Harford County Bel Air Bicycle Network Study

Harford County Bel Air Bicycle Network Study

Landscape Architecture

DEPARTMENT OF PLANT SCIENCE AND LANDSCAPE ARCHITECTURE

Bachelor of Landscape Architecture Capstone Studio, LARC 471

Spring 2018

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**coeditor*

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Introduction

In 2013, Harford County adopted a Bicycle and Pedestrian Master Plan that establishes goals and priorities for improving the County's bicycle and pedestrian networks and connecting to key destinations throughout the County.

In 2018, Harford County engaged with the Bachelor of Landscape Architecture Capstone Studio at the University of Maryland to develop a more comprehensive plan that would include an overall strategy and suite of best practices to guide the development, implementation and expansion of the County's bicycle network.

During the studio's first phase, students reviewed the existing plan, supporting materials, precedents of bicycle trails and Complete Streets policies, and met with planning officials to evaluate information gaps and missing links and to provide recommendwations for developing links. Working in design teams, students addressed the priority connections between the County and the Town of Bel Air. The teams also identified potential connections to or expansions of the green infrastructure network and opportunities for recreational tourism.

During the studio's second phase, students undertook a more detailed analysis of the Town of Bel Air's 2013 Bicycle and Pedestrian Plan to advance the proposed segments that connect to the County's Plan. County-identified priorities include Macphail Road, MD Route 24, and the connection between downtown Bel Air and Harford Community College. The teams field verified the concepts for proposed routes.

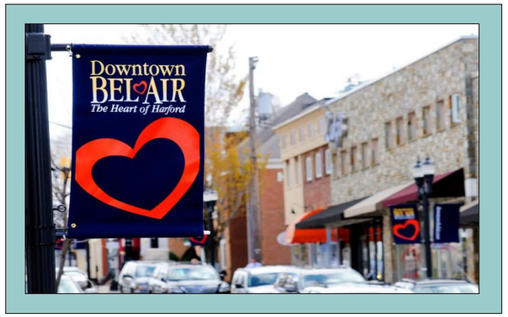
Standards for trail designs and markers were developed and marker locations were identified.

Analysis

Historical Context
Regional Context
Points of Interest
Circulation
Land Use
Climate & Soils
Topography
Demographics
Traffic & Road Safety
Bicycle Facilities

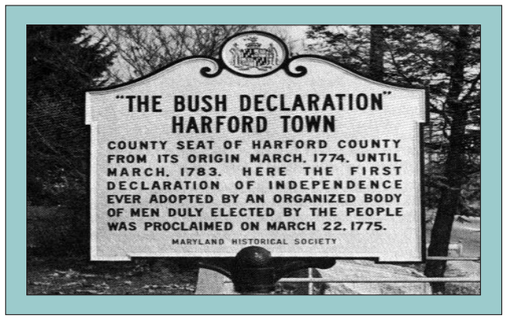
Historical Context

Bel Air

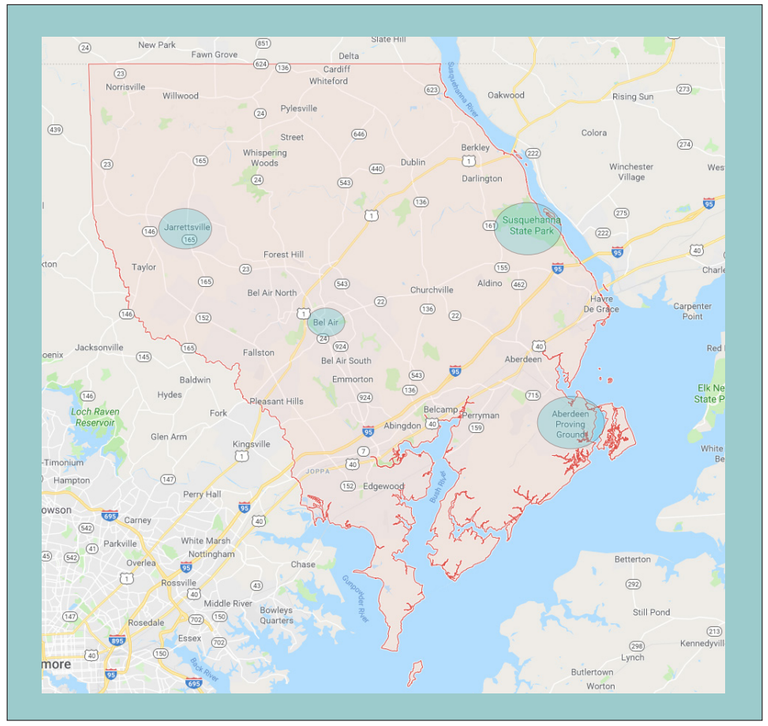


The town of Bel Air is the largest in Harford County.

Bush Declaration



In 1775, the Bush Declaration, written in Harford County, was the first expression of support for the Patriot cause in the American Revolution. The Thirteen Colonies would follow with similar resolutions.

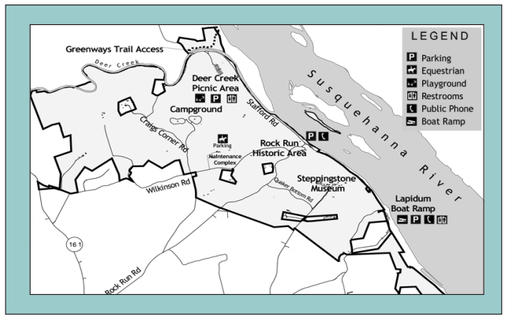


My Lady's Manor



My Lady's Manor is a historical district in Jarrettsvile.

Susquehanna State Park



Susquehanna State Park was created in 1957 with the donation of 300 acres of land to the state by J. Gilman D'arcy Paul.

Aberdeen Proving Ground



Aberdeen Proving Ground is the oldest active proving ground in the USA.

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LARC 471 Studio

William Wolfe

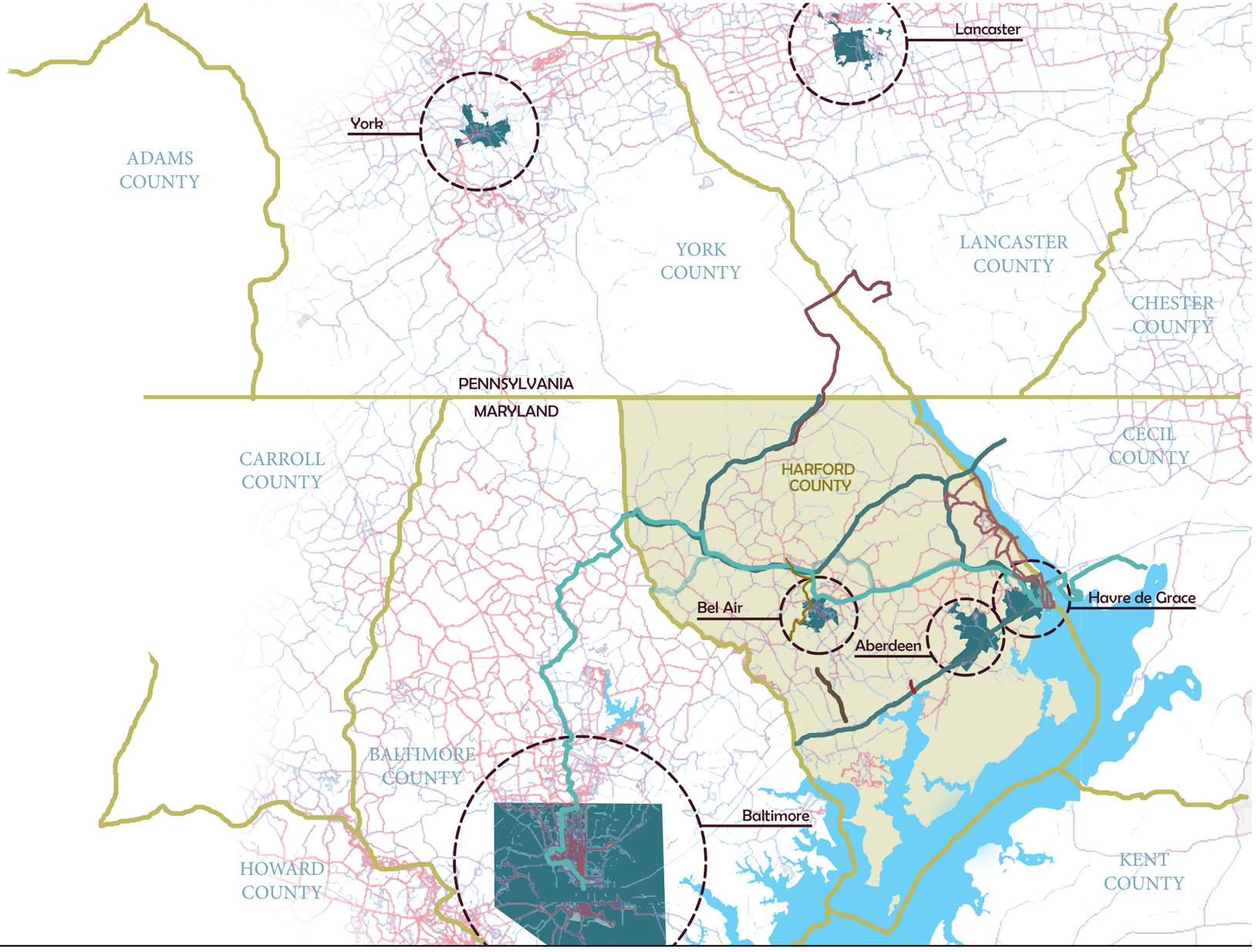
Regional Context

Harford County, Maryland

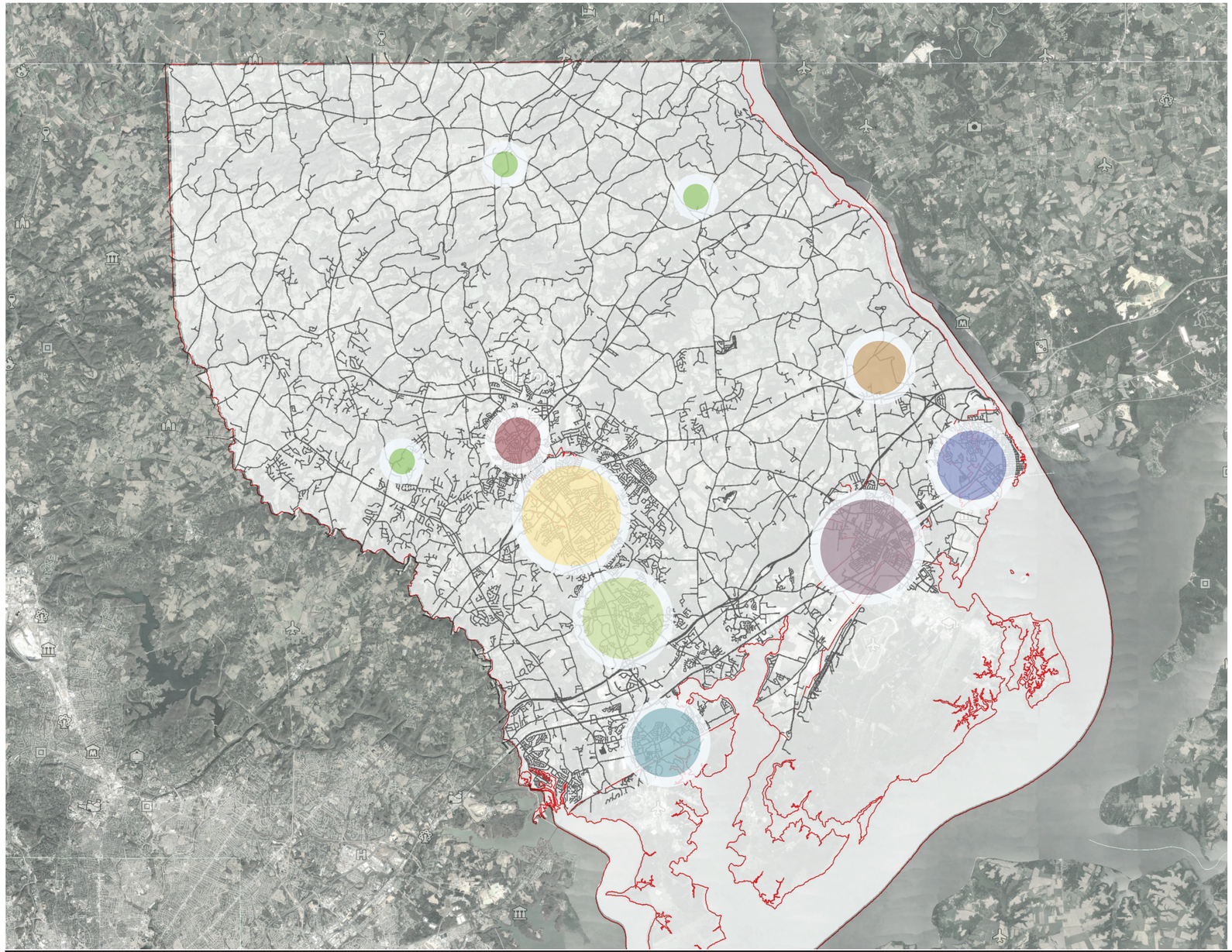
Harford County abuts the Maryland/Pennsylvania border. The County's network of trails connects to regional trails.

TRAILS

- Lower Susquehanna
- Church Creek
- Bike Trail
- Ma & Pa Trail
- East Coast Greenway
- Whiteford Trail
- Winters Run Trail



Points of Interest



North Bel Air

7	Entertainment
4	Schools
4	Parks
4	Churches
8	Grocery Stores

South Bel Air

5	Entertainment
8	Schools
4	Parks
7	Churches
3	Grocery Stores

Central Bel Air

7	Entertainment
13	Schools
10	Parks
16	Churches
5	Grocery Stores

Rural Neighborhoods

1	Entertainment
3	Schools
1	Parks
2	Churches
2	Grocery Stores

Edgewood

6	Entertainment
9	Schools
4	Parks
9	Churches
4	Grocery Stores

Aberdeen

4	Entertainment
8	Schools
6	Parks
18	Churches
8	Grocery Stores

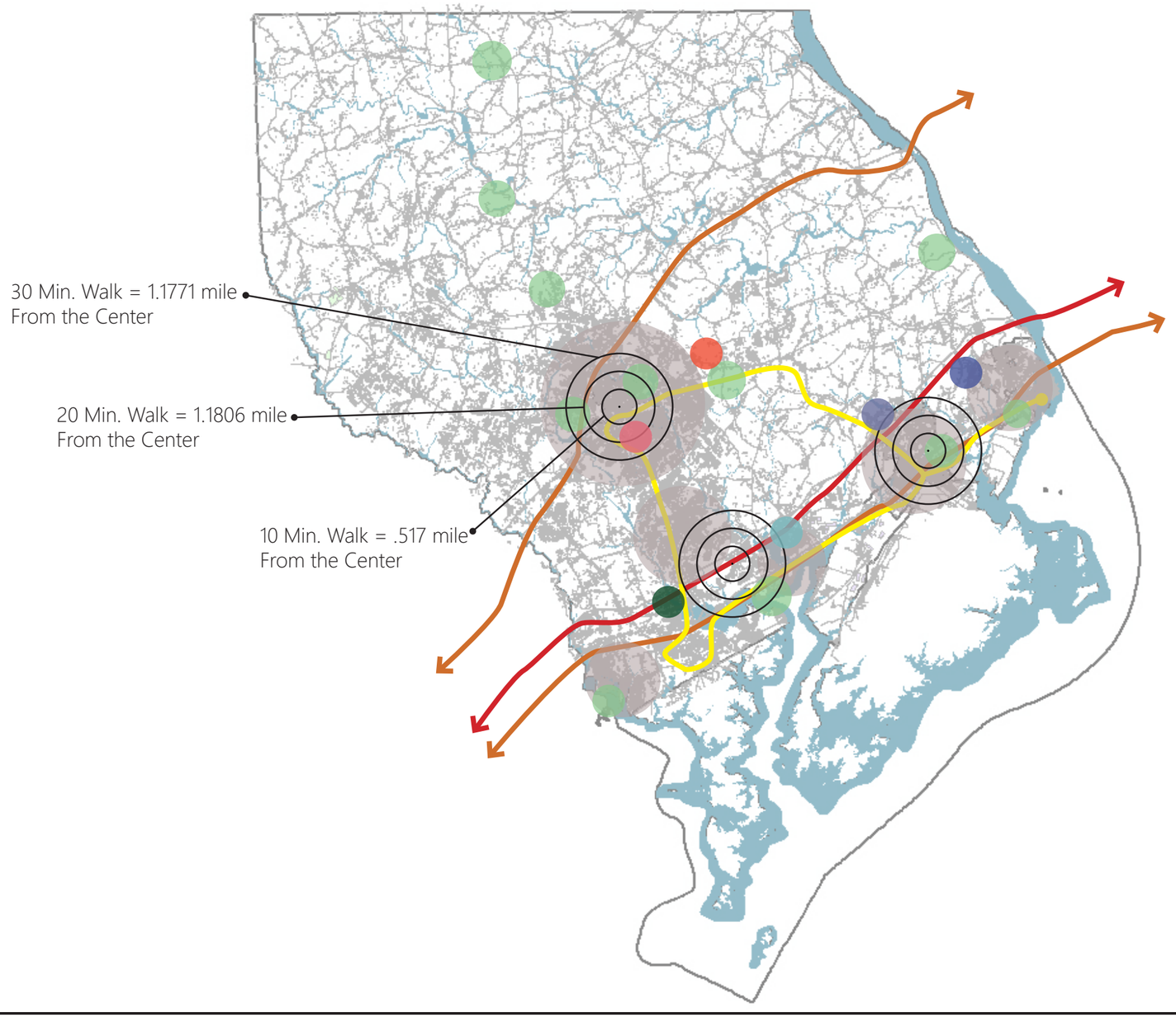
Harve De Grace

7	Entertainment
4	Schools
9	Parks
16	Churches
7	Grocery Stores

State Park

1	Entertainment
1	Schools
2	Parks
6	Churches
1	Grocery Stores

Circulation



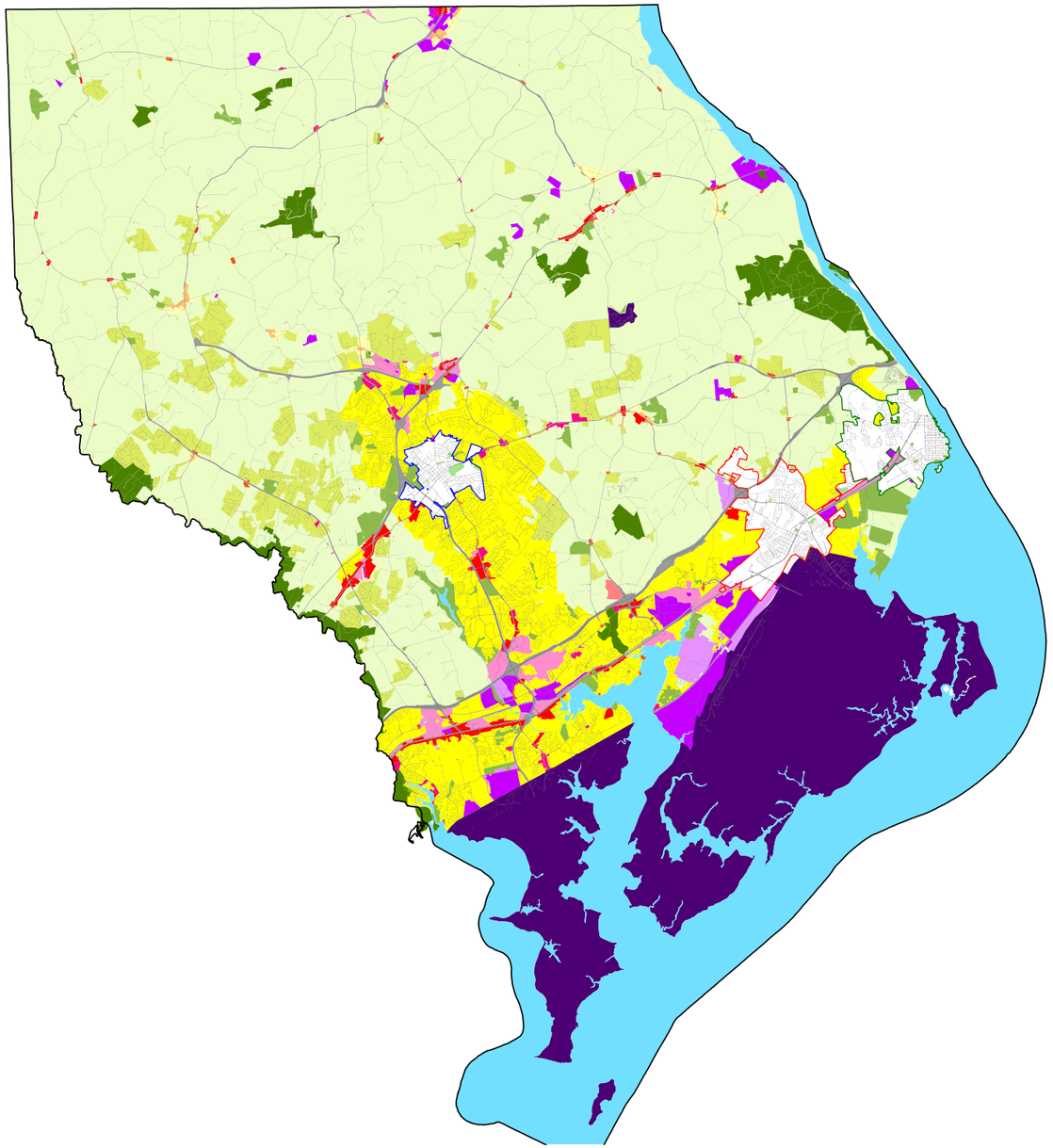
LEGEND

- Average Person Pace
- Residential & Housing
- Park
- Public Transit
- Primary Road
- Secondary Road

POINT OF INTEREST

- Harford Community College
- Harford Mall
- Harford Memorial Hospital
- Beard's Shopping Center
- Riverdale Shopping Center
- Edgewood Shopping Center

Land Use



North of Baltimore, Harford County covers 437 square miles of mostly rural land. These rural areas, about two-thirds of the County, include federally and locally owned parks, agricultural land, and forest stands. Development is located to the south, near the Chesapeake Bay, in the communities of Bel Air, Havre de Grace, and Aberdeen, as well as Aberdeen Proving Grounds. These towns and their outskirts are primarily residential, with pockets of industrial and commercial land. Aberdeen Proving Grounds, on the County's southernmost peninsula, is a military testing facility.

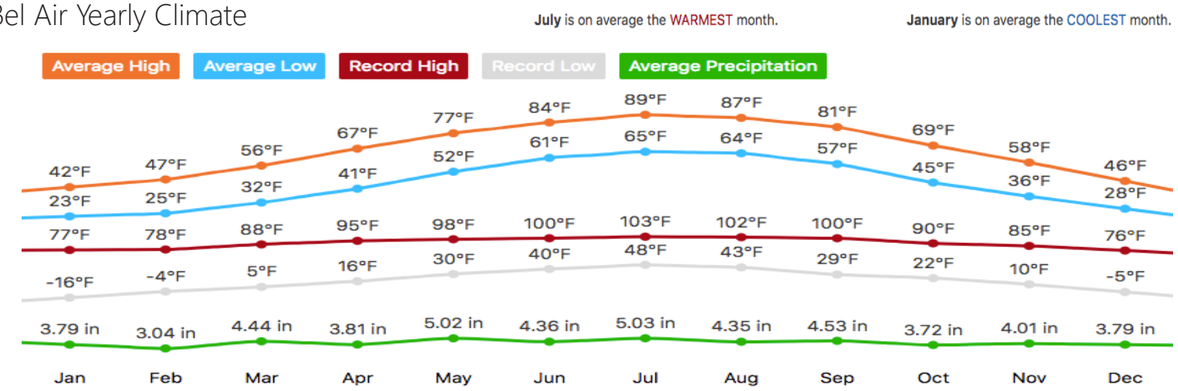
Harford County's park system offers many opportunities to establish a network of trail connections to future development.

Key

- Harford County Boundary
- Aberdeen
- Bel Air
- Havre de Grace
- Water
- Aberdeen Proving Ground
- County Parks
- Local Parks
- State Parks
- Agriculture
- Commercial Industrial District
- Community Business District
- General Business District
- General Industrial District
- Light Industrial District
- Mixed Office
- Neighborhood Business District
- Residential Office
- Right of Way
- Rural Residential
- Urban Residential District (R1)
- Urban Residential District (R2)
- Urban Residential District (R3)
- Urban Residential District (R4)
- Village Business District
- Village Residential District

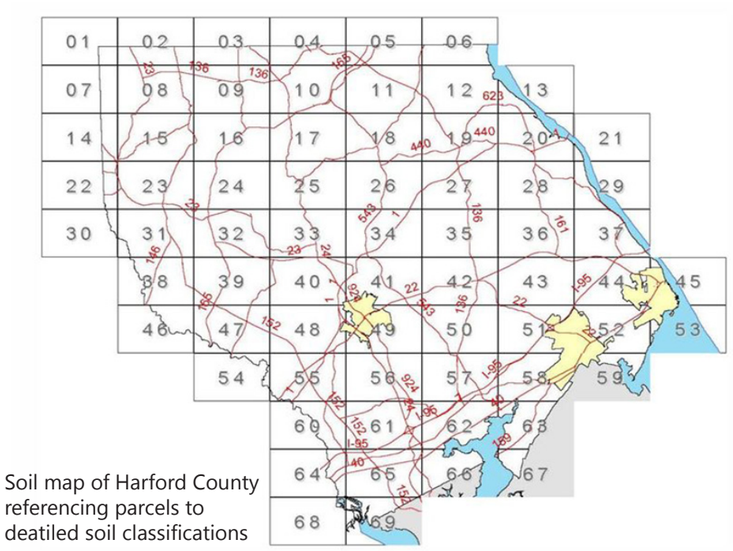
Climate & Soils

Bel Air Yearly Climate



https://weather.com/weather/monthly/l/Bel+Air+MD+21014:4:US

Harford County Soil Map



Soil map of Harford County referencing parcels to deatiled soil classifications

https://harfordcountyhealth.com/harford-soil-map/

County Soil Classifications

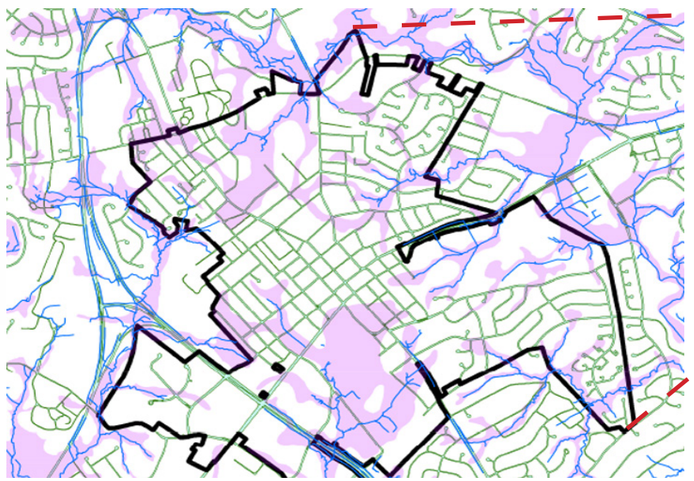
Bel Air-
Silt Loam Soils

Havre de grace-
Silt Loam, clay to stony

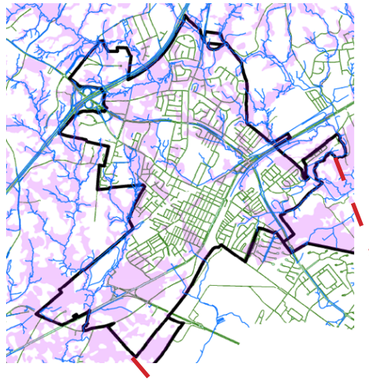
Aberdeen-
Silt Loam, clay, stony to sandy

Hydric soils are formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper area.

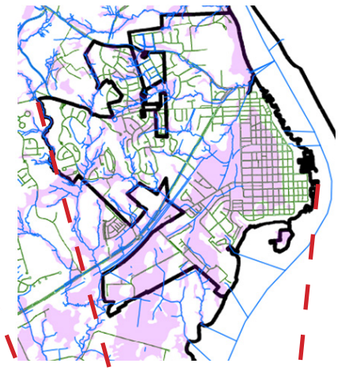
Hydrology lines are drainage features and structures including rivers, streams, drainage canals, locks, dams, lakes, ponds, reservoirs and mooring cells, hidden lakes, reservoirs or ponds.



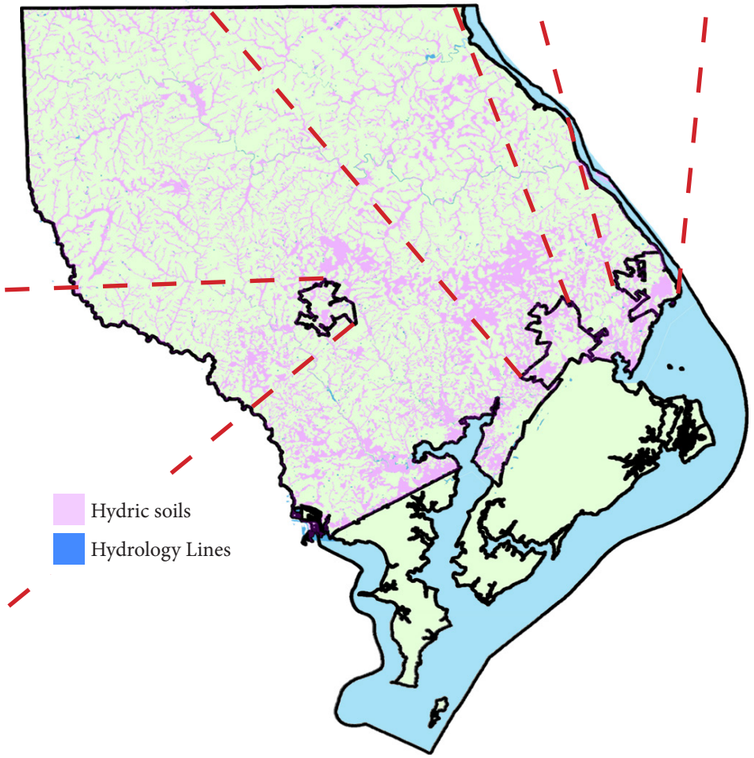
Bel Air



Aberdeen

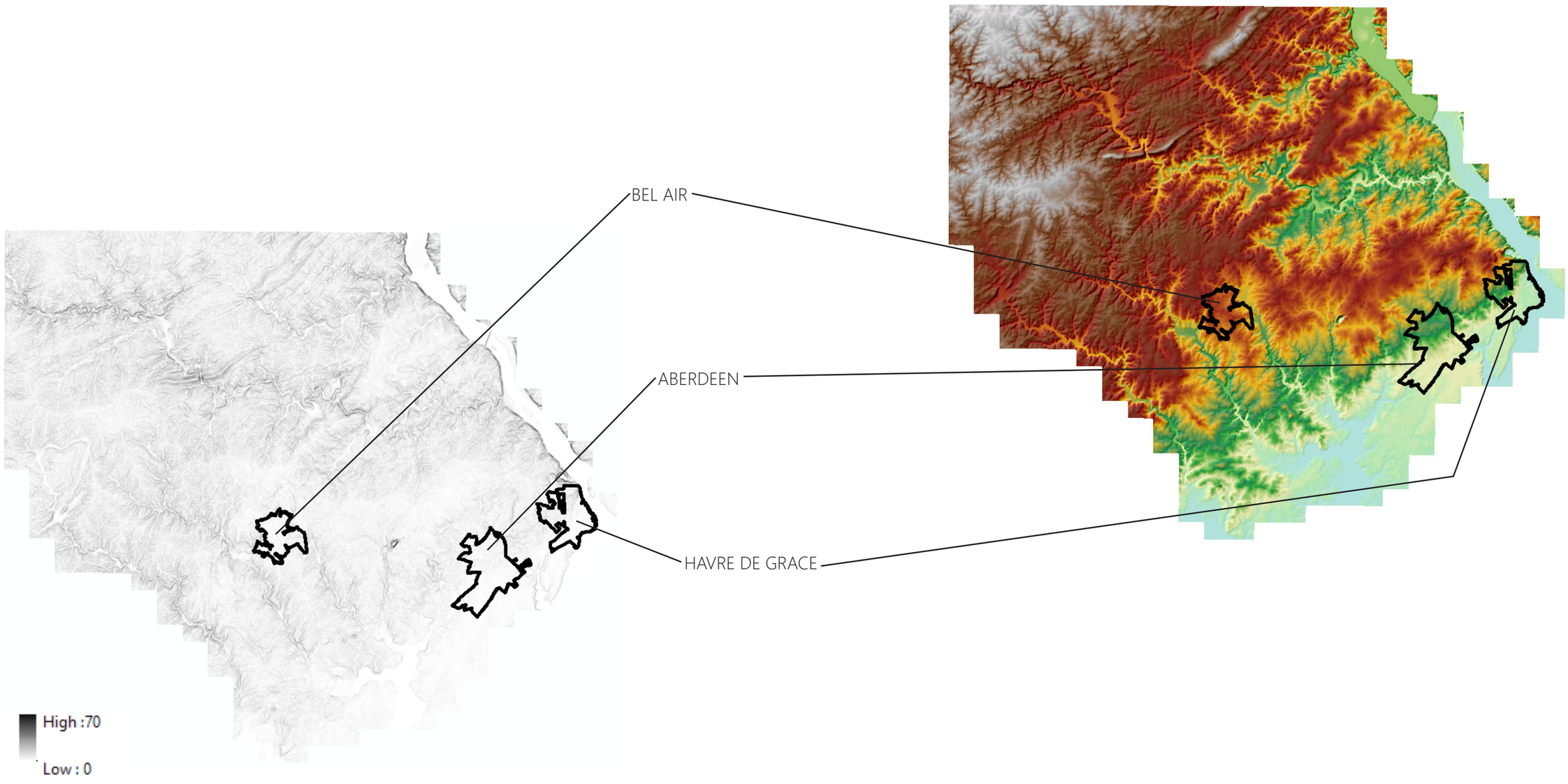


Havre de Grace



Harford County

Topography



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Chris Snyder

Not to Scale

Demographics Harford County

Population Size

251,032 (as of July 1, 2016)

Transportation

Mean travel time to get to work (people ages 16+):

31.6 Minutes

Housing

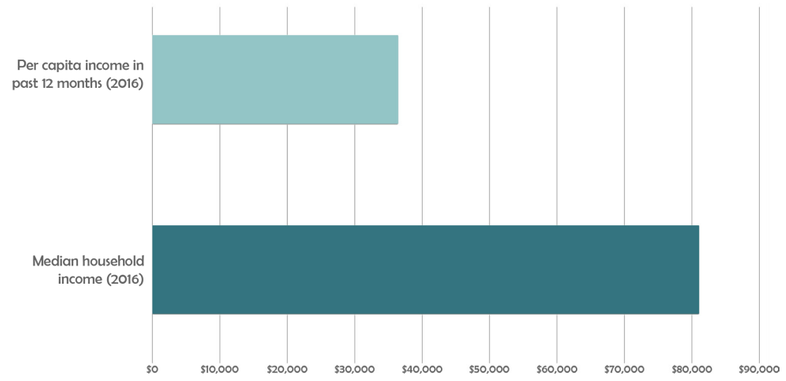
Housing Units: 99,710
Households: 92,597
Persons per Household: 2.68

Geography

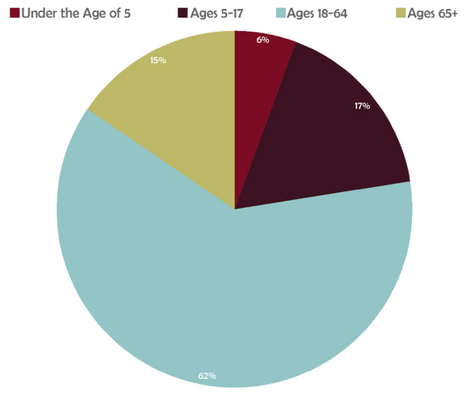
Population per square mile: 560.1 (2010)

Land area in square miles: 437.09 (2010)

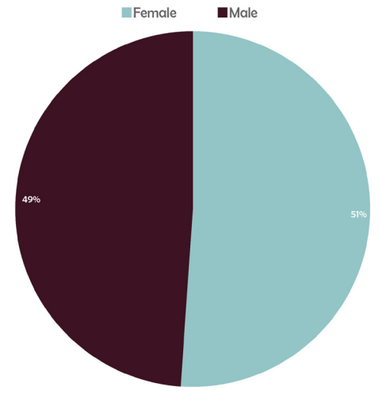
Income



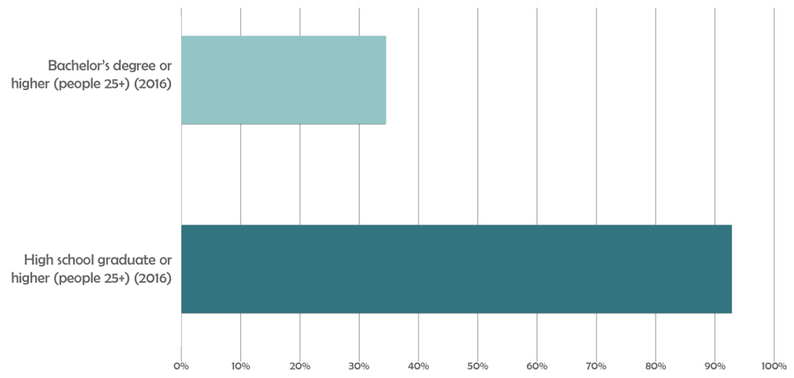
Age



Sex

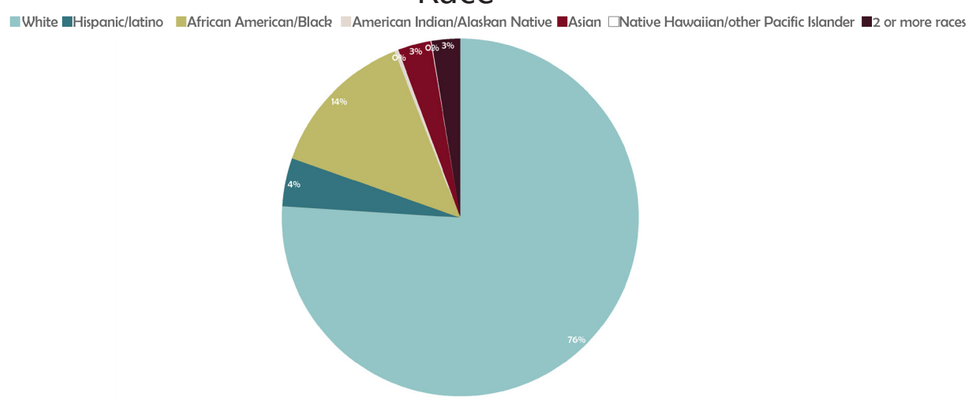


Education



Source: https://www.census.gov/quickfacts/fact/table/harfordcountymaryland/PST045216

Race



This information illustrates who the people of Harford County are and how they live. Applying this information in the design process can help develop proposals that best serve this community.

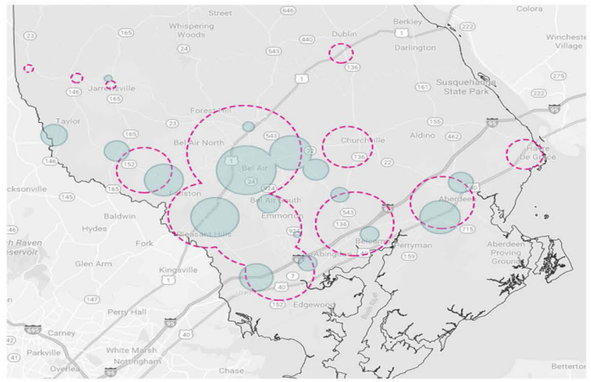
Traffic & Road Safety

Getting Around

Census data shows the average County household owns two cars and that most residents drive alone on their daily commutes, which average 29.7 minutes.

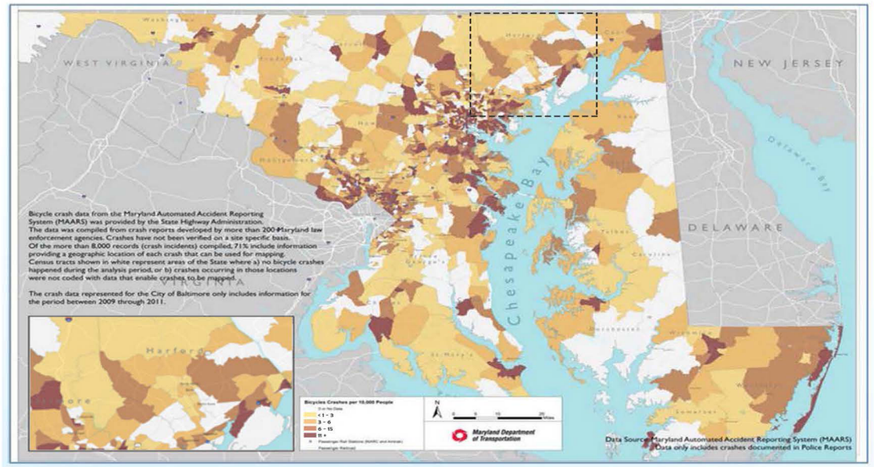
Bicycling to work
increased
by 64%
from 2000 to 2012

Traffic Congestion Map



8AM Traffic Density
5:30PM Traffic Density

Bicycle Crashes per 10,000 Residents (2006-2011) in



Data taken in 2009 through 2011 revealed that the majority of Harford County experienced less than 3 deaths per 10,000 resider however, a small area in the central area of Harford experienced between 3 to 6 deaths.

Law Enforcement & Education/ Outreach Grantees

			Aggressive Driving	Distracted Driving	Impaired Driving	Occupant Protection	Pedestrian & Bicycle Safety	Special Projects
Harford	Law Enforcement	Havre de Grace Police Department	X	X	X			
		Harford County Sheriff's Office	X	X	X	X		
		Bel Air Police Department	X	X	X	X		
		Aberdeen Police Department	X	X	X			
	Education & Outreach	Harford County DUI Court			X			

Table includes all grantees and the program areas in which funds were expended for Harford County.

BICYCLE SAFETY
UNDERSTANDING THE RISKS

726
BICYCLISTS KILLED IN MOTOR VEHICLE CRASHES IN 2014

Injury Prone
A bicyclist is more likely to be injured in a crash occuring between a bike and a motor vehicle.

Bicyclist Accident Rate
Bicyclists accounted for 2% of all traffic deaths, and 2% of all crash-related injuries in 2014.

Danger Hours
20% of bicyclist deaths occur between 6PM - 9PM. 71% of those deaths occur in urban areas.

Males Bicyclists at Risk
88% of bicyclist deaths occur to males. The largest number of male injuries occur to those between 20-24 years old.

Bicyclists Under the Influence
21%, or nearly 1/5, bicyclists killed in crashes were found to have blood alcohol concentrations (BACs) of .08g/dL or higher.

National Highway Traffic Safety Administration
ROAD SAFTEY STUDY
More info at https://www.nhtsa.gov/road-safety/bicycle-safety

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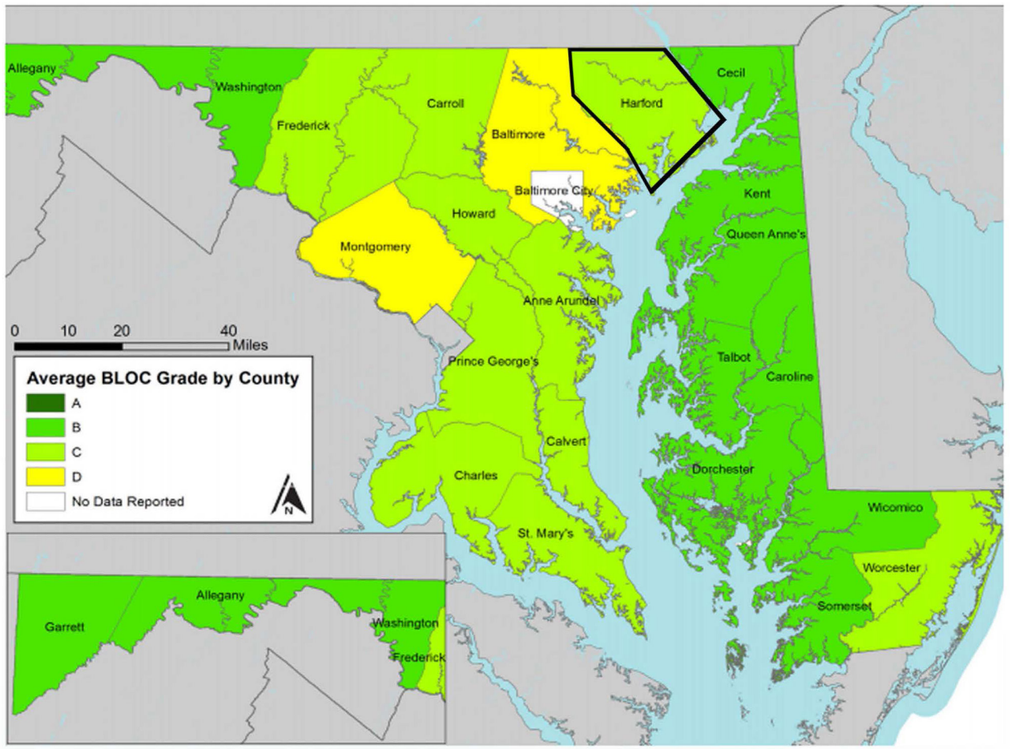
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Traffic & Road Safety

BLOC Systems

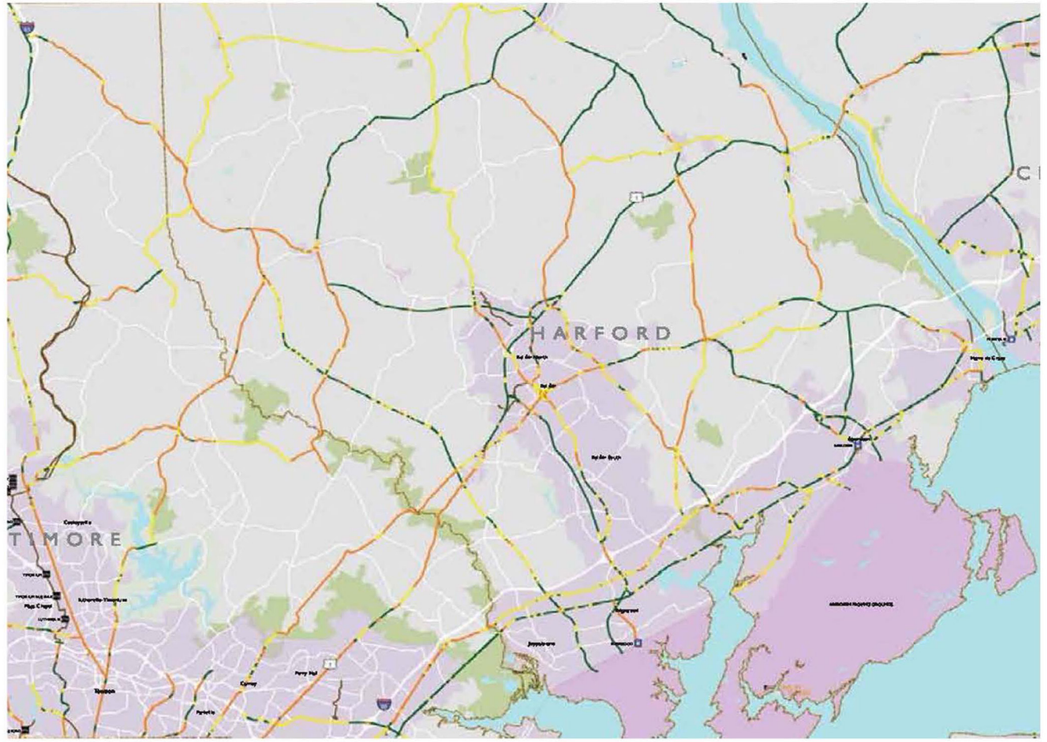
Bicycle Level of Comfort (BLOC) is a "method of evaluating the bicycling conditions on roadways." A being the best and D being the worst conditions for bicyclists. Grading criteria is based on volume and speed of vehicles, bike/ shoulder width, and etc. Harford County was rated a C average.



Mitigating Pedestrian Stress Levels

According to U.S. DOTS, for the safety and comfort of pedestrians, it is necessary to have some form of median between sidewalks, bike ways, and roadways. Landscape buffers provide pedestrians with a sense of safety and reduce stress.

Bicycle Level of Comfort and Existing Trails



BLOC Grade Examples



Bicycle Facilities

BICYCLE LANE

- Dimensions: One-Way= 5 feet, Two-Way= 10 feet
- Clearance: space between cyclists= 3 feet vertical clearance = 10 feet
- Benefits:
  - Provides designated paths for cyclists
  - Reminds drivers to share the road with bicyclists
  - Allow bicyclists to move at their own pace
- Constraints:
  - Irregular or incomplete street patterns
  - Street blocks are too large in a city



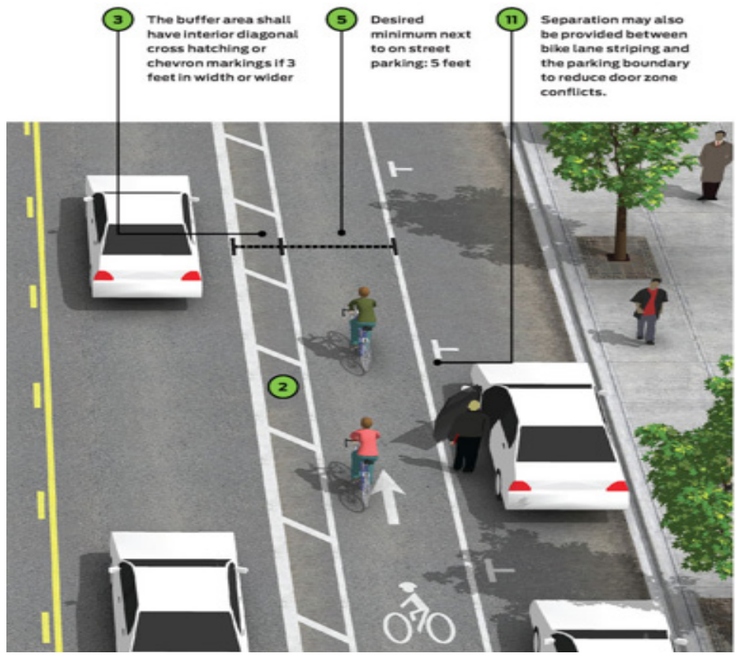
Alexandria, VA (www.thewashcycle.com)



Montgomery County, MD (www.montgomeryplanning.org)

BUFFERED BICYCLE LANE

- Dimensions: Buffers are minimum 18" and marked by solid white lines
  - Buffers= 34" lines for cross hatching; 30-45 degrees at 10-40ft. intervals
  - Clearance: Bike lanes can be narrower when buffers are used
    - Ex. 4ft. bike lane + 3ft buffer = 7ft. bike lane
- Benefits:
  - Provides greater shy distance between cars and bicyclists
  - Allows safe bicycle passing alongside cars
  - Encourages cycling through the perception of safety
- Constraints:
  - Has to be implemented within the existing networks
  - Causes car lanes to be smaller/enroached on



New York City, Ny & Eugene, OR (www.nacto.org)



15th Street Washington, DC (www.huffingtonpost.com)



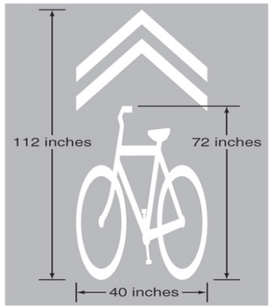
Uptown, Chicago (http://www.bethesdamagazine.com)

Bicycle Facilities

SHARED BIKE LANES

- Shared roadway bicycle facility
- Dimensions: same as street width
- Required features:
  - Signs and pavement markings
  - Speed management
  - Volume management
  - Minor and major street crossing
  - Offset intersection
- Also known as sharrows
- Not to be used on shoulders, in designated bike lanes

Figure 9C-9. Shared Lane Marking



(www.mutcd.fhwa.dot.gov)



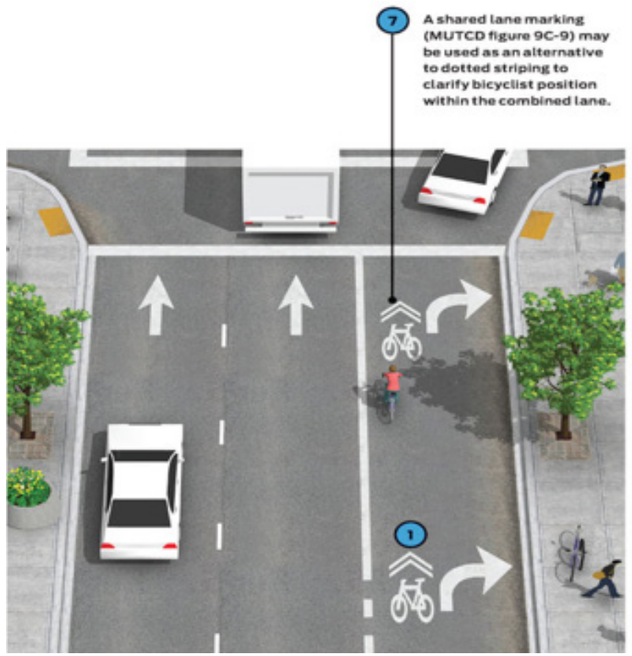
Austin, TX (www.nacto.org)

SHARED LANE MARKINGS

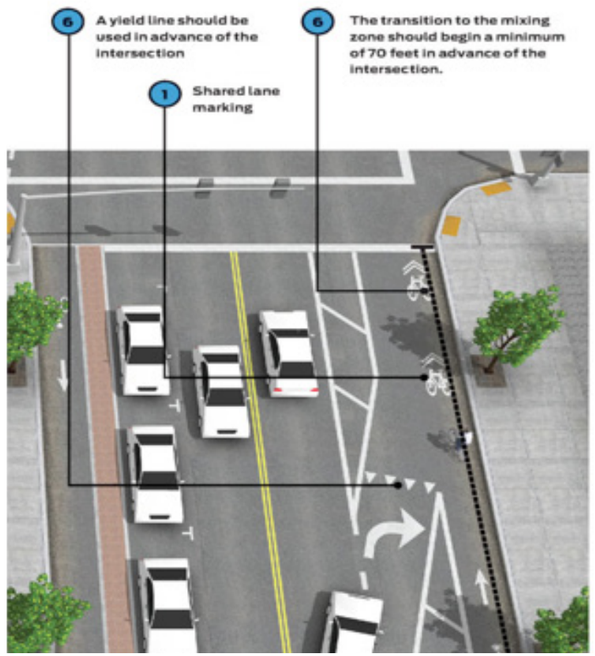
- Benefits:
  - Encourages bicyclists to safely position themselves
  - Advertises the presence of bicyclists to all users
  - Wayfinding element
  - Requires no additional street space
- Constraints:
  - Should not be used on road shoulders
  - Road work and associated detours and traffic



Montgomery County, MD (www.montgomerycountymd.gov)



New York City, Ny & Eugene, OR



(www.nacto.org)

Bicycle Facilities

SHARED-USE PATH

- Dimensions:
  - At least 10ft. wide with graded area of 2ft. on either side of path
  - Heavy volume paths should be 12-14ft.
- Information conveyed to users:
  - Shared-use path name and park length
  - Elevation changes
  - Permitted users
- Drainage grates should be placed outside the path tread
- Benefits:
  - Caters to multiple user groups- bicyclists and pedestrians
  - Saves money by only needing one path
- Constraints:
  - Conflict between user groups- bicyclists at high speeds and pedestrians
  - Requires ample signage and crossings





Bethesda Trolley Trail bridge Bethesda, MD



4-mile trail from Bethesda to North Bethesda



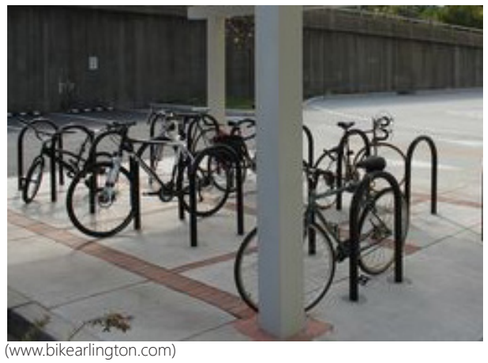


(www.taimages.railstotrails.org)

BICYCLE RACK

- Dimensions: 3-4ft. clearance
  - 2ft from wall minimum
  - 1.5ft. from curb minimum
  - Placed within 25-75ft. of main building entrance
- Benefits:
  - Provides central place for bicycles
  - Promotes bicycle use
- Constraints:
  - Takes up space on the sidewalks

Montgomery County, MD



(www.bikearlington.com)

Short term parking: inverted u-rack



(www.yochicago.com)

Long term parking: rack room in parking garage

Priority Connections from Bel Air to Harford County

Connection 1: Rock Spring Road
Connection 2: Conowingo Road & North Hickory Avenue
Connection 3: North Shamrock Road to Majors Choice Drive
Connection 4: Thomas Run Road to Churchville Road
Connection 5: West Macphail Road & Emmorton Road

Connection 1:

Rock Spring Road

Rock Spring Road

Goals

-Connect local landmarks and neighborhoods

-Promote safe biking, for both transportation and recreation

-Connect to the Ma & Pa Trail and the East Coast Greenway

Existing Conditions

This trail segment begins in the Town of Bel Air at the intersection of Williams and Thomas Streets and continues northwest onto Rock Spring Road (Route 24) until it reaches East-West Highway (Route 23). The existing Ma & Pa Trail crosses the segment at Williams Street from the west and continues northeast toward East-West Highway.

Williams Street

This street travels through a neighborhood in Bel Air, parallel to Main St. The speed limit along this road is 25 mph, and the traffic volume is low. There is street parking and speed bumps along this street so drivers/ cyclists should stay cautious. As it travels north, Williams St connects to Dallam Ave which connects to Rock Spring Road.

Rock Spring Road

Route 24 begins in Bel Air, near the memorial gardens, and travels North towards East-West Highway. The speed limit along this road varies from 40-45 mph. Some areas of concern along this road are the Route 1 Bypass and the intersection at East-West Highway.

Ma & Pa Trail

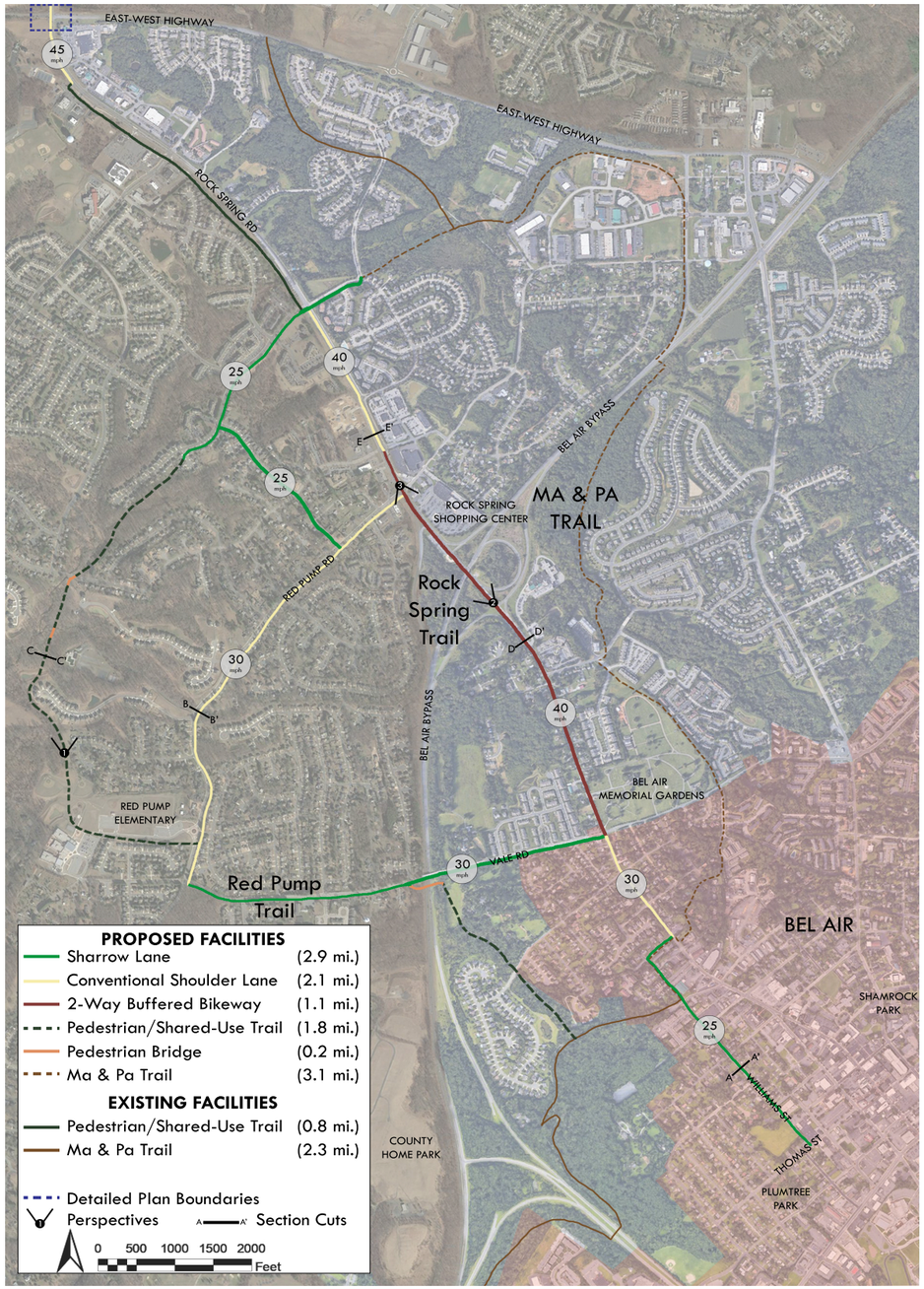
The Ma & Pa Trail follows the path of the former Ma & Pa Railroad that ran from Baltimore to York, Pennsylvania, through Harford County. This trail currently exists in two segments—in Bel Air and Forest Hills. A central, connecting segment is proposed.

Proposed Facilities

Given the areas of concern along this segment and the location of local landmarks and neighborhoods, there are a number of proposed routes that reach into the neighborhoods to the west and connect them to Red Pump Elementary School and other landmarks.

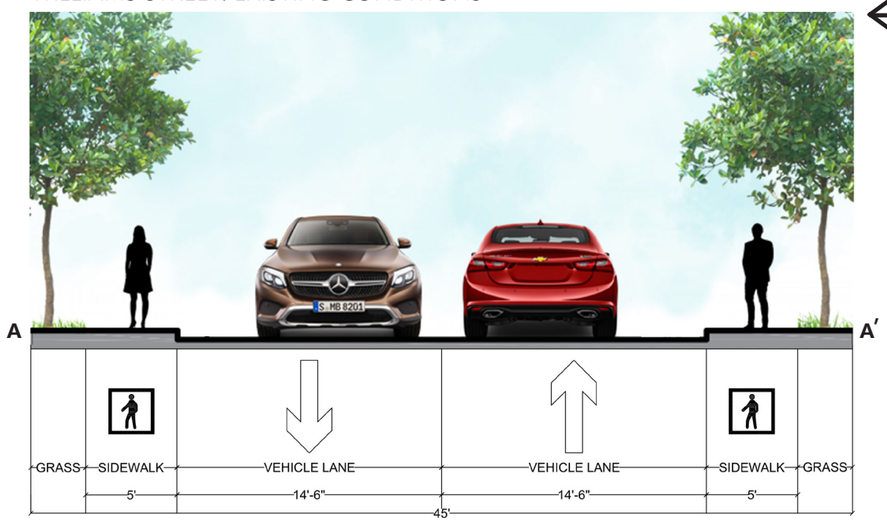
To promote safe cycling for both recreation and transportation, roads are recommended to receive specific bicycle facilities: sharrow lanes, conventional shoulder lanes, two-way buffered bikeways, pedestrian/shared-use trails, and pedestrian bridges.

Shifting the proposed bike routes away from Rock Spring Road creates a variety of biking experiences. Beginners and experts can travel along a path of their choosing at the appropriate experience level. The route shift also connects areas that are not easy to access.



Sections: Williams Street & Red Pump Road

WILLIAMS STREET: EXISTING CONDITIONS

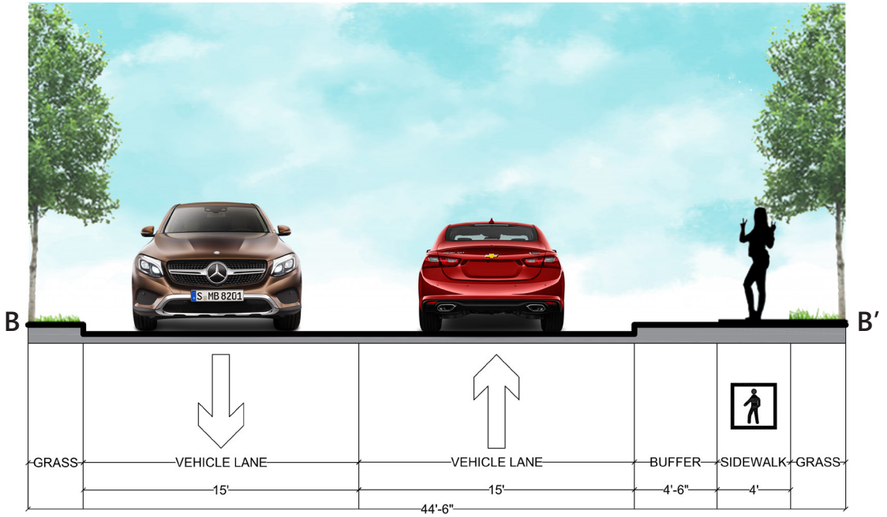


A. WILLIAMS STREET

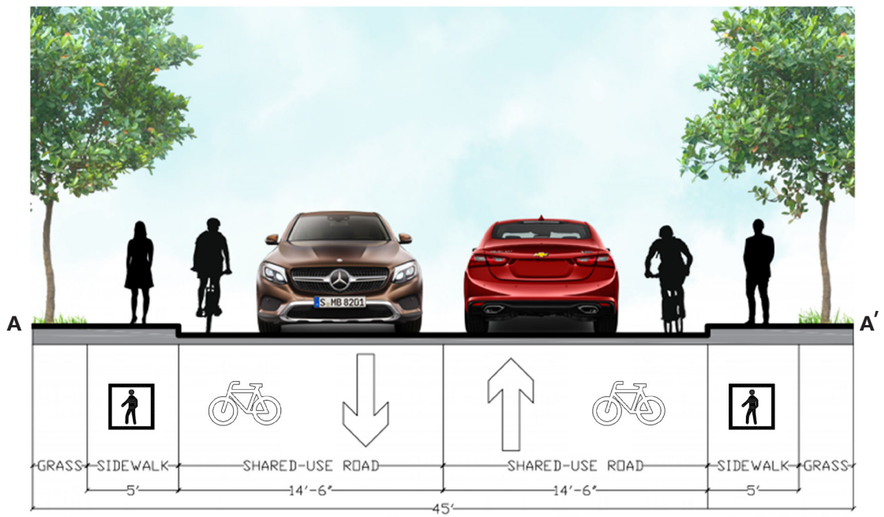
Proposed Facility Type: Sharrow

The proposed sharrow with signage will perform well on this street with low traffic flow. The street width can support parked cars, passing cars and cyclists.

RED PUMP ROAD: EXISTING CONDITIONS



WILLIAMS STREET: PROPOSED CONDITIONS

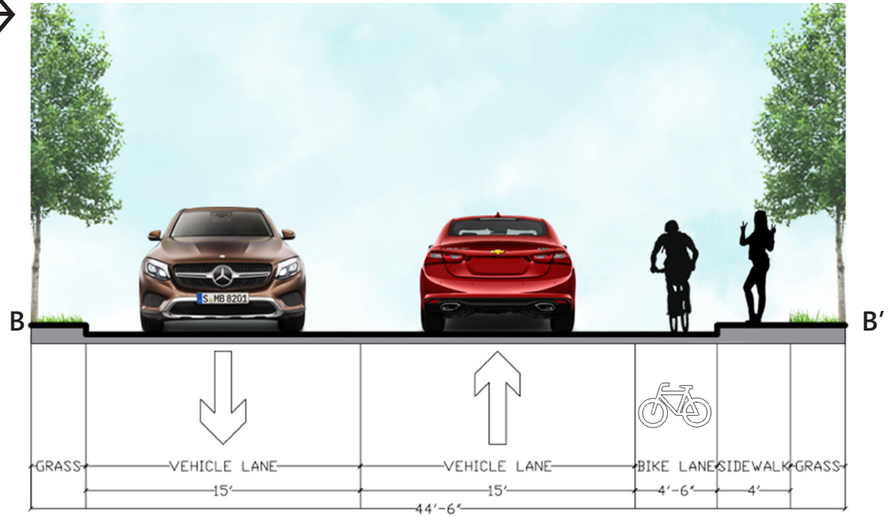


RED PUMP ROAD

Proposed Facility Type:
Conventional Bike Lane

Red Pump Elementary School generates moderate traffic levels. A conventional bike lane will provide a safe route.

RED PUMP ROAD: PROPOSED CONDITIONS



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0' 2' 4' 8'

Sections: Red Pump Trail & Rock Spring Road

RED PUMP TRAIL

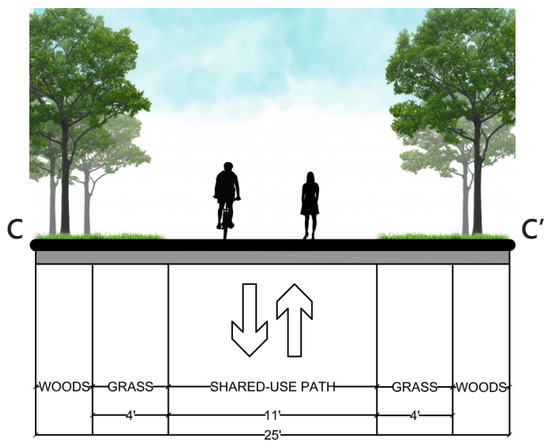
Proposed Facility Type: Pedestrian/ Shared-Use Trail

This route will open up a new, safer alternative to riding along the street and will connect neighborhoods, improve commuting and open access to Bel Air. A pedestrian/shared use trail can serve less experienced cyclists or those who want to enjoy the natural landscape.

RED PUMP TRAIL EXISTING CONDITIONS

The Red Pump Trail is currently undeveloped and forested. This trail is proposed to go behind the elementary school and follow a stream. It would then cross Bernadette Drive and connect with the neighborhood north of Red Pump Elementary, on Dellcrest Drive.

RED PUMP TRAIL: PROPOSED CONDITIONS

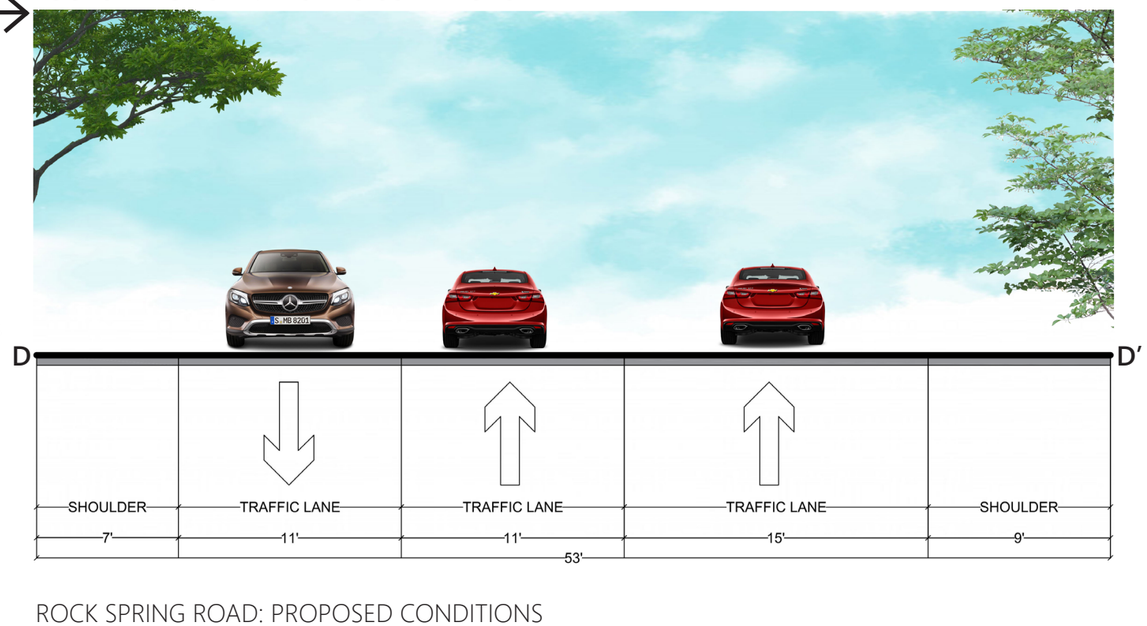


B. ROCK SPRING ROAD

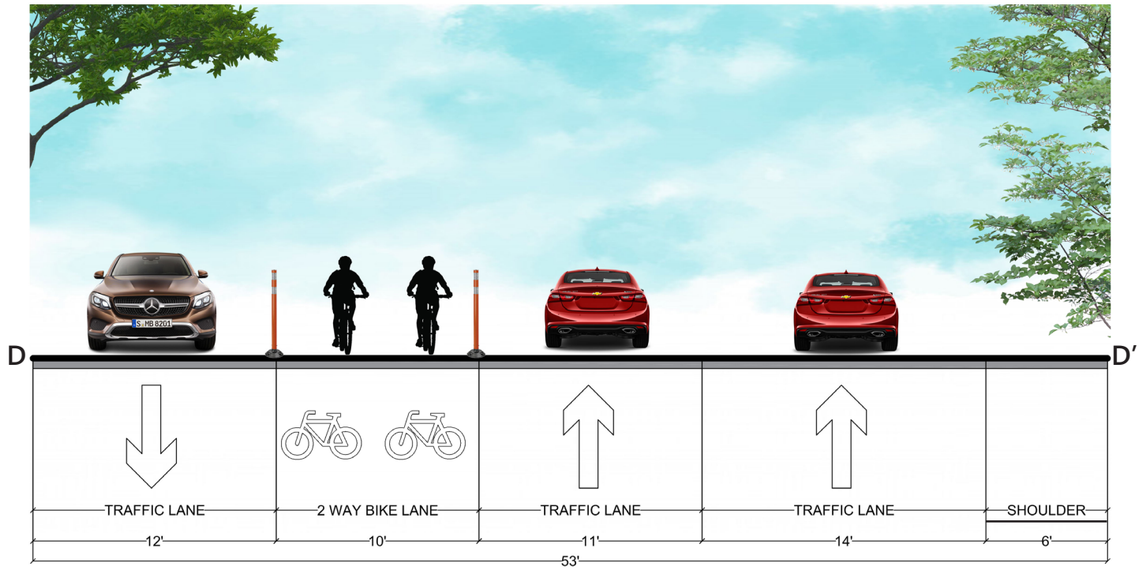
Proposed Facility Type: Two-Way Buffered Bikeway

This section illustrates the area before the Route 1 Bypass. In this location, a two-way buffered bikeway will create a safe route underneath the bypass for more experienced cyclists. Bike Boxes are proposed at both ends of this section to provide a safe area for cyclists to merge from a conventional shoulder lane to this two-way bike lane. Bollards along the bikeway will create a physical barrier between the vehicle traffic and cyclists.

ROCK SPRING ROAD: EXISTING CONDITIONS

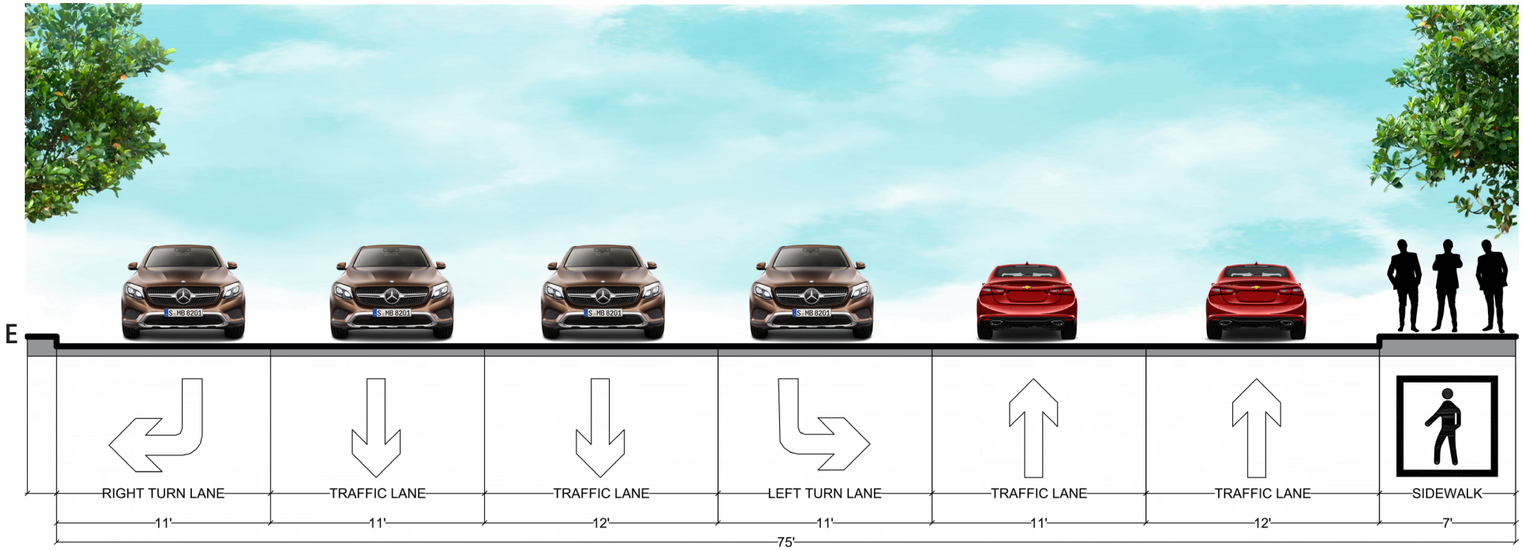


ROCK SPRING ROAD: PROPOSED CONDITIONS

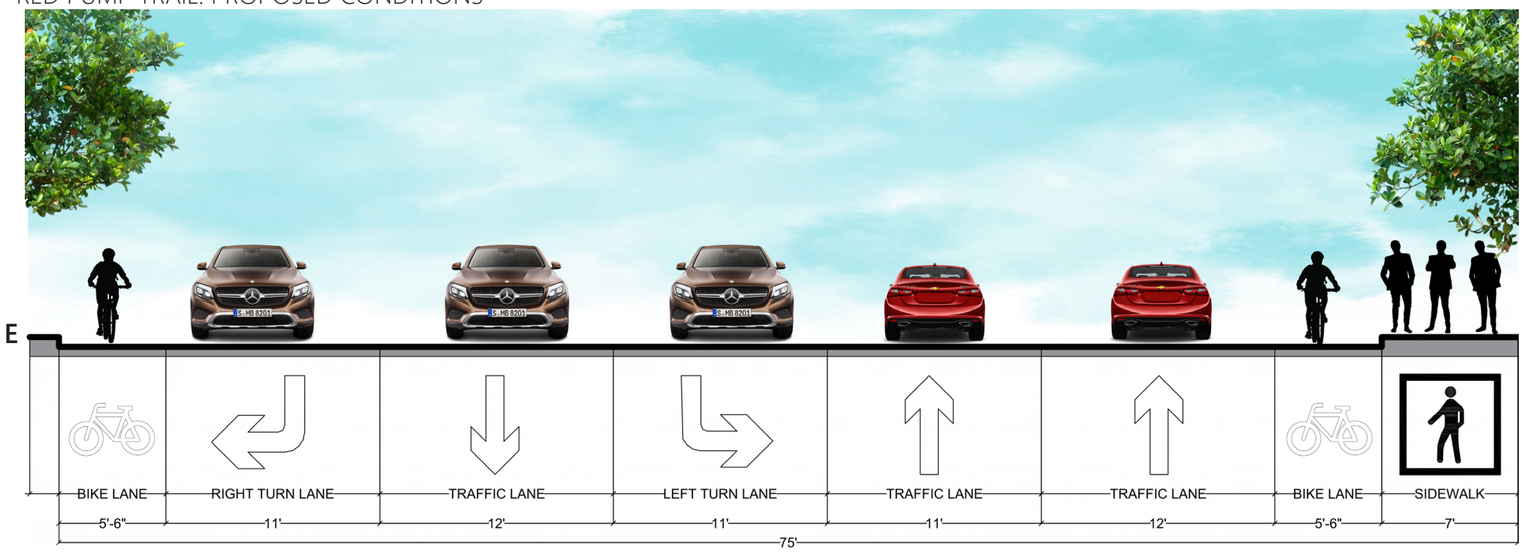


Sections: Rock Spring Road

RED PUMP TRAIL: EXISTING CONDITIONS



RED PUMP TRAIL: PROPOSED CONDITIONS



E. ROCK SPRING ROAD

Proposed Facility Type: Conventional Shoulder Lanes

This section illustrates the intersection of Route 24 and Red Pump Road, a point where the two-way bike lane merges into a conventional bike lane. Traffic levels here are moderate with most of the traffic located closer to the Route 1 Bypass. At this location, one of the vehicle lanes can be removed to accommodate the proposed two-way shoulder lanes that will provide safe cycling lanes and access to nearby landmarks like the Rock Spring Shopping Center. This facility type also makes a safe transition to the existing pedestrian/shared-use trail to the north.

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0' 2' 4' 8'

Detailed Plan

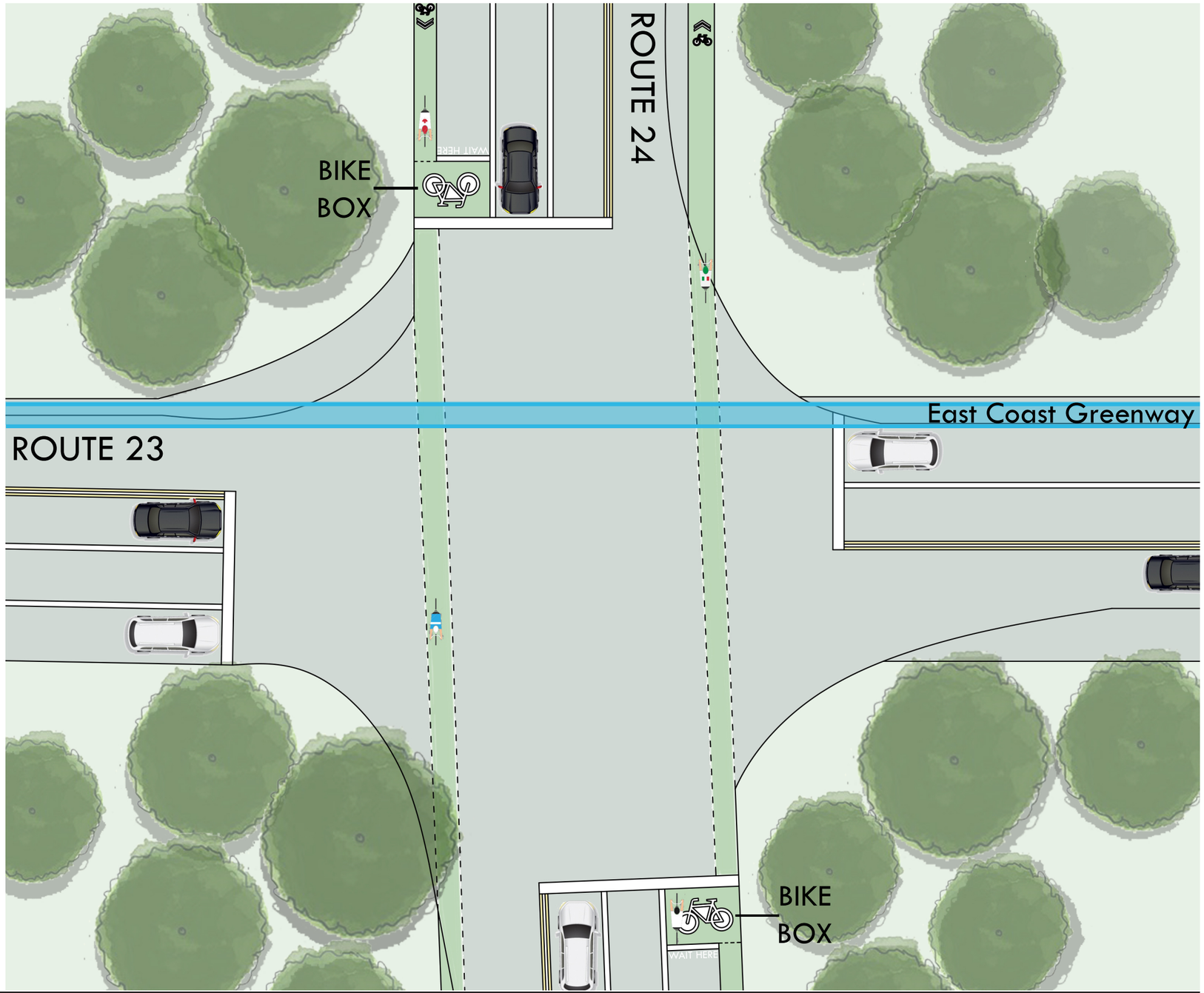
ROUTE 23 & 24 INTERSECTION

The intersection of Rock Spring Road (Route 24) and East-West Highway (Route 23) has high traffic volumes and is an area where cyclists go unnoticed by vehicles. Making drivers aware of bikers is important to their safety. At this intersection, conventional bike lanes with bike boxes at the front of the lanes will allow cyclists to be visible and provide plenty of space between the cyclists and vehicles.

This intersection is also where Rock Spring Road crosses the East-Coast Greenway, which connects the proposed bike trail and improves the Harford County bike system.

BIKE BOXES

Bike boxes improve cyclist safety at intersections. As seen in this plan, bike boxes are designated areas in front of driving lanes where cyclists can wait at stop lights. They are safe places, buffered from vehicles, which also allow cyclists to travel between lanes. Bike boxes are typically 10-16 feet long and as wide as the bike and vehicle lane(s). They must be marked and clearly identified. The adjacent bike lanes are also marked for 25-50 feet behind the bike box and must be highlighted through the intersection. Signage should include a "no turn on red" sign at the stoplight, a "yield to bikes" sign for vehicles, and a "stop on red" sign next to the bike lane. Pavement around and inside the bike box should be clearly marked.



1: Perspective of Shared-Use Trail

The proposed shared-use trail behind the Red Pump Elementary School will continue to the neighborhood north of the school. Currently the area is forested and undeveloped; the proposed trail will follow the path of a stream with a four-foot buffer on either side of the trail. The route will offer natural views and connect surrounding neighborhoods with school and the Town of Bel Air. This trail can help reduce the amount of vehicle trips and promote safe and sustainable transportation.



2: Perspective of Two-Way Buffered Bike-Way

The proposed center bike lane along Rock Spring Road will be identified by a green pathway and signage designating the route. Bollards along the sides of the bike lane will be a visible and create a safe area for cyclists traveling in this high-traffic corridor.

This trail is intended for more experienced cyclists biking at higher speeds under high-stress conditions. It is a more direct route than the other proposed routes. Those who are looking for a more leisurely route can take safer trails while those who bike for their primary mode of transportation can use this pathway.



EXISTING CONDITIONS



3: Perspective of Bike Box on Rock Spring Road

Bike boxes at the intersection at Rock Spring Road are designed to promote cyclist safety through the intersection. They allow cyclists to enter a designated area at the front of a driving lane located at stoplights. This allows vehicles to see the bikes at an intersection and gives cyclists a head start when the lights change. As shown in the perspective, this bike box will allow cyclists to merge from the two-way buffered bikeway into a conventional bike lane.



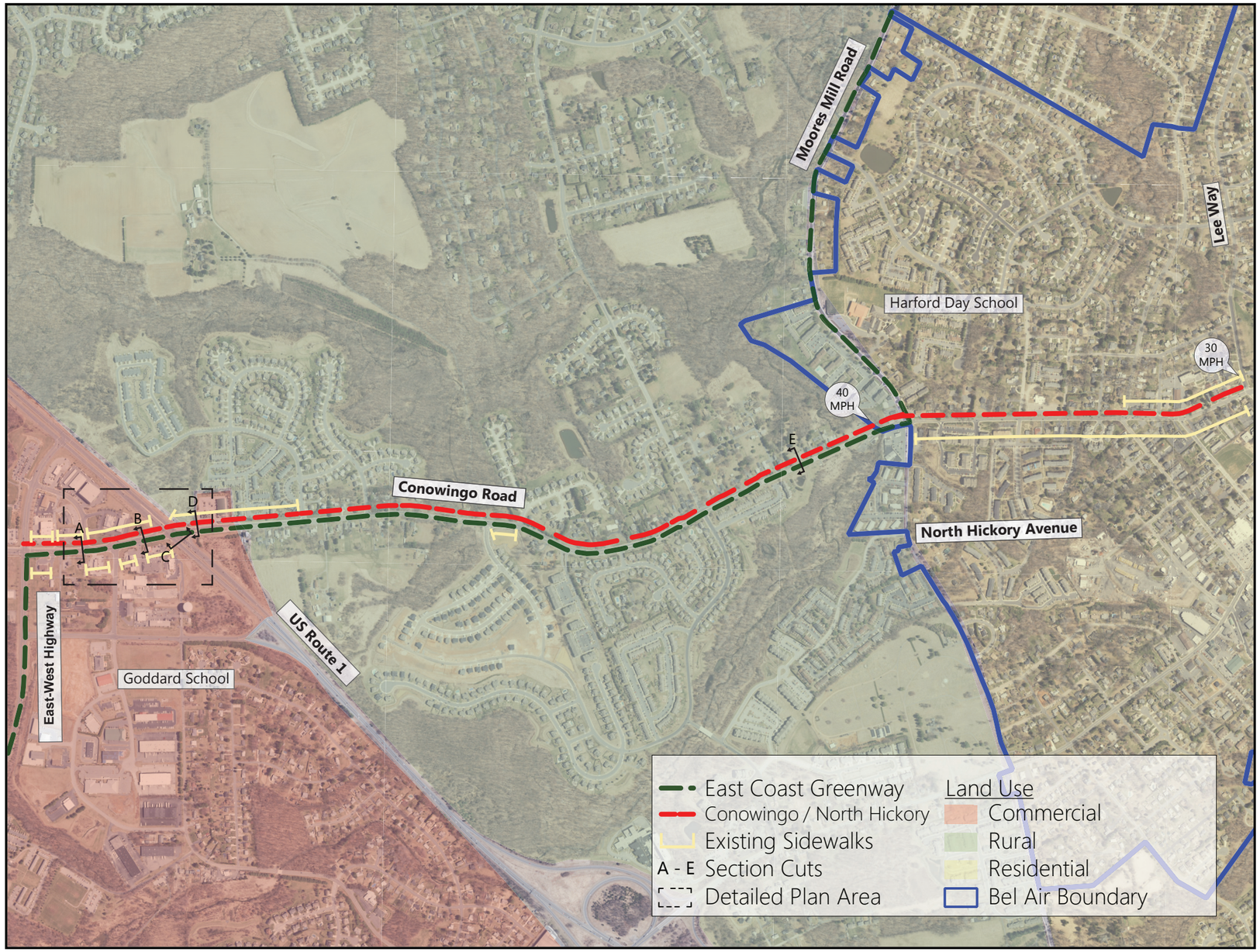
EXISTING CONDITIONS



Connection 2:

Conowingo Road & North Hickory Avenue

Existing Conditions



North Hickory Avenue / Conowingo Road is a 2.2 mile stretch of road that connects the edge of Bel Air to East West Highway. The route begins in a residential area, at the intersection of Lee Way and North Hickory Avenue. This residential section is characterized by its slower speed limit, increased number of sidewalks, and fewer road lanes. Although there are no dedicated bike lanes, the roads are slow and small enough that most cyclists should feel comfortable biking on them. Pedestrian access becomes possible as the southbound lane has an accompanying sidewalk that stretches the length of the residential section. Upon reaching the intersection of Moores Mill Road and North Hickory Avenue, a change in land use is apparent. The transition to rural residential lands is marked by a change in the road name, from North Hickory Avenue, to Conowingo Road. This intersection also happens to mark the start of the East West Green way, a bike trail which runs along the East Coast. There is also an increase in speed limit, going from 30 mph, to 40 mph. This stretch of road is primarily two lanes, with wide shoulders and little to no pedestrian access. Due to the lack of sidewalks, pedestrians are forced to walk along the shoulders. This condition continues until the intersection of Overlook Way and Conowingo Road. This intersection marks the start of the commercial area. The commercial area features two very high traffic intersections, which make pedestrian and cyclist access very difficult. These intersections occur between Conowingo Road & Route One and Conowingo Road & East West Highway.

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Proposed Facilities



The main focus of the Conowingo Road bike and pedestrian plan is to improve circulation throughout the entire study area. A combination of sharrows, buffered bike lanes, and conventional bike lanes are recommended. Also, a proposed sidewalk system will allow for safe pedestrian travel from the residential neighborhood to the commercial district. In addition, North Hickory Avenue will be converted into a two-way sharrow, to allow for safe cyclist access.

Appropriate signage is recommended along the road to alert drivers to the changes and to promote cyclist safety. The proposed facilities in this rural area are a combination of sharrows and buffered bike lanes, depending on the presence of shoulders. These rural area routes will connect the East Coast Greenway with additional signage.

Cyclists and pedestrians in the commercial area will be able to use safety-enhanced routes through the intersection of Route 1 and Conowingo Road. The proposed bike lanes will cross the intersection and feature prominent markings and signage.

Once in the commercial area, cyclists will be able to store their bikes at the proposed bike storage facilities, or continue through to the East Coast Greenway. Newly designed pedestrian crosswalks and islands are proposed to allow for the safe crossing of Route 1. Although the commercial area is currently somewhat sparse, it has been designated as a key development area. This designation, combined with enhanced pedestrian access, will be a catalyst in creating a new suburban hub along Conowingo Road.

Site Plan & Section Locations



Creating a clearly designated route for pedestrians and bicyclists will enable them to walk or bike safely across Route 1. Currently, conditions at Route 1 and Conowingo Road restrict safe pedestrian and cyclist circulation. Pedestrian crosswalks and pedestrian indicator lights at all four points of the intersection would allow for safe passage, as would pedestrian safety islands on both sides of Route 1 that are designed to reduce pedestrian exposure. The roadsides and the pedestrian safety islands are planted with deciduous trees, creating an "edge effect" meant to change driver perceptions of lane width, causing them to slow down.

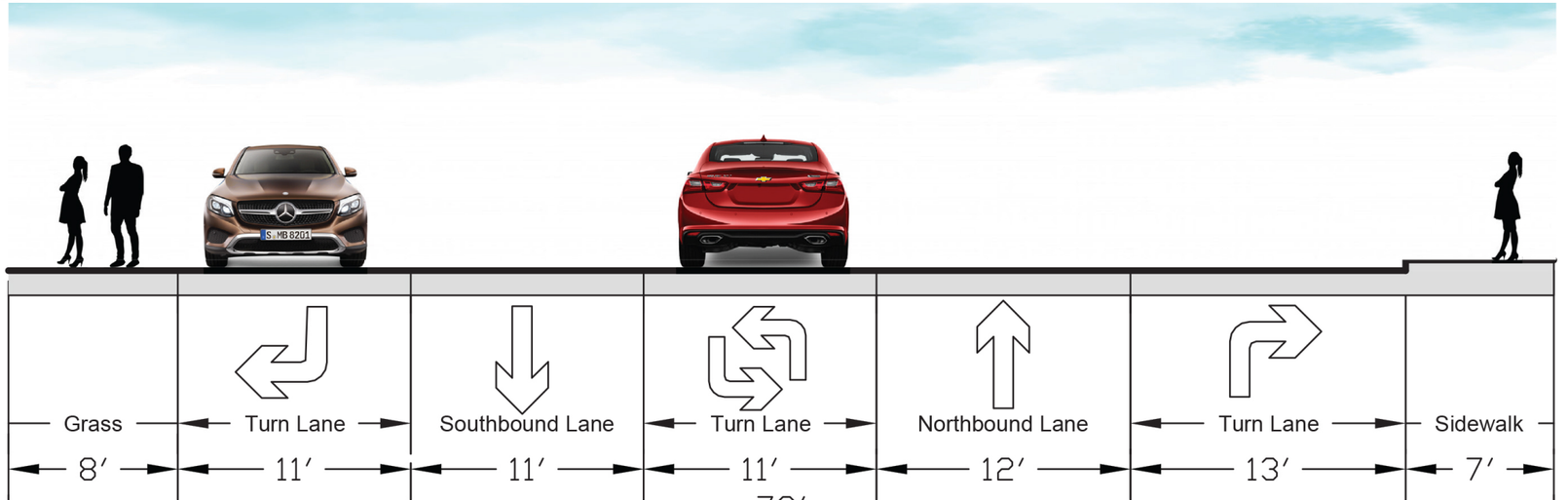
The absence of crosswalks near the commercial area along Conowingo Road restricts the ability of pedestrians to cross the street. Additional crosswalks along Conowingo Road will force a reduction in speed from 40 to 30 mph and create more opportunities for pedestrians to cross at clearly designated points.

Section A

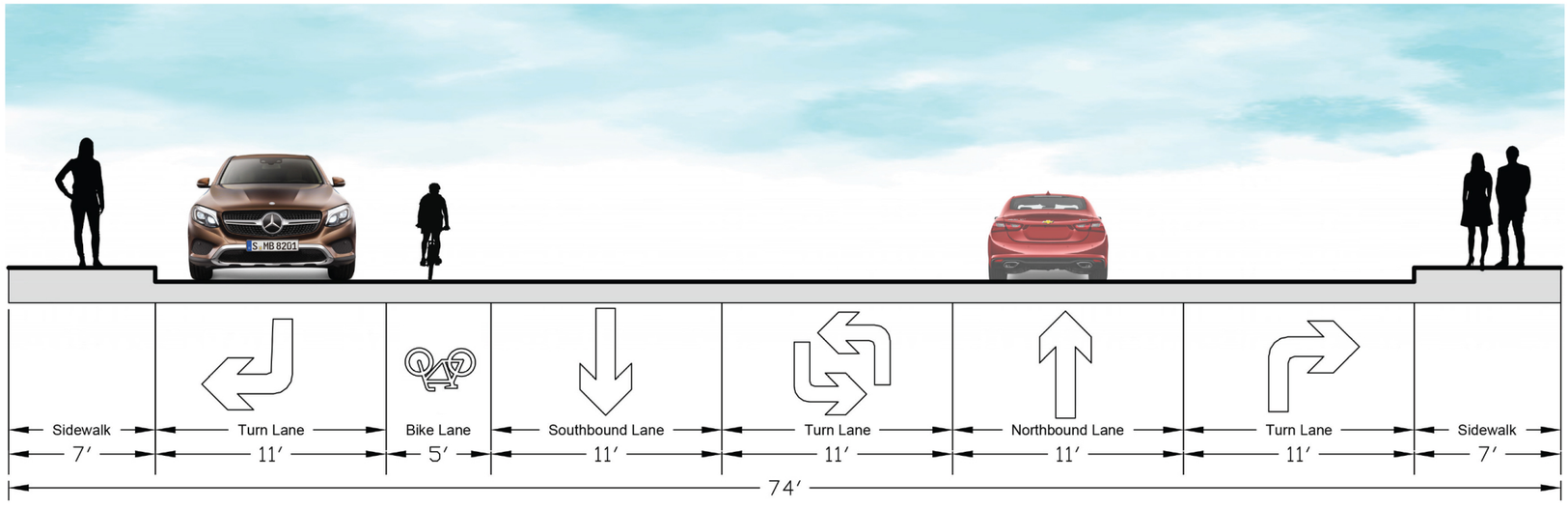
The existing five-lane road has sections with sidewalks along the north lanes and a stretch of grass along the south lanes. There are no bicycle lanes, and although there are sections of sidewalk, there is no complete connection that would allow a pedestrian onto grass or the road at some points.

The proposed road reduces the lane widths to 11 feet, installs a new five-foot bike lane along the southbound side, and sidewalks on both sides to enhance efficiency for pedestrians and bikers.

EXISTING



PROPOSED BIKE LANES



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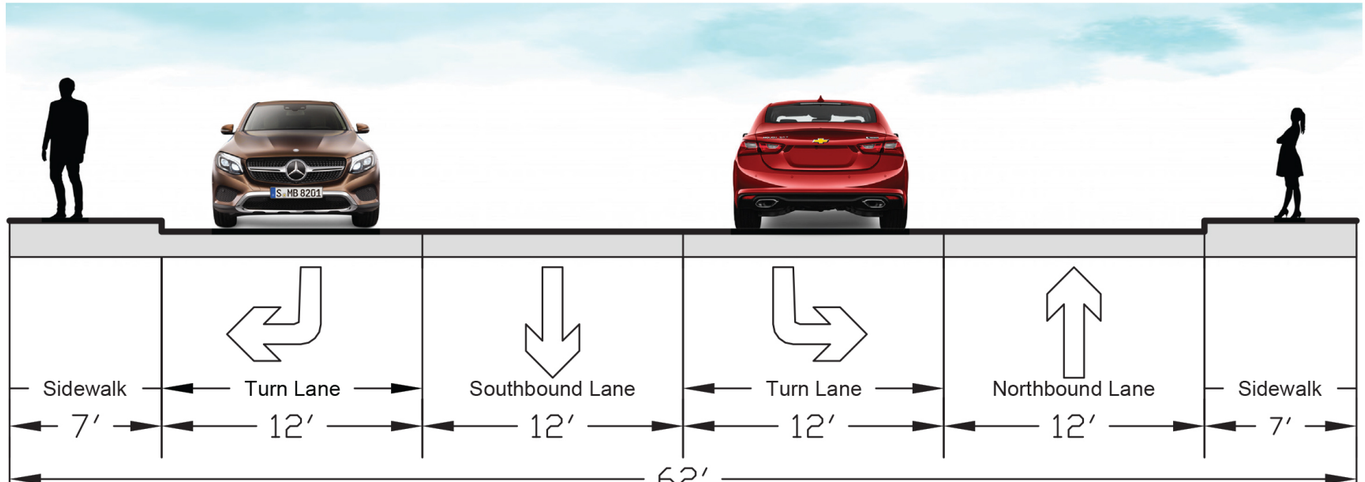
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Section B

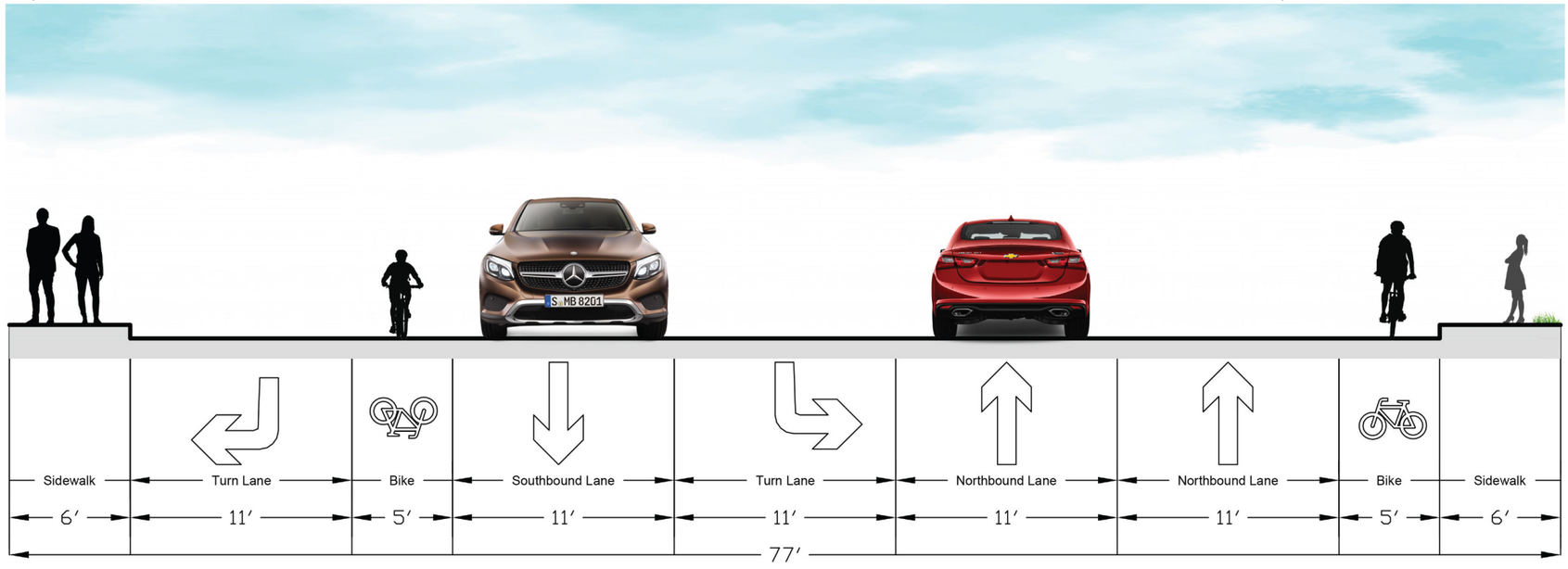
The existing four-lane road has sidewalks along the southbound and northbound sides. There are no bicycle lanes on either side, and the sidewalk along the northbound side is attached to a median used as a slip lane for drivers merging from Hickory Bypass onto Conowingo Road. The slip lane poses complications for pedestrians; it is an abrupt merge for cars into the northbound lane, and the slip lane's angle creates a blind spot.

The proposed road reduces the lane width to 11 feet and reduces the sidewalks to six feet to create space for an additional 11-foot northbound lane to give drivers a smoother transition onto Conowingo Road. Two five-foot bike lanes are proposed on the north and south sides.

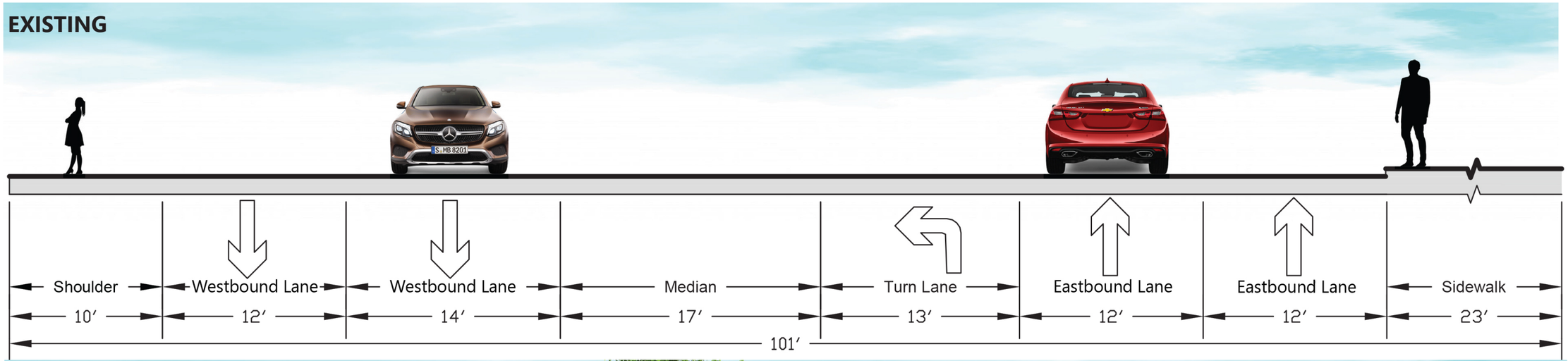
EXISTING

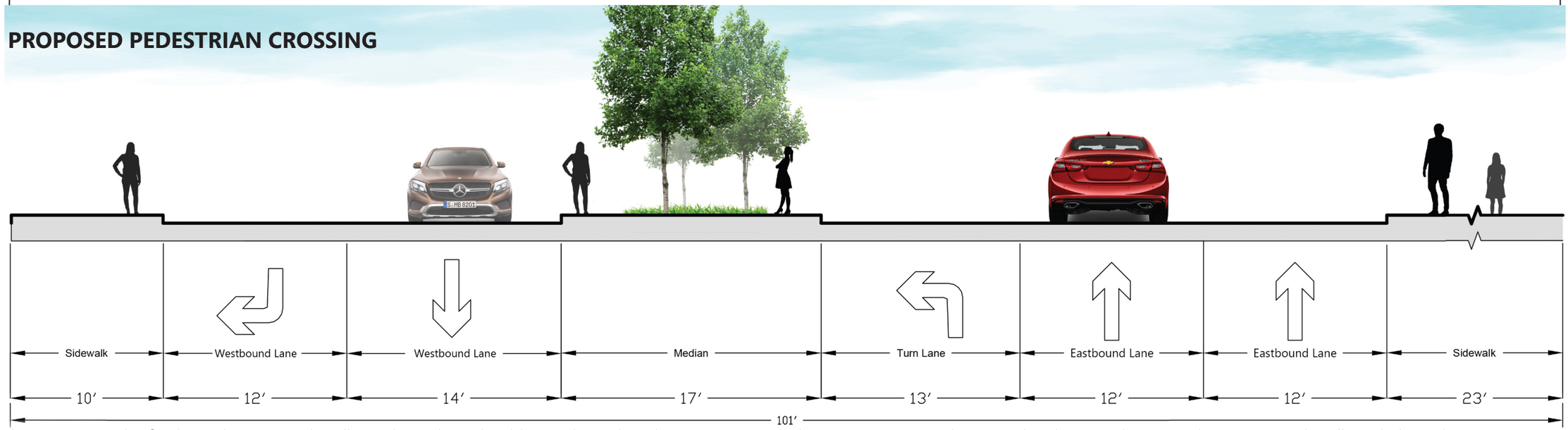


PROPOSED BIKE LANES



Section C





The existing road is five lanes, has a 23′ sidewalk westbound, 10′ shoulder eastbound, and a 17′ concrete median separating cars driving in the alternate direction. There are no sidewalks to help pedestrians transition through the large intersection and the median buffer is designed to control traffic rather than with pedestrian needs in mind. Our proposed road transforms the 10′ eastbound shoulder into a 10′ sidewalk and adds trees and vegetation to the 17′ median buffer to mitigate traffic and speed and provide a safer waiting area for pedestrians as they cross the intersection.

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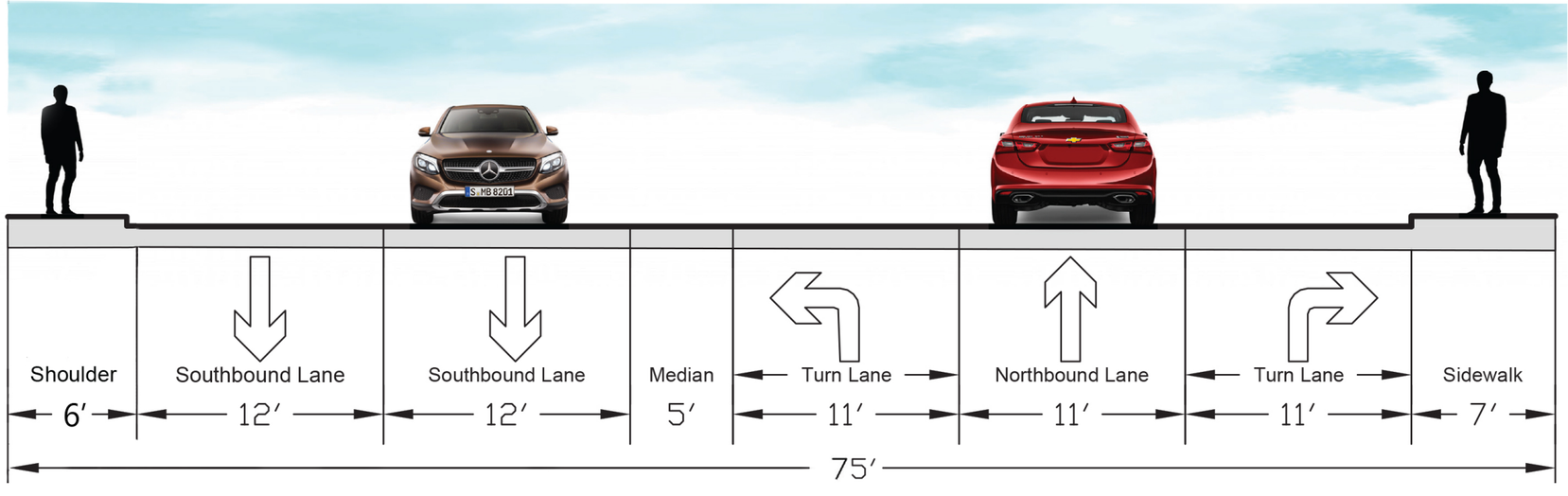
Garrett Foss, Blair Danies, Steven Palomino

Scale: 1/8”= 1’-0”

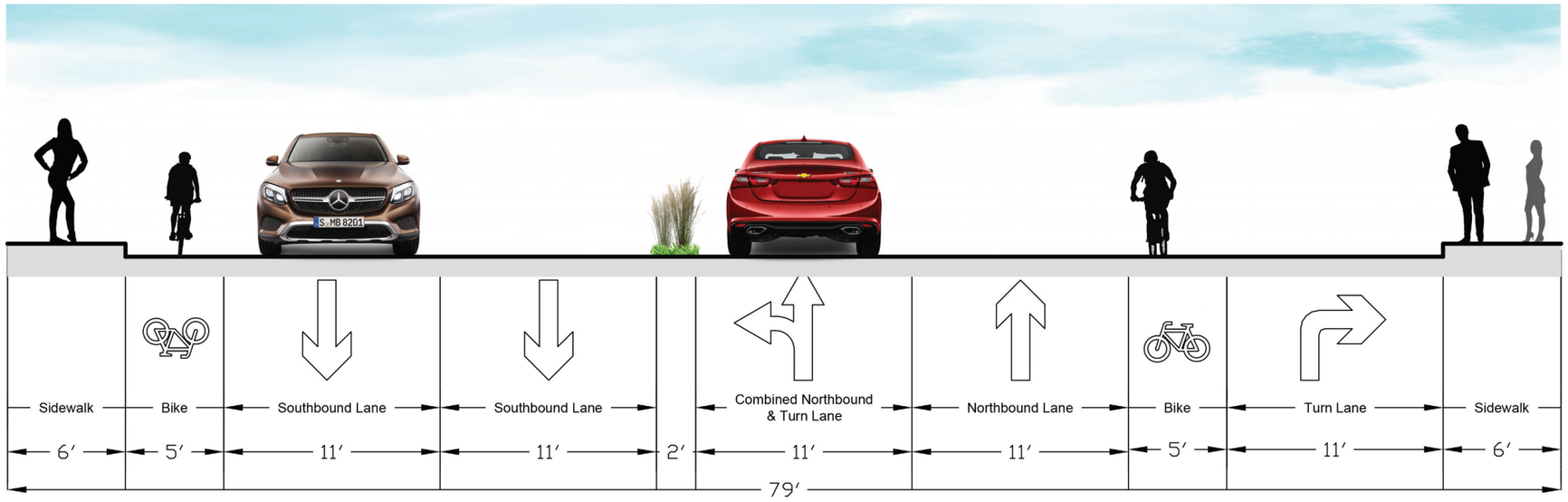
Section D

The existing road is five lanes, has a 6′ shoulder along the southbound lanes, a 5′ median separating the south and north lanes, and a 7′ sidewalk that runs northbound. There are no bike lanes or designated areas for pedestrians to walk along the southbound roads. Our proposed road minimizes the five lanes to 11′ each, the northbound sidewalk to 6′, and the 5′ concrete median to a 2′ vegetated median strip to make room for a 6′ southbound pedestrian sidewalk, and two 5′ bike lanes going both south and northbound. Additionally, the northbound left only turning lane transforms into a combined northbound & turn lane to give drivers more driving area on the stretch.

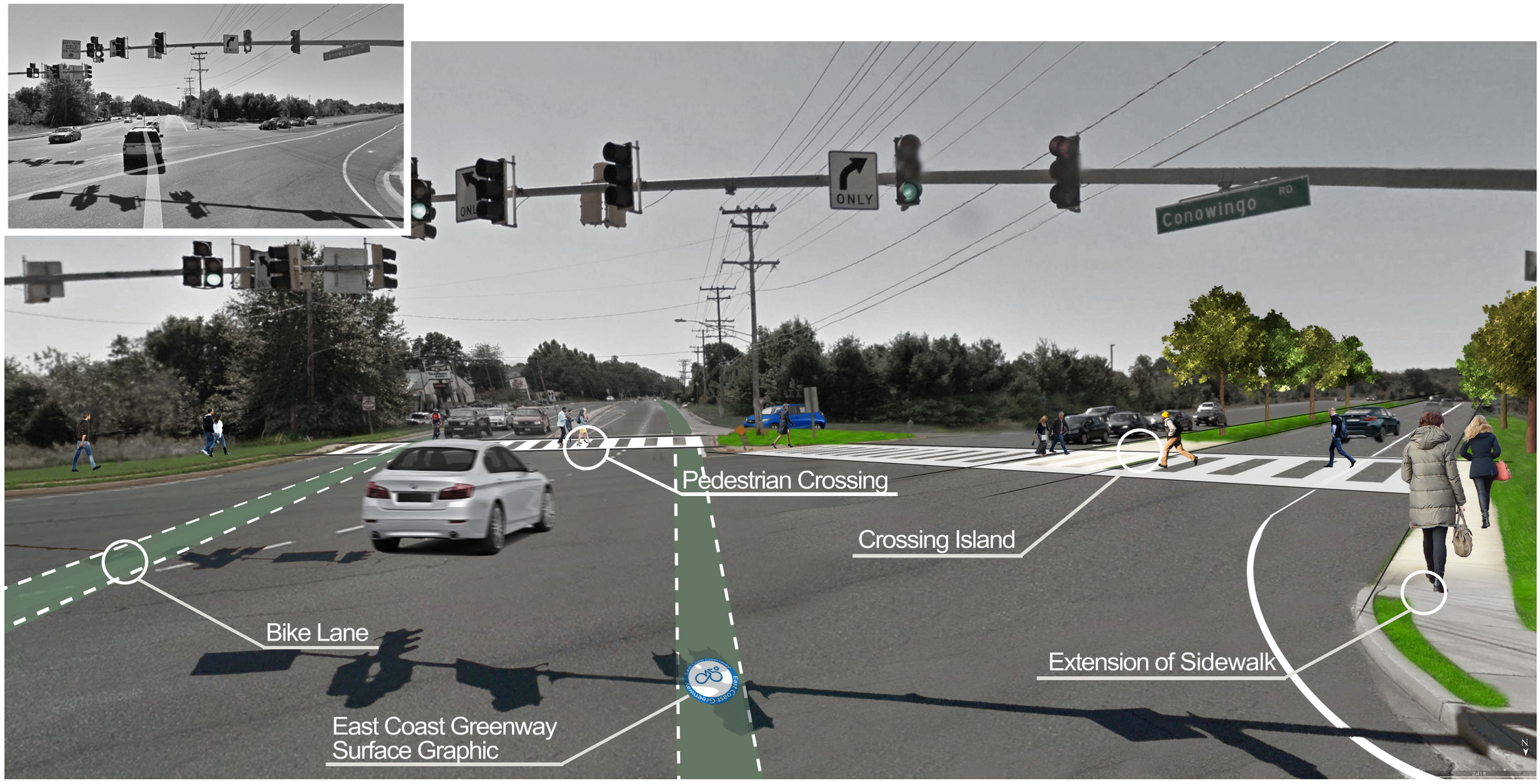
EXISTING



PROPOSED BIKE LANES



Conowingo Road & Route 1 Intersection



Looking southwest, the proposed pedestrian crossing at the intersection of Conowingo Road and Bel Air Bypass/Route 1 will consist of a safety island connected to the expanded sidewalk across Bel Air Bypass. Bike lanes traveling north and south will be marked with surface graphics that will identify the East Coast Greenway and local bike lanes.

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Pedestrian Crossings



At the northeast Conowingo Road and Hickory Bypass/Route 1 intersection, the proposed bike lanes and pedestrian crossings will offer safe travel across Route 1 to the commercial area, which could provide a bike station for parking and repairs.

Conowingo Road Bike Lanes



Buffered bike lanes are proposed along Conowingo Road traveling north and south. The bike lanes allow traffic to access driveways and adjacent sites.

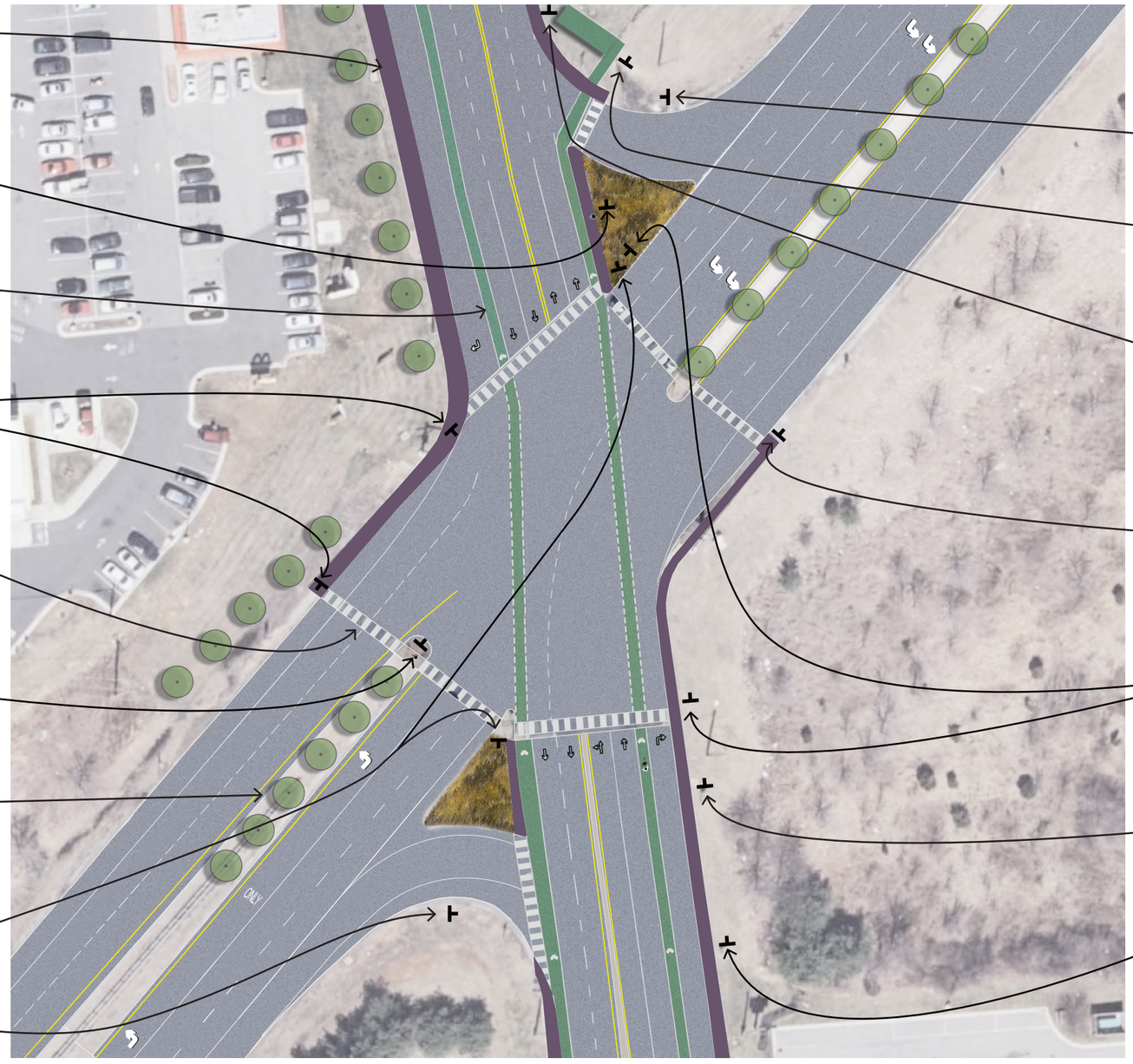
Intersection Signing Plan

Pedestrian Crosswalks

Bike Lanes

Pedestrian Crossings

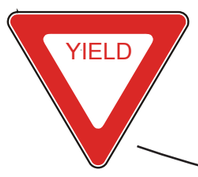
Safety Islands

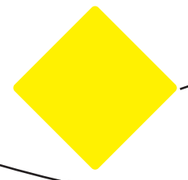


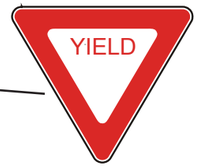
























Connection 3:

North Shamrock Road to Majors Choice Drive

Proposed Facilities Map



Facility Types

- 8' Share-use Path
- 10' Share-use Path
- One-Way Bike Lane

Destinations

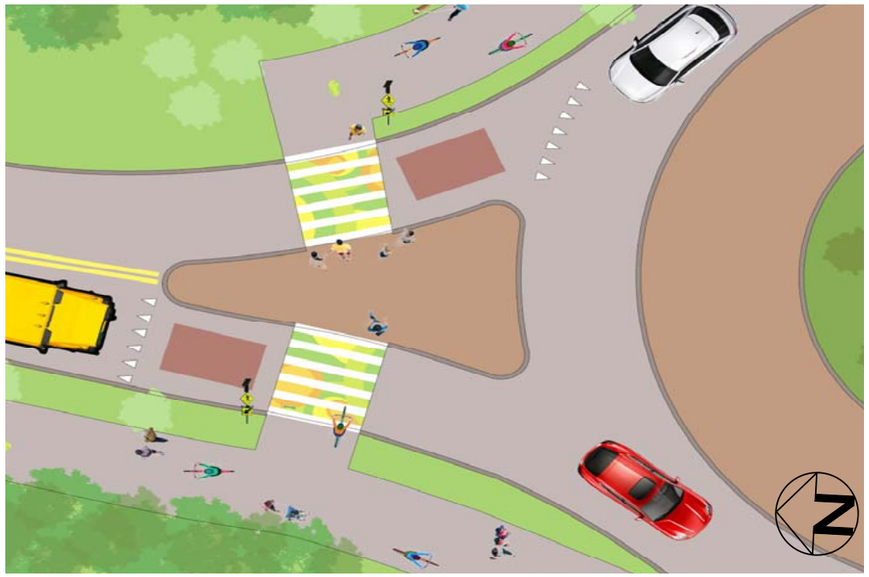
- A Majors Choice Park
- B Southampton M.S.
- C Shamrock Park
- D Bel Air Park
- E C. Milton Wright H.S.
- F Restaurants/Shops

Detailed Plans

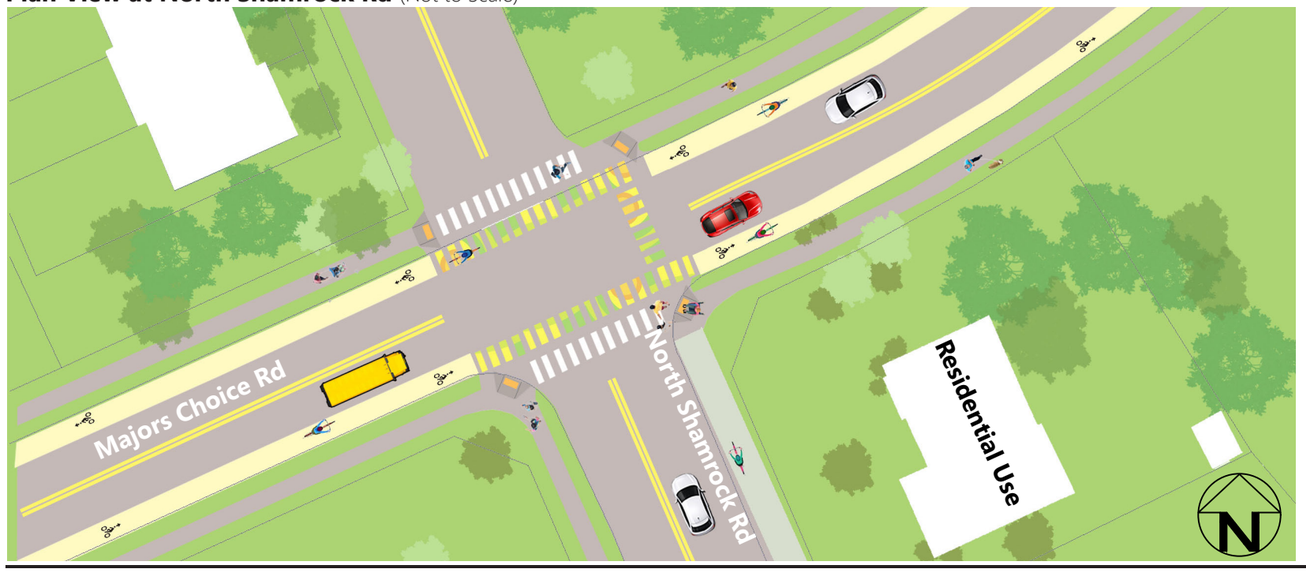
Plan View at Southampton and Moores Mill (Not to Scale)

The view (right) shows the transition between the proposed shared-use path on North Shamrock Road and the one-way bicycle lane on Majors Choice Drive. Safety and wayfinding signage have been added at the intersection, along with visually enhanced crosswalks and ADA ramps to provide safety, comfort, and access for all users.

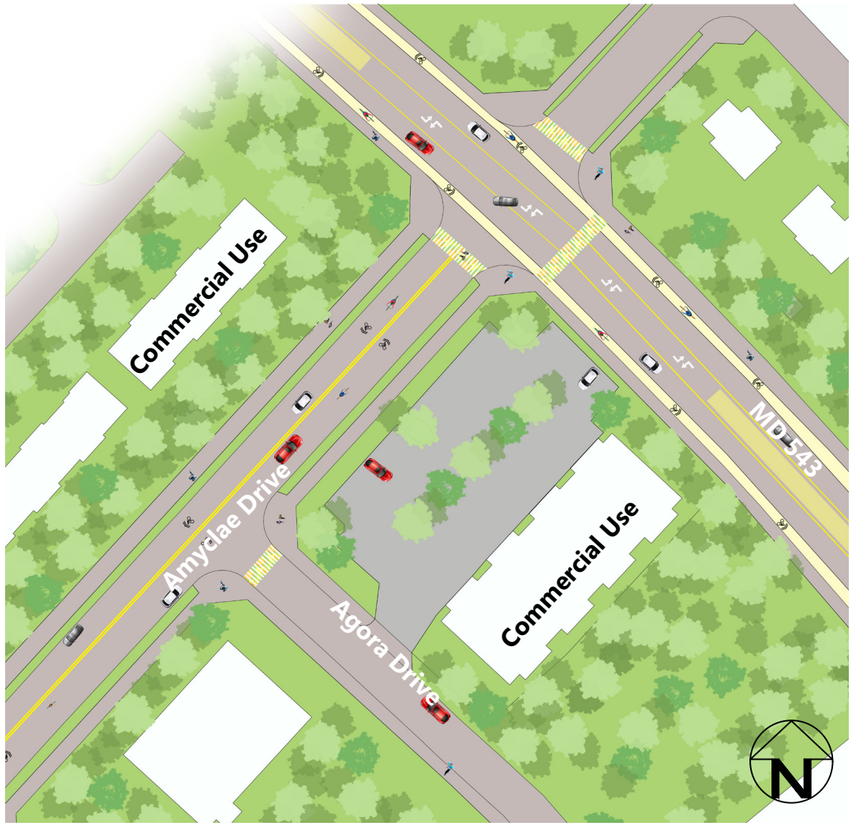
The view (below) shows the transition between the proposed shared-use path on North Shamrock Road and the one-way bicycle lane on Majors Choice Drive. Safety and wayfinding signage have been added at the intersection, along with visually enhanced crosswalks and ADA ramps to provide safety, comfort, and access for all users.



Plan View at North Shamrock Rd (Not to Scale)



Plan View at Amyclae Drive and MD-543 (Not to Scale)

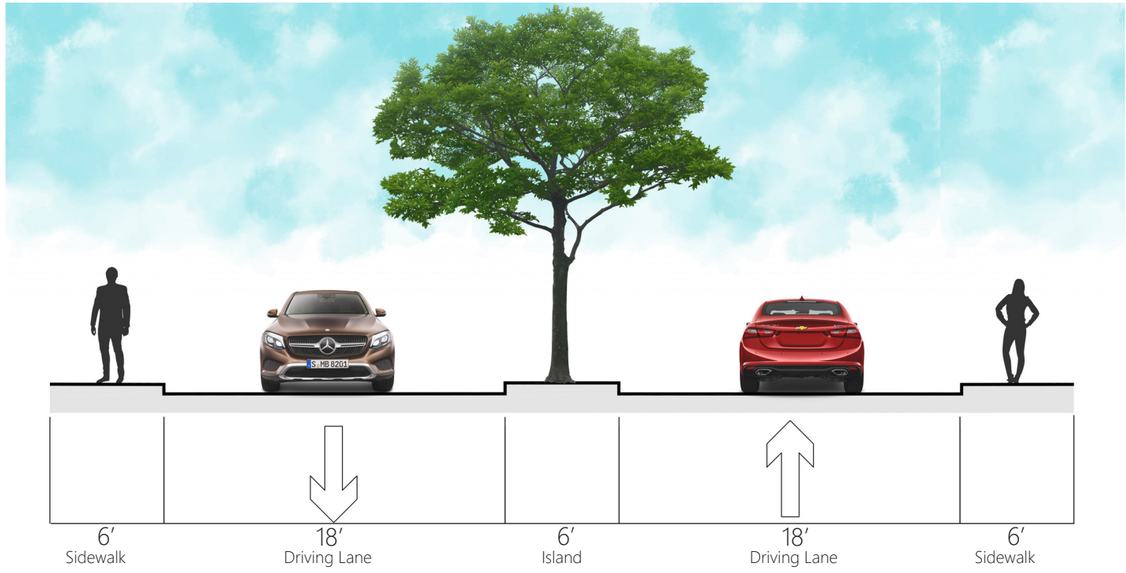


The illustration above shows the proposed sharrows along Amyclae Drive and the transition to MD-543. The existing median will be extended and lanes will be removed. Eliminating lanes creates space for a two-way bicycle lane along the length of MD-543, which can provide an accessible, safe, and convenient bicycle route. Visually enhanced crosswalks add to the consistency of the bicycle network, creating unity across the system. Safety and wayfinding signage will notify users of road changes and important information.

Majors Choice Drive

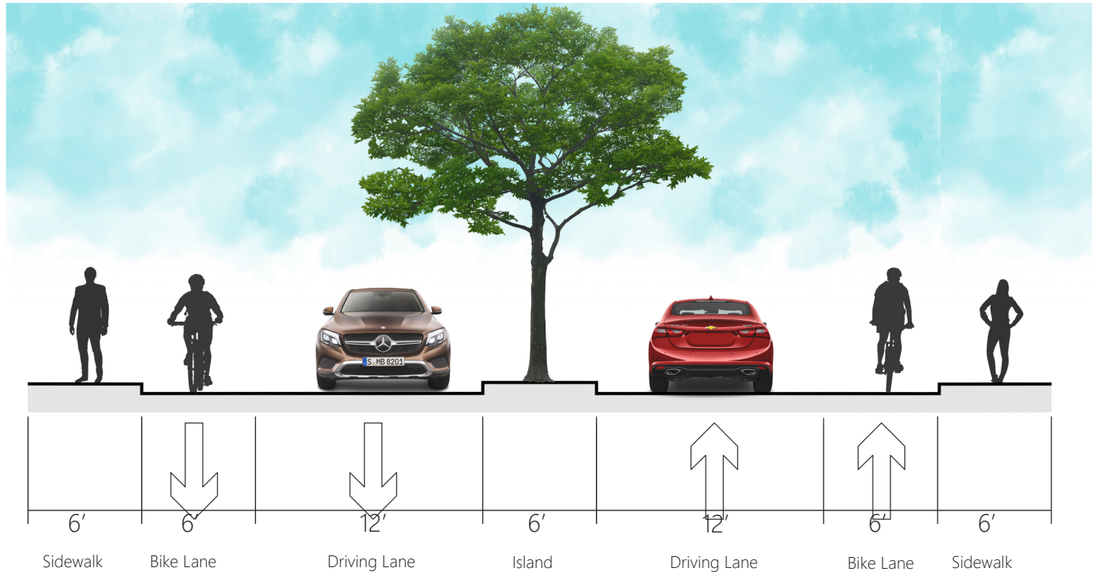
Section Narrative
Existing Conditions

At the entrance to a large residential area, a small median is present to calm incoming traffic. Majors Choice Drive runs parallel to Majors Choice Park, a main destination along the route. There are 6' wide sidewalks on each side of the street, but no identified facilities for bicyclists, who are currently being forced to ride on the streets.

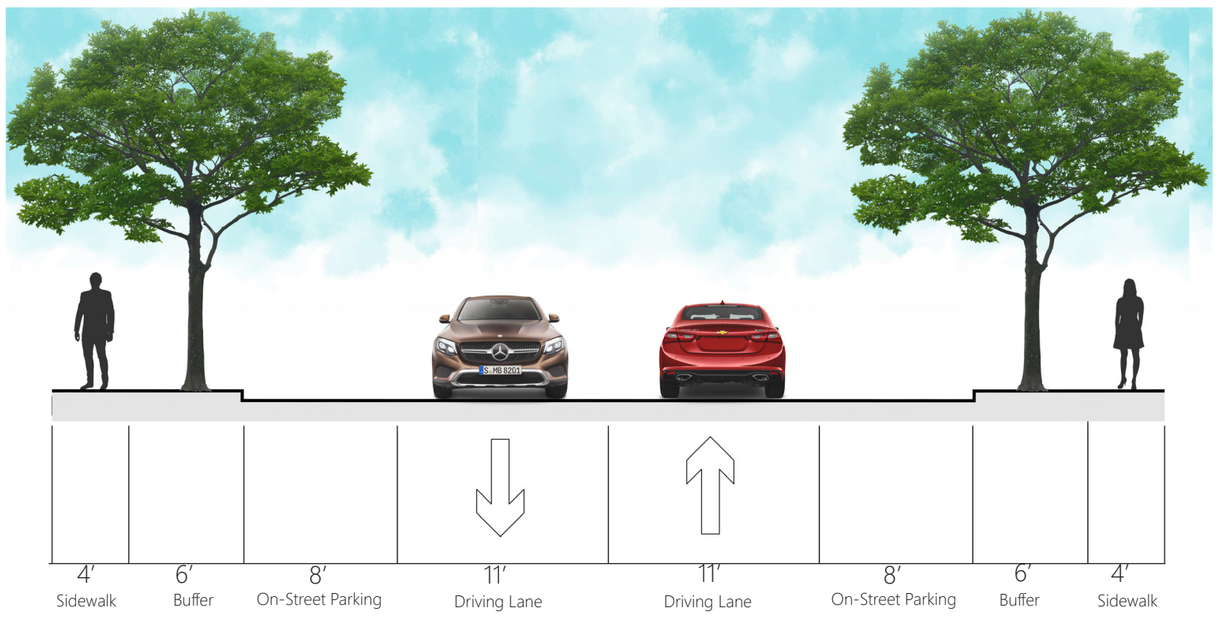


Proposed Facility

Implementing one-way bike lanes along the street would give bicyclists access to many important destinations along the route. Separating bicyclists from vehicular traffic significantly reduces the risk of accidents, and gives residents in the area an additional and safe option for traveling. Implementing crosswalks at the intersection with North Shamrock Road will further increase the safety and comfort levels for bicyclists along the street.

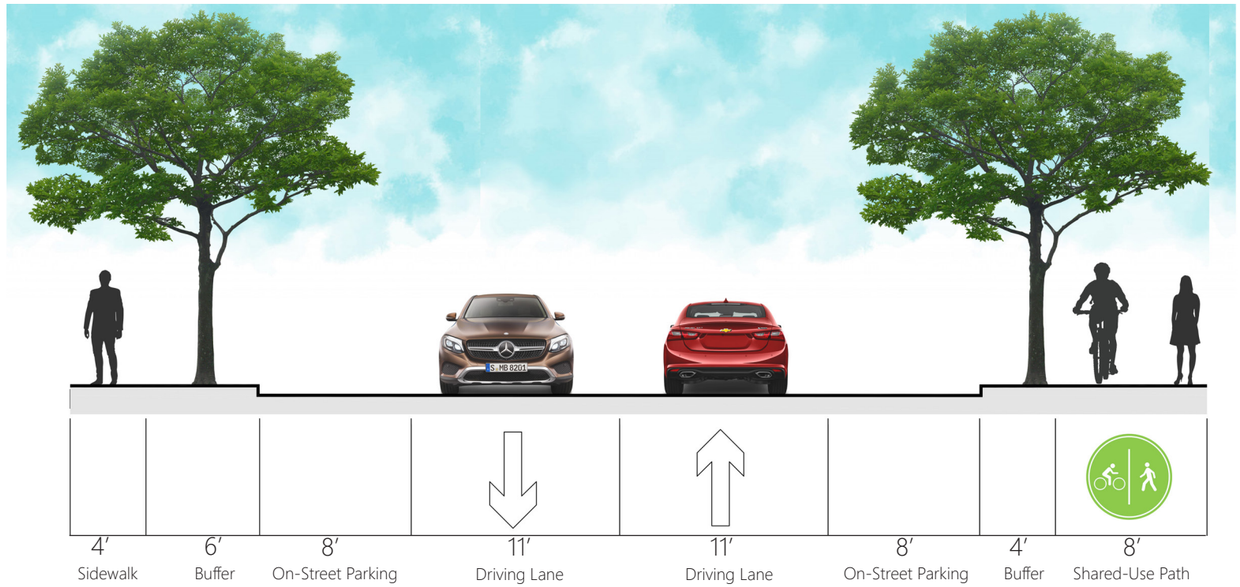


North Shamrock Road



Section Narrative
Existing Conditions

A rather wide street that accommodates 2-way traffic with parking on both sides. The sidewalk width is narrower than the standard 5′, which makes it uncomfortable for pedestrians to use. The street runs through a residential neighborhood with many families, however, the road does not support any bike facilities. This poses an issue, especially for families with children who do not feel safe having their children ride on the street.



Proposed Facility

Widening the sidewalk and turning it into a shared-use path will enable children, as well as adults who are not comfortable riding on the streets, to ride in the area. Residents will have safe and easy access to other neighborhoods, parks, schools, and destinations in the area. The ideal width of the sidewalk would be 10′ to comfortably accommodate multiple users.

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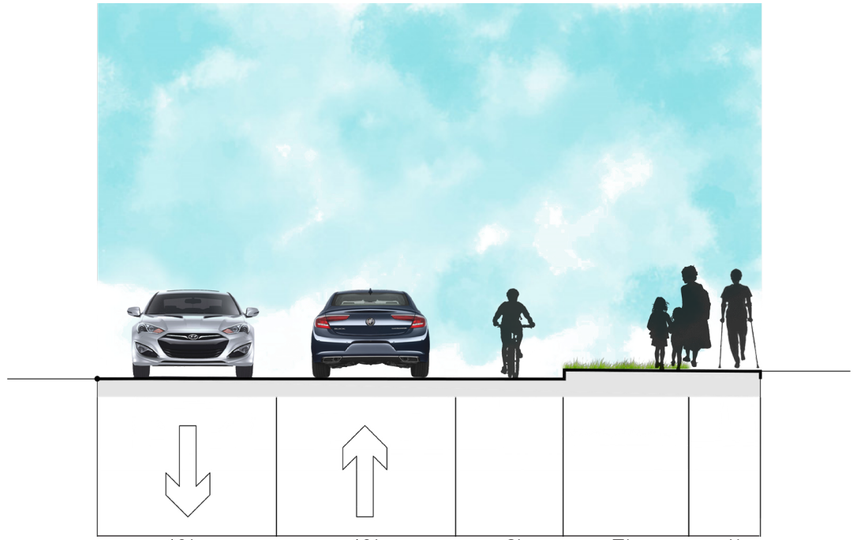
Chris Snyder, Sarah Whiteley, Sara Saernwald

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Moores Mill Road

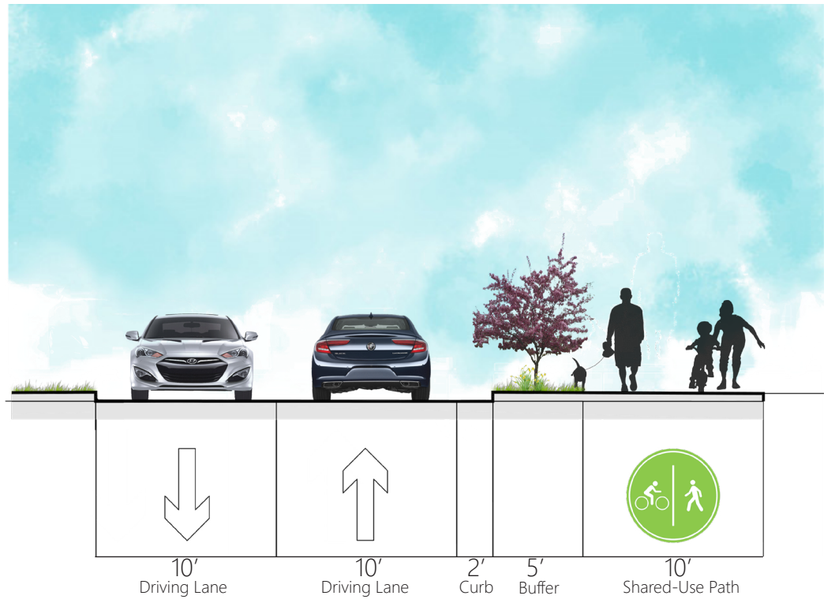
Section Narrative
Existing Conditions

Residents in the area currently access Southampton Middle School via a 2-way street or a 5′ sidewalk. Temporary parking is allowed along the south side of the street. There are no safe options for students or residents to get to the school via bicycles.

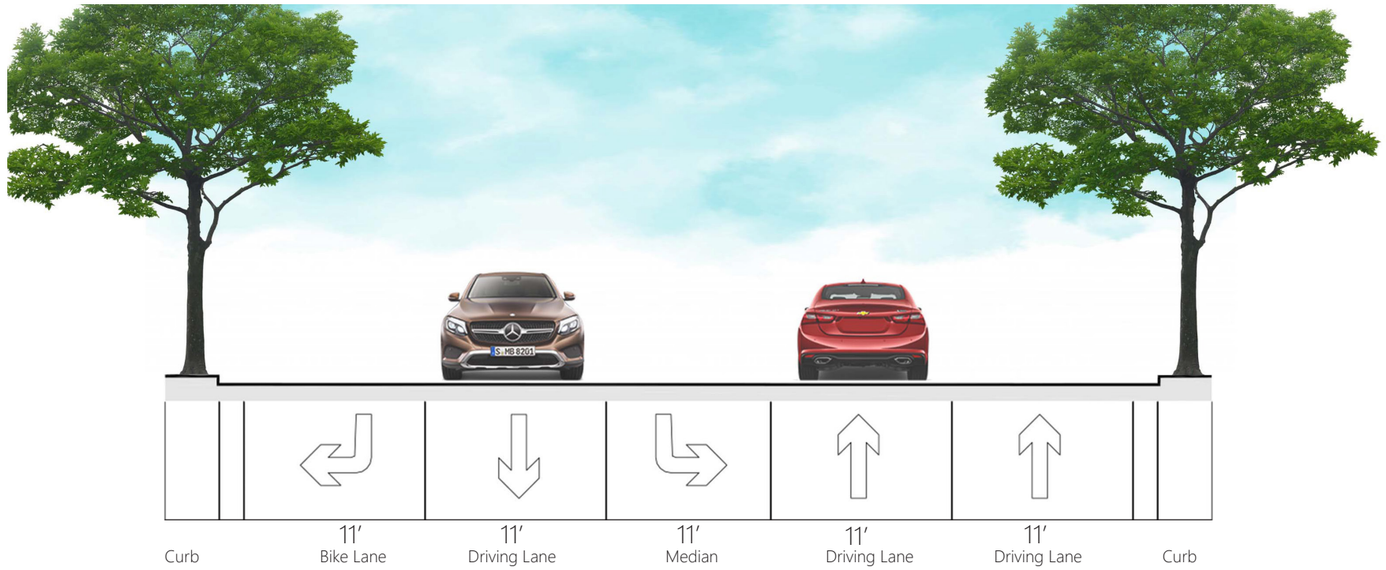


Proposed Facility

Widening the sidewalk and turning it into a shared-use path would not only add a safe option for students and parents to get to the school, but would also expand the bicycle network by connecting the residential neighborhoods along North Shamrock Road and Southampton Road.
Planting additional trees between the sidewalk and road would act as a buffer from the vehicles traveling on the street, acting as a traffic calming feature while providing shade. Recommended height for the trees are 20′ or less because of existing utility lines.

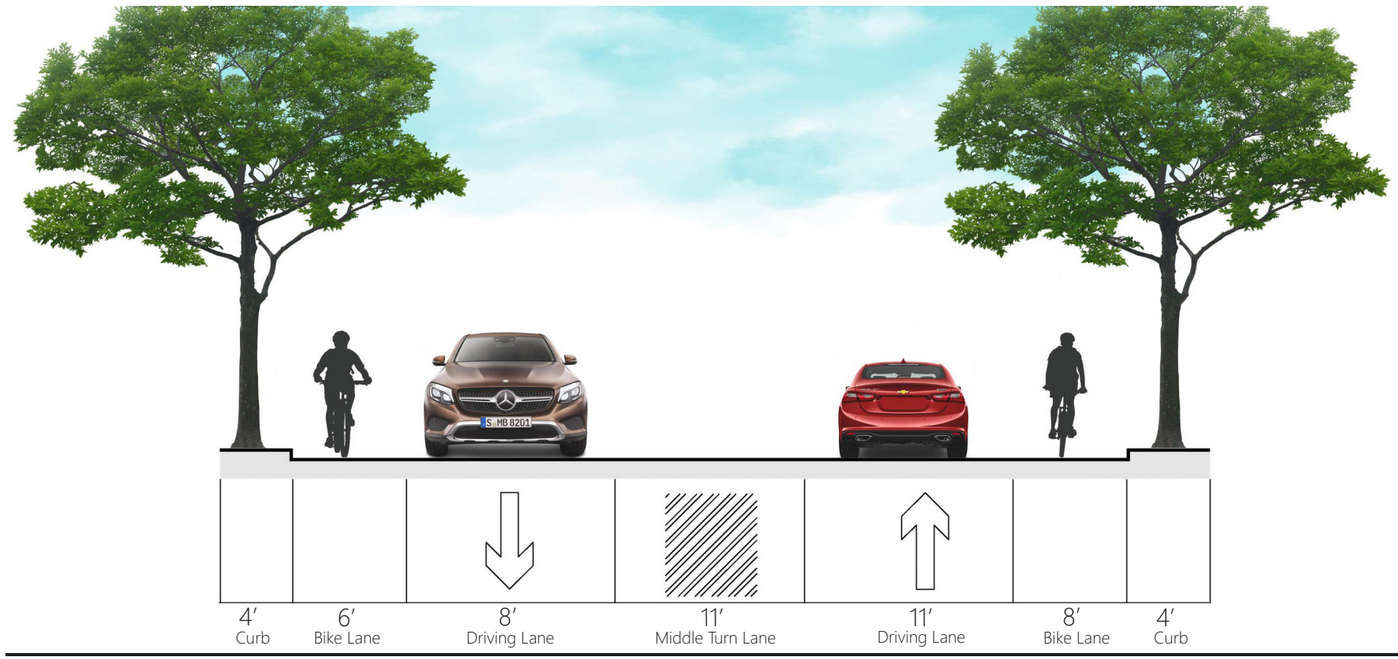


MD 543



Section(Right) Narrative
Existing Conditions

With a speed limit of 45 mph, MD-543 is one of the area's most difficult roads for bicyclists. Two lanes travel northwest and one lane travels southeast. In addition, four turning lanes—one in each direction—add up to a five-lane road in the southeast. Directional change is marked only by a short median.



Proposed Facility

Extending the median farther, changing the middle lane to a two-way turning lane, and allocating only one lane for each direction, creates enough space on the road's curb sides for a two-way bike lane. While these changes may naturally reduce speed limits, a 30-mph speed limit is also recommended, ensuring the highest level of comfort and safety for bicyclists.

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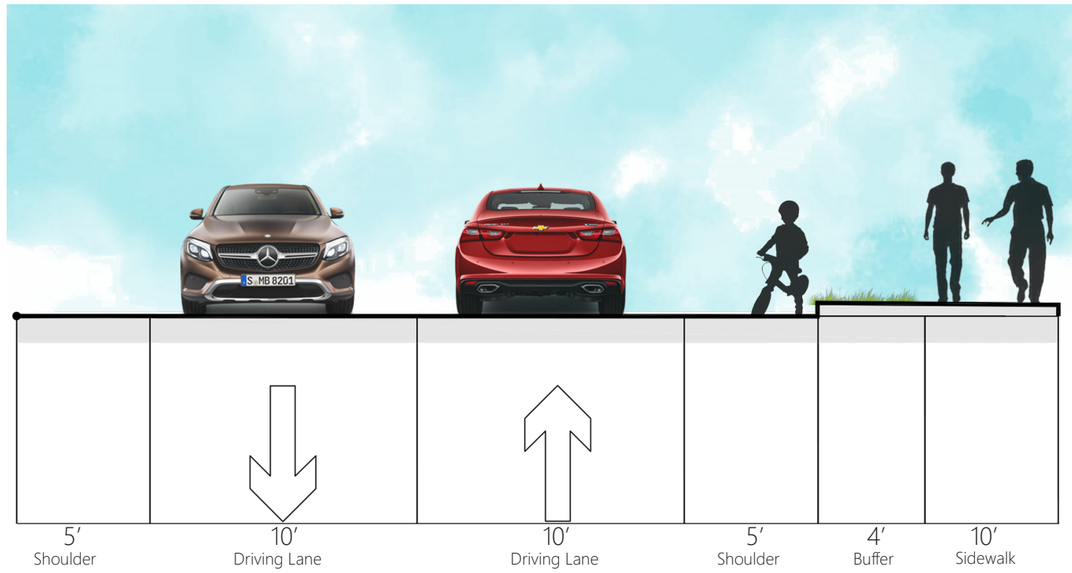
Chris Snyder, Sarah Whiteley, Sara Saernwald

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Southampton Road

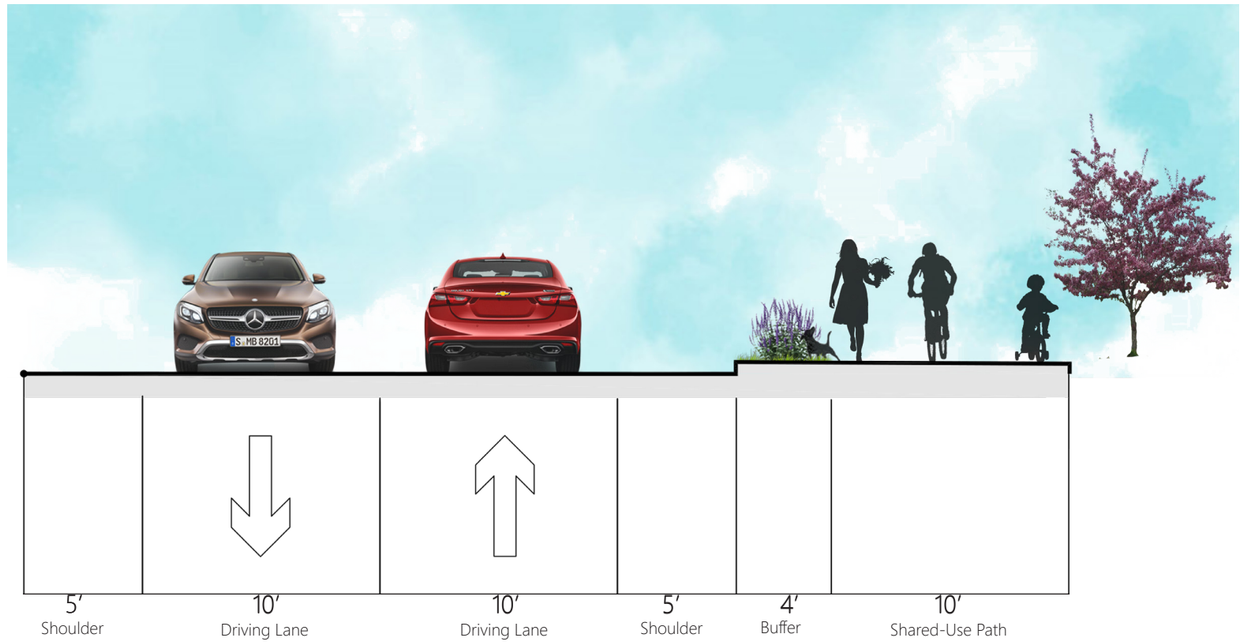
Section(Left) Narrative
Existing Conditions

Southampton Road connects Moores Mill Road with MD-543, with the majority of the residents living on the west side of the street. There is currently a 5′ wide sidewalk that is separated from the street by a 4′ wide grass strip. There are no existing bike facilities that enable the residents to bicycle to the nearby Southampton Middle School. Utility lines run along the street, parallel with the sidewalk, and there is very little vegetative cover.

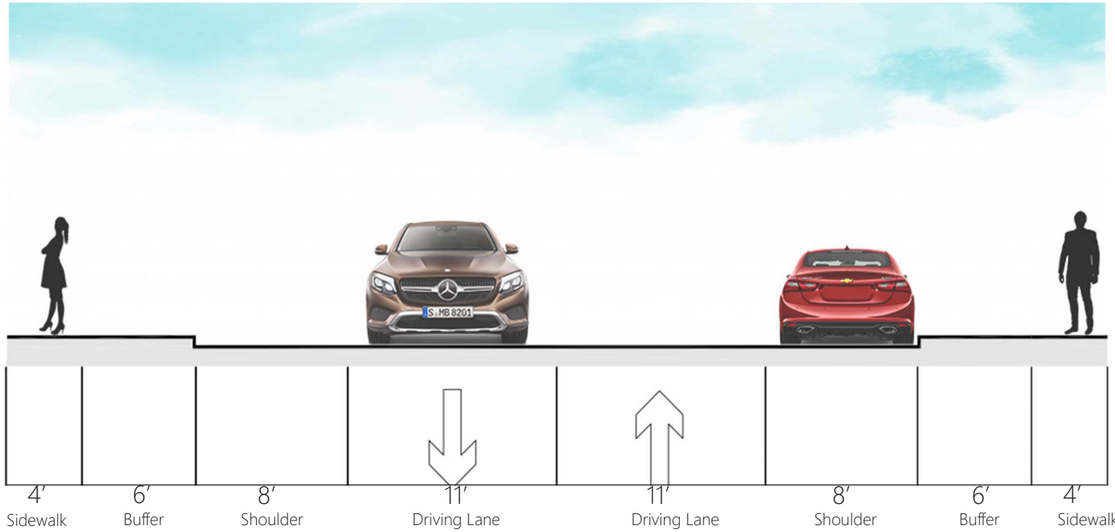


Proposed Facility

A proposed shared-use path along the west side of the street would accommodate both pedestrian users and bicyclists, creating a safe connection between the neighborhood and the school. Planting trees under 20′ (due to utility lines) would provide shade along the shared-use path.



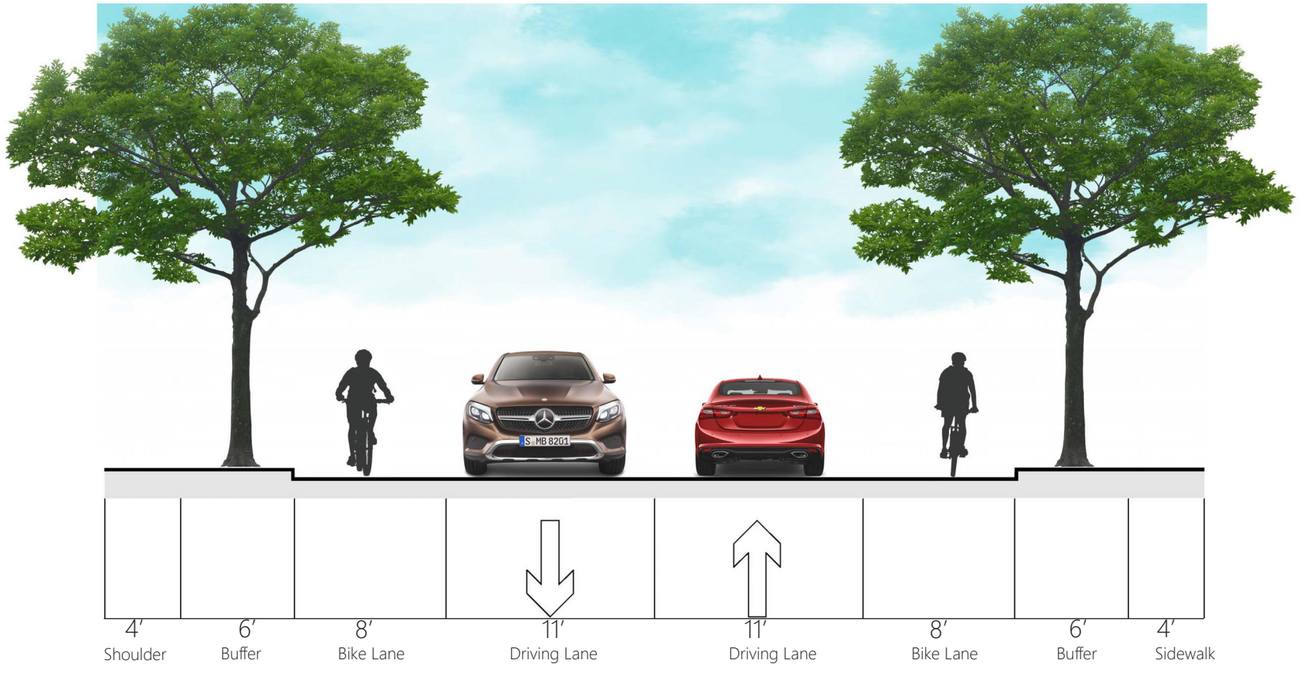
Amyclae Drive



Section(Left) Narrative
Existing Conditions

Amyclae Drive, just 520 feet long, connects the residential neighborhood of Econ Drive with MD-543. It provides access to a small but growing business area that includes an educational center, restaurants, shops, and a gym.

Amyclae Drive is a two-way street with parking on both sides. Four-foot-wide sidewalks run along both side of the street and are separated from the road by a six-foot grass buffer. Bicyclists are currently forced to ride on these narrow sidewalks or on the street, as there are no existing bike facilities along the road.



Proposed Facility

The ideal option for Amyclae Drive would be to replace the street parking with one-way bike lanes. Removing the street parking should not create any difficulties for drivers, as there are other parking options. Alternatively, sharrows are feasible on this short, low-speed street. Planting street trees in the grass buffer on both sides of the street would encourage lower vehicle speeds, fostering a positive atmosphere of coexistence among the different users.

Town of Bel Air
PALS
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Southampton Road

Proposed Conditions





Existing Conditions

Southampton Road Narrative

A shared-use path along North Shamrock Road would allow neighborhood residents to safely reach area parks and schools, without having to interact with vehicles on the street. Separating bicyclists and pedestrians from the street promotes safety, comfort, and convenience for all users.

Southampton Road



Existing Conditions

Moores Mill Road Narrative

A shared-use path separated from the street by trees improves the conditions for bicyclists and pedestrians who use the route to travel to Southampton Middle School. Street trees and narrower lanes work as traffic calming measures, fostering an overall neighborhood safety.

Proposed Conditions



North Shamrock Road Perspective

Proposed Conditions





Existing Conditions

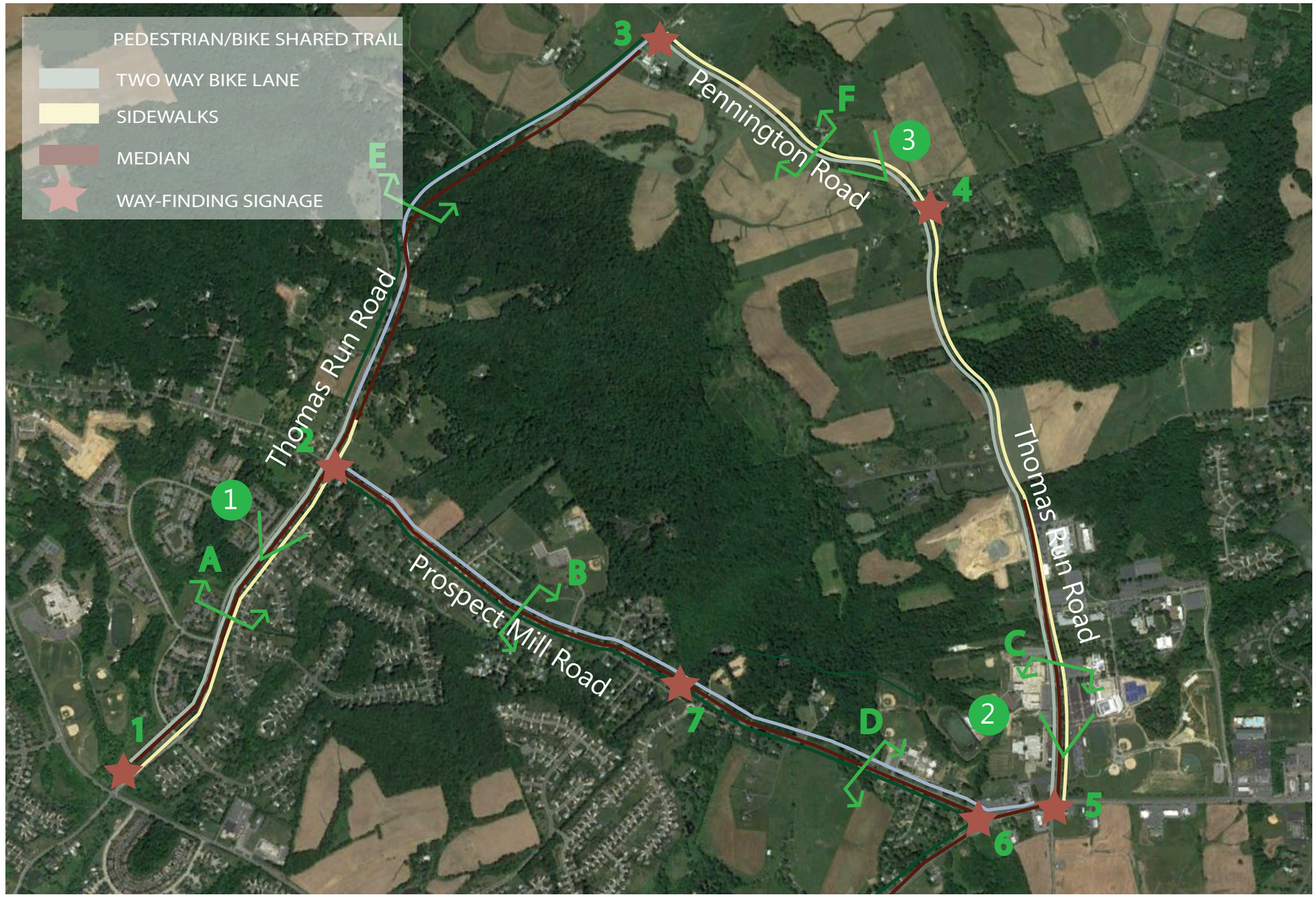
North Shamrock Road Narrative

A shared-use path along North Shamrock Road allow residents in the neighborhood to safely reach parks and schools in the area, without having to interact with vehicles on the street. Separating bicyclists and pedestrians from the street promotes safety, comfort, and convenience for all users.

Connection 4:

Thomas Run Road to Churchville Road

Proposed Facilities Map



Segment: 1- 2
- Travel Length: 1.00 mile
- Speed Limit: 35 mph
- Total Width: 36 ft
- Car Lane Width: 22 ft

Segment: 2-3
- Travel Length: 1.10 mile
- Speed Limit: 35 mph
- Total Width: 22 ft
- Car Lane Width: 20 ft

Segment 3-4
- Travel Length: 0.7 mile
- Speed Limit: 35 mph
- Total Width: 28 ft
- Car Lane Width: 20 ft

Segment 7-2
- Travel Length: 1.75 mile
- Speed Limit: 40 mph
- Total Width: 34 ft
- Car Lane Width: 24 ft

Segment 6-7
- Travel Length: 0.45 mile
- Speed Limit: 30 mph
- Total Width: 30 ft
- Car Lane Width: 24 ft

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Not to Scale

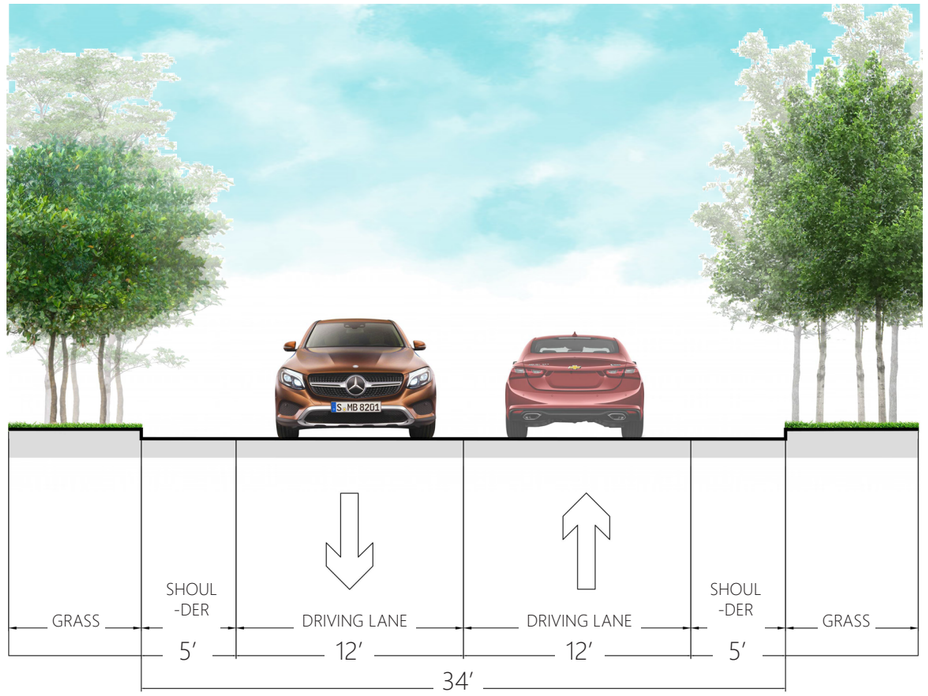
Churchville Road &Thomas Run Road & Churchville Road & Prospect Mill Road

Thomas Run Road and Prospect Mill Road both intersect with Route 22 (Churchville Rd). These two intersections will be priority areas because there will be heavy pedestrian, bicycle, and vehicular traffic. The schools as well as the sports facilities in close proximity of these intersections will make this area a high volume area. Safety is of utmost importance, and a complete street not only on Thomas Run Road and Prospect Mill Road, but also on Churchville Road would serve as a great design to enhance safety in this area as well as provide a vibrant campus atmosphere. Complete streets throughout this area will serve as a precedent for the surrounding community of Bel Air and the positive impacts it brings to a growing community. Addition of pedestrian and bike friendly paths and crosswalks makes the space more inviting for all forms of transportation.

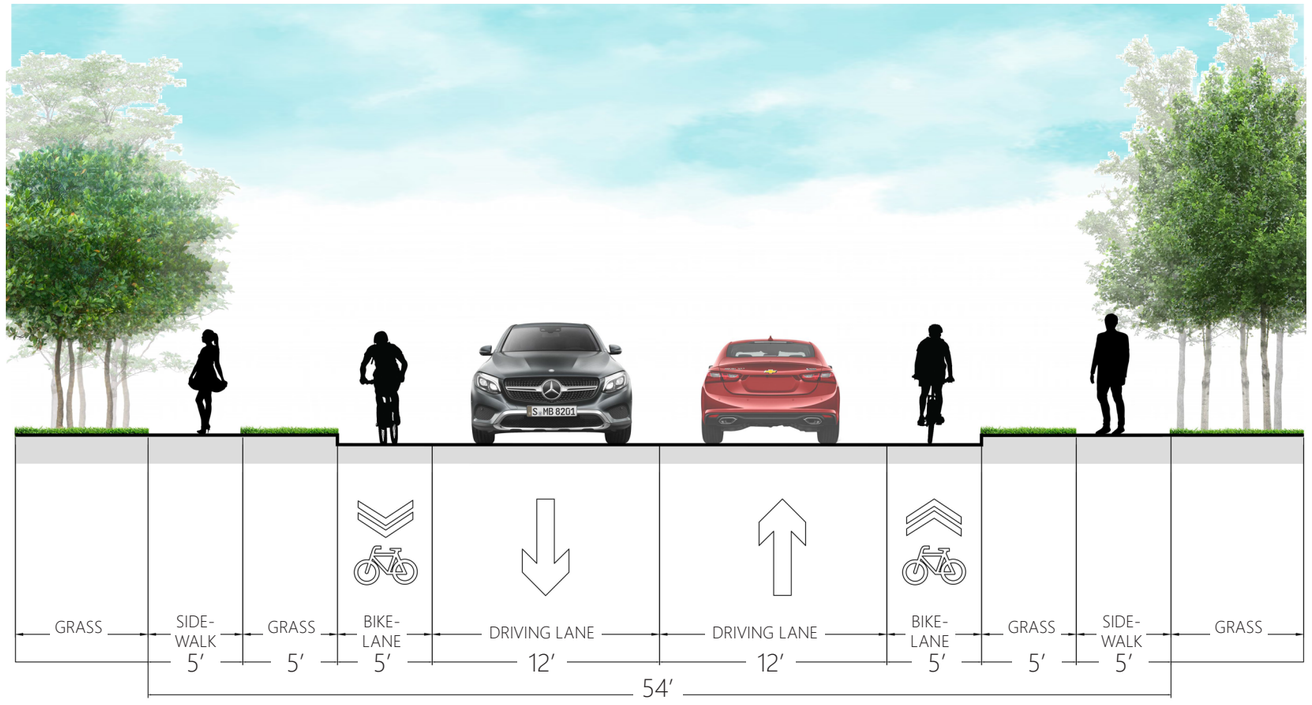


A: Section of Thomas Run Rd Complete Street

Existing Conditions



Proposed Complete Street



Adding sidewalks and a street buffer in the five feet of right-of-way on both sides of Prospect Mill Road turns Thomas Run Road into a complete street.

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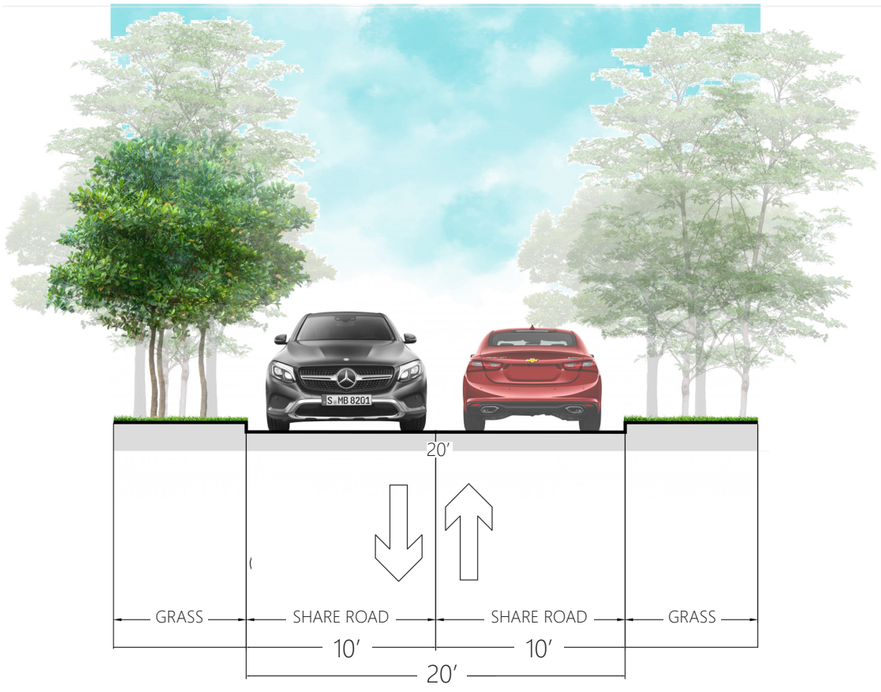
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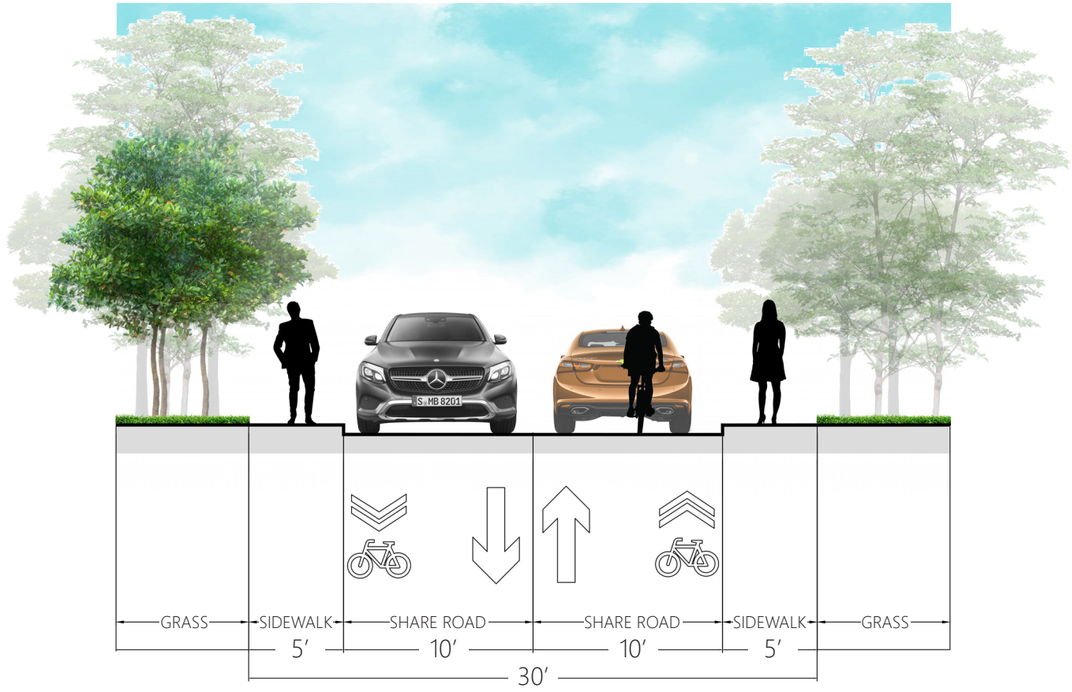
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B: Section of Prospect Mill Road

Existing Conditions



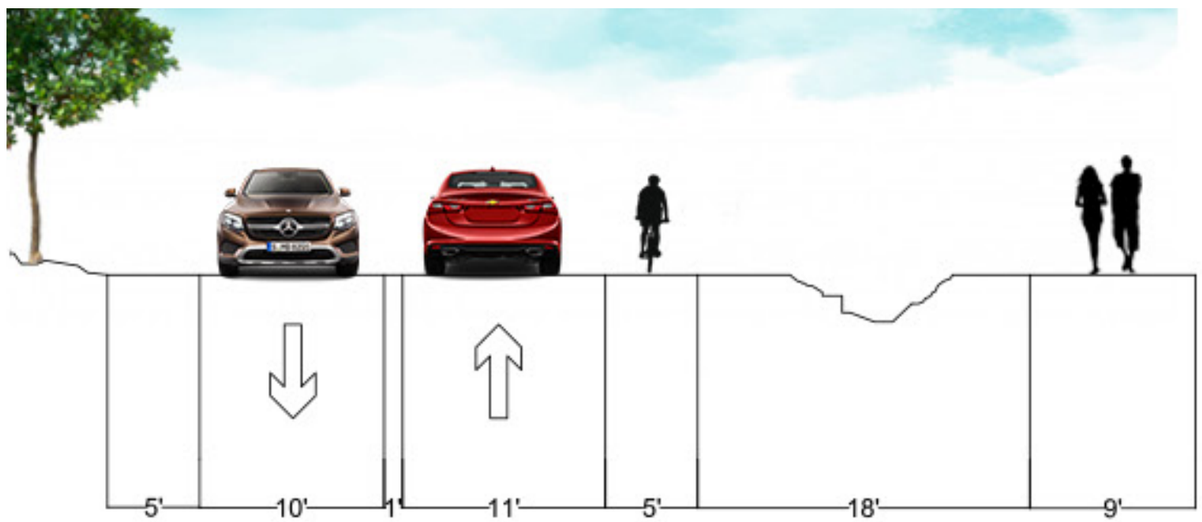
Proposed Complete Street



Using the additional five feet of right-of-way to build pedestrian walkways on both sides of Prospect Mill Road will provide an additional transportation route. Every community needs to accommodate safe and complete walkways, especially in residential areas.

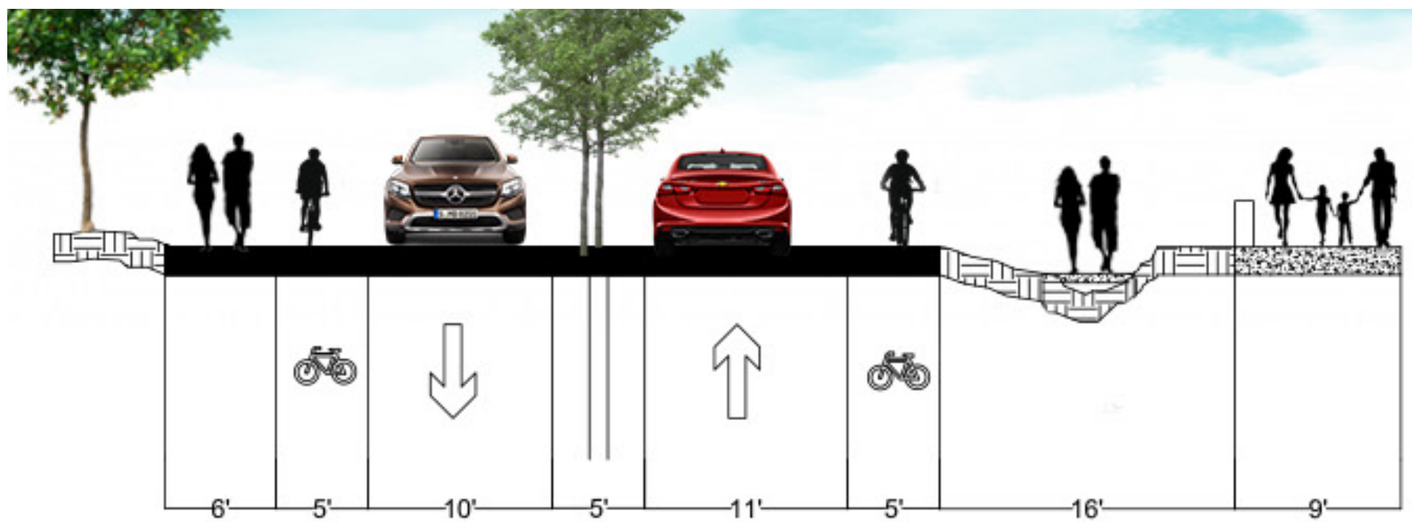
C: Section of Thomas Run Road Complete Street at Harford Community College

Existing Conditions



Thomas Run Road is the primary access road to Harford Community College and there will be heavy pedestrian traffic. The design goal is to cater to this pedestrian campus life by providing safe facilities for bicyclists, pedestrians, and vehicular traffic.

Proposed Complete Street Vegetative Buffer



We plan on providing a complete street for the surrounding community of Harford Community College. By marking and distinguishing the different facilities as well as providing additional pedestrian walkways we are turning Thomas Run Road into a complete street.

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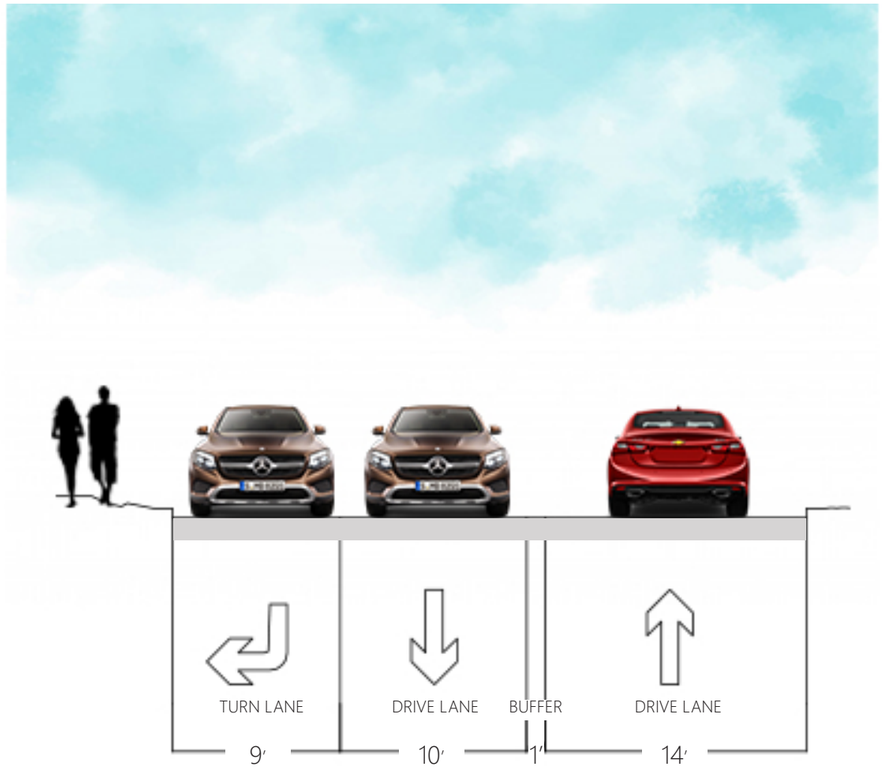
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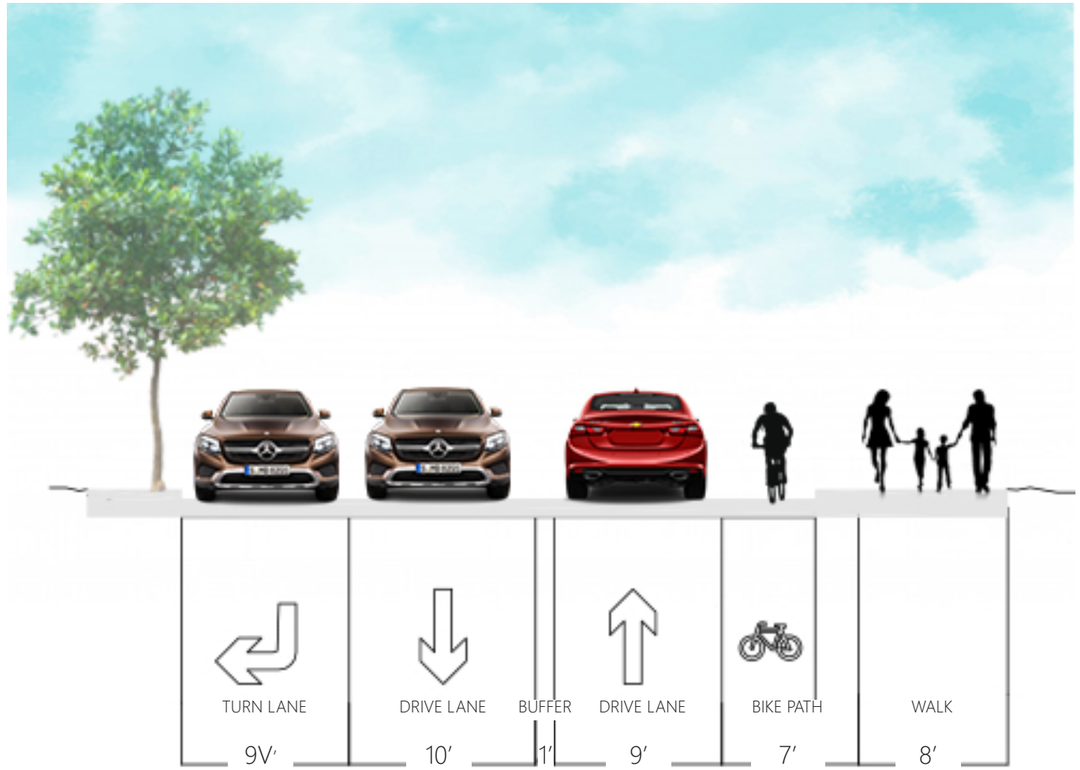
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D: Section of Prospect Mill Road

Existing Conditions



Proposed Complete Street



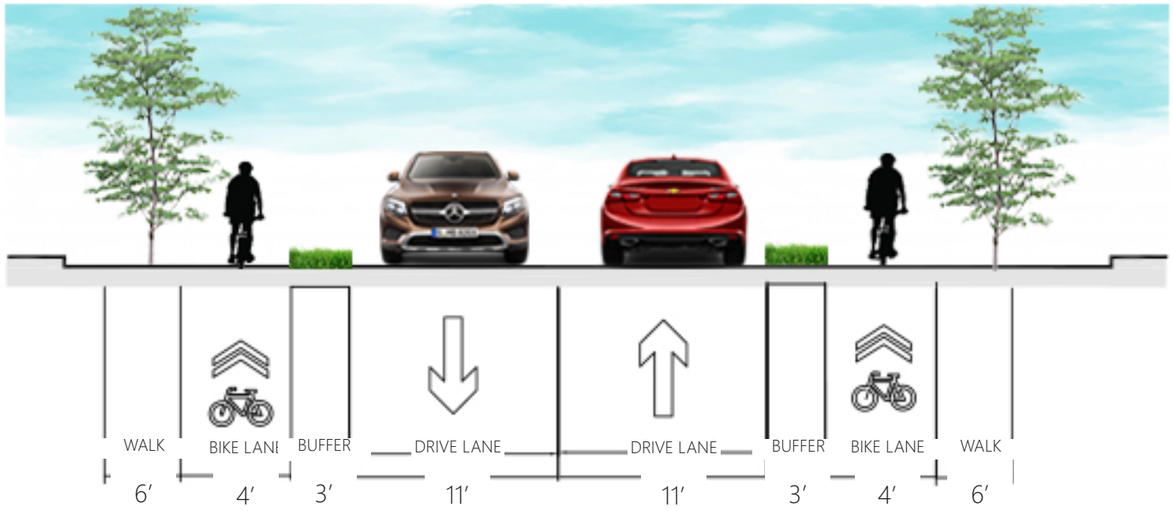
Prospect Mill Road could become a complete street by reducing width of the incoming drive lane and using the additional five feet of right-of-way to create a bike lane and sidewalks. The street could provide the benefits of multiple safe facility spaces for users.

E: Section of Thomas Run Road

Existing Conditions



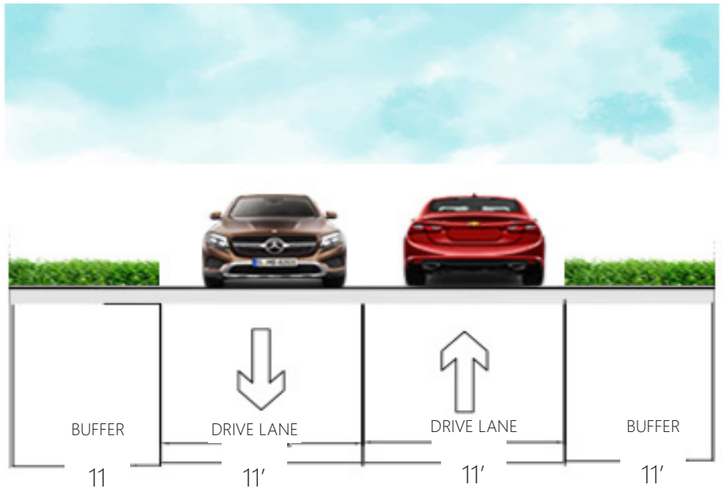
Proposed Complete Street



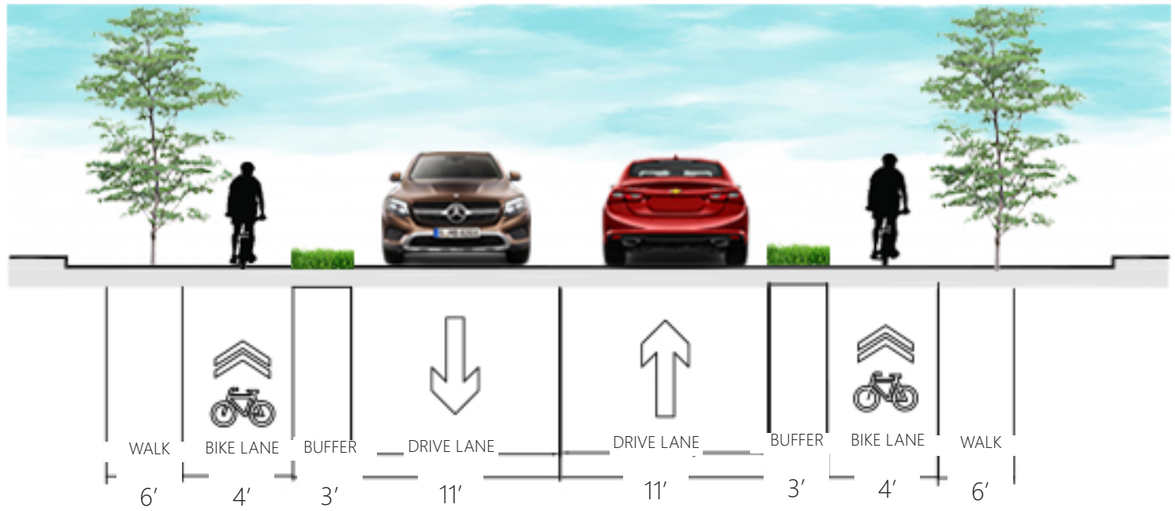
Thomas Run Road is currently one of the area's narrowest streets, with barely enough room for a two-way lane and no planted buffer. But is has potential space for expansion and could become a complete street that would allow shared access for pedestrians, bikers, and cars.

F: Section of Thomas Run Road to Pennington Road

Existing Conditions



Proposed Complete Street



From Thomas Run Road to Pennington Road is narrow, with access limited to two-vehicle lanes and with a limited planted buffer on both sides. As a complete street it will be expanded to accommodate pedestrians, bikers, and cars, safely buffered with vegetation.

1: Perspective of Prospect Mill Road A3



As seen in perspective, the addition of walkways and providing signage for bike route, will give the community safe spaces for all forms of transportation. These additions will provide safe and efficient travel spaces for the surrounding community.

2: Perspective of Thomas Run Road Proposed Complete Street B5



Thomas Run as a complete street embodies the future of Harford Community College as well as the surrounding community with life and vibrancy any campus should have.

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3: Perspective of Thomas Run Road



As a complete street, Thomas Run Road would be accessible to pedestrians, bicyclists, and cars. Each lane provides safe spaces for different users, along with vegetation buffers on both sides.

Connection 5:

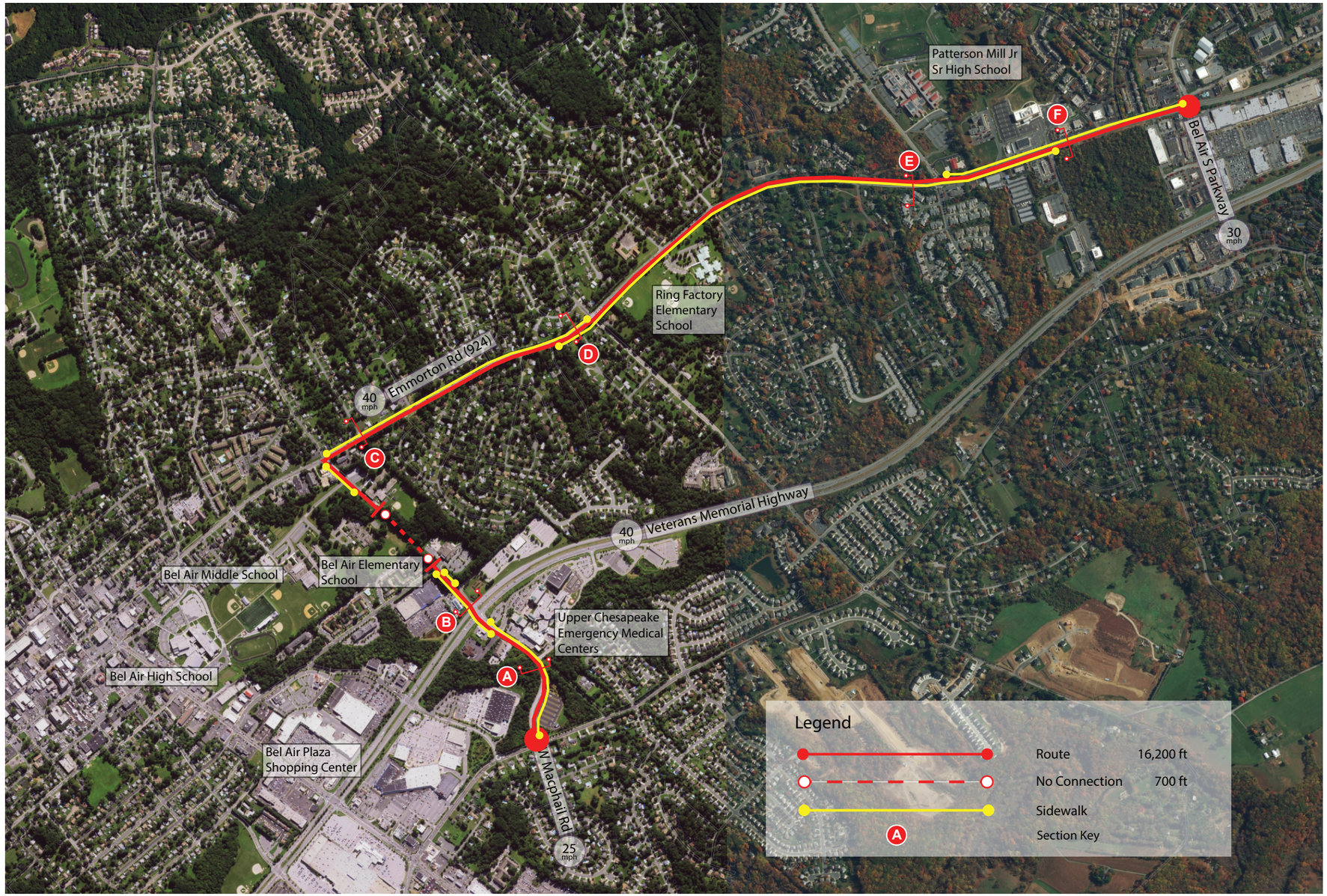
West Macphail Road & Emmorton Road

Existing Site Conditions

The 16,200-foot long segment between West Macphail Road and Route 924 connects the Bel Air Plaza shopping center, the Upper Chesapeake Emergency Medical Center, five schools, and the shopping area at Emmorton Road and Bel Air South Parkway.

This segment begins at the traffic circle at West Macphail Road and South Tollgate Road and continues east past Bel Air Elementary School to the intersection of West Macphail and East Macphail Roads. It then continues south down Emmorton Road. The route crosses Veterans Memorial Highway, a busy intersection dominated by vehicular traffic. The designated speed limits, problematic areas, and analysis informed the design.

Safety preservation is the main priority. Currently there is no designated area for bikers who are forced to travel on the streets with cars. With priority given to drivers, cyclists are left to share the road even in areas with high speed limits. The goal is to have safe bike routes that can take residents to their desired destinations. Since there are two shopping centers and five schools, the primary users are families with children. With that in mind, the proposed facilities offer the safest and most feasible way to get residents from their homes to their destinations.



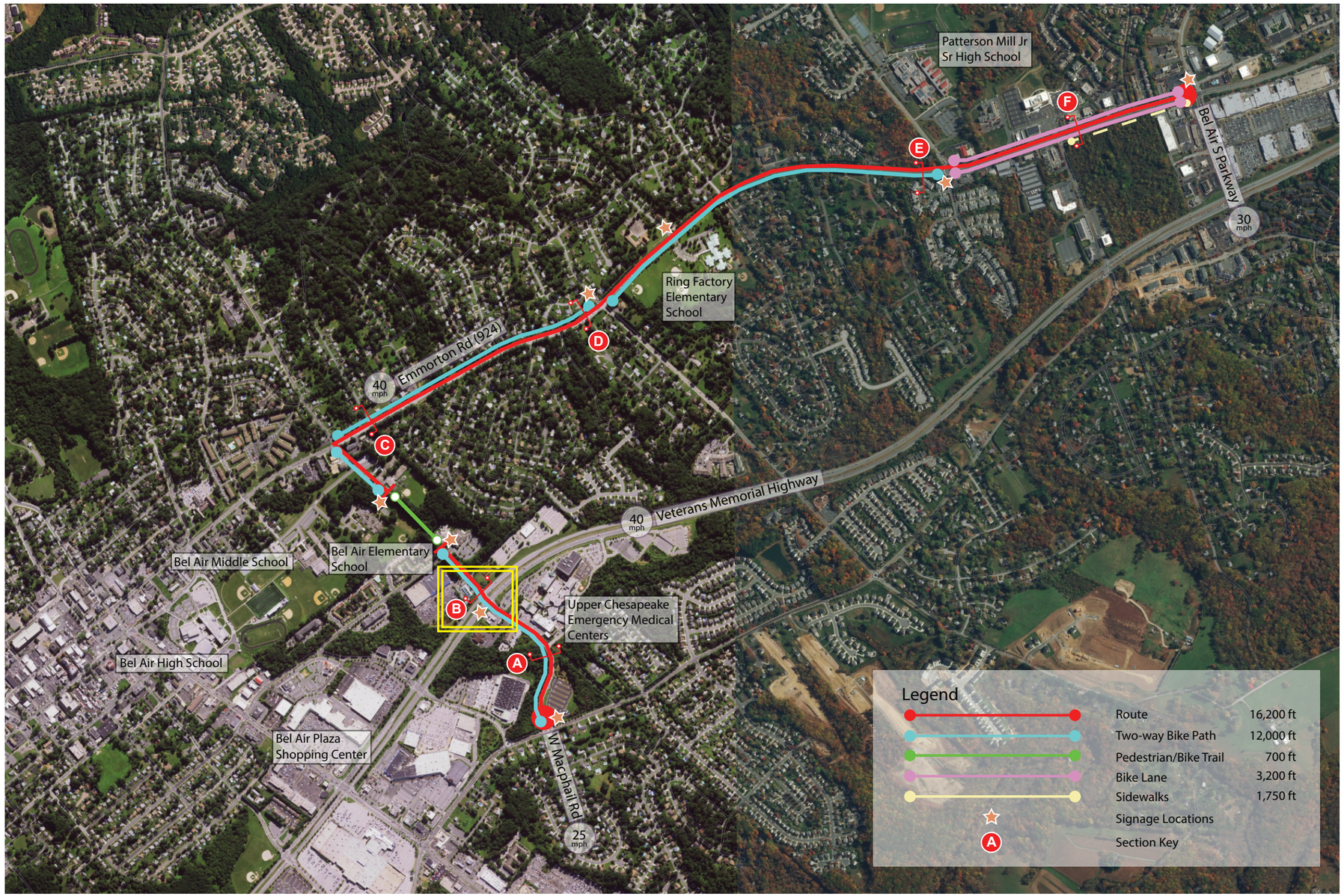
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Proposed Facilities



The bike paths proposed for the area all consider safety, reliability, and change along the route. A two-way, 12,000-foot long bike path runs along West Macphail Road and the residential segments of Emmorton Road (indicated in blue). Also along West Macphail Road is a 700-foot pedestrian/bike trail (indicated in green). Finally, the south end of Emmorton Road gets bike lanes on both sides of the road as users approach commercial centers.

This design also centers children and consideration for their needs and safety. With five schools along the route (ranging from elementary to high school), it is important to accommodate users of all ages and abilities. This proposal could create a regular and safe route for children to get to and from school.

Note: the yellow box (expanded on the following page) shows details of the intersection of West Macphail Road and Veterans Memorial Highway.

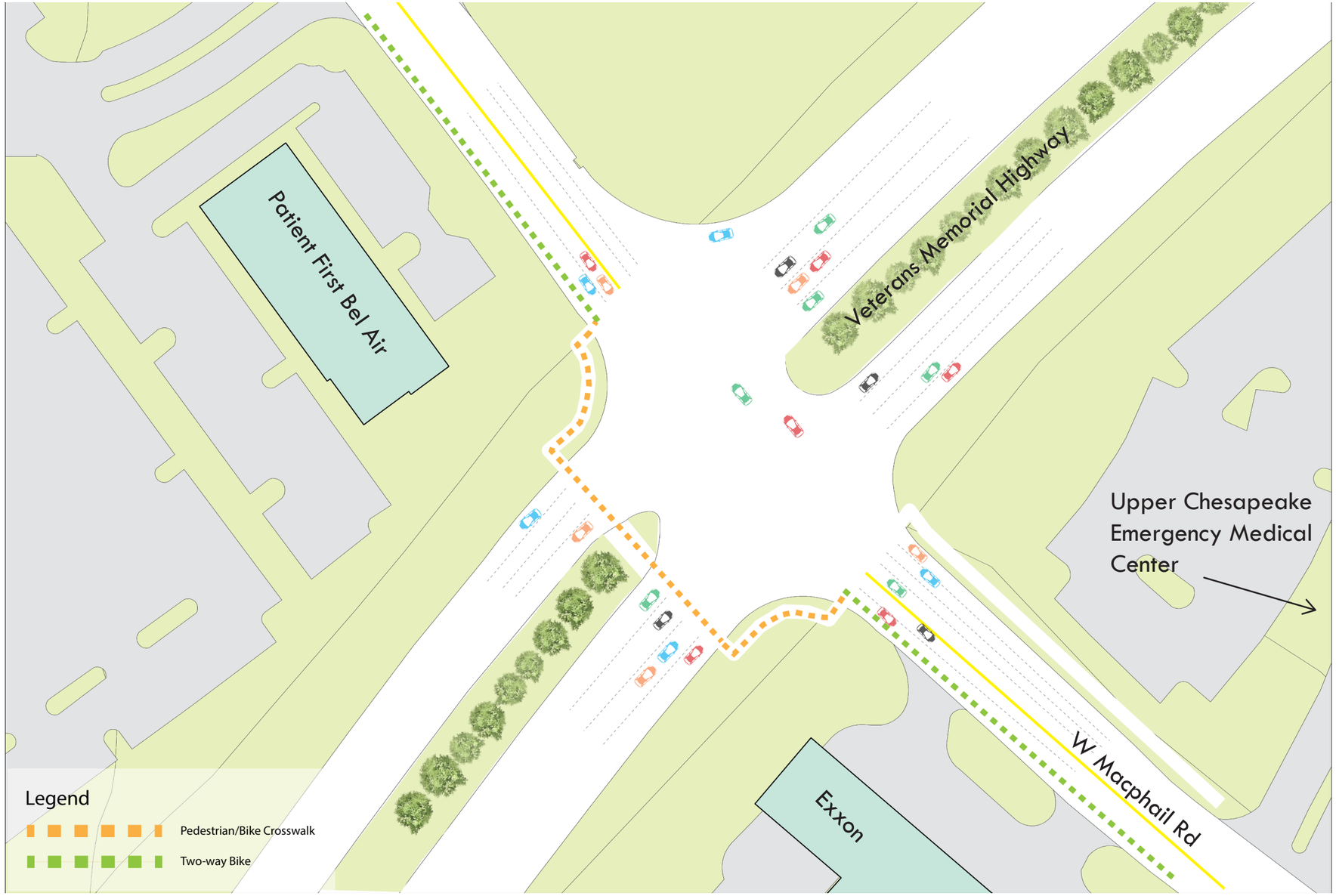
West Macphail Road & Veterans Memorial Highway

The design considers the Chesapeake Medical Center's location at the intersection of West Macphail Road and Veterans Memorial Highway (Route 24), and is mindful of ambulances and the potential safety hazard for cyclists. The rout also features several major intersections. The largest and most problematic intersection is where West Macphail Road meets Veterans Memorial Highway.

A two-way bike path will reduce the risk of harm to bikers; they would be on the same side of Route 24 as the current crosswalk. Cyclists can cross this intersection using the pedestrian crossing signals, a cost-effective strategy to get them safely across the intersection.

Also, the Route 24 median provides pedestrians refuge, a protected space to wait until the light ushers them safely across (orange dashed line).





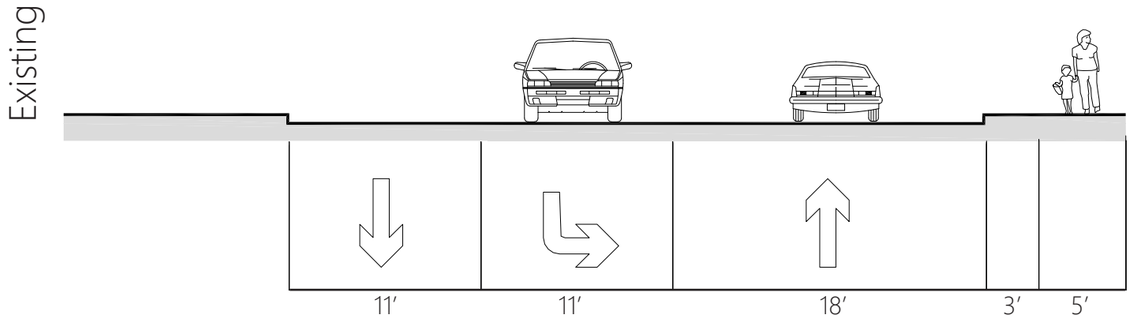
Landscape Architecture
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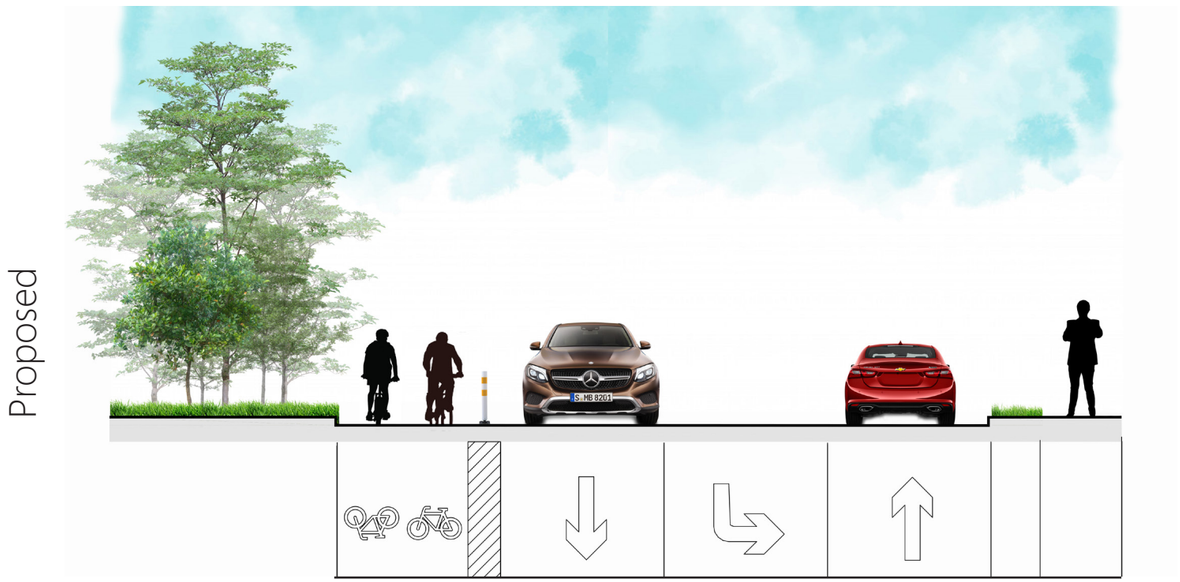
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Jenny Dibra, Akira Shepherd, Cecilia Tran

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Section A





Proposed Two-Way Bike Path on West Macphail Road

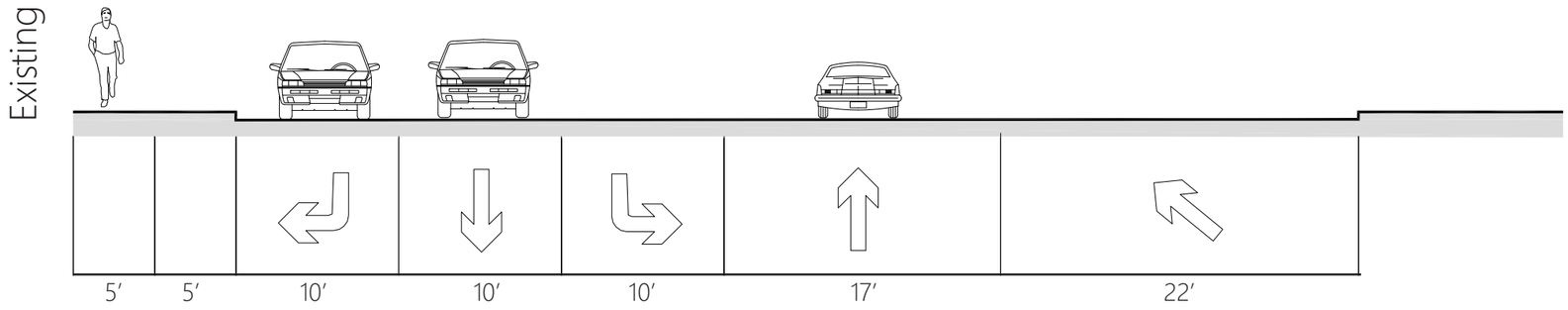
A two-way bike path will protect cyclists from high speed emergency vehicles entering bordering medical centers. The space needed for this two-way came from reducing the size of road lanes to 10′. The two-ways are all bordered with a protective barrier of 2′.

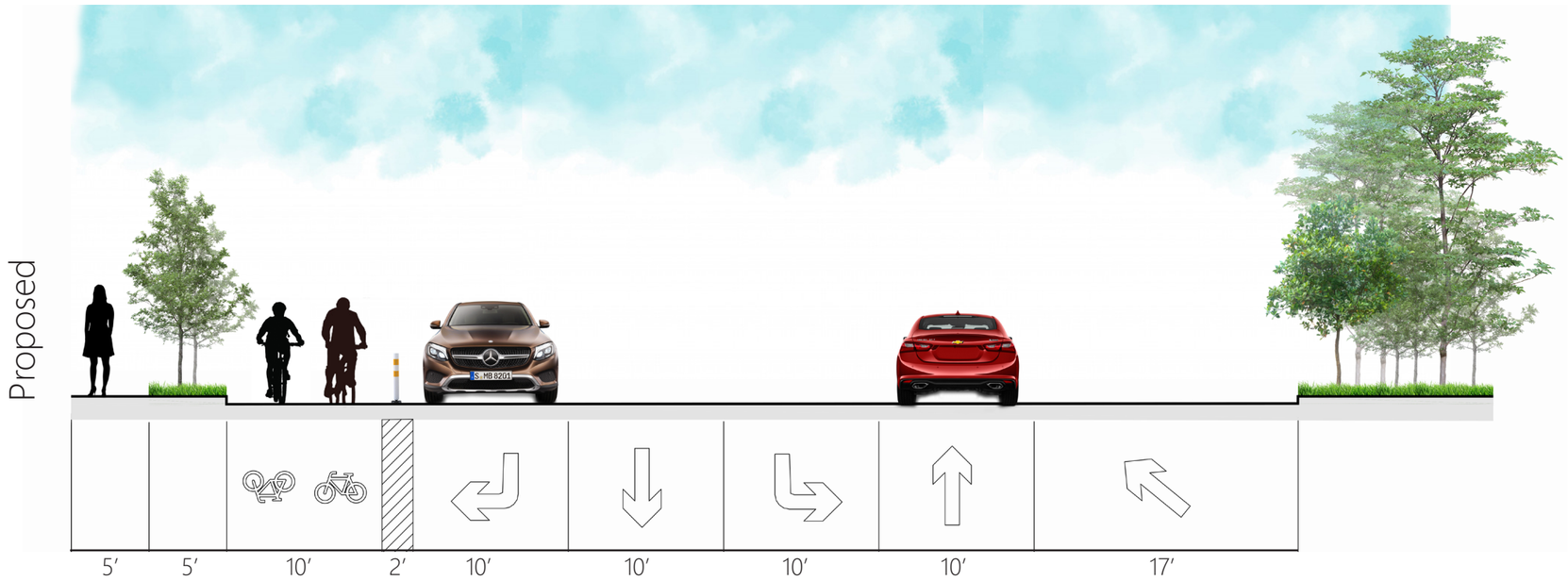
Jenny Dibra, Akira Shepherd, Cecilia Tran

Section B

Proposed Two-Way Bike Path crossing Veterans Memorial Highway

Veterans Memorial Highway spans 8 lanes with vehicles traveling up to 40 mph. The two-way bike path allows cyclists to travel side by side instead of alone on either side of traffic.





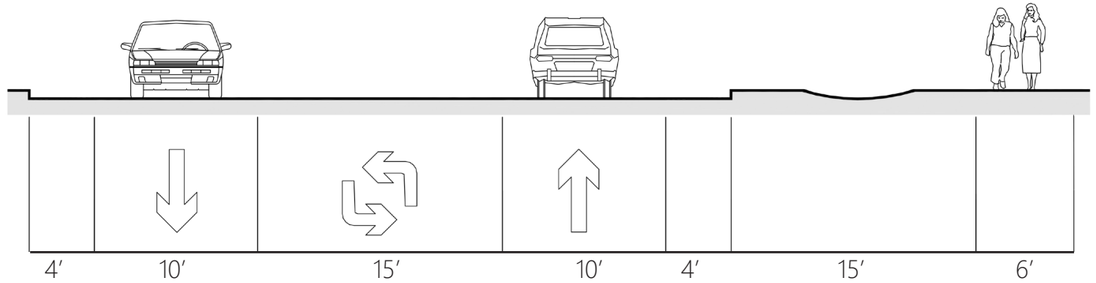
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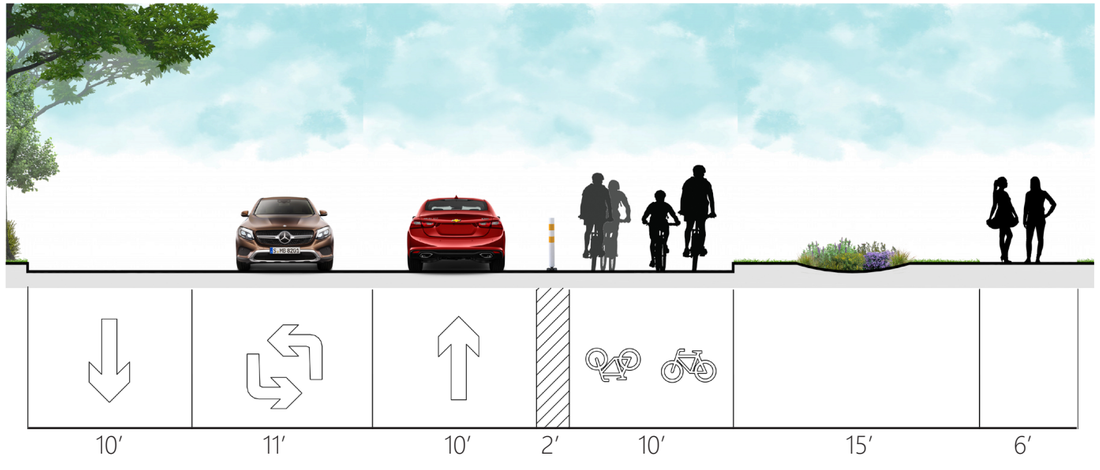
Jenny Dibra, Akira Shepherd, Cecilia Tran

Section C

Existing



Proposed



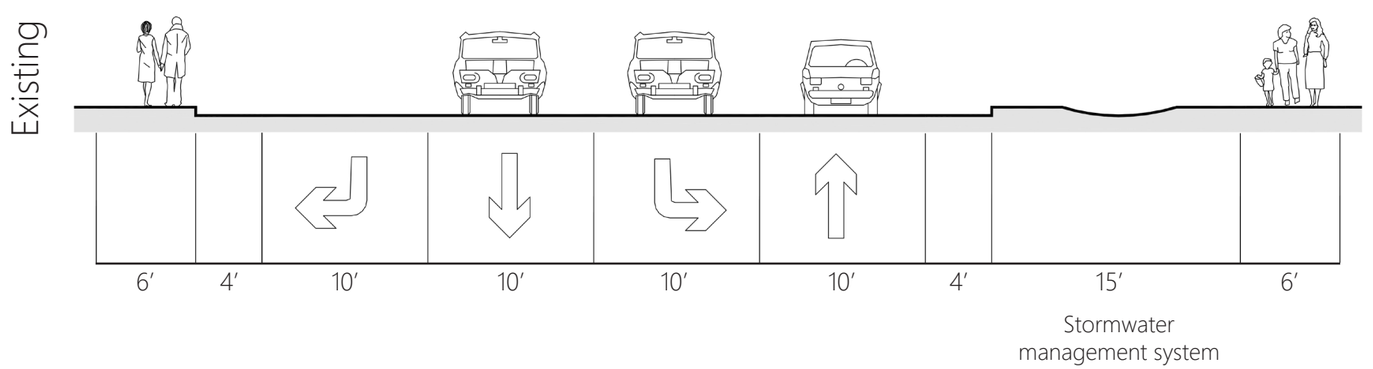
Proposed Two-Way Bike Path on South Main Street

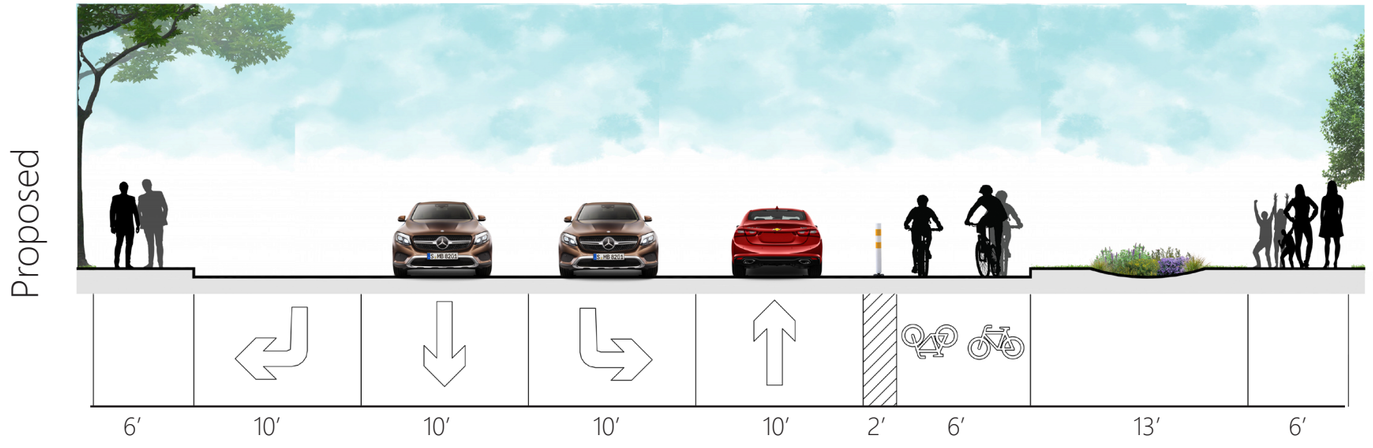
The conditions change by decreasing the width of the shared turning lane and repurposing the space for a two-way bike path. Currently, the middle, shared turn lane is 15′ and the shoulder is 4′. The new section will change the shared turn lane to 11′ and convert the shoulder into a dedicated twp-way bike path of 10′. The added width will provide more safety to bicyclists.

Section D

Proposed Two-Way Bike Path at Emmorton Road Intersection

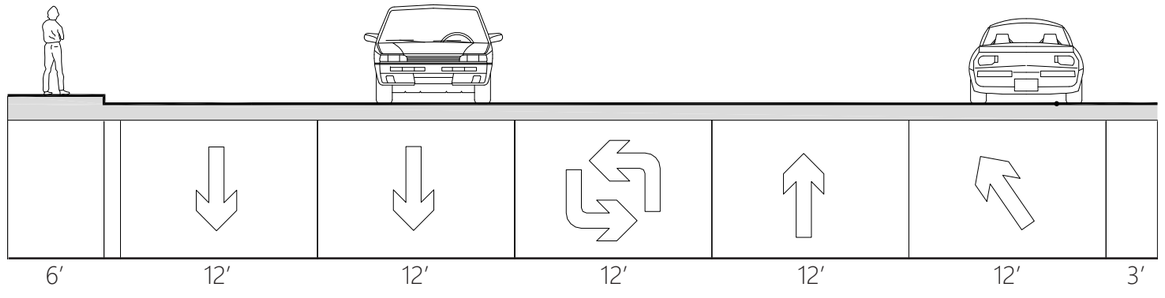
At this point, the facility will change, extending and converting the shoulder lanes into a two-way bike path. The shoulder lanes are currently four feet wide, the minimum for a bike lane. To ensure safety, they will increase to six feet wide by decreasing the stormwater management system on the right side to two feet wide and shifting the sidewalk on the left side two feet. The most cost-effective strategy would be to take four feet from the stormwater management system and repaint the lanes.



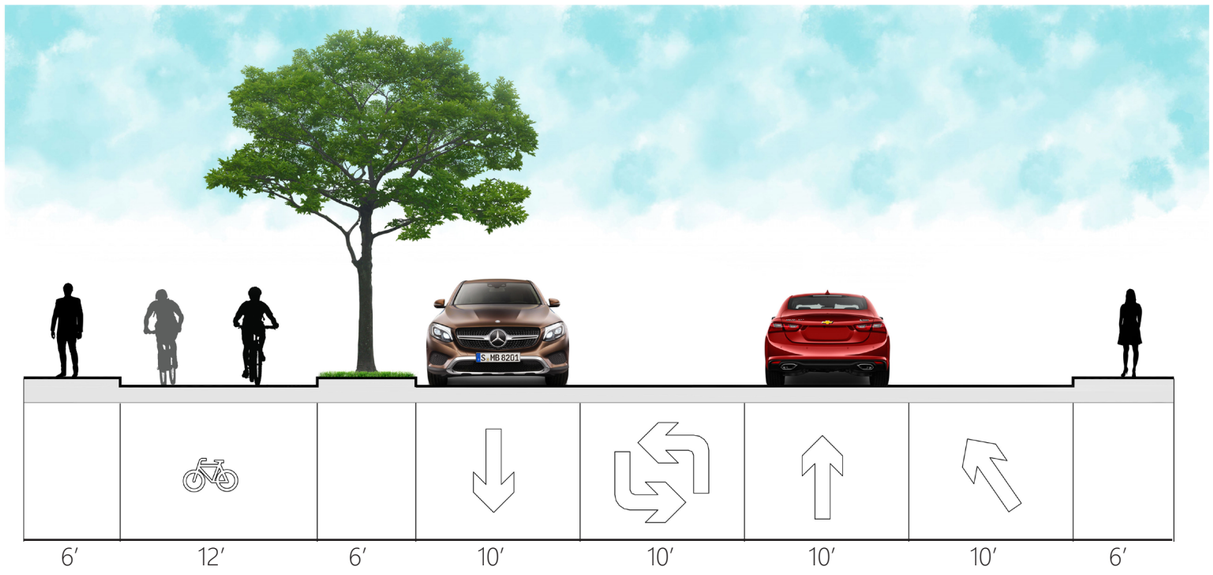


Section E

Existing



Proposed



Proposed Two-Way Bike Path on North Emmorton Road

Barrington Place, a residential street, intersects Emmorton Road and continues to the east as Patterson Mill Road, which leads to Patterson Mill High School. Given these uses, this intersection must become more accommodating to pedestrians and bicyclists.

In this scheme, the second southbound lane, Emmorton Road, will be removed and replaced by a 12-foot-wide, two-way bike path. A planted edge will buffer cyclists.

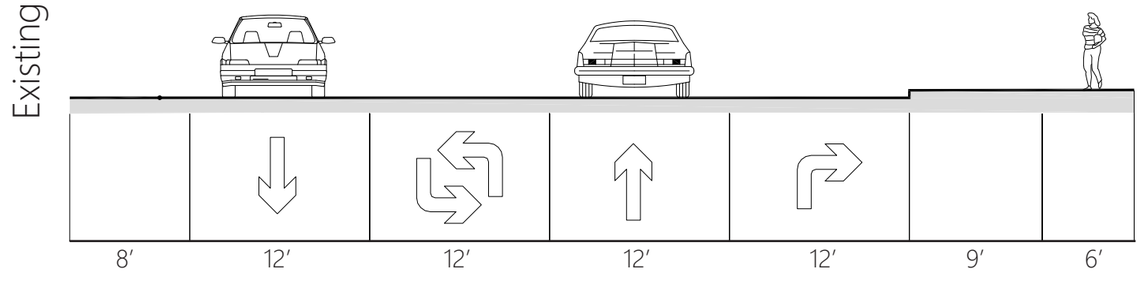
Jenny Dibra, Akira Shepherd, Cecilia Tran

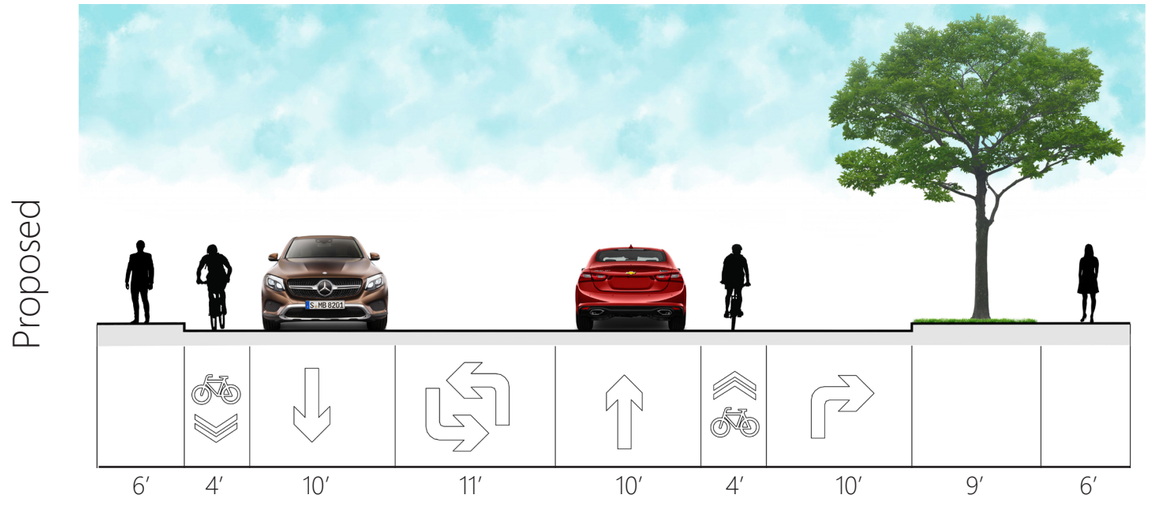
Section F

Proposed Two-Way Bike Path on South Emmorton Road

At Plumtree Road's intersection with Emmorton Road there are commercial facilities such as an EZ Storage, bank, gas station, and pharmacy. At this point, Emmorton Road is 72 feet wide and has four lanes of vehicular traffic.

The proposed scheme removes the center turning lane, unneeded at this point because there are no facilities on the west side of Emmorton Road. Only the east side has stores, and most traffic will be turning right into the center rather than left from the opposite lane. The lane will be replaced by two bike paths on either side of the road with a three-foot, six-inch buffer on one side. The scheme also adds a sidewalk on the west side of Emmorton Road.





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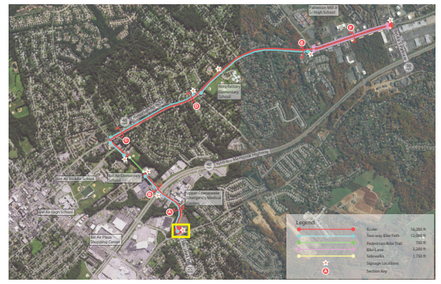
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Traffic Circle Signage at West Macphail Road



The beginning of the W. Macphail-Emmorton connection is at a traffic circle. The speed leading up to this traffic circle slows down from 25 mph to 15 mph. This speed can accommodate both cars and cyclists in a sharrow.

Appropriate signage at this location ensures that drivers will be looking out for cyclists and pedestrians.



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Proposed Trail Connection on West Macphail Road

West Macphail Road stops at a wooded area, turns north and continues as South Atwood Road. It picks up after about 700 feet, and after crossing South Main Street, becomes East Macphail Road. Currently, bikers need to go around this area by sharing South Atwood Road with cars.

Adding a path through the wooded area provides a safe shortcut to Homestead/Wakefield Elementary School on the continuation of West Macphail Road. This addition will be a natural trail for commuting or recreation.





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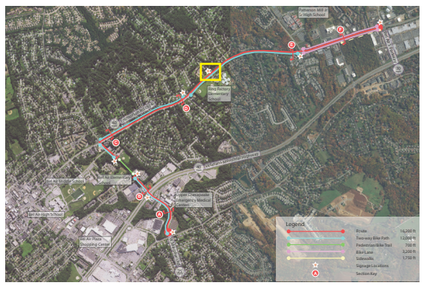
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Ring Factory Elementary School Crossing



Emmorton Road provides access to five schools, making it a primary route for students. The proposed two-way bike path on Emmorton Road provides a safe cycling route.

This proposed road crossing at Ring Factory Elementary School is dedicated to safe bike commutes for children.



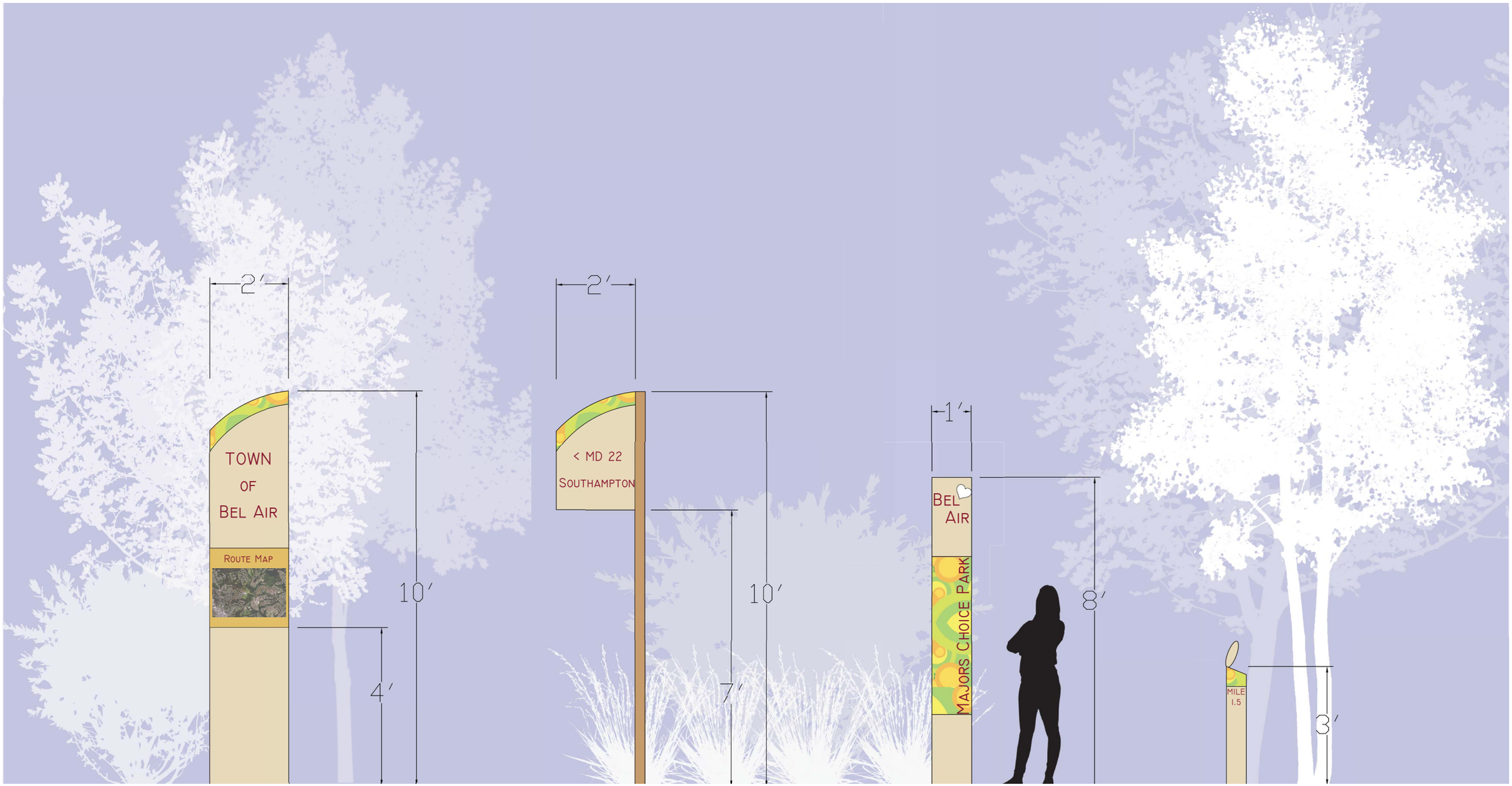
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Wayfinding Alternatives

Wayfinding Signage Types



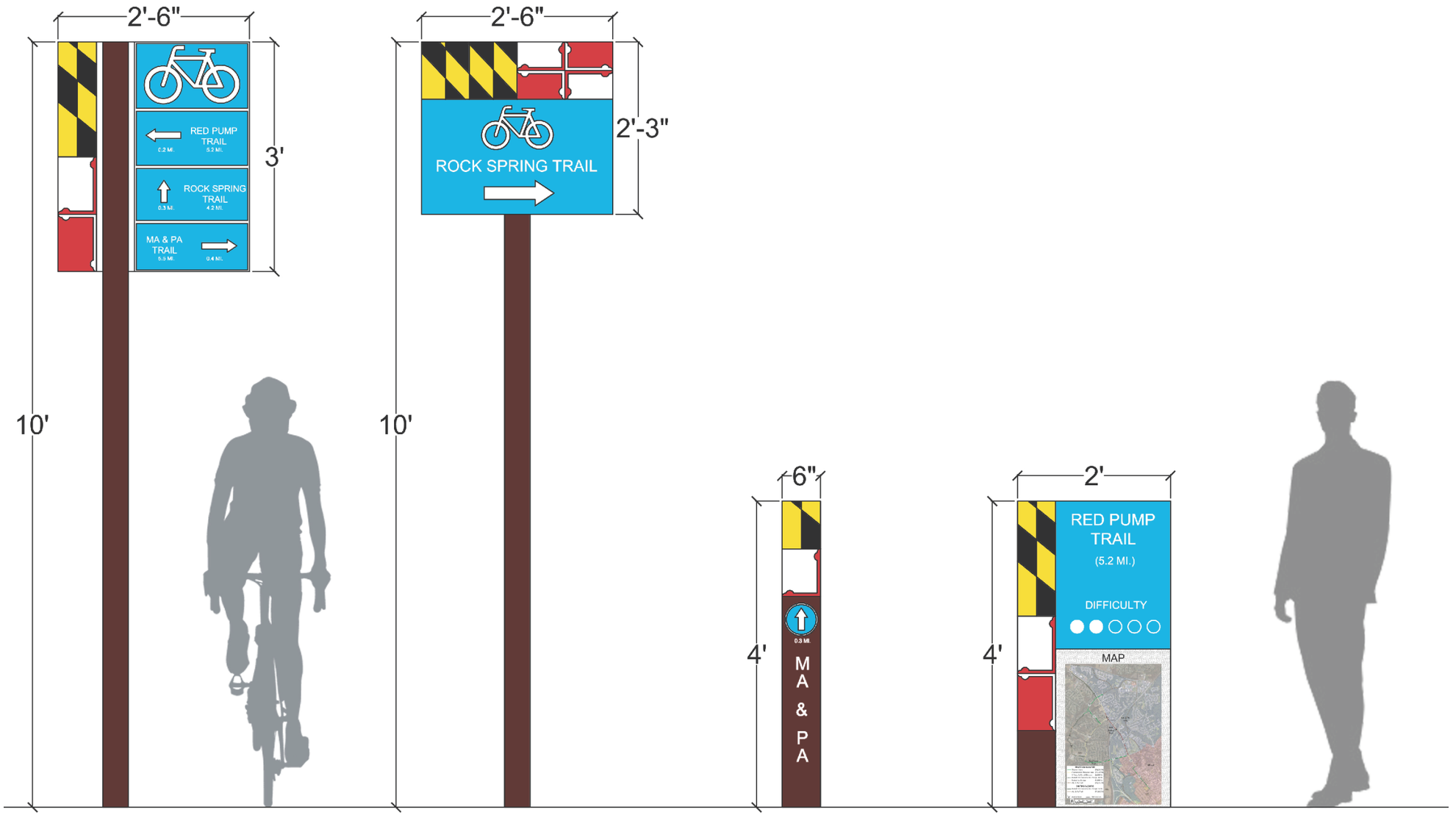
Trailhead | Community Guide | Destination | Mile Marker

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Sarah Whiteley

Wayfinding Signage Types

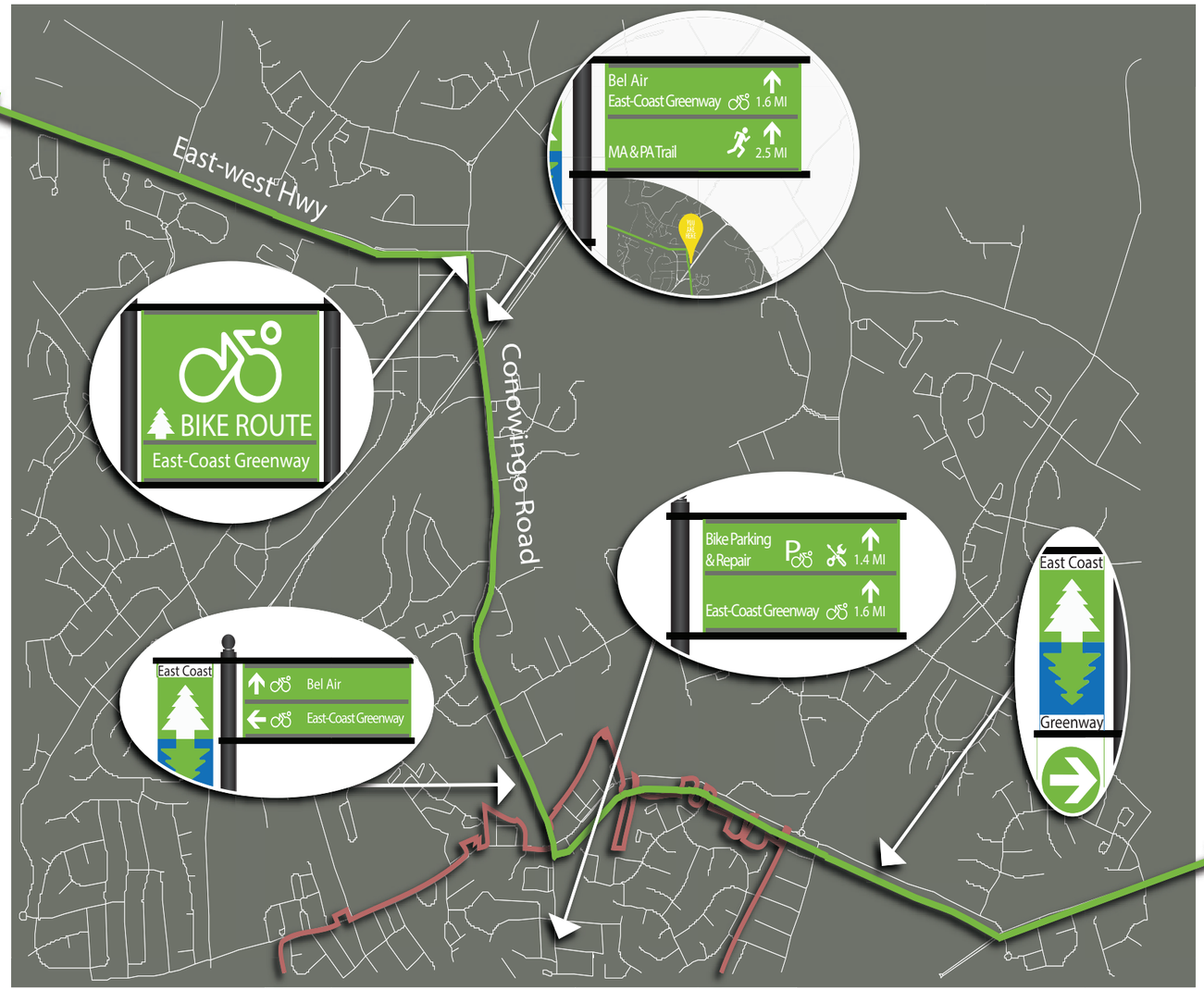


Decision Sign | Decision Sign | Confirmation Sign | Trailhead Sign

Wayfinding Signage Types & Locations



Trail-head Map



Proposed Sign Location



Bike Lane
Surface Graphics

Town of Bel Air

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NOT TO SCALE

Wayfinding Signage Types



Turn Sign | Turn Sign | Confirmation Sign | Directional Sign | Trail-head Sign

Priority Segments in Bel Air

Segment 1: Rock Spring Road
Segment 2: Conowingo Road to North Hickory Avenue
Segment 3: North Shamrock Road to Majors Choice Drive
Segment 4: West Macphail Road & Emmorton Road



Bicycle Lane



Shared-Use Path



Sharrow



Destination Trail Marker



Trailhead Marker



Parking Eliminated to Accommodate Facility

Key Map: Williams Street & Rock Spring Road



Williams Street



Williams Street



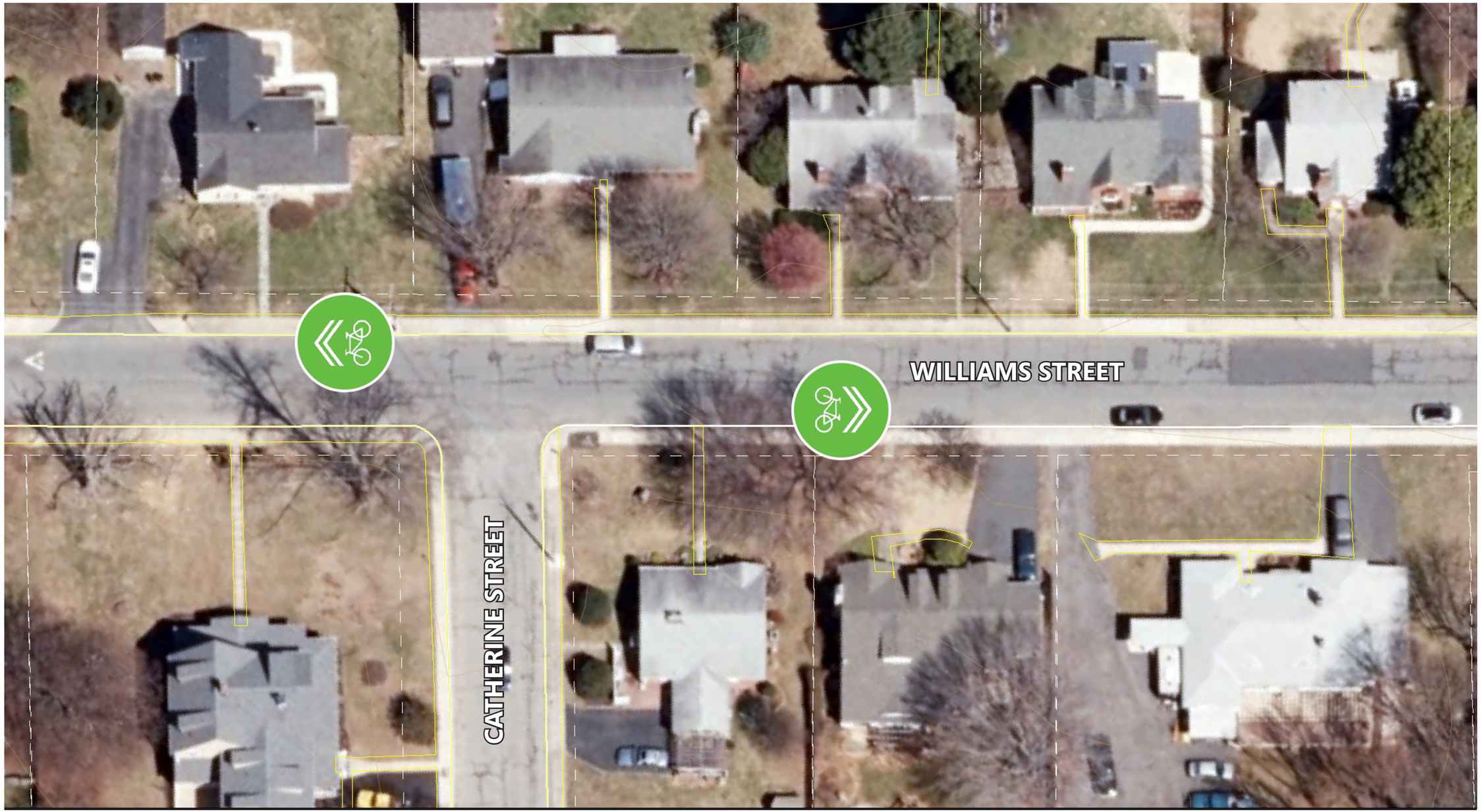
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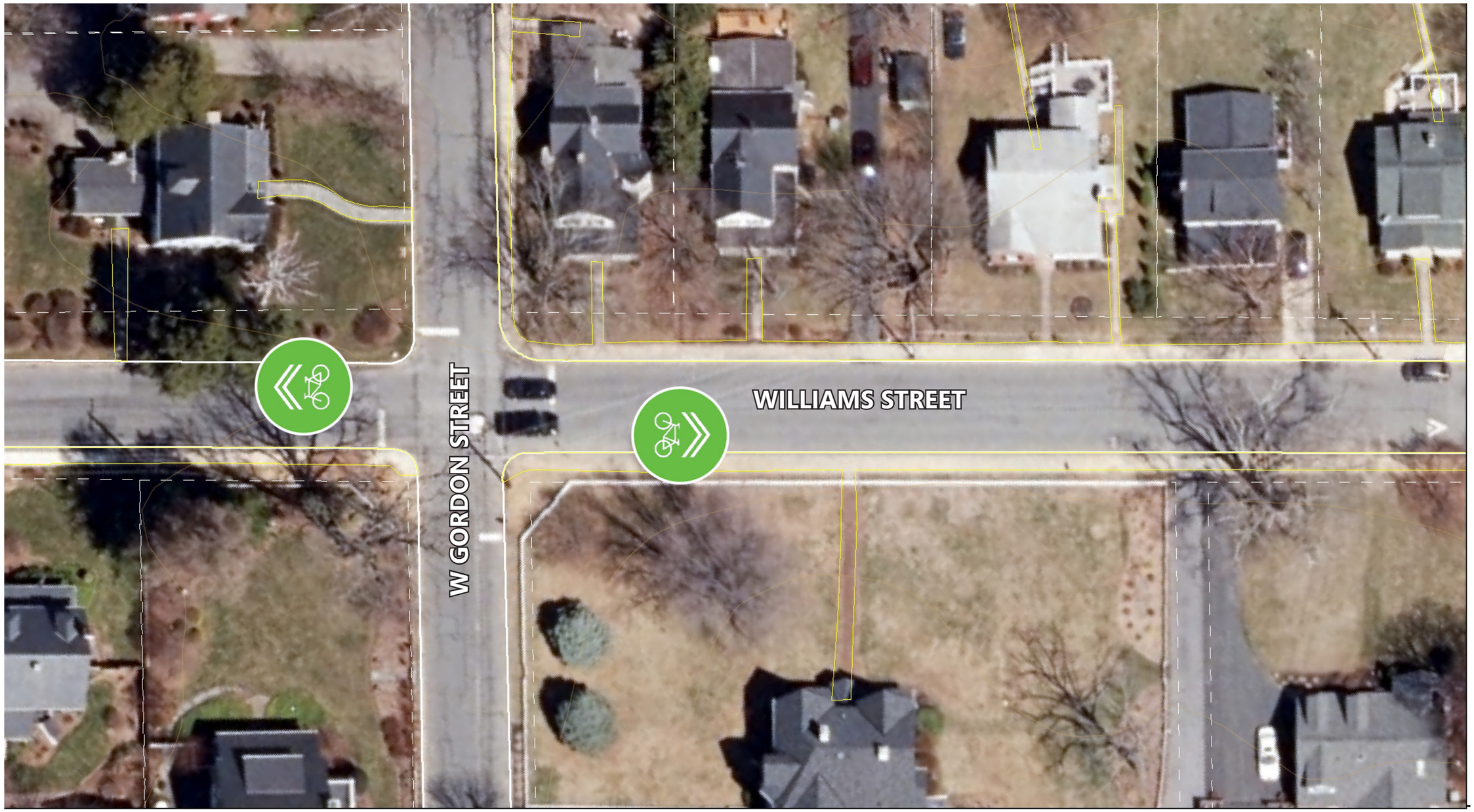
Paul Mayer, James Schwartz, Marc Wolfe

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Williams Street



Williams Street



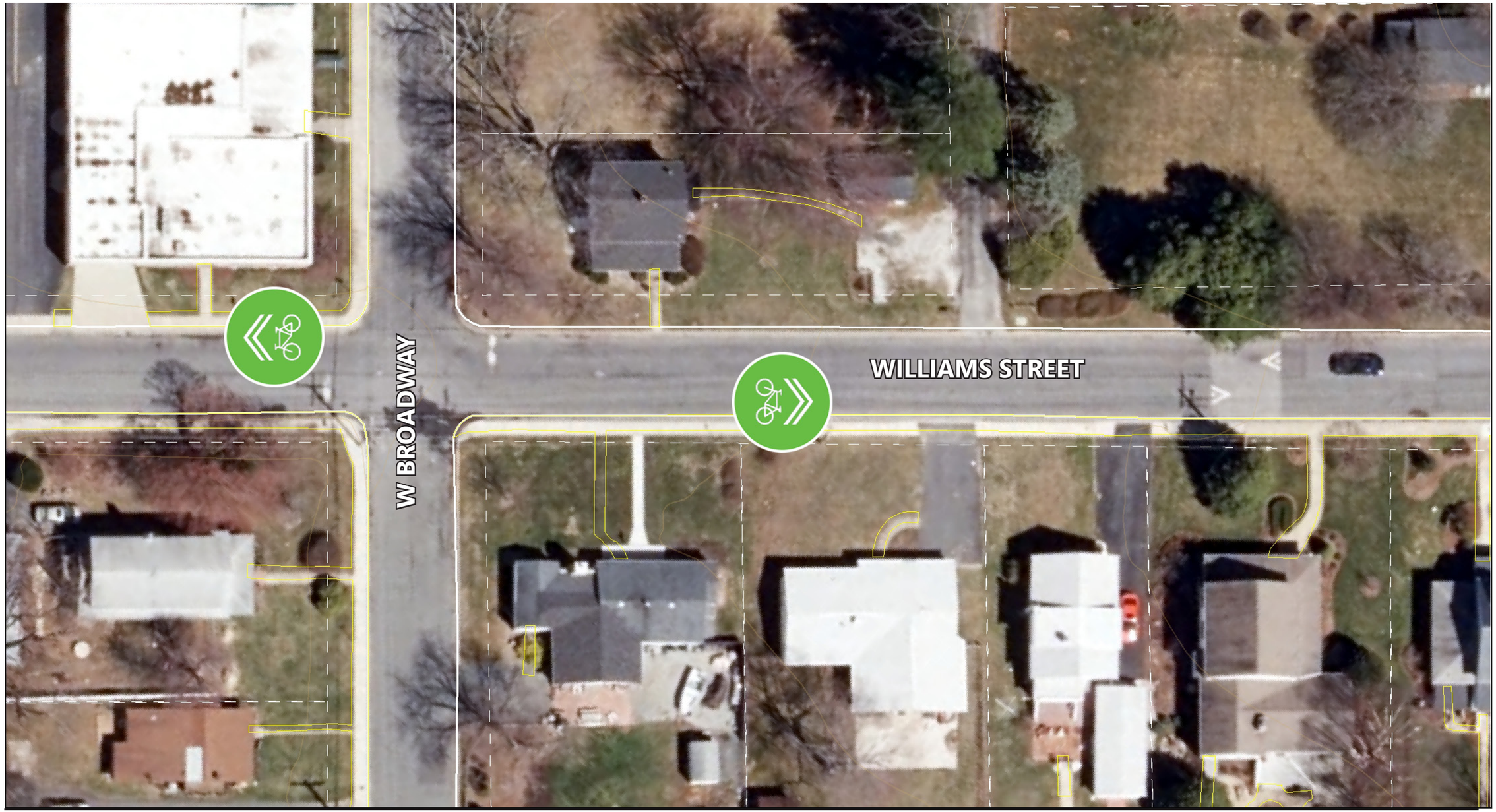
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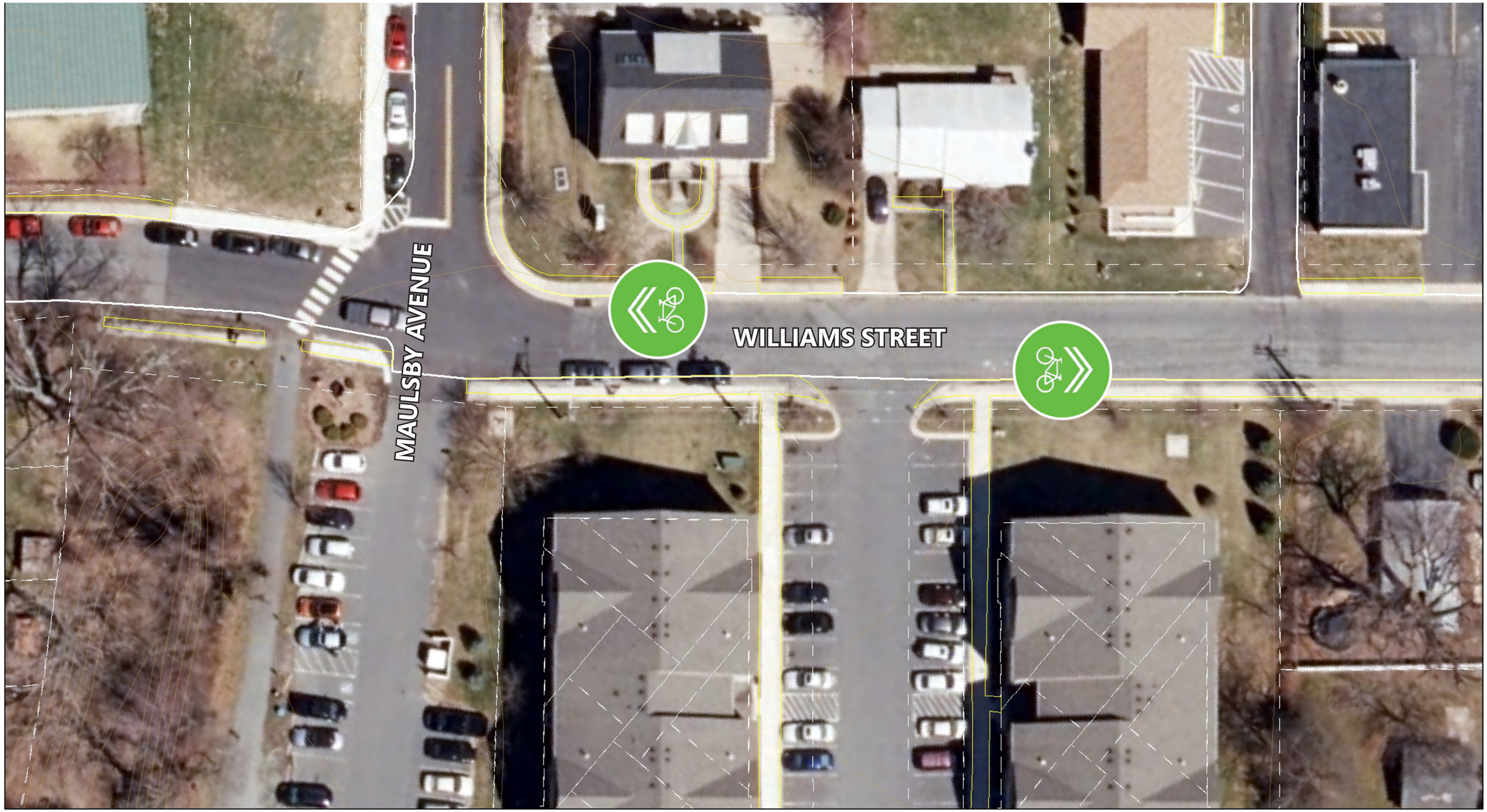
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Williams Street



Williams Street



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Mast Street



Dallam Avenue



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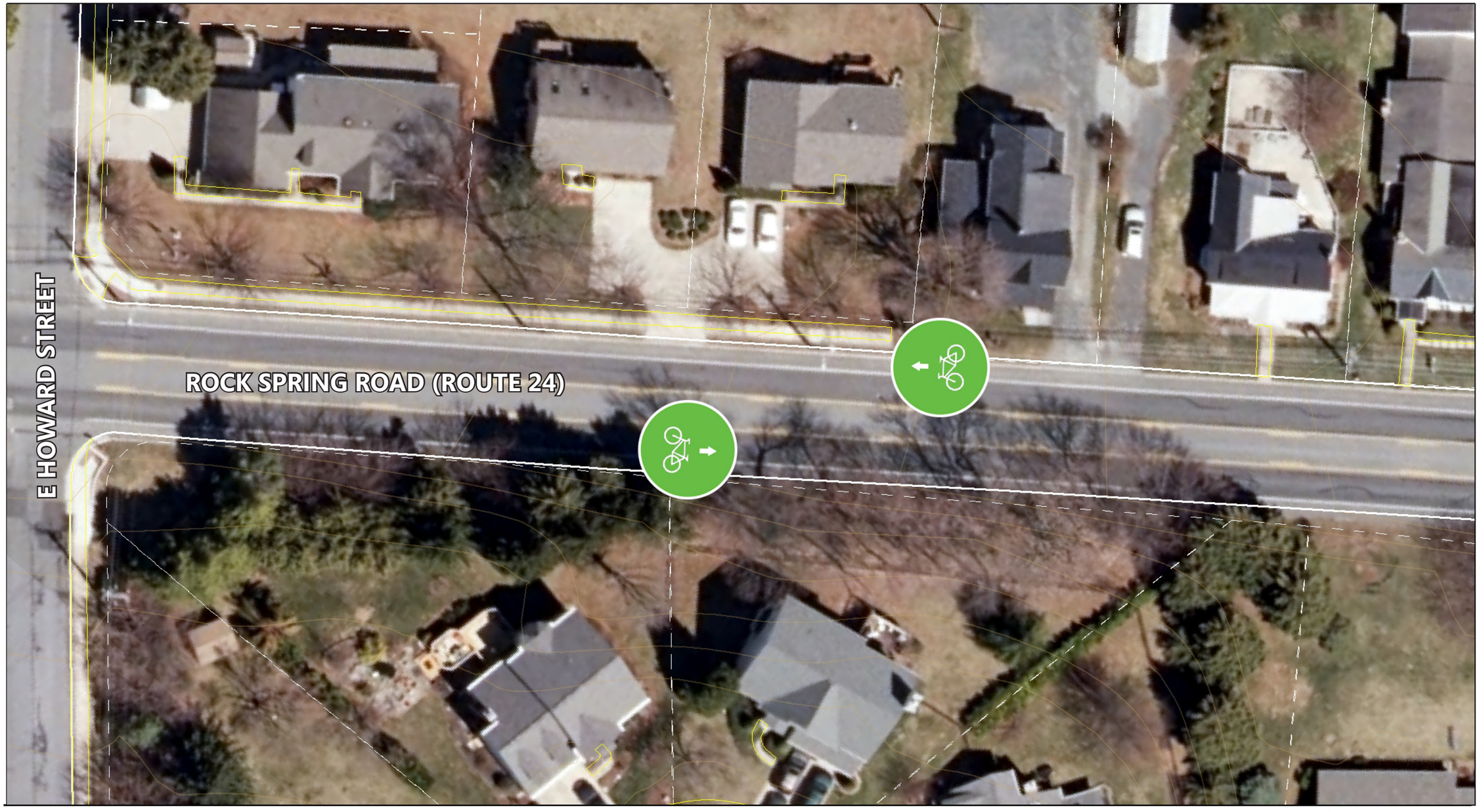
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Rock Spring Road



Rock Spring Road



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Rock Spring Road



Rock Spring Road



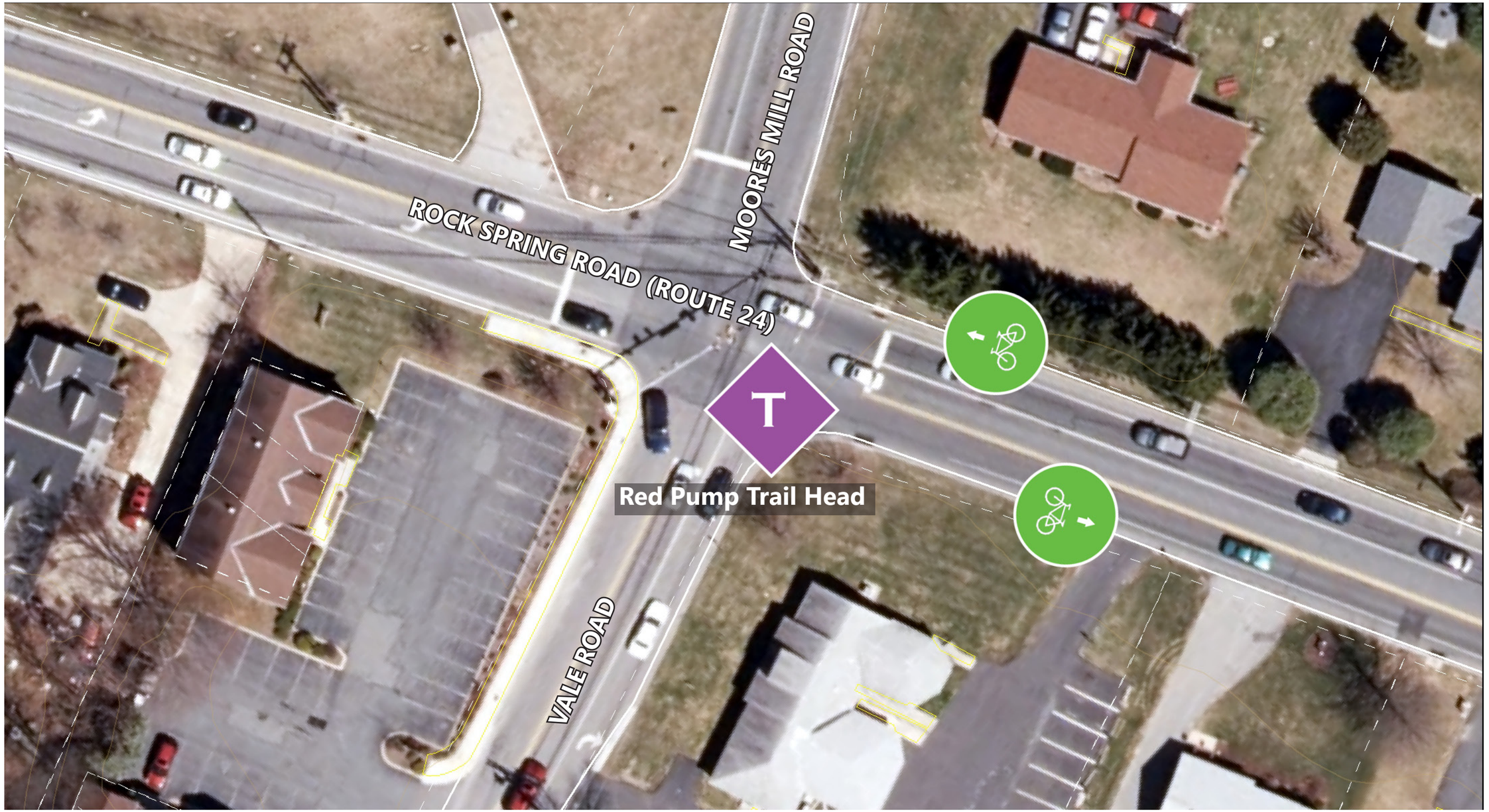
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Rock Spring Road



Key Map: Conowingo Road to North Hickory Avenue



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Conowingo Road & North Hickory Avenue



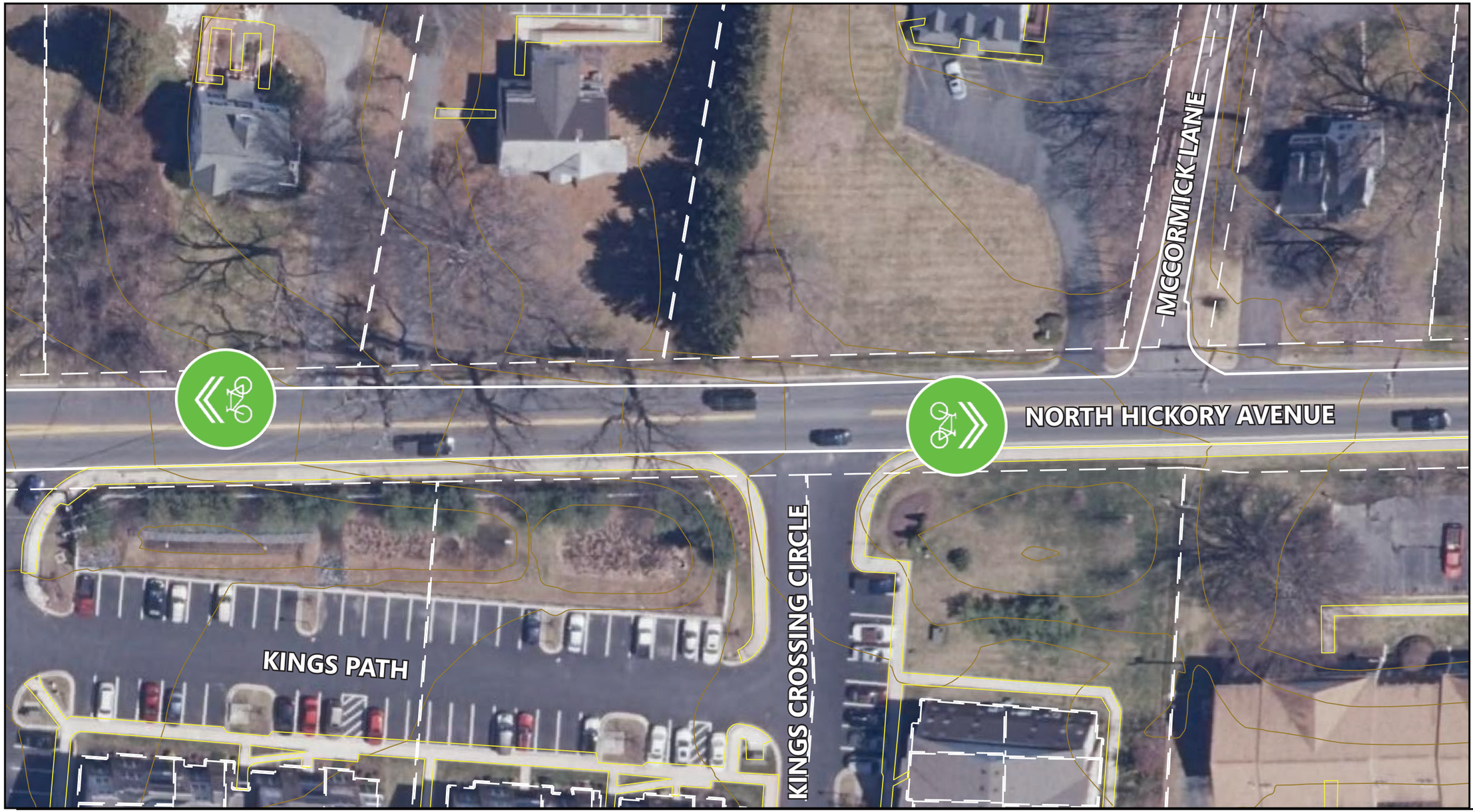
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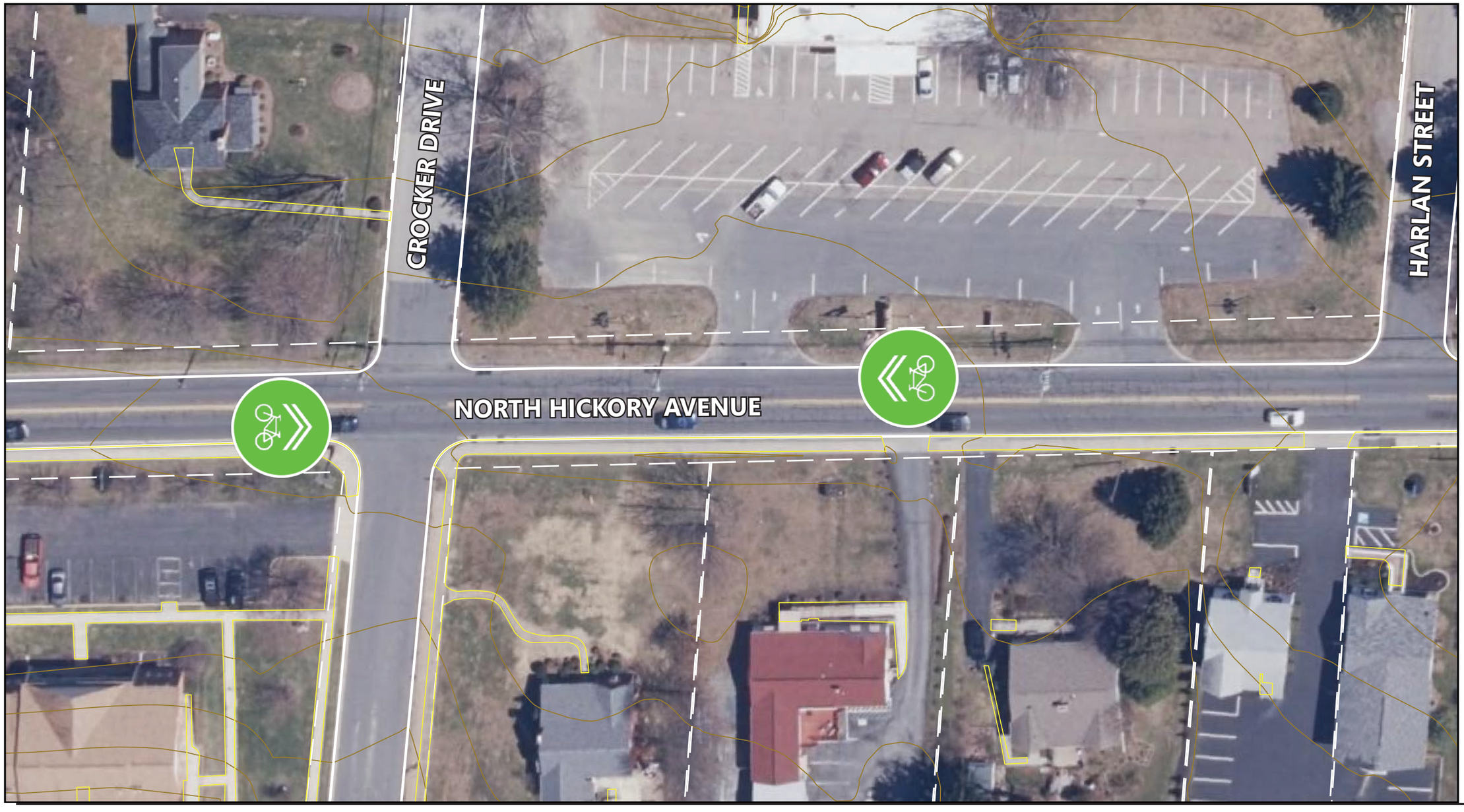
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North Hickory Avenue



North Hickory Avenue



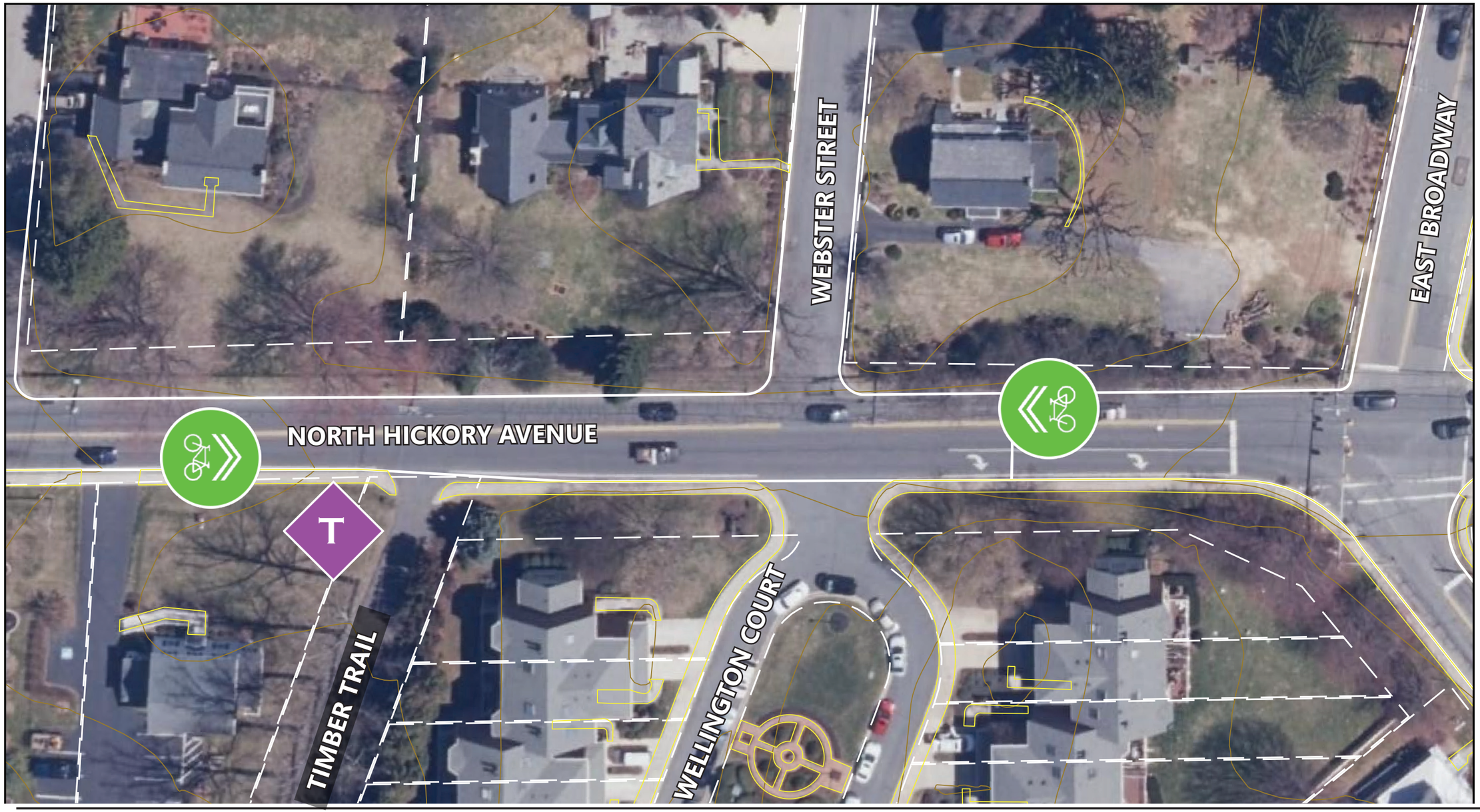
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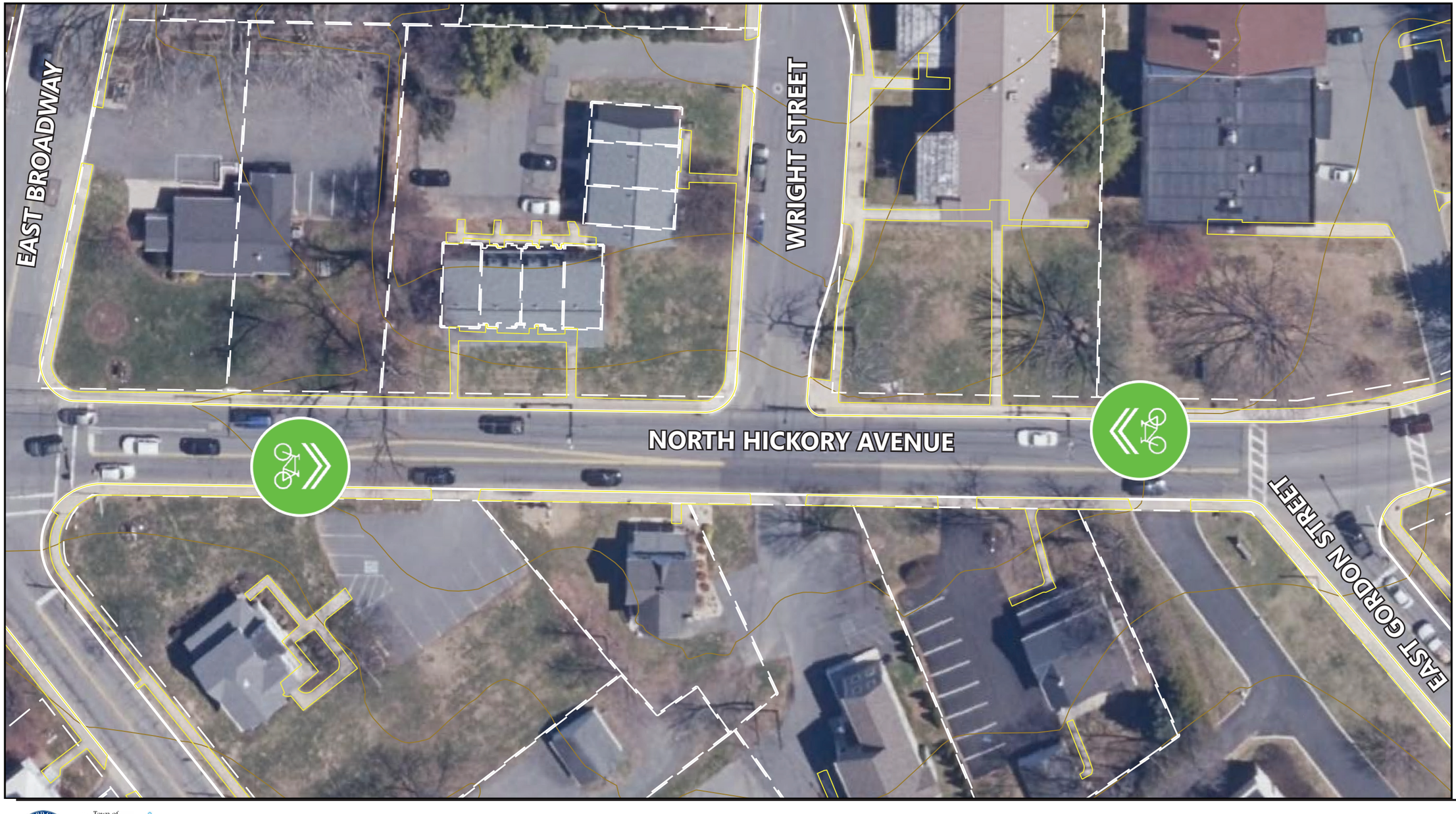
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North Hickory Avenue



North Hickory Avenue



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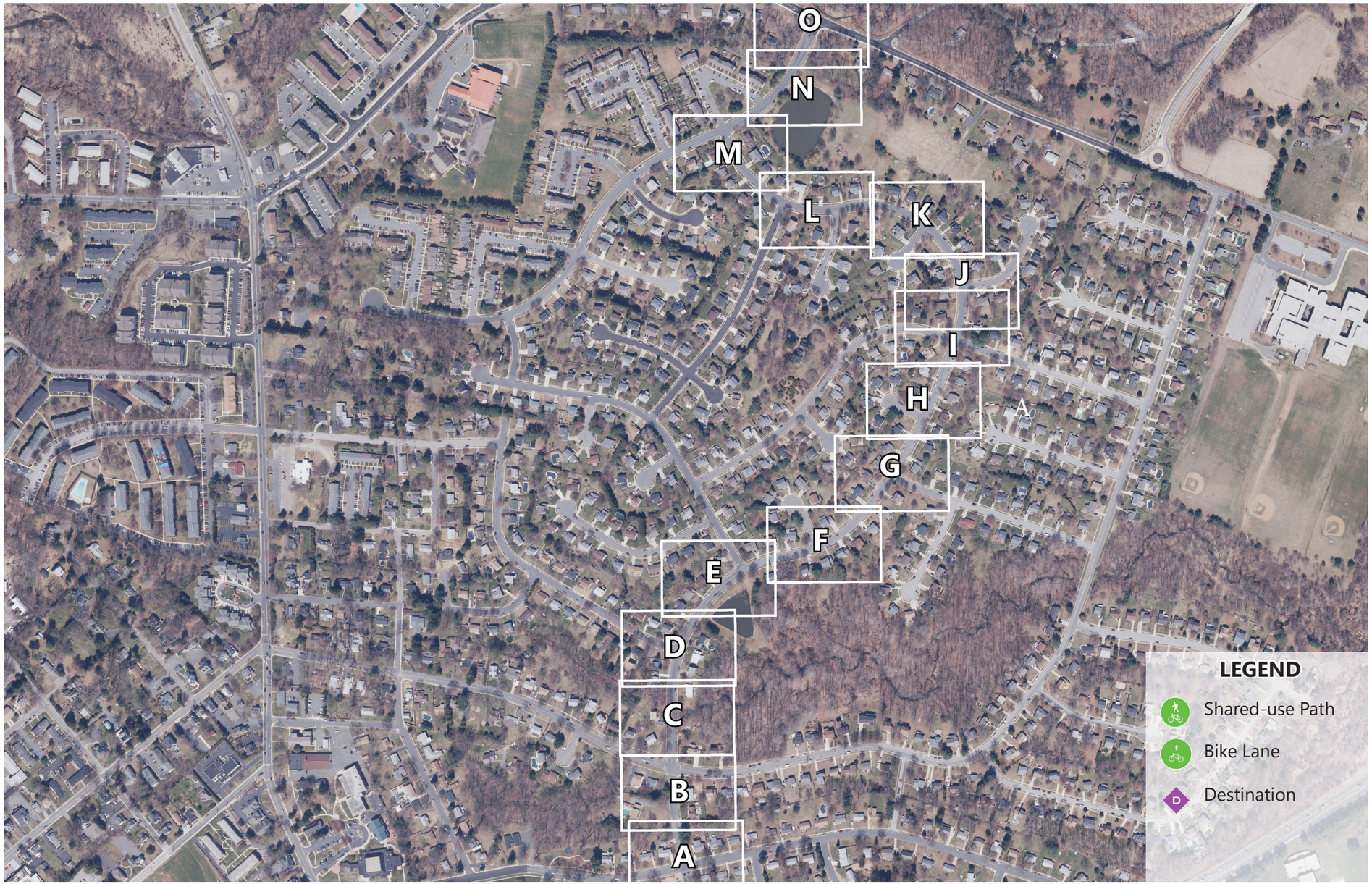
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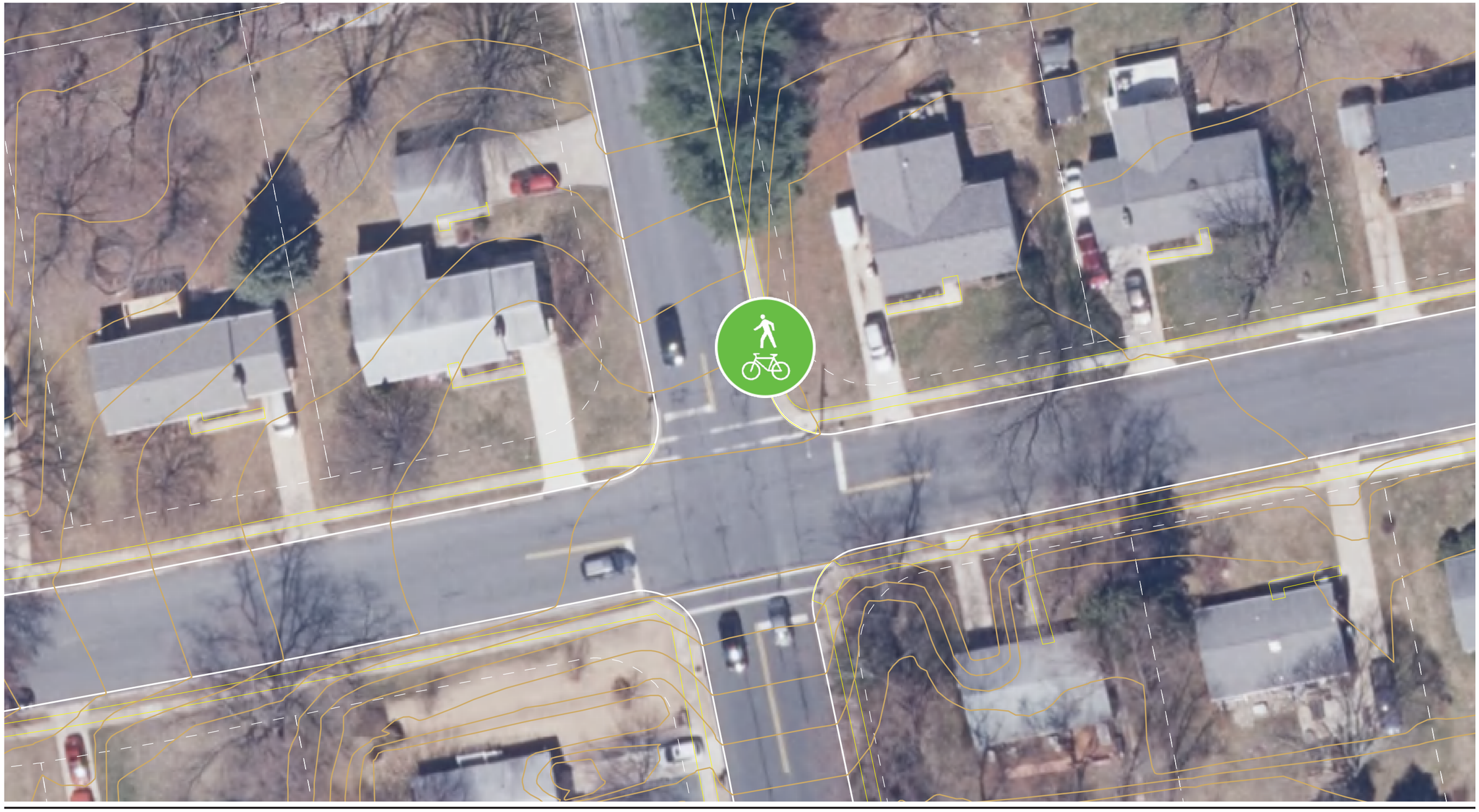
North Hickory Avenue



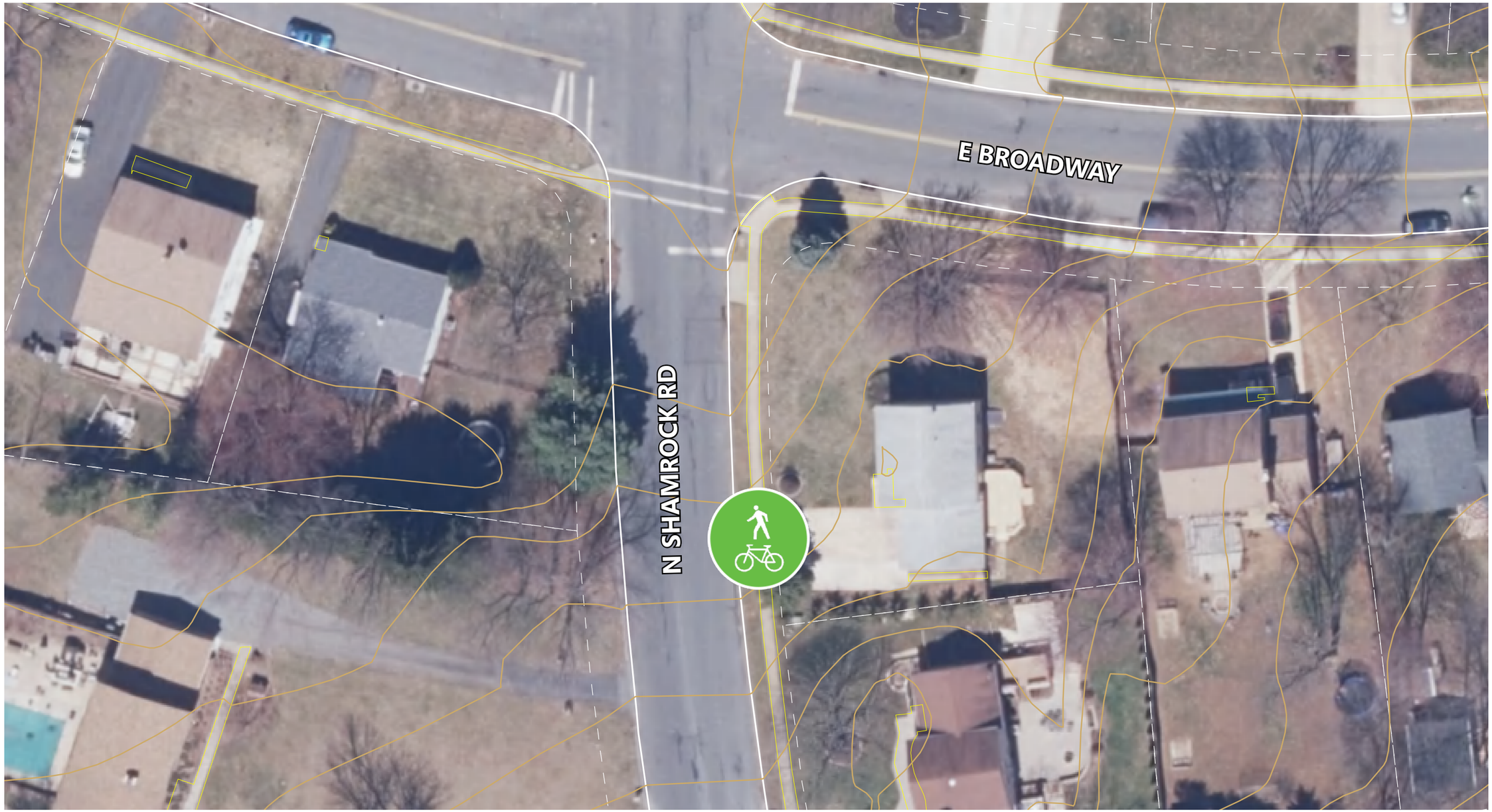
Key Map: North Shamrock Road to Majors Choice Drive



North Shamrock Road and Lee Way



North Shamrock Road and East Broadway



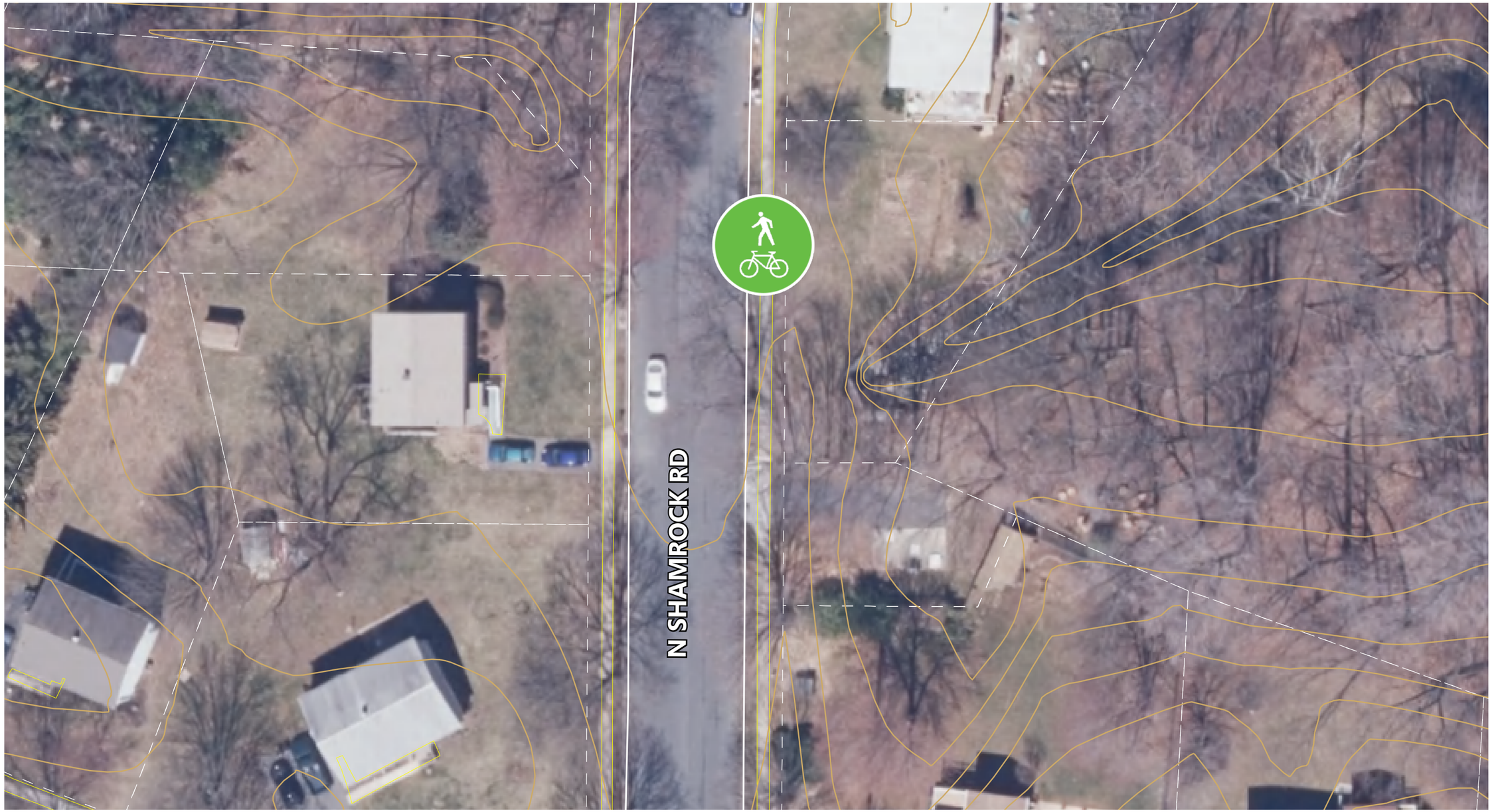
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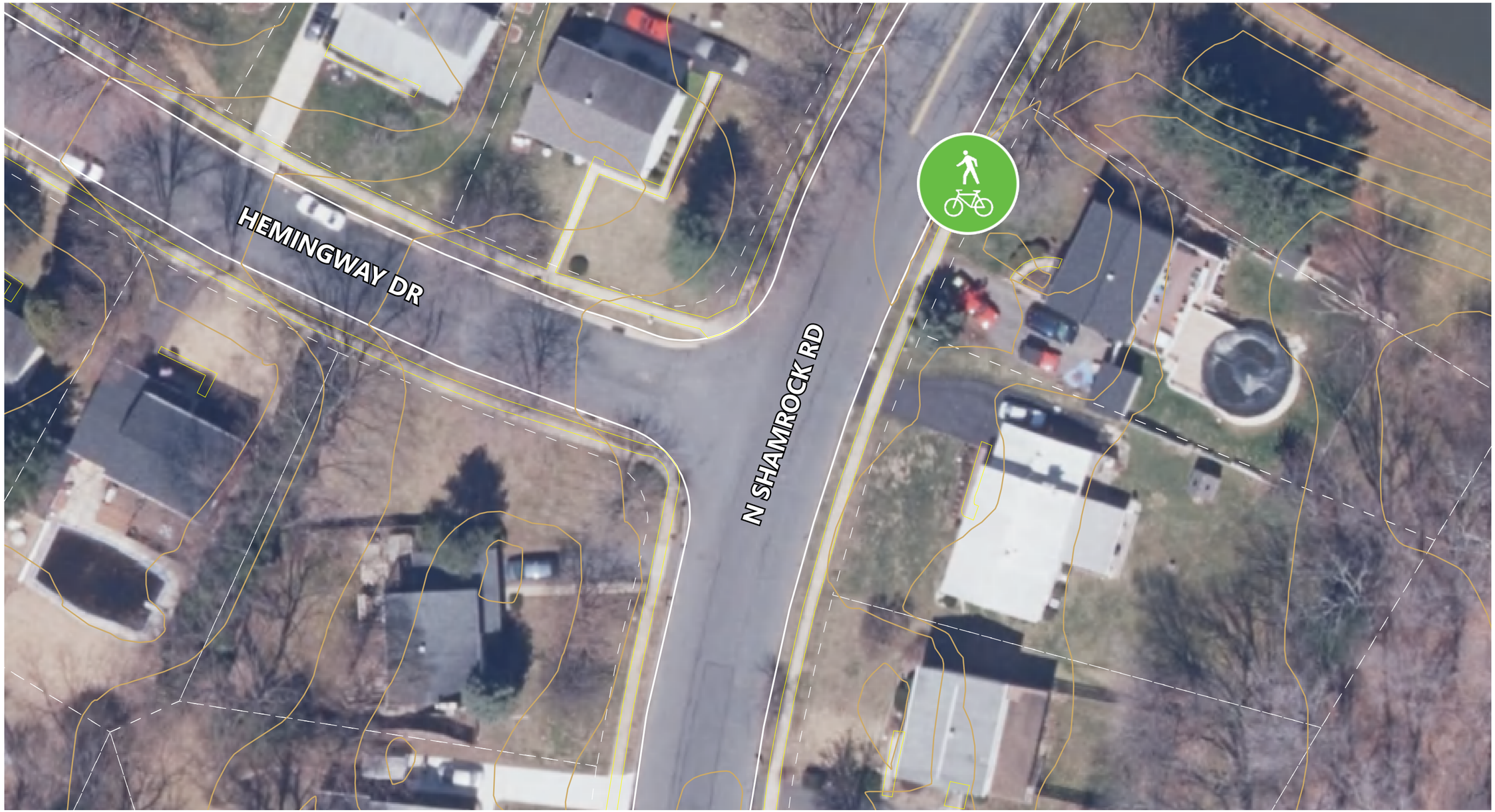
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North Shamrock Road



North Shamrock Road and Hemingway Drive



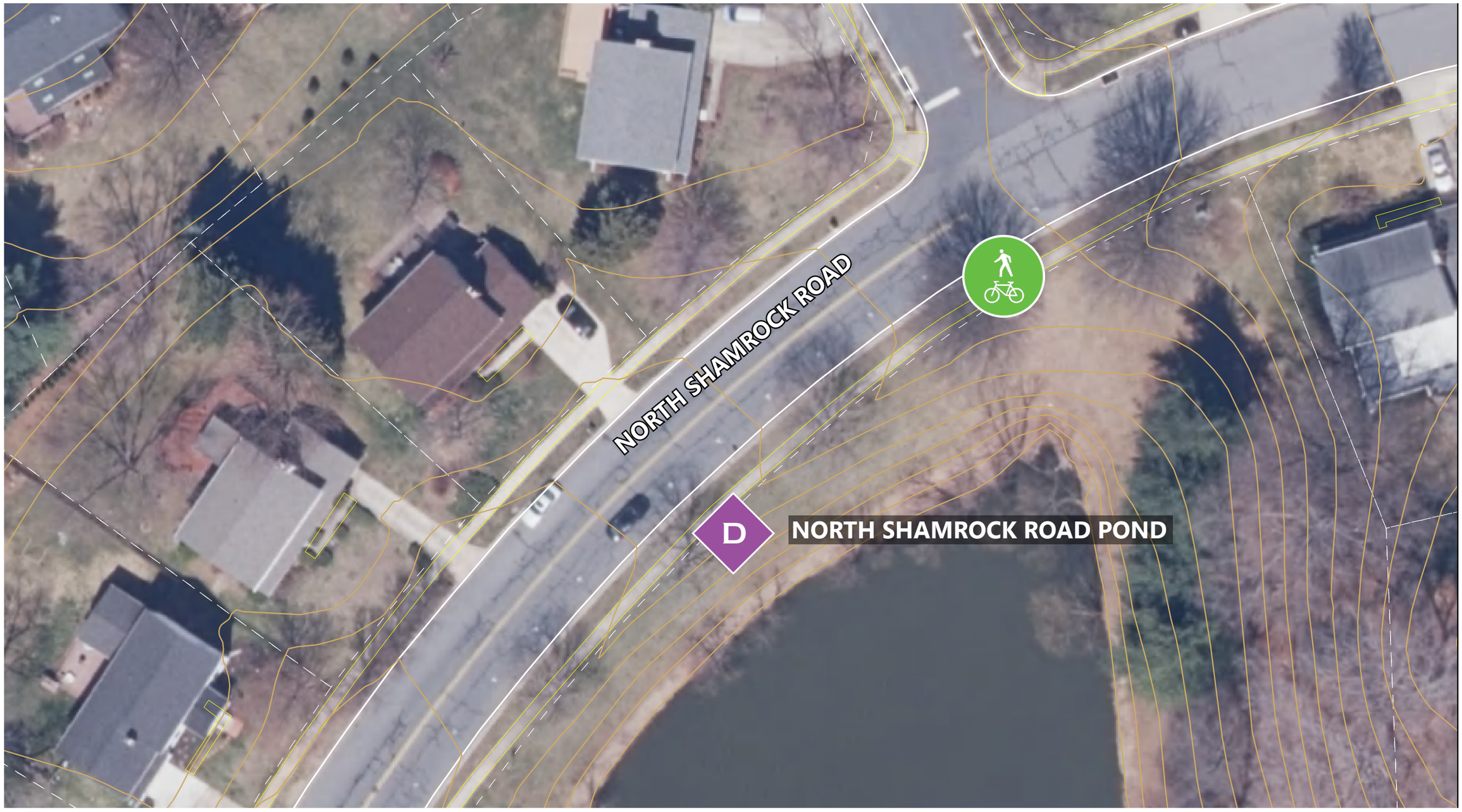
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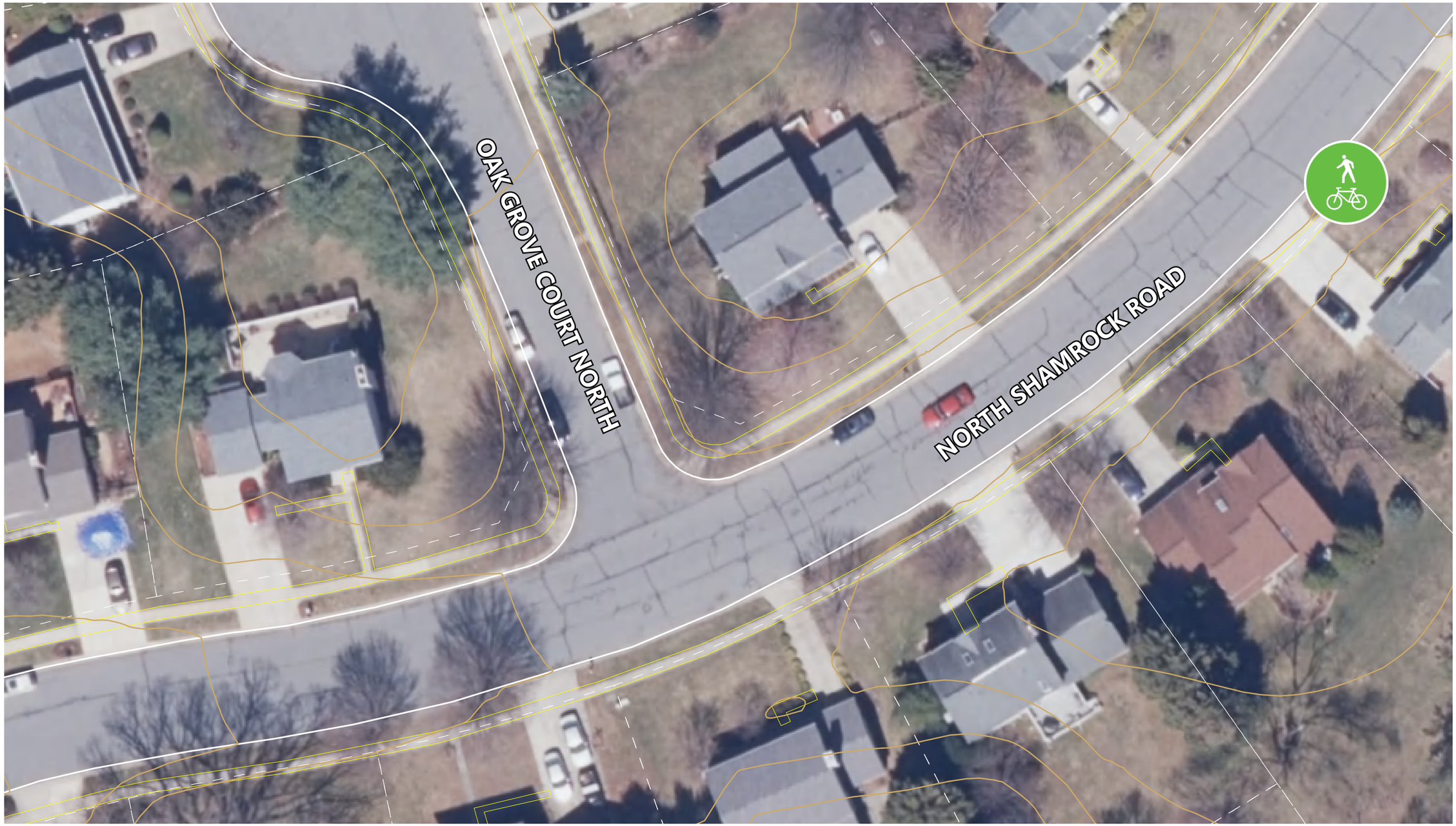
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North Shamrock Road



North Shamrock Road and Oak Grove Court North



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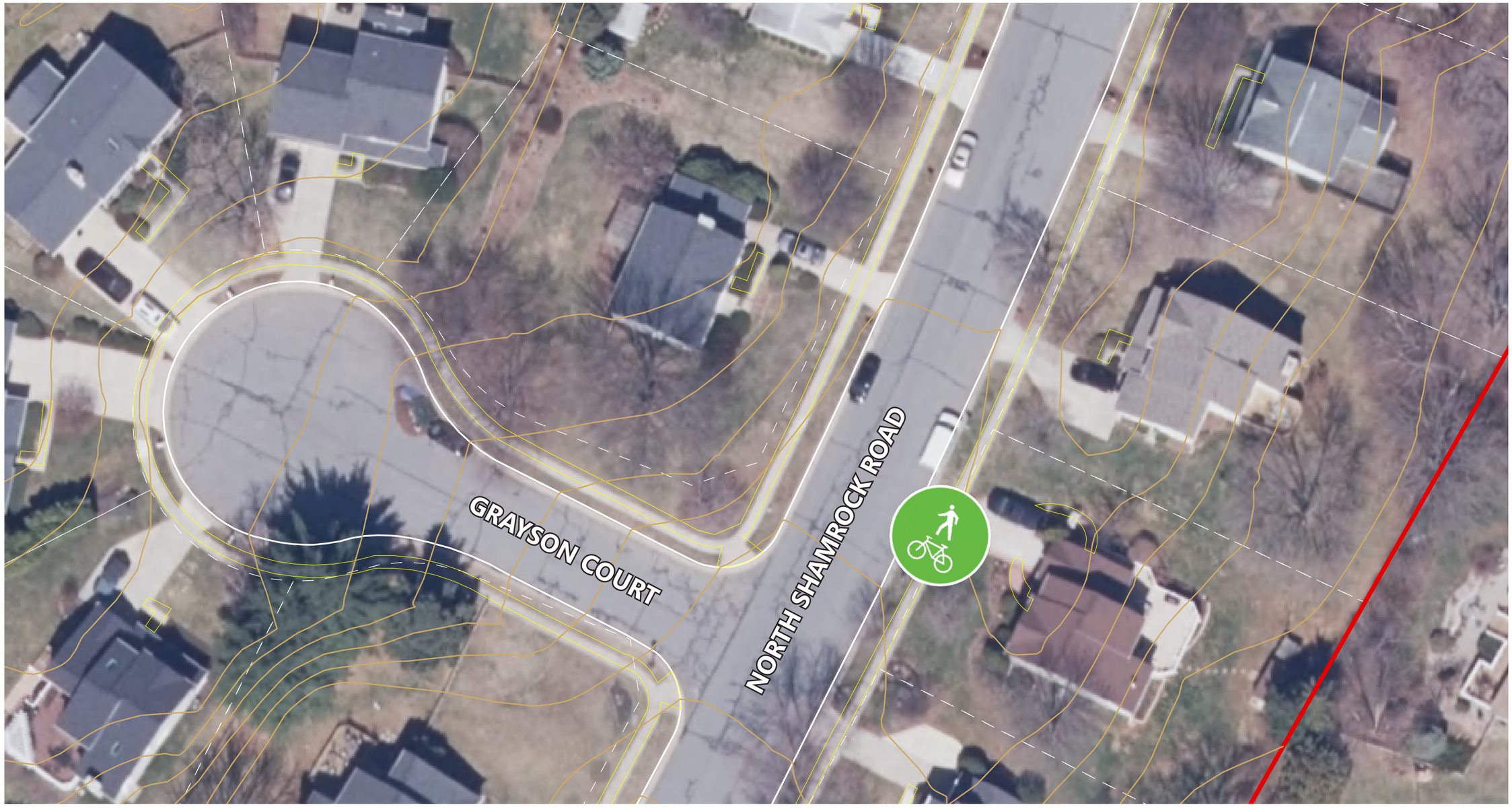
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North Shamrock Road and Malkus Way



Grayson Court and North Shamrock Road



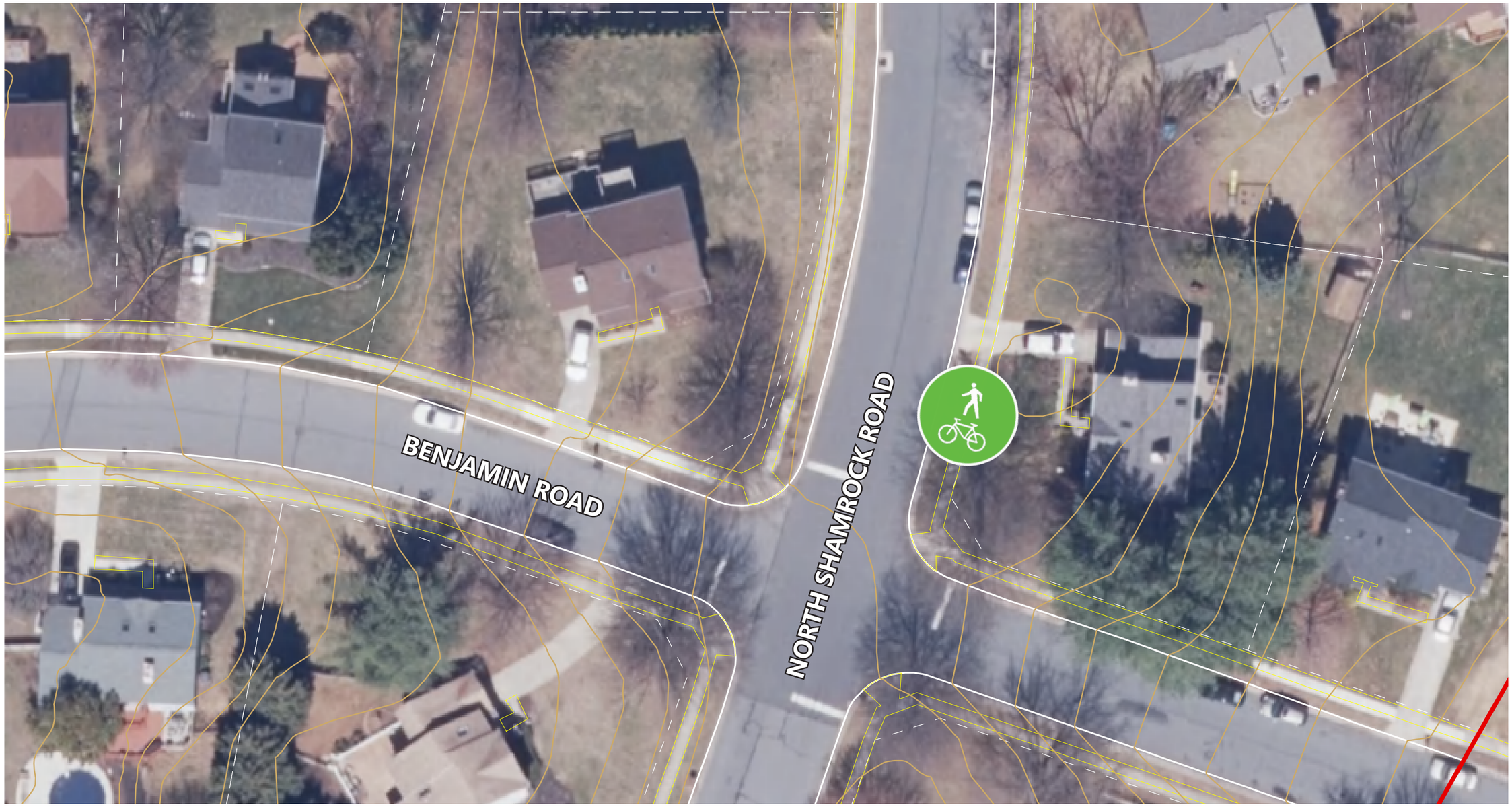
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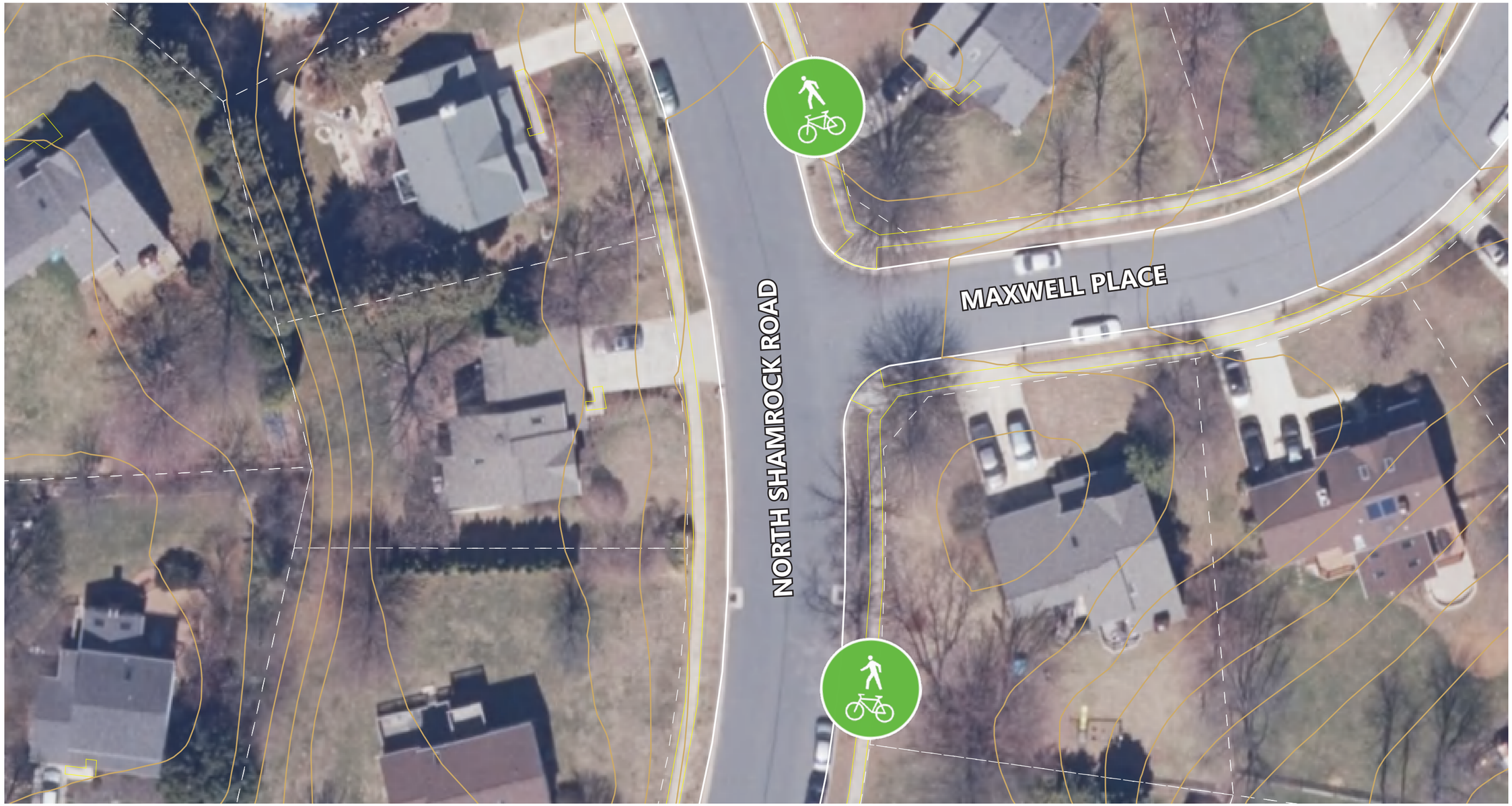
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Benjamin Road and North Shamrock Road



Maxwell Place and North Shamrock Road



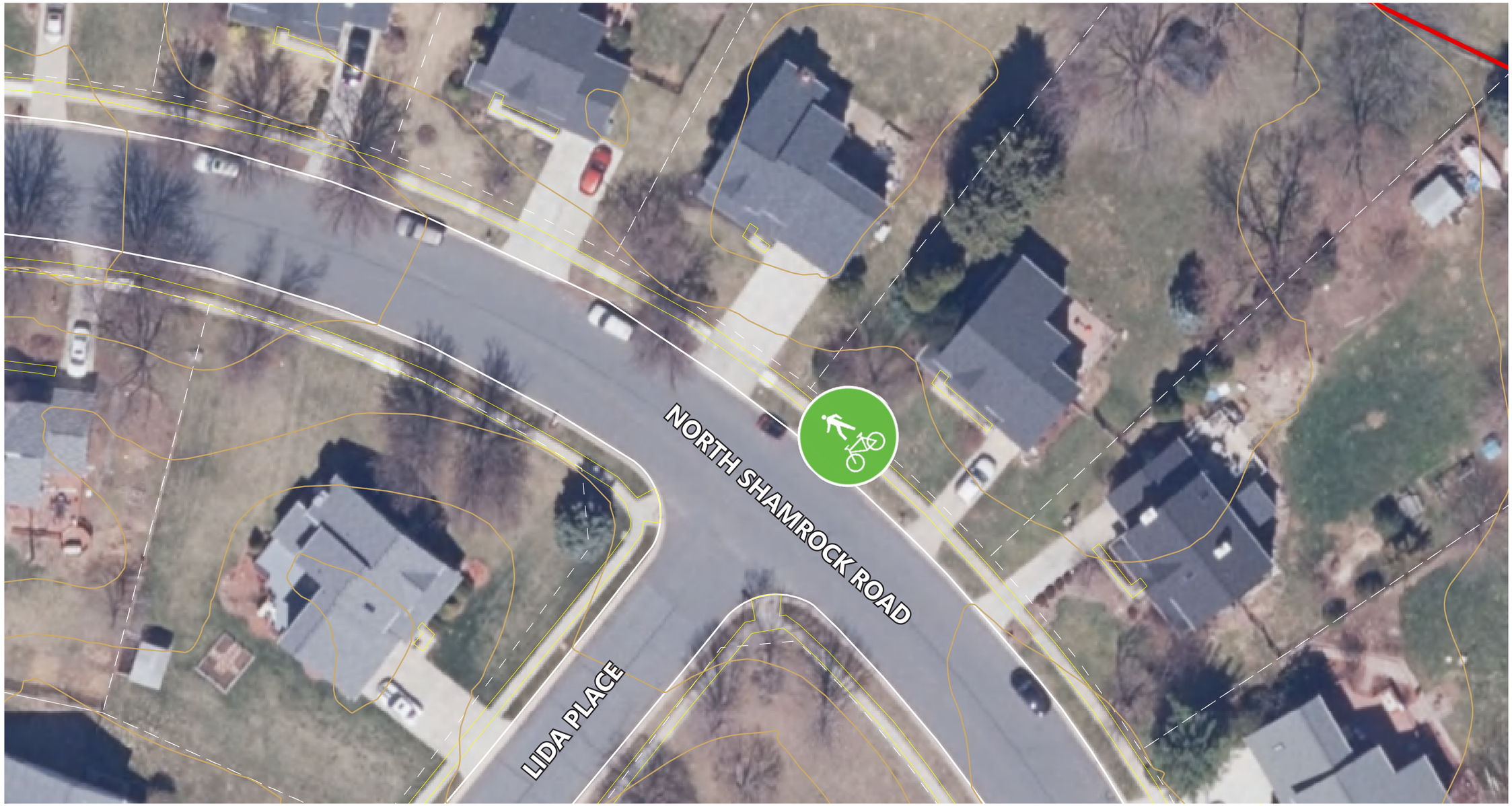
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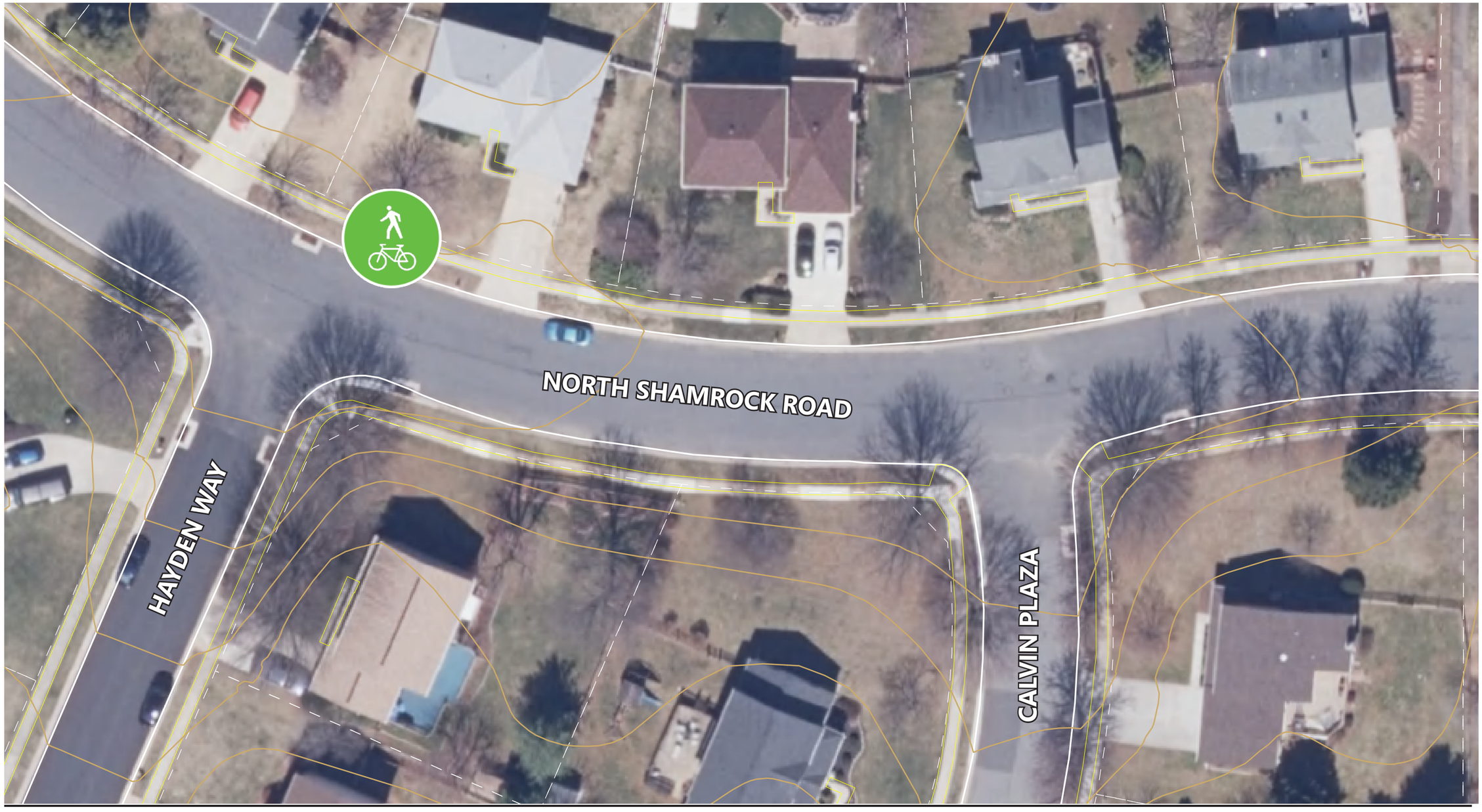
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Lida Place and North Shamrock Road



North Shamrock Road



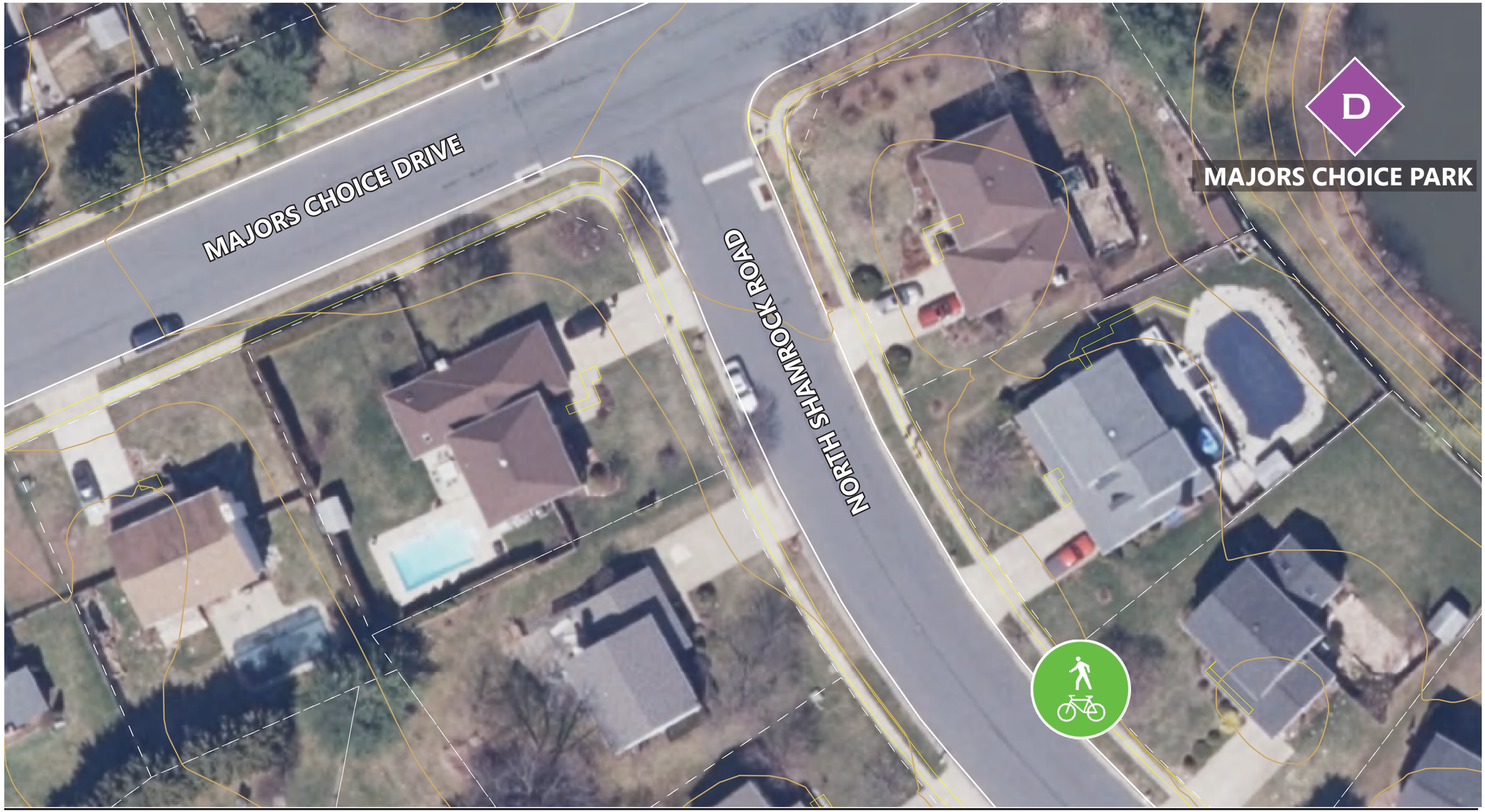
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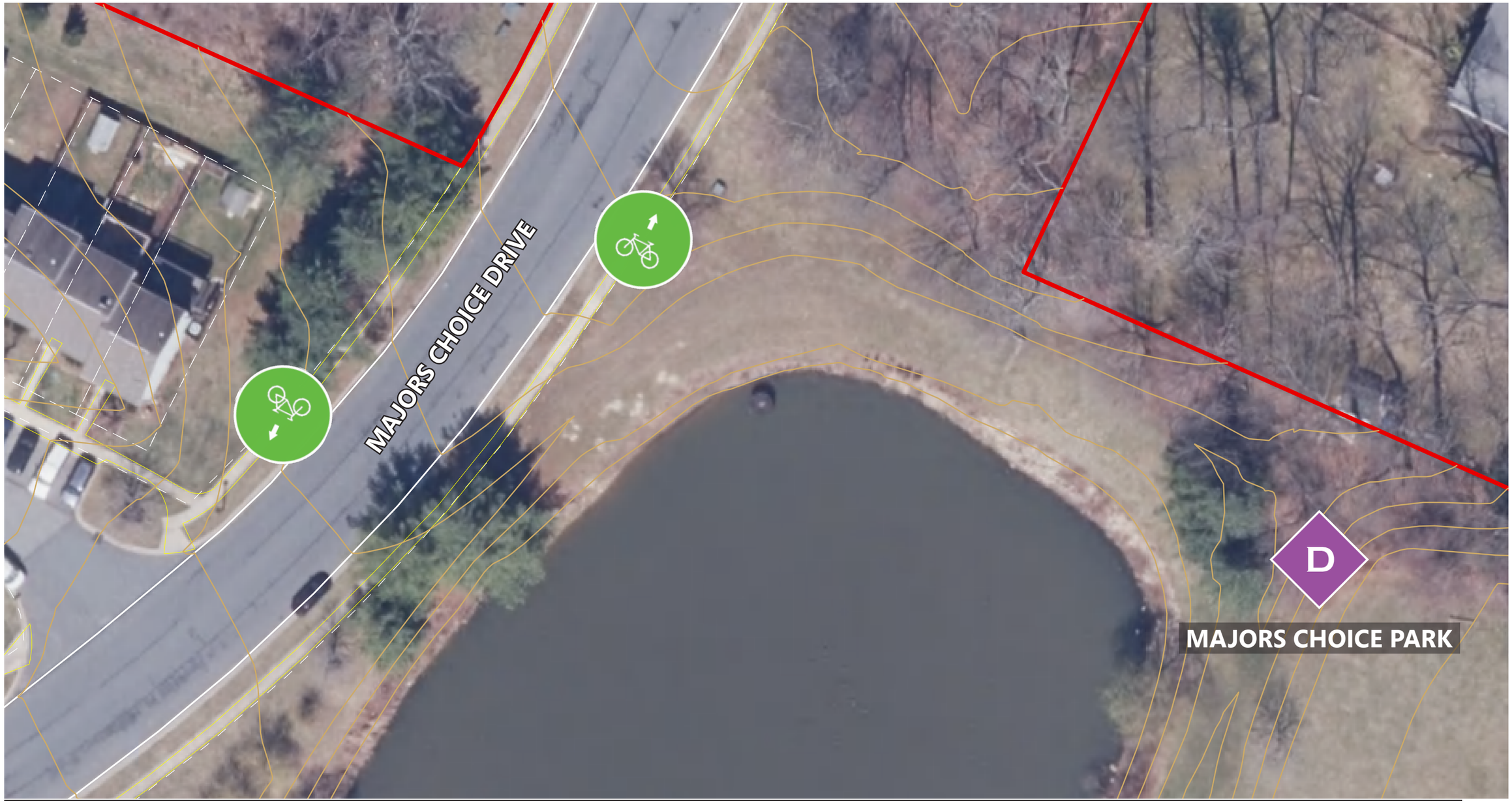
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North Shamrock Road and Majors Choice Drive



Majors Choice Drive



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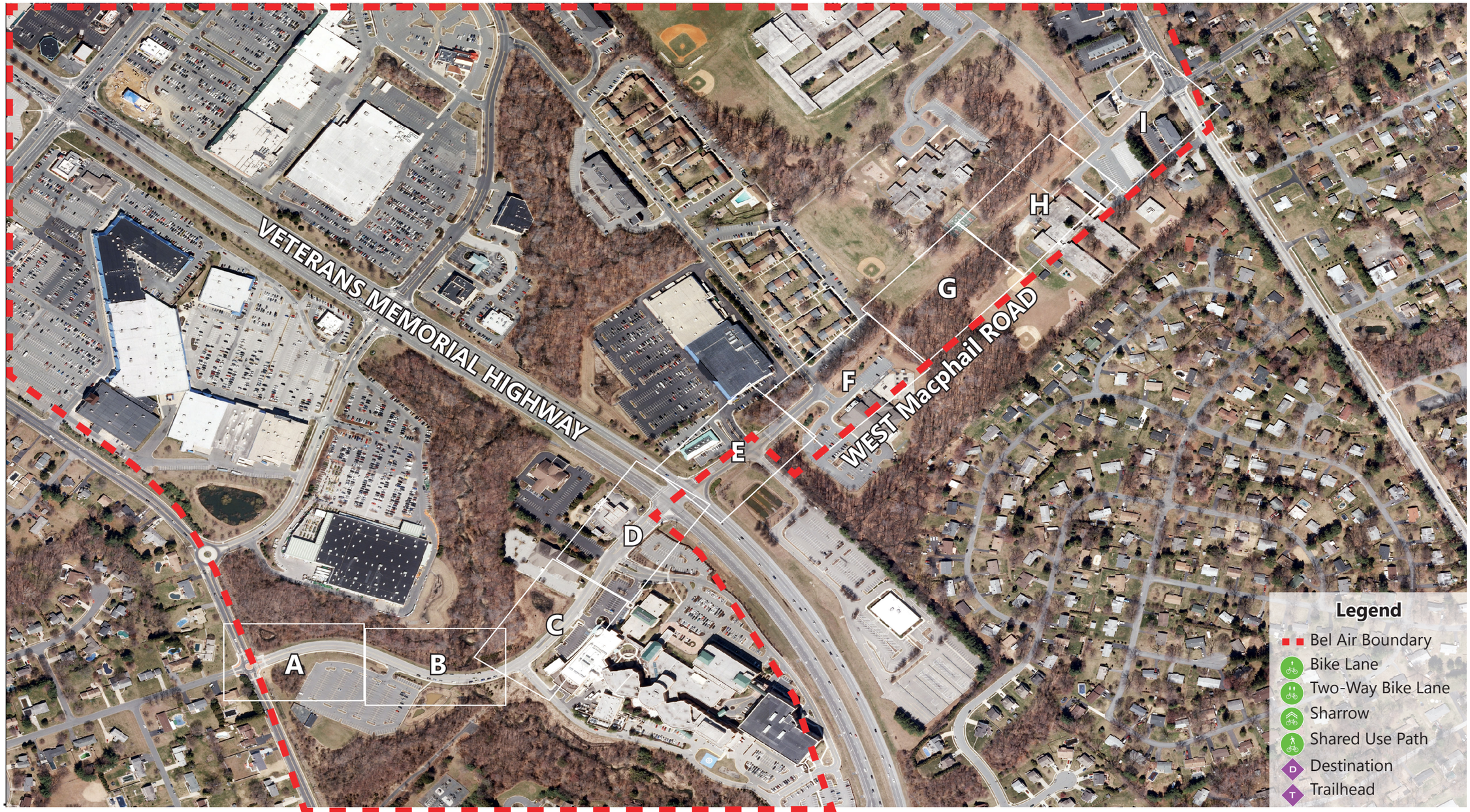
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Majors Choice Drive and Moores Mill Road



Key Map: West Macphail Road & Emmorton Road



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NTS

S Tollgate Road and W Macphail Road



W Macphail Road



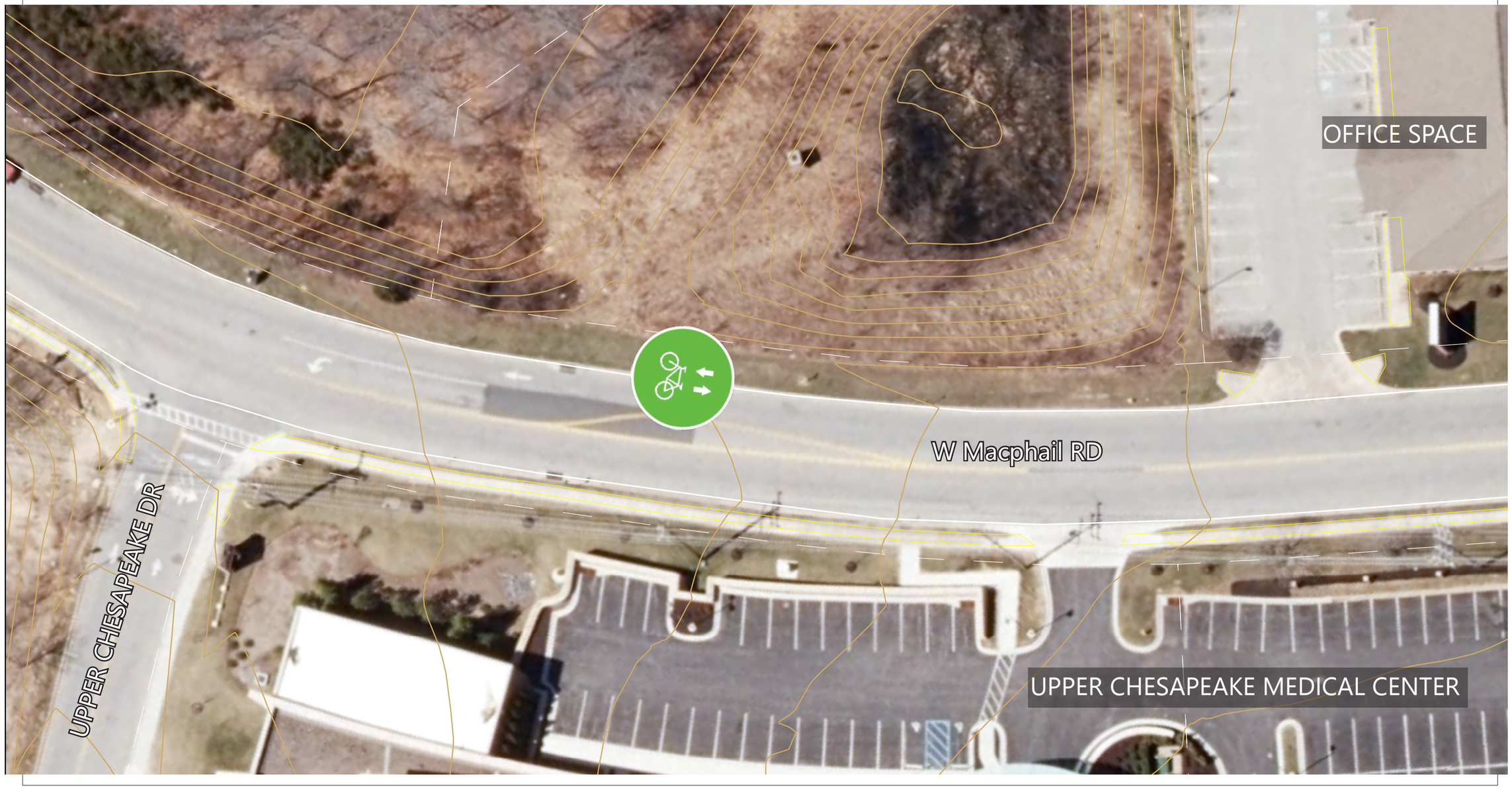
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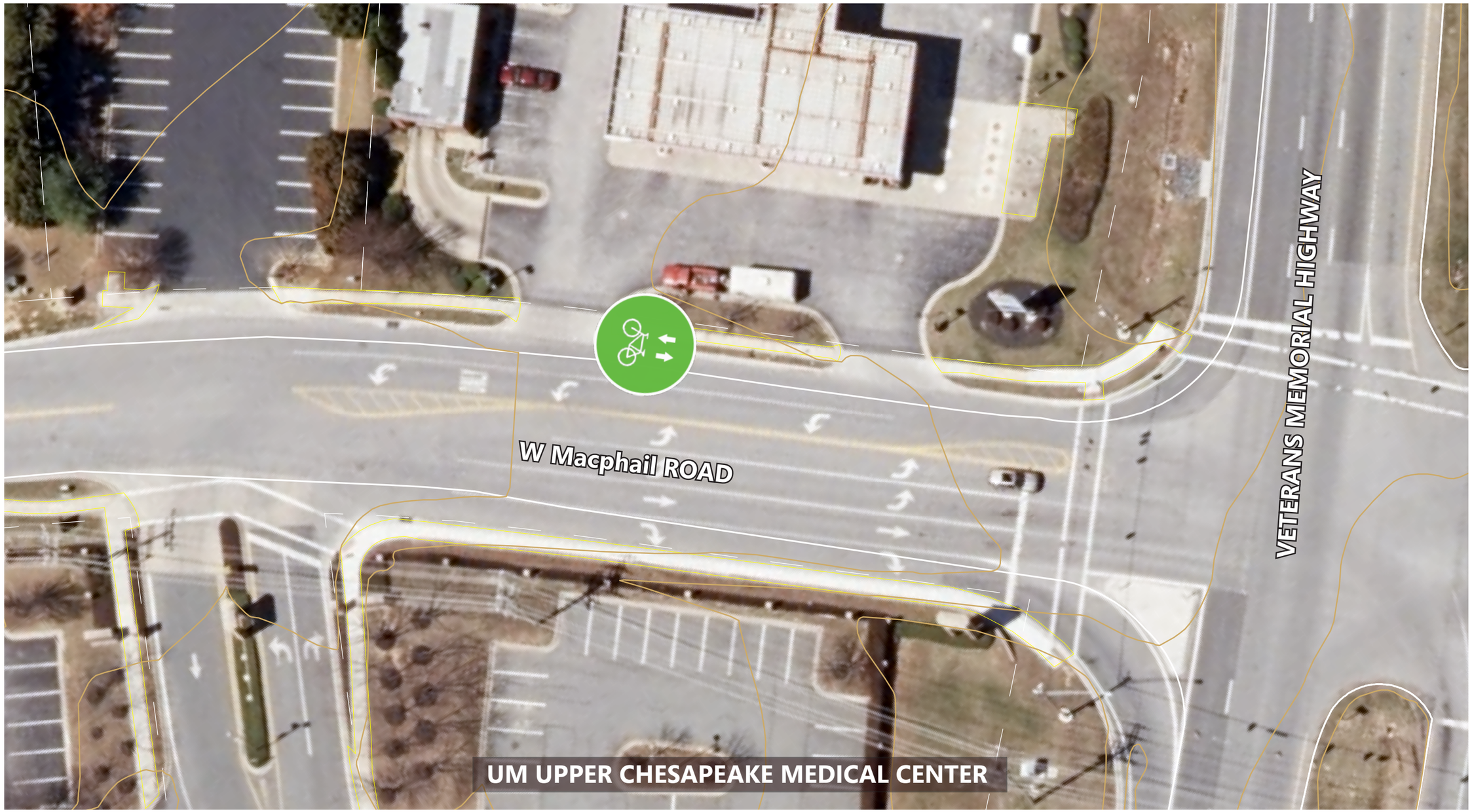
Jenny Dibra, Akin Jaiye, Akira Shepherd, Cecilia Tran

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Upper Chesapeake Drive and W Macphail Road



W Macphail Road



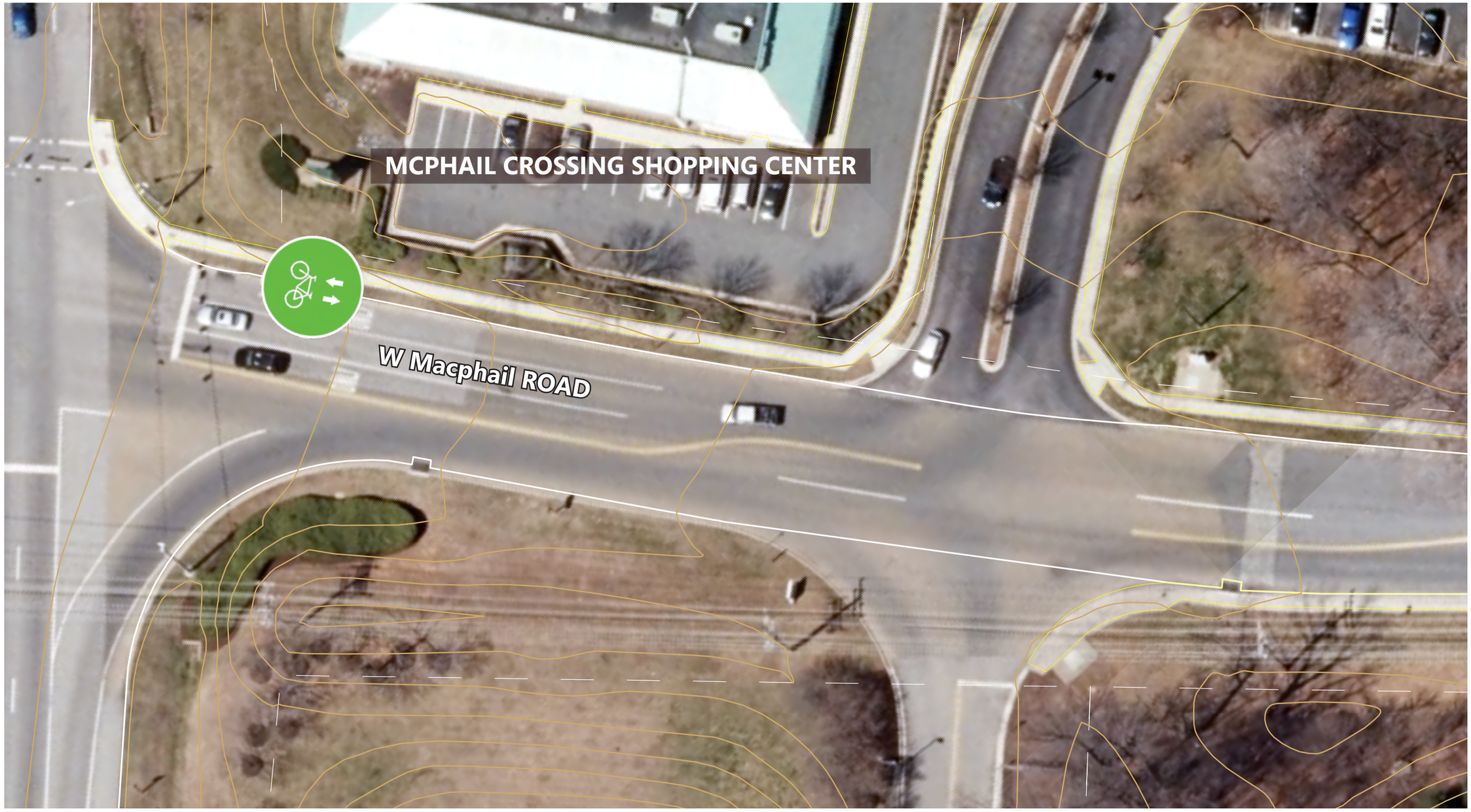
Landscape Architecture
DEPARTMENT OF PLANT SCIENCE AND LANDSCAPE ARCHITECTURE

Spring 2018
LARC 471 Studio

Jenny Dibra, Akin Jaiye, Akira Shepherd, Cecilia Tran

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W Macphail Road



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W Macphail Road



The green dotted line indicates the continuation of a pedestrian/ bike trail through W Macphail Rd.

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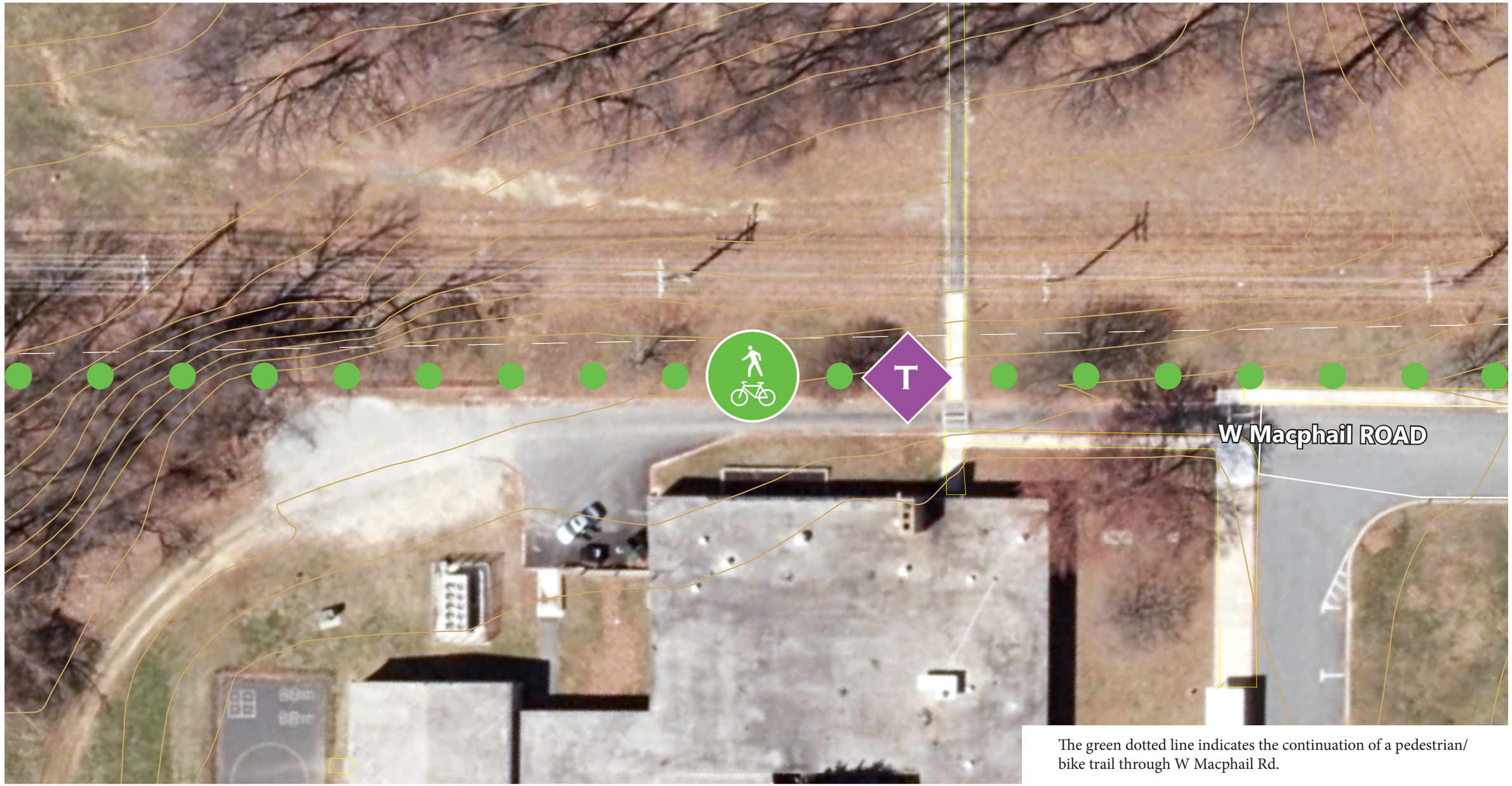
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W Macphail Road



The green dotted line indicates the continuation of a pedestrian/ bike trail through W Macphail Rd.

West Macphail & Emmorton Road



The green dotted line indicates the continuation of a pedestrian/ bike trail through W Macphail Rd.

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West Macphail & Emmorton Road



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