

Grosvenor--Strathmore



June 2015



Table of Contents – Grosvenor-Strathmore

EXECUTIVE SUMMARY	III
INTRODUCTION	1
STUDY AREA – GROSVENOR-STRATHMORE	2
ROCKVILLE PIKE (MD 355) CORRIDOR.....	4
STRATHMORE AVENUE (MD 547) CORRIDOR	4
TUCKERMAN LANE CORRIDOR	4
MASTER PLAN RECOMMENDATIONS, OTHER STUDIES, AND PLANNED PROJECTS	7
MASTER PLAN RECOMMENDATIONS	7
Countywide Transit Corridors Functional Master Plan (December 2013).....	7
Countywide Bikeways Functional Master Plan (March 2005)	7
North Bethesda Garrett Park Sector Plan (1992)	7
OTHER STUDIES	9
WMATA Capital Improvement Plan 2012-2017	9
PLANNED PROJECTS	9
Grosvenor-Strathmore Metro Station.....	9
PUBLIC INPUT.....	11
STAKEHOLDERS	14
FIELD INVESTIGATION AND OBSERVATIONS	15
FIELD INVESTIGATION SUMMARY	15
BICYCLE AND PEDESTRIAN NETWORK.....	16
TRANSIT NETWORK.....	16
RANKING CRITERIA.....	21
PRIORITY IMPROVEMENTS	23
OVERVIEW OF IMPROVEMENT TYPES	23
RECOMMENDED PRIORITY IMPROVEMENTS	30
Area Wide.....	30
Grosvenor Lane	30
Grosvenor-Strathmore Metro Station.....	30
Rockville Pike (MD 355)	32
Tuckerman Lane.....	32
CONCLUSION	37
REFERENCES	39



LIST OF TABLES

Table 1 – Existing Roadway Summary 5

Table 2 – Summary of Master Plan Recommendations 10

Table 3 - Summary of Public/Stakeholder Input Comments 12

Table 4 – Improvement Type Summary 23

Table 5 – Recommended Priority Improvements 35

LIST OF FIGURES

Figure 1 – Grosvenor-Strathmore Bicycle and Pedestrian Priority Area 3

Figure 2 – Grosvenor-Strathmore Land Uses 6

Figure 3 – Planned Bus Rapid Transit Routes 8

Figure 4 – Grosvenor Lane Looking Towards MD 355 16

Figure 5 – Grosvenor-Strathmore Metro Station 16

Figure 6 – Existing Bicycle Network 17

Figure 7 – Existing Sidewalk and Shared-Use Path Network 18

Figure 8 – Existing Transit Network 19

Figure 9 – Proposed Sidewalk and Shared-Use Path Network 24

Figure 10 – Proposed Bicycle Network 25

Figure 11 – Proposed ADA Improvements 26

Figure 12 – Proposed Intersection Improvements 27

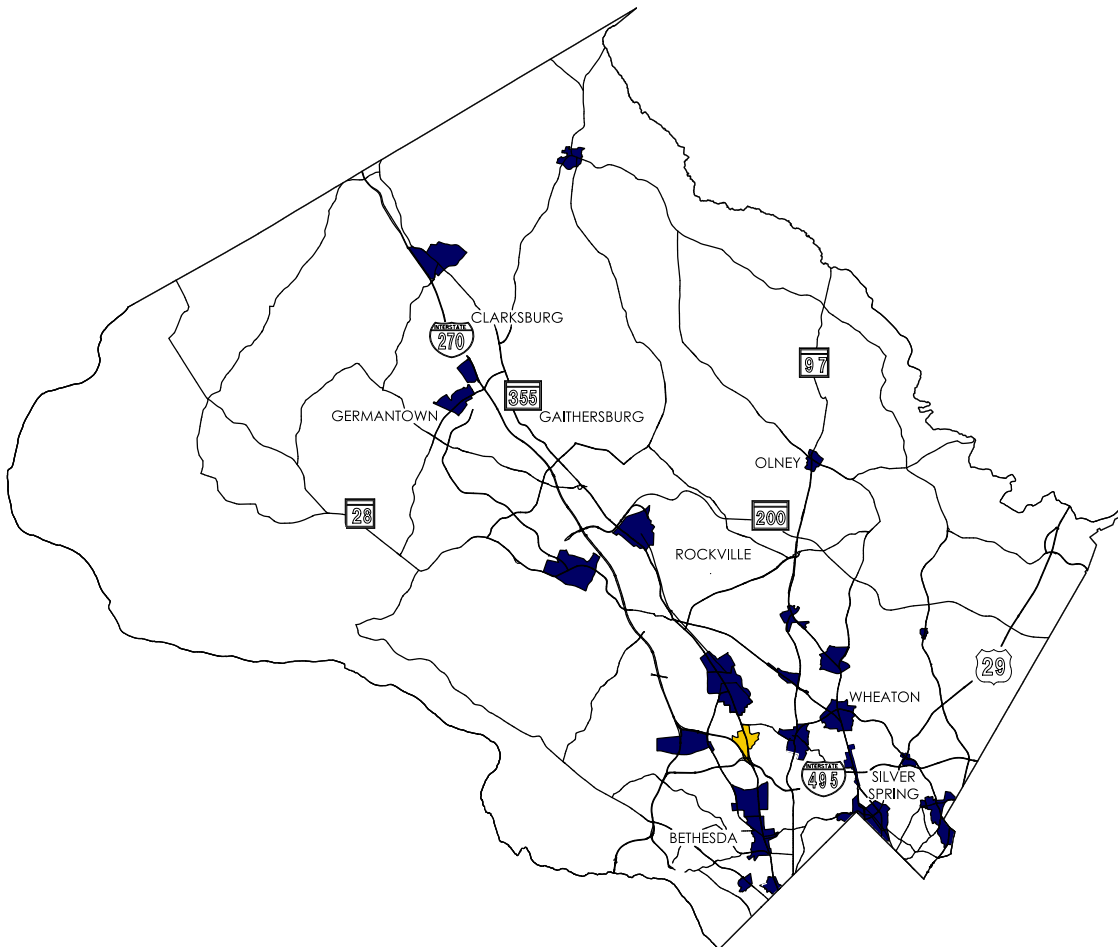
Figure 13 – Proposed Safety Improvements 28

Figure 14 – Proposed Maintenance 29

Figure 15 – a) Stairwell East of Grosvenor – Strathmore Metro Station b) Bike
 “Runnel” in Utah 31

Grosvenor– Strathmore

Executive Summary



EXECUTIVE SUMMARY

A Bicycle and Pedestrian Priority Area (BiPPA) is a geographical area where the enhancement of bicycle or pedestrian traffic is a priority. The objective of BiPPA is to enhance safe bicycle and pedestrian access to support cohesive neighborhoods, aging infrastructure, and improve long-range connectivity and circulation.

In 2013, the Maryland National Capital Parks and Planning Commission designated twenty-eight bicycle and pedestrian priority areas within Montgomery County. The Montgomery County Department of Transportation (MCDOT), in partnership with the State Highway Administration (SHA) and the Maryland-National Capital Park and Planning Commission (M-NCPPC), identified improvements to be made to five (Glenmont, Grosvenor-Strathmore, Silver Spring CBD, Veirs Mill Road-Randolph Road, Wheaton CBD) of the designated twenty-eight bicycle and pedestrian priority areas. This was done through public workshops, which allowed the department to understand the diverse concerns and opinions of the stakeholders and residents.

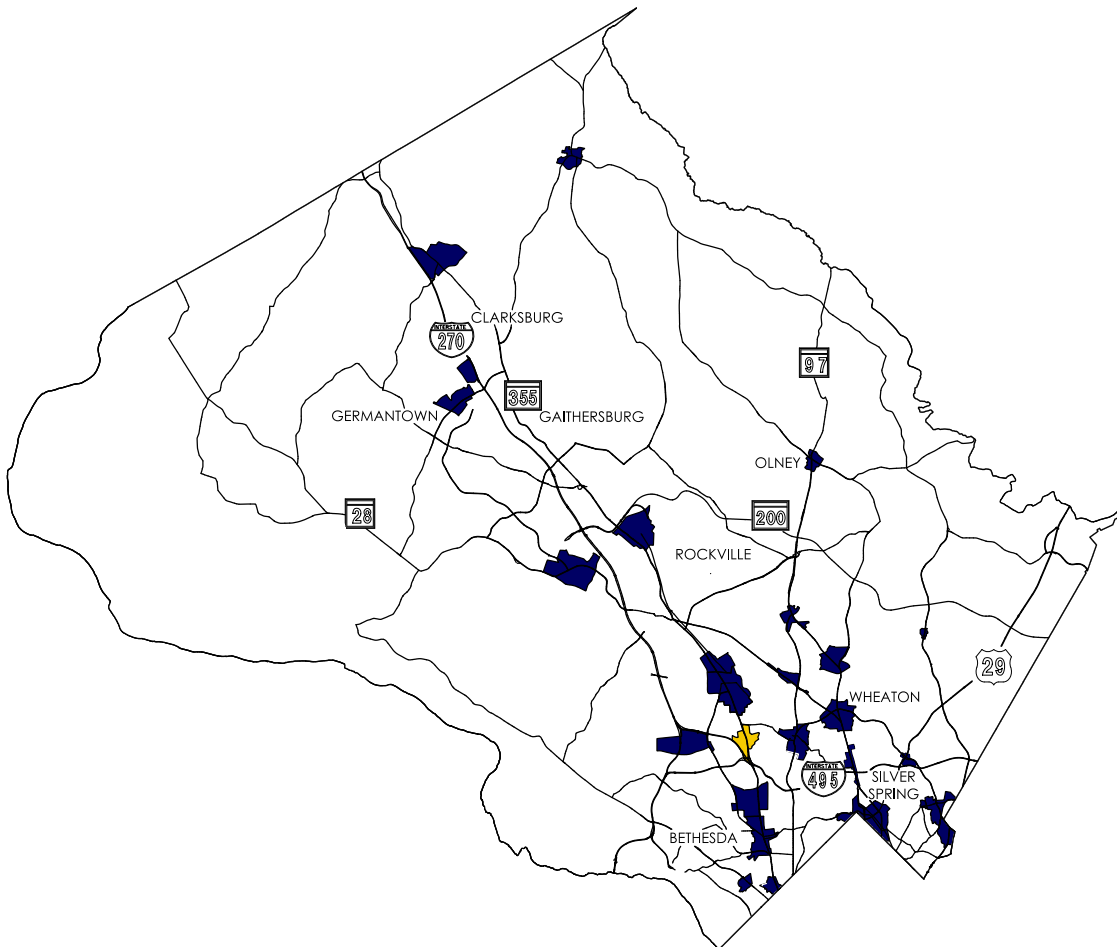
This report was prepared specifically for the Grosvenor-Strathmore BiPPA based on the collaboration of agency officials, community stakeholders, planners, engineers, and specialists in geographic information systems (GIS). An initial summary of master plan recommendations was progressed by the team, followed by field investigations, and the development of this report. All state, county, and municipal rights of way were included in the study. Recommendations were then prioritized based on benefits, impacts, timeframe, and cost.

Generally, improvements were evaluated based on three primary factors: priority, timeframe, and cost. Priority is based on the ratio of benefits to impacts. Each improvement was assigned to a timeframe category: Short-term (1 – 2 years), Mid-term (2 – 5 years), Long-term (5+ years). Similarly, each improvement was assigned an order of magnitude cost ranging from less than \$10,000 to greater than \$5,000,000.

Please refer to Table 5 for a summary of recommended priority improvements listed.

Grosvenor– Strathmore

Introduction





INTRODUCTION

Montgomery County is the most populous and one of the most diverse counties in Maryland. Our population exceeds one million residents and continues to grow. With such a large population, the Montgomery County Department of Transportation must address the varied transportation needs of all its residents, which is why BiPPA was created. The Montgomery County Department of Transportation considers bicycle and pedestrian facilities a critical component in the County's transportation infrastructure network. Bicycling and walking facilities provide a wide range of benefits to individuals, their communities, and the surrounding environment.

In urban areas, there are traditionally higher percentages of people of color, people with low income, and seniors – all are residents that put a greater share of their budget toward transportation. In such areas, walking and bicycling are among the most affordable forms of transportation. Therefore, providing safe, convenient, and attractive bicycle and pedestrian access – along with modernizing existing aging infrastructure – is essential to ensure equity for all transportation users and their access to jobs, public services, and social network.

Collectively, we can help decrease traffic congestion, air pollution, and enhance quality of life.

The goals of bicycle and pedestrian priority improvements are to engage the surrounding community for feedback to identify and develop recommendations for the area. These recommendations include upgrading aging infrastructure, improving safety, and improving long-range connectivity and circulation. This report provides recommendations for the design and construction of bicycle and pedestrian improvements within the bicycle and pedestrian priority areas that enhance and promote accessibility, safety, mobility, and comfort for bicyclists and pedestrians as voiced by the public.



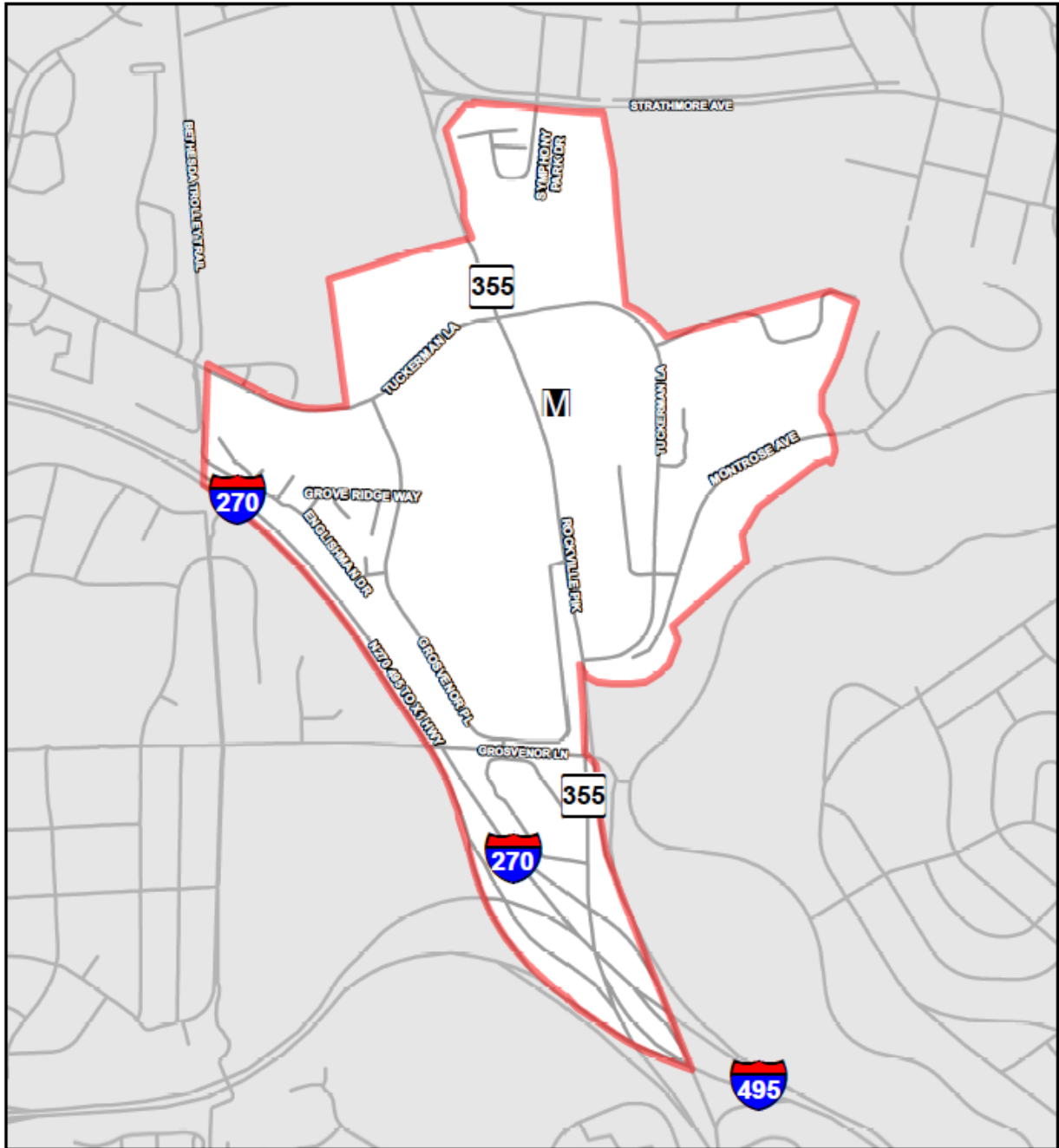
STUDY AREA – GROSVENOR-STRATHMORE



The Grosvenor-Strathmore Bicycle and Pedestrian Priority Area (BiPPA) boundary was designated by the M-NCPPC in 2013, in accordance with Section 2-604 of the Annotated Code of Maryland, which delegates this responsibility to local jurisdictions. The 0.44 square mile area is centered on the Grosvenor Metro-Rail station and is enclosed by I-495 (Capital Beltway) to the south; MD 547 (Strathmore Avenue) and Tuckerman Lane (CO 164) to the north; I-270 (Washington National Pike) to the west; MD 355 (Rockville Pike) and Montrose Avenue to the east. The area is bisected by MD 355.

The broader Grosvenor-Strathmore area is an unincorporated community in Montgomery County, Maryland, typically associated with the Grosvenor-Strathmore station on the Washington Metro-Rail System's Red Line and the Strathmore Music Center. Based on the 2010 Census, the North Bethesda area's population is estimated at 43,828 within an 8.85 square mile land area. The area is characterized by typical suburban residential (garden apartment complexes, high-rise apartments, and townhomes) developments, transit infrastructure, parks, rolling terrain, and small streams. Tilden Middle School and Georgetown Preparatory School are located to the west. Holy Cross School, Academy of the Holy Cross, and Garrett Park Elementary School are located to the east. Other points of interest include the Mansion at Strathmore, Strathmore Music Center, Strathmore Park at Grosvenor, and Rock Creek Trail.

Sidewalk connectivity throughout the area is good, however; bicycle connectivity is poor. On-street parking is available along residential local roads.

There are heavy traffic volumes in the peak hour and direction along MD 355.



-  Metro Station
-  BIPPA Boundary

**Figure 1 – Grosvenor-Strathmore
Bicycle and Pedestrian Priority Area**

0 275 550 1,100 Feet





ROCKVILLE PIKE (MD 355) CORRIDOR

Rockville Pike (MD 355) is a SHA-maintained, north-south roadway through the Grosvenor-Strathmore BiPPA. MD 355 is a 6-lane, divided roadway with a posted speed limit of 45 MPH from I-495 to MD 547. MD 355 is a closed section and is classified by the SHA as an Urban Other Principal Arterial on the secondary state system. There is an existing sidewalk with a grass buffer along the northbound side of the roadway for its entire length and sidewalk without a grass buffer along the southbound side from Grosvenor Lane to Grosvenor Place. The median is typically planted with grass without trees. Aerial utilities line both sides of the roadway.

STRATHMORE AVENUE (MD 547) CORRIDOR

Strathmore Avenue (MD 547) is a SHA-maintained, east-west roadway through the Grosvenor-Strathmore BiPPA. MD 547 is a 2-lane undivided roadway that has a 30 MPH speed limit from MD 355 to the entrance for the Academy of the Holy Cross. MD 547 has a partially closed section and is classified by the SHA as an Urban Minor Arterial on the secondary state system. There is an existing sidewalk with a grass buffer on the westbound side of the roadway. Aerial utilities line both sides of the roadway.

TUCKERMAN LANE CORRIDOR

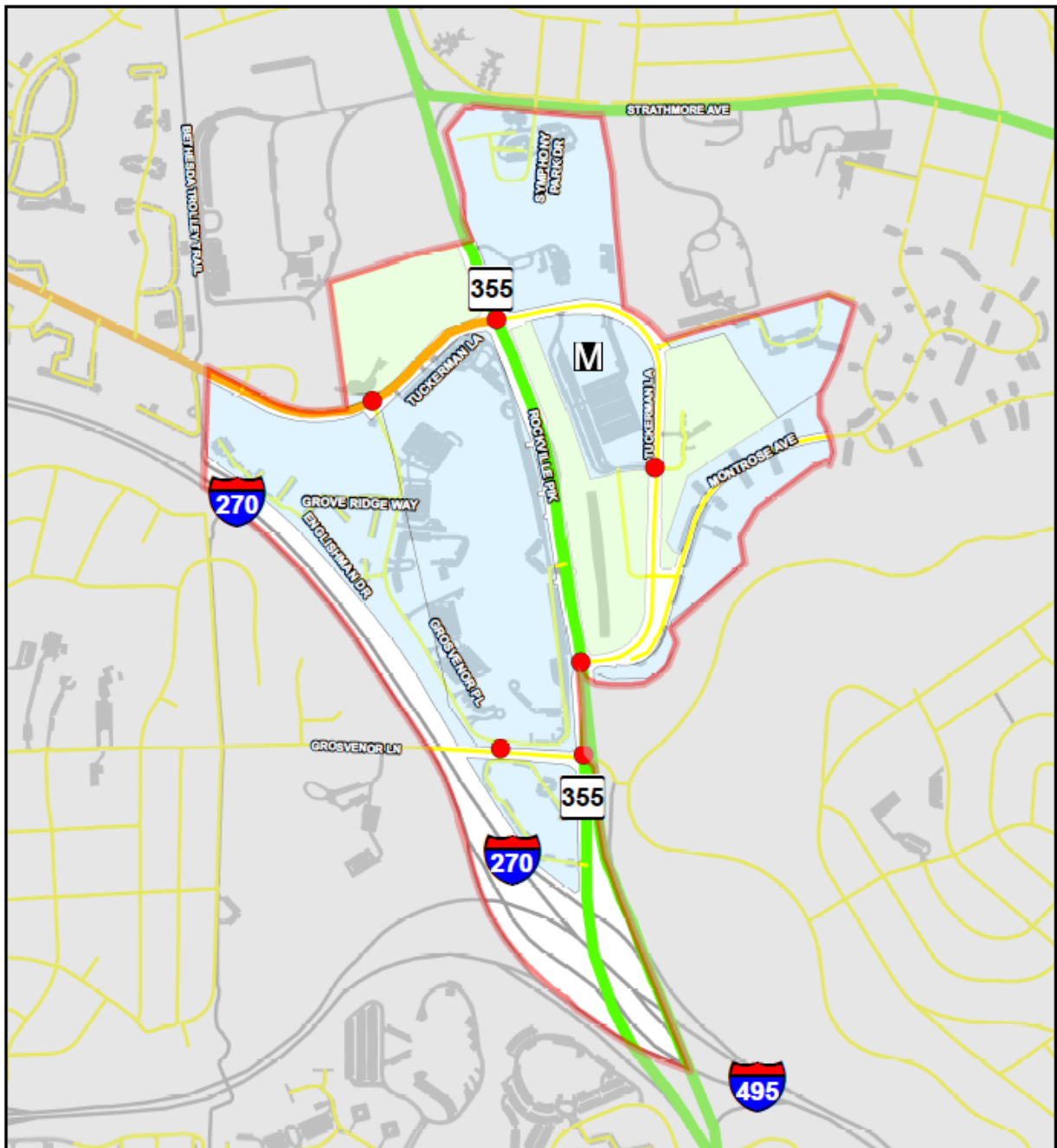
Tuckerman Lane (CO 164) is a MCDOT-maintained roadway through the Grosvenor-Strathmore BiPPA. Tuckerman Lane is oriented primarily in the east-west direction from the Bethesda Trolley Trail to MD 355 (northern intersection) then a north-south roadway with a "horseshoe" shape from MD 355 (northern intersection) to MD 355 (southern intersection). The posted speed limit for the roadway is 30 MPH. Tuckerman Lane is a 5-lane, closed section, undivided roadway from the Bethesda Trolley Trail to Grosvenor Place; it is a 4-lane, closed section, divided roadway from Grosvenor Place to Cloister Drive; and a 4-lane, closed section, undivided roadway from Cloister Drive to MD 355 (southern intersection). Existing street lighting for both sides of Tuckerman Lane is provided by luminaries on pendent posts. Parking is allowed along the outside travel lane during non-peak hours from MD 355 (southern intersection) to Cloister Drive.



The following is summary of existing major roadways within the Grosvenor-Strathmore BiPPA:

Table 1 – Existing Roadway Summary

Roadway	From	To	AADT as of 2013	Posted Speed Limit	Classification	Owner
Rockville Pike (MD 355)	I-495 (Capital Beltway) (south)	Strathmore Avenue (MD 547) (north)	@ I-495 59,552 @ MD 547 50,342	45 MPH	Urban Other Principal Arterial	SHA
Strathmore Avenue (MD 547)	MD 355 (Rockville Pike) (west)	Entrance to the Academy of Holy Cross (east)	@ MD 355 14,844	30 MPH	Urban Minor Arterial	SHA
Tuckerman Lane (CO 164)	Bethesda Trolley Trail (west)	Rockville Pike (southern) (east)	-	30 MPH	MC-2004.11A (MOD)	MCDOT
Montrose Avenue	Weymouth Street	Southern Terminus		25 MPH	MC 2004.20 (MOD)	MCDOT



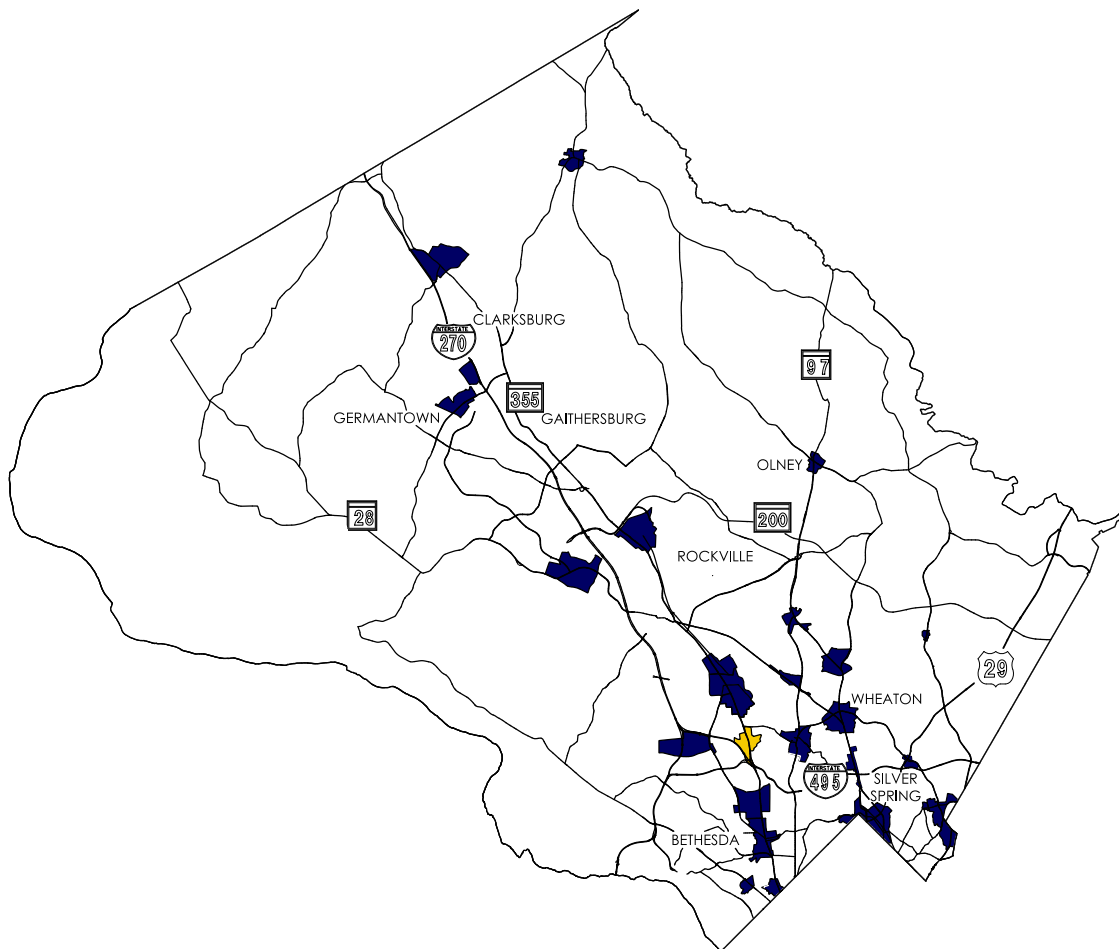
Metro Station	Zoning		Roads	
BiPPA Boundary	Planned Development	Industrial	Arterial	Collector
Signalized Intersection	Central Business District	Residential	Local	Parking Lots

Figure 2 – Grosvenor-Strathmore Land Uses

0 275 550 1,100 Feet

Grosvenor– Strathmore

Master Plan Recommendations, Other Studies, and Planned Projects



MASTER PLAN RECOMMENDATIONS, OTHER STUDIES, AND PLANNED PROJECTS

MASTER PLAN RECOMMENDATIONS

Countywide Transit Corridors Functional Master Plan (December 2013)

The Countywide Transit Corridors Functional Master Plan recommends the implementation of a Bus Rapid Transit (BRT) system, with dedicated transit lanes and signal priority throughout Montgomery County. The proposed MD 355 South corridor would pass through the Grosvenor-Strathmore BiPPA along MD 355. A BRT station is proposed for the Grosvenor-Strathmore Metro Station. The master plan also recommends overall pedestrian safety, accessibility, and mobility recommendations along with the proposed BRT routes. The recommendations from this master plan are listed in Table 2 below.

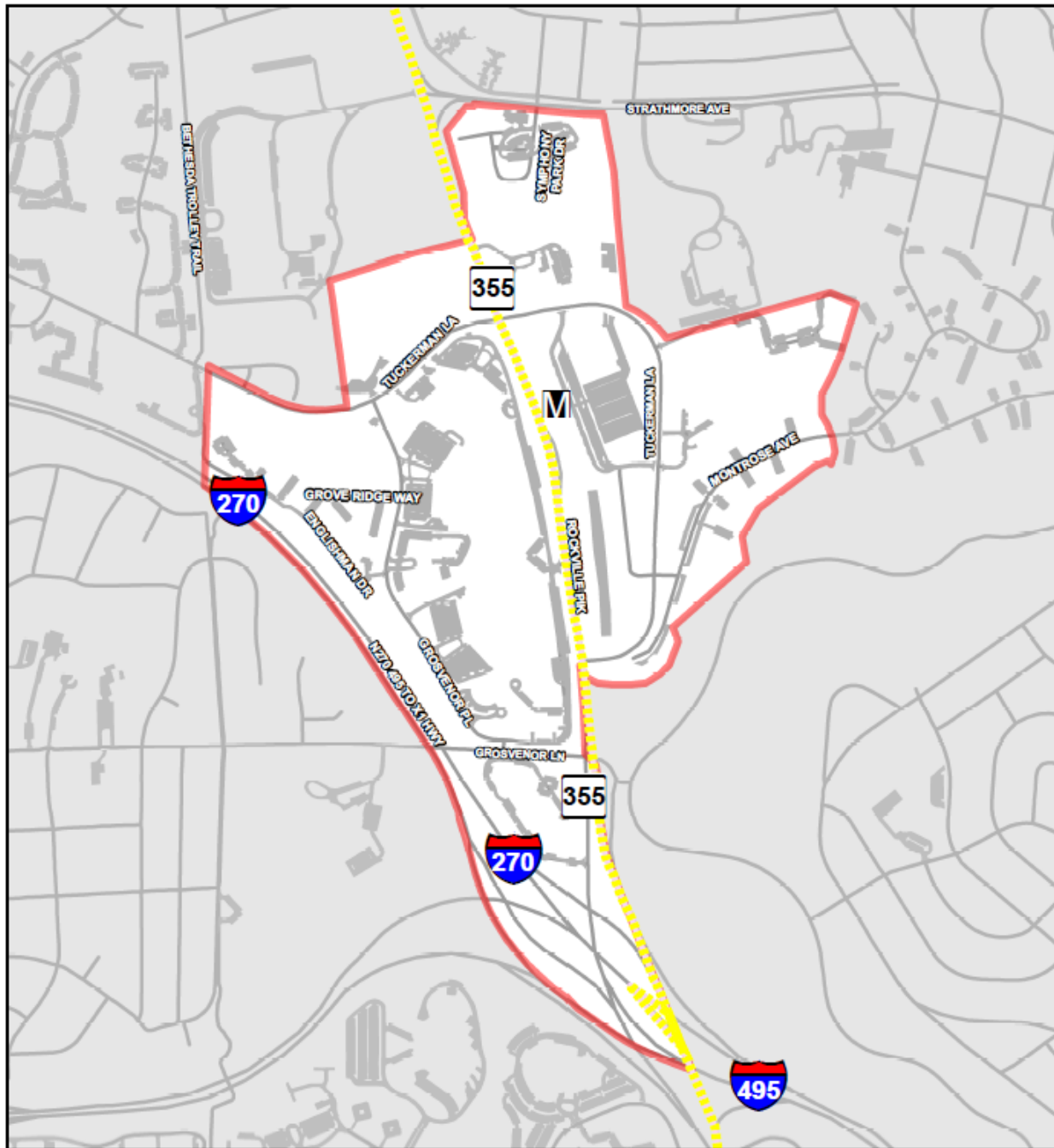
Countywide Bikeways Functional Master Plan (March 2005)

According to the Countywide Bikeways Functional Master Plan (March 2005), the following routes are either designated as existing or proposed bicycle facilities through the Grosvenor-Strathmore BiPPA:

1. Tuckerman Lane - Shared Use Path Proposed
2. Grosvenor Lane – Signed Shared Roadway
3. Grosvenor Connector – Shared Use Path

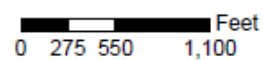
North Bethesda Garrett Park Sector Plan (1992)

The M-NCPPC North Bethesda Garrett Park Sector Plan recommended designating the Grosvenor-Strathmore area as a bicycle and pedestrian priority area. The plan provides recommendations for pedestrian circulation and the bikeway network. Table 2, below, provides a summary of these recommendations.



- Metro Station
- BRT Route
- BiPPA Boundary

Figure 3 – Planned Bus Rapid Transit Routes





OTHER STUDIES

WMATA Capital Improvement Plan 2012-2017

The WMATA Capital Improvement Plan 2012-2017 is focused on improving access, safety, and mobility around Metro Stations. The recommendations for the Grosvenor-Strathmore Metro Station are listed in Table 2 below.

PLANNED PROJECTS

Grosvenor-Strathmore Metro Station

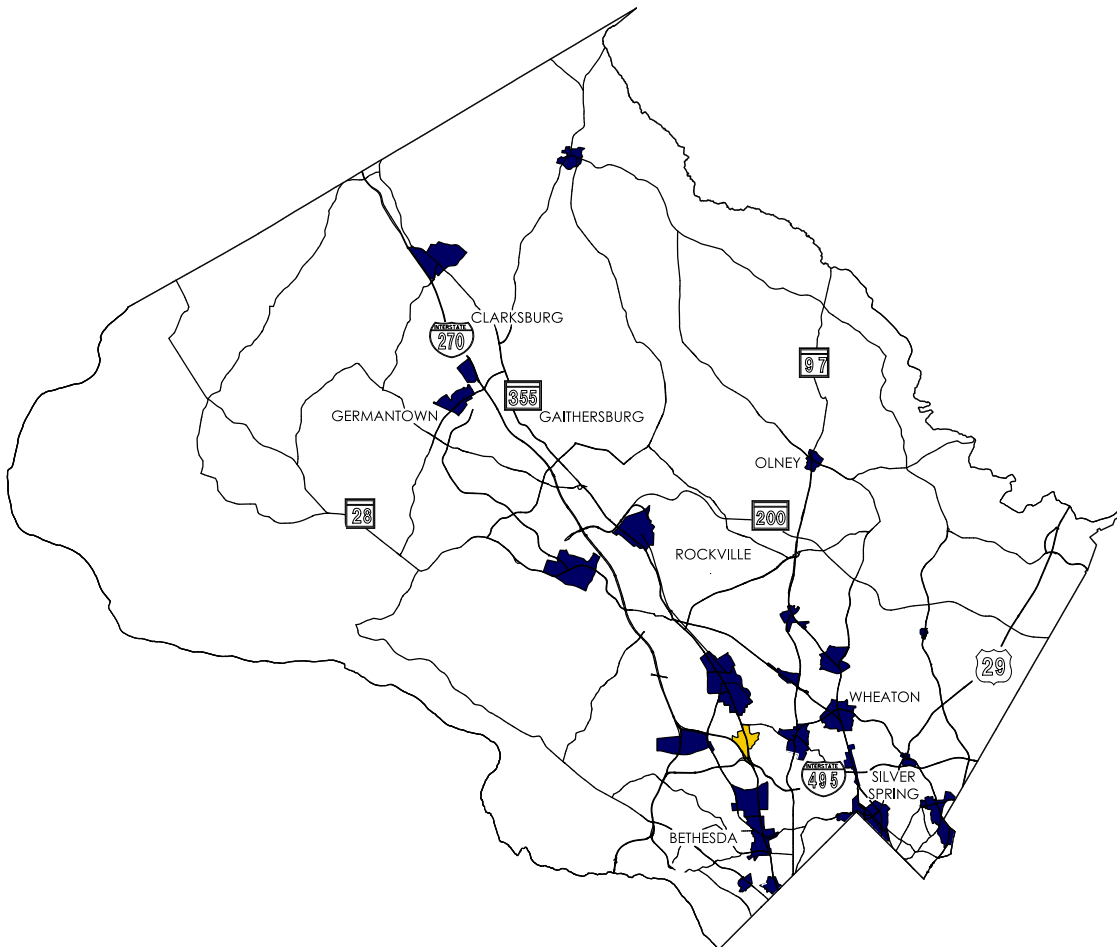
The Grosvenor-Strathmore Metro station is proposing to redevelop a 4.25 acre portion of the current 15 acre property owned by WMATA. The objectives for this redevelopment are to: integrate transit facilities, reduce automobile dependency, increase pedestrian/bicycle trips, foster safe station areas, enhance connections to transit stations, provide mixed-use redevelopment, offer active public spaces, promote and enhance ridership, and encourage revitalization and sound growth. These objectives will be achieved by: integrating the Metro Station into the surrounding community by filling in the physical gaps between the community and the Station entrance, provide the opportunity to live immediately adjacent to rail and bus transit, create a walkable environment, activate the area with new residents to create a safer environment, enhance bicycle connectivity to the Metro Station via new pathways and site grading, construction of multifamily residential housing and retail uses, and convert the surface parking lot into walkable paths. This project proposes 550 new residential units along with approximately 6,000 square feet of retail and expanding the existing parking garage.

Table 2 – Summary of Master Plan Recommendations

Item No	Corridor	Jurisdiction	Improvement Type	Description	Reference
1	Beach Drive	Montgomery County	Bicycle	Planned bikeway from Knowles Avenue - Kensington	North Bethesda Garrett Park Sector Plan (1992)
2	Grosvenor-Strathmore Metro	WMATA	Bicycle	Construct 'Bike and Ride' parking in the WMATA Grosvenor-Strathmore Station parking garage	2012-2017 WMATA CIP
3	None	Montgomery County	Shared Use Path	Widen the shared use path from Tuckerman Lane to the crossing below Rockville Pike (MD 355)	2012-2017 WMATA CIP
4	None	Montgomery County	Shared Use Path	Add the missing link of shared use path in the parking lot of the Strathmore between Tuckerman Lane and Strathmore Avenue	2012-2017 WMATA CIP
5	North Bethesda	Montgomery County	Bicycle	Planned bikeway Tuckerman Lane - Capital Beltway via Hunting Avenue	North Bethesda Garrett Park Sector Plan (1992)
6	Rockville Pike (MD 355)	MdSHA	Sidewalk	Widen the sidewalk on Rockville Pike (MD 355) between the ramps for Beach Drive to WMATA Grosvenor-Strathmore Station entrance	2012-2017 WMATA CIP
7	Rockville Pike (MD 355)	MdSHA	Curb Ramps; APS/CPS	Reconstruct the intersection of Rockville Pike (MD 355) and Grosvenor Lane to provide APS/CPS signals and ADA compliant curb ramps	2012-2017 WMATA CIP
8	Rockville Pike (MD 355)	MdSHA	Curb Ramp; APS/CPS	Reconstruct the intersection of Rockville Pike (MD 355) and Tuckerman Lane to provide APS/CPS signals and ADA compliant curb ramps	2012-2017 WMATA CIP
9	Rockville Pike (MD 355)	MdSHA	Sidewalk	Improve sidewalks to have a minimum width of 6' along BRT's	Countywide Transit Corridors Functional Master Plan
10	Rockville Pike (MD 355)	MdSHA	Curb Ramp; Sidewalk	Construct landscape buffers of sufficient width to achieve sidewalks and handicap ramps that meet ADA best practices along BRT's	Countywide Transit Corridors Functional Master Plan
11	Rockville Pike (MD 355)	MdSHA	All	Re-Construct Rockville Pike (MD 355) into a streetscape with enhanced medians, wider sidewalk, tree panels bikeway improvements and better pedestrian crossings	North Bethesda Garrett Park Sector Plan
12	Strathmore	MdSHA	Bicycle	Planned bikeway Rockville Pike - Weymouth Avenue via Strathmore Avenue	North Bethesda Garrett Park Sector Plan (1992)
13	Strathmore Hall Street	Montgomery County	Bicycle	Create a shared bicycle lane on Strathmore Hall Street	2012-2017 WMATA CIP
14	Tuckerman Lane	Montgomery County	Bicycle	Construct 5.5' Bike lanes along Tuckerman Lane	Countywide Transit Corridors Functional Master Plan
15	Tuckerman Lane	Montgomery County	Shared Use Path	Construct a shared use path along Tuckerman Lane (Part of larger system)	Countywide Bikeways Functional Master Plan

Grosvenor– Strathmore

Public Input



Public Input





PUBLIC INPUT

The public had a chance to voice their comments at two meetings held by the North Bethesda Transportation Management District and the Grosvenor-Strathmore Public Workshop. The North Bethesda Transportation Management District Meeting was held in March of 2015. MCDOT and community stakeholders met at the Feral Realty Trust Building in Rockville, MD to voice their concerns for the Grosvenor-Strathmore BiPPA. The Grosvenor-Strathmore Public Workshop was held in April of 2015. MCDOT and community stakeholders met at the Garrett Park Elementary School in Kensington, MD to voice their concerns for the Grosvenor-Strathmore BiPPA. A summary of the comments from the meetings is shown in Table 3.



Table 3 - Summary of Public/Stakeholder Input Comments

Item No	Corridor	Comment	Reference
1	Cloister Drive	Provide ADA access from Tuckerman Lane to Holy Cross Academy.	North Bethesda Transportation Management District Meeting
2	Grosvenor Lane	Residents would like to see pedestrian connections made to both the Bethesda Trolley Trail and Rock Creek Trail via Grosvenor Lane.	North Bethesda Transportation Management District Meeting
3	Grosvenor-Strathmore Metro Station	Improve accessibility of staircase from Tuckerman Lane to WMATA surface lot and improve drainage. Currently, standing water builds up on landing, probably due to settlement of the concrete.	North Bethesda Transportation Management District Meeting
4	Grosvenor-Strathmore Metro Station	Improve safety for pedestrians crossing access roadway between station and east surface lot. Currently, pedestrians care in conflict with kiss n ride traffic, taxis, and buses.	North Bethesda Transportation Management District Meeting
5	Grosvenor-Strathmore Metro Station	Construct a shared use path in the WMATA parking lot between the WMATA tracks and the parking garage.	North Bethesda Transportation Management District Meeting
6	MD 355 and Grosvenor Lane	Implement traffic calming along MD 355 NB at Grosvenor Lane by creating a gateway effect with landscaping and signage. This is a very inhospitable/intersection for pedestrians/bikes.	North Bethesda Transportation Management District Meeting
7	MD 355	The pedestrian crossing that underpasses MD 355 and connects the Metro Station with apartment complex to the west should be upgraded to meet current ADA standards.	North Bethesda Transportation Management District Meeting
8	Tuckerman Lane	Implement ADA/safety pedestrian crossing improvements at Tuckerman Lane and Strathmore mansion path (at-grade), Tuckerman Lane and WMATA garage entrance/Strathmore rear entrance intersection, and Tuckerman Lane and Cloister Drive.	North Bethesda Transportation Management District Meeting
9	Tuckerman Lane	At the intersection of Tuckerman Lane and Strathmore Park at Grosvenor-Strathmore/WMATA surface lot entrance, convert to 4-way stop. Include pedestrian refuge and advanced signing.	North Bethesda Transportation Management District Meeting
10	MD 355 and Tuckerman Lane	Upgrade pedestrian curb ramps to be bicycle and ADA compliant with APS/CPS.	North Bethesda Transportation Management District Meeting
11	Tuckerman Lane and Grosvenor Place	Please eliminate the channelized right turn, blind corner.	Grosvenor-Strathmore Public Workshop
12	MD 355 and Tuckerman Lane	Please realign the crosswalks.	Grosvenor-Strathmore Public Workshop
13	Tuckerman Lane from MD 355 to Grosvenor Place	Bush/tree trimming needed along Tuckerman Lane.	Grosvenor-Strathmore Public Workshop
14	MD 355	Provide more pedestrian friendly sidewalks.	Grosvenor-Strathmore Public Workshop
15	MD 547 and Jolly Lane	Crosswalk is currently hazardous to pedestrians.	Grosvenor-Strathmore Public Workshop

Table 3 - Summary of Public/Stakeholder Input Comments			
Item No	Corridor	Comment	Reference
16	MD 547 and entrance to the Academy of the Holy Cross	Please provide a crosswalk here.	Grosvenor-Strathmore Public Workshop
17	Montrose Avenue	Please construct a shared use path.	Grosvenor-Strathmore Public Workshop
18	Tuckerman Lane and Strathmore Park Court	Please consider a traffic signal at this location.	Grosvenor-Strathmore Public Workshop
19	Montrose Avenue	Traffic calming devices needed.	Grosvenor-Strathmore Public Workshop
20	MD 355 and Grosvenor Lane	This intersection is not pedestrian friendly.	Grosvenor-Strathmore Public Workshop
21	MD 355 from Tuckerman Lane to Grosvenor Lane	Shared use path along MD 355 is not wide enough and is narrowed by guardrails.	Grosvenor-Strathmore Public Workshop
22	MD 355	Bicycle and pedestrian facilities across I-270/-495.	Grosvenor-Strathmore Public Workshop
23	Grosvenor Lane	Please widen sidewalks across I-270.	Grosvenor-Strathmore Public Workshop
24	Grosvenor-Strathmore at Cloister Drive	Poor drainage causes ice on the shared use path at this location.	Grosvenor-Strathmore Public Workshop
25	Symphony Park Drive	Please provide destination signing for pedestrians and bicyclists.	Grosvenor-Strathmore Public Workshop
26	Tuckerman Lane from MD 355 to Montrose Avenue	Please provide a midblock crossing.	Grosvenor-Strathmore Public Workshop
27	MD 355 and Grosvenor Lane	Please provide more bicycle friendly facilities at this intersection.	Grosvenor-Strathmore Public Workshop
28	MD 547	Right turn lane mistaken for through lane.	Grosvenor-Strathmore Public Workshop
29	Intersection of Strathmore Avenue and Symphony Park Drive	Add a rectangular rapid flash beacon (RRFB) at the crosswalk in this intersection.	Grosvenor-Strathmore Public Workshop
30	Rockville Pike (MD 355)	Provide a shared use path link between the Grosvenor-Strathmore BiPPA and the White Flint Sector Plan.	Grosvenor-Strathmore Public Workshop



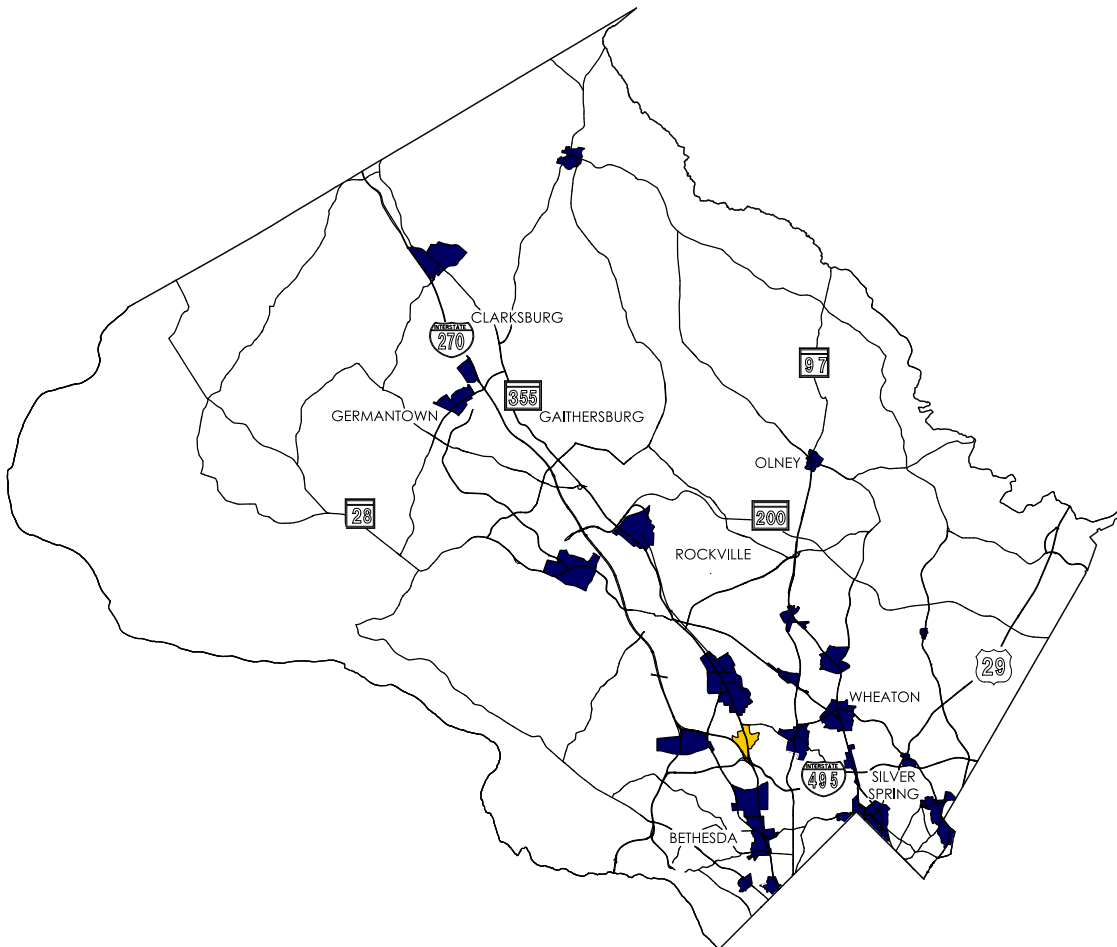
STAKEHOLDERS

Stakeholders for the Glenmont BiPPA include the Bethesda-Chevy Chase Regional Service Center, the Montgomery County Council, the North Bethesda Transportation Management District, the Maryland State Highway Administration (SHA), the Montgomery County Department of Transportation (MCDOT), and the Maryland-National Capitol Park and Planning Commission (M-NCPPC). As the planning and implementation process continues, it is expected that additional stakeholders will include:

- Bethesda-Chevy Chase Regional Service Center
- Montgomery County Department of Permitting Services
- Montgomery County Department of Environmental Protection
- Metropolitan Area Transit Authority (WMATA)
- PEPCO
- Verizon
- Washington Gas and Light
- Washington Suburban Sanitary Commission

Grosvenor– Strathmore

Field Investigation and Existing Conditions



FIELD INVESTIGATION AND OBSERVATIONS

FIELD INVESTIGATION SUMMARY

For the BiPPA study, a comprehensive field investigation was performed to further define how and where master plan improvements could be implemented at street level within the Grosvenor-Strathmore area. Preparation and execution of field investigations followed these basic steps:

- 1) Downloaded basemapping and aerial imagery available from the Montgomery County Parks and Planning Commission online database to the office network server;
- 2) Uploaded basemapping onto mobile iPad/ArcMap platform;
- 3) Prepared a customized menu with all potential improvement types and loaded onto ArcMap;
- 4) Visited study area with field crews consisting of one or two transportation engineers and one GIS technician;
- 5) Collected locations, photos, and notes on various proposed improvements in the field using iPad/ArcMap platform;
- 6) Uploaded data collected in the field to network server for further analysis and design.

The outlined method proved to be especially useful for locating potential spot improvements such as curb ramps, driveway aprons, APS/CPS, curb extensions, median refuge, signing, maintenance tasks, etc.

By performing field investigations, crews were also able to note other important factors such as site constraints, user behavior, facility operation, safety issues, and adjacent construction.



BICYCLE AND PEDESTRIAN NETWORK

There are currently shared use paths on Tuckerman Lane and in the Symphony Park development. The shared use path on Tuckerman Lane is along the westbound side of Tuckerman Lane from the Bethesda Trolley Trail to MD 355 and along the eastbound side from MD 355 (north intersection) to MD 355 (south intersection). There are existing bicycle racks at the Grosvenor-Strathmore Metro Station; however, bicycle connectivity from the surrounding area to the station is poor. There is a lack of signing or pavement marking for cyclists in the area. Sidewalks are prevalent throughout the BiPPA boundary.



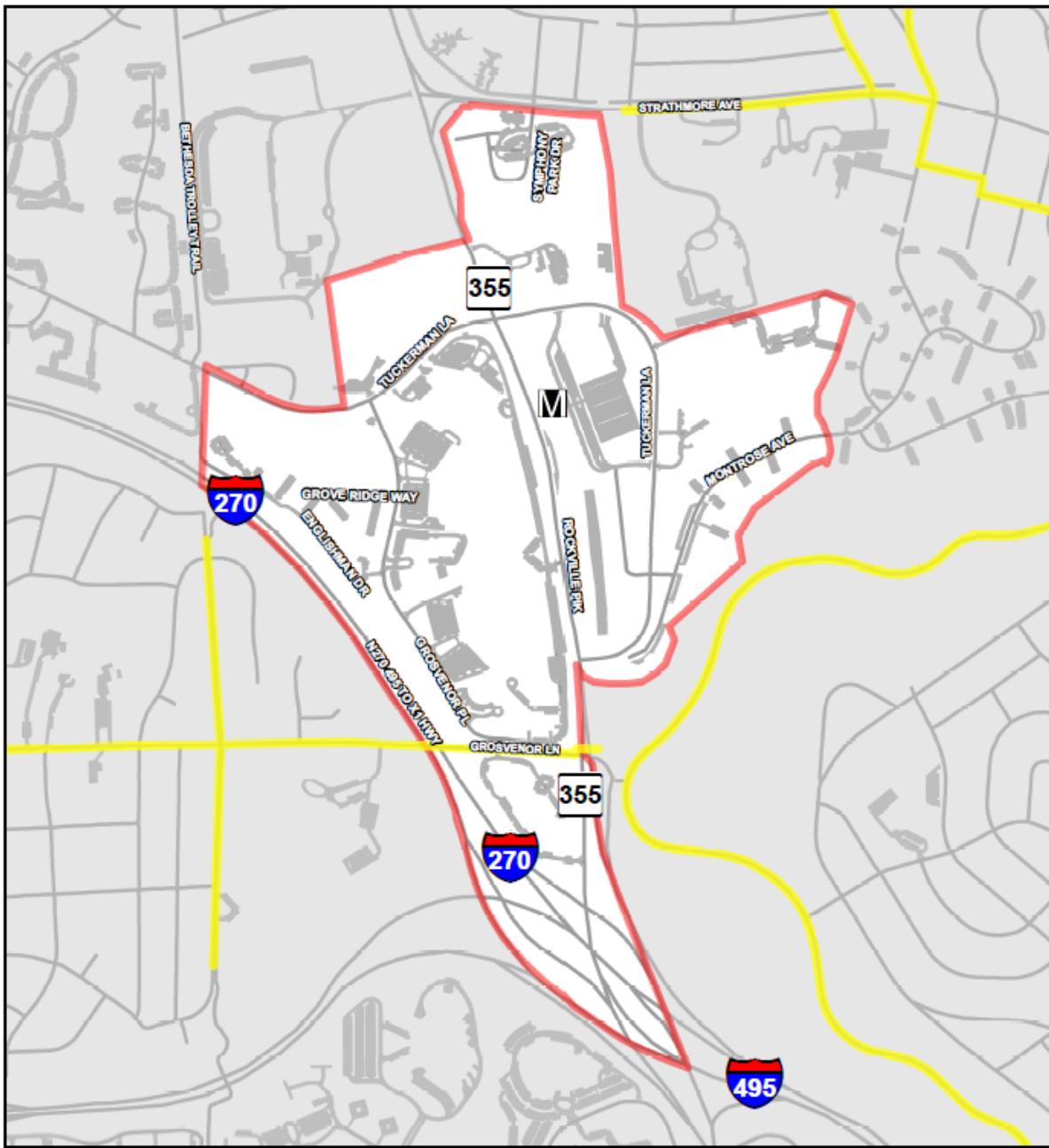
Figure 4 – Grosvenor Lane Looking Towards MD 355

TRANSIT NETWORK

The Grosvenor-Strathmore BiPPA is served by the Grosvenor-Strathmore Metro Station located on MD 355 between Tuckerman Lane (southern intersection) and Tuckerman Lane (northern intersection). The Grosvenor-Strathmore Metro Station is on the western leg of the Red Line; the Red Line has a U-shaped alignment with the western terminus at the Shady Grove Station in Rockville MD and an eastern terminus at the Glenmont Station in Glenmont, MD. The southernmost points along the Red-line are in downtown Washington D.C. near the Verizon Center. The station occupies a significant amount of land created by the parcel between MD 355 and Tuckerman Lane. There is a tunnel under MD 355 that connects Grosvenor Park to the Metro. There is also a pedestrian bridge that connects the WMATA parking garage to the Strathmore Music Center. There is a strong bus network in the area with many ride on and metro bus stops and routes. A map of the current transit network is shown in Figure 8.



Figure 5 – Grosvenor-Strathmore Metro Station

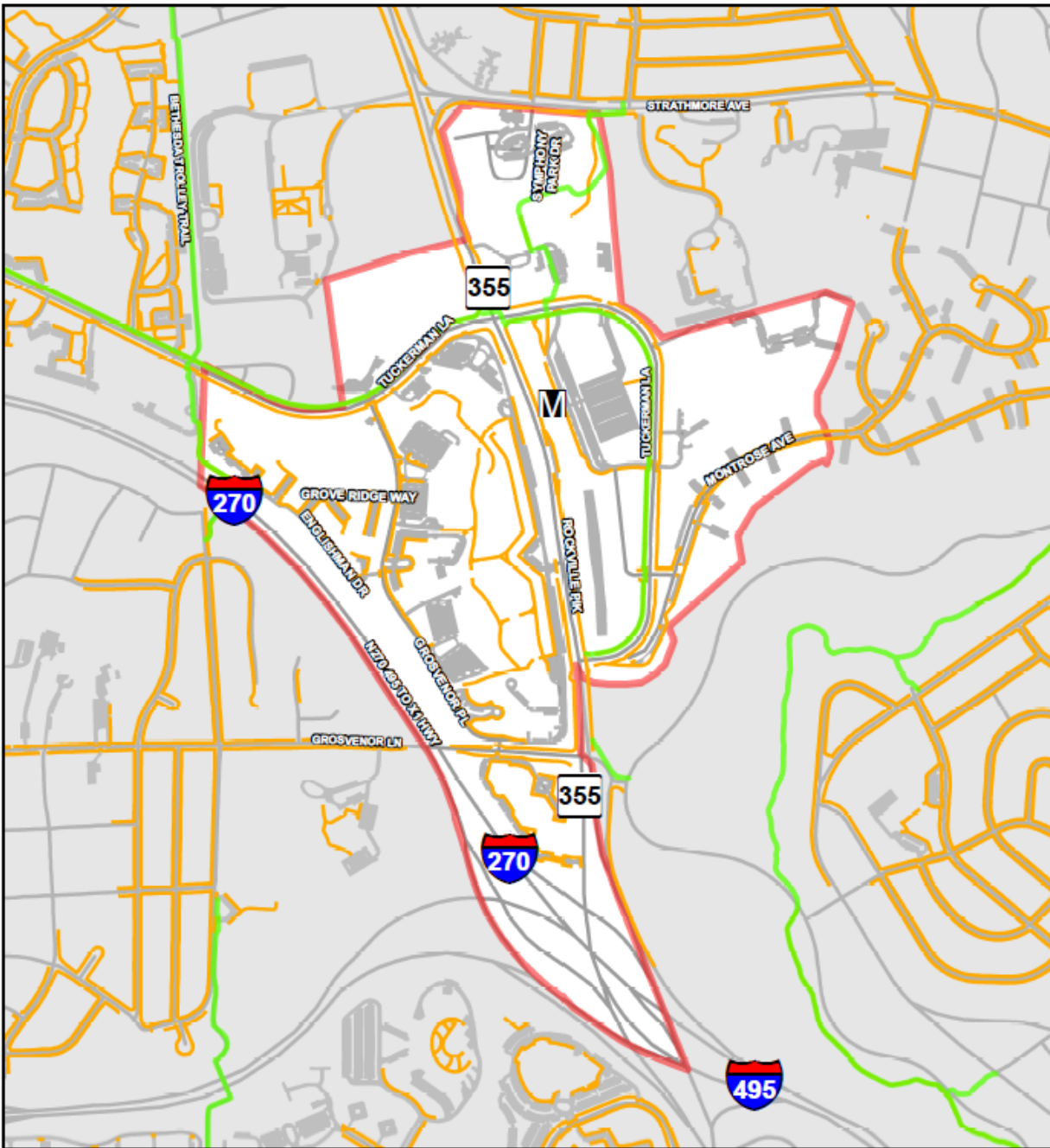


 Metro Station	 Bike Lane
 BiPPA Boundary	 Shared Roadway

Figure 6 – Existing Bicycle Network

0 275 550 1,100 Feet

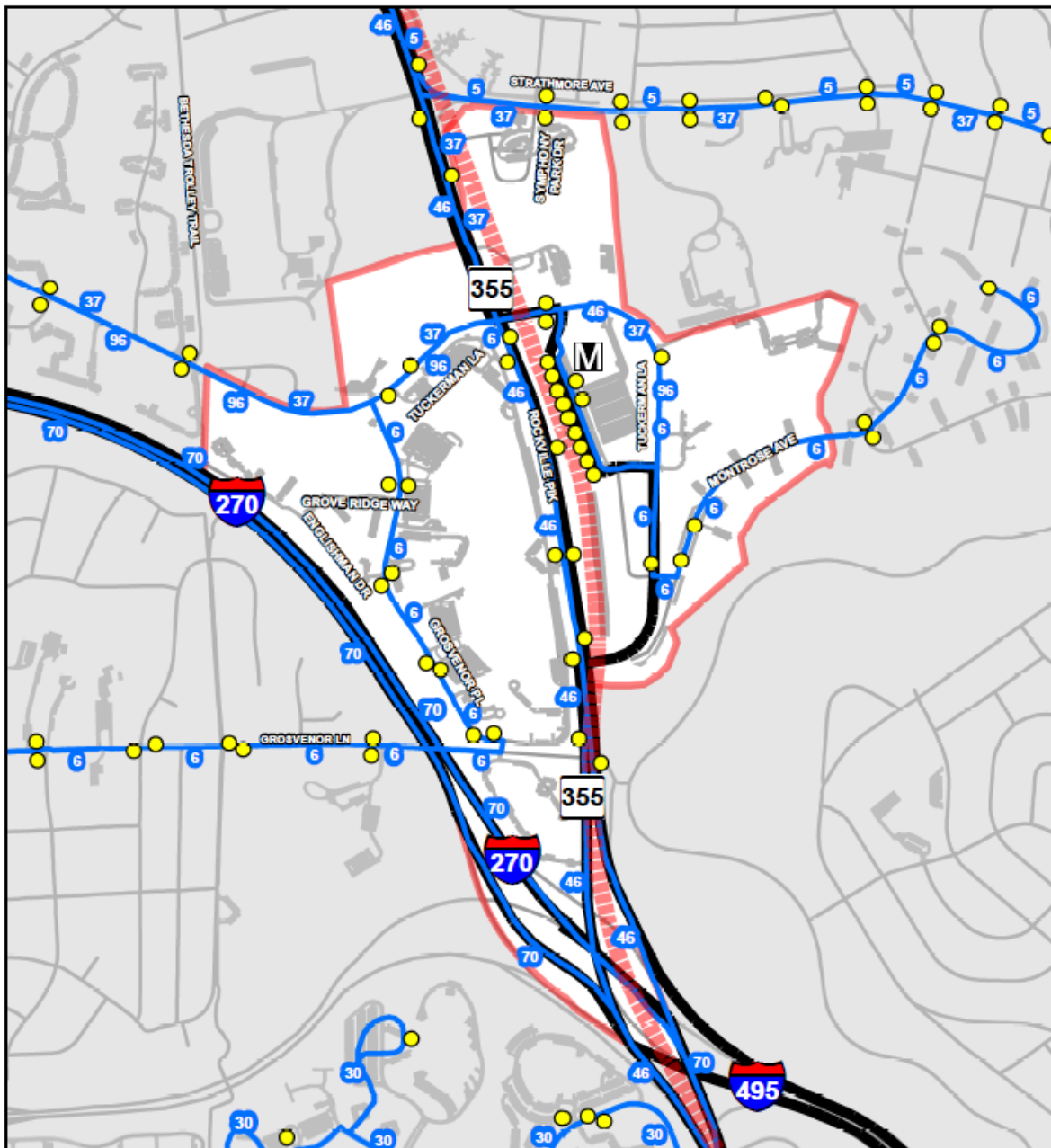




Metro Station	Shared Use Path
BiPPA Boundary	Sidewalk

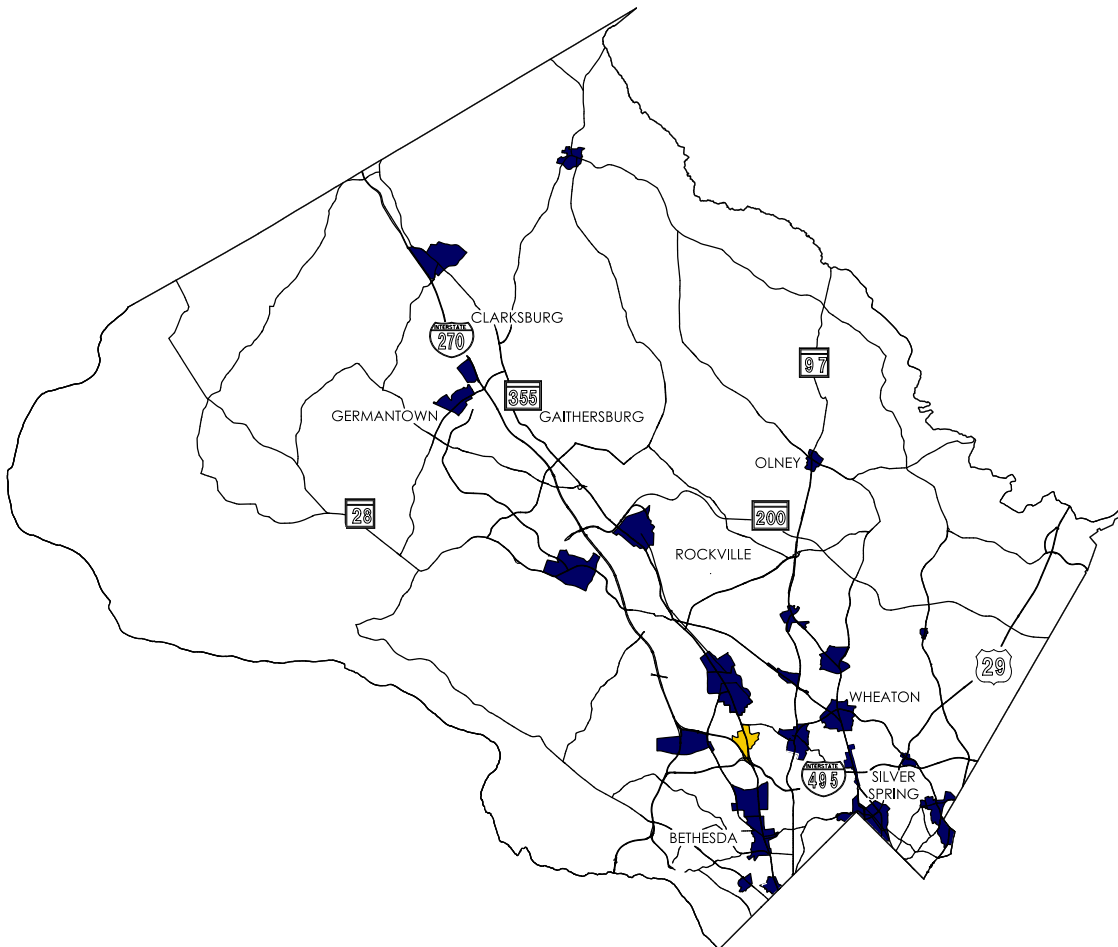
Figure 7 – Existing Sidewalk and Shared-Use Path Network

0 275 550 1,100 Feet



Grosvenor– Strathmore

Ranking Criteria



RANKING CRITERIA

This study proposes some improvements can be implemented almost immediately, some in phases or increments, while others will need to follow the capital project track through to planning, design and construction. To help prioritize improvements, the following factors have been considered for each of the proposed improvements:

1. Priority - High, Medium, Low
 - a. Determined based on the net sum of:
 - i. Benefits – Safety, Connectivity and Circulation, Transportation Equity, Accessibility, Infrastructure Upgrade, Master Plan, Public Input
 - ii. Impacts – Right of way, Environmental, Traffic, Parking, Utilities
2. Timeframe – Short-term (1 – 2 years), Mid-term (2 – 5 years), Long-term (5+ years)
 - a. Determined based on the sum of:
 - i. Design Tasks – Environmental Investigation, Survey, Utility Investigation, Soils Investigation, Traffic Study, Contract Documents, Public/Stakeholder coordination, Permits & Approvals, Right of way acquisition, Funding
 - ii. Construction Tasks – Paving, Grading, Structures, Utility Relocation, Drainage/Storm Water Management/Erosion & Sediment Control, Signals, Lighting, Signing & Marking, Traffic Control
3. Cost (Order of magnitude)
 - a. Broken down into the following ranges:
 - i. \$ = <\$10,000
 - ii. \$\$ = \$10,000 - \$100,000
 - iii. \$\$\$ = 100,000 - \$1,000,000
 - iv. \$\$\$\$ = 1,000,000 - \$5,000,000
 - v. \$\$\$\$\$ = >\$5,000,000



Priority is simply based on the ratio of benefits to impacts. For improvements with multiple benefits and few impacts, a high priority is the result. Likewise, improvements with few benefits and multiple impacts result in a low priority.

Timeframe is based on the number of design and construction tasks necessary to implement an improvement. Short-term improvements have an estimated completion time of 1-2 years and would require minimal design, coordination, or permits/approvals. Furthermore, short-term improvements can likely be implemented with established funding sources. Examples of short-term improvements include signing and marking, ADA upgrades, and maintenance tasks. Mid-term improvements have an estimated completion time of 2-5 years and would typically require a combination of further design, coordination, programmed funding, and permits/approvals. Typical mid-term improvements include shared-use paths, cycle tracks, and new signals. Lastly, long-term improvements have an estimated completion date that is greater than 5 years. These projects would require an extensive combination of further planning, design, coordination, political will, programmed funding, and permits/approvals. The typical scope of long-term improvements would include reconstruction and extensive impacts such as utility relocations and right of way acquisition.

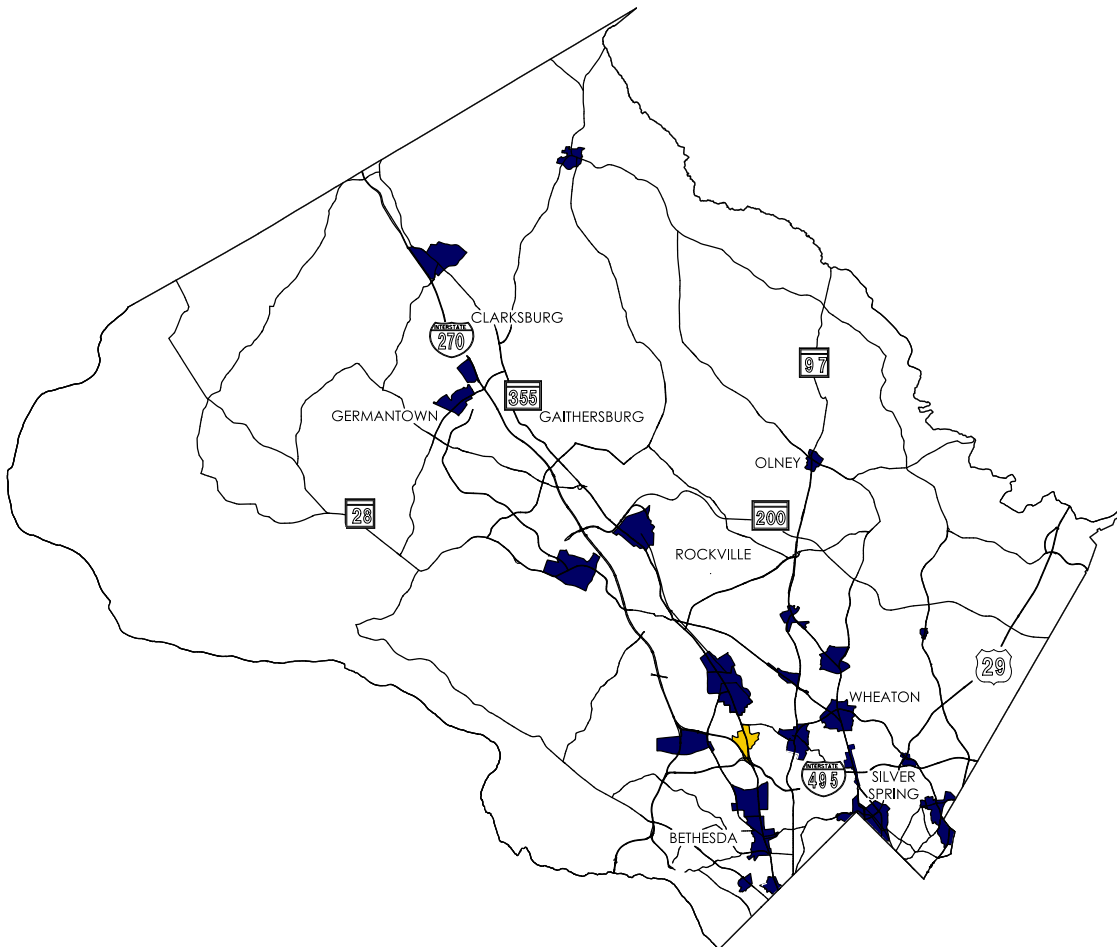
The cost component is largely subjective and should only be considered as an order of magnitude.

The implementation for each improvement could follow a different track, depending on the factors listed above, as well as the implementing agency. However, short-term improvements could likely be constructed with a combination of basic design drawings and MCDOT and/or MDSHA standard drawings to locate and construct improvements. Mid- and long-term improvements will generally require further project development that includes coordination, survey, design, right of way acquisition, permits, and/or approvals.

Funding sources are subject to change throughout the duration of this study. At the present time, all public transportation agencies and funding entities - federal, state, county, and municipal - are considered potential partners for funding of implementation and maintenance of these priority improvements. For county roads, funds are appropriated directly by the Montgomery County Council. For state roads, depending on the type of improvement, different funds can be used to implement improvements. Fund 76 and Fund 77 projects, commonly used for signal upgrades, pavement resurfacing, signing and marking, can incorporate bicycle and pedestrian accommodations. A list of known, potential funding sources is listed the appendices.

Grosvenor– Strathmore

Priority Improvements



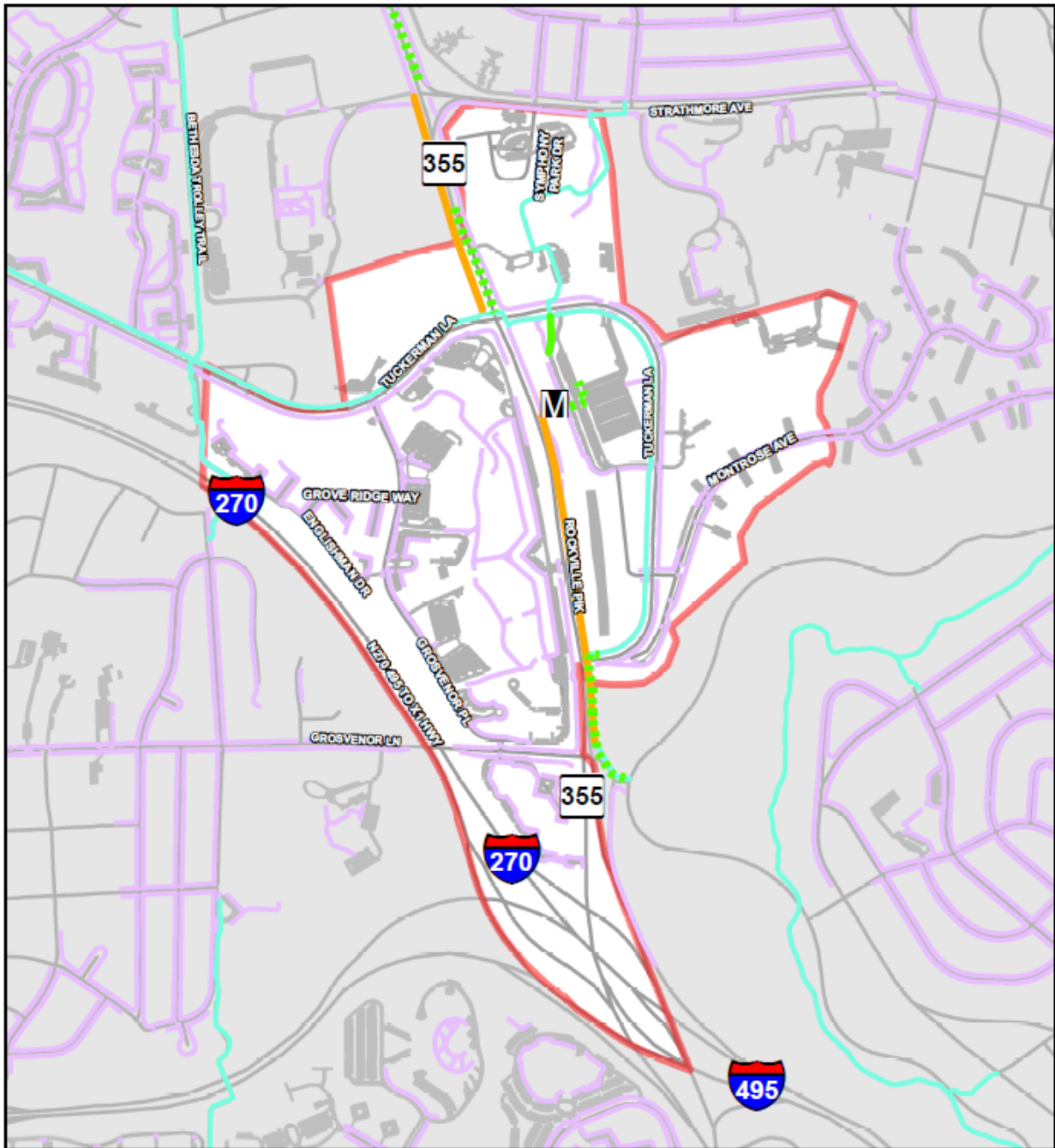
PRIORITY IMPROVEMENTS

OVERVIEW OF IMPROVEMENT TYPES

The Grosvenor-Strathmore BiPPA has been evaluated for various bicycle and pedestrian improvements types. Proposed improvements have been developed and prioritized based on master or sector plan recommendations and public/stakeholder input.

In the Recommended Priority Improvements section, improvements are primarily organized by corridors or intersections. However, many improvement types can be implemented in an area-wide project format as well. The area-wide improvements include pedestrian curb ramps, reconstruction of driveway aprons, widening of sidewalk, reconstruction of sidewalk, striping or re-striping of crosswalks, the addition of APS/CPS, installation or relocation of pedestrian/bicycle signing, and general tree trimming maintenance. The linear improvements include the implementation of shared lanes (sharrows), bike lanes, and cycle tracks, as well as, the construction of shared use paths and sidewalks.

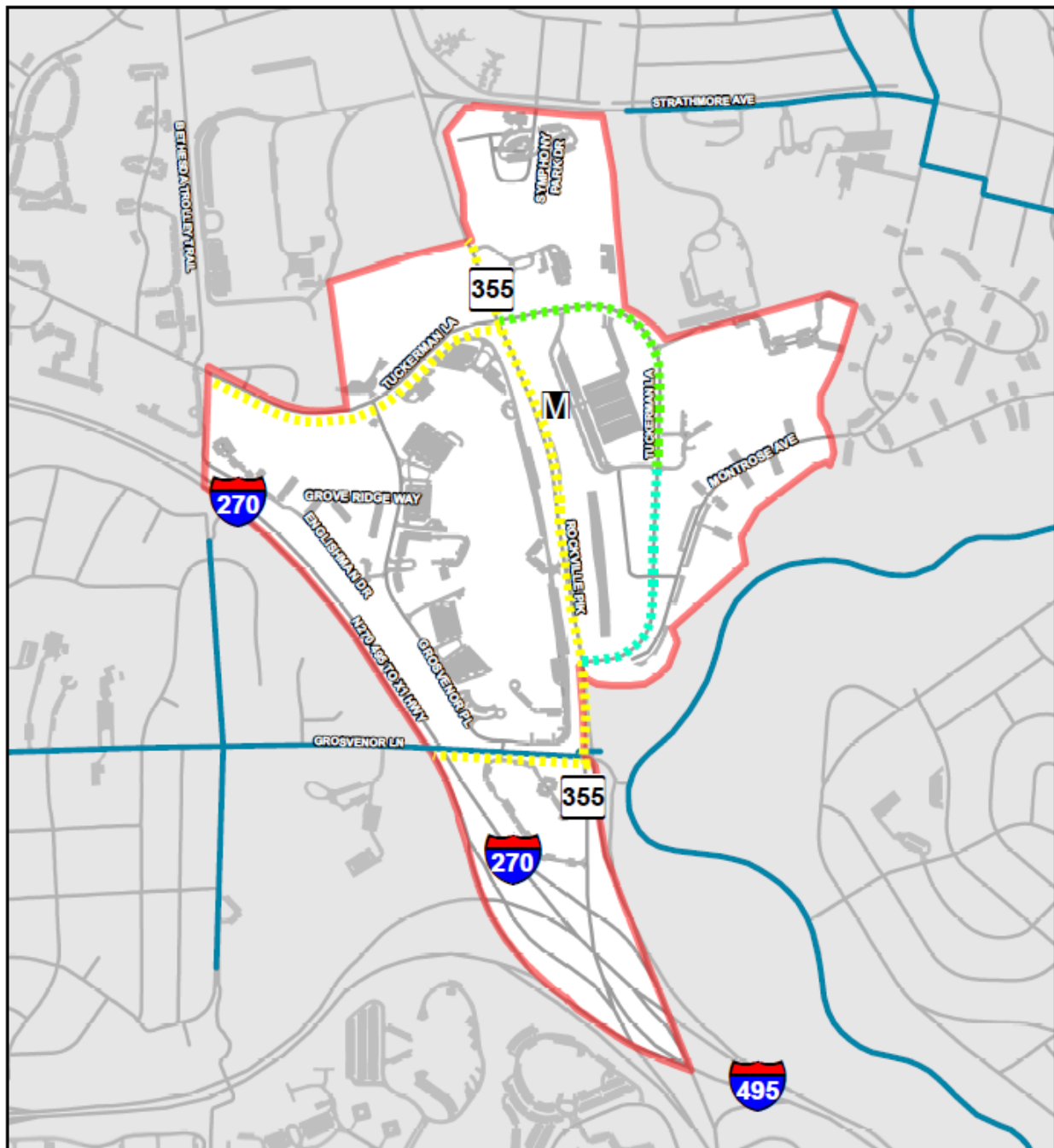
Table 4 – Improvement Type Summary	
Improvement	Applications and Benefits
Sidewalk	<i>Pedestrian connections to parks, schools, residents, businesses, or other sidewalk / trail sections</i>
Shared Use Paths	<i>Pedestrian connections to parks, schools, residents, businesses, or other sidewalk / trail sections</i>
Shared Roadway Markings	<i>Limited lane widths, on-street parking sections, wayfinding, or wherever correct bicycle positioning is vague</i>
Bike Lanes	<i>Higher-speed (greater than 25mph) streets to avoid some bicycle-car conflicts and create predictable movements</i>
Cycle Track	<i>Similar to bicycle lanes, also reduces some concerns from overtaking crashes and may reduce double-parking</i>
Curb Ramp	<i>Missing or non-ADA-compliant curb ramps</i>
Driveway Apron	<i>Deteriorated, missing, or non-ADA-compliant aprons</i>
Median Refuge	<i>Increases separation of pedestrians from car traffic to improve comfort levels and safety</i>
Curb Extension	<i>Shortens crossing distances, lowers speeds of turning vehicles, increases visibility of pedestrians entering an intersection</i>
Bike Box	<i>Reduces bicycle delay, increases bicycle convenience, and improves bicycle positioning in traffic in slow/start situations.</i>
Crosswalks	<i>Improves visibility of pedestrians in motorway (may be high-visibility markings), denotes best or preferred location for pedestrian crossings</i>
Accessible / Countdown Pedestrian Signal	<i>Replaces non-compliant signals, improves crossing safety for pedestrians, particularly on long crossing maneuvers</i>



Metro Station	Existing	Proposed	Shared-Use Path
BiPPA Boundary	Shared Use Path	Construct	Construct
	Sidewalk	Widen Existing	Repair Existing

Figure 9 – Proposed Sidewalk and Shared-Use Path Network

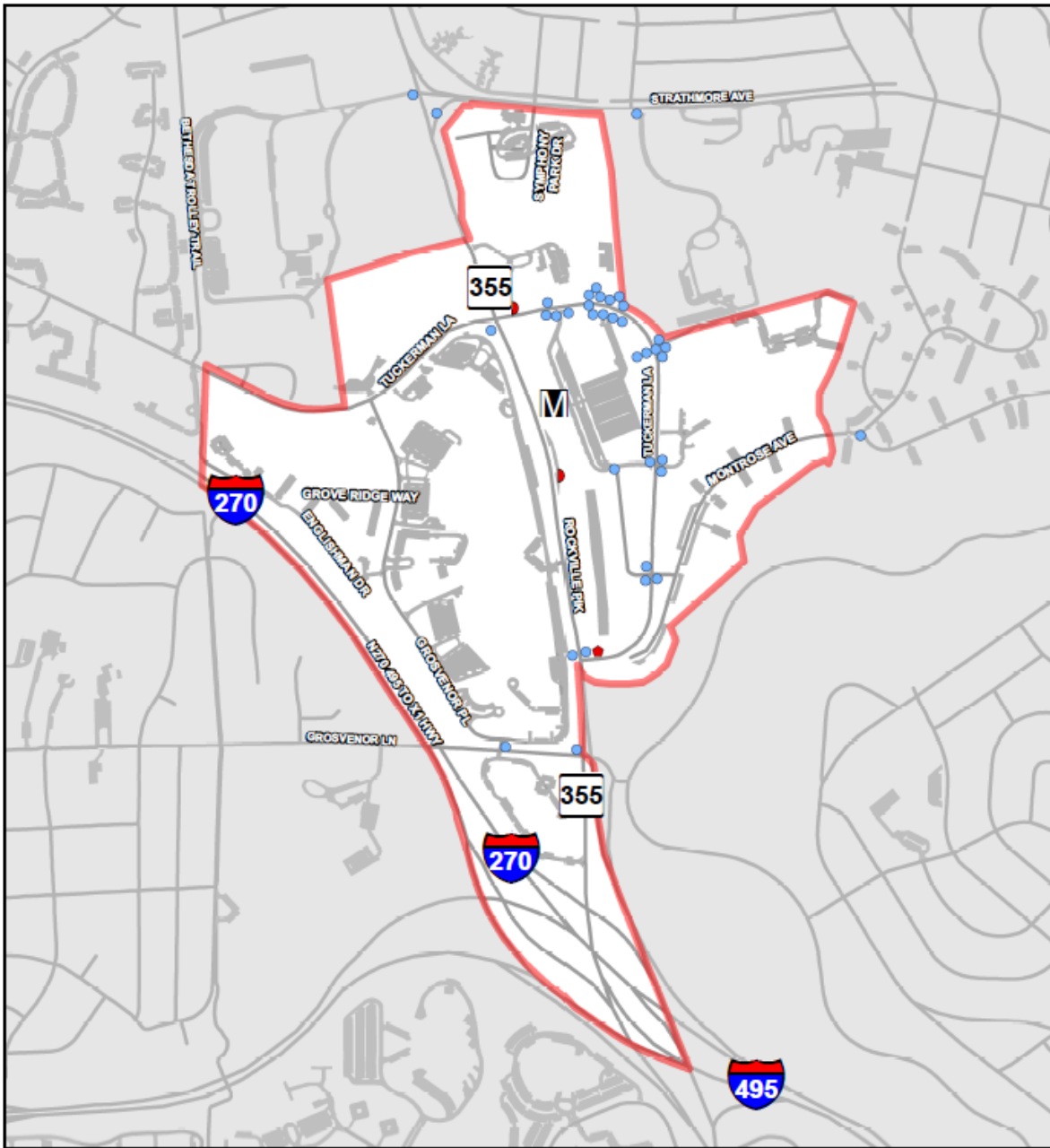
0 275 550 1,100 Feet



		Existing	Proposed
	Metro Station		
	BiPPA Boundary		
		Bike Lane	Shared Signage and Markings
		Shared Roadway	Bike Lane
			Cycle Track

Figure 10 – Proposed Bicycle Network

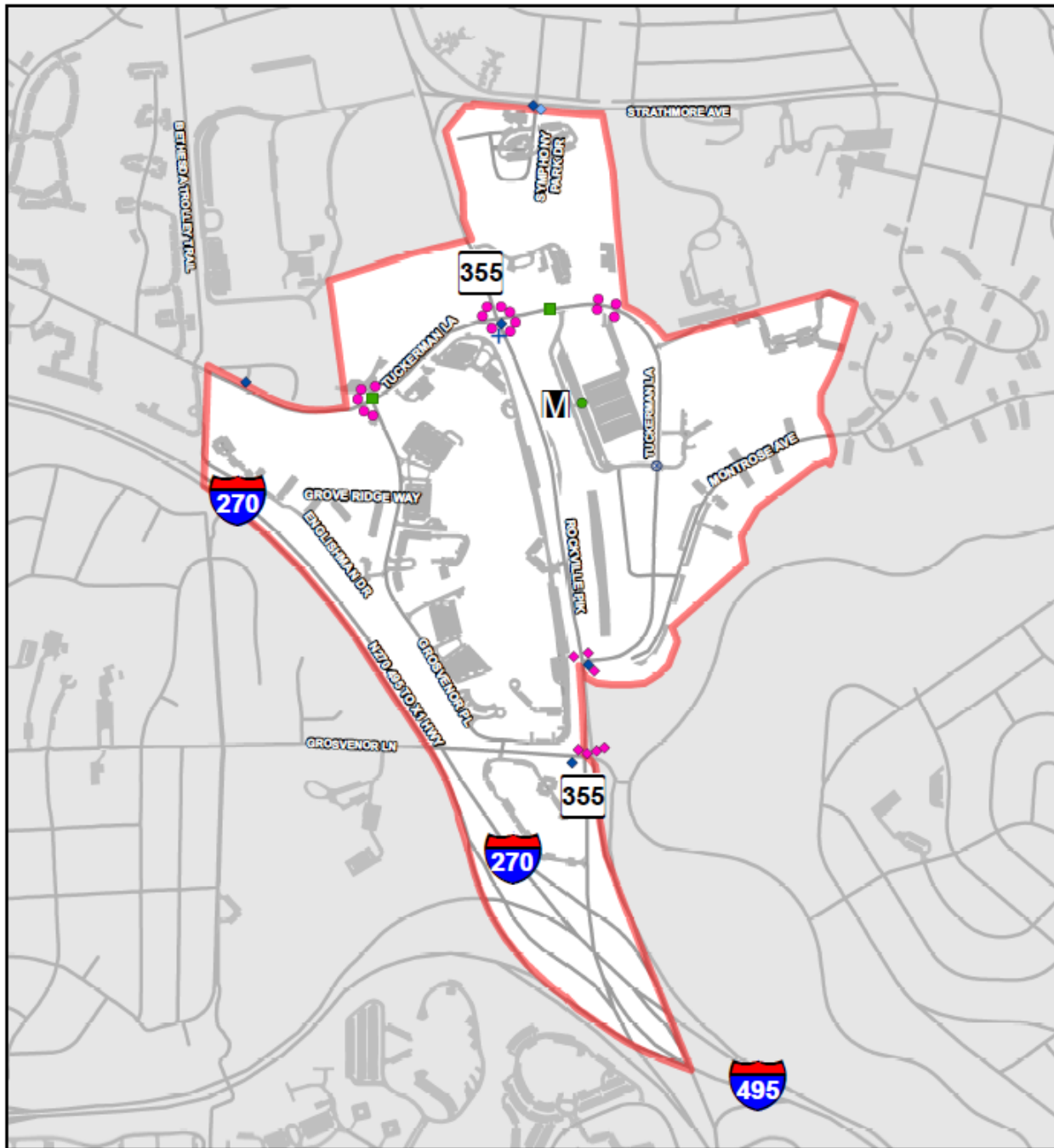
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Metro Station	Construct New Curb Ramp	Noncompliant Slope
BIPPA Boundary	Existing Curb Ramp Poorly Aligned or Located	Remove Driveway Apron
	Serves Two Crosswalks	Reconstruct Driveway Apron

Figure 11 – Proposed ADA Improvements

0 275 550 1,100 Feet

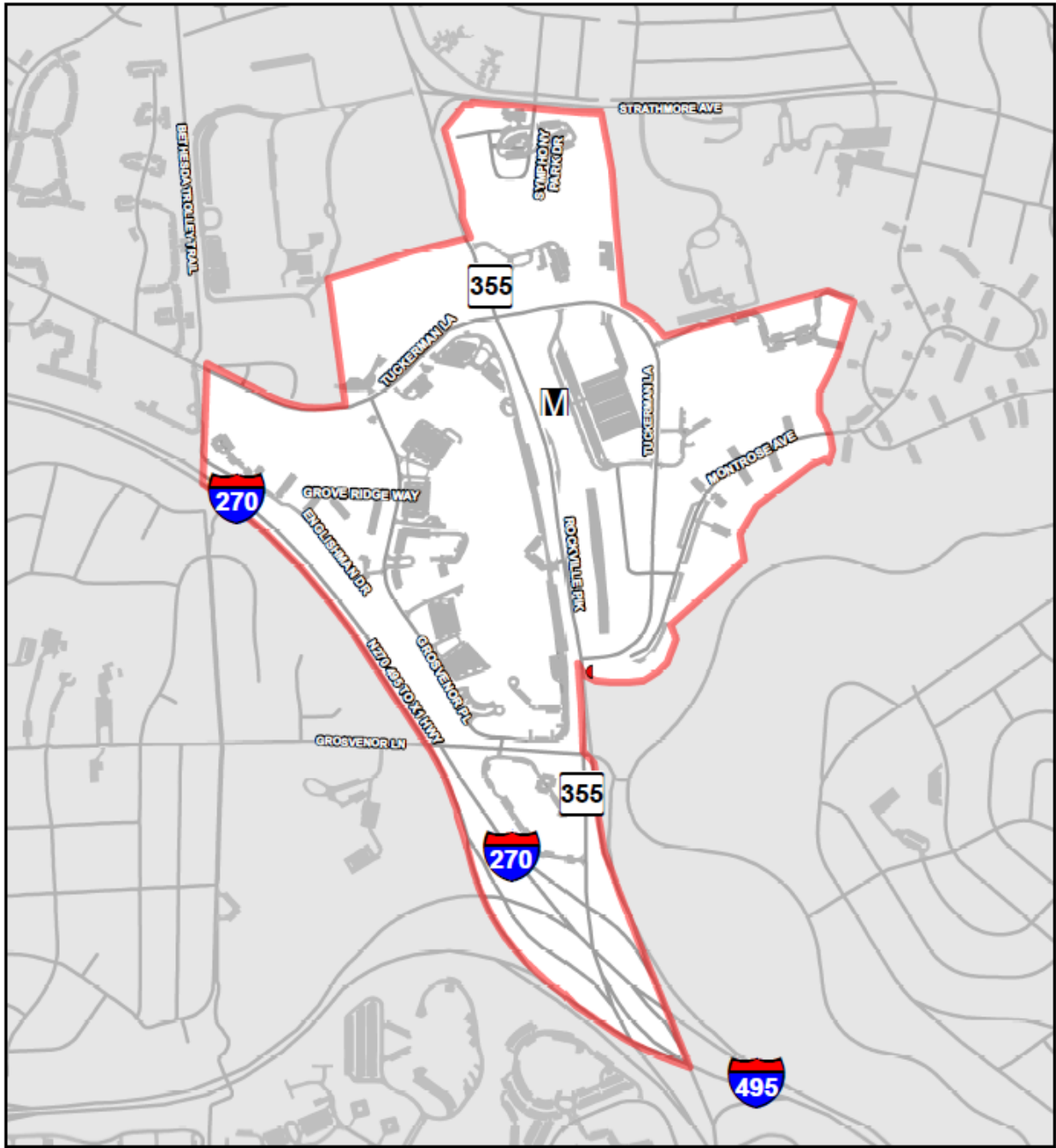


- | | | |
|--|--------------------------------|---|
| Metro Station | Cut Back Median | Reconstruct Mid-Block Pedestrian Crossing |
| BiPPA Boundary | Adjust Pedestrian Phase Timing | Relocate Mid-Block Pedestrian Crossing |
| Install Detectable Warning Surface | Relocate Traffic Control Box | Construct Curb Extension |
| Construct/Re-Align/Re-Stripe Crosswalk | Install APS | Reconstruct Curb Extension |
| Provide Median Refuge | Install APS and CPS | |
| | Construct Pedestrian Signal | |

Figure 12 – Proposed Intersection Improvements

0 275 550 1,100 Feet

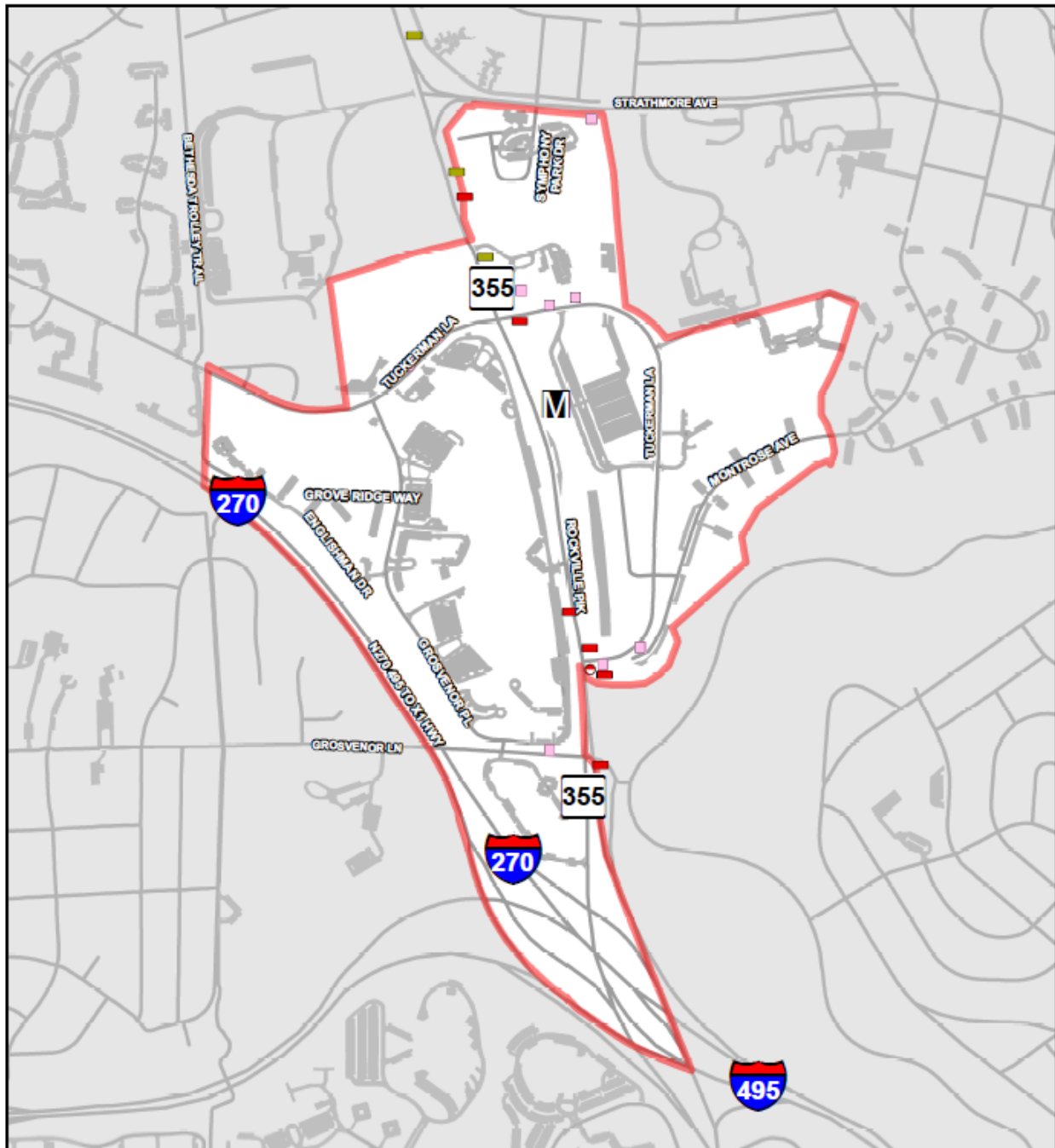




	Metro Station		Install Safety Railing
	BiPPA Boundary		Reduce Speed Limit
			Poor Sight Distance
			Construct Pedestrian Lighting
			Upgrade Pedestrian Lighting

Figure 13 – Proposed Safety Improvements

0 275 550 1,100 Feet



Metro Station	Construct/Reconstruct/Widen Sidewalk	Pavement Rutting/Pothole/Cracking
BiPPA Boundary	Vertical Obstruction - Trip Hazard	Cut Back Grass Growth
	Vertical Obstruction - Low Overhead Clearance	Cut Back Hedges Growth
	Remove/Relocate Street Furniture/Amenities	Cut Back Trees/Branches
	Construct/Reconstruct/Widen Shared-Use Path	Replace-Repair APS and/or CPS

0 275 550 1,100 Feet

Figure 14 – Proposed Maintenance



RECOMMENDED PRIORITY IMPROVEMENTS

The following section summarizes priority improvements developed for this BiPPA study. Priority and timeframe are based on the ranking criteria established in the previous section. Costs are also based on general assumptions and cost methodology.

Area Wide

Improvement Type: *APS/CPS, Driveway Aprons, Curb Ramps*

Priority: *High* **Timeframe:** *Short-term* **Cost:** *\$\$*

The area wide improvements consist of general upgrades to ensure that the Grosvenor-Strathmore BiPPA meets ADA compliancy. APS/CPS should be installed, driveway aprons should be reconstructed, and curb ramps should be reconstructed where needed. The locations of these proposed improvements are shown in Figure 11 and Figure 12.

Grosvenor Lane

From Old Georgetown Road to MD 355

Improvement Type: *Shared Roadway, Signing*

Priority: *High* **Timeframe:** *Short-term* **Cost:** *\$\$*

In the Countywide Bikeways Functional Master Plan it is recommended that Grosvenor Lane is utilized to create a connection between the Bethesda Trolley Trail and Rock Creek Trail. Sharrow markings and shared roadway signage should be placed along Grosvenor Lane from MD 355 to Old Georgetown Road. This improvement will not only allow cyclists to access the Bethesda Trolley Trail from MD 355/Rock Creek Trail but will also provide access to the Wildwood Shopping Center on Old Georgetown Road and Grosvenor Lane.

Grosvenor-Strathmore Metro Station

From Stairwell on Tuckerman Lane East of Metro Station

Improvement Type: *Runnel, Drainage*

Priority: *Medium* **Timeframe:** *Short-term* **Cost:** *\$*

One of the recommendations by the public was to install a bike “runnel” at the stair case to the east of the metro station that leads to Tuckerman Lane. An image of the staircase in consideration and a runnel in Utah are shown side-by-side on the following page. This improvement should be made for each of the three sets of the stairwell on both sides. This will allow bikers to easily access the Metro station from this stairwell rather than traveling to the northern or southern entrances to the Grosvenor-Strathmore station lot.

It was also mentioned by the public that there are drainage issues at this stairwell. This results in standing water in the landings. It is recommended that drainage improvements are made at this stairwell to correct this issue.

From WMATA Parking Garage to Grosvenor-Strathmore Metro Station

Improvement Type: Bicycle Parking, Shared-Use Path

Priority: Low

Timeframe: Mid-term

Cost: \$\$

The master plan states that 'Bike and Ride' parking should be added in the parking garage at the Grosvenor-Strathmore Metro Station. It is recommended that bicycle lockers are added to the garage so cyclists can park their bicycles safely for long periods of time. It is also recommended that a shared use path is constructed through the WMATA surface lot to provide a dedicated path for pedestrians and cyclists to travel from the stairwell on Tuckerman Lane to the WMATA station platform.



a)



b)

Figure 15 – a) Stairwell East of Grosvenor – Strathmore Metro Station b) Bike “Runnel” in Utah



Rockville Pike (MD 355)

From Grosvenor Lane to The Mansion at Strathmore

Improvement Type: Shared Use Path

Priority: High Timeframe: Long-term Cost: \$\$

It is recommended that a shared use path be constructed spanning from the Mansion at Strathmore to Grosvenor Lane. The Mansion at Strathmore is just south of a newly constructed housing development that has a strong shared use path network. The goal is to connect this shared use path network with the Rock Creek Trail at Grosvenor Lane by replacing the existing sidewalk between these two locations. From Tuckerman Lane (southern intersection) to Grosvenor Lane there is a pinching point created by one of the columns for the metro rail bridge crossing from above. This will be the only section that will not be 10 feet. This will complete the bicycle connectivity for the vicinity of Grosvenor-Strathmore Metro Station because it will connect the Rock Creek Trail to the cycle track and shared use paths at Tuckerman Lane (southern intersection).

Intersection with Tuckerman Lane (southern intersection)

Improvement Type: Intersection Reconstruction

Priority: Medium Timeframe: Mid-term Cost: \$\$

The intersection of MD 355 with Tuckerman Lane (southern intersection) should be reconstructed to provide a safer crosswalk for pedestrians crossing Tuckerman Lane. There is currently a channelizing island on the southern end of the crosswalk on Tuckerman Lane. This results in pedestrians having to cross a slip ramp, free right turn movement that vehicles make from MD 355 to Tuckerman Lane. The recommendation is to remove the channelizing island and reconstruct the corner with a tighter radius. This will result in removing the slip ramp and realigning the crosswalk so pedestrians can cross Tuckerman Lane in one movement.

Tuckerman Lane

From MD 355 (southern intersection) to Strathmore Park Court

Improvement Type: Cycle Track, Curb Ramps, APS/CPS, Signing, Crosswalks

Priority: High Timeframe: Mid-term Cost: \$\$

Tuckerman Lane from MD 355 (southern intersection) to Strathmore Park Court is currently a 5 lane roadway with one lane that is dedicated to left turns or is a striped median. The width of the left turn/median section is approximately 12 feet which leaves adequate room to replace this space of the roadway with a cycle track. This would require the roadway markings to be realigned and restriped resulting in two through lanes, two parking lanes, and a two way cycle track. The cycle track would be between the curb and the parking lane on the NB side of Tuckerman Lane and would be 8 feet wide with a two foot buffer. It is also recommended that



signage is placed on the roadway to assist in directing traffic to be attentive to the new cycle track bicyclists. Curb ramps should be reconstructed at intersections to be ADA compliant.

From Strathmore Park Court to MD 355 (northern intersection)

Improvement Type: Bike Lanes, Curb Ramps, APS/CPS, Signing, Crosswalks

Priority: High Timeframe: Short-term Cost: \$\$

Tuckerman Lane from Strathmore Park Court to MD 355 (northern intersection) is a roadway with a varying width. At Strathmore Park Court the roadway is 4 lanes and widens to six lanes as the roadway approaches MD 355 (northern intersection). The roadway typically has two parking lanes, two through lanes, and a left turn lane/median. It is recommended that five foot bike lanes are placed on each side of Tuckerman Lane to continue bicyclist connectivity through the Tuckerman Lane corridor.

The intersection of Tuckerman Lane and the Music Center at Strathmore is currently a signalized intersection with crossing signals. These are not ADA compliant and should be replaced with Actuated/Countdown Pedestrian signals. It is also recommended that the curb ramps at this intersection are reconstructed to ADA compliancy.

Intersection: Strathmore Park Court

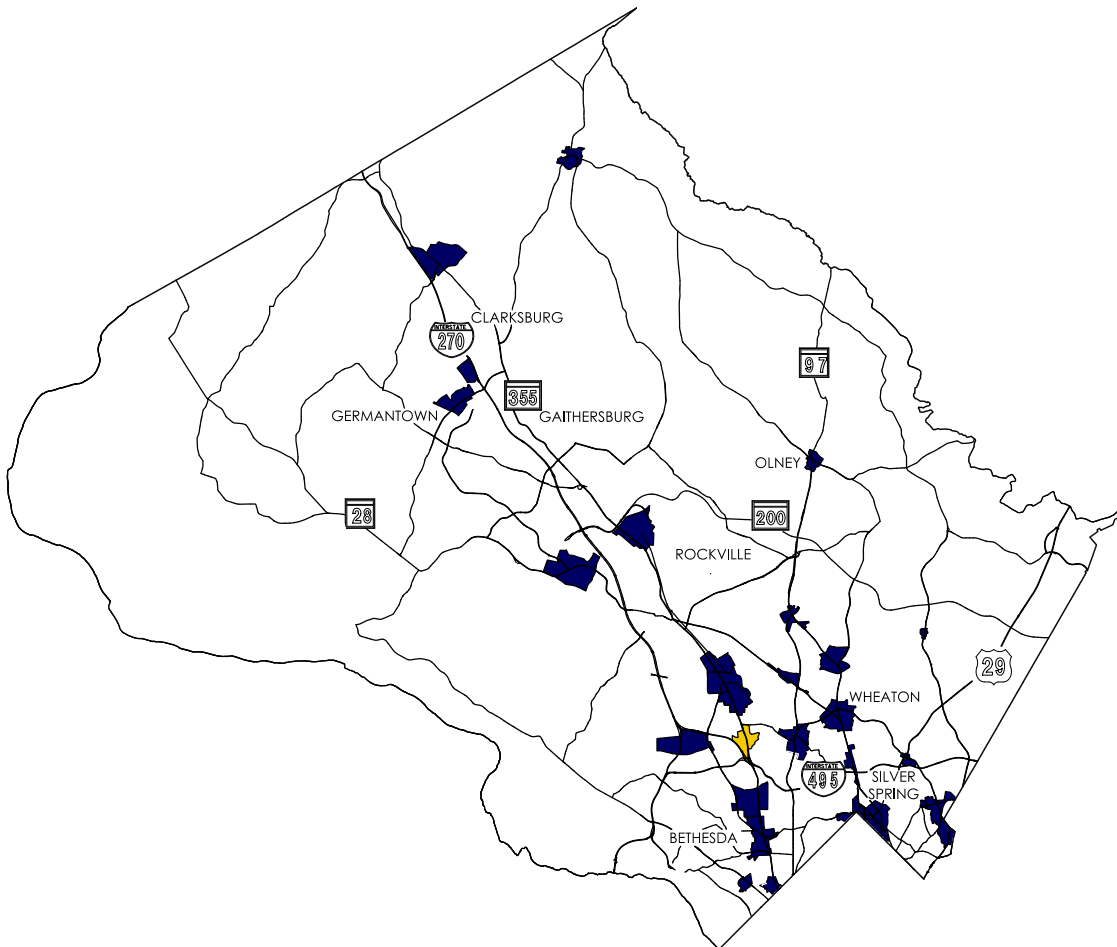
Improvement Type: Median Refuge, Signing, Curb Extensions, Curb Ramps, Crosswalks

Priority: High Timeframe: Mid-term Cost: \$\$

It is recommended that the intersection at Tuckerman Lane and Strathmore Park Court be redesigned so it is more pedestrian friendly. This intersection is currently unsignalized making it difficult for pedestrians to cross the 4-5 lanes on Tuckerman Lane. It is recommended that median refuges be constructed on both crosswalks across Tuckerman Lane. It is also recommended that curb extensions are placed at the intersection to slow traffic and shorten the distance pedestrians have to travel to cross Tuckerman Lane.

Grosvenor– Strathmore

Conclusion



CONCLUSION

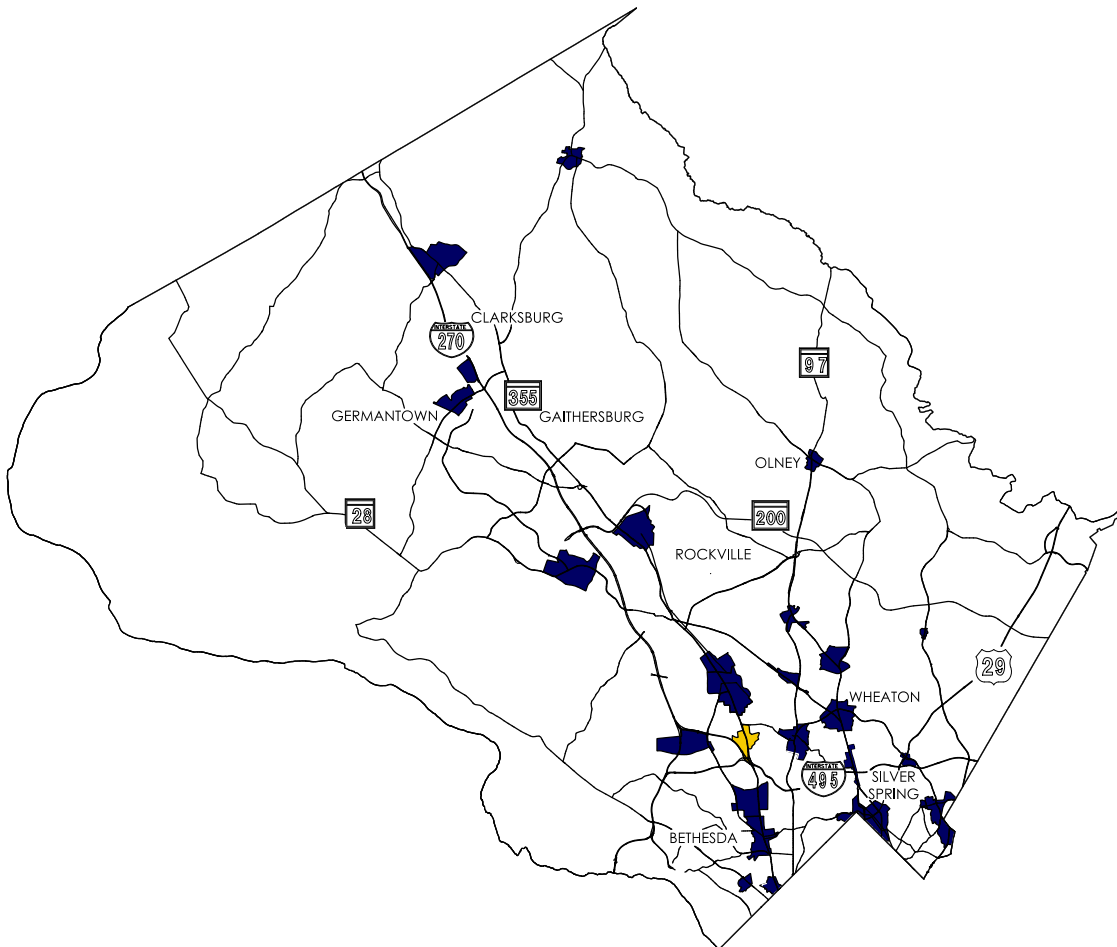
As is the case with the majority of suburban areas, the present day conditions in the Grosvenor-Strathmore BiPPA primarily accommodate automobiles. However, the area has the potential to be a moderately to highly walkable and bikable community. Rockvile Pike (MD 355), Tuckerman Lane, and Grosvenor Lane cover the majority of the BiPPA boundary for Grosvenor-Strathmore. With the implementation of bicycle and pedestrian improvements on these roadway the Grosvenor-Strathmore area will be transformed in a pedestrian and bicycle friendly area.

Other recommended improvements should be implemented as well that take into account the public's comment. The people in the community are the ones who will use the facilities and their comments and recommendations should hold value. Improvements such as APS/CPS, median refuge, curb ramps, curb extensions, signing, and marking should be implemented to not only show the community's voice is being heard but also to improve the quality of travel for disabled pedestrians. These improvements will upgrade the area's infrastructure, requires little to no excavation, are located in the Montgomery County right-of-way, and have established funding sources.

There is no shortage of opportunities to upgrade infrastructure to current standards. The best strategy to achieve short-term results will be to undertake improvements that require little to no excavation, are located in Montgomery County right-of-way, and have established funding sources. This primarily includes signing & marking, curb ramps, APS/CPS, median refuge, curb extensions, and driveway aprons.

Grosvenor– Strathmore

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