



# EXPANDING THE BETHESDA TROLLEY TRAIL

## Woodglen Dr & Nicholson Ln to Twinbrook Feasibility Study

North Bethesda, MD  
June 2023



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Source: Kittelson & Associates

## Chapter 1

# Introduction

## Project Background

The Bethesda Trolley Trail (BTT) is a green pathway that offers a direct connection for cyclists, runners, and pedestrians between Bethesda and Rockville in an urban setting. It allows easy access to various destinations, such as the National Institute of Health (NIH), the Woodmont triangle, downtown Bethesda, and several existing and planned trails in the county. Additionally, it aims to establish links to two metro stations, namely the North Bethesda (White Flint) station and the Twinbrook station in Rockville. In 2004, the County Council authorized funding for MCDOT to design and construct missing segments of the trail, including bridges over Interstate 495 and Interstate 270.

Currently, the BTT is designated between Woodglan Drive and Nicholson Lane in North Bethesda, encompassing segments of Rockville Pike (MD 355), Josiah Henson Parkway, Old Georgetown Road, Nebel Street, and Chapman Avenue in the northern vicinity of Twinbrook Station. However, only a few segments provide a safe and low-stress environment for biking, as the majority of the routes run alongside high-speed roadways with heavy traffic. This makes it uncomfortable for less confident bicyclists to access different areas. For instance, crossing

or riding along Rockville Pike (MD 355) is unsafe and poses difficulties for pedestrians and cyclists attempting to reach facilities on the east and west sides. Moreover, gaps in the trail network create conflicts with other modes of transportation. Therefore, it is crucial to consider alternative routes to complete the network in North Bethesda and establish seamless connectivity between the North Bethesda Metrorail and Twinbrook stations.

This feasibility study will examine various alignment options and types of pedestrian and bicycle facilities to extend the BTT. The goal is to create a bicycle-friendly environment with low stress and high comfort, potentially incorporating a combination of off-street and on-street facilities. This extension will connect the North Bethesda (White Flint) Metro station to the Twinbrook Metro station.

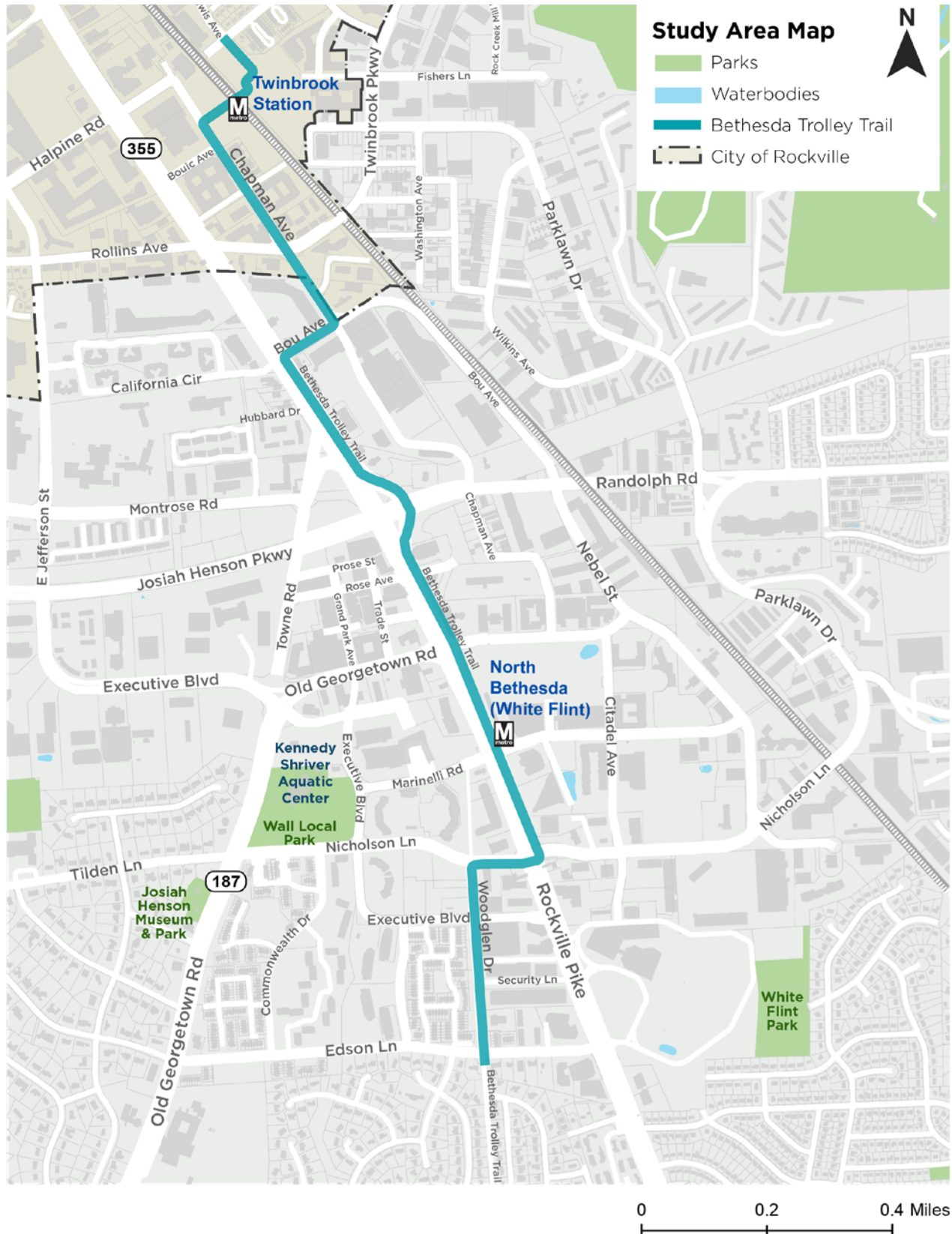
Each section of this report presents a detailed understanding of the study area, pertinent issues and opportunities that inform the route alignments. Chapter 1, presents the background and project overview; Chapter 2 describes the study area and existing conditions with maps; Chapter 3 presents the feedback received from the public and stakeholder engagement activities; Chapter 4 discusses the alternative route alignments and potential projects for the study area.

## Study Focus Area

The Bethesda Trolley Trail (BTT) is an urban greenway that spans over six miles providing a direct link between Bethesda and Rockville for people who walk, bike, and roll.

The study area extends between North Bethesda (White Flint) and Twinbrook Metro Stations along and around Rockville Pike (MD 355).

Figure 1.1: Study Area Map





## Project Goals

The project aims to assess different routes for expanding the Bethesda Trolley Trail, address any existing gaps, actively involve the community to gather feedback, and ultimately provide recommendations based on the findings. The following goals were defined to help guide this project.



- Explore alignment alternatives to expand the Bethesda Trolley Trail (BTT) and develop a wayfinding plan to connect to regional trails and neighborhoods.
- Evaluate existing and proposed off-road and on-road bicycle facilities between Edson Lane and Woodglan Drive to Twinbrook Metro station.
- Identify gaps in the overall bicycle network in North Bethesda.
- Engage major stakeholders and community members to gather feedback.

## Planning Process

Figure 1.2: Planning Process

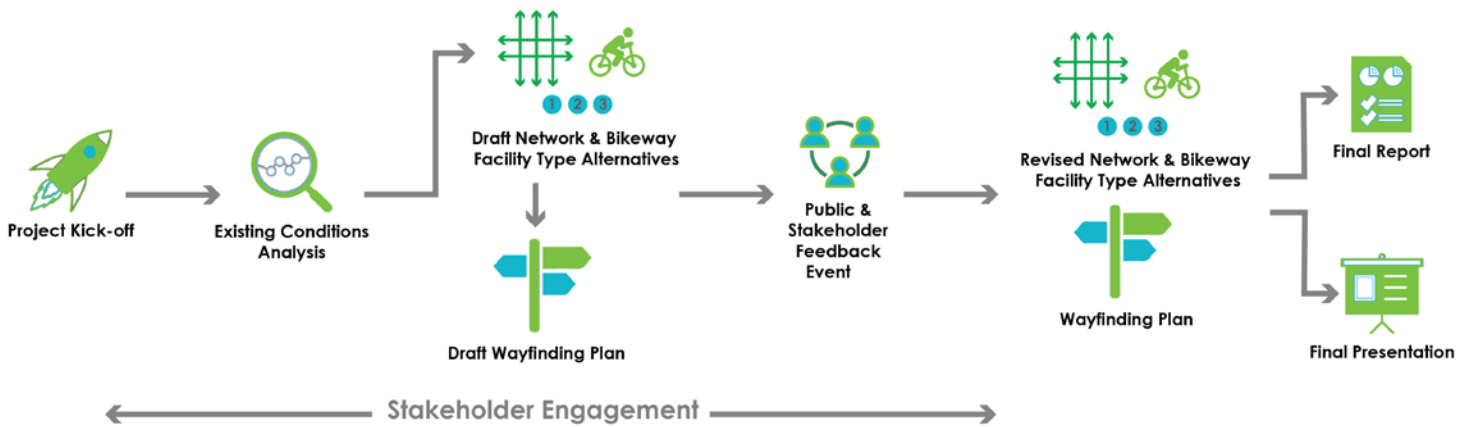


Figure 1.3: Project Timeline

Task	2022				2023												
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1. Project Kick-Off	█																
2. Existing Conditions Analysis		█	█	█	█												
3. Public Outreach and Stakeholder Engagement	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█		
4. Alternatives Development					█	█	█	█									
5. Recommendations & Final Report										█	█	█	█	█	█		
6. MCDOT & MDOT Review & Project Close-Out															█	█	█

## The Bethesda Trolley Trail Timeline

The Bethesda Trolley Trail is situated on what used to be the Rockville Trolley Line, which was a railroad line. The Georgetown and Tenallytown Railway Company operated trolleys along Wisconsin Avenue in Georgetown, extending up to the DC boundary. The origins of the trolley-to-trails concept can be traced back to 1890. This particular trail was developed on the path of the trolley lines operated by the Tennallytown and Rockville Railroad, which connected Georgetown and Bethesda in 1891. Eventually, the two

railroads merged and extended their line to the county seat of Rockville in the late 1890s. In 1902, the merged railroads were acquired by the Washington Railway and Electric Company, which later became part of the Capital Traction Company. The Rockville Trolley Line ceased operations in 1935. In 1978, the Countywide Bikeways Master Plan recommended the establishment of a network of trails along this former trolley route, and construction work commenced in the early 2000s.

The historical timeline of the trolley and trail are listed below:

### 1897 - 1900

Trolley extension completed to Rockville.

### 1902

The Washington Railway and Electric Company acquired the merged railroads in 1902, and later became part of Capital Transit.



Source: Photo by Lewis Reed, 1910. Courtesy of Reed Bros. Dodge. History Blog, <https://reedbrothersdodgehistory.wordpress.com/>.

Trolley Rail Right of Way (ROW) intersecting Rockville Pike (MD 355) in North Bethesda.

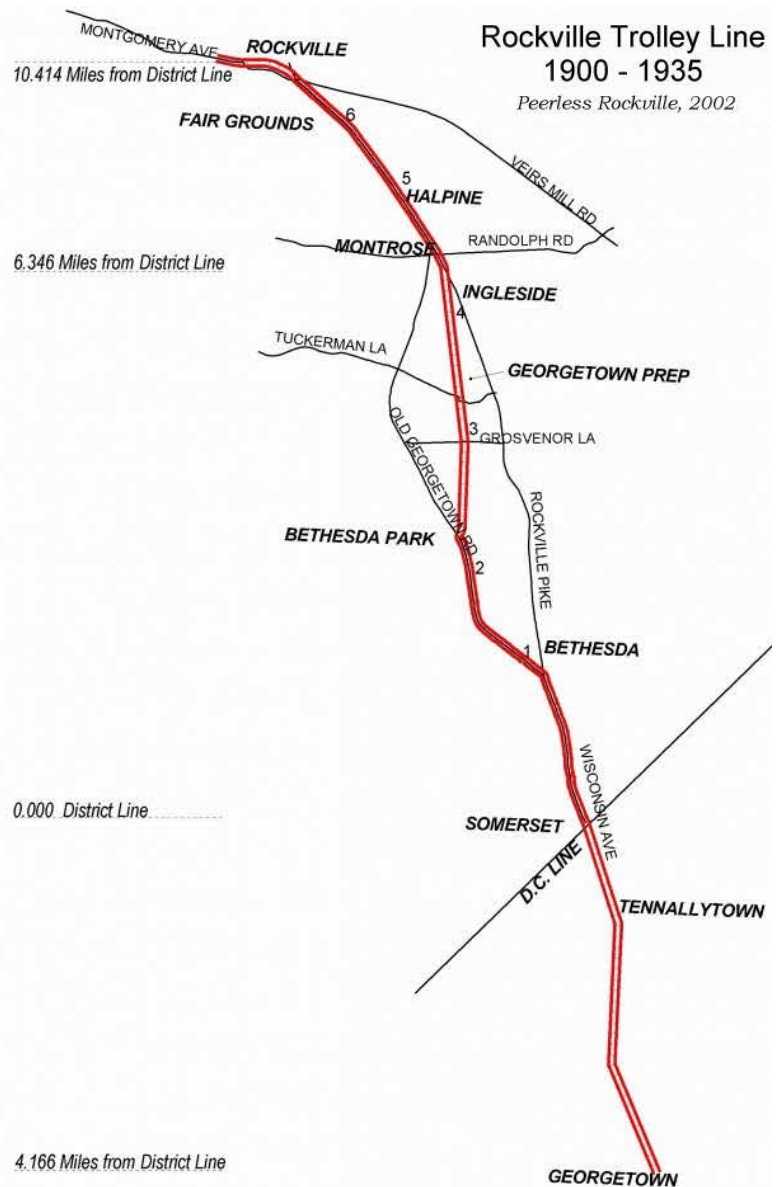
### 1935

In 1935, the Rockville trolley line ceased operation.

### 1978

County-wide Bikeways Master Plan recommends designing a trail along rail Right of Way (ROW).

Figure 1.4: Timeline of the Bethesda Trolley Trail



Source: [peerlessrockville.org](http://peerlessrockville.org)

## Early 2000s

Construction of The Bethesda Trolley Trail begins.

## 2005

Trail construction from Cedar Lane intersection to the intersection of Randolph Road begins.

## 2008

The southern edge of the trail is built, connecting Battery Lane Urban Park and Rugby Avenue.

## 2009

Shared use path along Rockville Pike (MD 355) is constructed.



**Bethesda Trolley Trail, 2023**  
Source: Google Earth

## 2014



**Two-way Separated Bike Lanes extending the BTT along Woodglan Drive to Nicholson Lane.**  
Source: Montgomery County Planning Department



**Bethesda Trolley Trail, 2023**

Source: <https://www.trailink.com/trail-gallery/bethesda-trolley-trail/>. Photo by: pault12

Figure 1.5: Existing Bethesda Trolley Trail

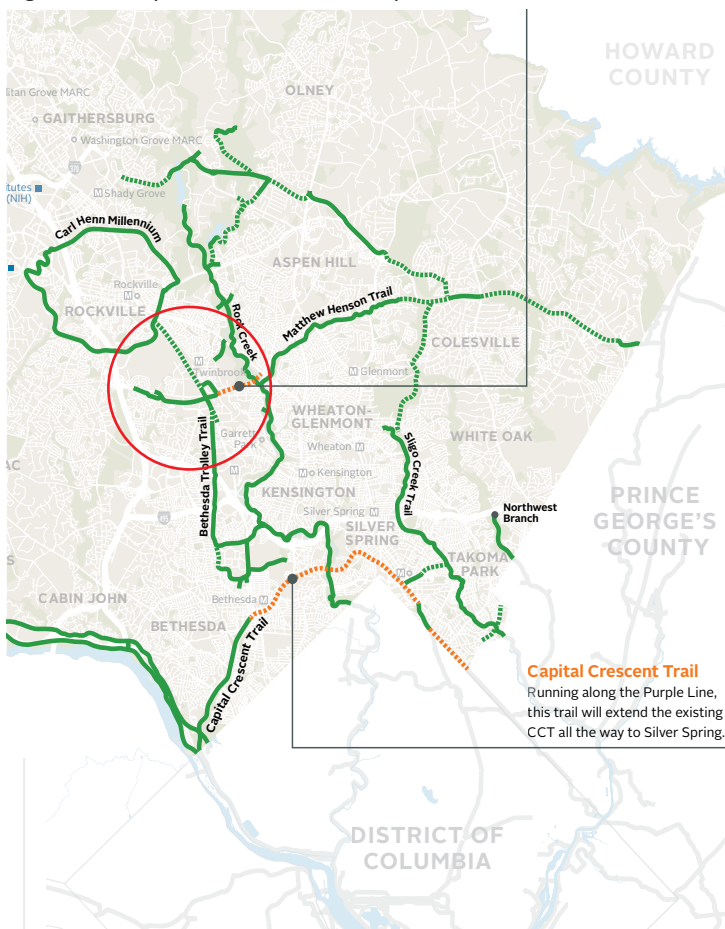


Source: MCDOT

## Previous Plan Review

The Bethesda Trolley Trail (6.8 miles) is part of the National Capital Trail Network, which is a 1400-mile, continuous network of long-distance, off-street trails, serving the entire TPB/COG region. The Capital Trails Coalition is a collective effort involving various public and private entities, agencies, and volunteers. Their main objective is to facilitate the development of a comprehensive network of multi-use trails in the greater Washington, DC area. Figure 1.6 below shows the geographic scope this network encompasses that includes District of Columbia, the City of Alexandria, Arlington and Fairfax counties in Virginia, as well as Prince George's and Montgomery counties in Maryland.

Figure 1.6: Capital Trail Network, Capital Trails Coalition



Source: Capital Trails Coalition

**The White Flint Sector Plan in 2010** established the vision and framework to transform the auto-oriented suburban development patterns into a more urban, mixed-use neighborhood with breaking down the street network to create more walkable blocks and to connect open spaces.

- Creating an urban boulevard for Rockville Pike (MD 355) is a major goal of the Sector Plan as well as providing new bikeways and increasing the non-auto driver mode share (NADMS) as we see in the rendering.
- Recommendations in this plan include reconfiguration of the mobility network into a grid system of smaller streets and a transit system that will expand to include a local as well as circulator bus service and convenient pedestrian access.
- Continued network of the Bethesda Trolley Trail and bike paths along Josiah Henson Parkway.
- Lastly, this plan recommends a continuous signed recreational pathway – the Recreation Loop – that connects the public use spaces to the civic green and Wall Local Park.

**The 2018 White Flint 2 Sector Plan** builds on recommendations outlined in the 2010 White Flint Sector Plan by recommending opportunities infill and transitional development at key locations, including the office park along Executive Boulevard. A special taxing district provides funding for mobility infrastructure that assesses an ad valorem tax on existing commercial properties. Three properties in the 2018 White Flint 2 Sector Plan also follow the staging and transportation standards in the 2010 Sector Plan and are included the special taxing district.

The plan emphasized the development of new streets to create smaller blocks, promoting pedestrian activity and expanding the bikeshare infrastructure. The boundary of the White Flint Bicycle and Pedestrian Priority Area (BiPPA) has been extended to include the Plan area. The

fourth Monitoring Report acknowledges the challenge of implementing bikeway facilities in North Bethesda due to potential utility and right-of-way impacts. Construction is underway for the Marinelli Road bikeway and Woodglen Drive is part of the '20 Is Plenty' initiative to enhance

**Montgomery County Bicycle Master Plan**

The Bicycle Master Plan represents a forward-thinking approach to enhance bicycling infrastructure and promote safety and accessibility. The aim is to ensure bicyclists of all ages and abilities can navigate with comfort and confidence. It is an essential part of Montgomery County’s Vision Zero Two-Year Action Plan to eliminate traffic-related fatalities and serious injuries. Through capital investments, educational programs, outreach efforts, and a robust legal and policy framework, the plan seeks to foster a culture of bicycling and establish bicycle-friendly communities in the county.

**Pike District Connector, M-NCPPC**

The Pike District Connector was built as planned for in the Advancing the Pike District Initiative that was formulated in partnership between Montgomery Planning, Montgomery Parks, the Montgomery County Department of Transportation (MCDOT), and The Better Block Foundation. This initiative aimed to examine the potential properties that could be redeveloped surrounding the Metro Station and to create new placemaking opportunities throughout the Pike District in alignment with the 2010 White Flint Sector Plan.

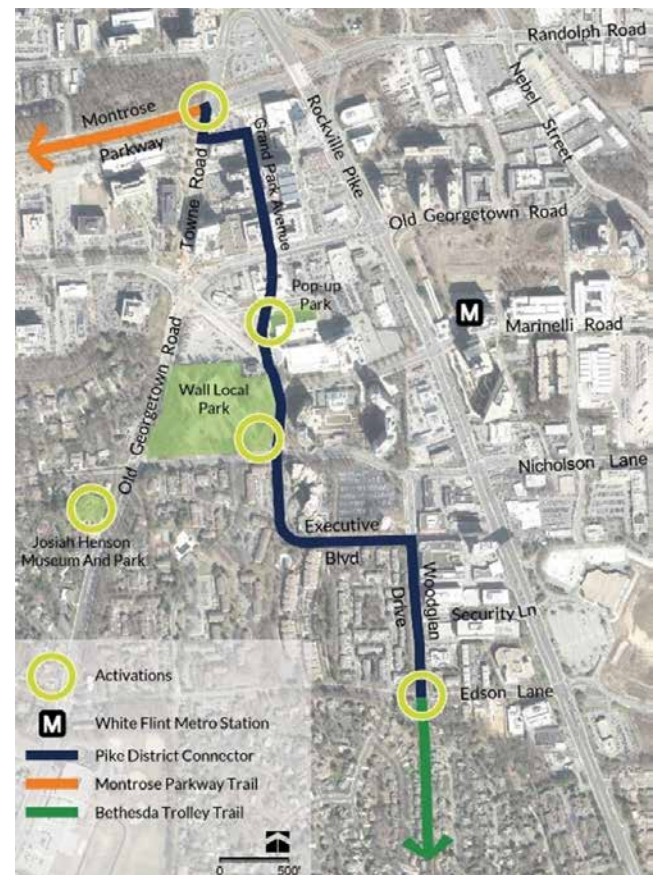
The Connector is a one-mile bike and pedestrian path linking the Bethesda Trolley Trail and the Montrose Parkway Trail. Semi-permanent art and wayfinding signage is also added along the new Pike District Connector. The Connector runs along the west side of the Pike District linking the Bethesda Trolley Trail to the Josiah Henson Parkway.

roadway safety. The Western Workaround, involving the realignment of Old Georgetown Road and Executive Boulevard, is progressing, with phase one completed and phase two set to finish in 2022. Additional bikeways on Marinelli Road are expected later this year.

The plan proposes a new classification system for evaluating cycling routes based on their level of separation from traffic. It introduces the concept of the Breezeway Network, to establish a high-capacity system of arterial bikeways connecting major activity centers. This network is designed to accommodate faster bicyclists while ensuring the safety and comfort of all users.

Additionally, the plan encourages the use of bicycles as a mode of transportation in conjunction with public transit. It recommends long-term bicycle parking stations at key transit hubs, such as Metrorail Red Line, MARC Brunswick Line, future Purple Line, and Corridor Cities Transitway stations.

Figure 1.7: Pike District Connector, M-NCPPC



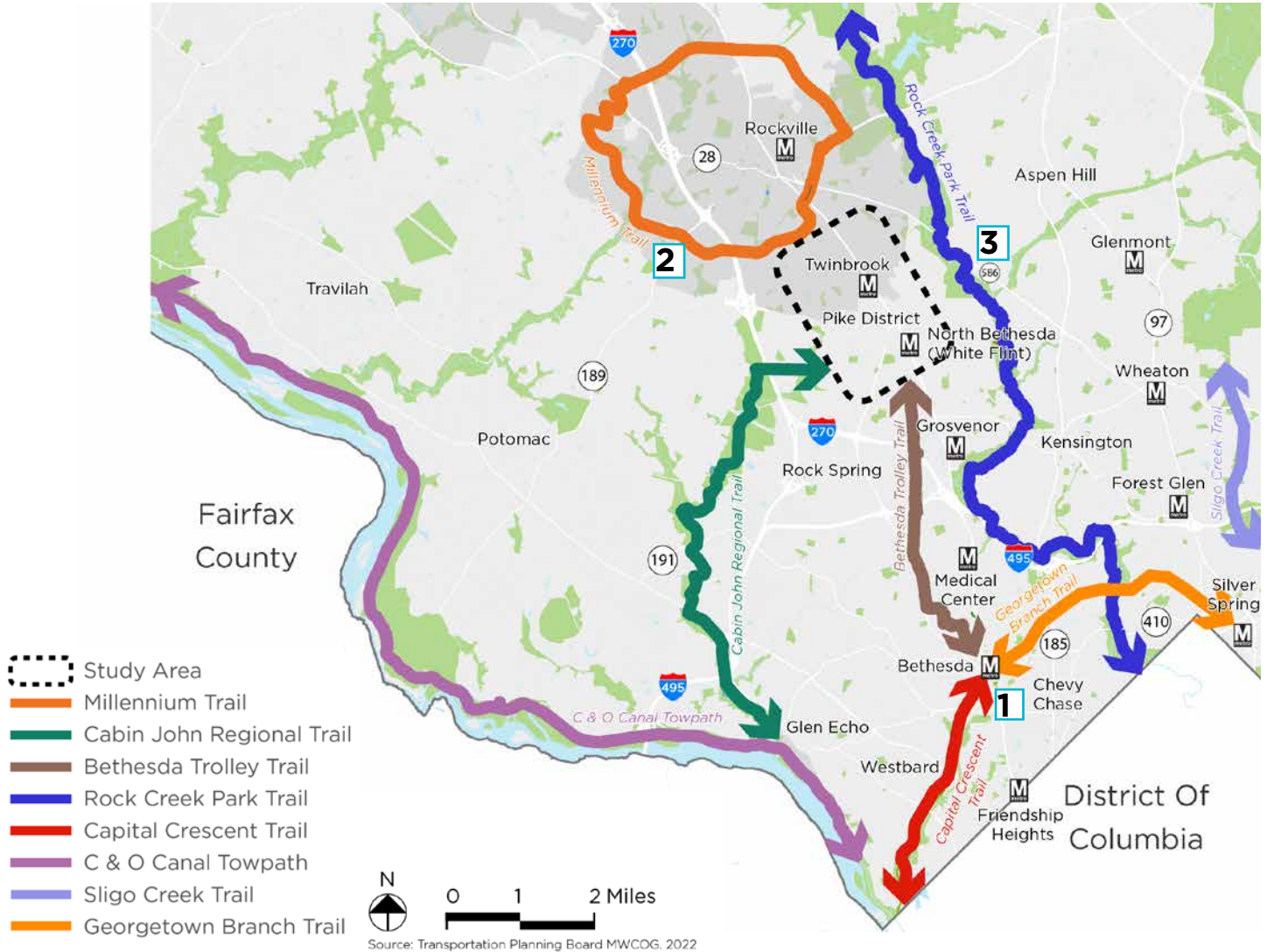
Source: MCDOT

## Connecting to Regional and Local Trails

Figure 1.9 depicts the study area, emphasizing its crucial position as a pivotal link within the regional trail network. By implementing the Bethesda Trolley Trail within this area, an essential connection will be established in the

regional trail network. Filling the existing gaps in the study area will enhance connectivity to surrounding trails and significantly improve the biking experience throughout Montgomery County.

Figure 1.8: Regional Trail Network



**1**  
Capital Crescent Trail in Downtown Bethesda  
Source: Kittelson & Associates



**2**  
Carl Henn Millennium Trail  
Source: [https://www.trailink.com/trail-photo/carl-henn-millennium-trail\\_181727/](https://www.trailink.com/trail-photo/carl-henn-millennium-trail_181727/). Photo: dtread



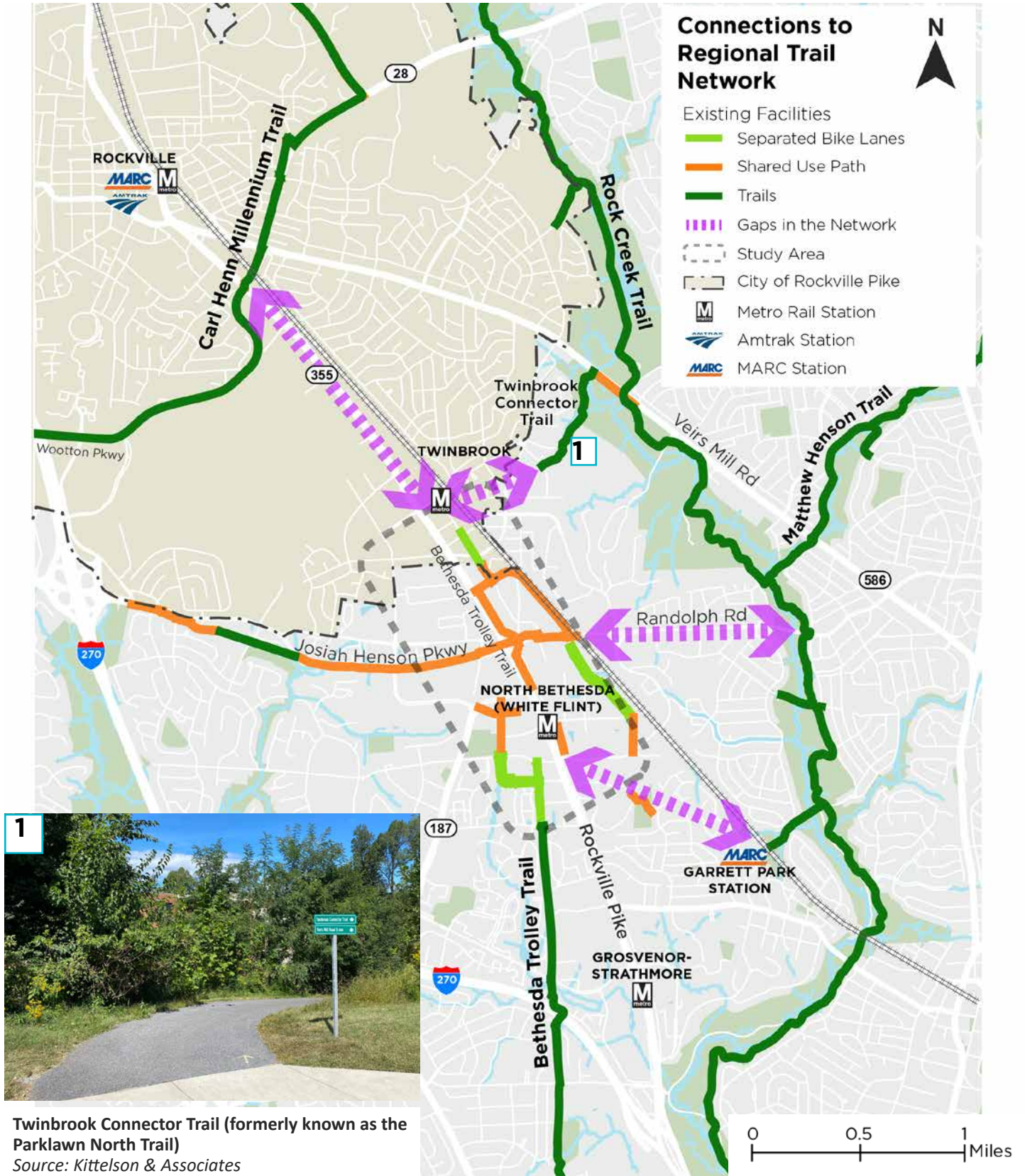
**3**  
Rock Creek Trail bridge over Veirs Mill Road  
Source: [https://www.trailink.com/trail-photo/rock-creek-trail-\(md\)\\_166748/](https://www.trailink.com/trail-photo/rock-creek-trail-(md)_166748/). Photo: dtread

## Key Link In The Regional Network

The study area has several regional trails and destinations nearby. Figure 1.10 situates the Bethesda Trolley Trail network in North Bethesda and highlights the critical gaps

in the network. This project will develop recommendations to connect the study area to regional trails, destinations, and neighborhoods.

Figure 1.9: Connections to Regional Trail Network





Source: Kittelson



## Chapter 2

# Public & Stakeholder Engagement

Effective public involvement and stakeholder engagement play a critical role in the development of viable alternatives for North Bethesda. To ensure this, the project team has taken the initiative to design stakeholder engagement activities in order to gather feedback.

The team began by conducting a comprehensive analysis of the existing conditions and creating maps to present to the public and stakeholders during virtual meetings. These meetings were aimed at collecting input on the current Bethesda Trolley Trail (BTT) route as well as potential alternatives. The team sought to identify popular destinations and areas where people frequently walk or bike, as well as desired locations they would like to connect to in the future. This informed decisions on elements such as route alignment and way-finding.

The findings from the walking tour, existing conditions analysis and other observations on site were presented to the public at these

engagement events and participants were requested to give feedback on preferred corridors, popular destinations in North Bethesda that should receive special attention to inform potential recommendations.

The activities, methods, and tools employed were specifically tailored to involve local community members and stakeholders who possess valuable insights into the existing facilities in North Bethesda. The objective of the outreach process was to foster an interactive and innovative engagement approach to gather valuable feedback and input from participants. The public outreach process includes the following four methods:

1. Walking Tour
2. Stakeholder Meetings
3. Public Open House
4. Project Website
5. Public Comments Log

The following section provides additional details on the various engagement activities.

*The public outreach process for this Plan included the following:*

- *Walking Tour*
- *Stakeholder Meetings*
- *Public Open House*
- *Project Website*
- *Public Comment Log*

## Walking Tour

The project team went on a walking tour on April 29, 2022 to experience the corridor. They observed the activity and noted the recently completed and on-going projects in the

area. This team also discussed the issues and opportunities for future improvements.

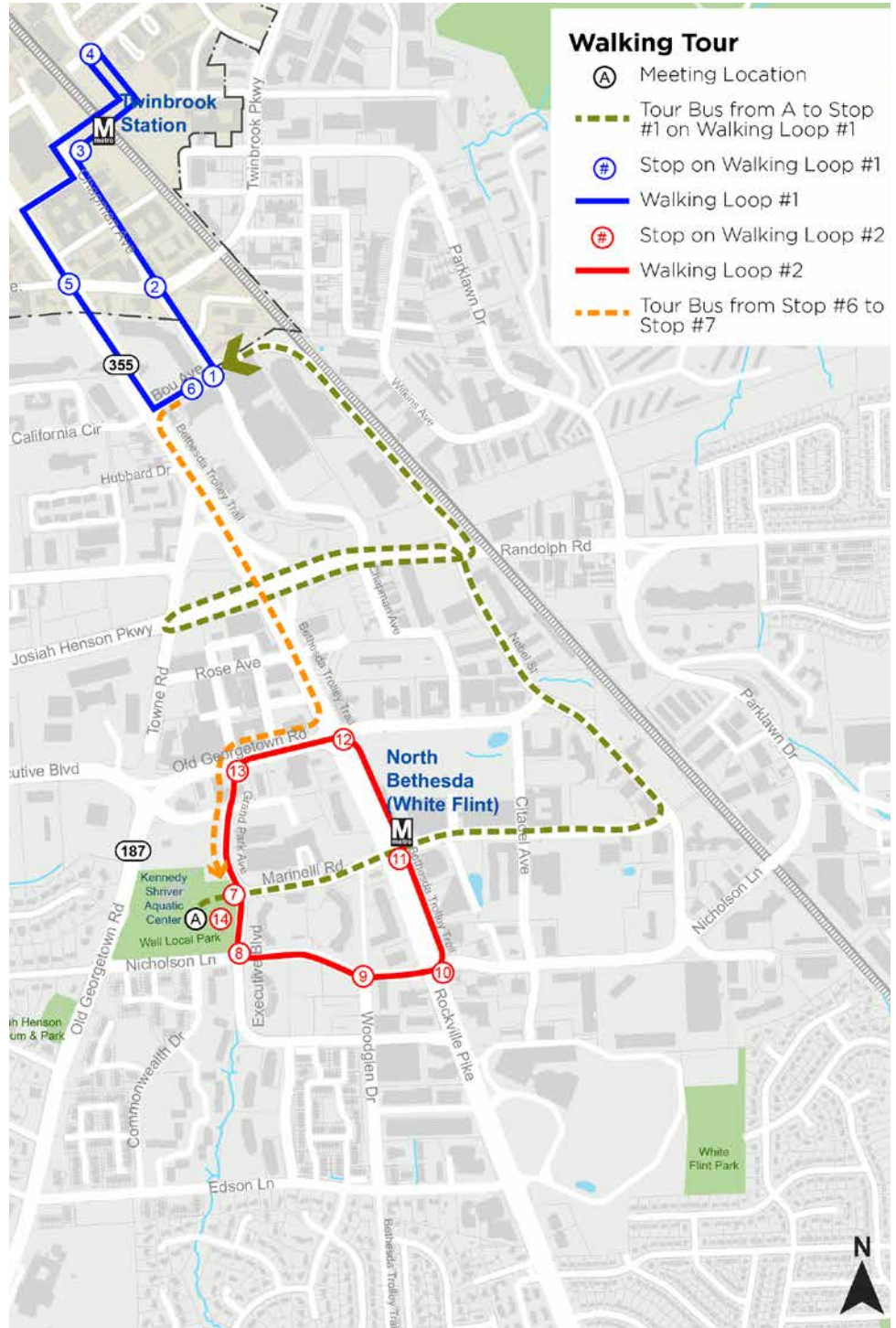


**Walking Tour in Progress**  
Source: Kittelson & Associates



**Walking Tour Map Showing Routes Covered by the Team**  
Source: Kittelson & Associates

Figure 2.1: Walking Tour Map



## Stakeholder Meetings

Gathering input from stakeholders is integral to the planning process. The project team organized individual meetings with several stakeholders such as Montgomery Planning Department (M-NCPPC), Montgomery County - Bicycle Advisory Group (MCBAG), North Bethesda Management District Committee, Friends of White Flint, Washington Area Bicycle Association - WABA, some major businesses, community and neighborhood organizations to address various matters concerning bicycling, including challenges, opportunities, and concerns.

## Public Open House

The project team gathered meaningful community feedback through public outreach events. On October 6, 2022, MCDOT hosted an open-house style public meeting to share project information, including a summary of the existing conditions analysis, and design alternatives. A total of 17 display boards were presented at this public meeting and 4 out of these 17 were interactive boards for participants to place dots or sticky notes with comments. Board numbers 1 to 13 provided project background, including a project overview, goals, planning process, schedule, history of the Bethesda Trolley Trail, regional trail network, demographic information (land use, destinations, socioeconomic characteristics), existing transportation network, and crash history. Board numbers 14 to 19 provided opportunities for the public to weigh in and add comments on preliminary ideas and recommendations. The boards were placed around the room to encourage community input, prompt questions, and collect feedback.

**The general comments are summarized below:**

### Parking compliance:

Parked cars block multimodal facilities. Minimal enforcement of parking can be an issue at locations. MCDOT should introduce and expand metered parking.

Before the meetings, a tailored set of questions were prepared and provided to each stakeholder group, which served as a framework for the discussions and ensured that important subjects were covered.

The project team met with the following stakeholder groups:

- North Bethesda Implementation Advisory Committee held on May 9, 2022
- Transportation Management District North Bethesda held on April 19, 2023
- Montgomery County bicycle Action Group (MCBAG), held on April 21, 2023

### Safety:

The fatal crashes on Rockville Pike (MD 355) are alarming and there must be safety measures to minimize fatalities.

### Multimodal Comfort:

Bicyclist may not always feel safe and installing flex posts may be a good idea to improve safety and comfort on bike facilities. Its not easy/comfortable for people on a bike to connect to Garrett Park from the Bethesda Trolley Trail.

### Nebel Street:

Cars and trucks often block the bike lane. There is a need for no parking enforcement and additional “no parking signs.” Additional flex posts may discourage illegal parking. Parking meters on the curb create confusion for drivers – many cars park along the curb in the bike lane.

### Greenspace:

There is a need for more green spaces in North Bethesda.

### Network:

MCDOT should build out a road network to provide additional connections, using state funding and developer resources.

## Key Findings

The following sections summarize public feedback received for the interactive boards.

### Board No. 14: Wayfinding Ideas:

- This board displayed the types of signage and branding examples, as well as a preliminary wayfinding plan. The project team asked participants to identify additional locations and areas to be included in the wayfinding plan. The following comments were collected:
- Provide wayfinding from Bethesda to the National Institute of Health (NIH).

### Board No. 15: Major Destinations and Planned Developments

- The project team asked participants to place a round sticker to identify the destinations they visited most by biking or walking.
- Most participants indicated that they bike or walk to the following destinations:
- Pike & Rose Shopping Center and the new development around it
- All shopping centers such as Montrose Crossing, Federal Plaza, Montrose Shopping Center are popular destinations are frequently visited by residents.
- Parks such as White Flint Park, Wall Local Park and Josiah Henson Park are important community destinations, as highlighted in the map.

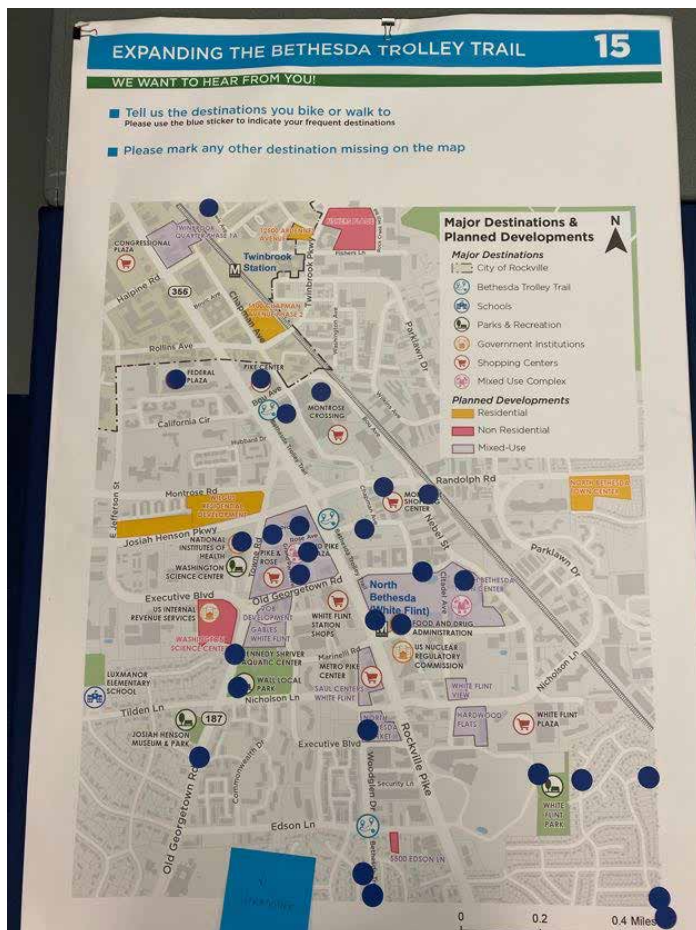


Table 1: Public Feedback on Board No. 15 - Major Destinations and Planned Developments

Major Destinations & Planned Developments	Count
Federal Plaza	1
Pike Center	1
Montrose Crossing	1
The Home Depot Center, Burlington, and Bank of America	1
Montrose Shopping Center	2
National Institutes of Health	1
Pike & Rose + Pike Plaza	4
Kennedy Shriver Aquatic Center	1
Wall Local Park	1
Josiah Henson Museum & Park	2
North Bethesda Market	1
White Flint Park	2
BTT (S of Edson Lane)	2

Public Open House Display Board No. 15  
Source: Kittelson & Associates

**Board No. 16: Network Alternatives**

- The project team asked attendees to identify a desired route for the Bethesda Trolley Trail. The board provided three route alignment options. Figure 3 displays public feedback, which included sticky dots to vote for their preferred route alignment
- Table 2 summarizes the total vote count for preferred route alignment, with the Eastern Connection route (Marinelli Road, Nebel Street, Bou Avenue, and Chapman Avenue) receiving the most votes (9 total).

- The majority of participants voted for the Eastern Connector to be branded as part of the Bethesda Trolley Trail expansion.
- The Western Route was also a preferred route to include in this expansion plan.

*Table 2: Public Feedback on Board No. 16 - Preferred Network Alternatives*

Route Alternative	Count
Western Connector	5
Central Connector	0
Eastern Connector	9

**Board No. 17: Network Alternative and Existing Bike Facilities:**

- Board No. 17 expanded on Board No. 16 and asked participants if they would like all three route alignment options to be signed for the Trolley Trail.
- Two participants responded that this entire network should be branded as the Bethesda Trolley Trail.

**Additional participants left comments on the board, including:**

- Connect Nebel Street to Strathmore Green and find ways to connect this route to Beach Drive.
- Continue the bike lane on Chapman Avenue going south to Citadel Avenue to White Flint Pak and To Garret Park and more trains stations.
- Connections from White Flint Park to Rock Creek.



**Public Open House**  
Source: Kittelson & Associates



**Interactive Boards at the Public Open House**  
Source: Kittelson & Associates

## Public Comments Log

The project team received comments, questions and feedback via email to which we responded accordingly.

Generally there was strong support for expanding and enhancing the trolley trail along Rockville Pike and Chapman Ave to improve safety for pedestrians and cyclists. The suggestion also talked about extending the trail all the way to downtown Rockville and specifically suggests the need for a painted crosswalk at the intersection of Lewis Avenue and Edmonston Drive. However this is beyond the goals and scope of this study and will have to be considered by the City of Rockville's jurisdiction and require their funding and resources. The project team did coordinate between the relevant parties.

The project team received a comment from a senior resident that emphasizes the need for safe, off-road bike trails, particularly for older individuals and children. They mention using a recumbent tricycle for their errands and highlight the importance of accommodating different types of person-powered devices on the trail. They request that the Bethesda Trolley Trail (BTT) be wide enough for both bikes and pedestrians to use simultaneously and safely, with minimal on-road riding. The response acknowledges the writer's concerns and mentions that the county's design guidance recommends wider trails to accommodate

various devices, including recumbent tricycles. The project aims to explore alternative routes for the BTT and develop a wayfinding plan. While the specific engineering design is not included in the project, future facilities will be designed according to recommended width standards, with considerations for accommodating a variety of devices.

The team also received suggestions to connect Woodglen Drive to the trail and creating a buffer between the bike lane/walkway and car traffic on MD 355 and improvements on Tilden Lane and Nicholson Lane. They propose narrowing lanes or removing one to encourage slower driving speeds. They also highlight the need for safer crossings at Rockville Pike, suggesting pedestrian islands and prioritized signals for trail users. Additionally, they advocate for connected bike lanes that lead to popular destinations like Pike and Rose and the metro station. The response acknowledges the suggestions and notes that while this project focuses on exploring alignment alternatives and developing a wayfinding plan, the mentioned design considerations will be taken into account during the engineering design phases of individual projects. Coordination with MDOT- SHA will be necessary for implementing improvements on Rockville Pike (MD 355) and Old Georgetown Road (MD 187).

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## Chapter 3

# Existing Conditions Analysis

An existing conditions analysis is the first step in evaluating and understanding the study area's challenges and opportunities. This analysis involved mapping and analyzing land use, multi-modal transportation infrastructure, roadway characteristics, and crash history. This data analysis will inform the project as we develop and assess conceptual alternatives to identify bicycle facility types and the overall bike network. This existing conditions section will present findings for the following topic areas:

### Land Use Data

- Existing Land Use
- Generalized Zoning

### Major Destinations

- Schools & Colleges
- Parks
- Libraries
- Government Offices
- Hospitals
- Parking Facilities

### Demographic Study

- Equity Emphasis Areas
- Senior & Youth Population Density
- Households in Poverty
- Households without a Car

### Pedestrian and Bicycle Facilities

- Existing Pedestrian Network
- Existing Bike Network
- Bicycle Level of Traffic Stress

- Pedestrian Level of Comfort

### Crashes

- Pedestrian Crashes
- Bicycle Crashes

### Transit Facilities

- Existing and Planned Transit Network

### Roadway Characteristics

- Posted Speed
- Roadway Functional Classification

The project team collected data from open-source databases and other agency sources such as:

- Montgomery County Department of Transportation (MCDOT)
- GIS Open Data portal for Montgomery County
- Maryland- National Capital Parks and Planning Commission (M-NCPPC)
- Maryland Department of Transportation (MDOT) – State Highway Administration (SHA)

This section discusses the findings from the existing conditions analysis with maps and key takeaways.

**Land Uses Mapped:**

- Single Family Residential
- Multifamily Residential
- Civic/Institutional
- Retail/Commercial
- Offices
- Industrial
- Open Space/  
Recreational
- Parking and  
Transportation
- Vacant Land

**Existing Land Use**

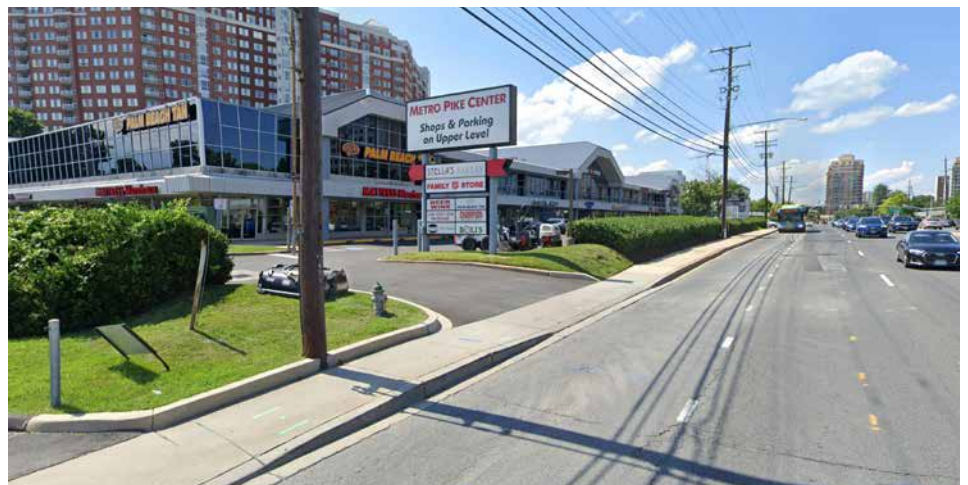
The existing land uses in Figure 3.1 shows a mix of commercial, office, and residential land uses in the study area. There are light Industrial land uses along the rail corridor, especially on the east side and finally, several single-family residential areas are concentrated to the south and the east of the study area. Rockville Pike (MD 355) is a prominent suburban commercial corridor located in North Bethesda, serving as a crucial north-south thoroughfare.

In the north of the study area the city of Rockville in the north has a mix of uses that include commercial, retail, and light industrial, while to the south there are more low-density residential neighborhoods. There are some federal institutions such as the US Nuclear Regulatory Commission, National Institutes of Health and Food and Drug Administration in the study area. They are also major employment centers in North Bethesda. There are several existing medium to high-density multi-family residential developments as well along this corridor especially near the North Bethesda and Twinbrook metro stations.



**Pike & Rose development with mixed land uses**

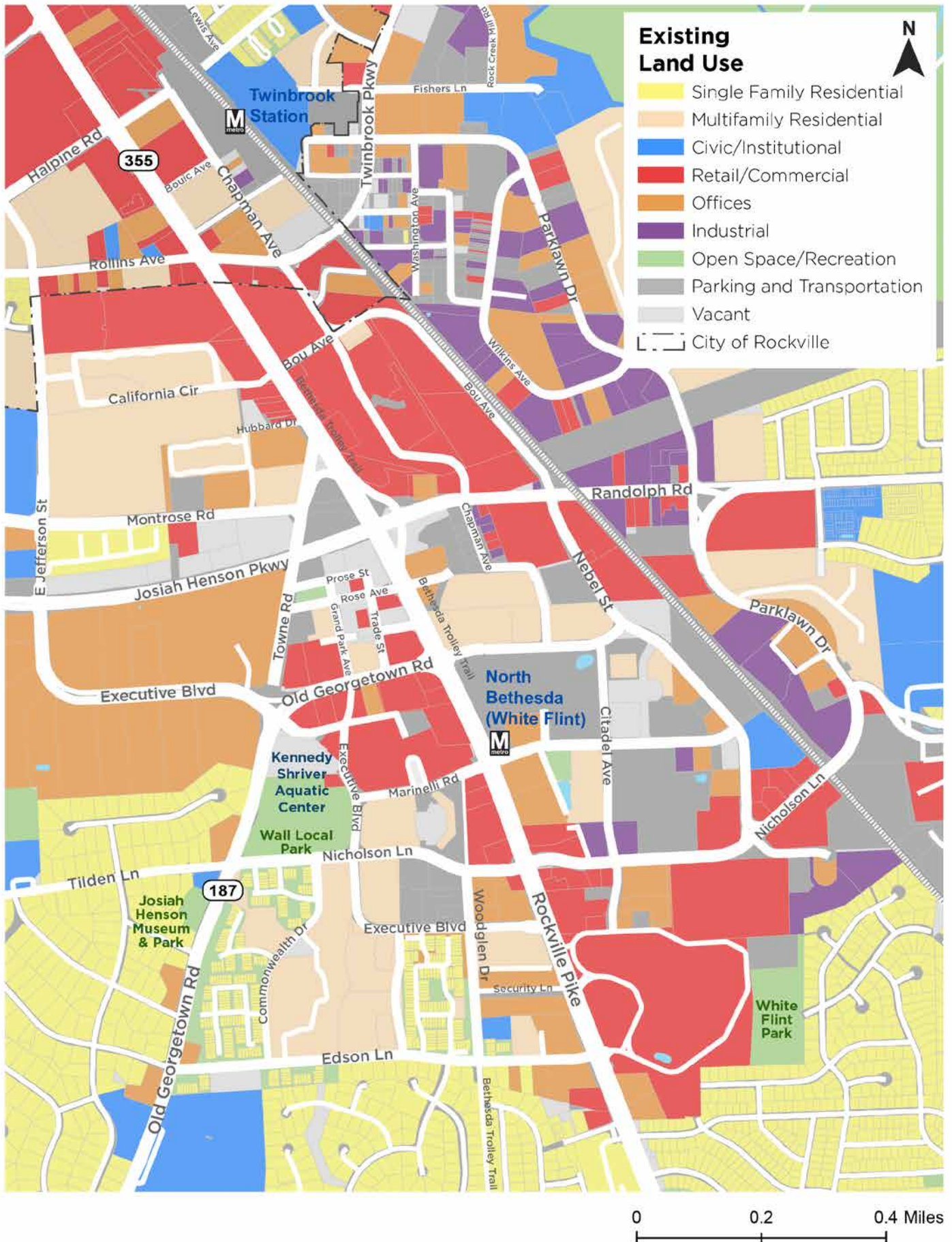
Source: Kittelson & Associates



**Retail and commercial land uses along Rockville Pike (MD 355)**

Source: Google Earth

Figure 3.1: Existing Land Use



## Generalized Zoning

The existing zoning shows a concentration of mixed-use zones in the center of North Bethesda as seen in Figure 3.2. Rockville Pike (MD 355) cuts through the center of North Bethesda and is a major north-south road connecting the City of Rockville to Garrett Park and Bethesda.

As outlined in the Sector Plan, the zoning along this corridor has a high concentration of medium to high density mixed-uses that includes commercial, multifamily residential and retail. To the east of the rail line, north and south of Randolph Road, there is a concentration of light industrial areas. The areas beyond Old Georgetown Road and Edson Lane in the southeast and southwest are zoned as residential areas for townhomes.



**Mixed use development with retail and residential units**

*Source: Kittelson & Associates*



**Retail and Commercial zoning**

*Source: Kittelson & Associates*



**Major destinations:**

- North Bethesda (White Flint) Metro Station
- Twinbrook Metro Station
- Wall Local Park
- Josiah Henson Museum and Park
- Kennedy Shriver Aquatic Center
- Pike & Rose Plaza
- Montrose Shopping Center
- Metro Pike Center
- White Flint Station Shops
- US Internal Revenue Services
- National Institutes of Health
- Washington Science Center
- Food and Drug Administration
- US Nuclear Regulatory Commission
- White Flint Park

**Major Destinations**

The land use analysis involved creating a compilation of activity centers and significant destinations. Activity centers refer to areas characterized by a blend of different land uses, dense residential or employment populations, and substantial transit usage, thereby generating a considerable number of pedestrian and bicycle trips. Major destinations, such as schools, parks, government offices, libraries, and attractions, were mapped as potential starting points or destinations for bicycle journeys. For example destinations like the North Bethesda (White Flint) Metro Station, Twinbrook Metro Station, Pike & Rose, Wall local Park, Kennedy Shriver Aquatic Center, Josiah Henson Museum and Park and US Internal Revenue Services.

Figure 3.3 highlights the concentration of everyday destinations like metro stations, restaurants, parks, convenience stores, banks, and shopping centers are located along major roads in North Bethesda. The study area also contains many large vacant parcels that are likely to develop in the near future. There are a number of existing and planned multifamily residential developments.



**North Bethesda (White Flint) Metro Station**

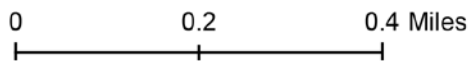
Source: Google Earth



**Twinbrook Metro Station**

Source: Kittelson & Associates

Figure 3.3: Major Destinations



## Household Characteristics

Household characteristics in the study area was analyzed using U.S. Census American Community Survey (ACS 5-Year Estimates, 2021) data as part of the existing conditions analysis to understand the patterns in population along with identifying areas that have a high concentration of people who may depend on non-automobile modes of transportation. One goal of this project is to create a bicycle facilities network that connects these populations to destinations, employment centers and recreational areas.

The ‘Equity Emphasis Areas ’ are mapped within the study area as shown in Figure 3.4. Aligning with the TPB’s vision of fair access and cost-effective transportation facilities to everyone especially for persons with disabilities, low incomes, and limited English proficiency in the Washington Metropolitan region. All sub-areas to the north of the study area near Twinbrook Station and to the east of the Metro rail line is a equity emphasis area. A high number of youth population and BIPOC communities live in these designated areas.

Figure 3.4: Equity Emphasis Areas

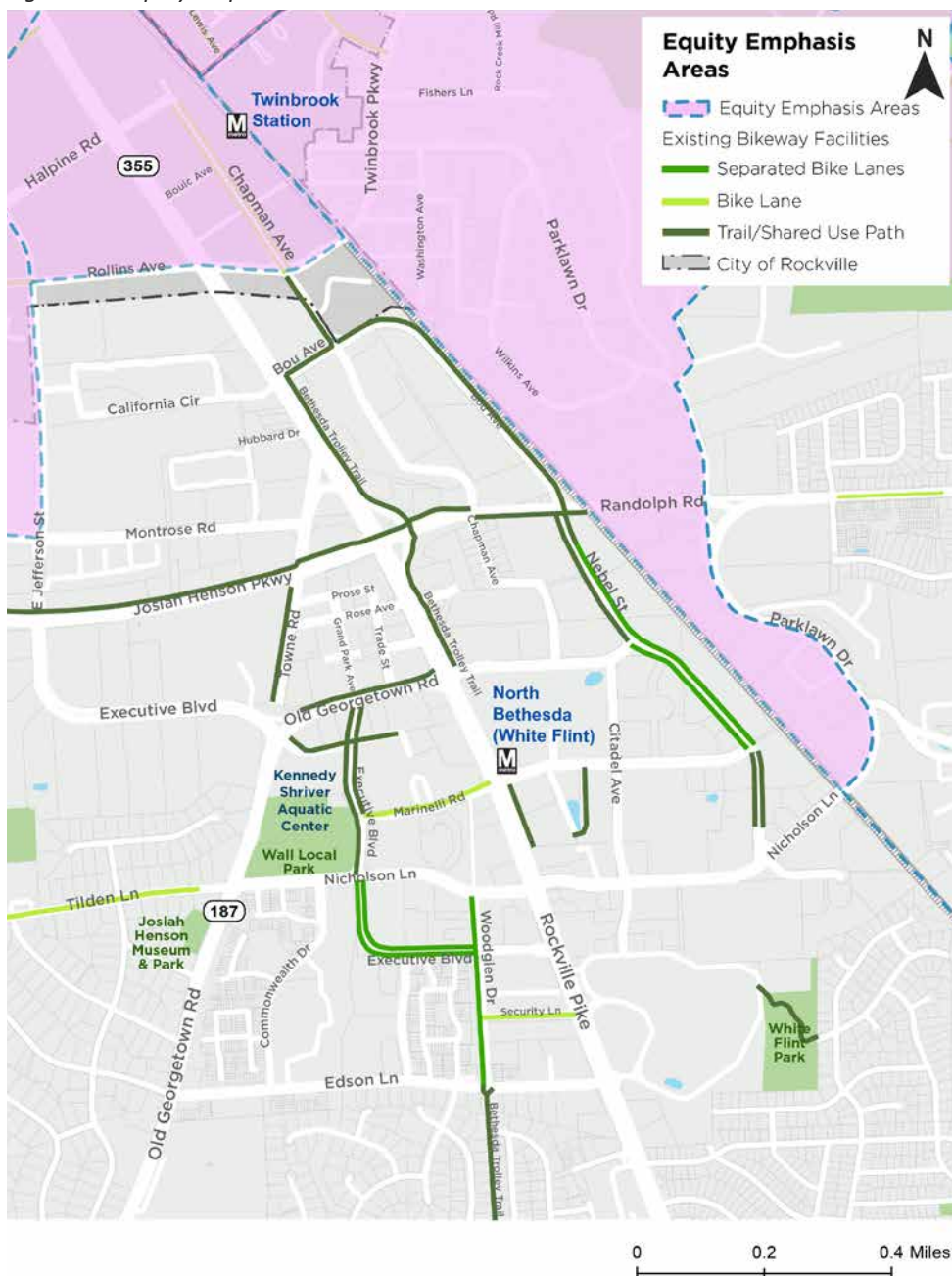




Figure 3.5: Youth Population (Percentage under 18 years)

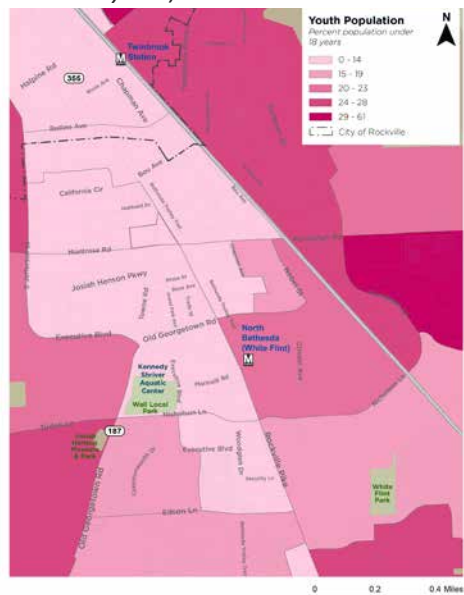


Figure 3.7: Youth Population (Percentage above 65 years)

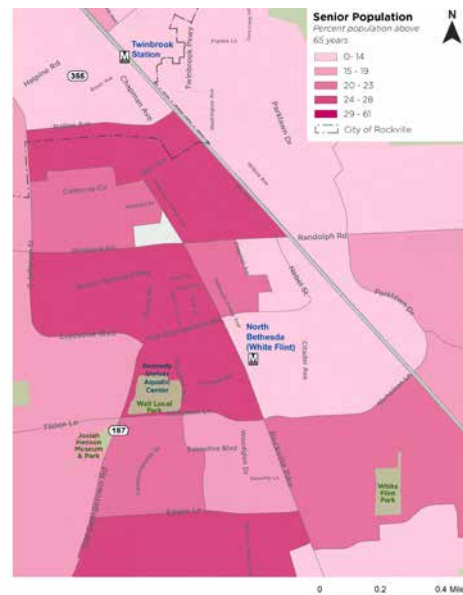


Figure 3.5 shows, fewer youth live in the downtown area of North Bethesda along Rockville Pike. The neighborhoods in the southwest and northeast have high concentrations of youth populations. From this figure and Figure 3.11 we see that the majority of youth are from BIPOC communities.

Figure 3.7 shows a higher concentration of senior population in neighborhoods east of Rockville Pike, between Josiah Henson Parkway and Edson Lane and in neighborhoods northeast of the Bethesda Trolley Trail.

Figure 3.6: Percentage of Households in Poverty

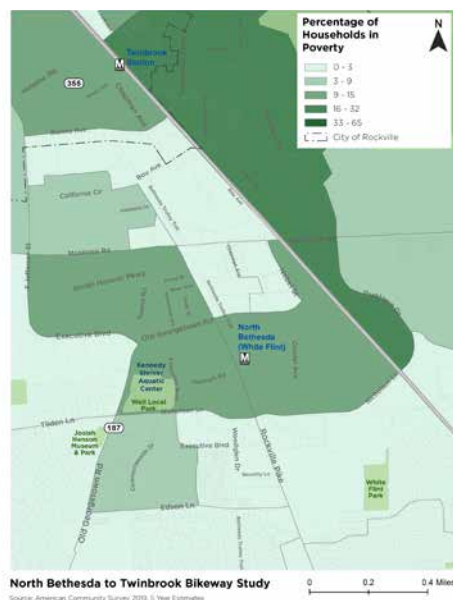


Figure 3.8: Percentage of Households with No Access to Cars



Figure 3.6 shows that 60% of households in poverty live in the neighborhoods west of Rockville Pike, between Josiah Henson Parkway and Nicholson Lane. The neighborhoods to the east of the Metro rail line have a higher concentration of households with zero cars.

Figure 3.8 shows that about 25% of communities west of Rockville Pike lack car access, while neighborhoods east of Metrorail have higher concentrations of car-less households. These areas also have high poverty rates and significant BIPOC and Hispanic populations, relying heavily on public transit and alternative transportation options.

## Demographic Study

It is important to recognize that bicycle facilities serve not only as a convenience for individuals who choose to cycle but also as a necessity for those facing transportation disadvantages. This includes demographic groups that frequently experience transportation disadvantages, such

Figure 3.9 shows the concentration (11%-27%) of African American population to the east of the North Bethesda (White Flint) Metro Station and further south of the study area.

as households in poverty, households with no vehicles/cars, people who commute by transit, walking, or biking and children and senior population. The demographic study was conducted using U.S. Census American Community Survey (ACS 5-Year Estimates, 2021).

Figure 3.9: Percentage of African American Population

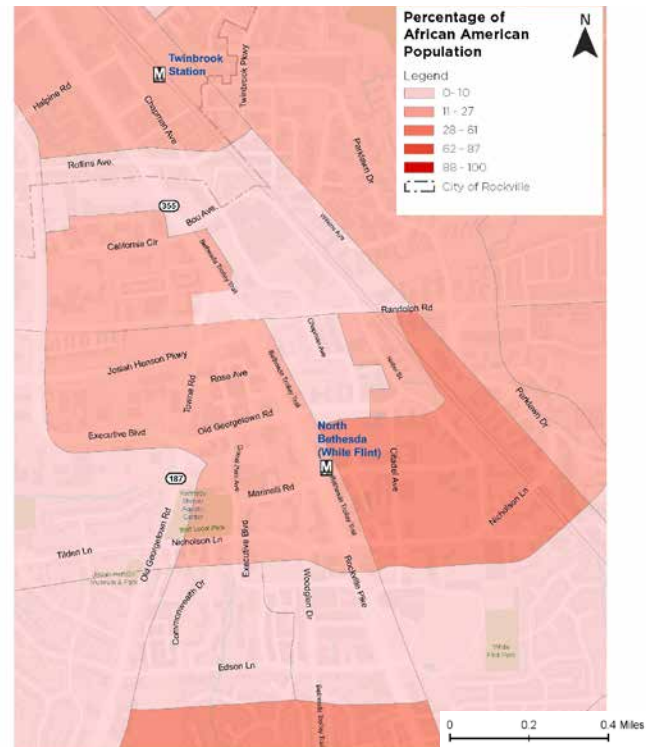


Figure 3.10 shows a high concentration (greater than 25%) of Hispanic population is observed in the neighborhoods that are to the east of the Metro rail line beyond Randolph Road. While Hispanic people live in the City of Rockville much fewer are observed in the residential areas central to North Bethesda.

Figure 3.10: Percentage of Hispanic Population

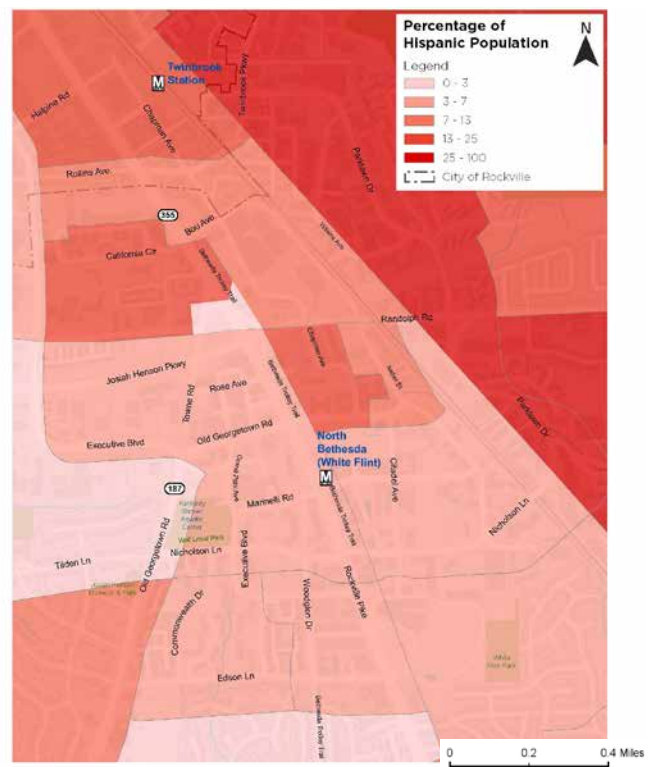
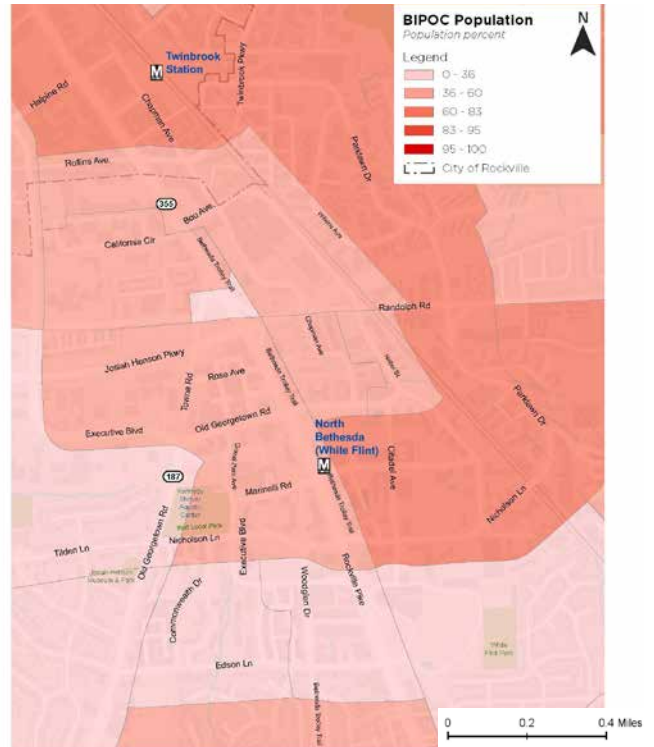


Figure 3.11 shows the distribution of Black Indigenous and People of Color (BIPOC) population is high (36%-60%) in neighborhoods to the north and south of the North Bethesda Metro Station south of Old Georgetown Road. Higher distribution of BIPOC populations is prevalent in the neighborhoods to the east of the study area that overlaps with a high prevalence of Hispanic populations.

Figure 3.11: BIPOC Population (Percentage)

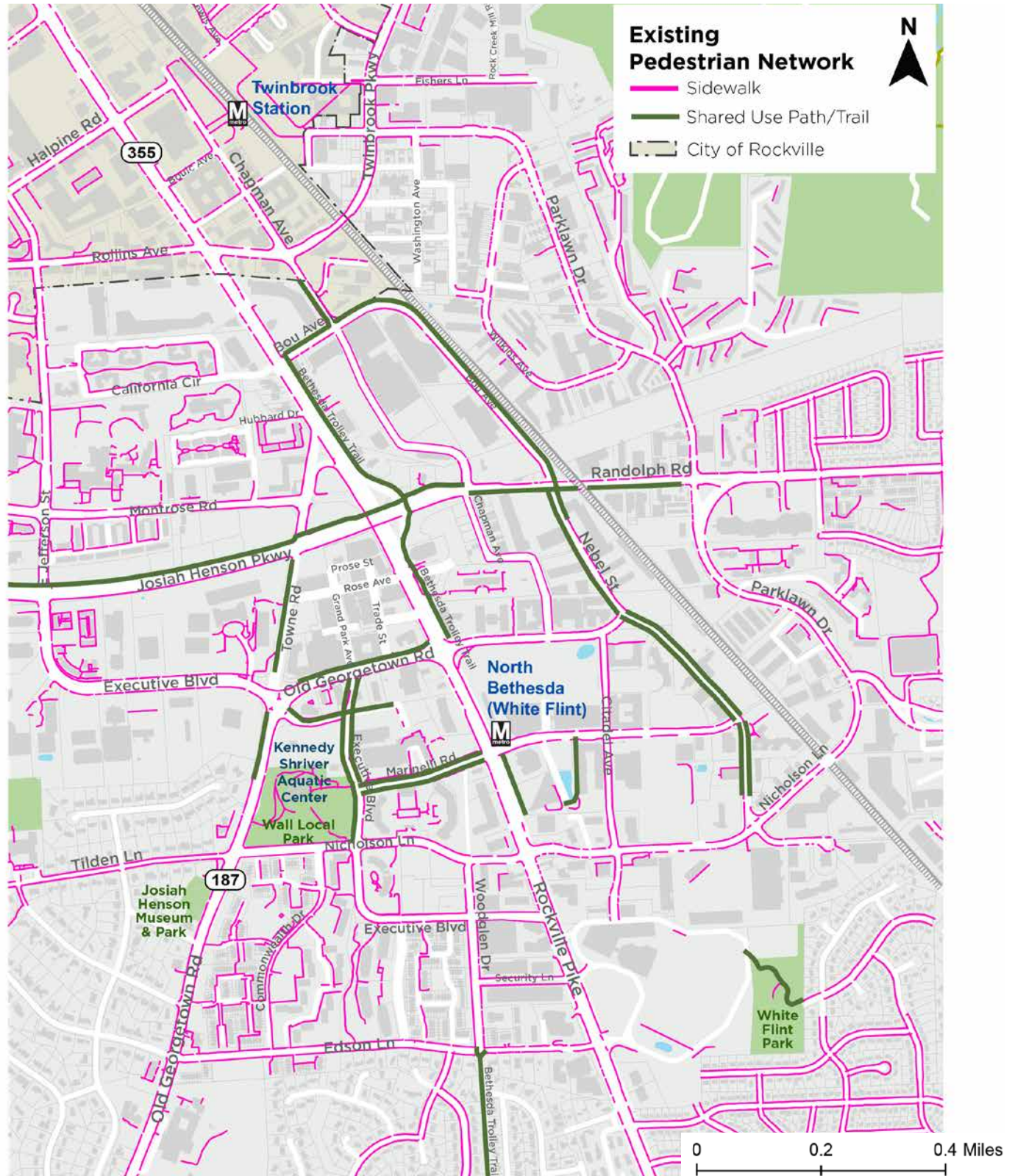


## Existing Pedestrian Network

Most of the roads in the study area have sidewalks on both sides. However, many sidewalks are not buffered by a curb or are not wide enough for pedestrians to feel safe and comfortable walking along high-speed, high-traffic volume

roads. Some sidewalk gaps exist along Bou Avenue and Citadel Avenue. Crossings are not frequent and are mostly limited to signalized intersections.

Figure 3.12: Existing Pedestrian Network



### Existing condition of pedestrian facilities in North Bethesda



Crosswalk across Rockville Pike at Old Georgetown Road



Sidewalk along Twinbrook Parkway, East of Chapman Avenue



Shared Use Path along Marinelli Road, West of Rockville Pike



Intersection of Twinbrook Parkway and Chapman Avenue



Right-Turn Slip Lane and Sidewalk at Nicholson Lane & Rockville Pike



Sidewalk along Marinelli Road, East of Rockville Pike



Sidewalk along Nicholson Lane, West of Rockville Pike



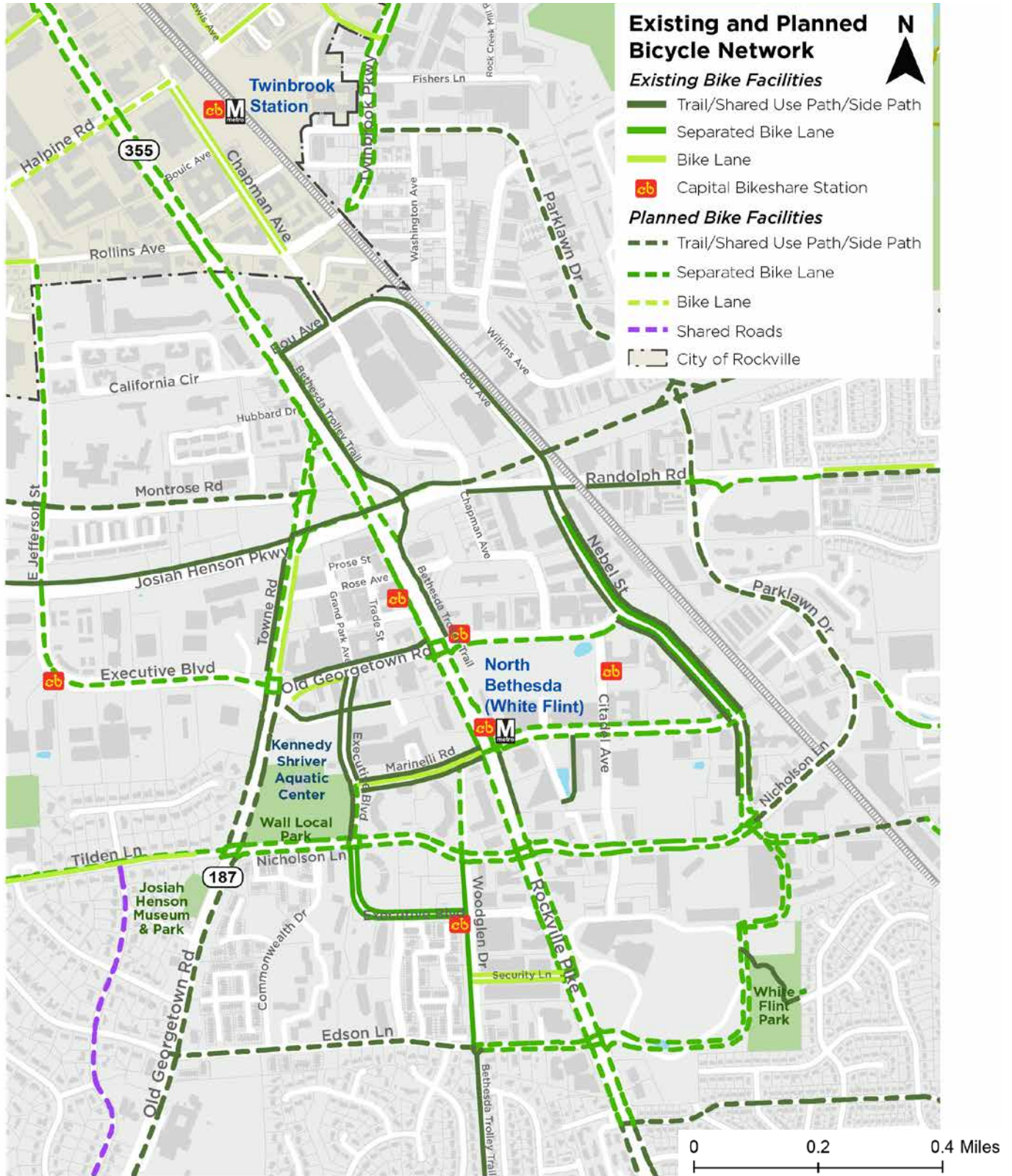
Sidewalk along Nicholson Lane, East of Rockville Pike

## Existing Bikeway Network

figure 3.13 shows the existing and planned bicycle projects in the study area. This network includes a range of facility types such as shared-use paths, separated single and two-way bike lanes. For majority of the length of Rockville Pike (MD 355) a Shared Use Path has been built to connect to

places. On roads in the east and west of MD 355, there are separated bicycle facilities in both directions particularly on Bou Avenue, Nebel Street, Executive Boulevard and Nicholson. The segment on Woodglen Drive has a two-way separated bicycle facility.

Figure 3.13: Existing and Planned Bicycle Network



Existing condition of bicycle facilities in North Bethesda



Shared Use Path along Old Georgetown Road, West of Rockville Pike



Shared Use Path along Towne Road/Hoya Street



Shared Use Path along Executive Boulevard/Grand Park Avenue



Shared Use Path along Nebel Street



One-Way Separated Bike Lanes along Executive Boulevard



One-Way Separated Bike Lanes along Nebel Street



Two-Way Separated Bike Lanes along Woodglenn Drive



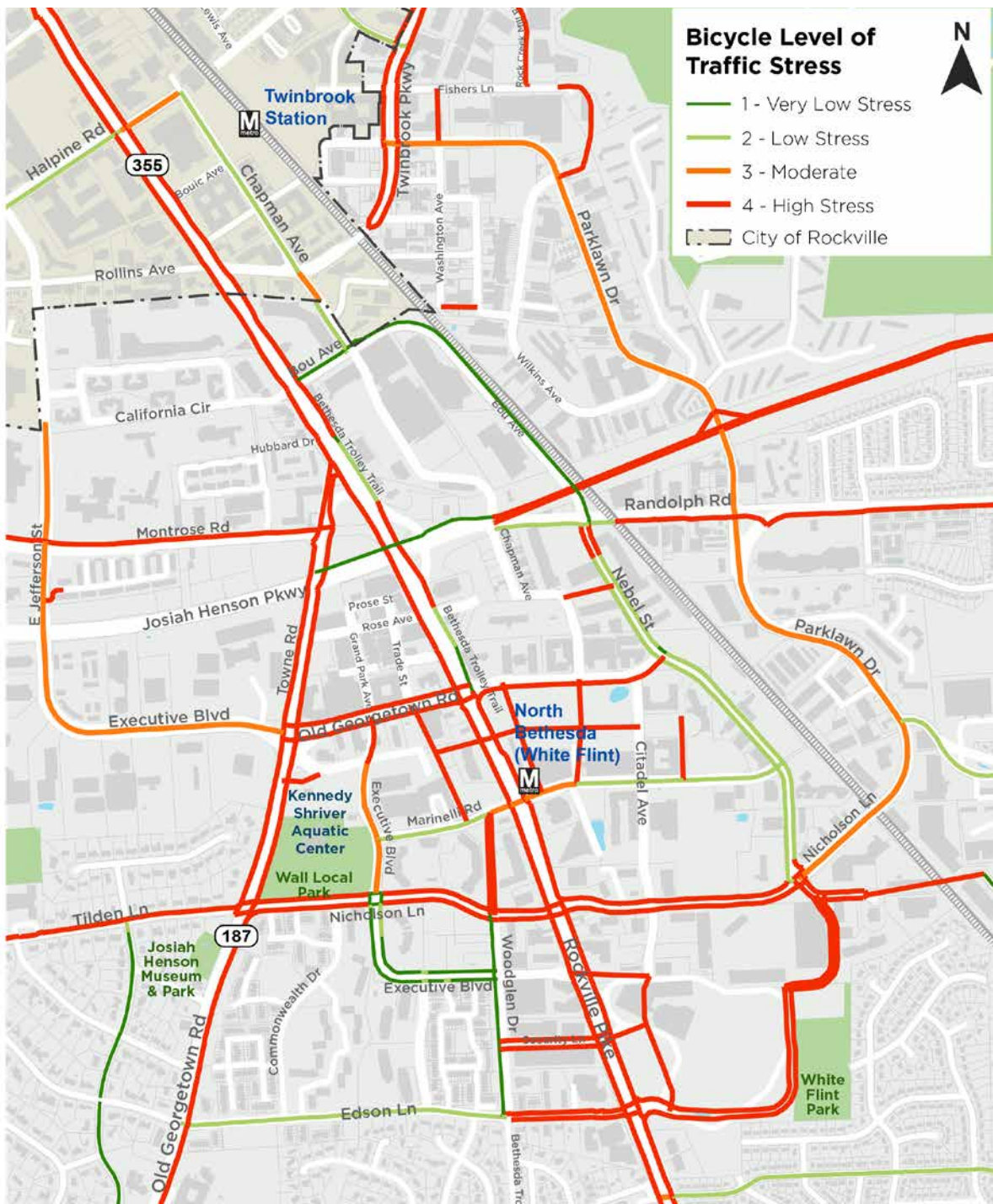
Wide Sidewalk/Shared Use Path along Nebel Street

## Bicycle Level of Traffic Stress

Bicycle Level of Traffic Stress (LTS) is a classification system developed by the Montgomery Planning Department to assess the comfort and safety of bicycling in different areas of Montgomery County. LTS takes into account factors like traffic volume, speed, road design, and presence of bicycle infrastructure. It uses a scale from 1 (low-stress) to 4 (high-stress), helping guide planning and design decisions

for more bike-friendly conditions. Figure 3.14, shows that most of the arterial roads in the study area, like Rockville Pike (MD 355), Old Georgetown Road (MD 187), Nicholson Lane, and Marinelli Road, are classified as High to Moderate Bicycle Level of Traffic Stress. However, several planned and under-construction projects along these roads will assist in decreasing the Bicycle Level of Traffic Stress on these roads.

Figure 3.14: Bicycle Level of Traffic Stress



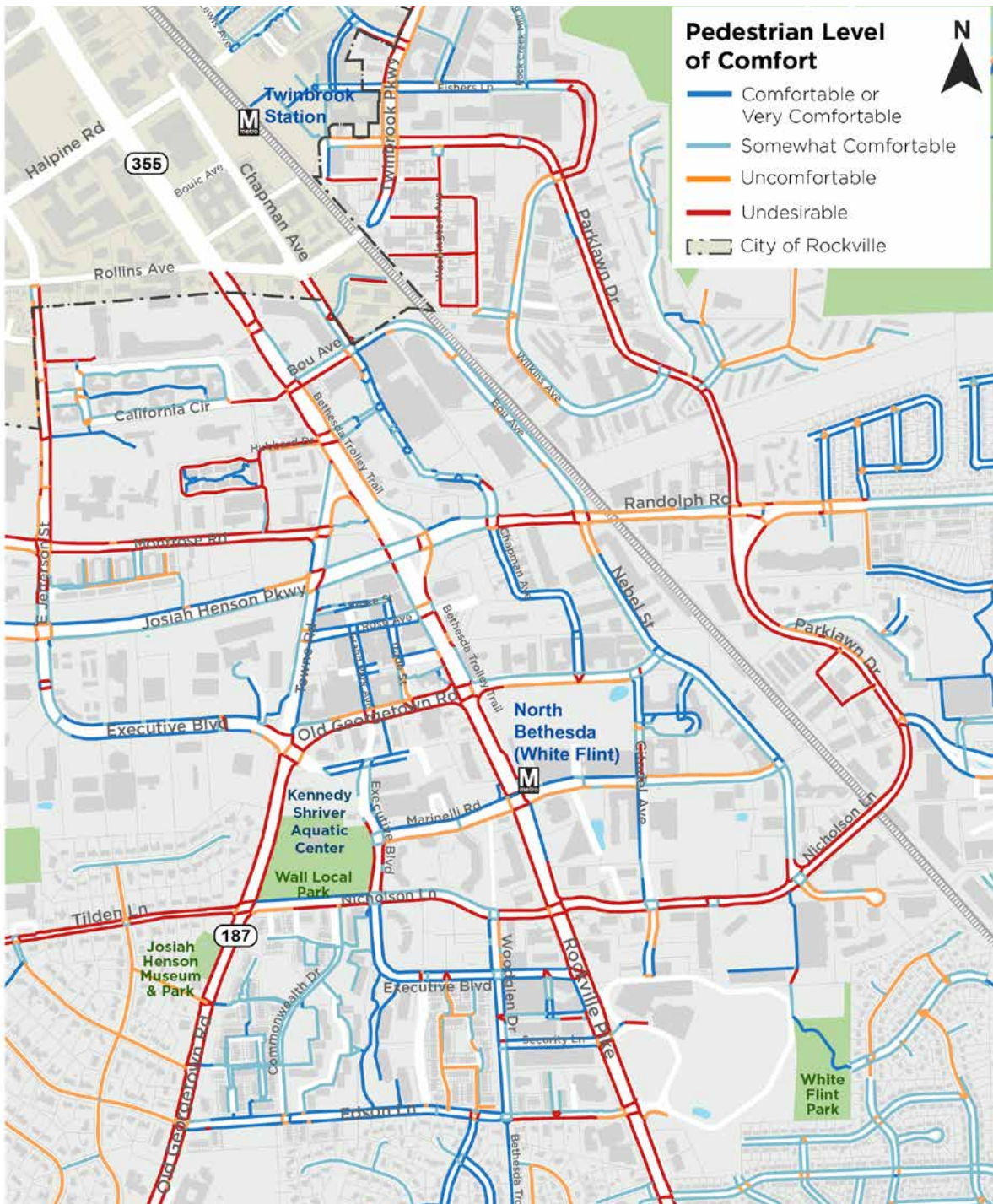


## Pedestrian Level of Comfort

Pedestrian Level of Comfort (PLC) measures how safe, convenient, and comfortable pedestrians feel while walking in a specific location. Factors such as sidewalk width, street furniture, lighting, traffic speed, and separation from vehicles are considered to create pedestrian-friendly environments that enhance the walking experience. Figure 3.15 shows that many segments of Rockville Pike (MD 355), Nicholson Lane, Marinelli Road, and Old Georgetown Road

(MD 187) are classified as Uncomfortable or Undesirable as per the Pedestrian Level of Comfort Analysis. Several Shared Use Paths are currently under construction or planned along Old Georgetown Road (MD 187) and Rockville Pike (MD 355). These Shared Use Paths will enhance pedestrian comfort along these roads. Future projects along Marinelli Road and Nicholson Lane could improve pedestrian facilities.

Figure 3.15: Pedestrian Level of Comfort



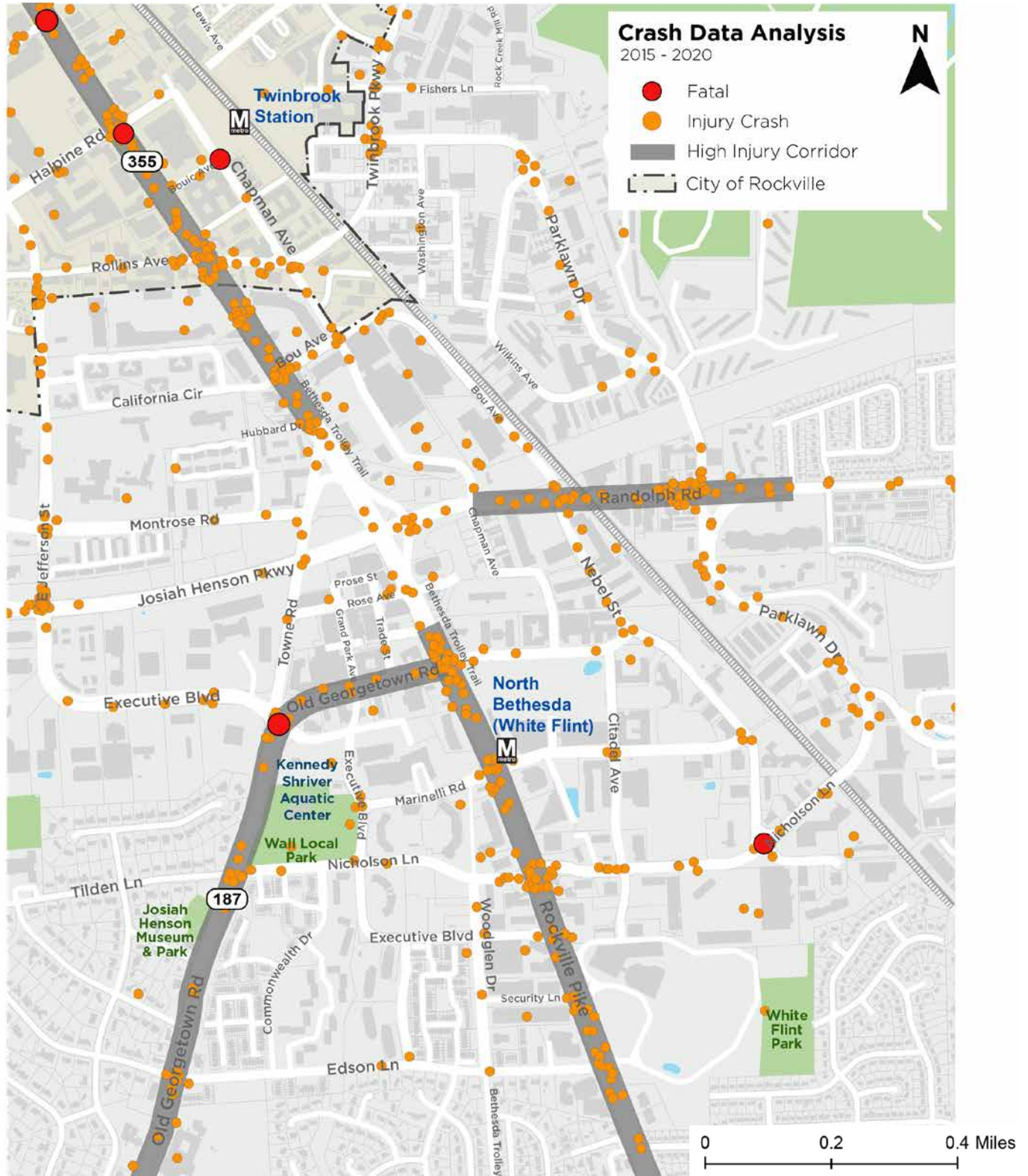
## Crash Analysis

### Crash Severity (2015 - 2020)

Between 2015 and 2020, there were a total of five fatal crashes recorded. Additionally, there has been a cluster of injury crashes reported along the routes of Rockville Pike (MD 355), Old Georgetown Road (MD 355), Old Georgetown Road (MD 187), and Randolph

Road. Rockville Pike (MD 355), Old Georgetown Road (MD 187), and Randolph Road are also on the County's High Injury Network.

Figure 3.16: Crash Severity

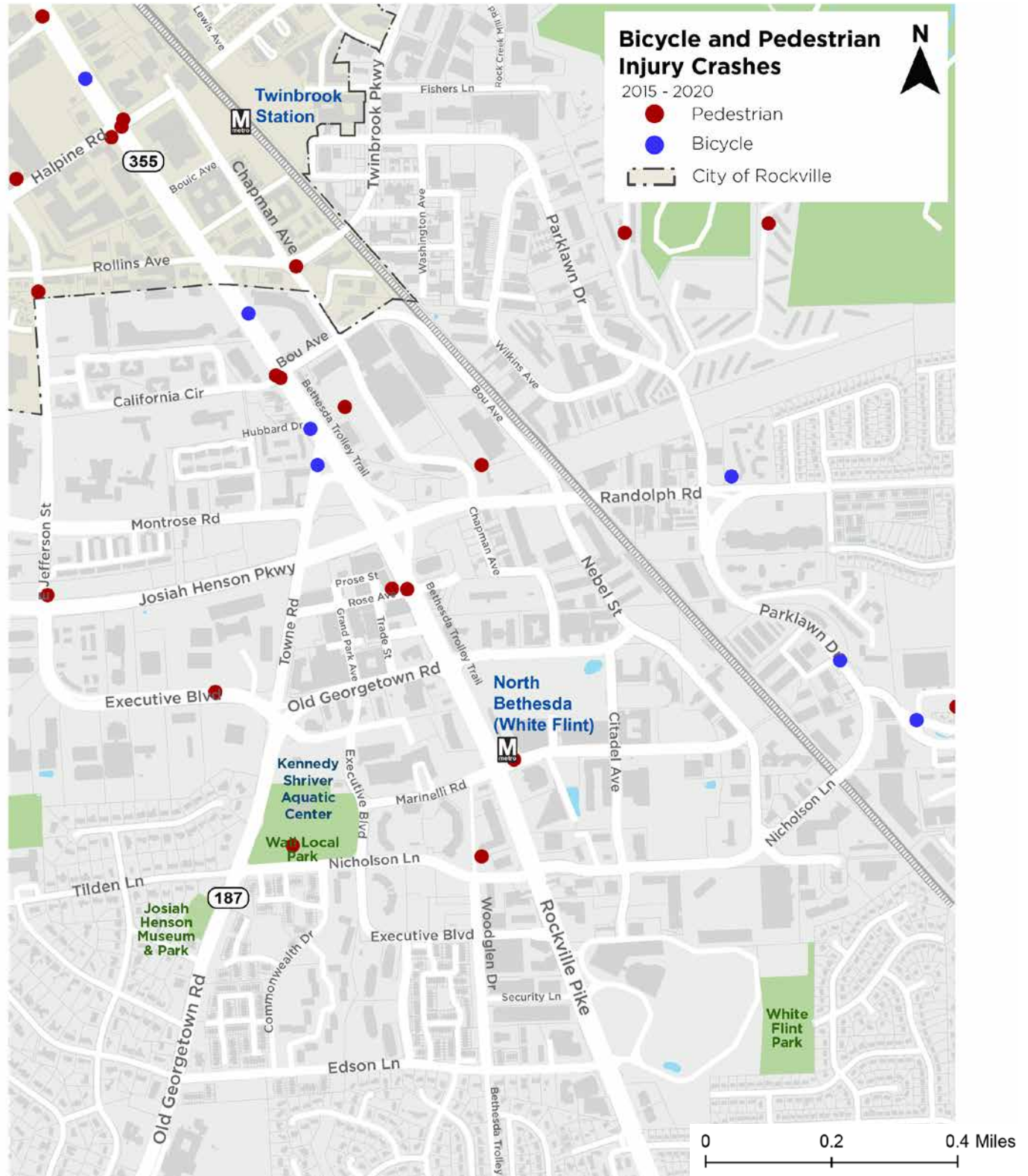


### Bicycle and Pedestrian Injury Crashes (2015 - 2020)

The analysis of bicycle and pedestrian crashes in the study area helps in identifying corridors that experience a high frequency of such incidents. During the period of 2015 to 2020, there were a total of 21 pedestrian crashes and

7 bicycle crashes recorded. Notably, these crashes were concentrated along Rockville Pike (MD 355), indicating a clustering of incidents involving pedestrians and bicyclists in that area.

Figure 3.17: Bicycle and Pedestrian Injury Crashes

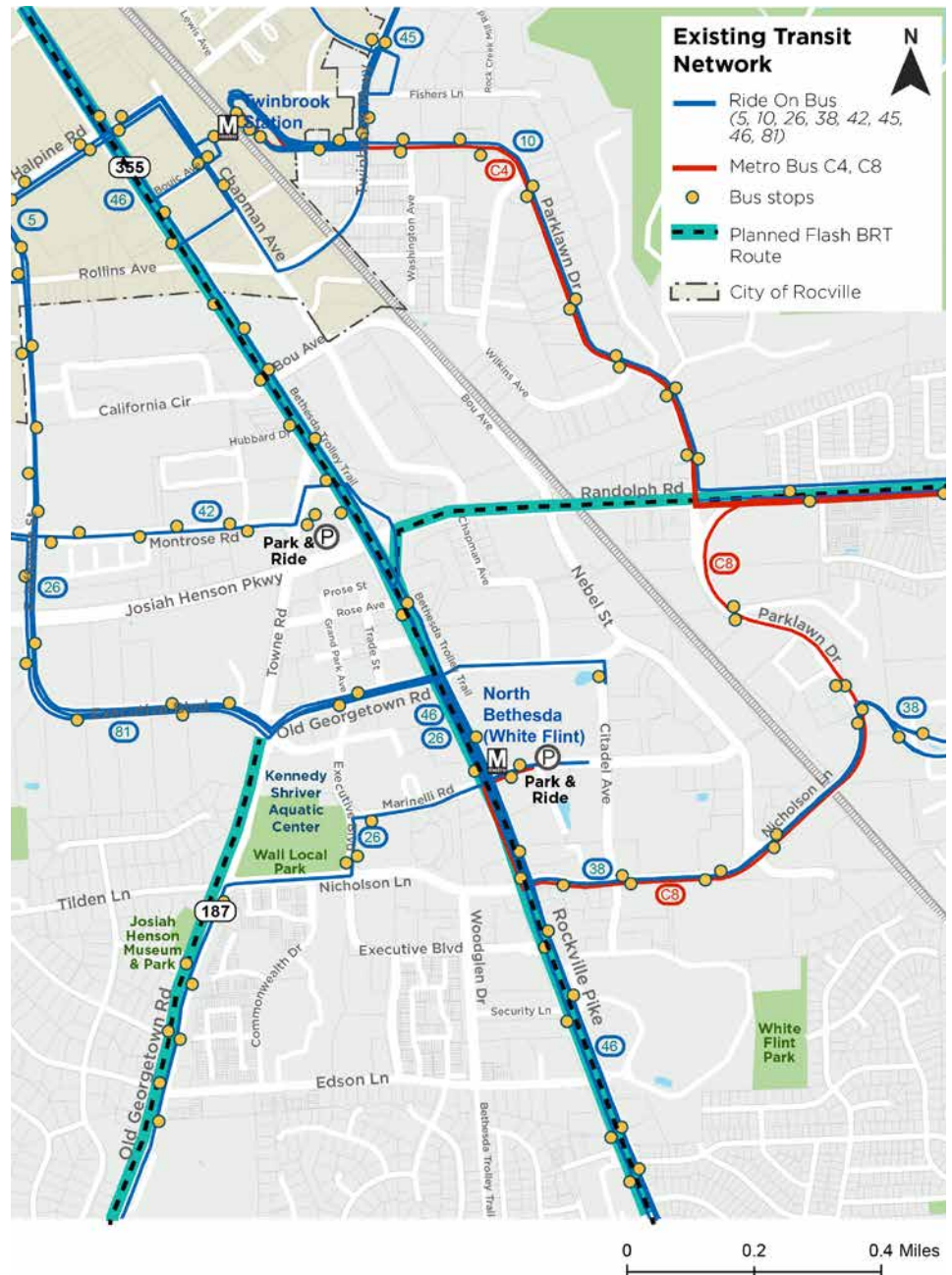


## Transit Network

Figure 3.18 shows the existing transit modes available within the study area are:

- Metro Bus (Route C4 and C8) serves the neighborhoods in the east providing connectivity to North Bethesda and Twinbrook Station
- Metrorail WMATA (North Bethesda and Twinbrook Stations)
- Montgomery County Bus service - Ride On Routes 5, 10, 26, 38, 42, 45, 46, 81)
- There are two Metro Bus lines that service this area, namely C4 and C8.
- Metro bus C4 and C8 serve the neighborhoods in the east providing connectivity to North Bethesda and Twinbrook Station
- C4 – 10-30 minutes headway - Serves Twinbrook Metro, Veirs Mill area, Wheaton Metro, University Boulevard area and Prince George’s Plaza Metro.
- C8 – 35 minutes headway - Serves North Bethesda Metro, Randolph Road, Veirs Mill Road, Glenmont Metro, New Hampshire Avenue, University of Maryland.

Figure 3.18: Transit Network



The county bus-based transit service Ride-On, ensures connectivity withing North Bethesda to adjacent towns.

- Ride-On route 46 and route 5 run north south on Rockville Pike and are a weekly bus service. They do not run on the weekends.
- Ride-On route 5, 42 and 81, connect the northwest neighborhoods to North Bethesda and route 46 on Rockville Pike.

- Ride-On route 26 enters North Bethesda from Old Georgetown Road and connects to destinations along Rockville Pike via Marinelli Road.
- Ride-On route 45, 10 and C4 are bus services in the northeast that connect people from City of Rockville and Twinbrook Station to the destinations in the study area.

## Planned Transit Projects

Two FLASH Bus Rapid Transit (BRT) projects are being planned in the study area:

- Rockville Pike (MD 355)
- Old Georgetown Road (MD 187)

### FLASH BRT along Rockville Pike (MD 355) in North Bethesda

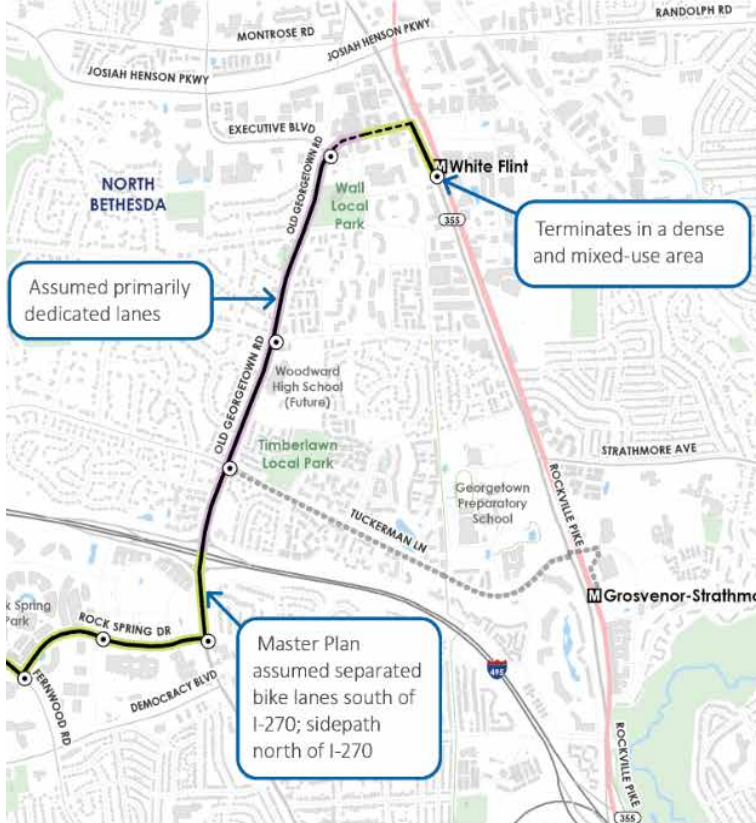


### Recommended alignment for FLASH BRT along Old Georgetown Road (MD 187) in North Bethesda

### FLASH BRT along Rockville Pike (MD 355)

Figure 3.19: FLASH BRT alignment on Georgetown Road (MD 187)

Figure 3.20: FLASH BRT alignment on Rockville Pike (MD 355)



Source: MCDOT

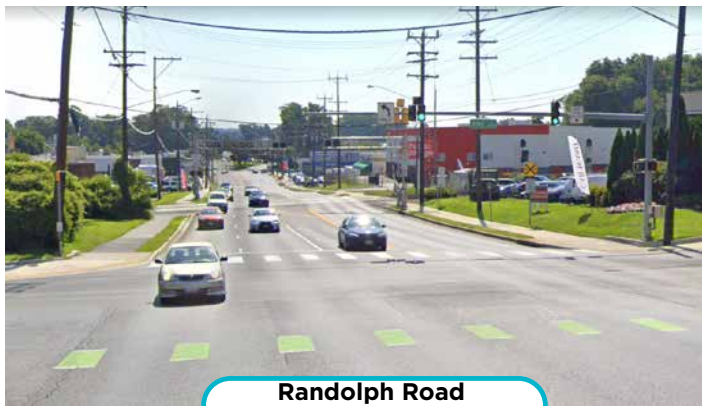
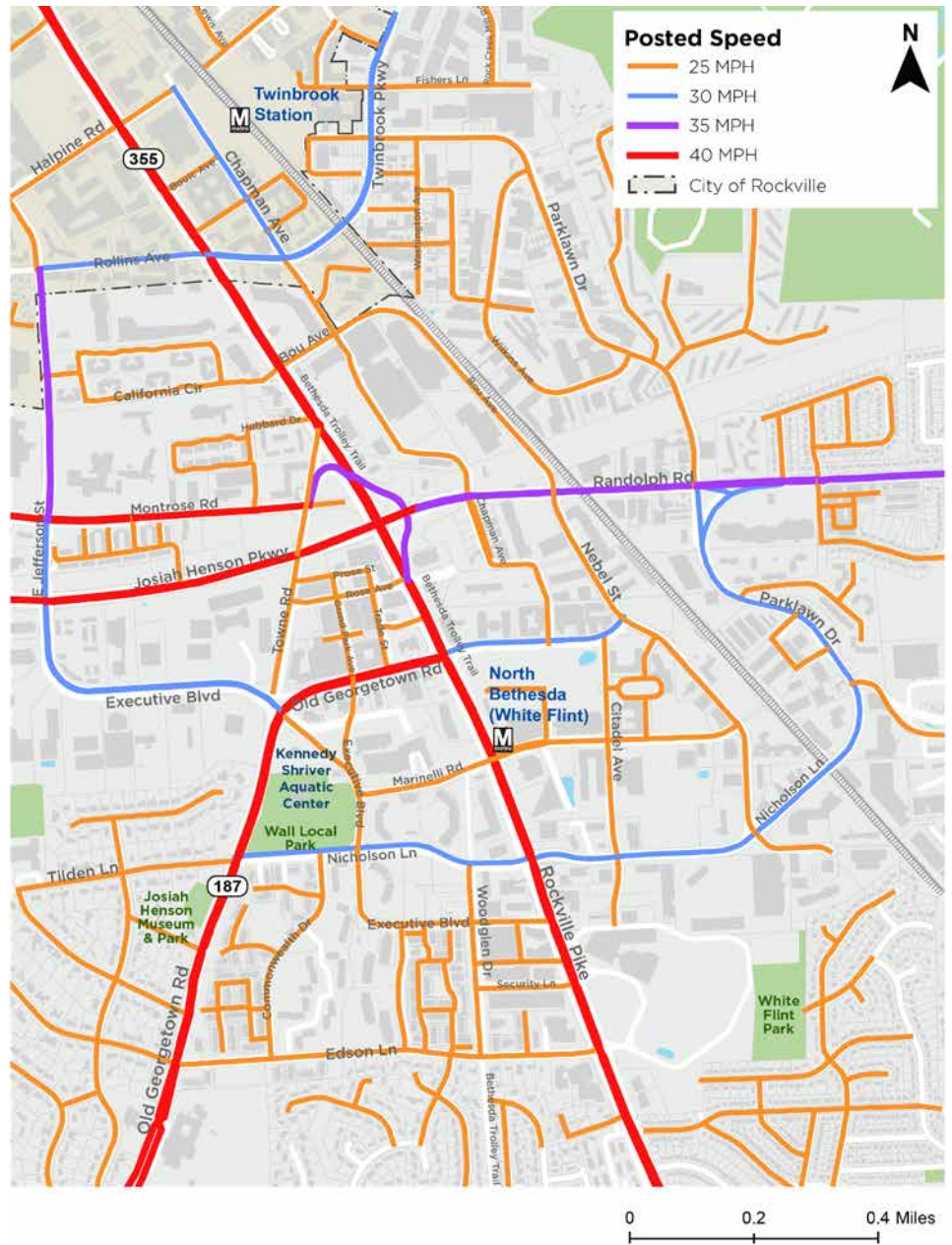
Source: MCDOT

## Speed Limit

Roadway characteristics will help establish baseline existing conditions and will assist in developing alternatives and assess impacts. Roadway characteristics will also help determine comfortable routes for people on bikes and what type of bicycle facilities can be designed within pavement widths and ROW.

The following section summarizes the findings from the existing roadway evaluation. Roads like Rockville Pike (MD 355), Old Georgetown Road (MD 187) Randolph Road are posted at 35 MPH and higher and do not feel safe and comfortable for pedestrians and bicyclists.

Figure 3.21: Posted Speed



Source: Google earth

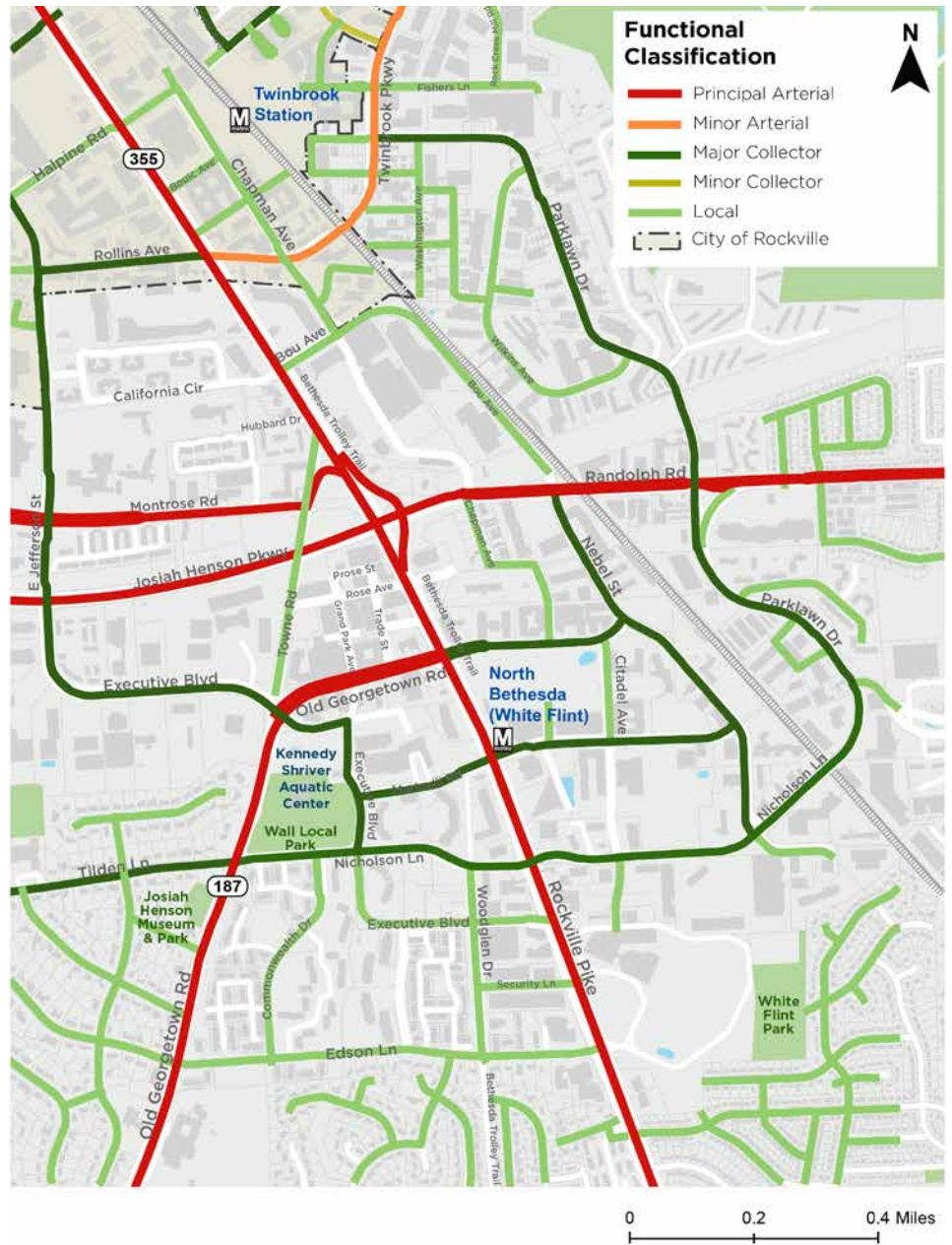


Source: Google earth

## Functional Classification

Many arterial and collector roads create barriers for pedestrians and bicyclists subdividing the study area.

Figure 3.22: Functional Classification



**Nicholson Lane  
(Looking East)**

Source: Google earth



**Marinelli Road  
(Looking East)**

Source: Google earth





## Chapter 4

# Route & Network Alternatives

The assigned BTT along Rockville Pike (MD 355) is not comfortable and low-stress for pedestrian and bicyclist as we seen in the previous chapter. However there are new low-stress facilities on parallel routes like Executive Boulevard, Old Georgetown Road (MD 187), Nebel Street, Bou Avenue, etc. provide an opportunity to rethink the branded BTT route in the study area. This section presents three route alternatives for BTT.

The recent and ongoing land use development projects also establish new destinations on both sides of Rockville Pike. A well-connected, low-stress and comfortable pedestrian and bicycle network is identified as the long-term vision that could be branded as BTT network in the long-term to connect new destinations in the study area.

The Bicycle Master Plan for Montgomery County aims to develop county-wide bicycle planning standards and is an important part of the Vision Zero Two-Year Action Plan, which seeks to eliminate traffic-related fatalities and serious injuries. The plan suggests the creation of a low-stress network of bikeways throughout the county,

ensuring that cyclists of all ages and abilities feel safe and comfortable while traveling to various destinations such as transit stations, workplaces, shops, and public facilities. To support this network, the plan introduces a new bikeway classification system that categorizes bikeways based on their level of separation from traffic. Additionally, the plan recommends the establishment of long-term bicycle parking stations at multiple transit stations to promote cycling as a mode of transportation.

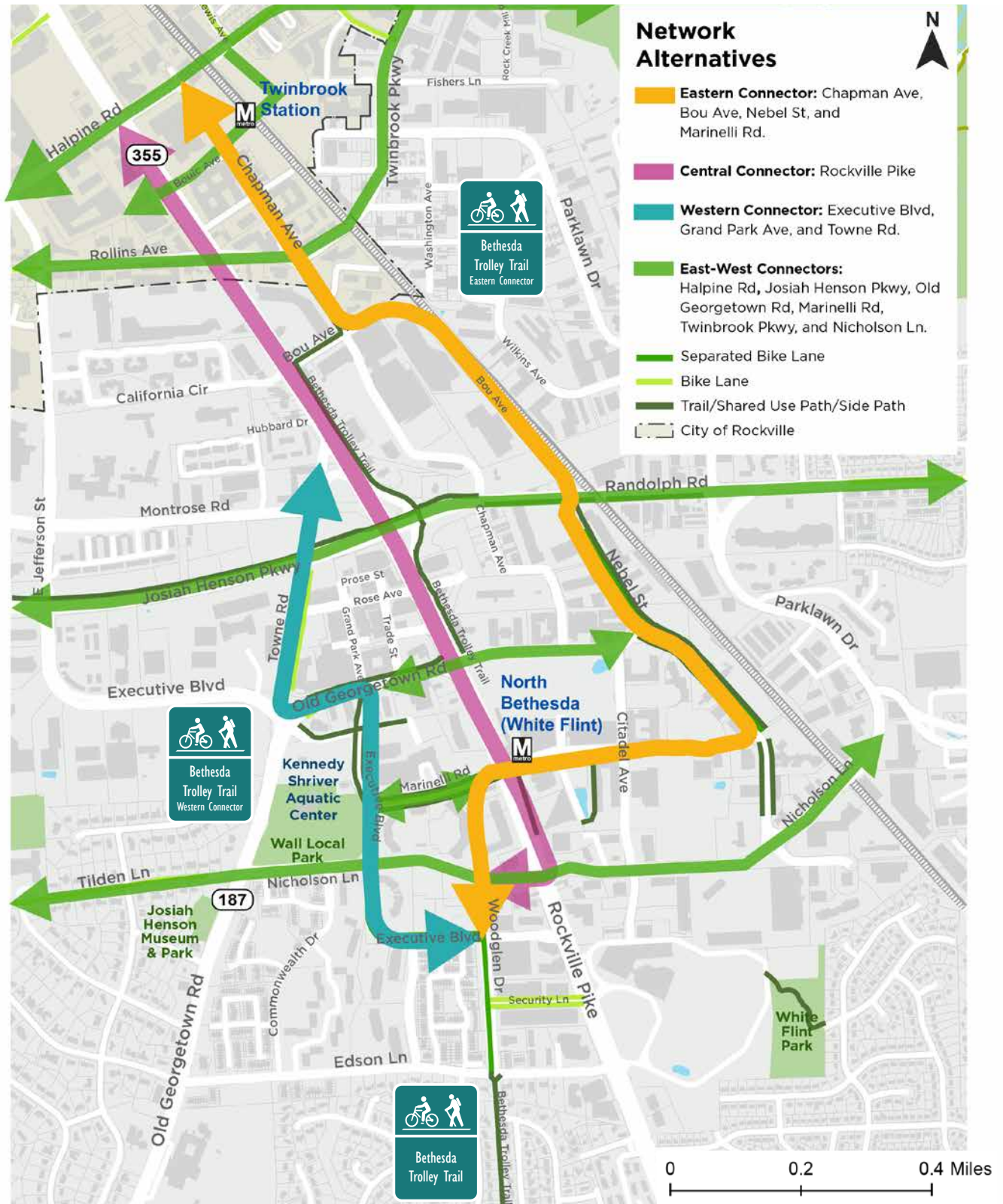
The potential alternative routes and bicycle facilities network was developed based on findings from the existing conditions assessment, bicycle level of traffic stress evaluation, and public feedback. This chapter outlines the route alternatives, wayfinding and potential facility types for North Bethesda. Figure 4.1 and Figure 4.6 and Table 3 illustrate the recommended connectors and the potential projects recommended respectively in alignment with the Bicycle Master Plan for Montgomery County.

## Expanding the Network

Figure 4.1 shows alternative routes linking existing bicycle facilities in North Bethesda. The Eastern, Central, and Western Connectors connect destinations like Twinbrook Station, shopping districts, North Bethesda Station, and the Bethesda Trolley Trail. The East-West connectors

recommend bicycle facilities on Halpine Road, Josiah Henson Parkway, Old Georgetown Road (MD 187), Marinelli Road, Twinbrook Parkway, and Nicholson Lane.

Figure 4.1: Network Alternatives

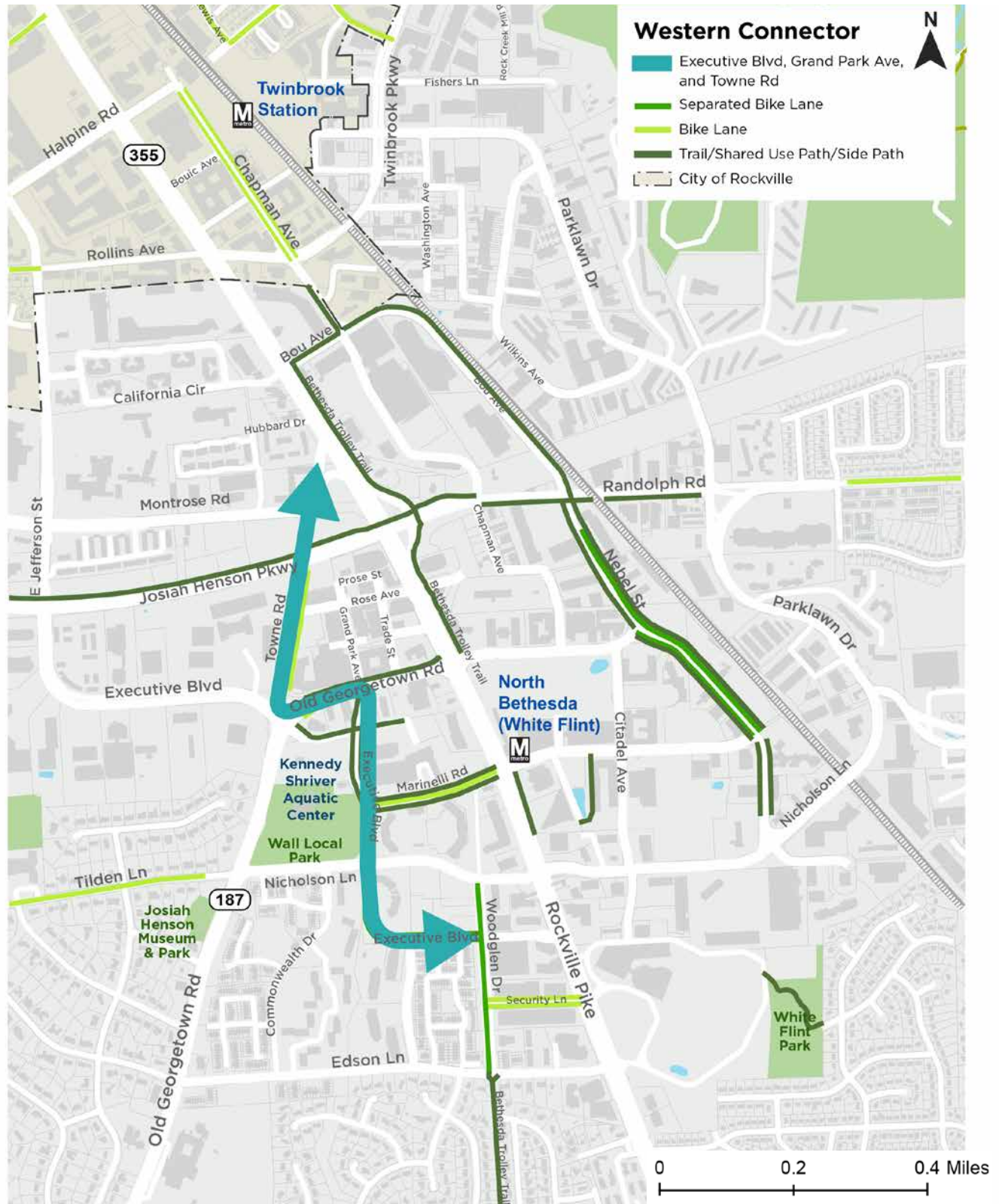


## The Western Connector

The Western Connector is a north-south route that links Towne Road, Grand Park Avenue, and Executive Boulevard. This particular segment will facilitate connections between the shared use path on Josiah Henson Parkway,

Old Georgetown Road (MD 187), and Marinelli Road, ultimately connecting to the bike lane on Woodglan Drive.

Figure 4.2: Western Connector

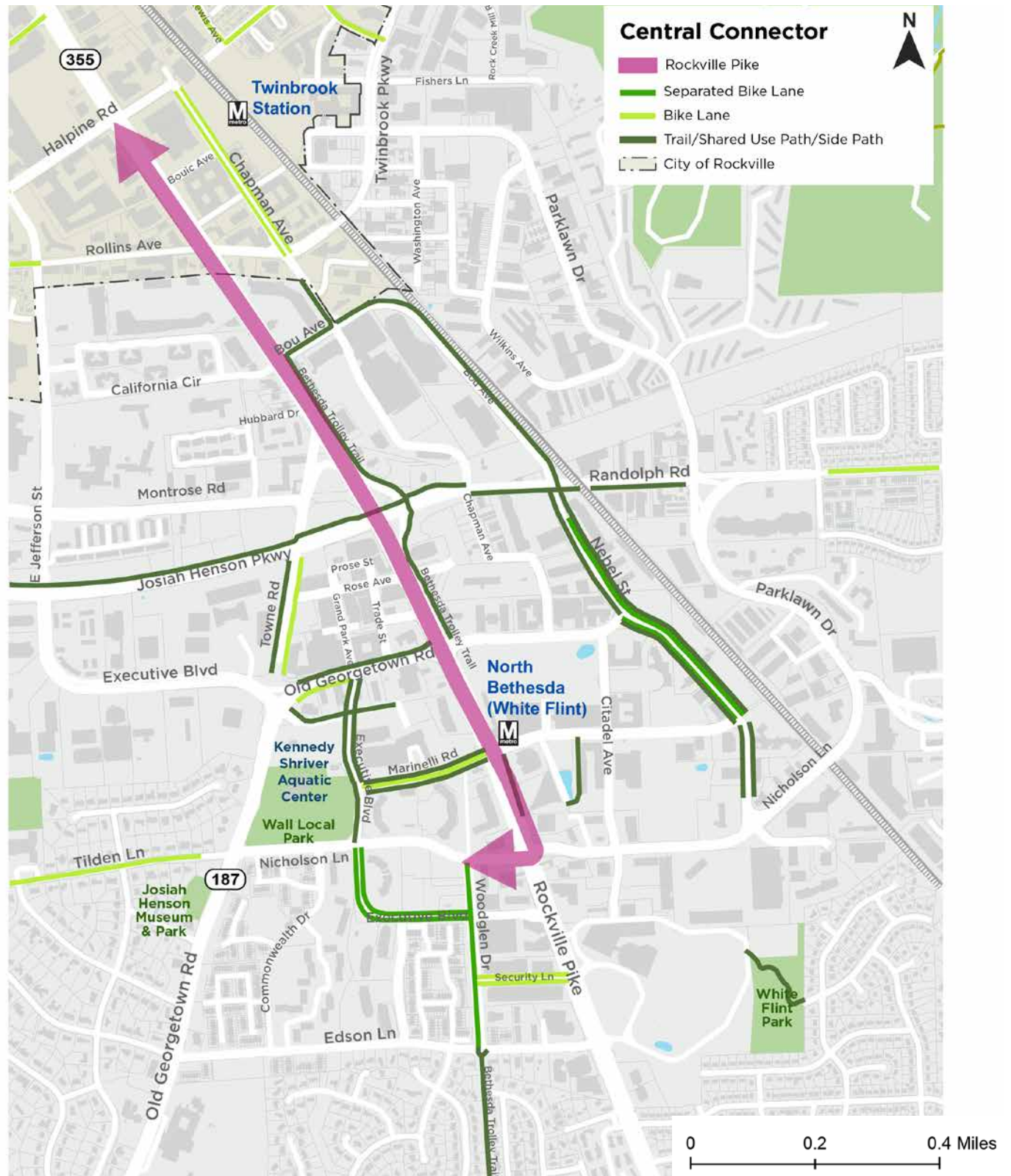


## The Central Connector

The Central Route traverses Rockville Pike (MD 355), addressing the existing gaps in the network. This specific segment aims to create a low-stress biking experience on Rockville Pike (MD 355), promoting both

biking and walking. Additionally, it will facilitate east-west connections, enhancing accessibility to various destinations in North Bethesda.

Figure 4.3: Central Connector

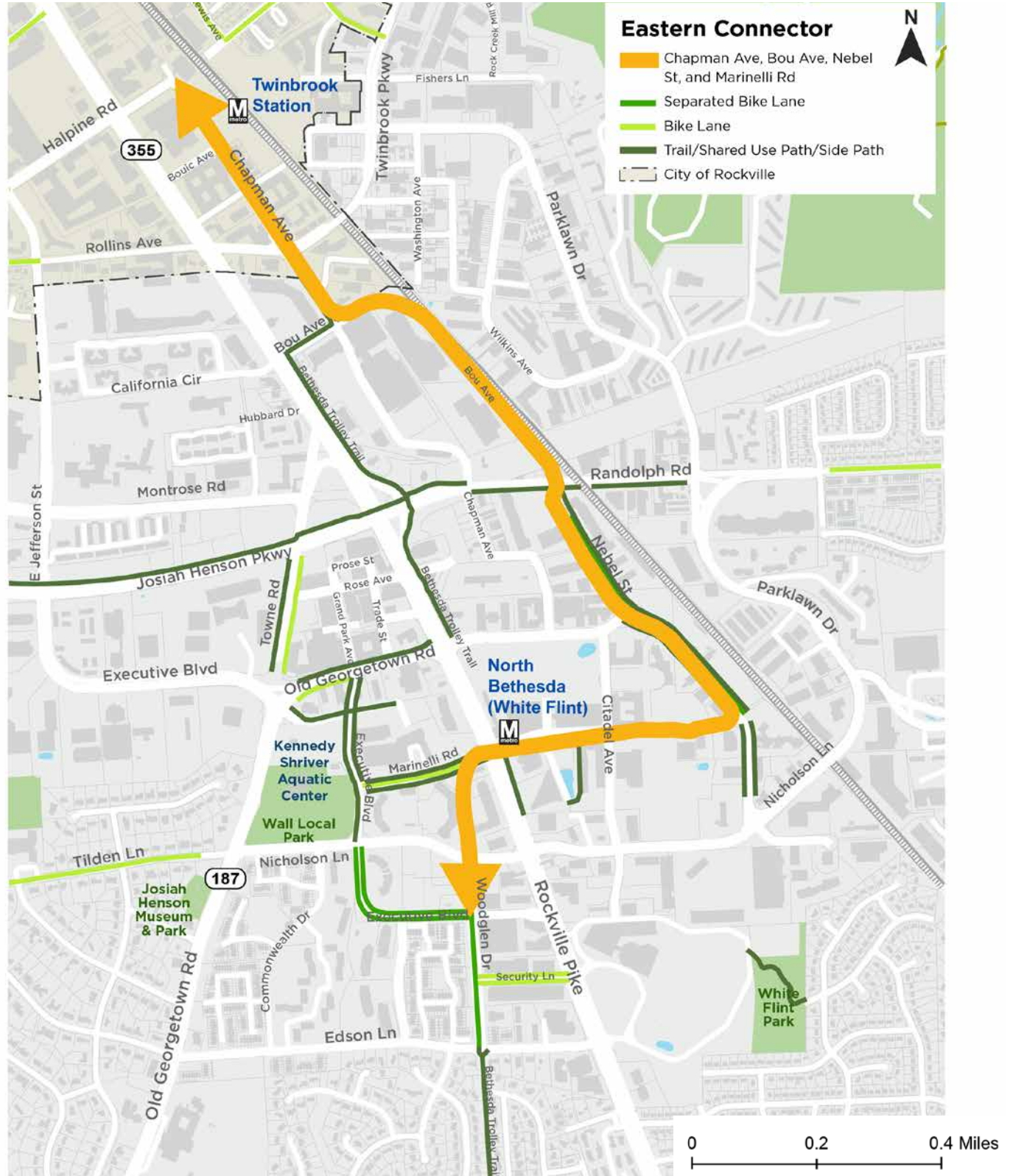


## The Eastern Connector

The Eastern Connector connects Twinbrook Station and North Bethesda Station, facilitating seamless transitions for transit and bicycle users. This segment plays a crucial role in connecting various destinations along Chapman Avenue, Bou Avenue, and Nebel Street, while also providing a link to the Bethesda Trolley trail via Woodglen Drive.

Bou Avenue, and Nebel Street, while also providing a link to the Bethesda Trolley trail via Woodglen Drive.

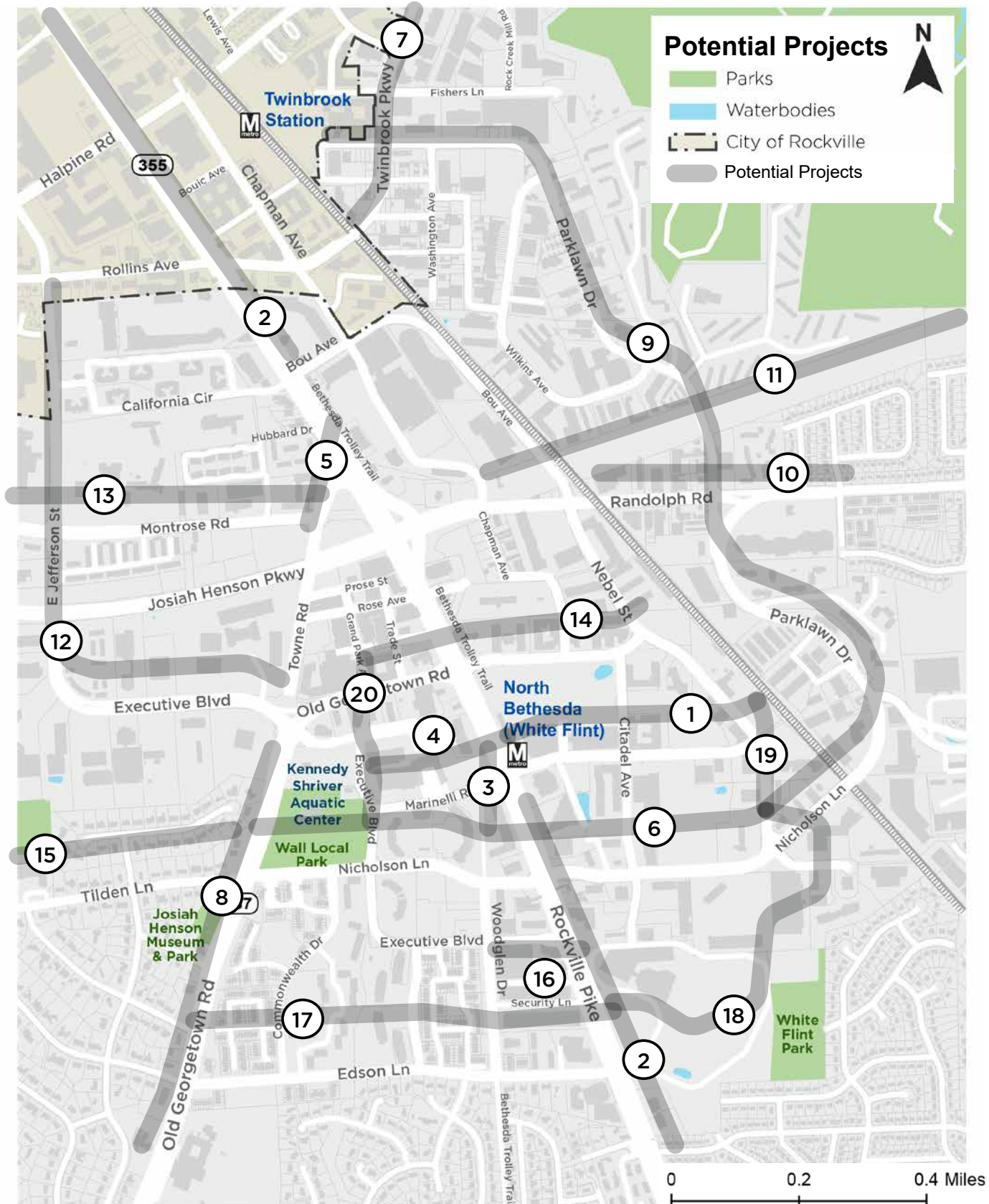
Figure 4.4: Eastern Connector



## Potential Projects To Complete the Network

There are several opportunities identified to complete the bikeway network in North Bethesda to achieve goals outlined in the Bicycle Master Plan for Montgomery County.

Figure 4.5: Potential Projects



## List of Potential Projects and Facility Type

Table 1 provides a compilation of recommendations for potential projects, specifying the appropriate facility type based on the characteristics of the roadway and the available right of way.

Table 3: List of Potential Projects

No.	Street Name	Extents	Potential Facility Type Recommendation
1	Marinelli Road	Rockville Pike (MD 187) to Nebel Street	Separated Bike Lanes (Design and construction funded for 2023)
2	Rockville Pike (MD 355)	North of Bou Avenue & South of Nicholson Lane	Shared Use Path (To be constructed as part of MD 355 FLASH BRT project)
3	Woodglen Drive	Nicholson Lane to Nebel Street	Separated Bike Lanes/Shared Use Path (Can be constructed as part of Saul Centers White Flint development)
4	Marinelli Road	Executive Boulevard to Rockville Pike (MD 355)	Separated Bike Lanes
5	Towne Road	Josiah Henson Parkway to Rockville Pike (MD 355)	Separated Bike Lanes/Shared Use Path
6	Nicholson Lane	Old Georgetown Road (MD 187) to Nebel Street	Separated Bike Lanes
7	Twinbrook Parkway	Rockville Pike (MD 355) to Veirs Mill Road	Separated Bike Lanes/Shared Use Path
8	Old Georgetown Road (MD 187)	Charles Street (Bethesda Trolley Trail) to Banneker Avenue	Separated Bike Lanes/Shared Use Path
9	Parklawn Drive	Nebel Street to Twinbrook Parkway	Shared Use Path
10	Randolph Road	Rail Tracks to Putnam Road	Separated Bike Lanes/Shared Use Path
11	Montrose Parkway (ROW)	Randolph Road to Veirs Mill Road	Shared Use Path/Trail
12	Executive Boulevard/ Jefferson Street	Old Georgetown Road (MD 187) to Rollins Avenue	Separated Bike Lanes/Shared Use Path
13	Montrose Road	Josiah Henson Parkway to Towne Road	Shared Use Path
14	Old Georgetown Road	Grand Park Avenue to Nebel Street	Separated Bike Lanes/Shared Use Path
15	Tilden Lane	Danville Drive to Old Georgetown Road (MD 187)	Shared Use Path
16	Security Lane	Woodglen Drive to Rockville Pike	Separated Bike Lanes
17	Edson Lane	Old Georgetown Road to Rockville Pike (MD 355)	Separated Bike Lanes/Shared Use Path
18	Nebel Street Extension	Rockville Pike (MD 355) to Nicholson Lane	Separated Bike Lanes
19	Nebel Street	Nicholson Lane to Marinelli Road	Separated Bike Lanes
20	Executive Boulevard	Nicholson Lane to Old Georgetown Road (MD 187)	Separated Bike Lanes

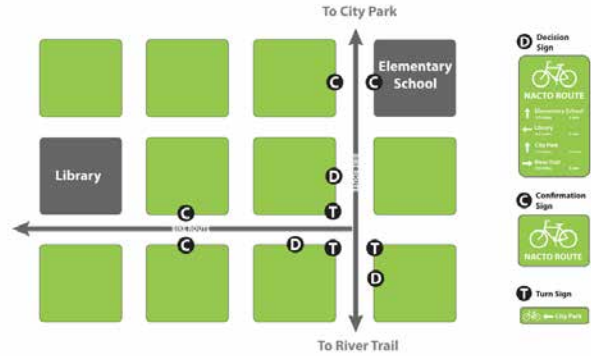
## Wayfinding Plan

A wayfinding system helps people orient themselves, explore new areas, and navigate to reach their destinations. A well-designed wayfinding and signage system can be integrated with place-making to foster a

sense of place. The study area will benefit from a well-designed wayfinding system to connect new development with various destinations such as retail, recreational, transit, and regional trails.

## Hierarchy Of Signs

A hierarchy of four types of signs Provides users with key information based on where they are in the network, reinforcing an engaging experience on the trail.



### Design Guidance for Bicycle Wayfinding System

Source: NACTO

## 1. Kiosks



Source: Pennsylvania Highlands



Source: Kittelson & Associates



Source: The Intertwine Alliance, OR



Source: Ayers Saint Gross

## 2. Trail Identification

## 3. Directional Signs



Source: Montgomery Planning



Source: Volpe, USDOT

## 4. Amenity & Regulatory Signs



Source: www.e3signs.com



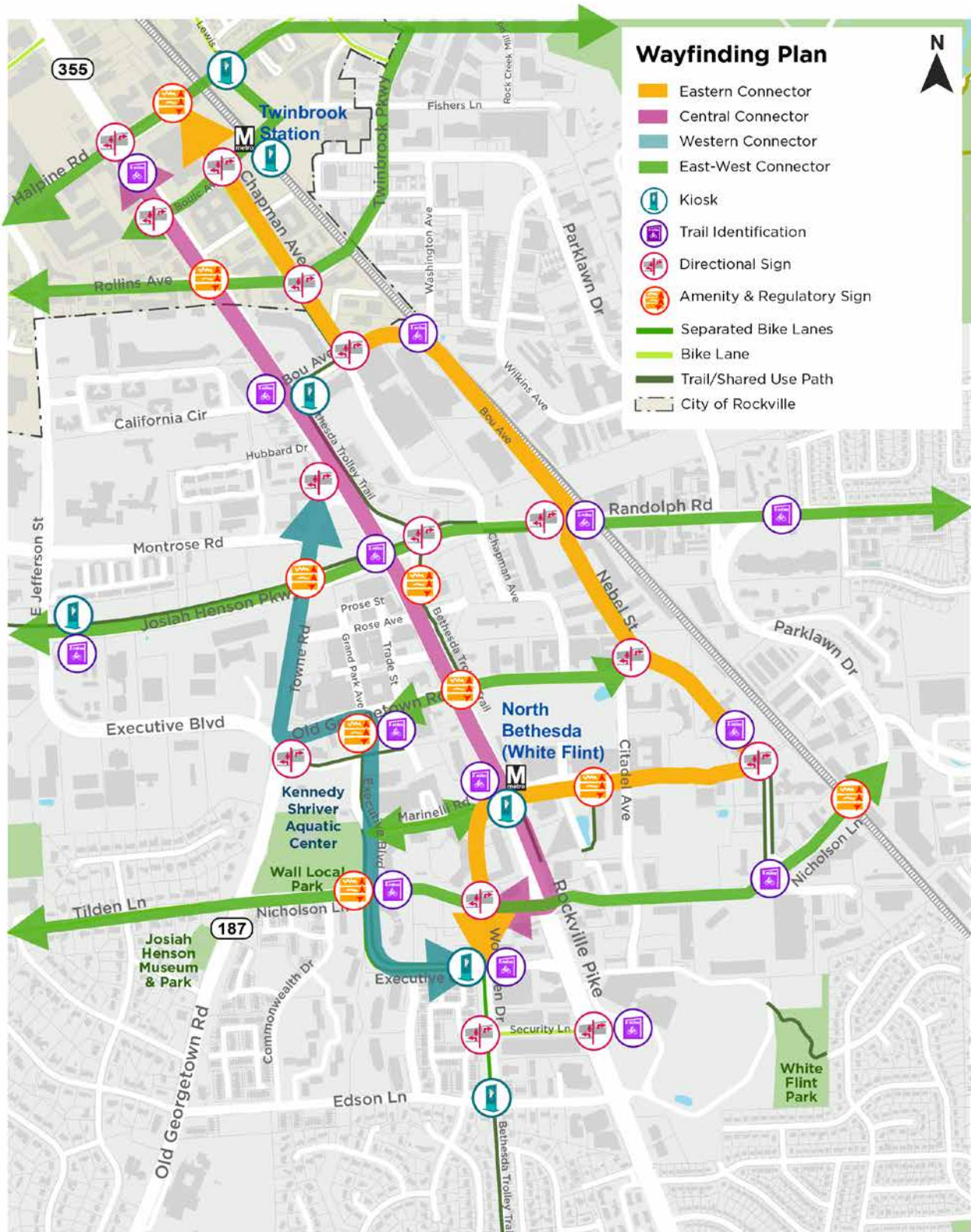
Source: www.dreamstime.com. Photo: Stuart Perry



Figure 4.6 depicts a conceptual wayfinding plan using various sign types in the study area. These sign types including kiosks with network maps, mile marker trail identification signs, directional signs for navigation, and amenity signs for information on amenities, reminders, and regulations.

Montgomery Planning is working on a comprehensive wayfinding and branding initiative. As part of this bikeways branding endeavor, the department will be implementing a pilot program on the Western Connector by installing new signs on the route.

Figure 4.6: Wayfinding Plan



## Options to Implement Without Property or Curb Impacts

This section explores the possibility of incorporating separated low-stress bike facilities by repurposing the existing road space without altering the curbs. Consider a scenario where the road consists of four travel lanes alongside buffered sidewalks and trees that are aligned with the road. Figure 4.6 demonstrates how different types of bicycle facilities may be implemented. These examples are for illustrative purposes only.

To integrate any bicycle facility within this framework, a road diet would be necessary. A road diet is a design strategy that involves reducing the number of travel lanes on a road to allocate space for other purposes, such as bike lanes or wider sidewalks. The primary objective is to enhance safety and accommodate various modes of transportation. This process entails narrowing the overall right of way to create a more balanced and pedestrian-friendly street environment.

Figure 4.7: Example Street Cross Section to illustrate implementation of bicycle facilities without widening.



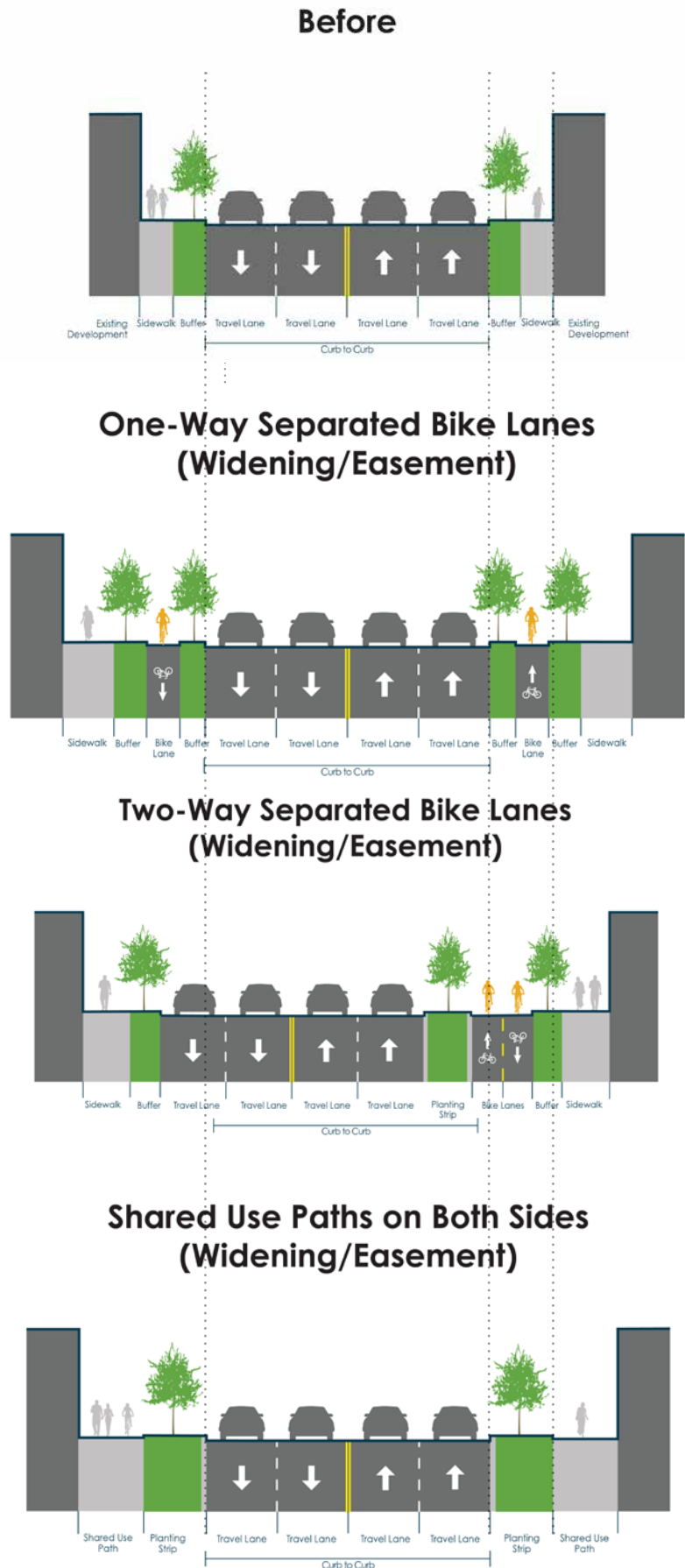
## Options to Implement With Widening/Easement/Redevelopment

This section discusses the need for additional space beyond the curb to include a particular low-stress bicycle facility. In such cases one may need to get additional easement and/or right of way that can make this possible.

This expansion allows for the creation of dedicated spaces for bike lanes and sidewalks alongside the roadway. By widening the road, there is more room available to safely accommodate cyclists and pedestrians, providing separate and protected areas for their use. It helps enhance the overall transportation infrastructure, promotes active modes of transportation, and improves safety for non-motorized users sharing the road with vehicles.

Redevelopment projects provide an excellent opportunity to require developers and property owners to dedicate easement or ROW.

Figure 4.8: Example Street Cross Section to illustrate implementation of bicycle facilities with roadway widening.



## Next Steps

In May 2023, the recommendations were finalized, setting the stage for further action. The focus shifted to developing the Final Report in June 2023, outlining the comprehensive plan. This section outlines the forthcoming steps and action items based on the recommendations identified in this study.

As part of this plan, MCDOT proposed the implementation of a wayfinding signage pilot program near the North Bethesda Metro Station area. This initiative aimed to improve navigation and provide clear directions for commuters and visitors. Additionally, MCDOT sought to accelerate the progress of bikeway projects in North Bethesda. By doing so, they aimed to establish a fully connected network of bikeways in the region within the coming years, promoting sustainable transportation options and enhancing the overall accessibility of the area.

The Montgomery County Bicycle Master Plan aims to create a world-class bikeway system that connects people to their destinations while promoting equity and enhancing the well-being of residents. The Bikeway Branding Plan project will develop a cohesive brand identity, including logos and

signage, for the network. The goal is to create fabrication-ready design templates that can be applied to any bikeway in the county, ensuring consistency and a sense of place.

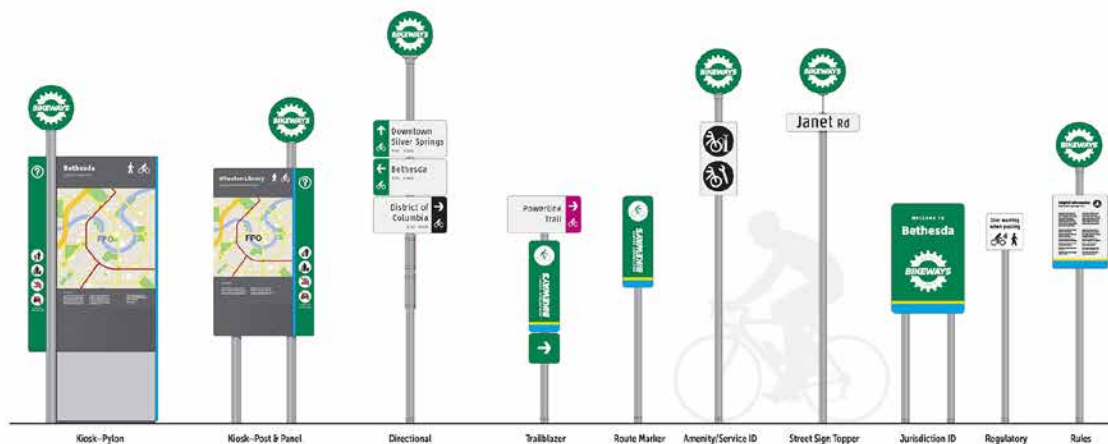
The ultimate goal of the plan is to develop design templates that are ready for fabrication. These templates can be applied to any bikeway within Montgomery County, ensuring a consistent and cohesive visual identity throughout the entire network.

**The Western Connector presented in this report has been selected to pilot this bikeway branding project.**

*Breezeway Branding, by Montgomery Planning*



*Bikeway Branding Sign Types, by Montgomery Planning*





Source: Kittelson & Associates

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