

### INTRODUCTION

This concept plan details the development of a bikeway between the Glenmont Metrorail station and downtown Silver Spring via downtown Wheaton. While the original intent of the plan was to introduce the county to the neighborhood greenway concept, the presence of Interstate-495 in the plan area presents several design challenges that make a continuous neighborhood greenway complicated and costly to implement. Therefore, this short-term concept includes segments of sidepaths and conventional bike lanes, rather than one continuous treatment along the corridor. The Bicycle Master Plan, however, could recommend a continuous neighborhood greenway between Glenmont and Silver Spring, given its long-term vision for connecting all major activity centers by low-stress bikeways.

While sidepaths and bike lanes are recognized bikeway types, neighborhood greenways do not yet exist in Montgomery County. Also known as bicycle boulevards or slow streets, neighborhood greenways are streets with low volumes of motorized traffic (less than 2,000 vehicles per day), slow vehicular speeds (less than or equal to 25 mph) and are designed to give priority to bicycling and walking.

Neighborhood greenways use signs, pavement markings and speed and volume management measures to discourage through-trips by motor vehicles and create safe, convenient crossings of busy arterial streets. Specific infrastructure treatments can be installed to help bridge gaps in the low-stress street network to slow traffic and/or improve safety. Some of these treatments may be:

- Traffic diverters (full or partial) at key intersections to reduce cut-through traffic while permitting passage by pedestrians and bicyclists.
- Assigning priority to the neighborhood greenway at intersections with stop controls at two legs so bicyclists can ride with few interruptions.
- Neighborhood traffic circles and mini-roundabouts at minor intersections to slow traffic but allow bicyclists to maintain momentum.
- Measures to reduce traffic speeds, including speed humps, speed cushions, chicanes and neckdowns.
- Wayfinding signage to guide bicyclists to the neighborhood greenway and key destinations along it.
- Shared lane markings (sharrows) where appropriate to alert drivers to the path bicyclists need to take on a shared roadway.
- Crossing improvements at the intersection of major streets, including traffic signals, median refuges and curb extensions, to facilitate safe walking and bicycling crossings.

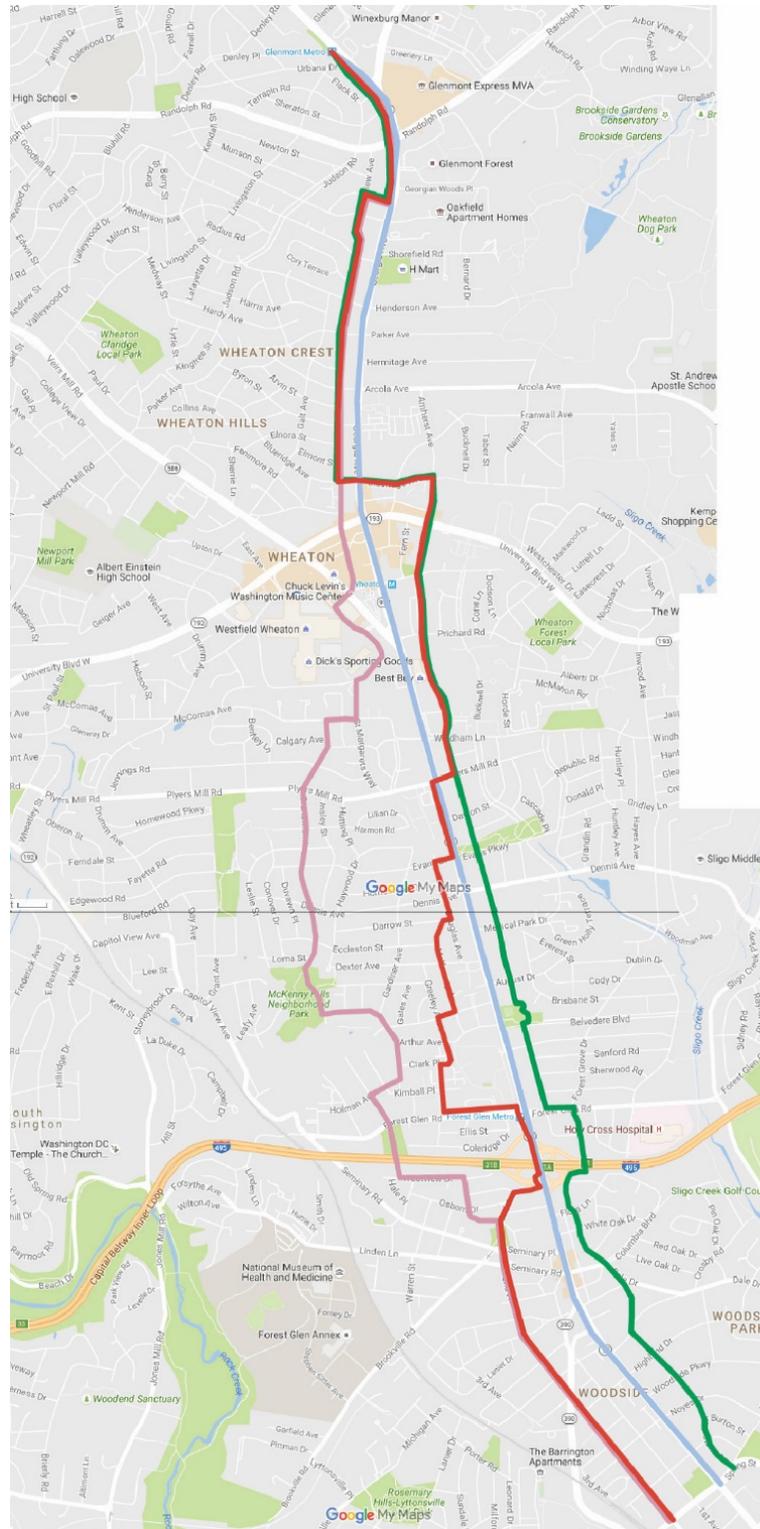
Many of the recommendations in this concept plan are detailed in the design toolkit in the appendix to the Bicycle Master Plan.

This concept plan is divided into three sections: First, the advantages and disadvantages of several routes are discussed. Second, the preferred route is highlighted. Third, the proposed treatments for the preferred route are described with supporting rationale and an accompanying map.

# DRAFT Concept Plan for a Glenmont to Silver Spring Bikeway

## ROUTES CONSIDERED

Potential routes considered are shown in the map below. The table that follows describes each potential route and its advantages and disadvantages.



- Georgia Avenue —
- Westside —
- Eastside —
- 2<sup>nd</sup> Avenue —

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**COMPARISON OF ROUTES**

Name	Description	Advantages	Disadvantages
Georgia Avenue	The Glenmont Greenway and Grandview Avenue from Wheaton to Glenmont. Sidepath along Georgia Avenue from the Wheaton Metrorail Station to Spring Street via I-495 bicycle-pedestrian bridge.	<ul style="list-style-type: none"> <li>• Flattest route.</li> <li>• Most direct route</li> <li>• Bicycle-pedestrian bridge crossing I-495 already exists.</li> </ul>	<ul style="list-style-type: none"> <li>• Building an off-street bikeway would require substantial construction and moving utilities, in addition to potential additional right-of-way purchases.</li> <li>• Without redevelopment, many existing driveway and curb cuts on Georgia Avenue around Seminary Road make a low-stress off-street facility difficult to construct.</li> <li>• Without ample setbacks and landscaping, a sidepath along Georgia Avenue will be an uncomfortable, unpleasant experience due to adjacent automotive traffic.</li> </ul>
Westside	The Glenmont Greenway and Grandview Avenue from Wheaton to Glenmont. From the Wheaton Metrorail Station to Spring Street along local streets and a new shared-use bridge crossing I-495 at Forest Glen Park.	<ul style="list-style-type: none"> <li>• Creates an additional I-495 crossing for pedestrians and bicyclists, increasing the number of routing options for these modes.</li> <li>• Generally relies on low-stress neighborhood streets to connect the central business districts (CBDs).</li> </ul>	<ul style="list-style-type: none"> <li>• Complicated, indirect route between Wheaton and Silver Spring.</li> <li>• Significant grade changes north of I-495.</li> <li>• New bridge is a costly expense.</li> </ul>
Eastside	The Glenmont Greenway and Grandview Avenue from Wheaton to Glenmont. From the Wheaton Metrorail Station to Spring Street along Woodland Drive and other local streets.	<ul style="list-style-type: none"> <li>• Creates an additional I-495 crossing for pedestrians and bicyclists, increasing the number of routing options.</li> <li>• Closely follows Georgia Avenue; very direct.</li> <li>• Generally relies on low-stress neighborhood streets to connect the CBDs</li> </ul>	<ul style="list-style-type: none"> <li>• New bridge is a costly expense.</li> <li>• Certain sections of the route would need to wait for redevelopment for right-of-way to become available.</li> <li>• Two blocks of Woodland Drive are one-way streets.</li> <li>• One block of Woodland Drive from Dennis Avenue to Evans Parkway is steep.</li> </ul>

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Name	Description	Advantages	Disadvantages
2 <sup>nd</sup> Avenue	The Glenmont Greenway and Grandview Avenue from Wheaton to Glenmont. Short sidepath on Georgia Avenue south of Wheaton. Along 2 <sup>nd</sup> Avenue and other local streets from Wheaton Metrorail Station to Spring Street to via I-495 bicycle-pedestrian bridge.	<ul style="list-style-type: none"> <li>• Bicycle-pedestrian bridge crossing I-495 already exists.</li> <li>• Generally relies on low-stress neighborhood streets to connect CBDs.</li> <li>• Closely follows Georgia Avenue; very direct.</li> </ul>	<ul style="list-style-type: none"> <li>• More route jogs than some other alignments.</li> <li>• Multiple Georgia Avenue crossings may dissuade some users from using this alignment.</li> </ul>

**PREFERRED ROUTE**

After considering estimated cost of construction, feasibility and topography, the study team selected the 2<sup>nd</sup> Avenue route to pursue as a short-term bikeway between the Glenmont Metrorail Station and downtown Silver Spring.

Starting at the Glenmont Metrorail Station, the bikeway travels south along the Glenmont Greenway, located on the west side of Georgia Avenue. The bikeway turns west onto Maston Street and then south onto Grandview Avenue. Entering the Wheaton CBD, it turns east onto Blueridge Avenue, crosses Georgia Avenue, and then turns south onto Amherst Avenue. The bikeway heads west onto Plyers Mill Road, crosses Georgia Avenue a second time, and travels south along the west side of Georgia Avenue for a block. It then turns west onto Evans Drive and south onto Douglas Avenue, then heads southwest onto McKenney Avenue. It turns west onto Hildarose Drive, south onto Greeley Avenue, and west onto Clark Place, and then south onto Darcy Forest Drive. The bikeway turns east onto Forest Glen Drive, traveling along the north side of the road, and then turns south onto the west side of Georgia Avenue. It travels along the Interstate-495 bicycle-pedestrian bridge, heads west onto Lansdowne Way, through Montgomery Hills Park, and south onto 2<sup>nd</sup> Avenue, terminating at Spring Street.

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### BIKEWAY TREATMENTS

This section details the improvements recommended to create a low-stress bikeway between Glenmont and downtown Silver Spring. A comprehensive wayfinding plan should also be completed to direct users to the neighborhood greenway and help them navigate it. Proposed treatments are described starting at the Glenmont Metrorail Station and heading south to downtown Silver Spring.

### THE GLENMONT GREENWAY

Treatment: Sidepath

From the Glenmont Metrorail Station, the bikeway travels south along the Glenmont Greenway and passes under the future Georgia Avenue and Randolph Road interchange, under construction as of December 2016.

This analysis presupposes that the reconstructed Randolph Road intersection has adequate crossing facilities and signal timing, which provides sufficient bicyclist crossing time.

1. Roads intersecting the Glenmont Greenway (Sheraton Drive, Judson Road and Urbana Drive) should have signage installed beneath their existing stop signs that advises drivers to look for two-way bicycle traffic on the greenway. See example below.



Two-way bicycle traffic signage (Recommendation 1)

### MASON STREET

Treatment: Neighborhood Greenway

The bikeway turns west onto Mason Street and then south onto Grandview Avenue.

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2. Install a marked crosswalk at the intersection of Georgia Avenue and Mason Street.
  - This crosswalk will aid northbound bicyclists transitioning from to Mason Street to the Glenmont Greenway by improving motorist awareness of crossing activity.

### GRANDVIEW AVENUE FROM MASON STREET TO ARCOLA AVENUE

Treatment: Neighborhood Greenway

3. Construct a traffic circle at the intersection of Mason Street and Grandview Avenue.
  - This traffic circle will reduce motor vehicle speeds while allowing bicyclists to travel smoothly through the intersection.
4. Install speed cushions.
  - This treatment will slow motorized traffic without impeding bicyclists.
5. Switch stop signs from north/south to east/west at Lindell Street, Henderson Avenue, Parker Avenue, and Arcola Avenue.
  - This improvement prioritizes the neighborhood greenway as the through movement, making it more convenient and quicker to use.
6. Tighten the curb radius at the northwest corner of Weisman Road and Grandview Avenue.
  - This tightened radius will slow southbound right turns and northbound left turns, making the intersection safer for all road users.

### GRANDVIEW AVENUE FROM ARCOLA AVENUE TO BLUERIDGE AVENUE

Treatment: Neighborhood Greenway

4. Install speed cushions.
  - This treatment will slow motorized traffic while not impeding bicyclists.
5. Switch stop signs from north/south to east/west at Dawson Avenue.
  - This improvement prioritizes the neighborhood greenway as the through movement, making it more convenient and quicker to use.
7. Because Grandview Avenue is an existing one-way street in the southbound direction, a six-foot northbound contraflow bicycle lane should be striped. The 10-foot southbound travel lane should be upgraded with shared lane markings. This recommendation requires the removal of vehicular parking on the east side of the roadway.
  - Grandview Avenue is the most direct route to access the Glenmont area. Creating the contraflow bicycle lane in the northbound direction provides for two-way bicycle travel.
8. The parking lot exit near the intersection of Grandview Avenue and Blueridge Avenue should be signed to inform drivers to watch for contraflow bicycle traffic. See example for Recommendation 1.

### BLUERIDGE AVENUE FROM GRANDVIEW AVENUE TO ELKIN STREET

Treatment: Separated Bike Lanes

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9. Adjust signal timing to add an east/west leading bicycle/pedestrian interval or allow for left turns from Blueridge Avenue onto Georgia Avenue that are only possible during a protected phase.
  - Both recommendations aim are intended to reduce left-hook collisions between bicyclists and turning motor vehicles.
10. Reconfigure Blueridge Avenue to have a 7 foot raised separated bike lane, a 6 foot buffer, two 11 foot travel lanes, a 6 foot buffer, and a 7 foot separated bike lane.
  - These lanes provide dedicated space for bicyclists in both directions.
  - This reconfiguration removes both parking lanes.

### BLUERIDGE AVENUE FROM ELKIN STREET TO AMHERST AVENUE

Treatment: Separated Bike Lanes

11. Install a median immediately on Blueridge Avenue west of Elkin Street.
  - This median will create a left-turn bay and match the number of approach lanes to receiving lanes. It will also narrow the roadway, calm traffic and make this street more comfortable for bicycling.
12. Expand the master-planned right-of-way to 80 feet to have a 7 foot raised separated bike lane, a 6 foot buffer, a 8 foot parking lane, two 11 foot travel lanes, a 6 foot buffer, and a 7 foot raised separated bike lane.
  - These separated bike lanes provide dedicated space for bicyclists in both directions.
  - This reconfiguration removes one parking lane.

### AMHERST AVENUE FROM BLUERIDGE AVENUE TO UNIVERSITY BOULEVARD

Treatment: Separated Bike Lanes

13. Expand the master-planned right-of-way to 90 feet to have a 7 foot raised separated bike lane, a 3 foot buffer, a 8 foot parking lane, and a 11 foot travel lane in each direction.
  - These lanes provide dedicated space for bicyclists in both directions and preserve on-street parking on both sides of the street.

### AMHERST AVENUE FROM UNIVERSITY BLVD TO WINDHAM LANE

Treatment: Separated Bike Lanes

14. Adjust signal timing to add a north/south leading bicycle/pedestrian interval or allow for left-turns from Amherst Avenue onto University Boulevard that are only possible during a protected phase.
  - Both recommendations aim are intended to reduce left-hook collisions between bicyclists and turning motor vehicles.
15. Reconfigure Amherst Avenue to have a 7 foot raised separated bike lane, a 6 foot buffer, two 11 foot travel lanes, a 8 foot parking lane, a 6 foot buffer, and a 7 foot separated bike lane.
  - These lanes provide dedicated space for bicyclists in both directions.

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- This reconfiguration removes one parking lane.
16. Install a median on west leg of Prichard Road and Amherst Avenue intersection.
- This median will narrow the wide roadway and moderate the approach speeds of vehicles crossing the Amherst Avenue neighborhood greenway.

### AMHERST AVENUE FROM WINDHAM LANE TO PLYERS MILL ROAD

Treatment: Neighborhood Greenway

17. Install regularly placed speed cushions.
- This treatment will slow motorized traffic without impeding bicyclists.

### PLYERS MILL ROAD FROM AMHERST AVENUE TO GEORGIA AVENUE

Treatment: Neighborhood Greenway

The bikeways turns west onto Plyers Mill Road.

18. At the intersection of Plyers Mill Road and Amherst Avenue, create a westbound left turn bay by installing a median island (shown below). This measure could be accomplished in the interim by striping a new median rather than constructing a new island.
- This median will make it easier for eastbound bicyclists to turn left onto Amherst Avenue because they will only have to cross one lane of traffic.

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Westbound left turn bay at the intersection of Georgia Ave and Plyers Mill Rd (Recommendation 18)

19. Install bicycle boxes at both the eastern and western approaches to Georgia Avenue.
  - These bicycle boxes will provide bicyclists a place to safely position themselves while waiting to cross Georgia Avenue.
20. Adjust signal timing to add an east/west leading bicycle/pedestrian interval or facilitate left turns from Plyers Mill Road onto Georgia Avenue during a protected phase.
  - Both of these potential recommendations are intended to reduce left-hook collisions between bicyclists and turning motor vehicles.

### GEORGIA AVENUE

Treatment: Sidepath

The bikeway turns south onto Georgia Avenue and then west onto Evans Drive.

21. Replace the existing sidewalk with a 10-foot-wide (preferred) sidepath separated by landscaping from the roadway and reconfigure the curb area at the southwest corner of Plyers Mill Road and the northwest corner of Evans Drive to accommodate bicycles.
  - This facility, set back from Georgia Avenue's heavy traffic, will provide a direct, convenient connection between Plyers Mill Road and Evans Drive for bicyclists. The sidewalk in this area is too narrow for shared pedestrian/bicycle use. The sidepath should be positioned behind any bus stops on this side of the roadway.

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22. A marked crosswalk should be installed at the intersection of Georgia Avenue and Evans Drive.
- The crosswalk will aid northbound bicyclists transitioning onto the sidepath by advising motorists to look for crossing bicyclists.

### DOUGLAS AVENUE

Treatment: Neighborhood Greenway

The bikeway turns south onto Douglas Avenue.

23. Install speed cushions on the block south of Darrow Street and on the two blocks north of Darrow Street.
- The traffic calming will moderate traffic speeds and make the turn between Douglas Avenue and Darrow Street safer, while not impeding bicyclists.

### MCKENNEY AVENUE

Treatment: Neighborhood Greenway

The bikeway turns southwest onto McKenney Avenue.

24. Reconfigure the intersection of McKenney Avenue and Darrow Street to create a “T” intersection.
- The reconfigured intersection will slow motor vehicle speeds for traffic between McKenney Avenue and Douglas Avenue, improving bicyclist safety.
25. Install speed cushions to the north and south of Dexter Avenue (see below).
- The traffic calming will moderate traffic speeds along these stretches of road without impeding bicycle traffic.



Example of Speed Cushions (Recommendation 25)

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26. Switch the stop signs at the intersection of Dexter Avenue and McKenney Avenue to face Dexter Avenue.
- This improvement prioritizes the neighborhood greenway as the through-movement, making it more convenient and quicker to use.

### HILDAROSE DRIVE, GREELEY AVENUE, CLARK PLACE, AND DARCY FOREST DRIVE

Treatment: Neighborhood Greenway

27. Switch the stop signs at the intersection of Clark Place and Arthur Avenue to face Arthur Avenue and Belvedere Boulevard.
- This improvement prioritizes the neighborhood greenway as the through-route, making it more convenient and quicker to use for bicyclists.

### DARCY FOREST DRIVE FROM KIMBALL PLACE TO FOREST GLEN ROAD

Treatment: Neighborhood Greenway

28. This road should be striped with an 8-foot parking lane, a 10-foot travel lane in each direction and a 6-foot climbing lane.
- The climbing lane will provide dedicated space to bicyclists as they proceed northbound on Darcy Forest Drive. Due to the steep grade, cyclists will be travelling much slower than motor vehicles and the climbing lane will improve motorist-bicyclist interactions on this street.

### FOREST GLEN ROAD

Treatment: Sidepath

The bikeway turns east and continues along the north side of Forest Glen Drive and then turns south onto Georgia Avenue toward the Interstate-495 bicycle-pedestrian bridge. Several improvements are recommended for this segment along Forest Glen Drive.

29. A marked crosswalk should be striped at the north leg of the intersection of Forest Glen Road and Darcy Forest Drive.
- This crosswalk will improve safety and motorist awareness of bicyclists traveling southbound on Darcy Forest Drive who turn east onto the Forest Glen Road sidepath.
30. The through/left-turn lane Kiss and Ride/Bus Loop exit lane should be removed to create room for a median. The remaining outbound lane will be used for all turns.
- This median will break up the crossing for bicyclists and pedestrians.
31. The northern sidewalk along Forest Glen Road should be widened to a sidepath and a landscape buffer should be provided up to the vehicular entrance to the Kiss and Ride/Bus Loop at the Forest Glen Metrorail Station. Space for the sidepath and buffer will come from removing the westbound right turn lane on Forest Glen Road.
- This separation will improve bicyclist comfort on this corridor.

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32. The southwest and northwest corners of the intersection of Georgia Avenue and Forest Glen Road (see below) are severely obstructed by utility poles, utility boxes and fire hydrants. These corners should be extended with a tighter radius and the obstructions should be removed. There is no room at either of these corners for bicyclists to safely queue to cross Forest Glen Road or to exit the crosswalk and resume bicycling on the sidepath.



Existing curb ramps at southwest corner of Georgia Avenue and Forest Glen Road (Recommendation 32)



Existing curb ramps at northwest corner of Georgia Avenue and Forest Glen Road (Recommendation 32)

These improvements will enhance both pedestrian and bicyclist safety and comfort.

### GEORGIA AVENUE FROM RILEY PLACE TO INTERSTATE-495 BICYCLE-PEDESTRIAN BRIDGE

Treatment: Neighborhood Greenway

The bikeway travels along the Interstate-495 bicycle-pedestrian bridge. At the southern end of the bridge, the connection to Lansdowne Way should be improved as follows:

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33. The southern entrance to the bridge should be widened to make it easier for bicyclists to enter and exit the bridge. Wayfinding is particularly important at this opening to help bicyclists successfully access Lansdowne Way from the bridge.



Connection from Lansdowne to Interstate-495 bridge (Recommendation 33)

34. Rather than direct bicyclists from the sidewalk to Lansdowne Way through a driveway, a curb cut is needed at the end of the street.

### RILEY PLACE TO SEMINARY PLACE

Treatment: Sidepath

The neighborhood greenway continues west along Lansdowne Way, turns southwest onto 2<sup>nd</sup> Avenue and briefly onto Riley Place before heading south through Montgomery Hills Park.

35. Signage or some type of marked crossing should be considered where Riley Place meets the park to indicate to motorists that bicyclists may be exiting or entering the park.
36. Construct a shared use path in Montgomery Hills Park that aligns with reconfigured 2<sup>nd</sup> Avenue.
- This route will allow bicyclists to conveniently and directly connect between the paths in Montgomery Hills Park and 2<sup>nd</sup> Avenue (see below).

### SECOND AVENUE FROM SEMINARY PLACE TO SEMINARY ROAD/LINDEN LANE

Treatment: Conventional Bike Lanes and Sharrows

The Montgomery County Department of Transportation is in the process of redesigning the Seminary Road/Seminary Place/Brookville Road intersection to make it simpler and safer for all road users. The scope of its work includes bicycle lanes and sidewalks.

37. Adjusting the signal timing at 2<sup>nd</sup> Avenue and Seminary Road to provide a 5-7 second Leading Bicycle/Pedestrian Interval.

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- This signal timing will create a safer crossing for pedestrians and bicyclists because the longer interval increases the visibility of crossing pedestrians and bicyclists to motorists, and gives them priority in the intersection.

### SECOND AVENUE FROM LINDEN LANE/SEMINARY PLACE TO LUZERNE AVENUE

Treatment: Neighborhood Greenway

38. Install speed cushions to slow traffic.

### SECOND AVENUE FROM LUZERNE AVENUE TO 16<sup>TH</sup> STREET

Treatment: Neighborhood Greenway

39. This section of 2<sup>nd</sup> Avenue is sufficiently wide for a climbing lane to be installed, providing bicyclists with dedicated northbound roadway space. The downhill direction should be marked with shared lane markings to let motorists know where bicyclists will be located on the roadway.

### SECOND AVENUE FROM 16<sup>TH</sup> STREET TO SPRING STREET

Treatment: Neighborhood Greenway

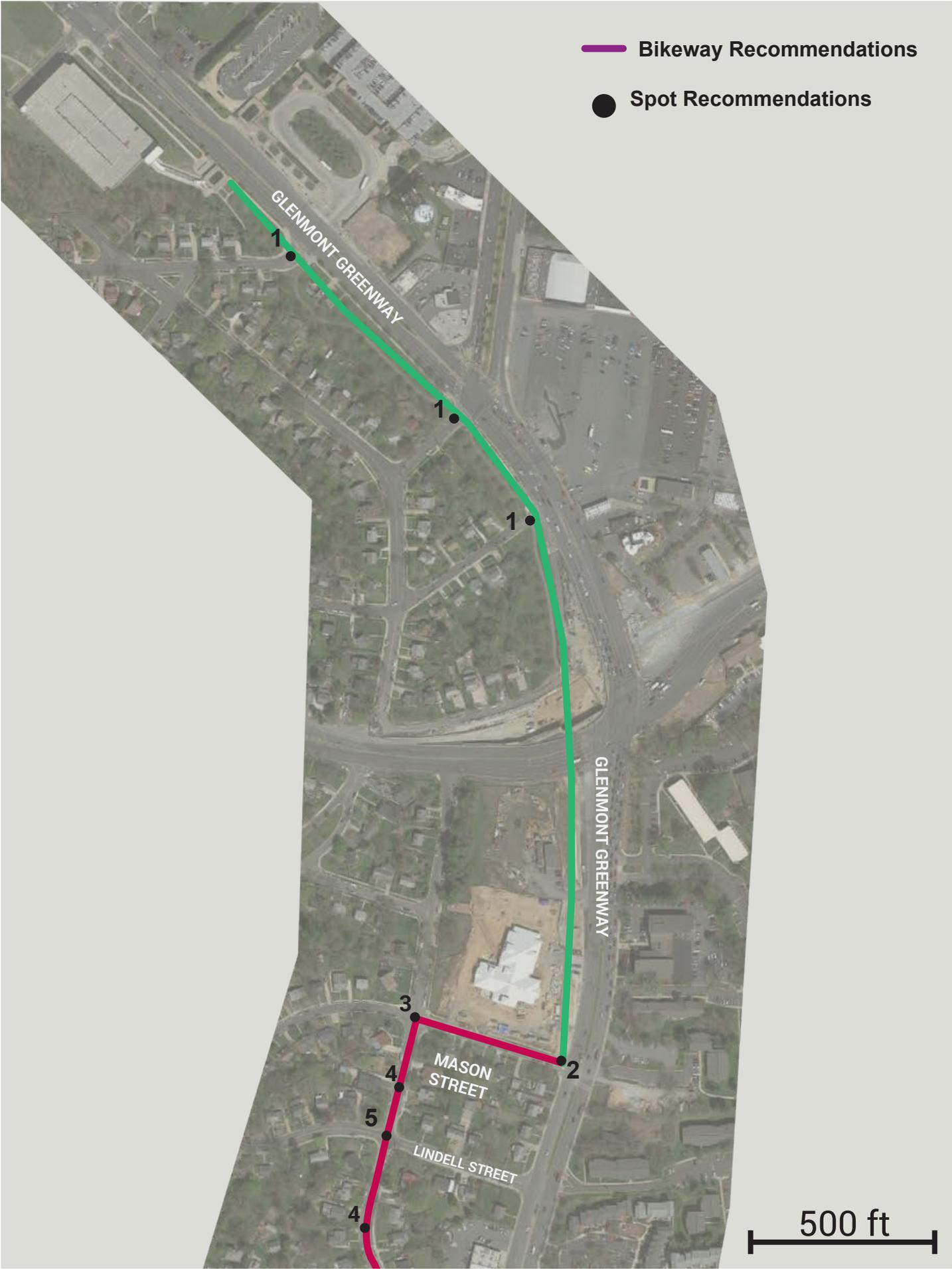
Currently, 2<sup>nd</sup> Avenue in Silver Spring is a signed bicycle route that helps connect the Georgetown Branch Trail to Downtown Silver Spring. As a result, traffic-calming measures exist between 16<sup>th</sup> Street and Spring Street, and include speed humps and a peak-direction access prohibition at 16<sup>th</sup> Street and Spring Street for all users except transit vehicles, bicyclists and pedestrians. These two treatments significantly reduce the volume and speed of motorized vehicles along this section of the bikeway.

At the intersection of Second Avenue and 16<sup>th</sup> Street, recommended treatments include:

40. Install corner islands at the southeast and northwest corners of the 2<sup>nd</sup> Avenue/16<sup>th</sup> Street intersection.
  - The corner islands will slow right turns, tighten intersection geometry and reduce intersection crossing distances.
41. Install a curb extension on the northeast side of 2<sup>nd</sup> Avenue.
  - This curb will narrow the roadway, slowing vehicular speed. It also allows cars pulling out of the driveway at 2<sup>nd</sup> Avenue and 16<sup>th</sup> Street to be more visible to bicyclists.
42. Adjusting signal timing to provide a 5-7 second Leading Pedestrian/Bicycle Interval.
  - This timed signal will create a safer crossing for pedestrians and bicyclists because the longer interval increases the visibility of crossing pedestrians and bicyclists to motorists, and gives them priority in the intersection.

 Bikeway Recommendations

 Spot Recommendations



 Bikeway Recommendations

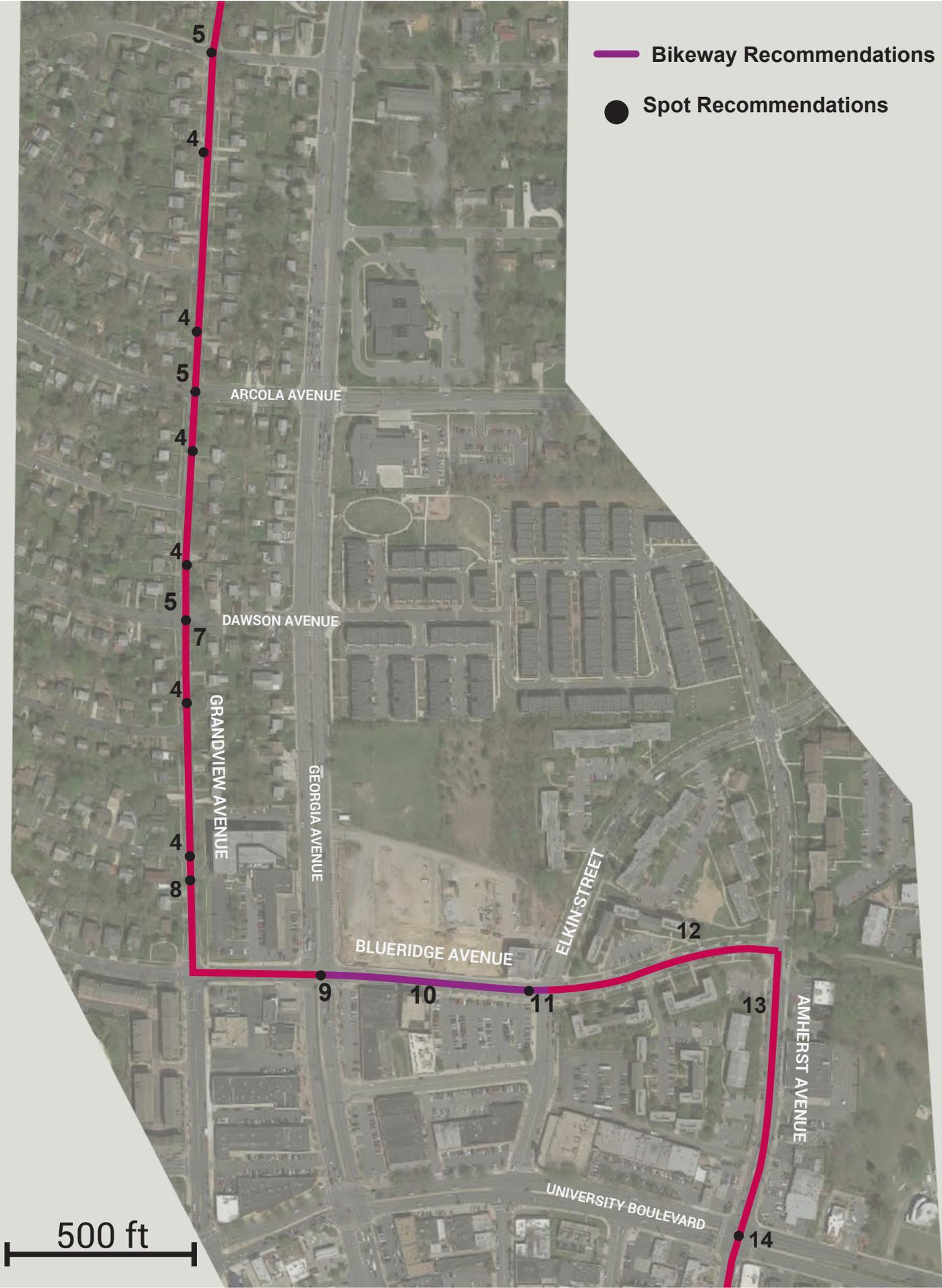
 Spot Recommendations



500 ft

 **Bikeway Recommendations**

 **Spot Recommendations**



500 ft

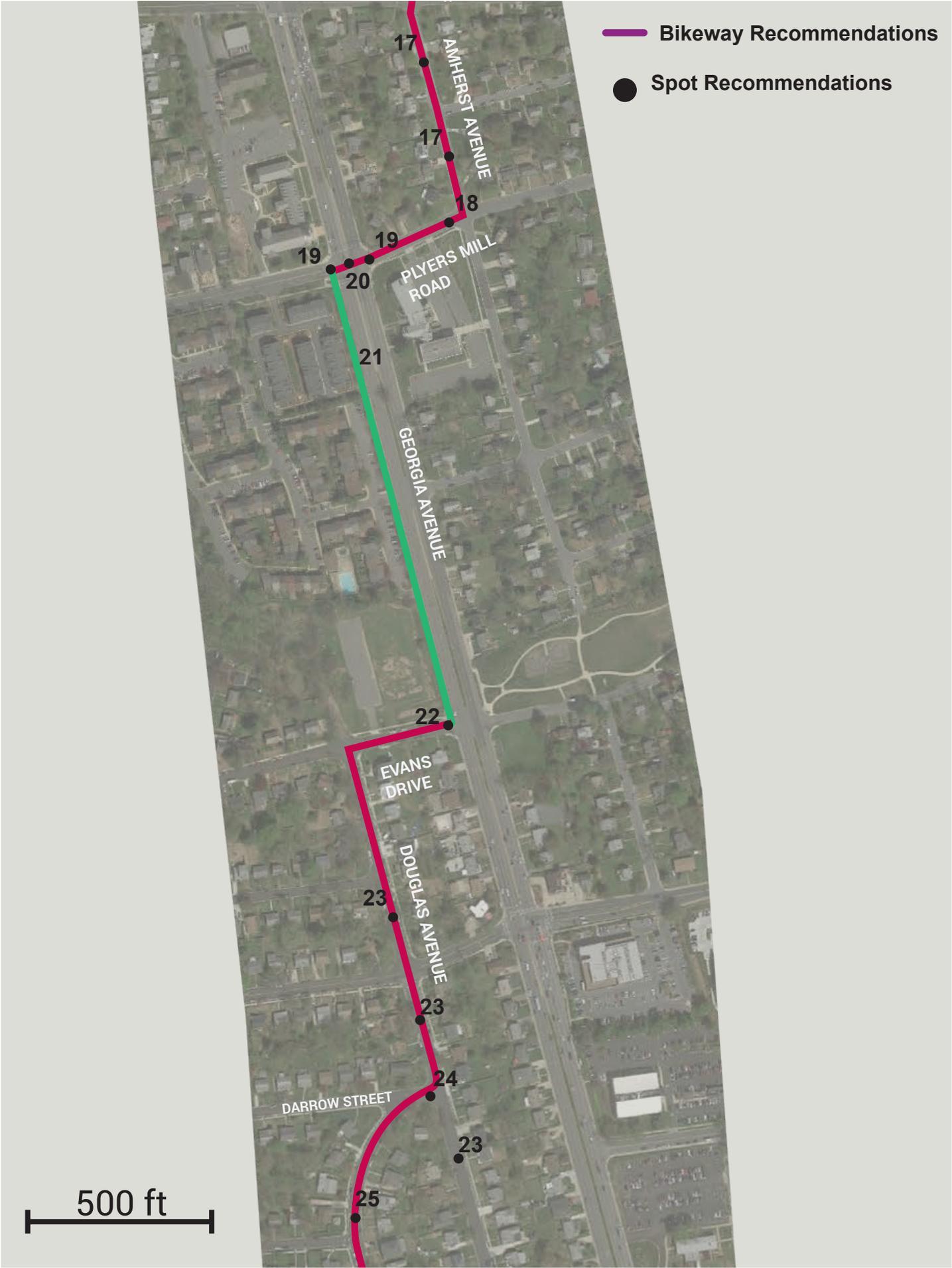


 **Bikeway Recommendations**

 **Spot Recommendations**

 Bikeway Recommendations

 Spot Recommendations



500 ft



 Bikeway Recommendations

 Spot Recommendations

CYCLE-PEDESTRIAN BRIDGE

LANSDOWNE WAY

2nd AVENUE

35

36

RILEY PLACE

MONTGOMERY HILLS PARK

SEMINARY PLACE

LINDEN LANE

37

SEMINARY ROAD

38

38

39

33

34

500 ft



 Bikeway Recommendations

 Spot Recommendations

