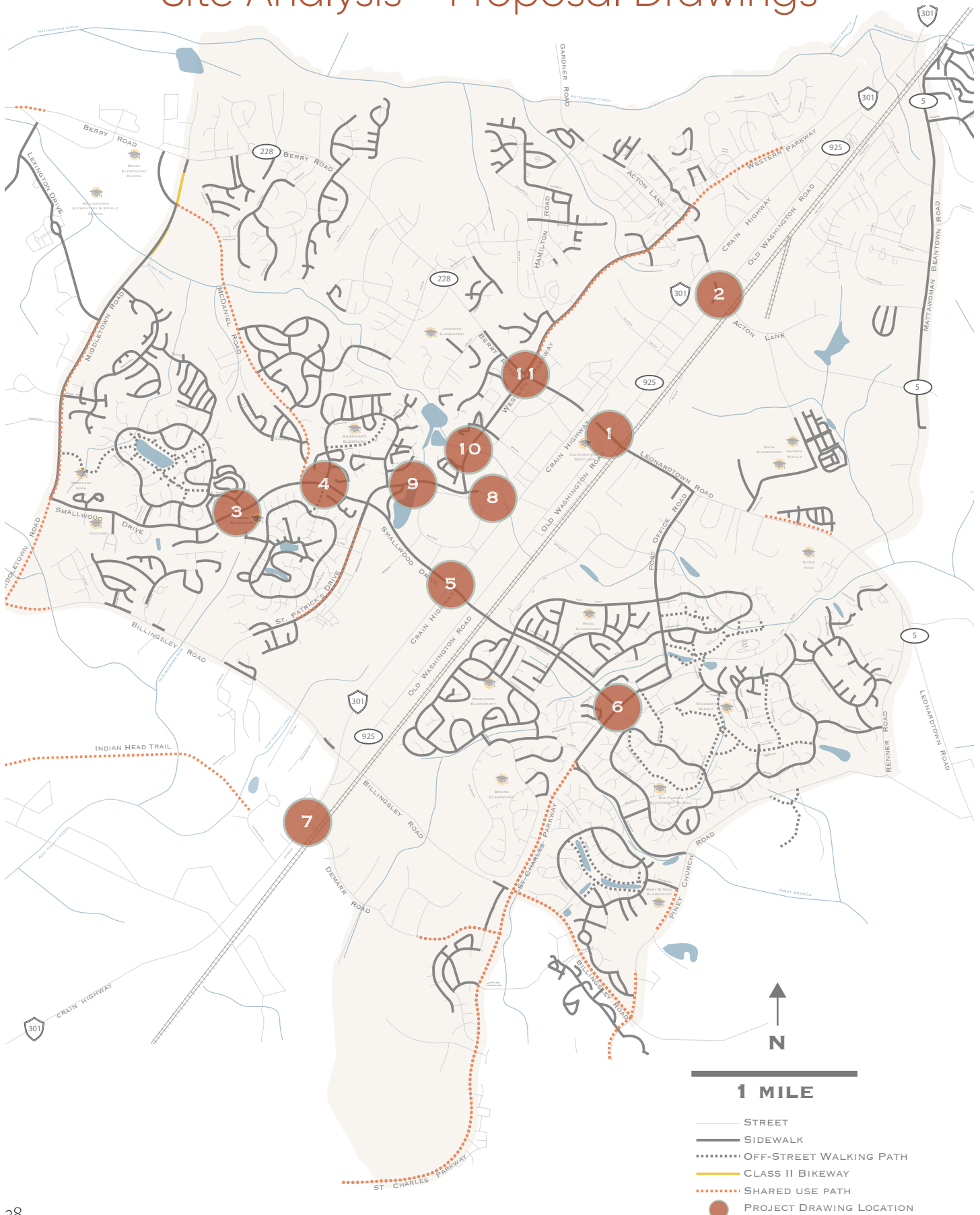
This recommended palette of bikeway infrastructure seeks to build a low-stress network that truly works for people of all ages and abilities. To achieve this goal, Charles County will have to rethink how it approaches street design and dedicate resources such as capital funding; pursuing federal/state grants to fund eligible infrastructure projects; requiring new standards for HOA's as neighborhood shared use paths need to be rebuilt/resurfaced; and by simply adding bikeway improvements as local streets are up for repaving/resurfacing.

CONNECT WALDORF - PROPOSED BIKEWAY NETWORK -



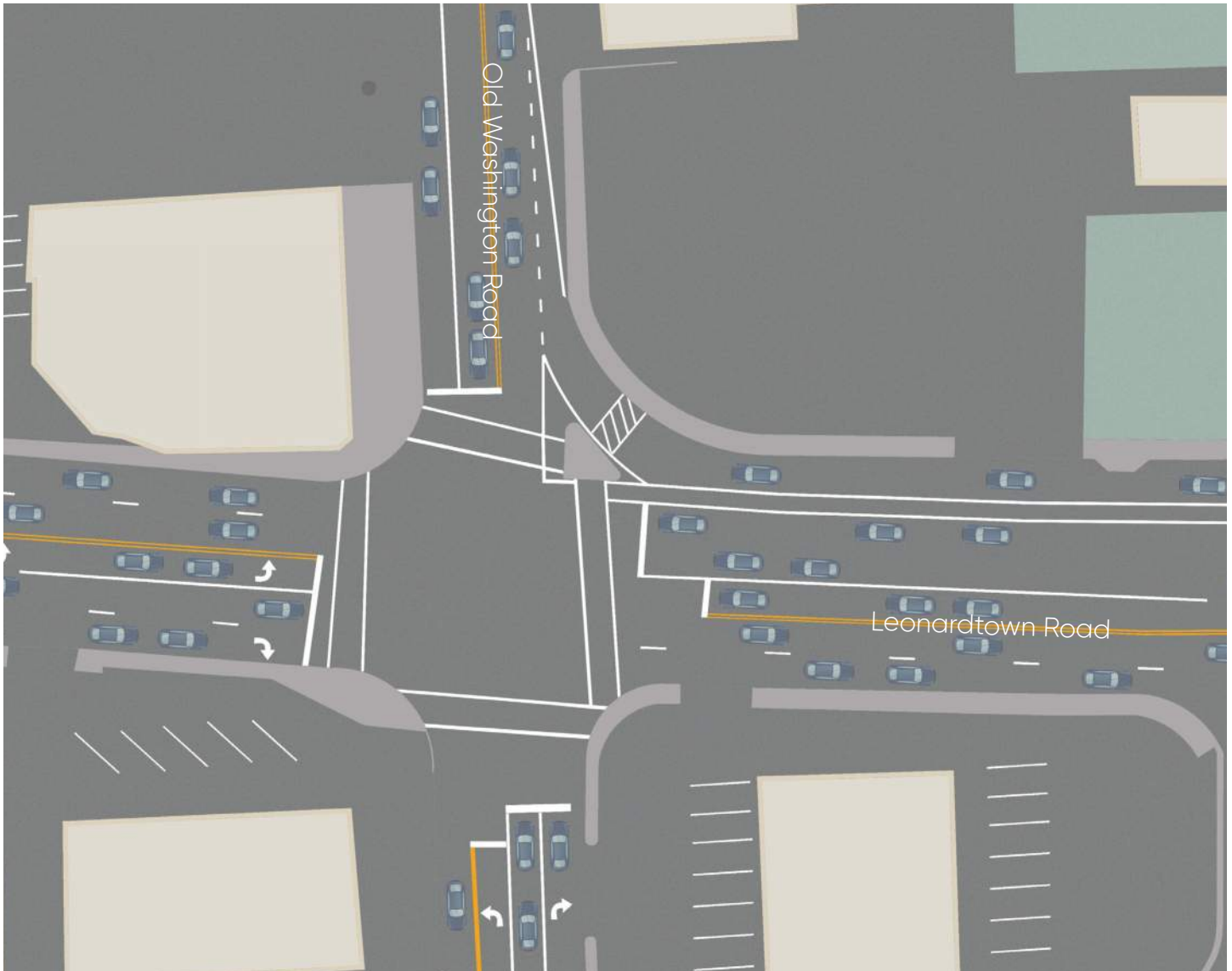
Connect Waldorf

- Site Analysis + Proposal Drawings -

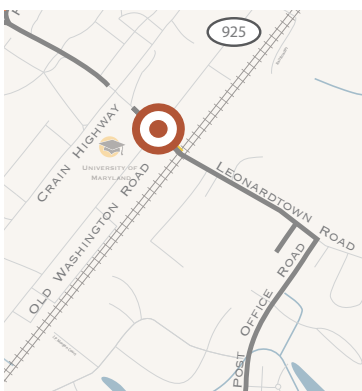


1. Old Washington Road @ Leonardtown Road

Existing Condition



Existing Context Map

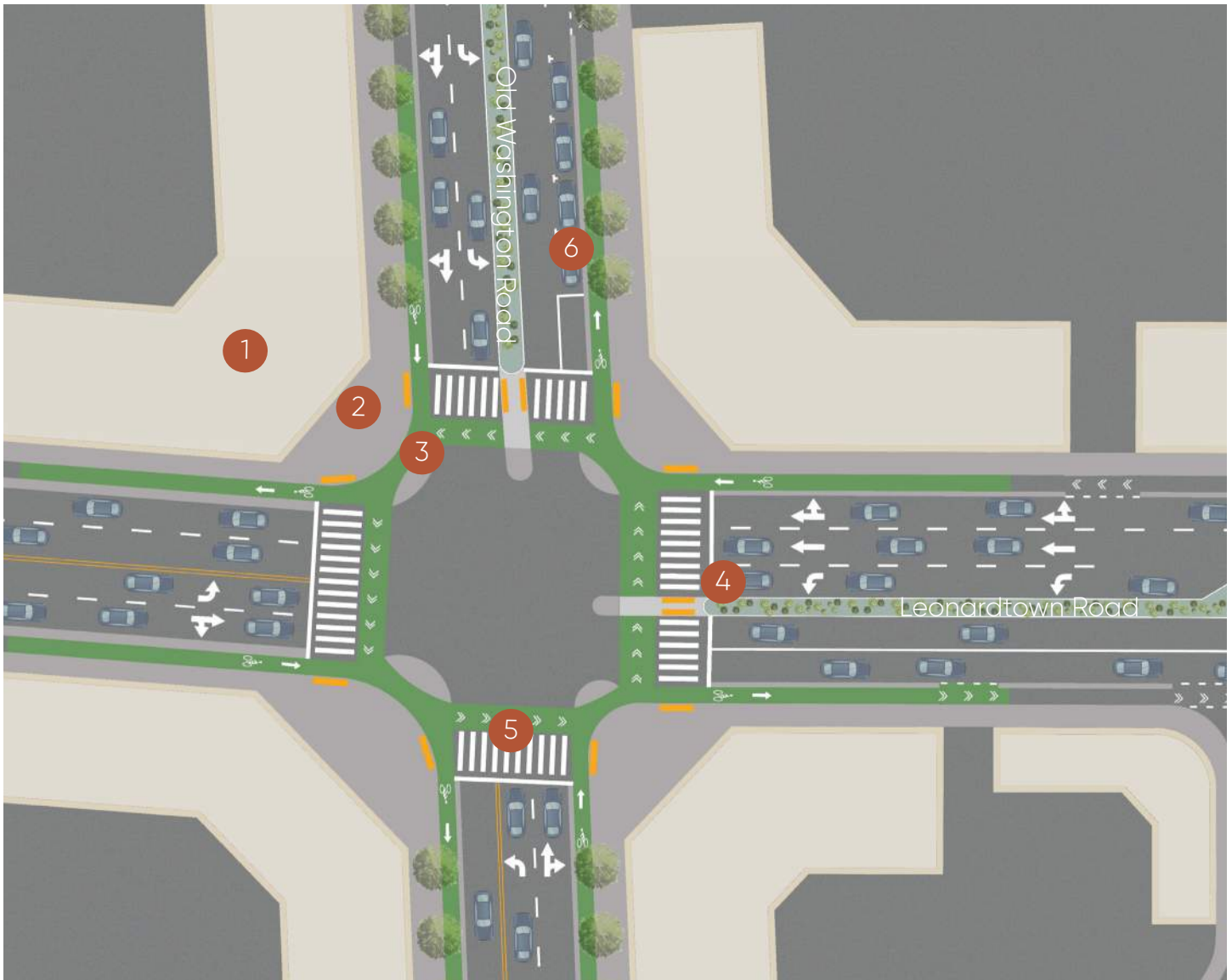


Overview

Old Washington Road once served as the primary link between Waldorf and Washington D.C. With Crain Highway now serving as the primary north-south spine, Old Washington Road may now be re-envisioned as a more urban corridor. The proposal at right, which is long-term and visionary in its nature, seeks to leverage public and private investment to vastly improve the economic, social, and safety performance of the area. This includes adding mixed-use urban infill development (possibly oriented to a future light rail station), and the inclusion of better walking and cycling facilities, including the use of a protected intersection.

1. Old Washington Road @ Leonardtown Road

Proposed

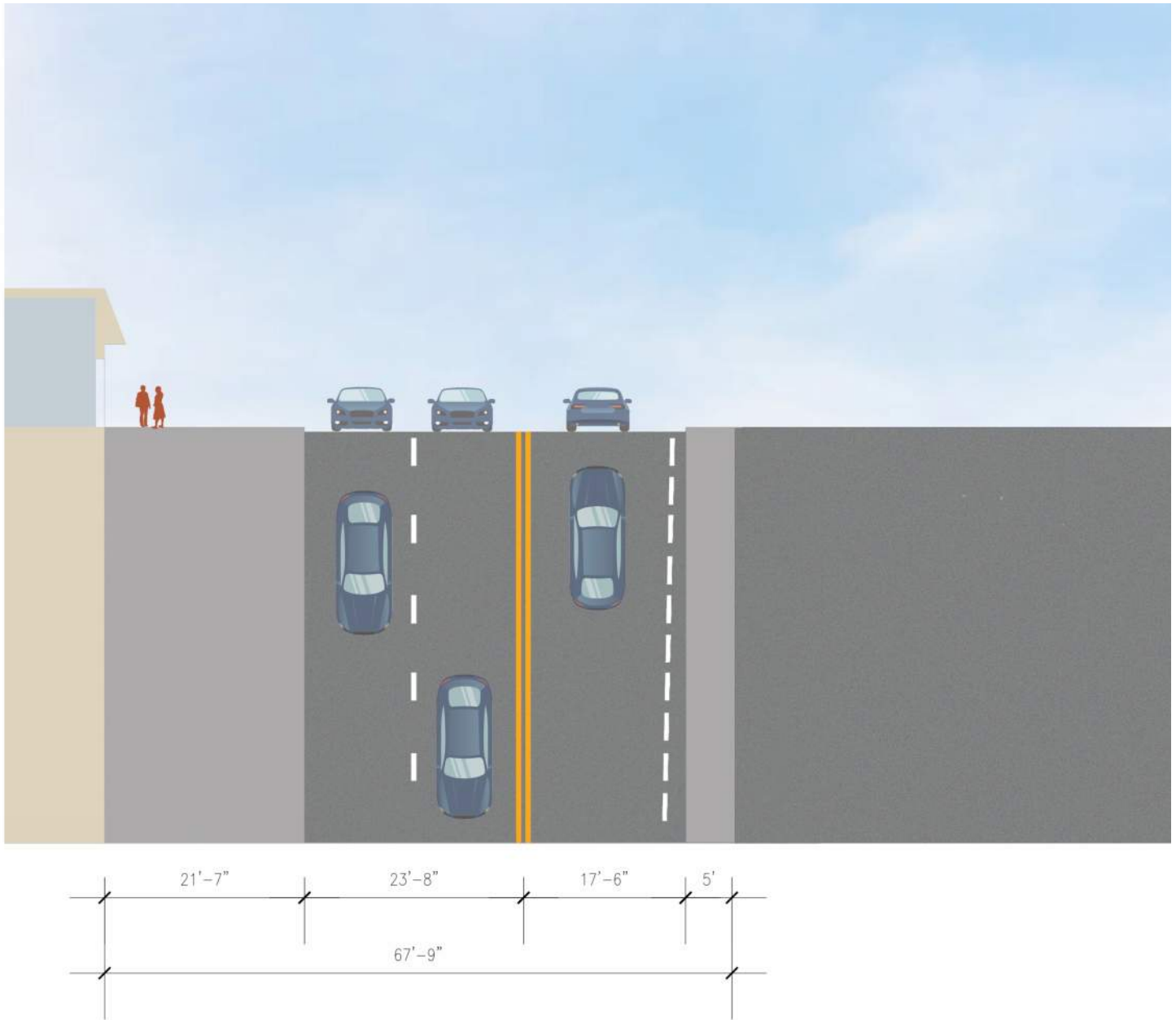


Key Features

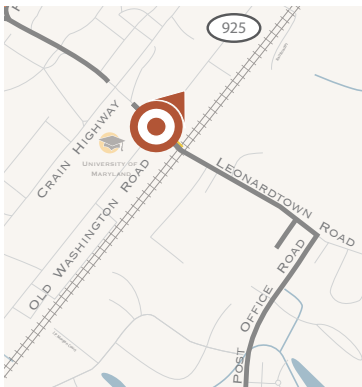
- 1 Mixed-Use Redevelopment
- 2 Wider, ADA-Compliant Sidewalks, Sidewalk Cafes, Street Trees/Landscaping
- 3 Class I - Protected Bike Lane with Protected Intersection
- 4 Planted Median Bioswale / Pedestrian + Bicyclist Refuge Island
- 5 High-Visibility Crosswalks and Crossbikes
- 6 On-Street Parking

1a. Old Washington Road @ Leonardtown Road

Existing Condition - Looking North



Existing Context Map

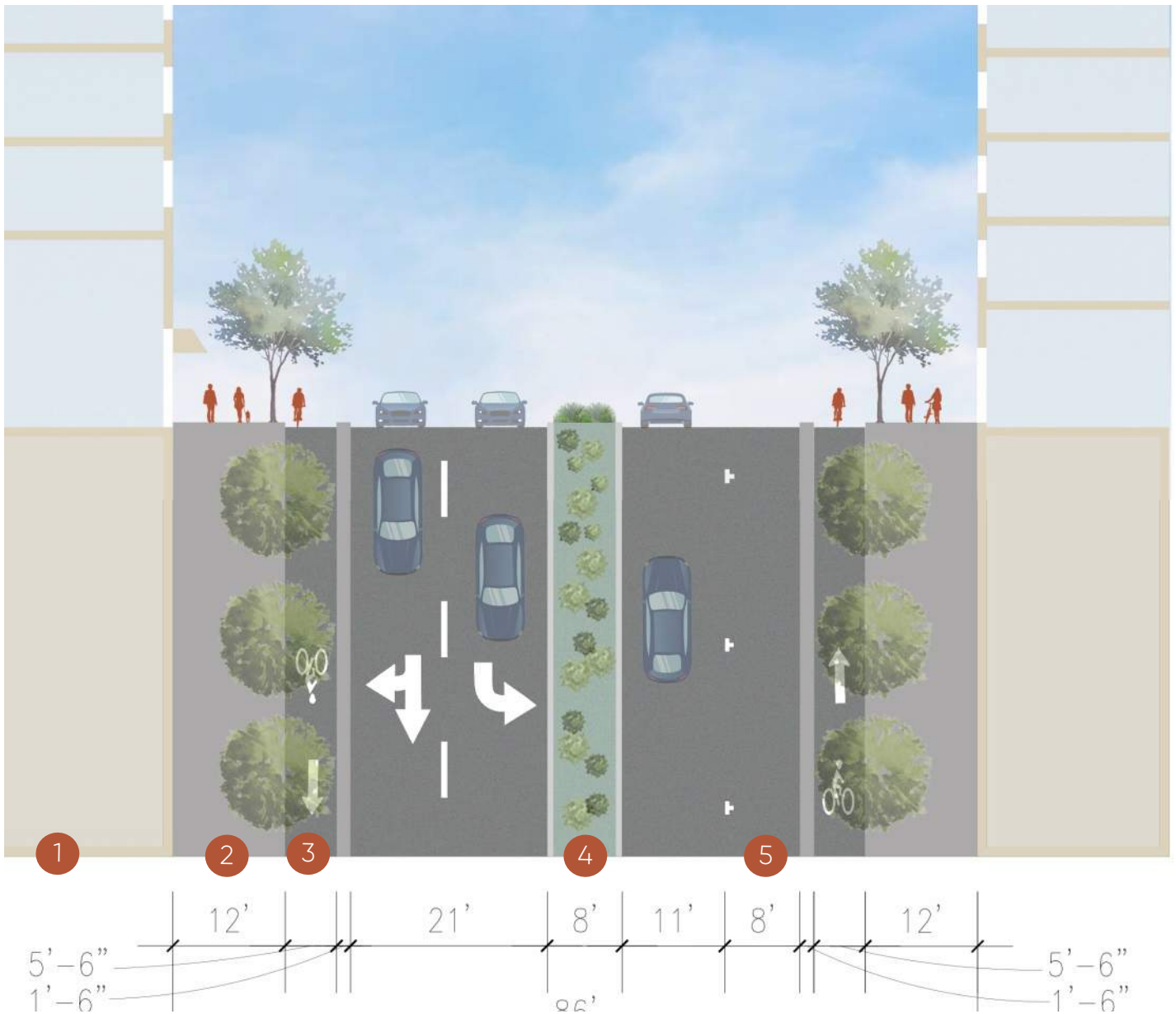


Overview

The northern side of this intersection features an undefined sidewalk/parking lot serving a low slung commercial building on the west, and a large vacant corner lot on the east. The proposal at right seeks to maintain or reduce the moderate volumes of north-south traffic while drastically increasing the quality of the public realm. As this legacy area redevelops, improving walkability, accommodating active modes of travel, and improving the street frontage will yield many safety, economic, and social benefits for Charles County and its residents, as well as provide a model for future redevelopment along this and other corridors in Waldorf.

1a. Old Washington Road @ Leonardtown Road

Proposed - Looking North

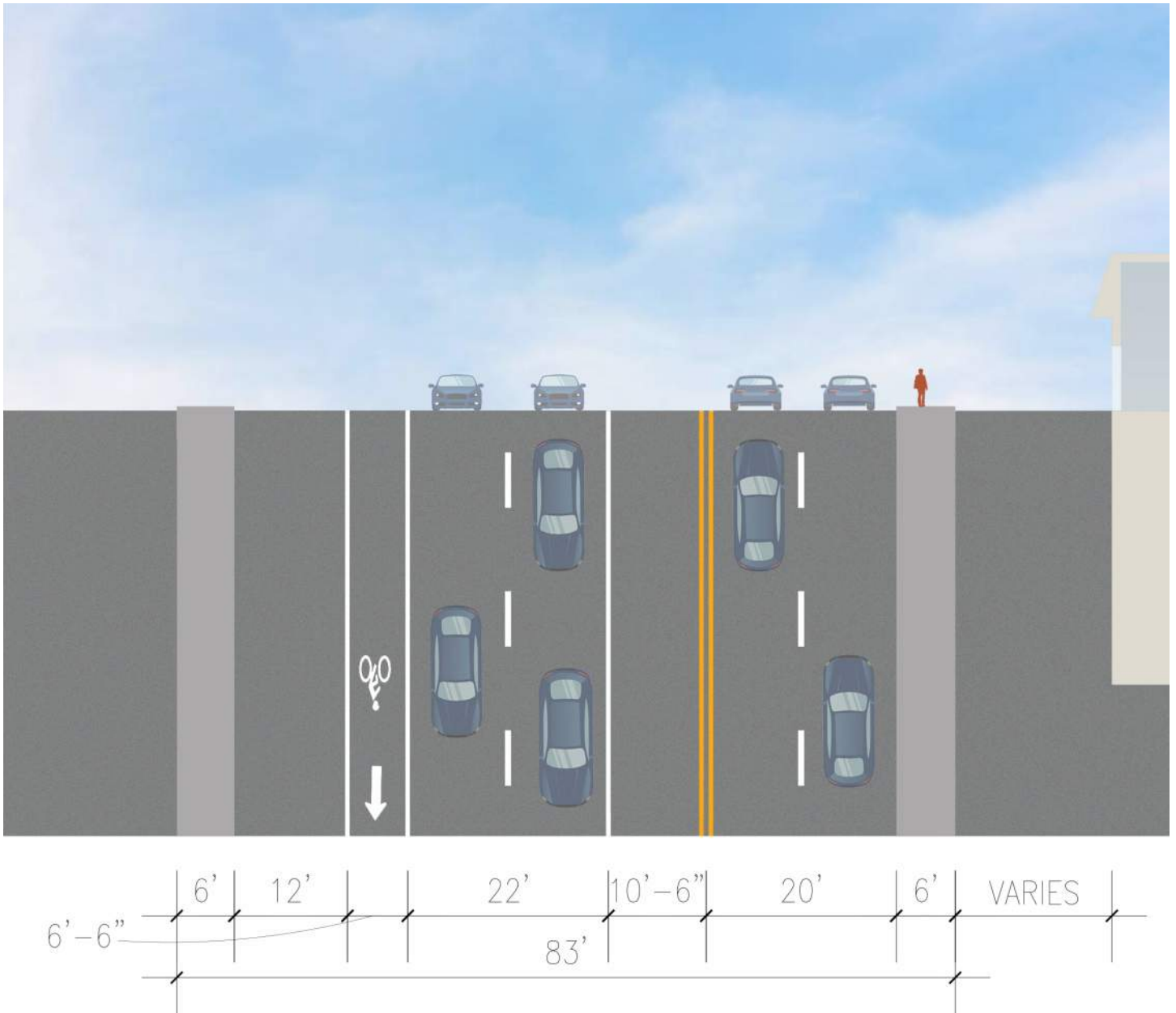


Key Features

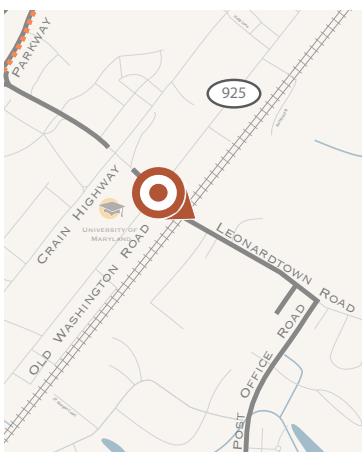
- 1 Mixed-Use Redevelopment
- 2 Wide Sidewalks, Sidewalk Cafes, Street Trees/Landscaping
- 3 Class I - Protected Bike Lane
- 4 Planted Median Bioswale / Pedestrian Refuge Island
- 5 On-Street Parking

1b. Leonardtown Road @ Old Washington Road

Existing Condition - Looking East



Existing Context Map

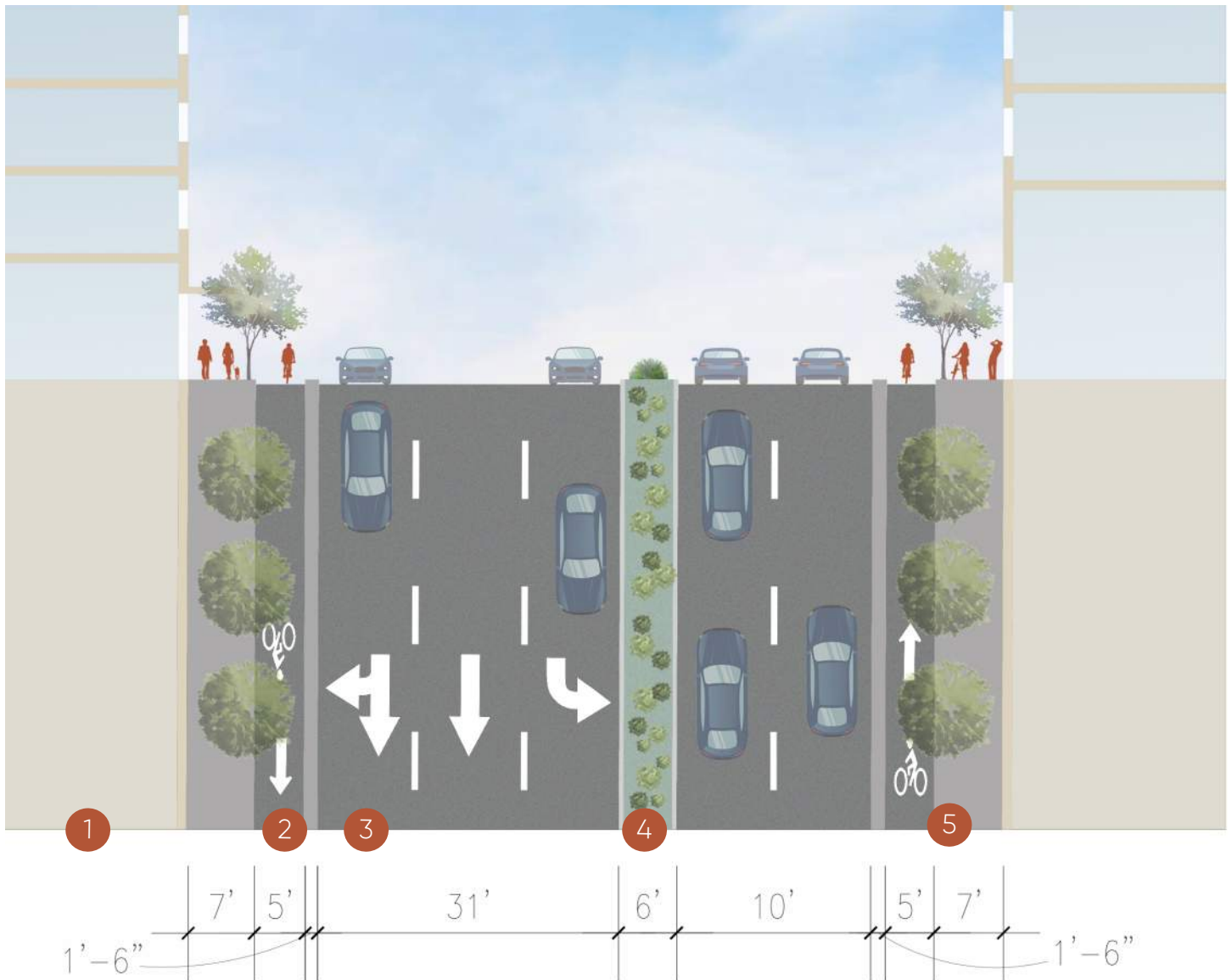


Overview

Leonardtown Road is a major east-west route through the Waldorf Urban Area. According to data collected from 2015 - 2017, the segment just east and west of Old Washington Road features the greatest volume of crashes in the study area. Unsurprisingly, the corridor was identified by stakeholders as one of the most challenging and unpleasant to traverse on foot or bike, especially as it intersects with Crain Highway, where no bicycle or pedestrian accommodations exist. The proposal at right seeks improve safety and accessibility for people traveling on foot, bike, and transit, which is especially critical given all of the employment, entertainment, educational, and commercial land uses along Leonardtown Road and Crain Highway.

1b. Leonardtown Road @ Old Washington Road

Proposed - Looking East



Key Features

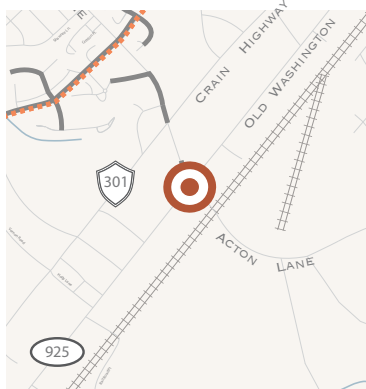
- 1 Mixed-Use Redevelopment
- 2 Class I - Protected Bike Lane
- 3 Consolidated right-turn / thru lane
- 4 Planted Median Bioswale / Pedestrian Refuge Island
- 5 Sidewalk with Street Trees

2. Old Washington Road @ Acton Lane

Existing Condition



Existing Context Map



Overview

Acton Lane serves as an important vehicular link between Crain Highway and Old Washington Road. The skewed intersection geometry, free right turn lane (southbound onto Acton Lane), and lack of sidewalks/crosswalks makes this area particularly challenging for walking. With large parcels of land and big box store uses on the west, and industrial uses to the east, there is a possibility that higher and better, more urban redevelopment could one day be leveraged to strengthen tax rolls and increase walkability. In addition, the introduction of protected bike lanes will increase accessibility, while additional open space, shown as a plaza, will invite social activity.

2. Old Washington Road @ Acton Lane

Proposed

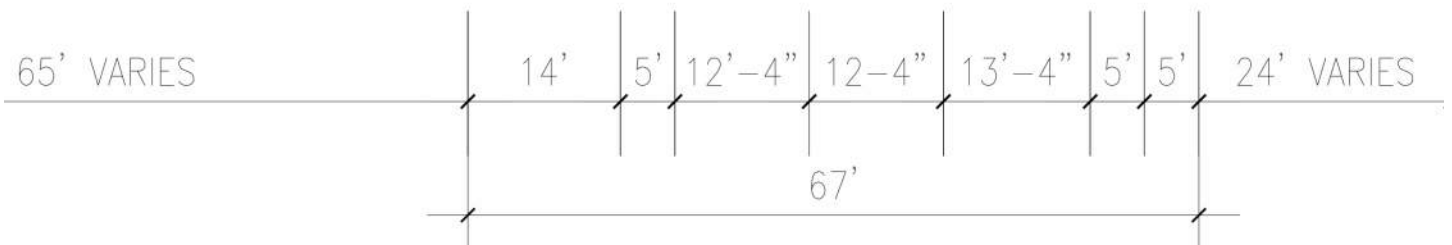
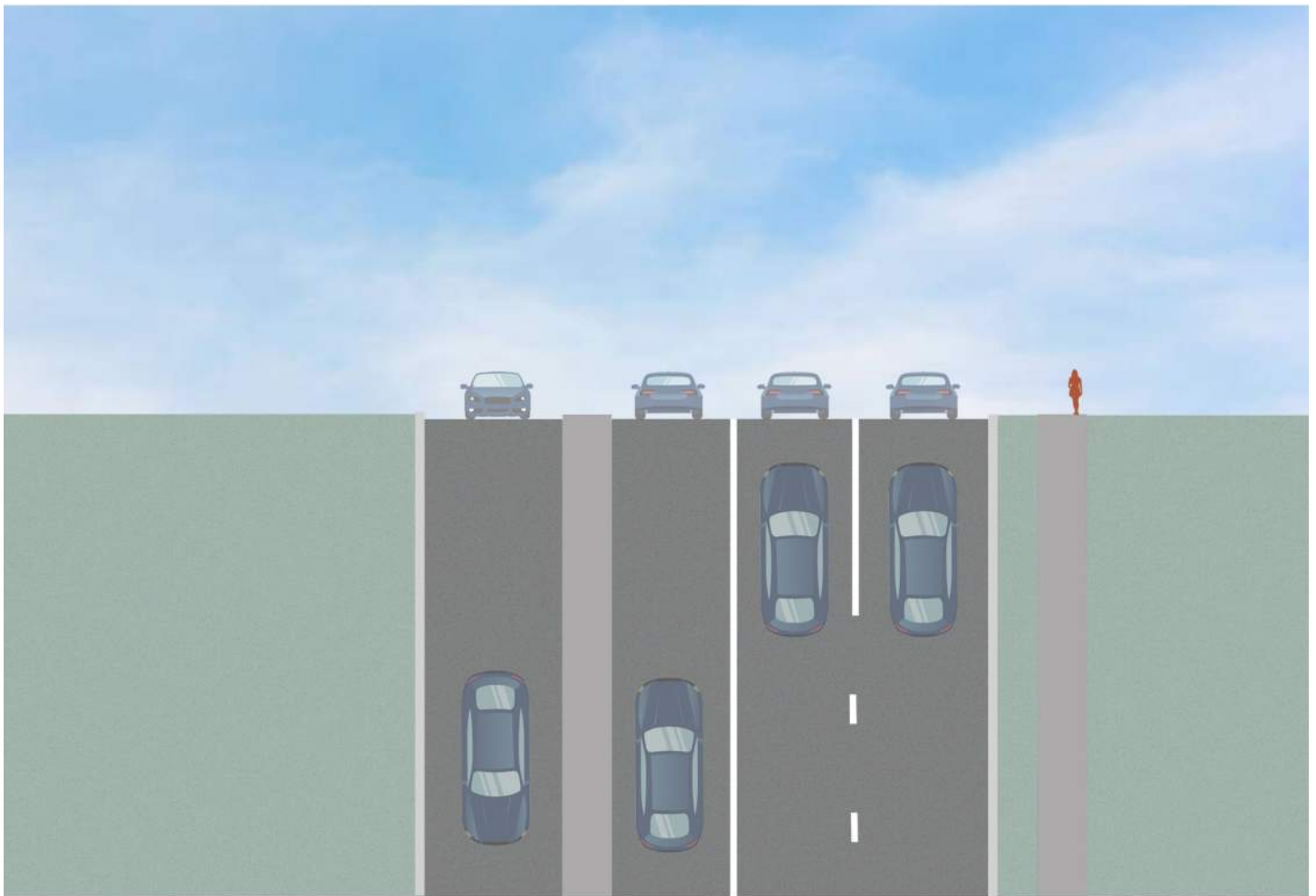


Key Features

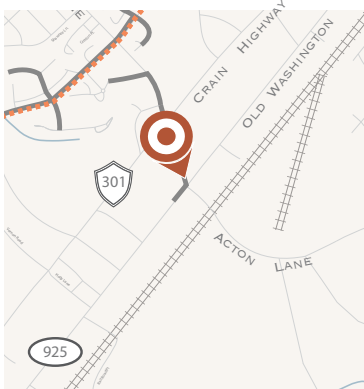
- 1 Mixed-Use Redevelopment
- 2 Public Plaza
- 3 Class I - Protected Bike Lane with Protected Intersection
- 4 Planted Median Bioswale / Pedestrian + Bicyclist Refuge Island
- 5 ADA-Compliant Sidewalk with Street Trees
- 6 High-Visibility Crosswalks / Crossbikes

2a. Acton Lane, West of Old Washington Road

Existing Condition - Looking East



Existing Context Map

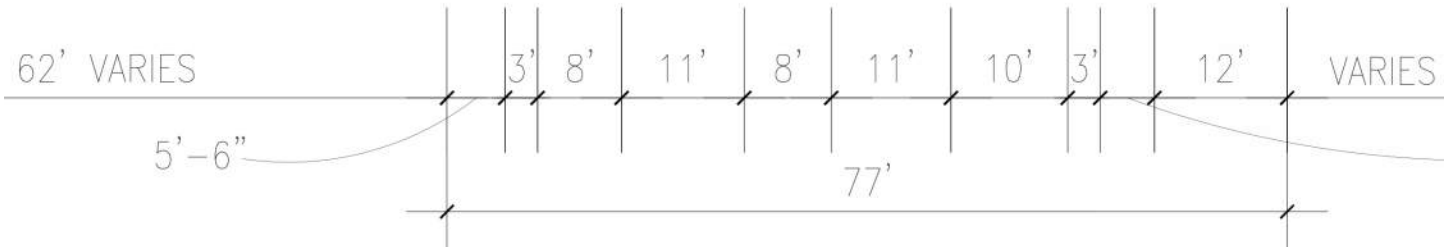
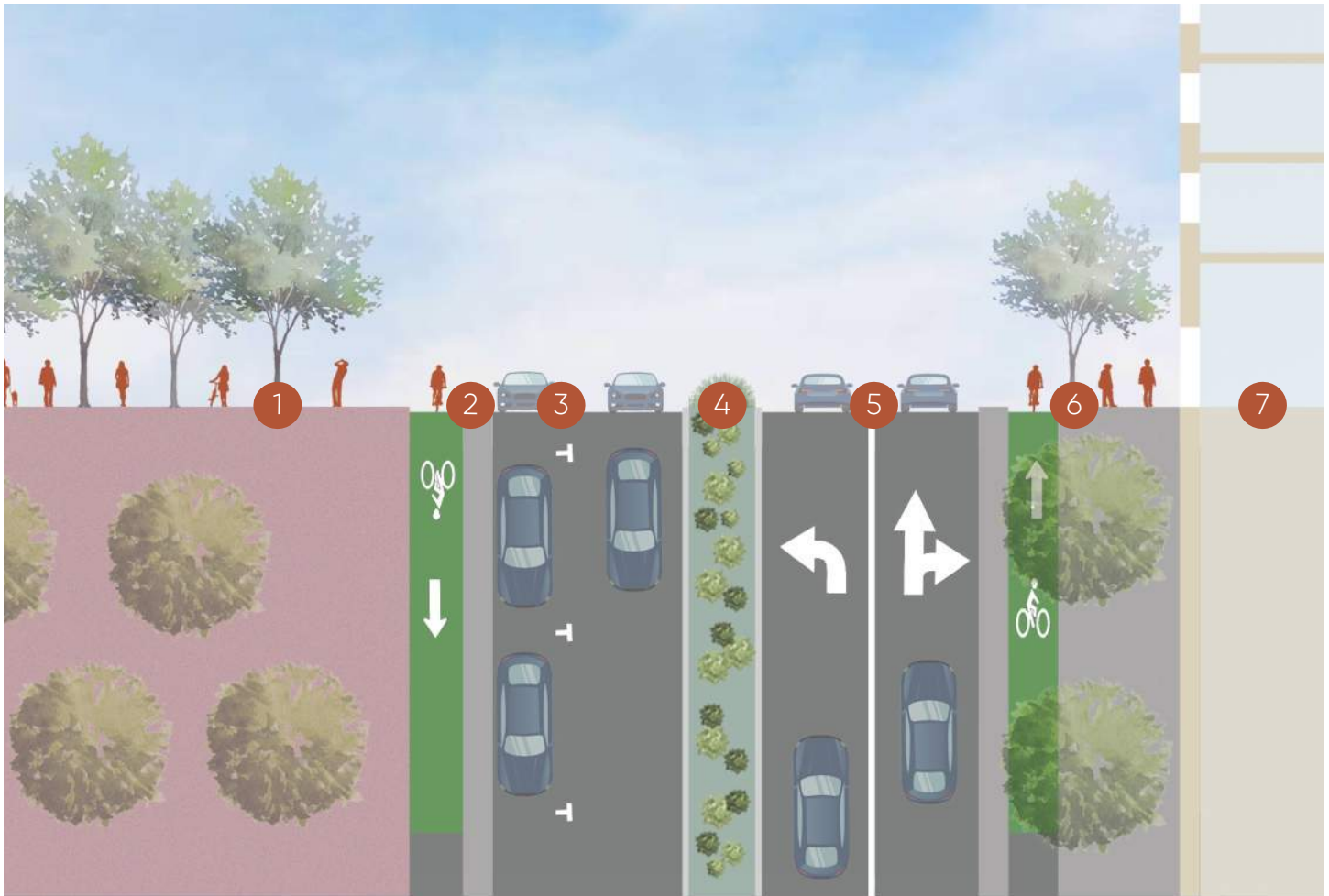


Overview

Acton Lane is an important east-west link, bordered by heavy commercial and light industrial uses such as Walmart and Toyota dealership. While these land uses may not be large pedestrian generators now, they are employment hubs and currently challenging to access without the use of a car. Adding pedestrian and cycling infrastructure will help people access this area of Waldorf as well as provide the needed armature for long-term redevelopment, effectively serving as a northern bookend to Waldorf's priority redevelopment area, which stretches south to Old Washington Road / Leonardtown Road.

2a. Acton Lane, West of Old Washington Road

Proposed - Looking East

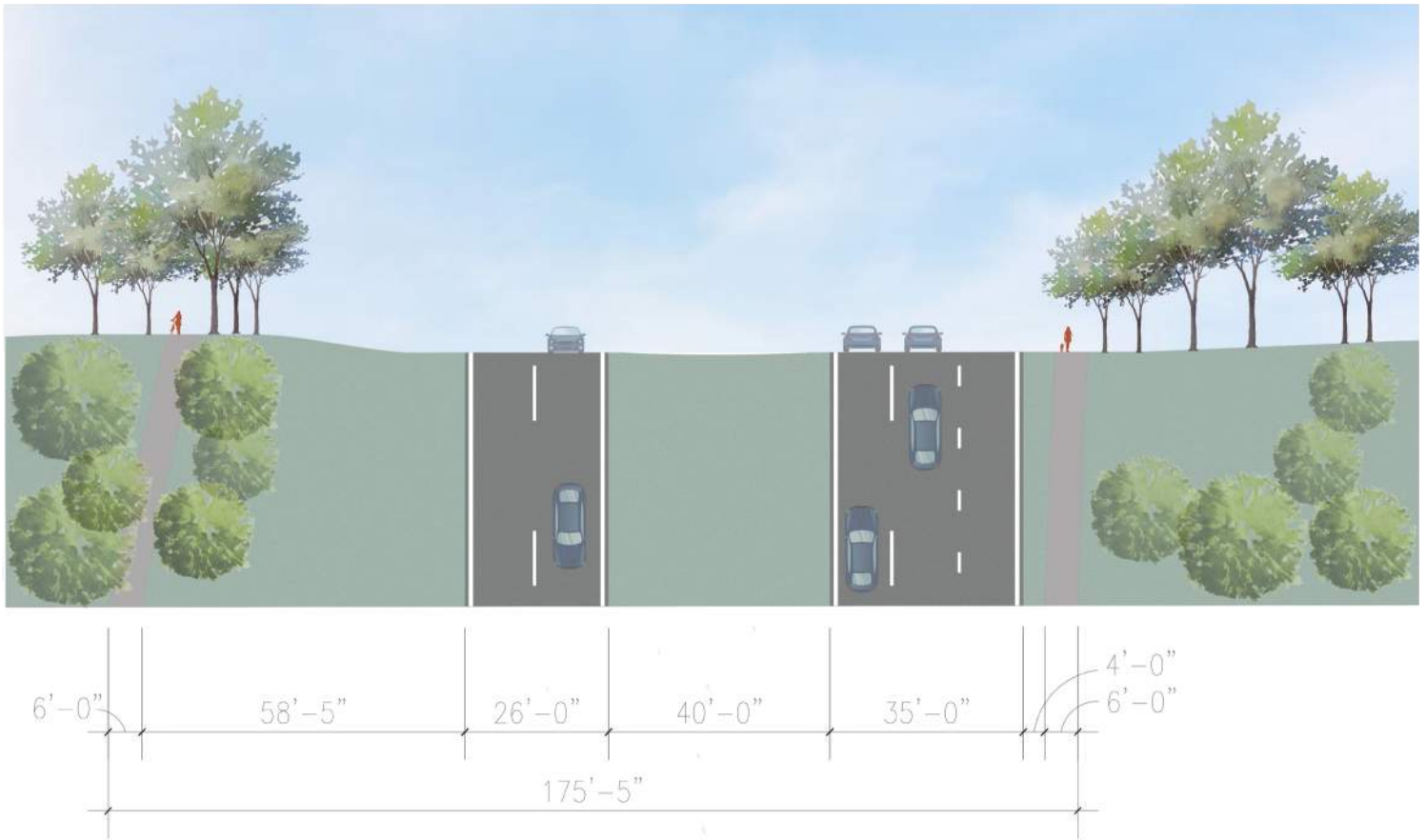


Key Features

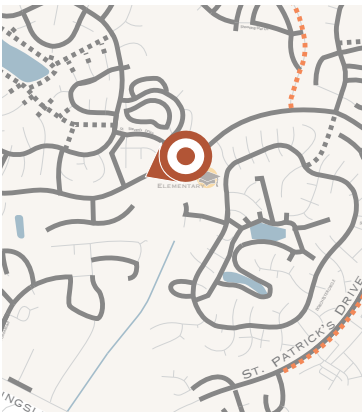
- 1 Public Plaza
- 2 Class I - Protected Bike Lane
- 3 On-Street Parking
- 4 Planted Median Bioswale / Pedestrian Refuge Island
- 5 Consolidated right-turn / thru lane
- 6 Wide Sidewalk with Street Trees
- 7 Mixed-Use Development

3. Smallwood Drive @ West of St. Stevens Drive

Existing Condition - Looking West



Existing Context Map

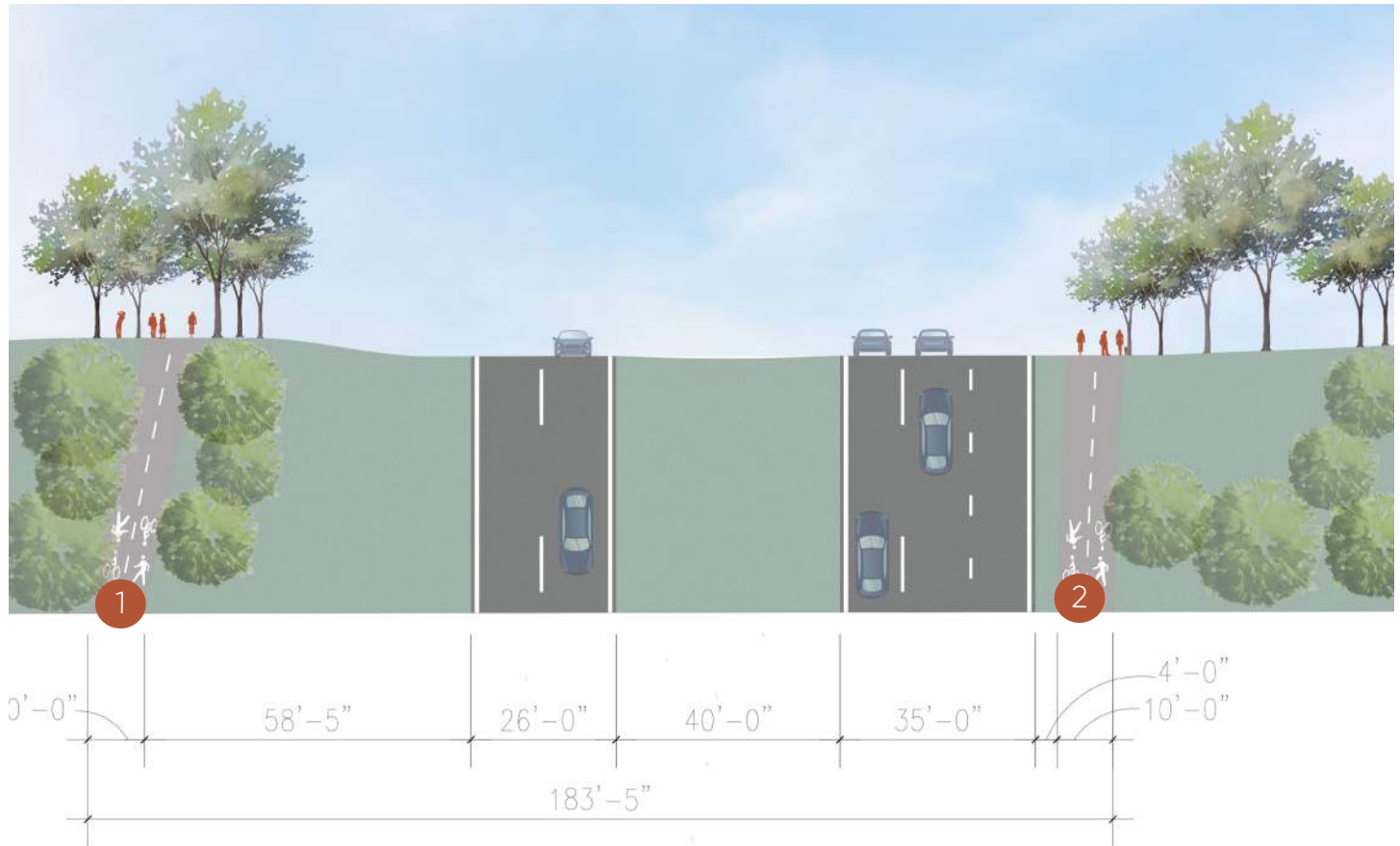


Overview

Smallwood Drive is one of Waldorf's most important east-west corridors, providing critical pedestrian access to schools, neighborhoods, businesses, employment centers, and commercial destinations. Indeed, the thoroughfare features sidewalks on one or both sides over its full trajectory. That said, there are only nine marked pedestrian crossings over its 4-mile length and the corridor does not accommodate bicyclists. The proposal at right shows the expansion of the existing sidewalk network to a full shared use path system. Enhanced crossings at key locations, such as St. Charles Parkway, Crain Highway, and Lancaster Circle, are detailed elsewhere in this document.

3. Smallwood Drive @ West of St. Stevens Drive

Proposed - Looking West

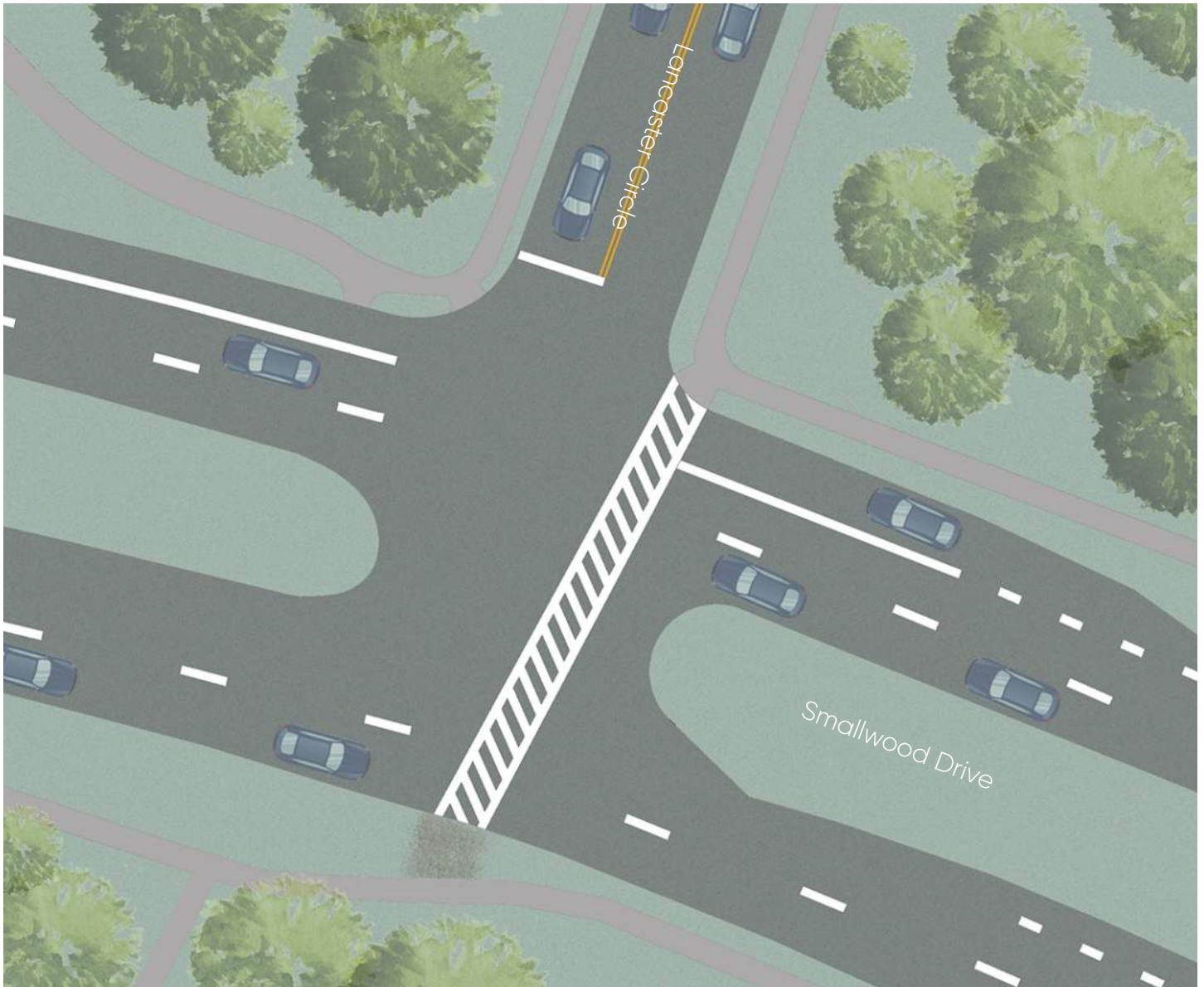


Key Features

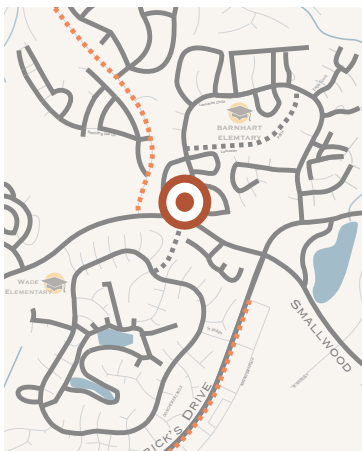
- 1 Shared Use Path
- 2 Shared Use Path

4. Smallwood Drive @ Lancaster Circle

Existing Condition



Existing Context Map

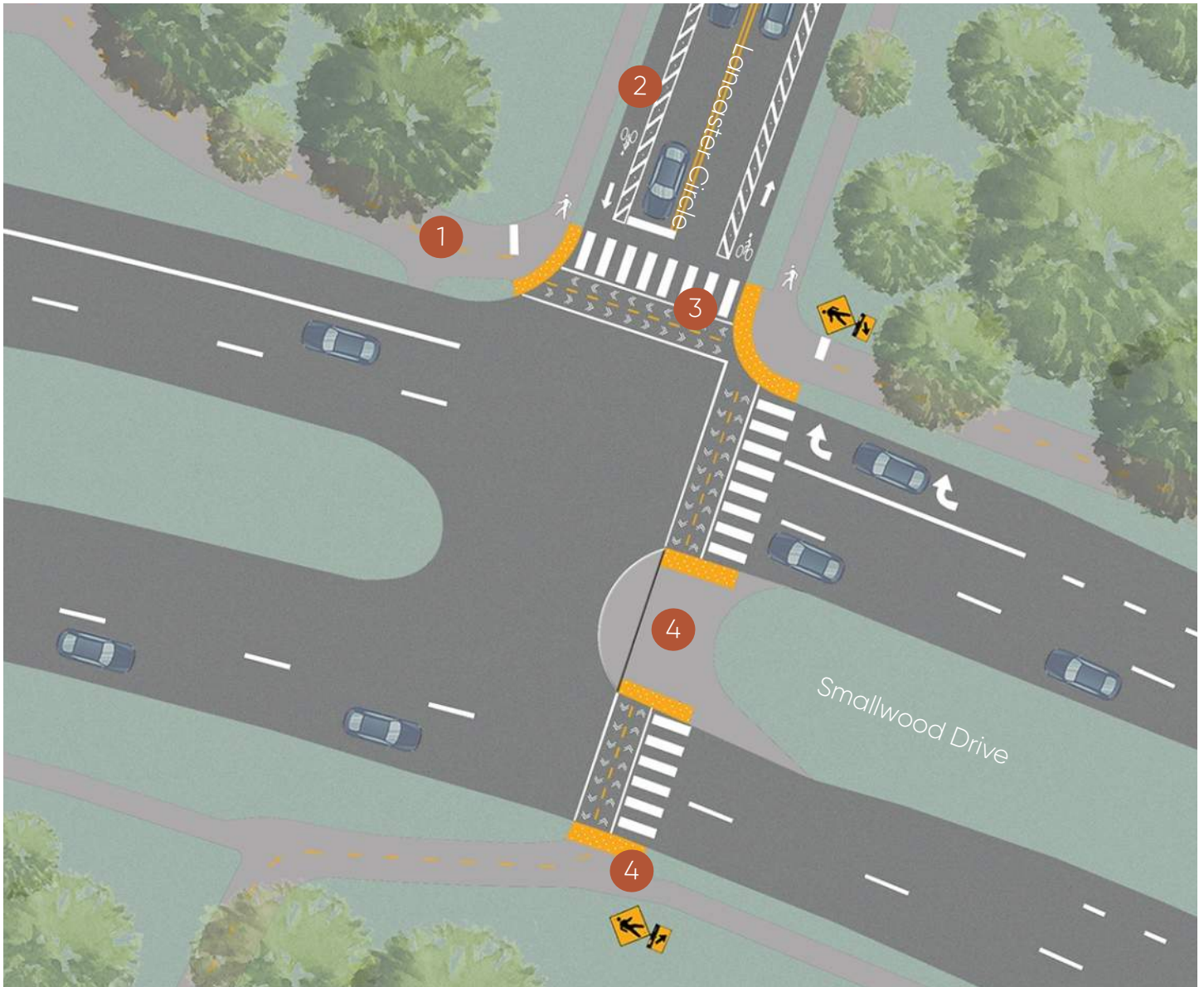


Overview

The intersection of Smallwood Drive and Lancaster Circle features a single skewed crosswalk, poor sidewalk ramps, no bicycle accommodations, and a lack of ramp on the southern edge. The proposed plan at right seeks to straighten/shorten the existing crossing, extend the median with a generous pedestrian / bike refuge island, and add high-visibility crosswalks and crossbikes. Additionally, protected bike lanes are recommended for Lancaster Circle, linking people from the interior of the neighborhood / Barnhart Elementary to the shared use path system envisioned for the north side of the Smallwood Corridor. Finally, a short trail extension upgrade and an ADA-compliant ramp is proposed for the southside of the intersection, better linking the neighborhoods on either side.

4. Smallwood Drive @ Lancaster Circle

Proposed

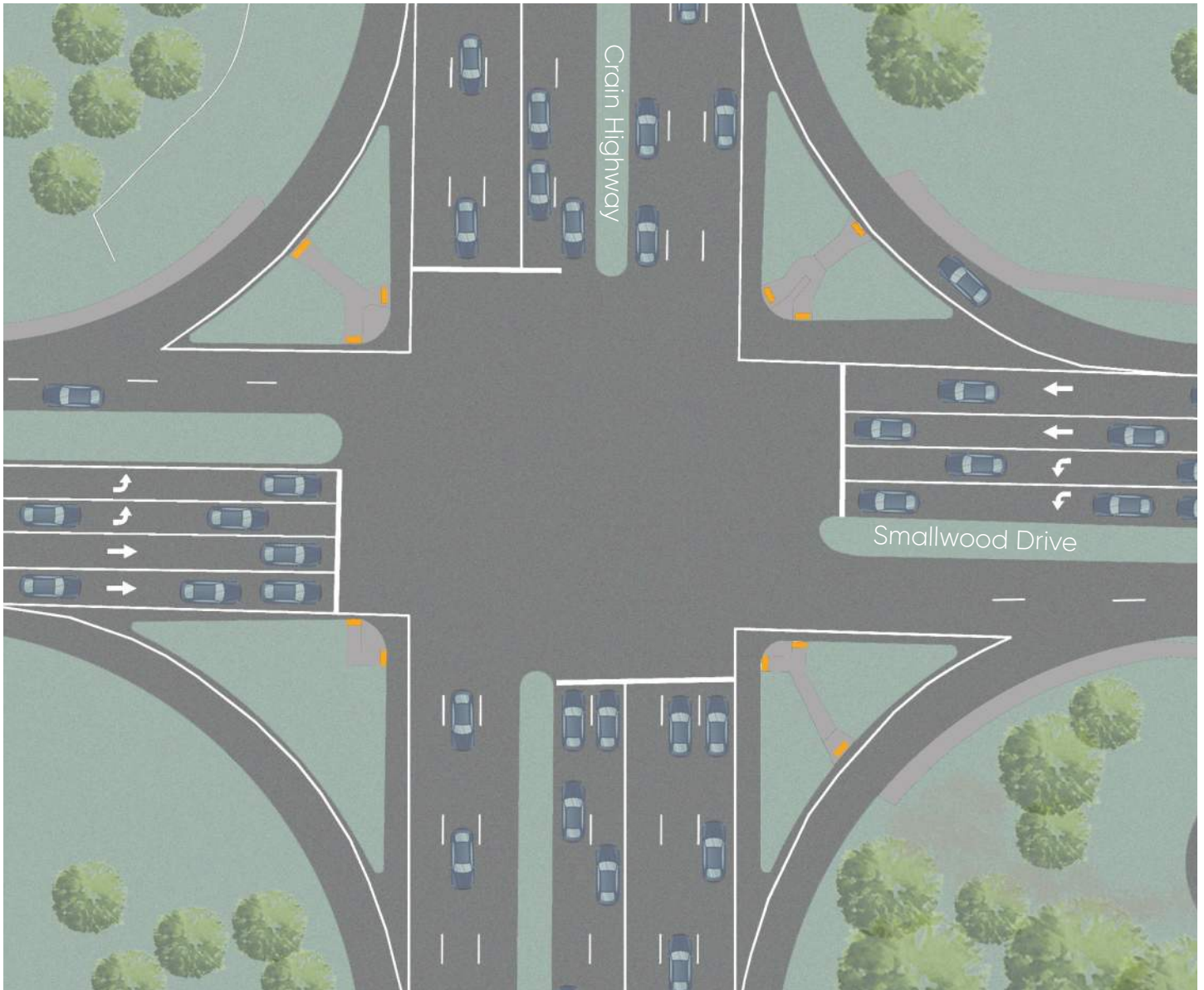


Key Features

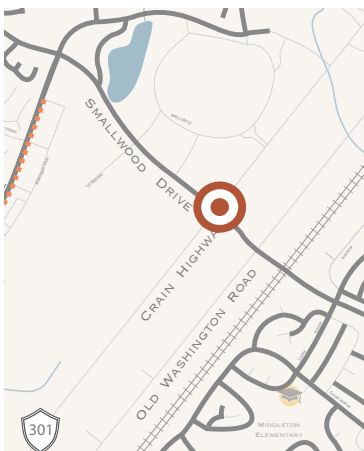
- 1 Shared Use Path
- 2 Class I - Protected Bike Lanes
- 3 High-visibility Crosswalks and Crossbikes
- 4 Pedestrian / Bicyclist Refuge Island
- 5 ADA-Compliant Pedestrian Ramps

5. Smallwood Drive @ Crain Highway

Existing Condition



Existing Context Map

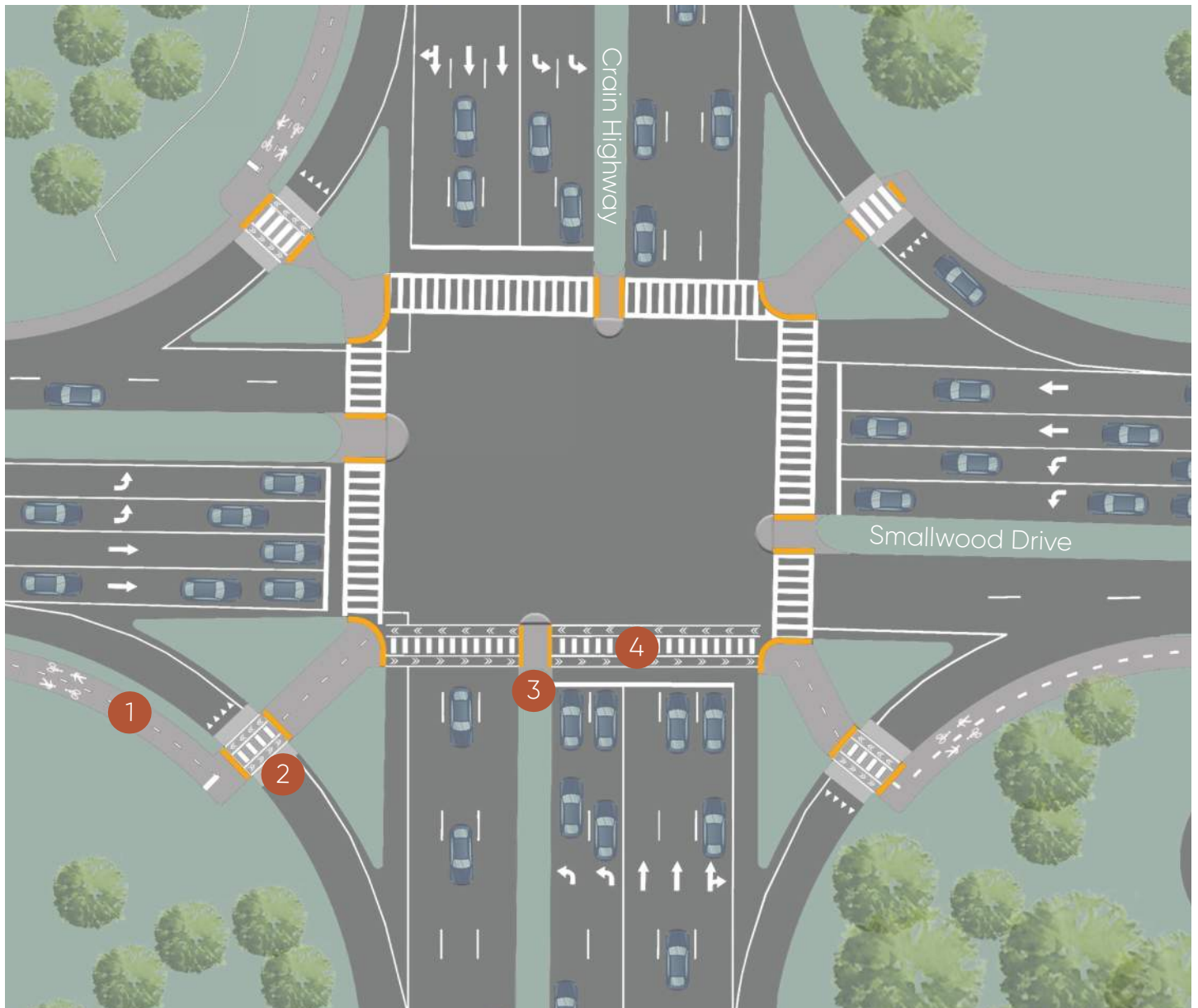


Overview

From a transportation perspective, the intersection of Smallwood Drive and Crain Highway is one of Waldorf's most important. However, Crain Highway does not include a sidewalk or a marked or signalized crosswalk at the Smallwood intersection, or anywhere else in Waldorf. Unsurprisingly, this intersection made the high-crash list and was called out by stakeholders as one of the least pleasant. The proposal at right includes safety upgrades, such as marked and signalized crossings and the addition of shared use paths to accommodate a wider variety of users. These improvements could be considered a "Phase 1" effort to deliver basic bicycle and pedestrian infrastructure before seeking any major geometric changes.

5. Smallwood Drive @ Crain Highway

Proposed

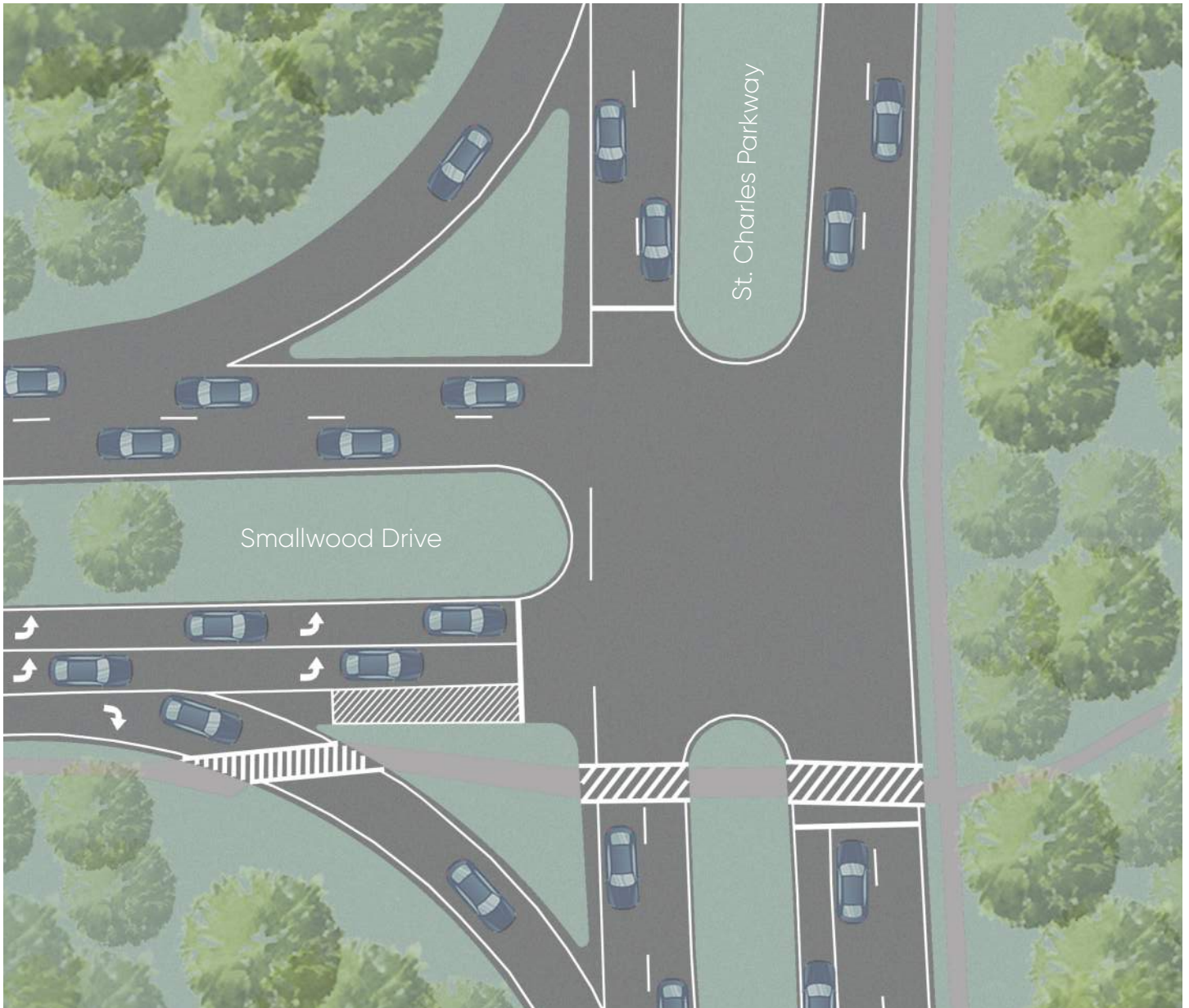


Key Features

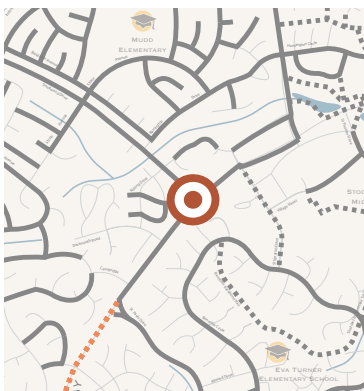
- 1 Class I - Shared Use Path
- 2 Raised Crosswalk
- 3 Pedestrian / Bicyclist Refuge Island
- 4 High-Visibility Crosswalk with Crossbike Markings

6. Smallwood Drive @ St. Charles Parkway

Existing Condition



Context Map

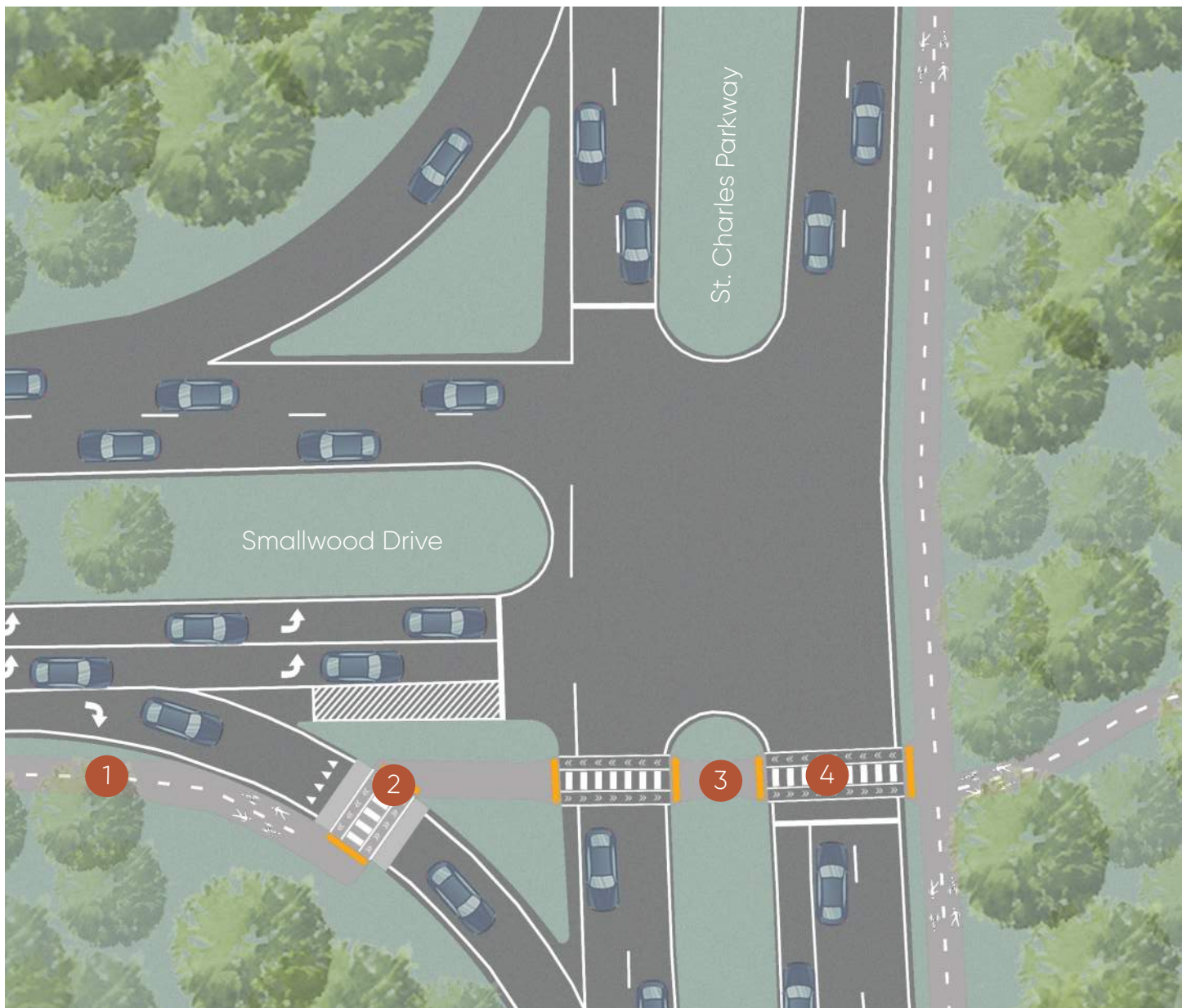


Overview

The eastern terminus of Smallwood Drive occurs at St. Charles Parkway. Narrow sidewalks and a crosswalk over the intersection's southside links to an existing sidewalk on the west, and narrow pathway linking neighborhoods to the east. That said, the crosswalk angle over the free right onto St. Charles Parkway limits the visibility of oncoming traffic and bicycle facilities are non-existent. The proposal at right seeks to expand the existing sidewalks into shared-use paths. Along with crosswalk upgrades, this will more comfortably accommodate a broader range of users and improves the visibility and safety of vulnerable road users.

6. Smallwood Drive @ St. Charles Parkway

Proposed

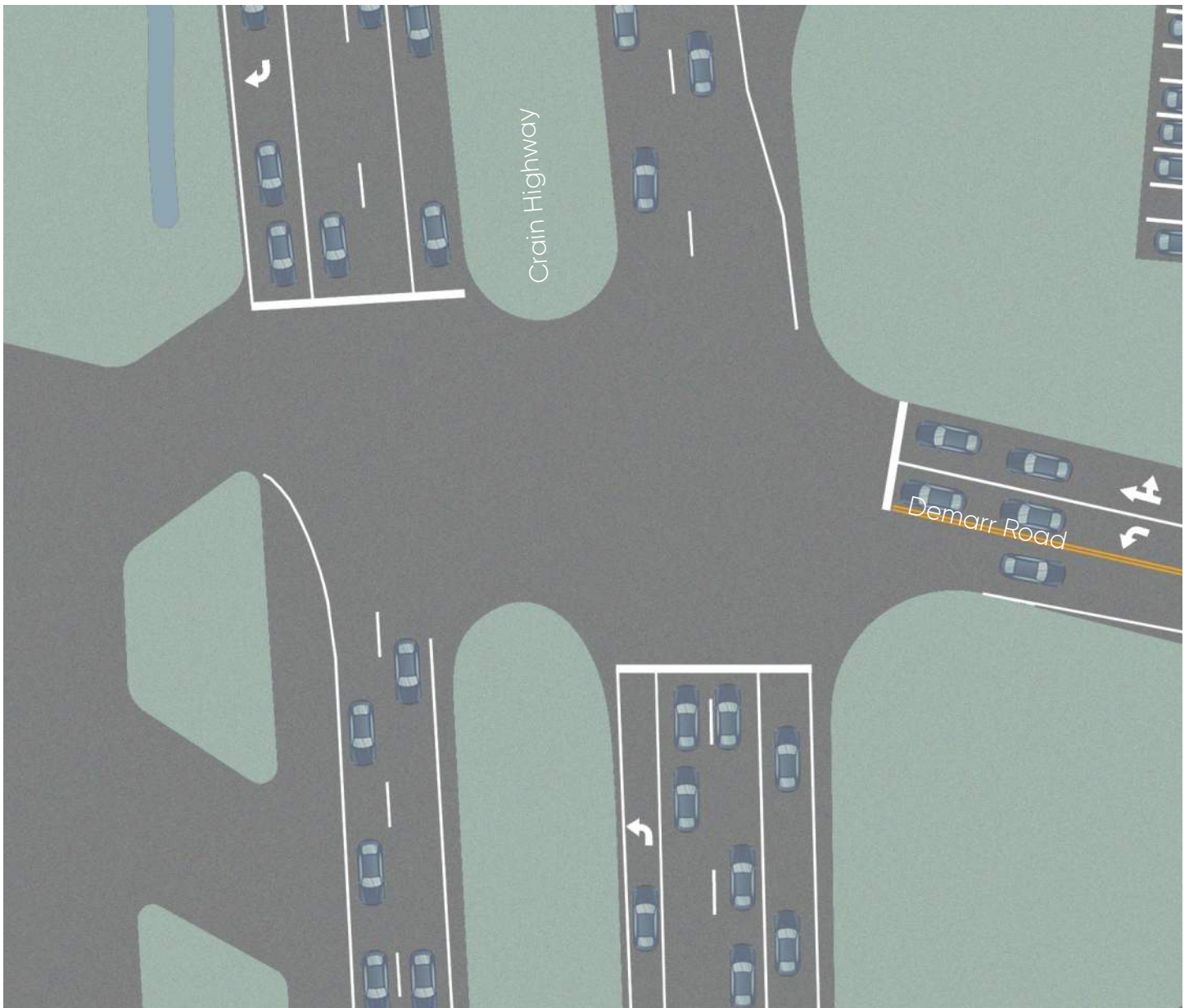


Key Features

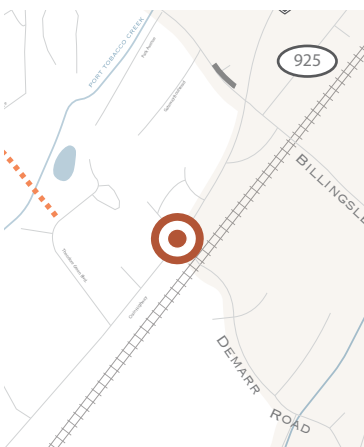
- 1 Class I - Shared Use Path
- 2 Raised Crosswalk
- 3 Pedestrian / Bicyclist Refuge Island
- 4 High-Visibility Crosswalk with Crossbike Markings

7. Demarr Road @ Crain Highway

Existing Condition



Context Map

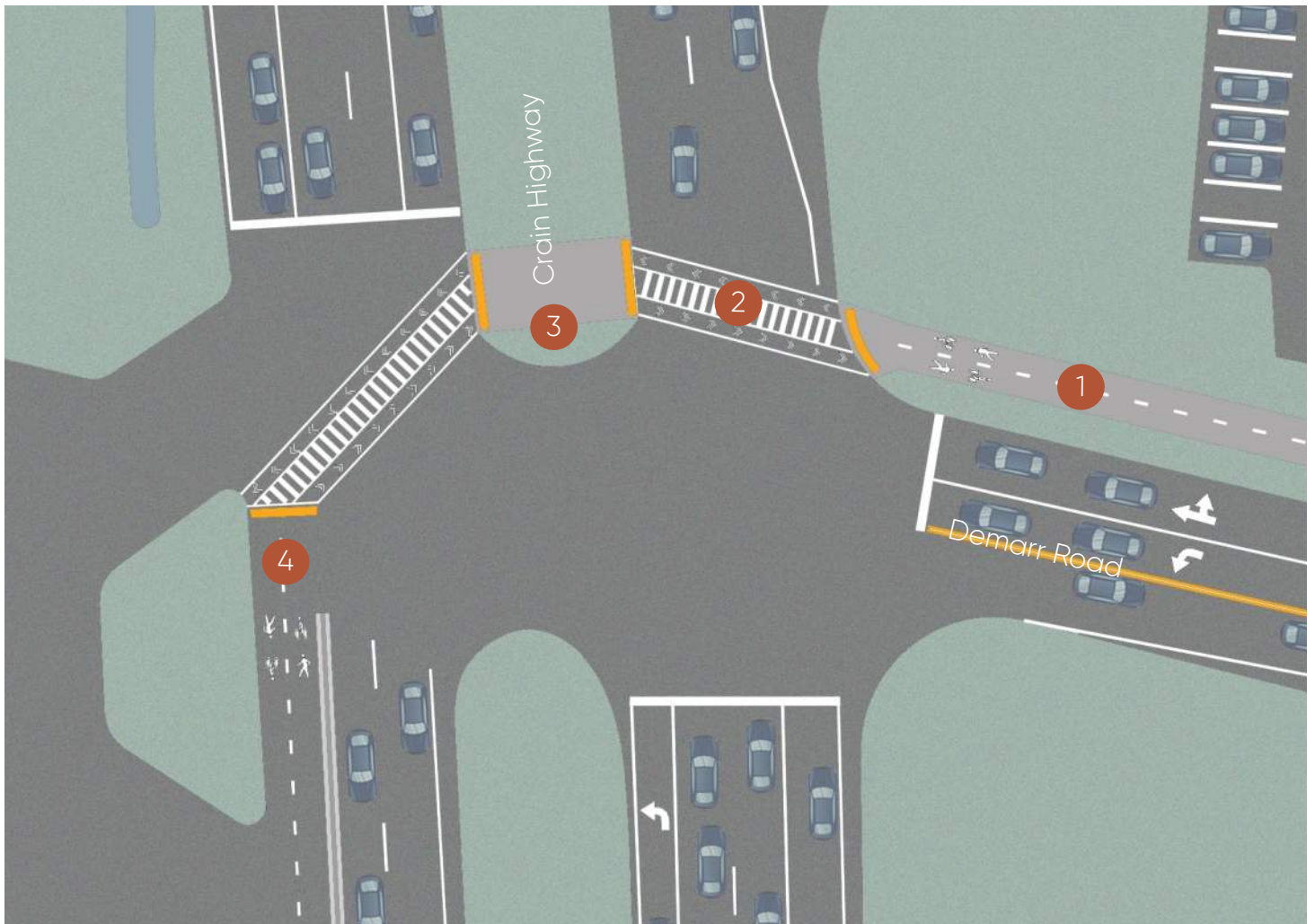


Overview

Demarr Road is a relatively low-traveled east-west “country road” in southeast Waldorf. While not formally identified as an intersection of high need, the proposal at right seeks to link an existing St. Charles Parkway shared use path with the Indian Head Trail. This intersection is currently the largest barrier to doing so safely. To facilitate this connection, an existing shared use path segment running along the northside of Demarr Road would be extended west to the Crain Highway intersection, before turning south for a short, on-street path linking to the Indian Head Rail Trail parking lot. This path could be created by retrofitting the existing southbound shoulder. Key intersection improvements include new crosswalks/crossbikes, signals, and a pedestrian / bike refuge island.

7. Demarr Road @ Crain Highway

Proposed

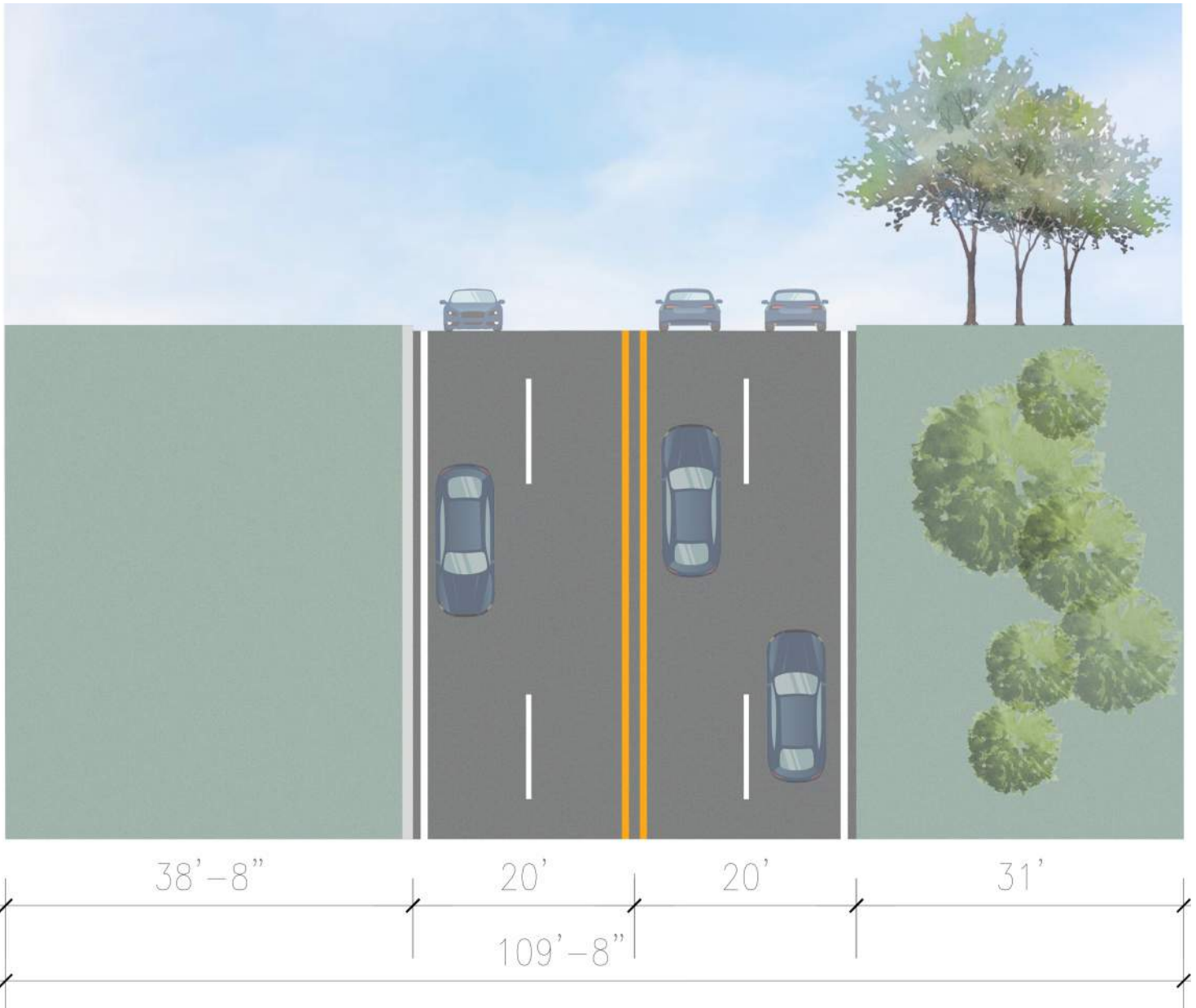


Key Features

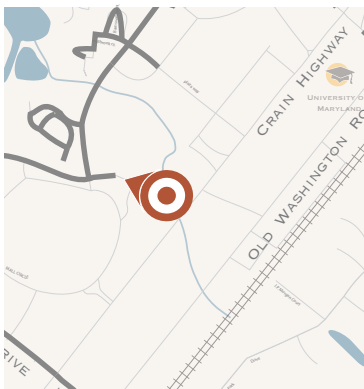
- 1 Class I - Shared Use Path
- 2 High-Visibility Crosswalks / Crossbikes
- 3 Pedestrian / Bicyclist Refuge Island
- 4 Class I - Barrier Protected Shared Use Path

8. St. Patrick's Drive, East of Western Parkway

Existing Condition - Looking West



Existing Context Map

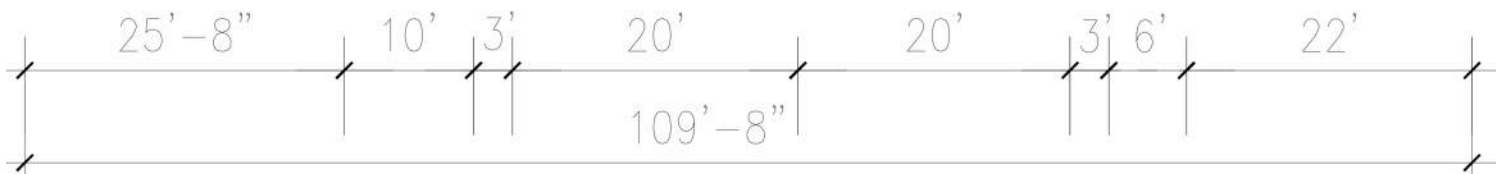
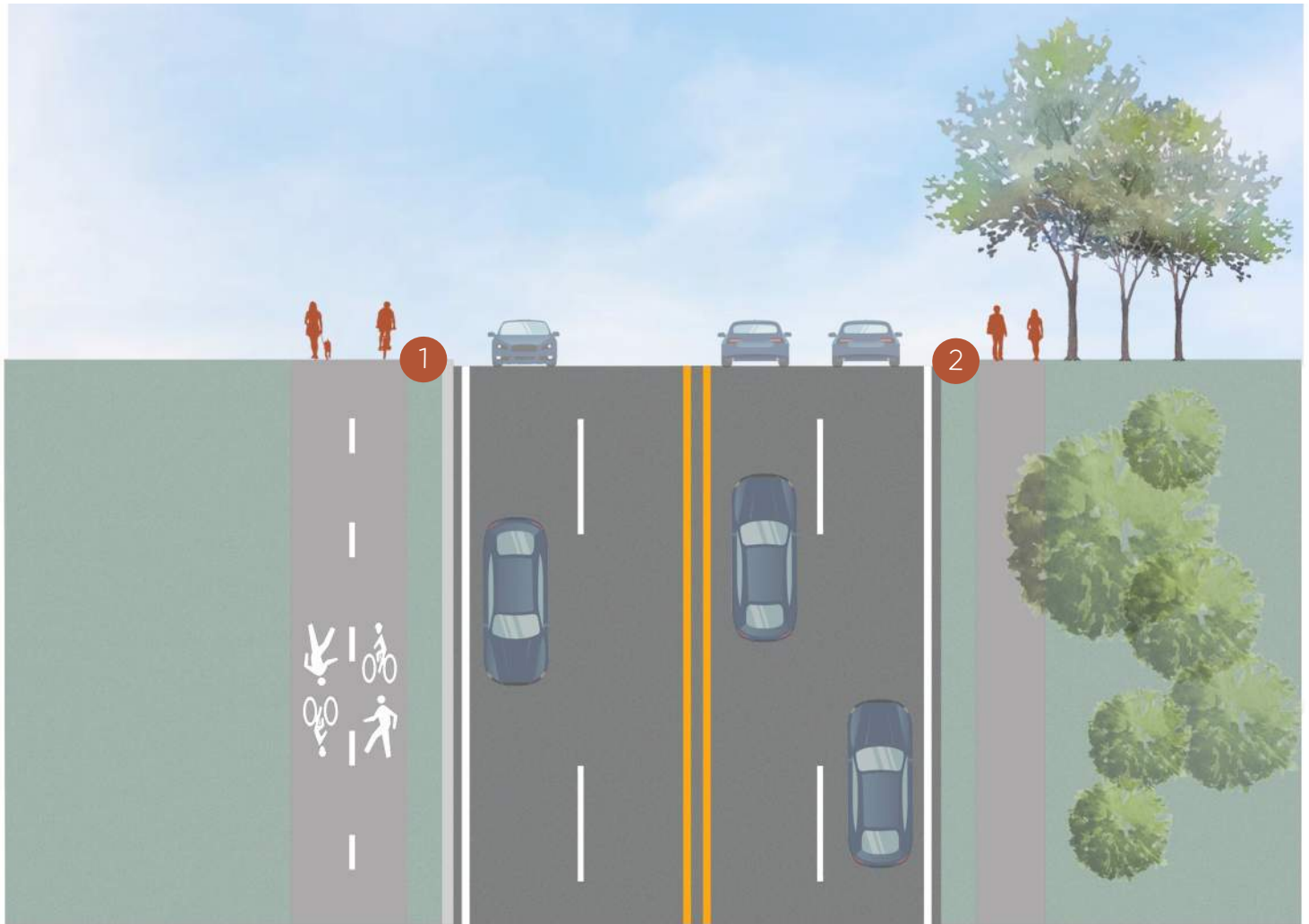


Overview

St. Patrick's Drive provides an important connection between the region-serving Crain Highway, many destination commercial businesses (St. Charles Towne Center Mall, Target etc.) and neighborhoods to the west, and Smallwood Drive. The segment between Western Parkway and Crain Highway (drawn above) is currently without sidewalks, safe crossings, or bicycle facilities. The proposal at right aims to include all three so that people have additional, viable options to move along St. Patrick's Drive, and the many other planned connections linking to it proposed in this document.

8. St. Patrick's Drive, East of Western Parkway

Proposed - Looking West

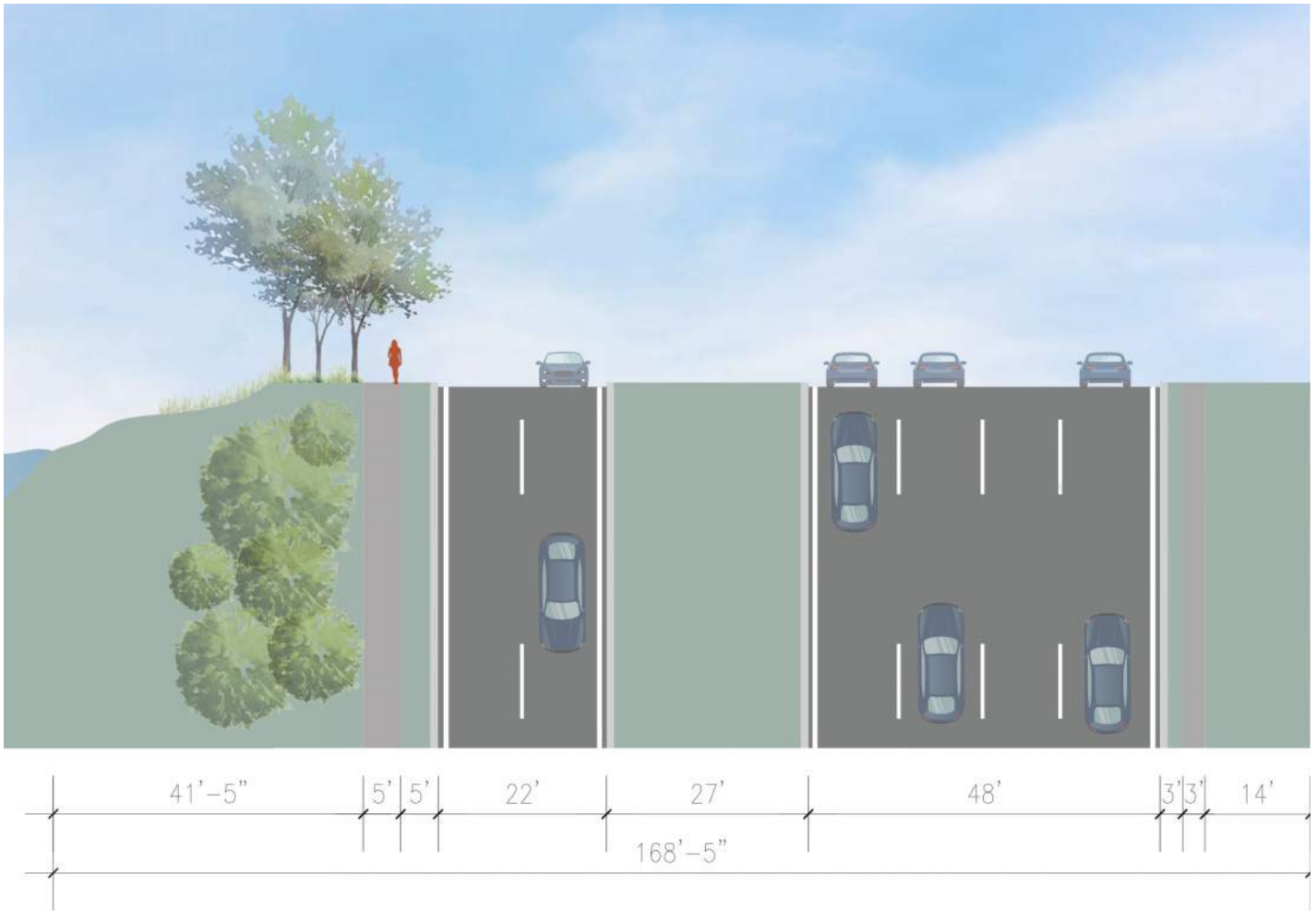


Key Features

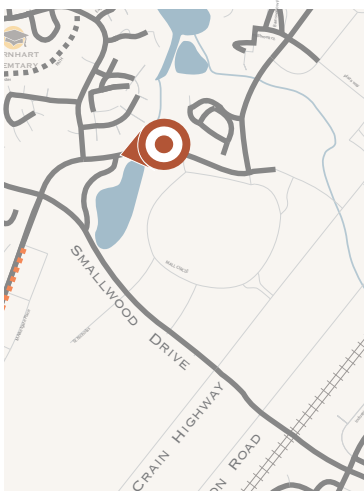
- 1 Class I - Shared Use Path
- 2 Sidewalk

9. St. Patrick's Drive, West of O'Donnell Place

Existing Condition - Looking West



Existing Context Map

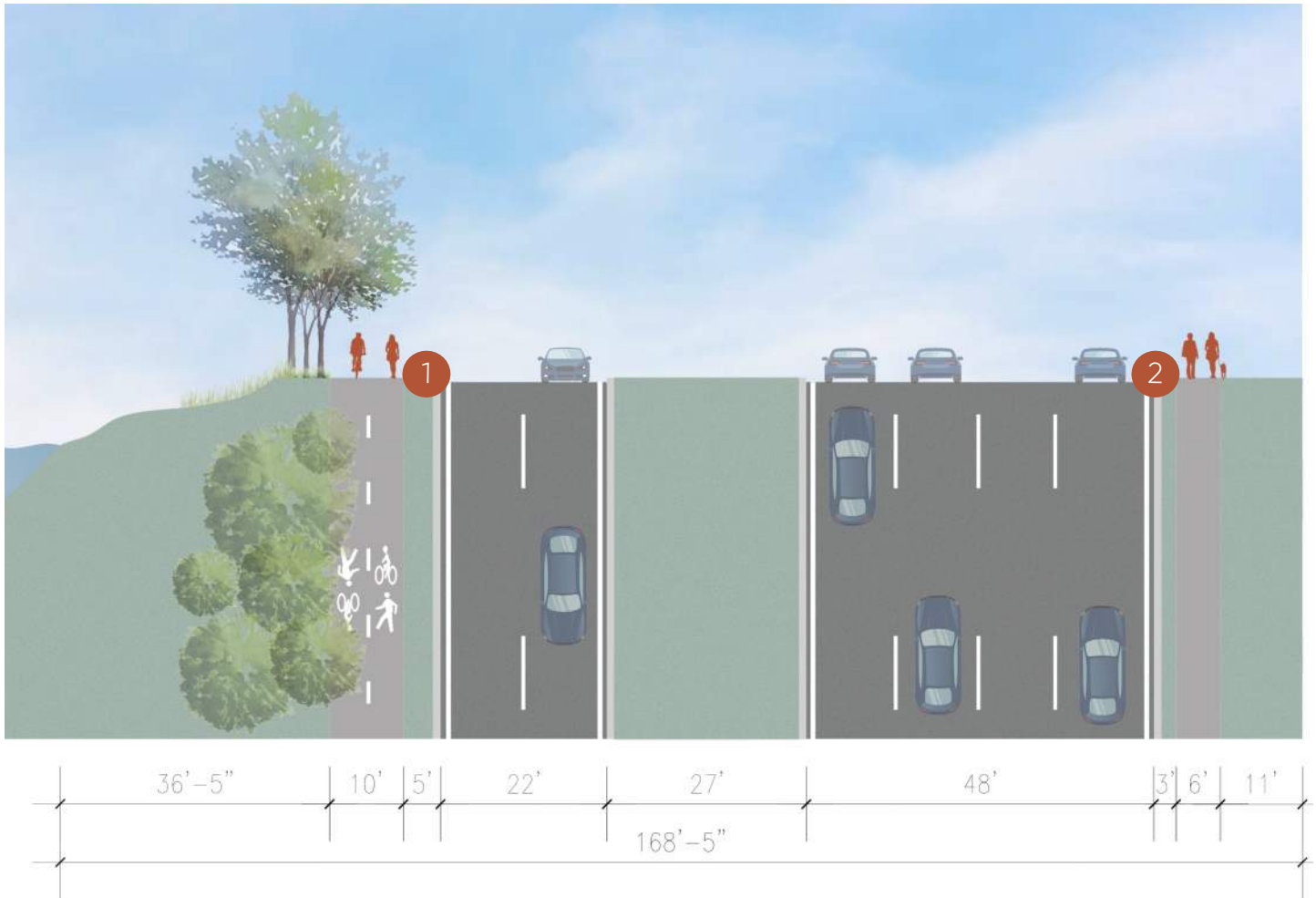


Overview

Further East, St. Patrick's Drive wraps around St. Charles Towne Center Mall and adjacent commercial businesses, and then bisects a number of higher density multi-family and single-family neighborhoods as it arcs towards Smallwood Drive. The segment above, between O'Connell Place and Western Parkway currently features narrow sidewalks on either side of the corridor. There is plenty of space to expand them so that people walking and cycling may have a more comfortable, connected way to access all of the destinations along this corridor. Thus, the proposal at right aims to widen the existing sidewalk on the southside so that a continuous shared use path can link Smallwood Drive with Crain Highway. Additionally, this segment deserves a wider, ADA-compliant sidewalk on the northside, allowing safe mobility for all.

9. St. Patrick's Drive, West of O'Donnell Place

Proposed - Looking West

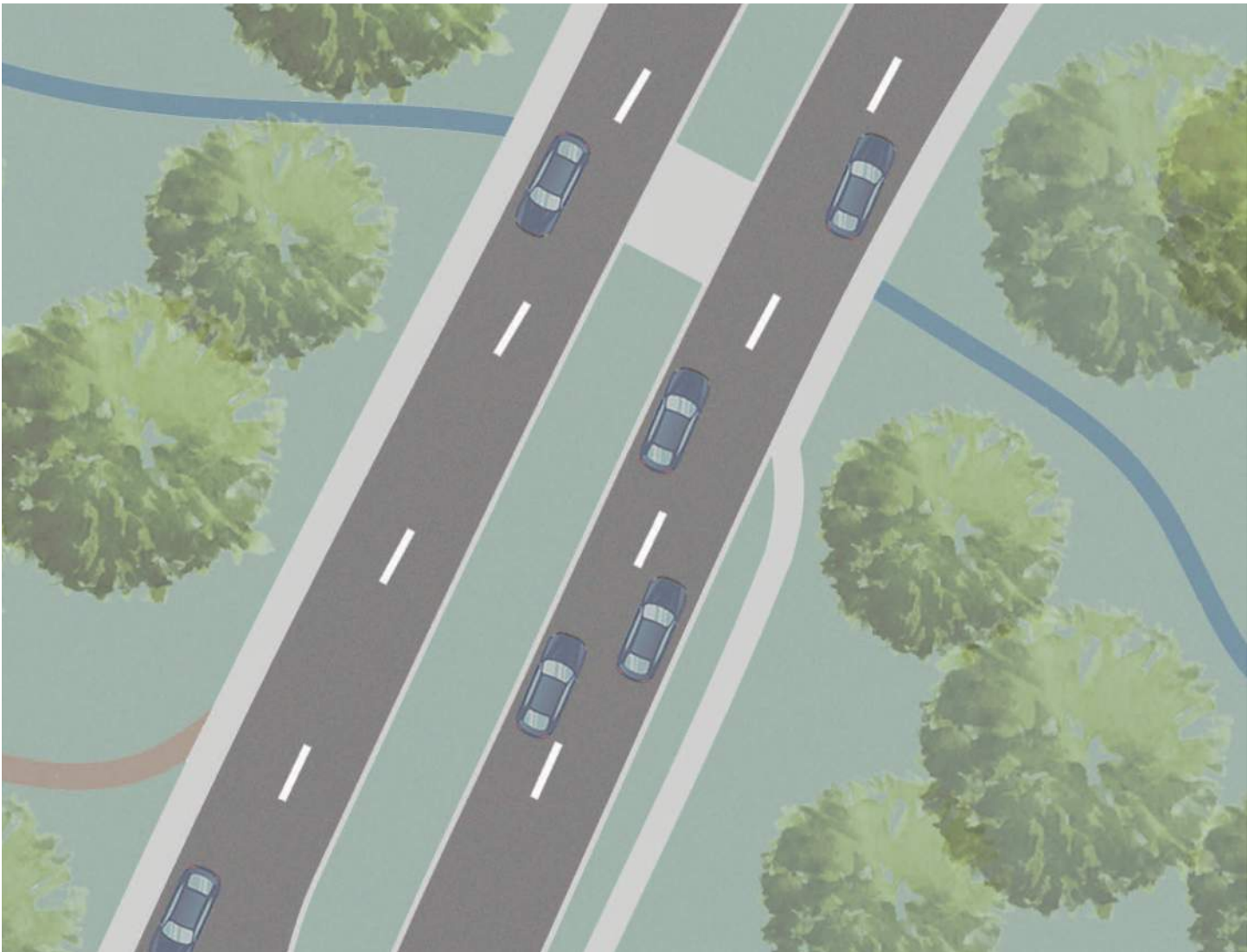


Key Features

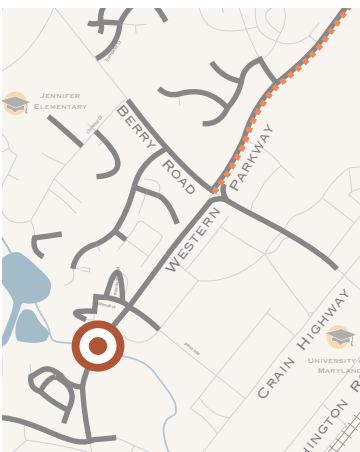
- 1 Class I - Shared Use Path
- 2 Wider Sidewalk

10. Western Parkway @ Piney Branch Creek

Existing Condition



Existing Context Map

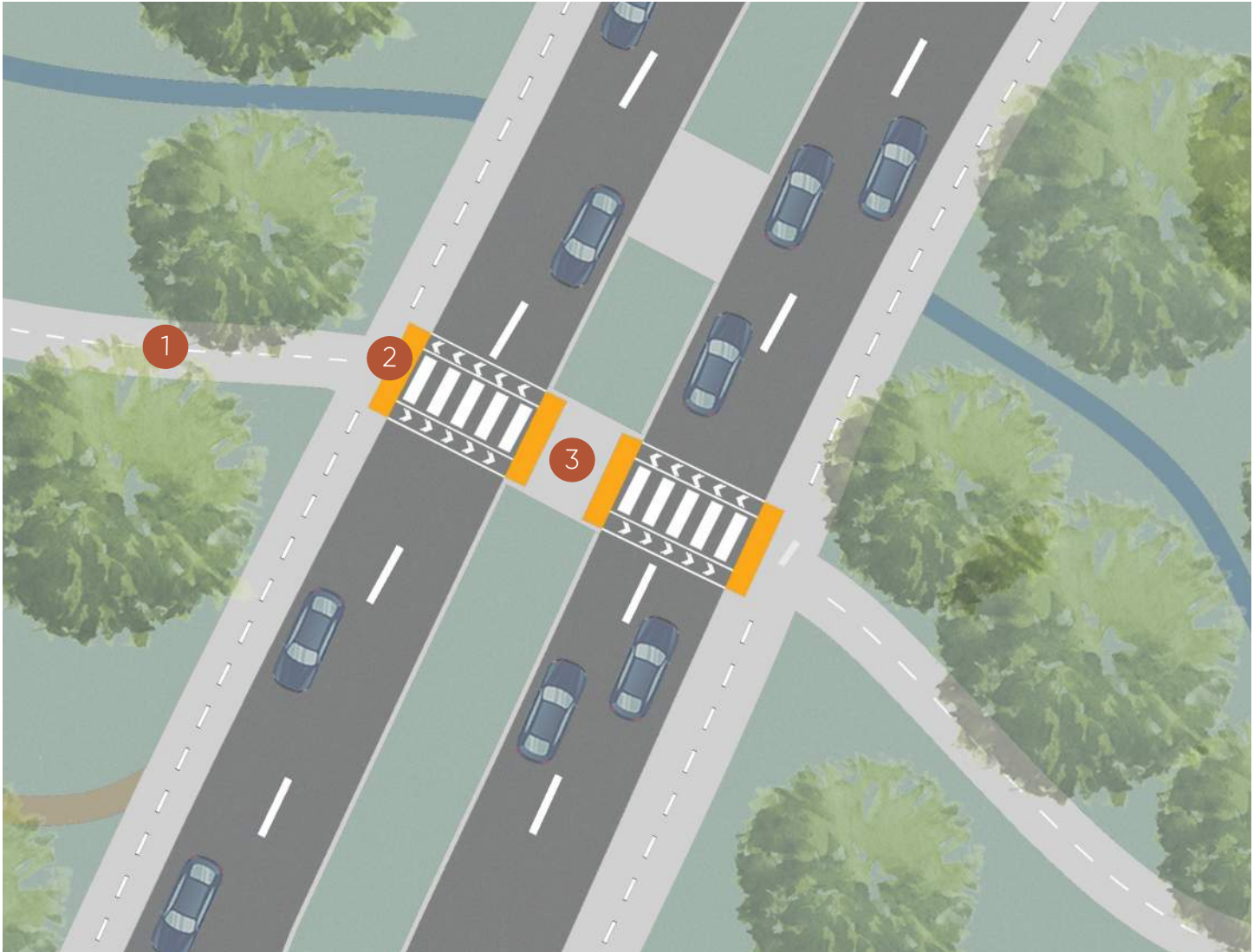


Overview

Western Parkway is a critical, and emerging transportation corridor. It parallels Crain Highway and for much of its trajectory includes sidewalks and / or a shared use path. The corridor links the St. Charles Towne Center Mall at the south with the redevelopment district emerging at Mattawoman Drive / Crain Highway in the north. There are a number of opportunities to improve the existing facilities and link them to proposed east-west connections. At the Piney Branch Creek Crossing (shown above), there is a clear opportunity to transform the existing sidewalk on the east side of the corridor into a shared use path, as well as to formalize an existing 'desire line' running parallel to the creek. The proposal at right seeks to enhance both of these north-south and east-west connections.

10. Western Parkway @ Piney Branch Creek

Proposed

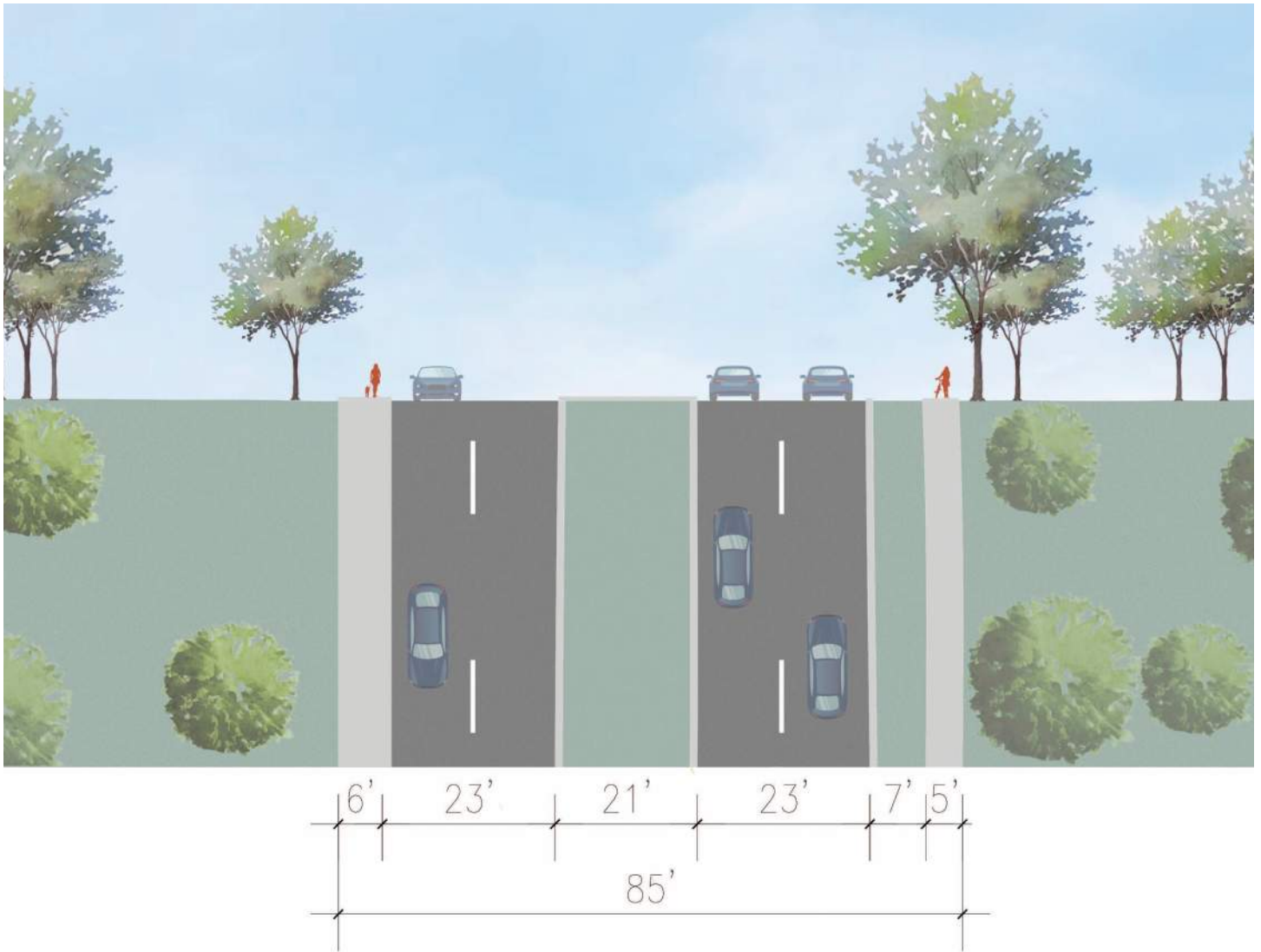


Key Features

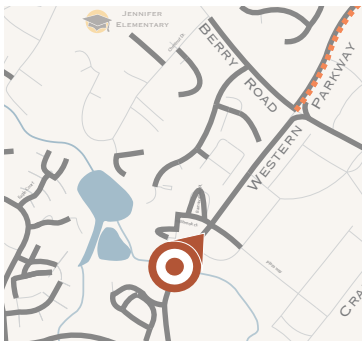
- 1 Class I - Shared Use Path
- 2 High-Visibility, AD-Compliant Crosswalk with Crossbike Markings
- 3 Pedestrian / Bicyclist Refuge Island

10. Western Parkway @ Piney Branch Creek

Existing Condition - Looking North



Existing Context Map



Overview

Piney Branch Creek provides a wonderful but heretofore publicly inaccessible slice of open space that runs from the Mattawoman Creek southeast to Crain Highway. While much of this land is preserved as defacto unbuildable land, it offers a wonderful opportunity to add soft trails and /or hard surface shared us paths where appropriate. This link will provide much needed open space access and drive value for nearby properties. Pictured above is one of only a few locations where the Piney Branch Shared Use Path system would need to cross a major road (Western Parkway).

10. Western Parkway @ Piney Branch Creek

Proposed - Looking North

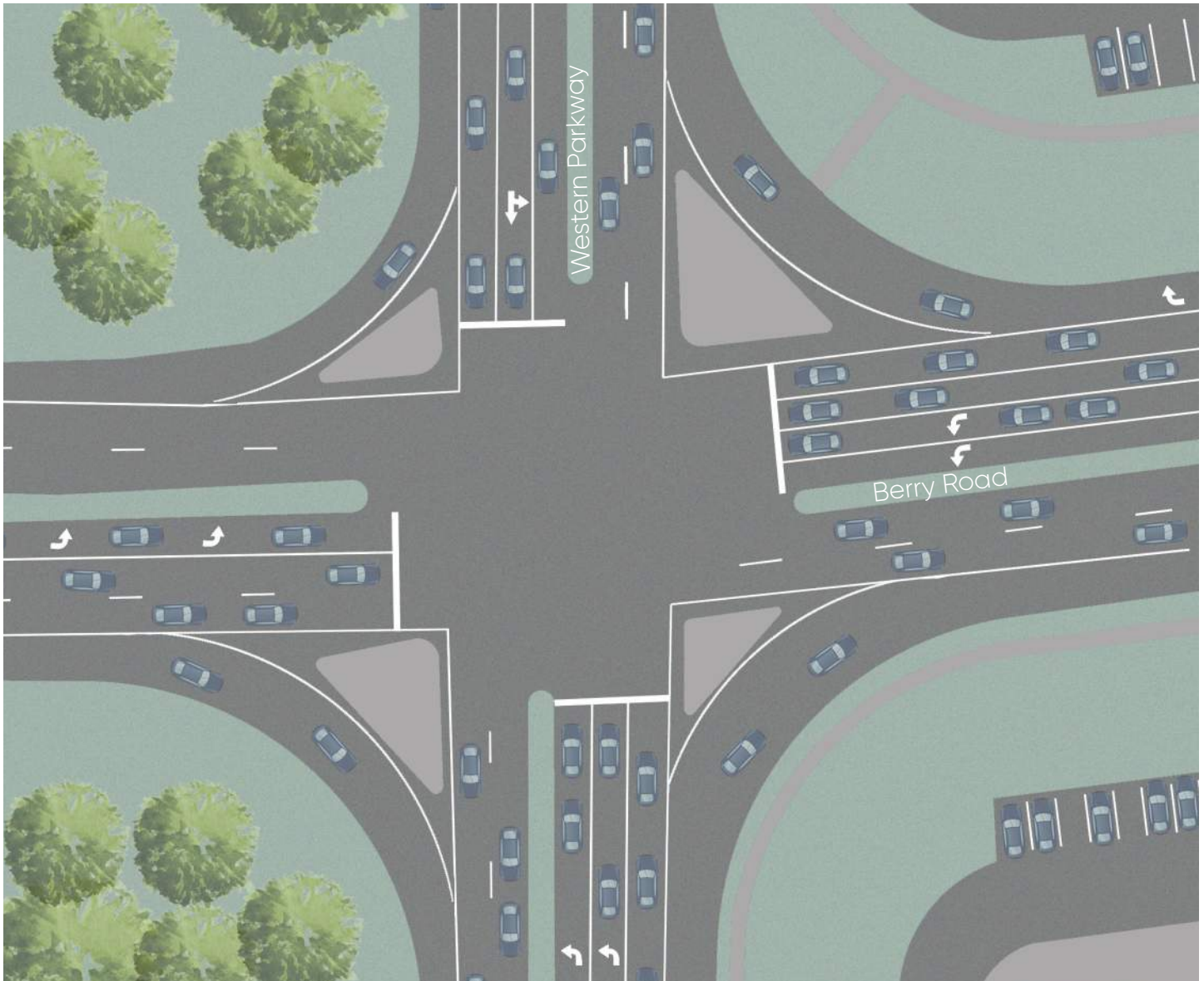


Key Features

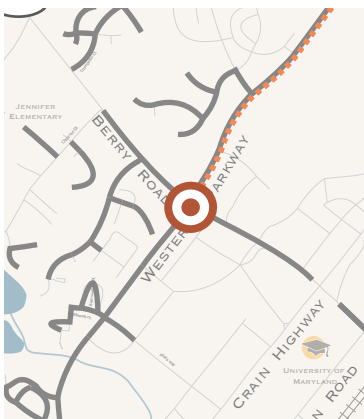
- 1 Class I - Shared Use Path
- 2 High-Visibility, ADA-Compliant Crosswalk / Crossbike Markings
- 3 Pedestrian / Bicyclist Refuge Island

11. Western Parkway @ Berry Road

Existing Condition



Existing Context Map

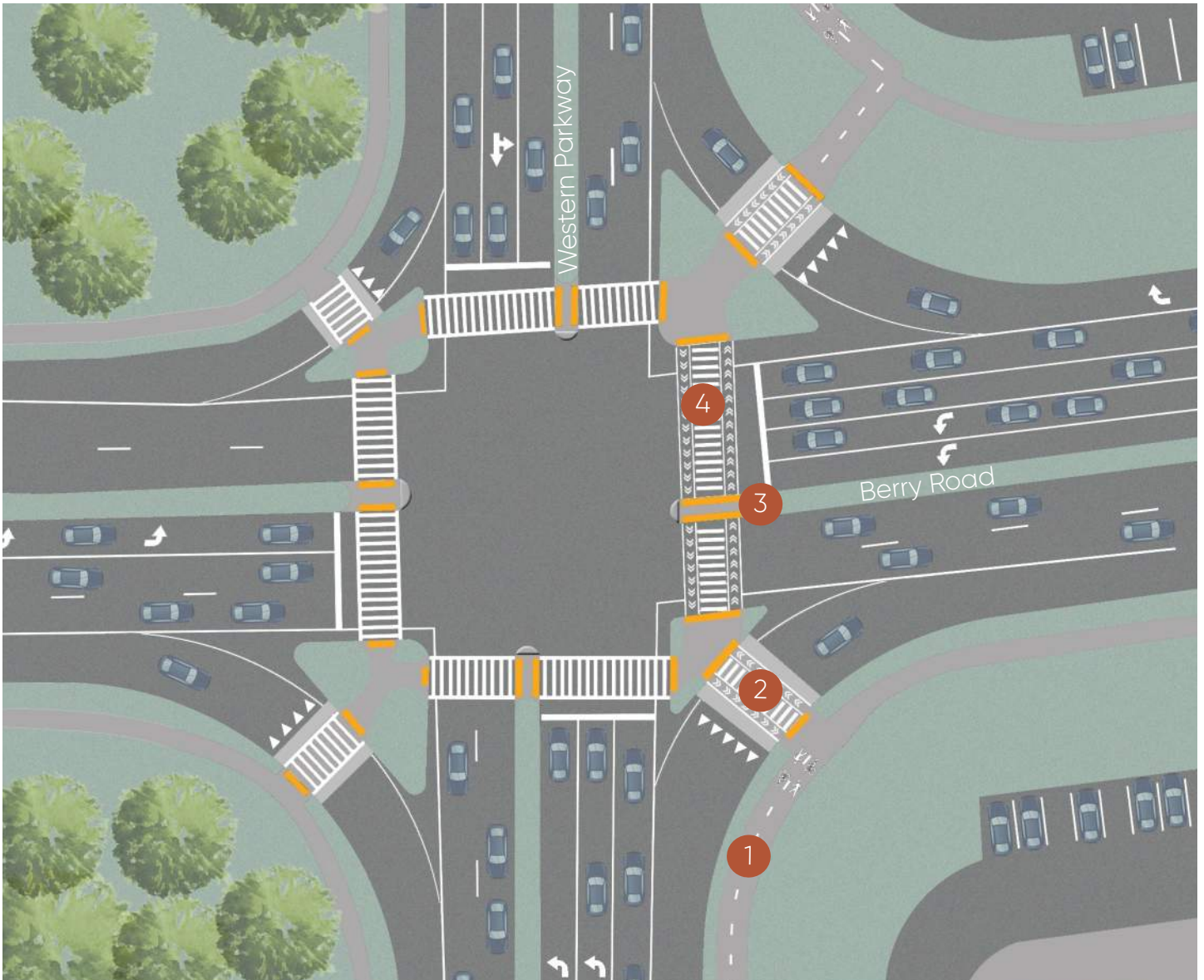


Overview

The convergence of Berry Road and Western Parkway is designed to accommodate motor vehicles. With little to no space left over for comfortable bicycle and pedestrian facilities, it's no surprise that this intersection is one of Waldorf's high crash locations, but also called out by stakeholders as one of its least appealing. Like other similar intersections, the proposal at right seeks to ameliorate the most egregious safety concerns with basic pedestrian and bicycling safety upgrades, including raised crossings, shared use paths, and high-visibility, ADA-Compliant crossings. A second, more aggressive version (call it a phase II) is presented thereafter. Both can be delivered with little impact to vehicular traffic.

11. Western Parkway @ Berry Road (Option 1)

Proposed

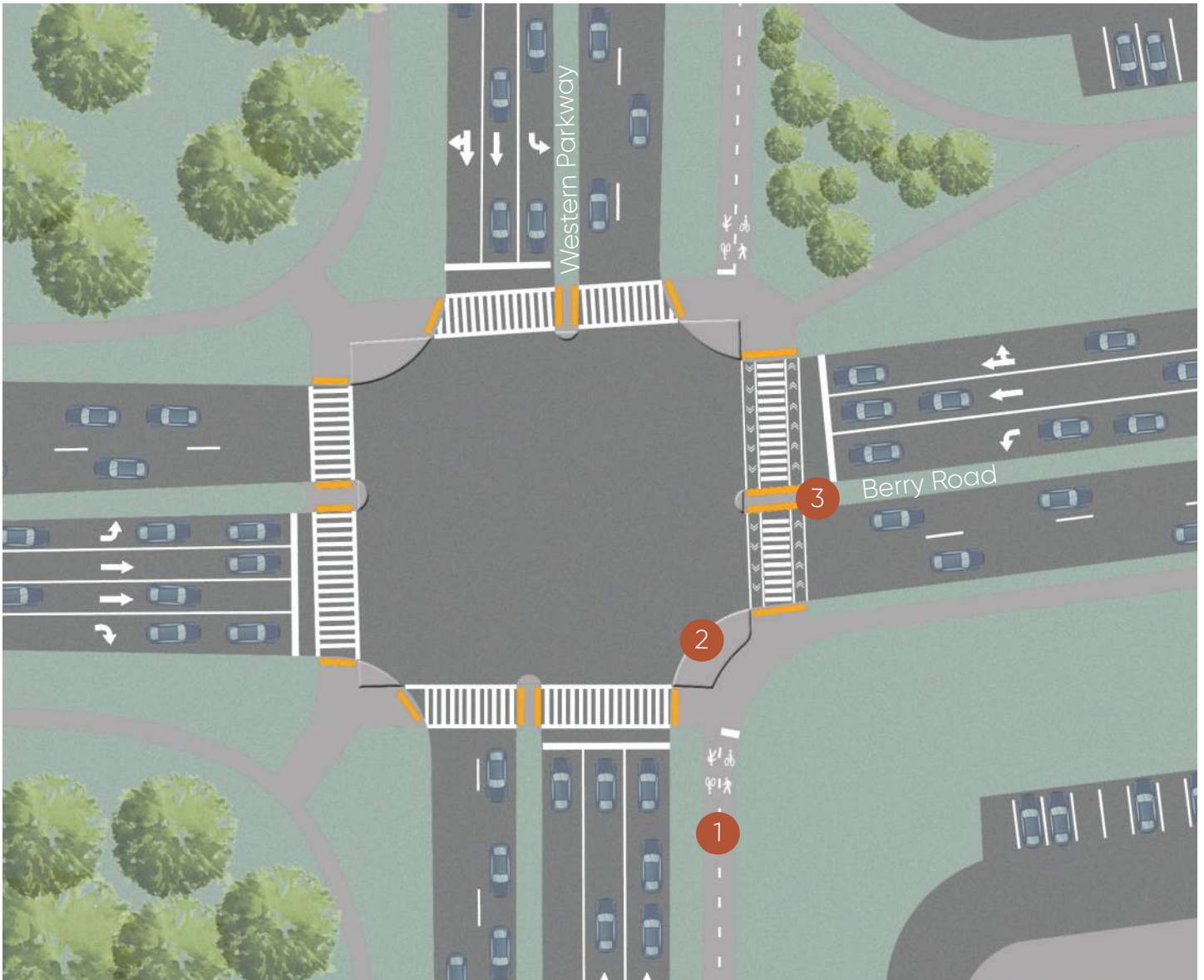


Key Features

- 1 Class I - Shared Use Path
- 2 Raised Crosswalk
- 3 Pedestrian / Bicyclist Refuge Island
- 4 High-Visibility Crosswalk with Crossbike Markings

11. Western Parkway @ Berry Road (Option 2)

Proposed



Key Features

- 1 Class I - Shared Use Path
- 2 Free-Right Turn Lanes Removed
- 3 Pedestrian / Bicyclist Refuge Island
- 4 High-Visibility, ADA-Compliant Crosswalk with Crossbike Markings



Implementation

Getting in Gear

Let's Ask The Right Questions

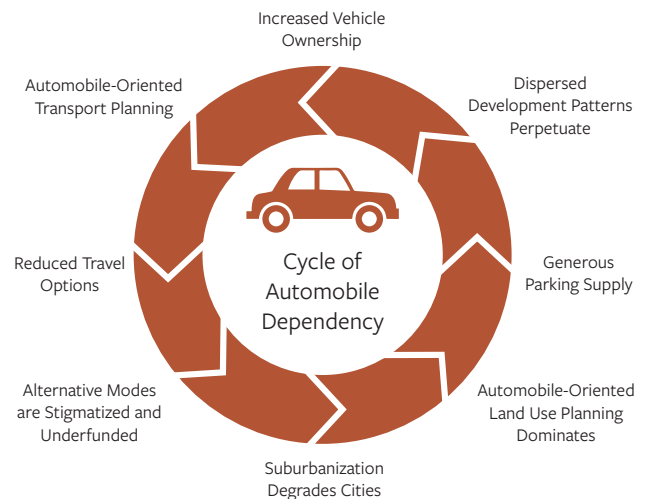
Many of the Connect Waldorf recommendations fundamentally require reconsidering how street space is allocated between people driving, walking, cycling, or taking the bus. Doing so will require looking at transportation investments in a more holistic, balanced, and inclusive way. As new projects are proposed and developed, it's imperative that Charles County and its many partner not be limited to asking "What will happen to the traffic?" Instead, questions such as "What will happen if we provide an attractive, low-stress bikeway in this corridor? What are the economic and public health benefits if we make safe and accessible street crossings? What are the outcomes for transportation access and choice? Will these proposed changes reduce the need for peak hour traffic capacity or parking?" Asking a broader array of questions, coupled with other land use and urban design policies and street safety and access improvements, will instigate not only a sustainable cycle of investments that reinforce a safe, low-cost, and healthy transportation system, but more importantly create a wonderful place for people to live.

Where to Start? What Will It Cost?

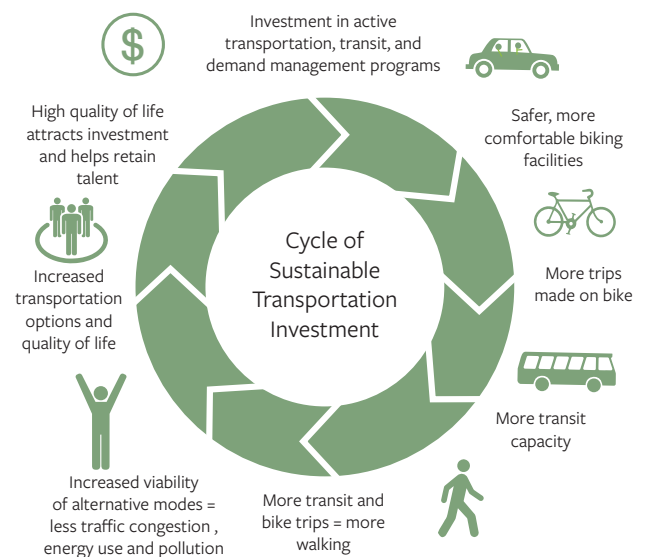
With so many projects, where should Charles County start? This section attempts to answer this important question by recommending a list of 25 priority projects and estimating what those projects might cost (in 2018 dollars). Using a project evaluation tool developed by Street Plans and a number of Maryland cost estimating resources, we've outlined we think the top 25 projects (see next page) will make the most impact for people who want to walk and bicycle safely around Waldorf. All told, we think implementing this list of projects, which will results in a mininum grid of connected, low-stress cycling and walking infrastructure, is doable within ten years, if not five.

Let's get to work!

Current Trend



Sustainable Cycle

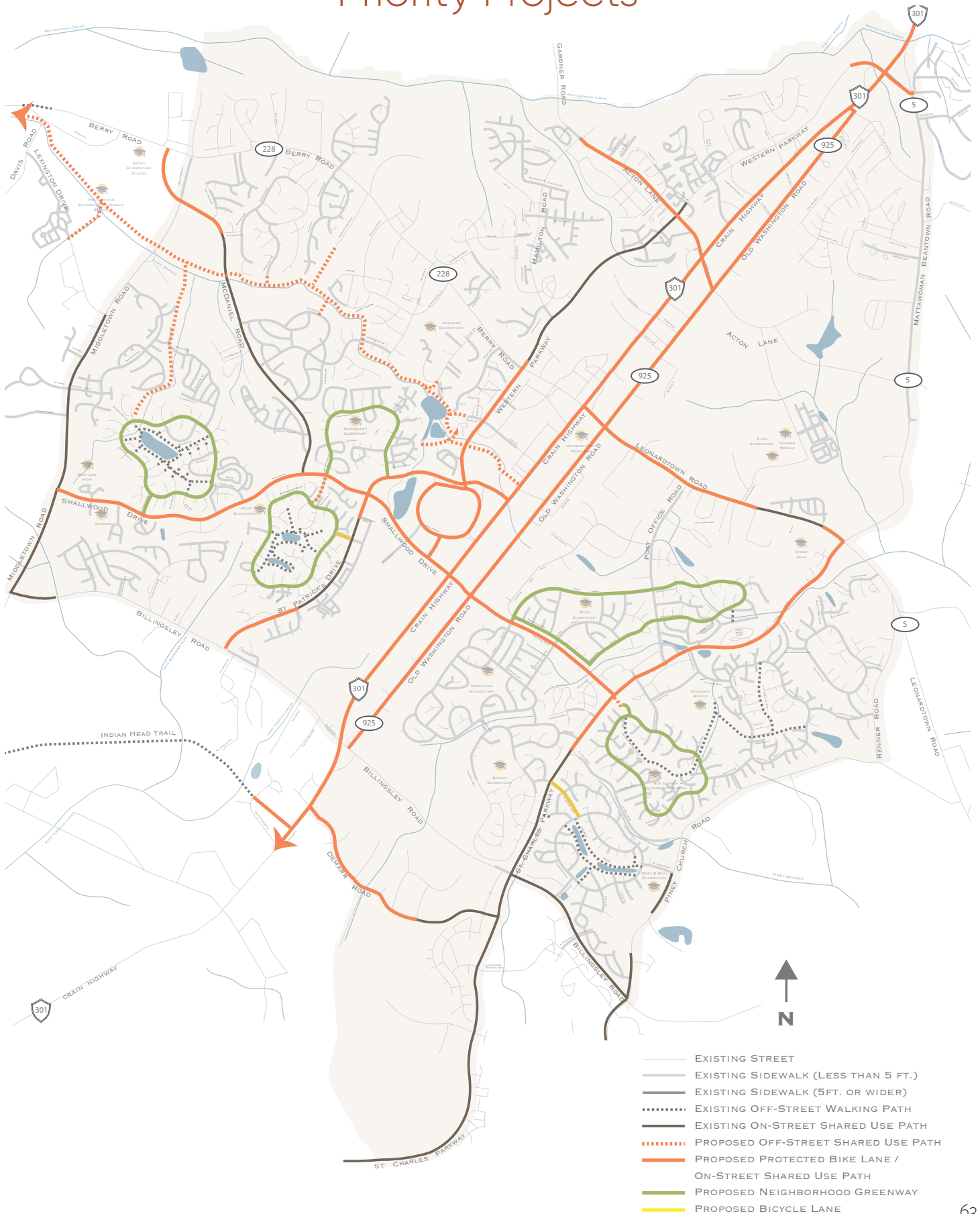


Project Prioritization

Using our project evaluation matrix, the following 25 projects scored the highest; each is mapped at right.

Priority Project	Score	Length	Treatment(s)	Cost
1. Smallwood Drive (West of Crain Highway)	31	2.10 miles	4' wide sidewalk extension to create 10' shared use path (asphalt).	\$692,481
2. Lancaster Circle	31	1.30 miles	Low speed Neighborhood Greenway. Traffic-calming.	\$47,739
3. Smallwood Drive (East of Crain Highway)	30	1.30 miles	New on street buffered 10' Hiker Biker (asphalt). Minimal clearing/grading (doesn't include new bike/ped bridge).	\$183,347
4. Smallwood Drive - Dorchester Circle Sidewalk Upgrade	29	0.19 mile	4' wide sidewalk extension to create 10' shared use path. (asphalt).	\$30,914
5. Saint Charles Parkway - Bannister Circle path connection	29	0.03 mile	New off street 10' Hiker Biker trail (asphalt). Clearing/grading required	\$6,010
6. Leonardtown Road (Post Office Road to Old Line Center)	29	0.51 mile	New buffered 10' shared use path (asphalt). Minimal clearing / grading required.	\$42,311
7. St. Patricks Dr. (Marketgate Place - Crain Highway / Billingsley Rd. - Quillback St)	29	1.58 miles	New buffered 10' shared use path (asphalt). Minimal clearing / grading.	\$222,837
8. Leonardtown Road (Post Office Road - Crain Highway)	28	0.80 mile	4' wide sidewalk extension to create 10' on street paved shared use path (concrete).	\$280,930
9. St. Charles Parkway (St. Paul Drive - Leonardtown Road)	28	2.13 miles	New 10' wide paved shared use path (asphalt). Clearing /grading required.	\$450,631
10. Acton Lane (Hamilton Road - Old Washington Road)	28	1.25 miles	Protected bike lane / lane re-striping.	\$107,078
11. McDaniel Road (Hallmark Lane - Berry Road)	28	0.66 mile	6' wide sidewalk extension / new buffered 10' shared use path (asphalt). Minimal clearing / grading required.	\$93,490
12. Piney Branch off-street shared use path	28	3.96 miles	New 10' wide off-street shared use path (asphalt). Significant clearing / grading required.	\$837,792
13. Bannister Circle	28	1.80 miles	Low speed Neighborhood Greenway. Traffic-calming.	\$66,100
14. Dorchester Circle	28	1.65 miles	Low speed Neighborhood Greenway. Traffic-calming.	\$60,592
15. Western Parkway (Mall Circle - Berry Road)	27	0.84 mile	4' - 6' wide sidewalk extension to create 10' shared use path (concrete).	\$295,296
16. Demarr Road (Just east of Ellinger Drive - Crain Highway)	27	1.03 miles	New buffered 10' shared use path (asphalt). Minimal clearing / grading.	\$145,267
17. Mattawoman Drive (Western Parkway - Mattawoman Beantown Road)	27	0.30 mile	Protected bike lane. Lane re-striping.	\$46,188
18. St. Charles Town Center entrance / Mall Circle	27	1.21 miles	Protected Bike Lane. Lane re-striping.	\$186,291
19. St Andrews Drive	27	0.27 mile	Stripe conventional bicycle lane.	\$15,126
20. St Phillips Drive	27	0.10 mile	Stripe conventional bicycle lane.	\$5,357
21. Hampshire Circle	27	1.80 miles	Low speed Neighborhood Greenway. Traffic-calming.	\$66,100
22. Huntington Circle / Barrington Drive / Barksdale Avenue / Copley Avenue	27	1.40 miles	Low speed Neighborhood Greenway. Traffic-calming.	\$51,411
23a. Old Washington Road south (Billingsley - Smallwood)	27	1.20 miles	New buffered 10' shared use path (asphalt). Minimal clearing/grading.	\$169,243
23b. Old Washington Road central (Smallwood - Acton Lane)	27	1.20 miles	Widening to create protected bike lane (does not include other street reconstruction costs.	\$209,874
23c. Old Washington Road north (Acton Lane - Sub-station Road)	27	2.40 miles	New buffered 10' shared use path (asphalt). Minimal clearing / grading.	\$191,809
24. Crain Highway	27	6.20 miles	New buffered 10' shared use path (asphalt). Minimal clearing / grading.	\$874,424
25. Indian Head Trail - Crain Connection	26	0.30 mile	New buffered 10' shared use path (asphalt). Minimal clearing / grading.	\$42,738
TOTALS		37.51 miles		\$5,421,377

Connect Waldorf - Priority Projects -



Cost Estimates

Introduction

The cost estimates for each of the network enhancements projects in this report have been calculated by multiplying the cost per mile of the proposed treatment, by the length of the project. The treatment types and their treatment elements are explained in the following pages.

Cost Estimate Methodology

The cost estimate for each treatment type was derived from typical costs of materials and construction based on the Maryland DOT cost sheet (2018), and the Anne Arundel County cost sheet (2012), which were used for cost comparison, project prioritization, and 'ball-park' estimates. A more detailed cost estimate per project will be required for the design/engineering phase of each project.

Notem non-essential additions such as trenching, conduit, and electrical infrastructure for lighting, water fountains, restrooms, gates, fences, signage, water fountains, bike parking/tool stands were not included. Stormwater infrastructure costs may vary considerably between projects.

Treatment Types

This study includes 10 typical treatments to complete the network outlined in this report. They include.

- ① New buffered 10' shared use path (asphalt); Minimal clearing / grading required.
- ② New 10' wide on-street shared use path (asphalt); Clearing/grading required.
- ③ 4'- 6' wide sidewalk extension to create 10' shared use path (Asphalt).
- ④ 4' - 6' wide sidewalk extension to create 10' shared use path (Concrete).
- ⑤ Widening to create protected bike lane (8' total assumed).
- ⑥ Curb protected bike lane (width varies); to be used in some locations as street width allows.
- ⑦ Lane re-assignment to include protected bike lanes, pedestrian refuge island etc.
- ⑧ 5' Conventional (striped) bike lane.
- ⑨ Low Speed Neighborhood Greenway (assumes a variety traffic-calming countermeasures).
- ⑩ New 5' concrete sidewalk.

Treatment Elements

Treatment Types Illustrated

1. New buffered 10' shared use path (asphalt). Minimal clearing/grading

Project elements include:

- 10' wide Asphalt trail
- 8" Curb with 12" gutter
- Dashed yellow trail centerline
- Shared us path pavement markings
- 10' green cossbike markings @ intersections
- Needed curb cuts

Notes: Gravel base course, lighting, and buffer turf establishment may also be required



2. New 10' wide on street paved shared use path (asphalt). Clearing/grading required

Project elements include:

- Removal of trees / clearing
- Grading
- Asphalt path
- 10' green cossbike markings @ intersections
- Needed curb cuts

Notes: Lighting may also be required



3. 4' wide extension to create 10' paved trail (asphalt)

Project elements include:

- 4'-6' wide asphalt trail extension
- 4" gravel base course
- 10' green cossbike markings @ intersections and new curb cuts
- Shared us path pavement markings

Notes: 8" curb and 12" gutter may also be required.



4. 4'-6' wide sidewalk extension to create 10' on street shared use path (concrete)

Project elements include:

- 5' Concrete Sidewalk expansion (cost assumes curb cuts and base course).
- Shared use path pavement markings
- Dashed Intersection Green Paint (10' wide)
- 10' green cossbike markings @ intersections and new curb cuts



5. Widening to create protected bike lane (8' total assumed)

Project elements include:

- 4' shoulder widening
- Buffer striping (2' -4')
- Dashed Intersection Green Paint (6' wide)
- Flexible delineator posts



6. Curb protected bike lane (width varies)

Project elements include:

- Buffer striping (2' - 4')
- 10' green cossbike markings @ intersections)
- 2' concrete median



7. Road Diet

Project elements include:

- Remove striping for 4 lane section
- Yellow re-striping 3 lanes including center lane
- White re-striping 3 lanes including center lane
- Buffer striping
- 6' green cossbike markings @ intersections
- Flexible delineator posts



8. 6' Conventional (striped) bike lane

Project elements include:

- 4' Shoulder widening (as needed)
- Bike lane buffer striping (2' - 4')
- 6' green crossbike markings @ intersections



9. Neighborhood Greenway

Project elements include:

- Shared use lane markings
- Signage
- Traffic calming, including mini-roundabouts, chicanes, bike refuge islands etc.



10. 5' concrete sidewalk

Project elements include:

- 5' Concrete sidewalk
- 10' wide high-visibility crosswalks
- Curb cuts



Appendix: Project Prioritization Template

The template below was used to evaluate / score all of the projects proposed in this study. The the top 25 projects are listed and mapped on report pages 60-61.

Project Location:	Leonardtown West	
Project Limits:	Crain Hwy	Post Office Rd
Details:	4' wide sidewalk extension to create 10' on street paved trail (concrete)	
	Scoring Criteria	Points Awarded
Improves Safety: Does the project location align with a priority intersection or corridor?	Yes = 3	3
	No = 1	
Enhances Safe Routes to Schools	Within 0.25 miles of a school = 3	3
	Within 0.5 miles of a school = 2	
	Within 1 mile of a school = 1	
Provides Connectivity to Neighborhood Activity Centers (NAC)	Within 0.25 miles of a NAC = 3	3
	Within 0.5 miles of a NAC = 2	
	Within 1 mile of a NAC = 1	
Estimated impact on parking/traffic (evaluated in broad terms based on need for lane reassignment or parking changes)	No significant impact anticipated = 3	3
	Some perceived impact anticipated (e.g. longer wait times) = 2	
	Includes significant trade-offs or costs (e.g. may require removal of parking, lane reassignments; may impact intersection capacity; may require changes to signal operations) = 1	
Reduces Bike/Walk Access Barriers	Directly addresses real or perceived biking or walking barrier (ex: unsafe intersection, gap in bike network, etc.) = 2-3	3
	Does not addresses real or perceived biking or walking barrier = 1	
Access to Transit	Within direct access to a bus stop = 3	3
	Within 0.25 miles of a bus stop = 2	
	Within 0.5 miles of a bus stop = 1	
Public Input	Identified by the public as priority = 1-3 (varies)	3
	Identified by the public as a top priority at least once = 1	
	Not identified = 0	
Ease of Implementation	Exclusively in the public right-of-way with few cost complications or changes to traffic patterns = 3	3
	Some modifications to curb/traffic lanes required, use of private property and/or modest engineering challenges = 2-3	
	ROW negotiations/acquisition and sidewalks along multiple private properties is required; expensive engineering required = 1	
Order of magnitude cost	< \$20,000 = 5	
	< \$50,000 = 4	
	< \$100,000 = 3	
	< \$250,000 = 2	
	< \$500,000 = 1	1
	< \$1,000,000 = 0	
Curb Appeal (Impact on beauty and appeal of the street)	Gotta have it! = 3	3
	Very desirable = 2	
	Desirable = 1	
	How-hum = 0	
TOTAL SCORE		28

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