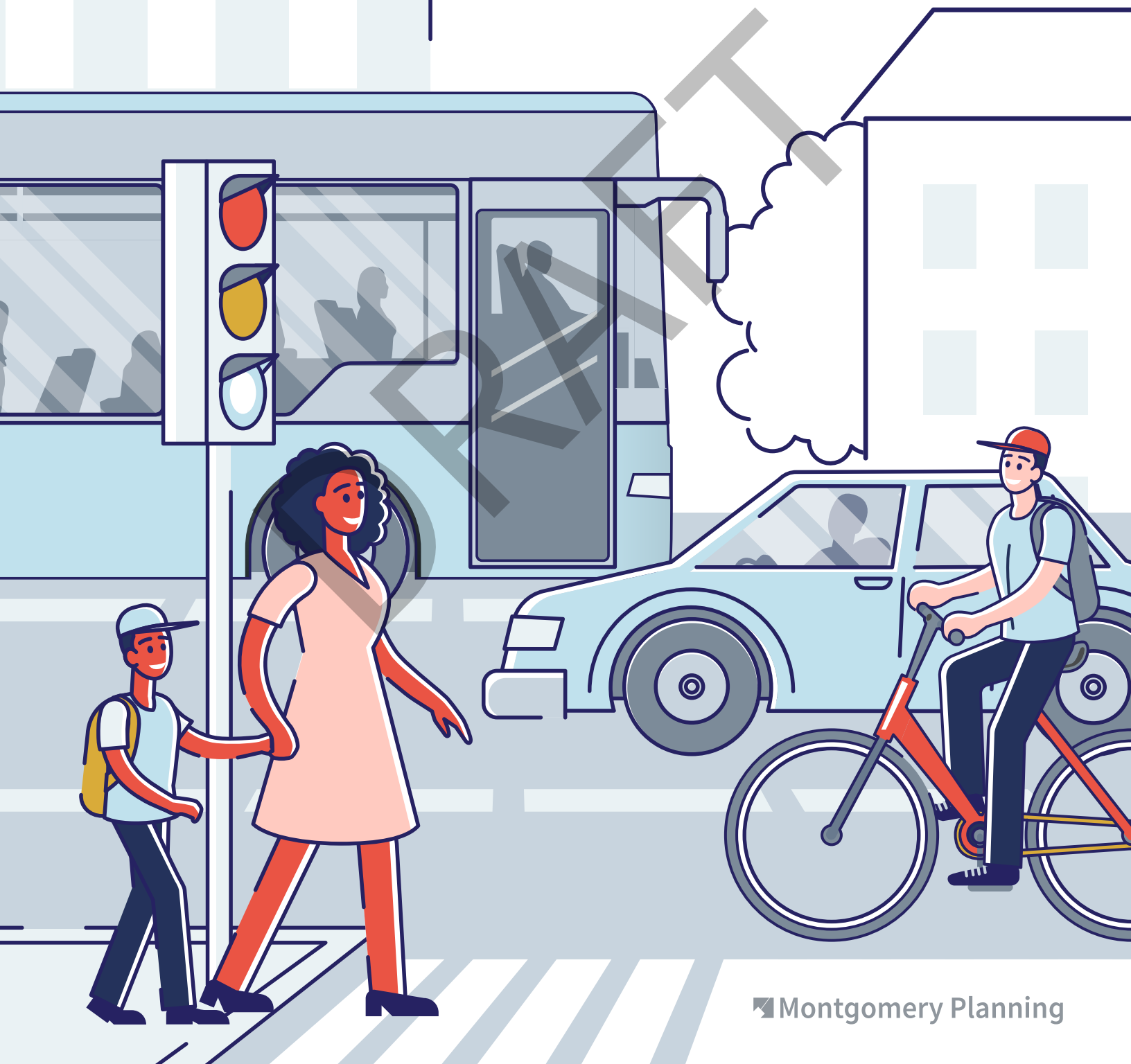
2023 TRAVEL MONITORING REPORT



Montgomery Planning

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Chapter 1: Introduction

The 2023 Travel Monitoring Report (TMR) provides residents, developers, and decision makers with insights into various aspects of Montgomery County's transportation system. As with each edition of the TMR, the report strives to explore and leverage new alternative transportation datasets and analytical tools that help provide a clearer vision of how the county is meeting its transportation goals, objectives, and metrics defined in the General Plan, *Thrive Montgomery 2050*, and functional plans. These goals, objectives, and metrics are rapidly evolving as the county strives to create a more balanced, equitable, and safe transportation system.

This report was created by the Montgomery County Planning Department, part of the Maryland-National Capital Park and Planning Commission (M-NCPPC). With each subsequent edition of the TMR, Planning Department Staff aim to better align the report's contents with metrics that drive policy decisions and discussions within the Planning Department that have been vetted by the Planning Board and County Council, including those described in Table 1, below. The TMR serves as a compendium for the agency's transportation-related monitoring activities.

Table 1: Progress Measures as Identified by Various Policy Documents Included in this Document

Source	Goal/Metric/Progress Measure	Spatial Resolution
Thrive Montgomery 2050	Vehicle Miles Traveled (VMT)	Countywide, Growth Corridors
	Non-Auto Driver Mode Share	Countywide, Growth Map Areas
	Average Commute Time by Mode	Countywide
	Transit Coverage	Transportation Policy Areas, Equity Focus Areas
	Job Accessibility via Transit	Activity Centers
	Difference between Travel Time by Car and Transit	Activity Centers
Complete Streets Design Guide (CSDG)	Average Protected Crossing Spacing Compared to CSDG Guidance	Growth Corridor
	Percent Comfortable Walkways	Growth Corridor
	Percent Master-Planned Bikeways	Growth Corridor
	Completeness of Street Grid	CSDG Area Types Organized by Growth Corridors
Bicycle Master Plan	Increase Bicycling Rates in Montgomery County (Goal 1)	Countywide, Transportation Management Districts, Metro Rail Stations, Schools
	Create a Highly Connected, Convenient, and Low-Stress Bicycling Network (Goal 2)	Countywide, Transportation Policy Areas, Transit Stations, Public Schools, Other Public Facilities

Source	Goal/Metric/Progress Measure	Spatial Resolution
	Provide Equal Access to Low-Stress Bicycling for All Members of the Community (Goal 3)	Equity Focus Areas, Title 1/ Focus or FARM Public Schools
	Improve the Safety of Bicycling (Goal 4)	Countywide, Equity Focus Areas
	Facility Construction	Bikeways, Bicycle Parking
	Bicycle Supportive Programs & Legal and Policy Framework	Countywide
Pedestrian Master Plan	Increase Walking Rates and Pedestrian Satisfaction in Montgomery County (Goal 1)	Countywide, Public Schools, Transit Stations, Transportation Management Districts
	Create a Comfortable, Connected, Convenient Pedestrian Network (Goal 2)	Countywide, Public Schools, Transit Stations, Other Public Facilities
	Enhance Pedestrian Safety (Goal 3)	Countywide
	Build an Equitable and Just Pedestrian Network (Goal 4)	Equity Focus Areas, Title 1/ Focus or FARM Public Schools

In addition to this summary document, the 2023 TMR is supplemented by a set of online and interactive data dashboards intended to provide users with interactive tools to better explore the numerous transportation datasets that are managed by the Planning Department and other transportation agencies in the region. The metrics and analyses in these dashboards were selected based on their inclusion in past TMR reports and their relevance to transportation goals, metrics, and progress measures identified in the policy documents noted in Table 1.

Moving Beyond Vehicle Level of Service Metrics

Since its inception nearly two decades ago, the TMR has expanded the purview of its monitoring effort. Initially, the document served as an accounting report to assess whether roadway construction was keeping pace with development. As better congestion modeling tools became available, the report shifted its focus to primarily monitoring highway congestion. More recently, as the county began to focus on safety and planning for a transportation system that serves all users (not simply those who drive cars), the report expanded its analysis to include many transportation modes. It is important to consider why the Planning Department emphasizes planning for other modes of transportation and has shifted away from solely considering vehicle level of service metrics as the prime determinant of transportation investments and planning.

Single occupancy vehicles (SOVs) cause many negative externalities, costs that are borne by society. These externalities cause inefficiencies in the transportation sector, as the private costs to vehicle users are artificially lowered, causing a demand for SOVs that exceeds the socially efficient number of vehicles.

One of the biggest negative externalities of this artificial inflation of SOV demand is congestion. In 2019, congestion on Montgomery County's interstates and Thrive Growth Corridors cost users approximately $422 million. The cost of congestion in 2022 stood around $342 million. A simple application of microeconomics to a hypothetical travel corridor illustrates the difference between the equilibrium demand for SOV travel and the socially optimal demand for traffic volume (Table 2).

Table 2: Hypothetical Illustration of Congestion Externalities along a 10-Mile Corridor[1]

Volume (A)	Trip Time (B) (Min)	Private Trip Cost (C)	Increase in Time Caused by One Additional Vehicle (D) (Min)	Increase in Total Travel Time for All Vehicles (E) (Min)	External Trip Cost (F)	Social Trip Cost (G)
400	10.000	$8.74			$0.00	$8.74
599	10.476					
600	10.480	$8.88	0.004	2.4	$0.72	$9.59
1,199	15.268					
1,200	15.280	$10.31	0.012	14.4	$4.29	$14.61
1,399	17.985					
1,400	18.000	$11.12	0.015	21.0	$6.26	$17.39
1,599	21.262					
1,600	21.280	$12.10	0.018	28.8	$8.59	$20.69
1,799	25.100					
1,800	25.120	$13.25	0.020	36.0	$10.74	$23.99

In this hypothetical example, travel along a 10-mile corridor takes approximately 10 minutes at free-flow speed. However, travel time begins to increase as more cars enter the corridor, causing delays not only to the driver entering the corridor, but also to all other vehicles previously traveling on the roadway. The private trip cost (third column) depends on a monetary travel cost (57.5 cents/mile) and an opportunity time cost (30 cents/min). Once the volume surpasses 400 vehicles, every additional vehicle causes an increase in travel time. The rows highlighted in blue illustrate the marginal impacts to one additional vehicle entering the corridor, compared with the preceding white row.

For example, the travel time for 1,399 vehicles is 17.985 minutes, and the travel time for 1,400 vehicles is 18 minutes, an increase of .015 minutes for every vehicle when the 1,400th vehicle enters the roadway (column D). The 1,400th vehicle increases the total travel time for all vehicles (column E), the external trip cost (the additional cost external to the 1,400th vehicle caused by this vehicle entering the corridor, column F), and the total social cost (column G). The social cost is a combination of the private vehicle cost and the external trip cost borne by society and represents the actual cost incurred by the 1,400th vehicle.

[1] This example is adapted from O'Sullivan, A (2009). Urban Economics, 7th Edition. McGraw-Hill.

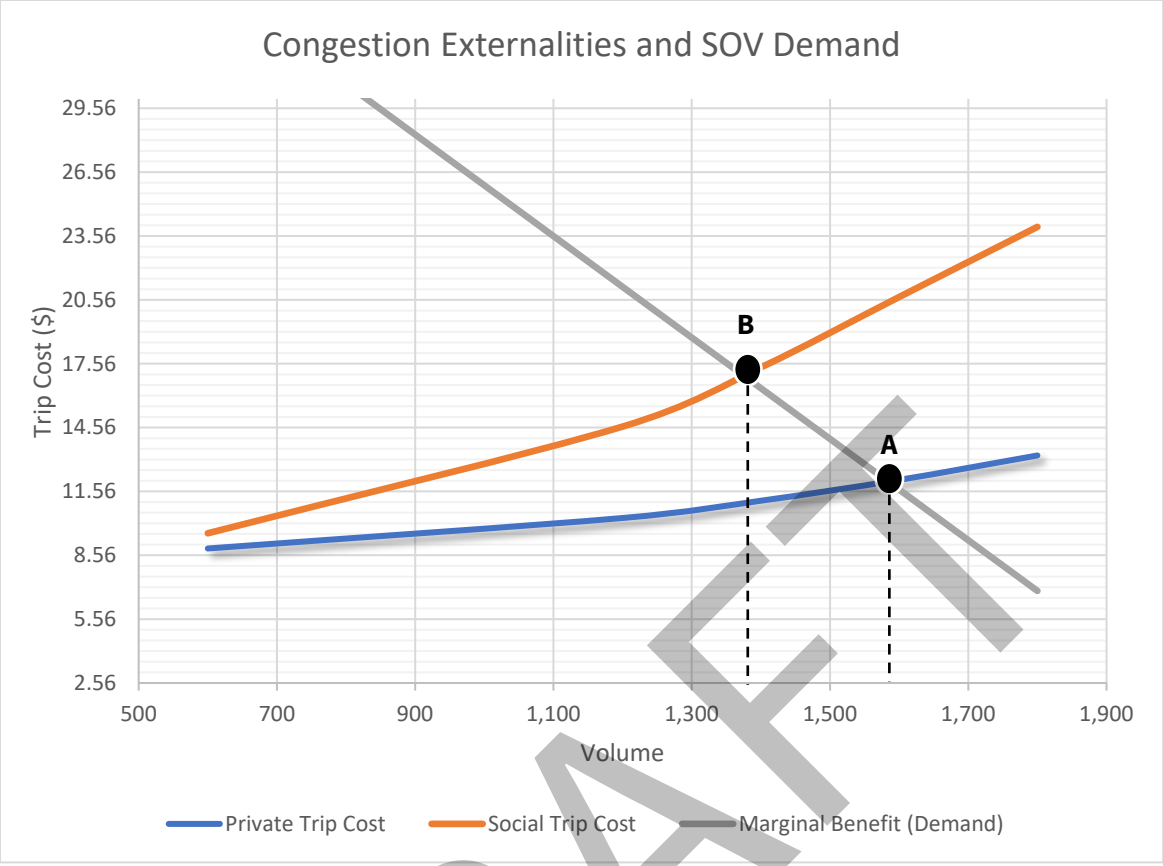


Figure 1: Graphical Representation of Congestion Externalities and Inflated Single Occupancy Vehicle (SOV) Demand

When the costs of congestion (private trip cost curve) are not internalized, equilibrium is reached at point A (approximately 1,600 vehicles). Internalizing the costs of congestion, however, means that the socially efficient number of vehicles (point B) is much lower, approximately 1,375 vehicles, with a cost of $17.56 per trip. This example illustrates only one negative externality of SOV travel. Others include air pollution, noise pollution, opportunity costs of forgoing more productive land uses, property damage, injuries and deaths associated with accidents, and issues of equity. If these externalities and opportunity costs were internalized, the demand for SOV travel would dramatically shift.

Chapter 2: Travel Trends

The COVID-19 pandemic had obvious and profound impacts on the demand for transportation services in Montgomery County. The demand for transportation is largely derived, meaning most travel is not done for the sake of traveling but rather to carry out other tasks, and as demand for other services plummeted, so did travel (apart from bike, pedestrian, and e-commerce travel). What is becoming clearer is that the shift to teleworking continues to impact our transportation system now, three years after the beginning of the pandemic. A survey of 8,396 employed residents in the Washington, DC area estimated that there was "a nearly five-fold increase in the percentage of commute trips replaced by telework in 2022, compared with 2019." Overall, 48% of commute "trips" were replaced by telework in 2022, compared with just 1 in 10 in 2019, which means over 2.9 million daily commute trips have been eliminated.[2]

Vehicular Travel

Figure 2 compares the average weekday travel time on the county's interstates during 2019, 2020, and 2022. Travel time along I-270 between Frederick County and the Capital Beltway was significantly shorter in 2022 than in 2019. In 2022, travel time during the 8 a.m. hour in the southbound direction was 8 minutes shorter in 2019 (Figure 2). Travel time during the 5 p.m. hour in the northbound direction was approximately 9 minutes shorter than in 2019, potentially saving a commuter traveling this section of I-270 an average of one hour and 40 minutes each workweek. Peak travel times along the Capital Beltway were also shorter in 2022, although to a lesser degree (Appendix A). This reduction in travel time estimated from big data corroborates the finding that in 2022, 52% of workers reported a commute time of 30 minutes or fewer, compared with 40% whose commutes were this length in 2019.[3]

[2] State of the Commute Survey Report, Washington Council of Governments: https://www.mwcog.org/documents/2022/09/20/state-of-the-commute-survey-report--carsharing-state-of-the-commute-telework-travel-surveys/

[3] State of the Commute Survey Report, Washington Council of Governments.

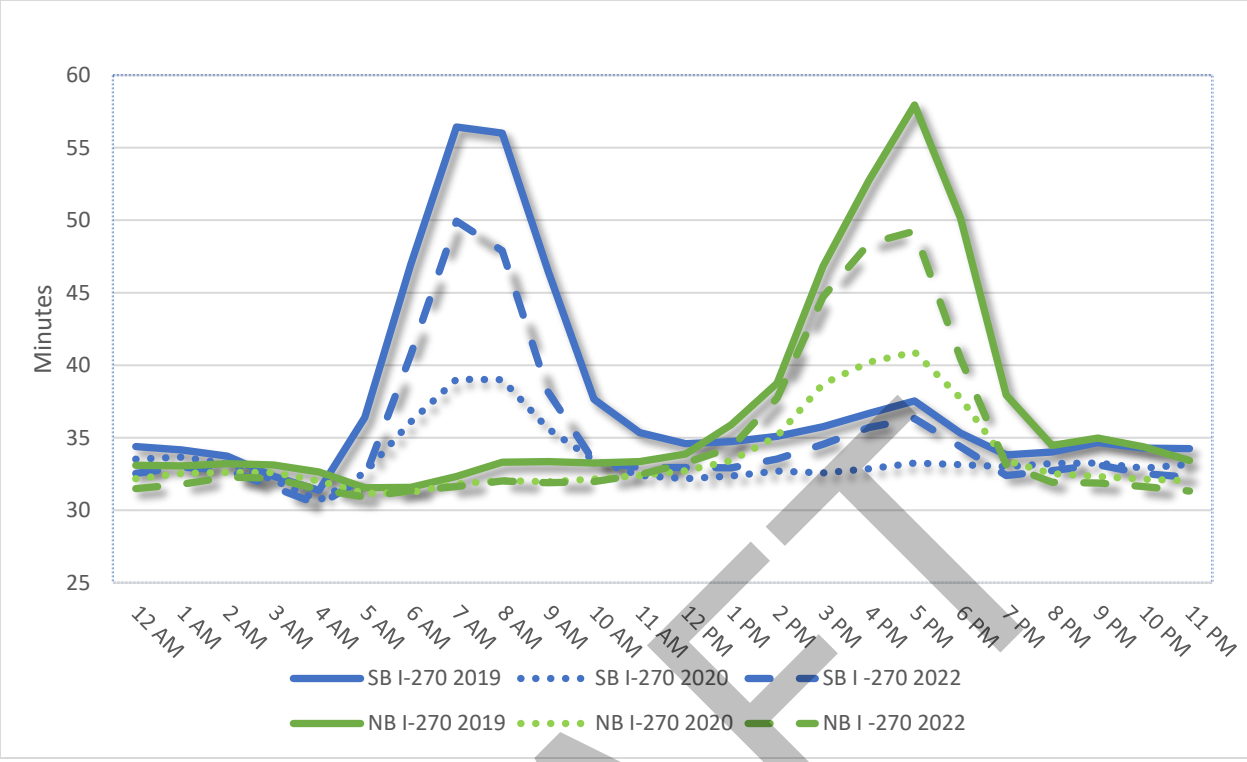


Figure 2: Average 2019, 2020, and 2022 Weekday Travel Time on I-270 between the Frederick County Line and Capital Beltway[4]

Vehicular volumes, which plummeted during 2020, have not rebounded uniformly across the county. Annual average daily traffic (number of vehicles expected to pass a given location on an average day) are still down approximately 7% compared with 2019 (Table 3) at Maryland State Highway's permanent counter locations. Traffic volume at permanent counter locations on the Capital Beltway is still approximately 11% below 2019 levels, while traffic volume on I-270 is 1.5% below 2019 levels (Table 3). The estimated vehicle miles traveled (VMT) on the county's Growth Corridors is approximately 9.4% below 2019 levels. (Please see Chapter 3 for a map of the county's Growth Corridors.)

Table 3: Traffic Volumes at Maryland State Highway Permanent Counter Locations[5]

Location	2019 AADT	2020 AADT	2022 AADT	2019–2022 Change
I-270 South of MD 121	111,270	93,772	110,253	-0.9%
I-495 at Persimmon Tree Rd	231,287	175,735	206,953	-10.5%
I-495 West of MD 650	215,614	178,006	190,914	-11.5%
I-270 South of Middlebrook Rd	175,352	144,437	172,134	-1.8%
Total	**733,523**	**591,950**	**680,254**	**-7.3%**

[4] Inrix travel time data summarized using RITIS' Probe Data Analytics Suite.
[5] Maryland State Highway's Internet traffic Monitoring System (https://maps.roads.maryland.gov/itms_public/).

In addition to lower traffic volumes, 2020 brought a flattening of the traditional dichotomous peak travel patterns, which have now returned. Figures 3 and 4 illustrate this phenomenon by comparing the average measured weekday speed as a percentage of free-flow speed during 2019, 2020, and 2022 along Growth Corridors described in *Thrive Montgomery 2050* (Thrive). Although not a direct measure of volume, this speed ratio is a good surrogate for congestion and hence volume. Presumably, the lower the speed ratio, the higher the volume of vehicles.

The solid lines in Figures 3 and 4 illustrate the traditional peak direction/period traffic pattern that occurred in May 2019 along north–south Thrive Growth Corridors. For example, the average southbound weekday speed across all Thrive Growth Corridors in the 8 a.m. hour was 79% of free-flow speed in 2019. The dashed lines, however, show that the peak periods/peak directions were attenuated. The average southbound weekday speed during the 8 a.m. hour in 2020 was 96.5% of free flow speed in 2020. Finally, the dotted lines represent travel patterns observed during 2022. This analysis indicates that the traditional peak direction/period pattern of travel is returning to Montgomery County. For example, the average southbound weekday speed across all Thrive Growth Corridors in the 8 a.m. hour was 81% of free-flow speed in 2022.

Interestingly, travel speeds did not differ much from historical averages in the southbound direction during the p.m. peak period in 2020. This may be a product of people using remote work flexibility to conduct personal errands, as well as an increase in e-commerce deliveries. It is important to understand that factors outside of volume can impact speed, including construction, speed limit reductions, road reconfigurations, and changes in speed enforcement.

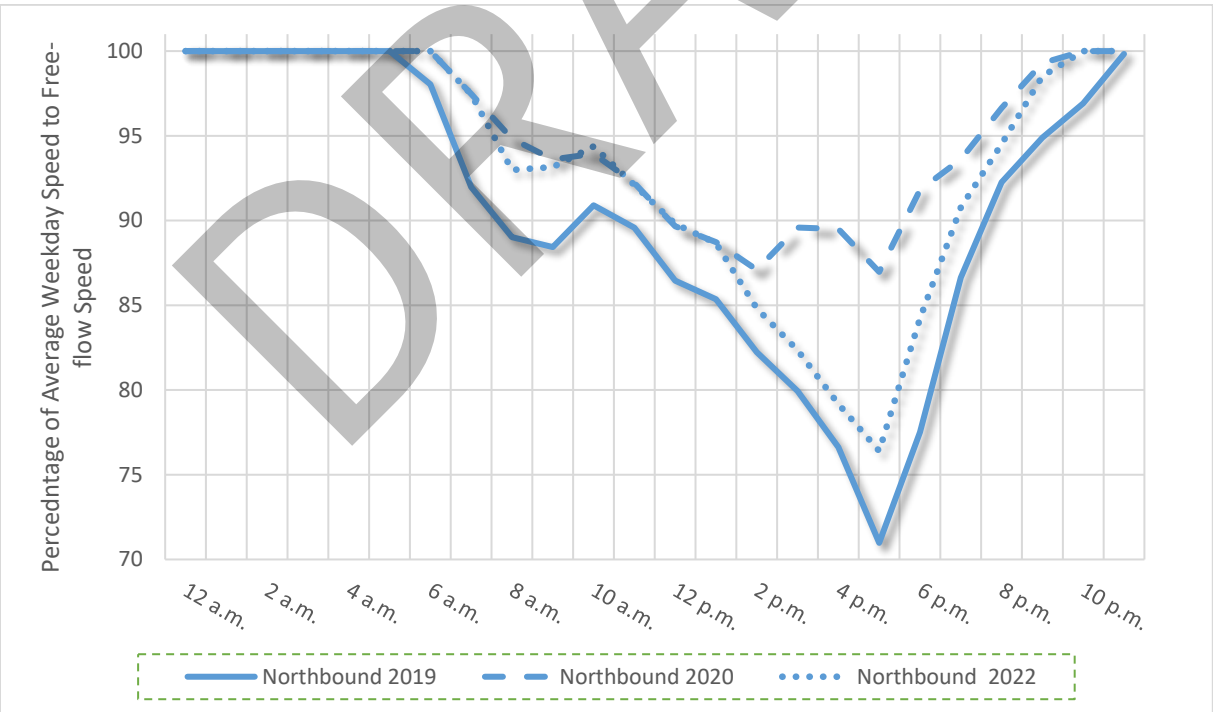


Figure 3: Average Weekday Northbound Speed as a Percentage of Free-Flow Speed along Thrive's Growth Corridors[6]

[6] Inrix travel time data summarized using RITIS' Probe Data Analytics Suite.

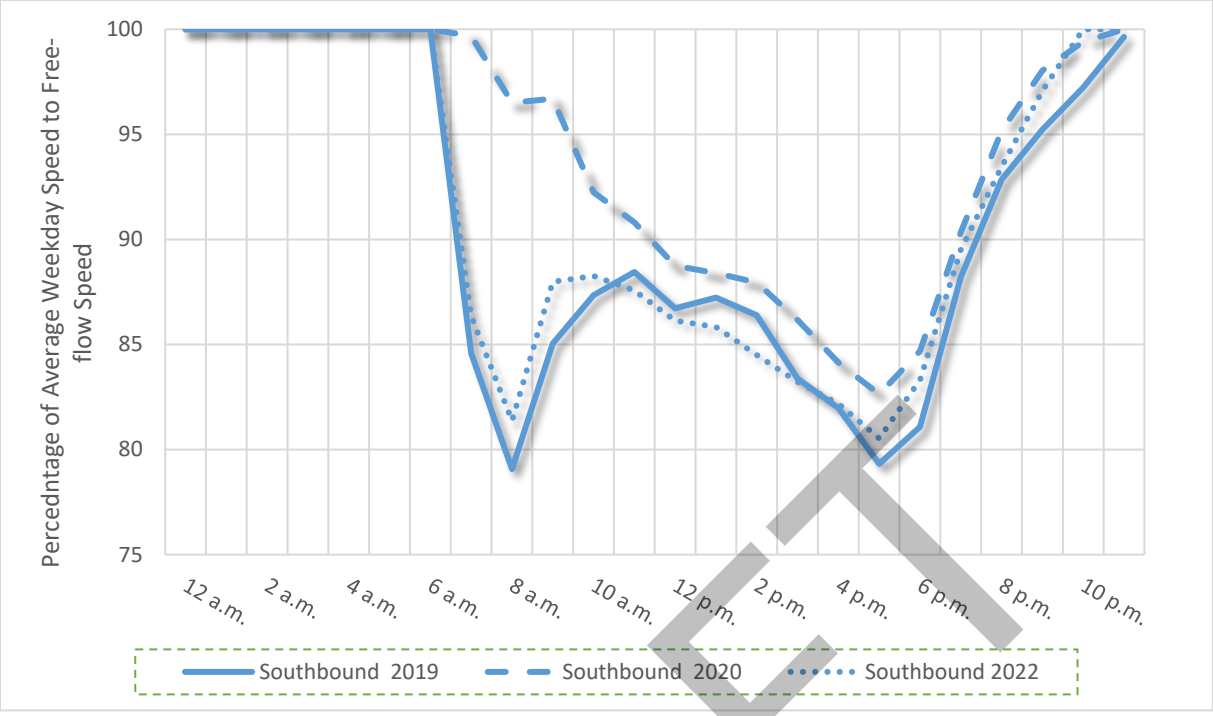


Figure 4: Average Weekday Southbound Speed as a Percentage of Free-Flow Speed along Thrive's Growth Corridors[7]

Transit Travel

Transit ridership is slowly rebounding but at different rates across service types. After a sharp decline at the onset of the pandemic, bus ridership steadily rebounded, with a pause when the Delta variant of COVID was circulating during the winter of 2021–2022. Unlinked passenger trips in November 2022 were still, however, 31% and 18% below January 2020 levels for Ride-On and Metrobus respectively (Figure 5). Service availability, as indicated by monthly vehicle revenue miles, plummeted during the heart of the pandemic, but has largely reached pre-pandemic levels. As of November 2022, Metrobus service levels have returned to pre-pandemic levels and Ride-On was running approximately 6% below pre-pandemic levels. For route-by-route ridership information, please see Appendix A.

Although Metrobus ridership has rebounded, rail ridership remains well below pre-pandemic levels (Figure 7). Overall, Red Line station entries in Montgomery County are approximately 55% below pre-pandemic levels. Station entries on the east side of the Red Line (Glenmont, Wheaton, Forest Glen, Silver Spring, and Takoma) have recovered a bit better than stations on the west side of the Red Line (52% below pre-pandemic levels for the east side vs. 57% below for the west side).

[7] Inrix data; RITIS' Probe Data Analytics Suite.

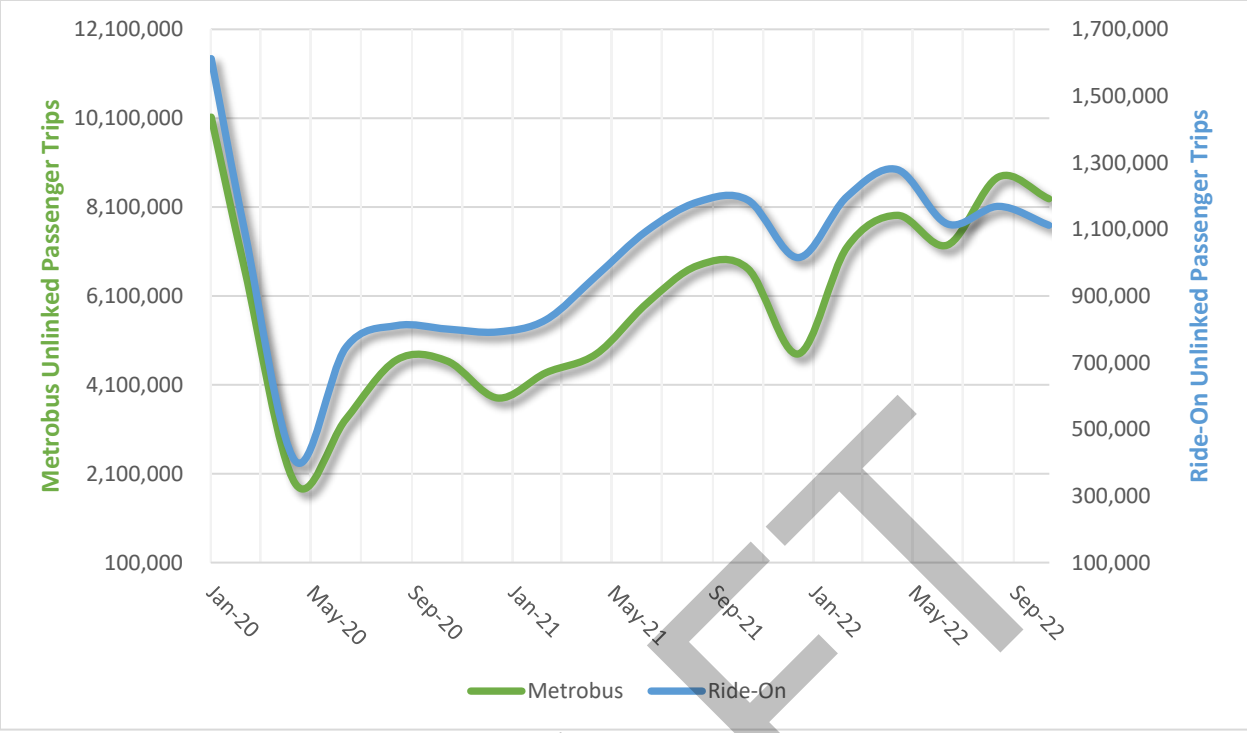


Figure 5: Ride-On and Metrobus Unlinked Bus Passenger Trips[8]

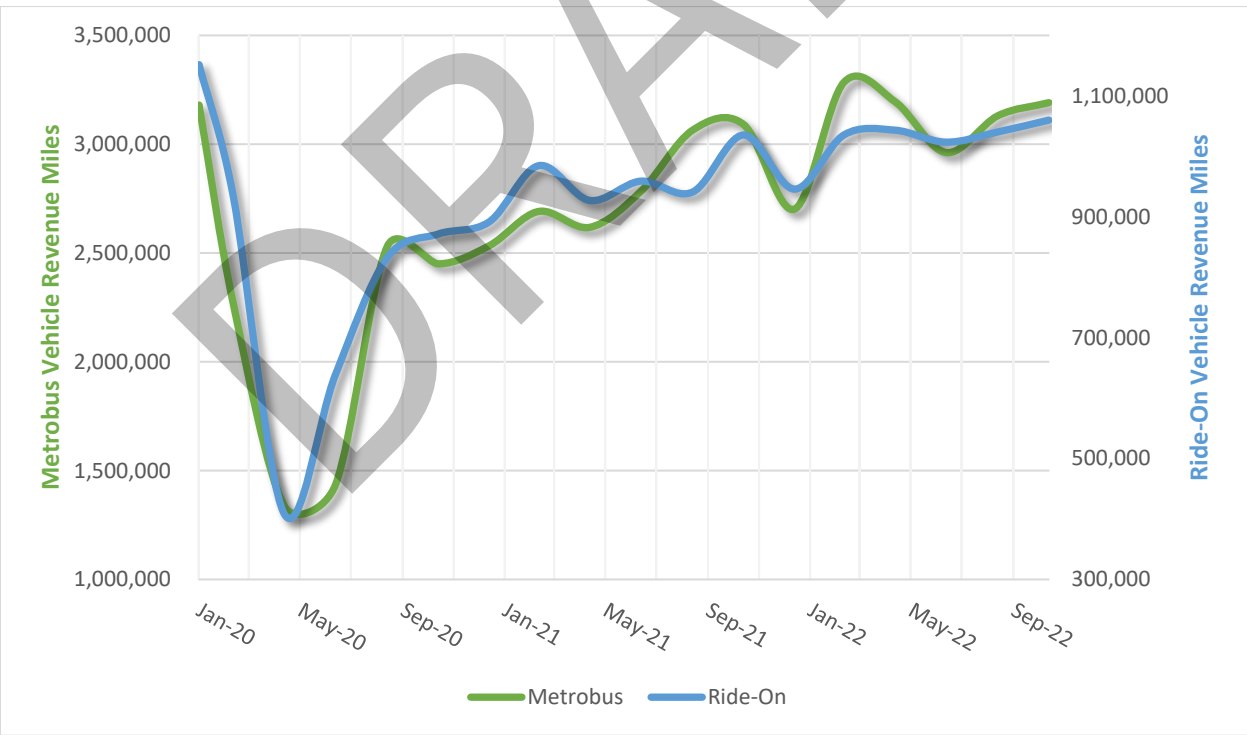


Figure 6: Metrobus and Ride-On Vehicle Revenue Miles for January 2020 to November 2022[9]

[8] National Transit Database: https://www.transit.dot.gov/ntd; WMATA trips are system wide.

[9] National Transit Database

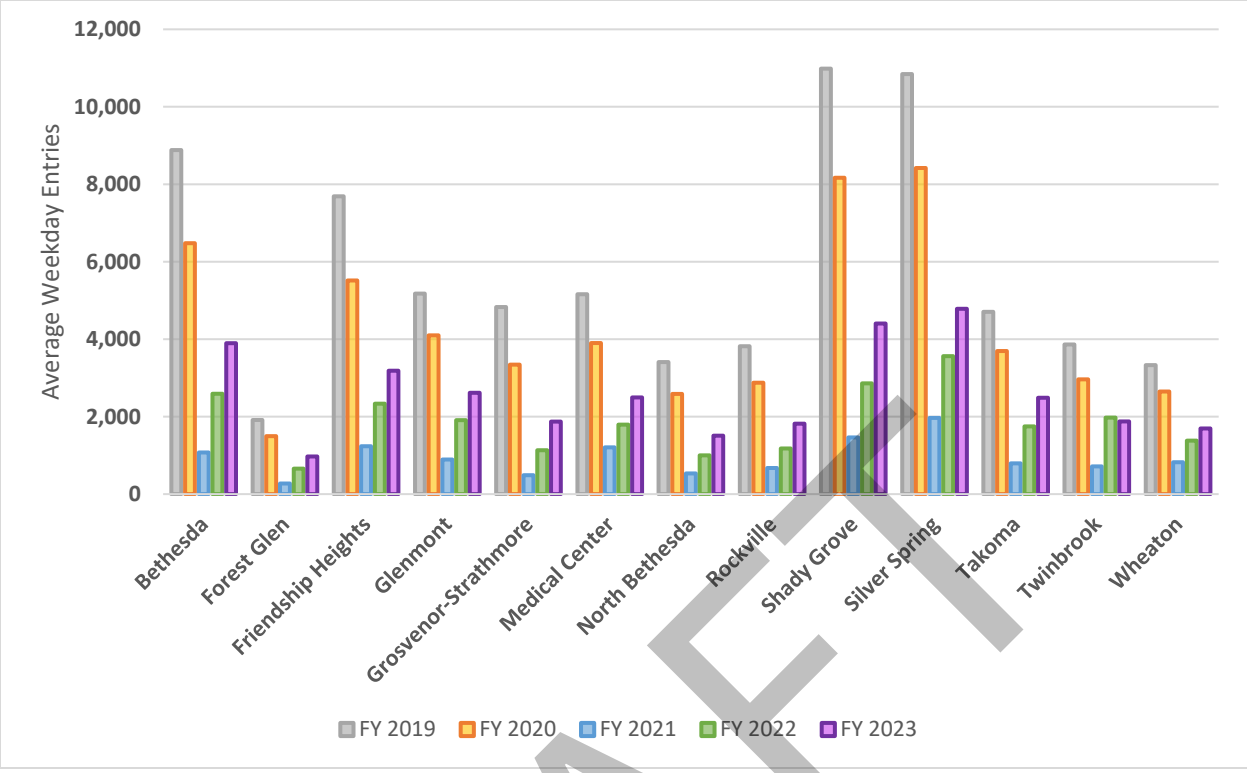


Figure 7: Average Weekday Metrorail Red Line Station Entries by Fiscal Year[10]

Bike and Pedestrian Travel

While the demand for transit and private automobile sharply declined in 2020, the demand for biking and recreation remained resilient during the heart of the pandemic in 2020. After an unseasonal decline in Capital Bikeshare trips between March and April 2020, the number of trips steadily increased from May 2020 through June 2020 in Montgomery County (Figure 8). The average trip length (in minutes) also sharply increased the moment a State of Emergency was declared in Maryland. This is likely an indication that people used bicycles to complete trips rather than as last-mile connections to transit hubs. Evidently, bicycles were instrumental in maintaining a sustainable and resilient transportation system for vulnerable populations who needed to meet their employment obligations; another possibility is that recreational trips tend to be longer than utilitarian trips. In 2022, the number of Capital Bikeshare trips has been consistent with 2020 activity; however, the average trip duration is closer to 2019 levels. Please note that this analysis does not consider changes in Capital Bikeshare capacity in the county or trips that do not have a start or end docked location in Montgomery County. The rise of dockless trips likely impacts the number of trips in each subsequent year.

[10] WMATA Data Ridership Portal: https://www.wmata.com/initiatives/ridership-portal/Metrorail-Ridership-Summary.cfm

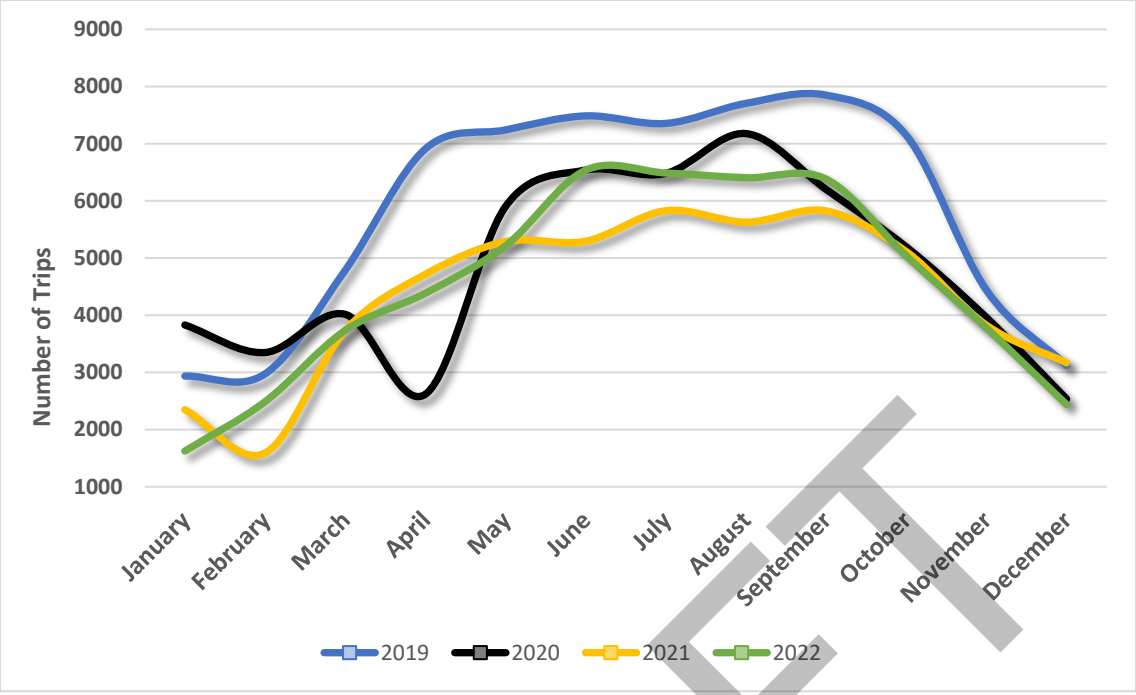


Figure 8: Number of Locatable Capital Bikeshare Trips Beginning or Ending in Montgomery County[11]

Like Capital Bikeshare usage, bicycle and pedestrian activity on the county's trail remained robust during the pandemic. For example, combined pedestrian and cyclist activity on the Capital Crescent Trail in Bethesda was 29.5% higher in 2020 than in 2019. The number of cyclists in 2020 was approximately 33% higher than in 2019, indicating that perhaps a portion of the increase was due to commuting and other utilitarian trips that would have otherwise been completed via a different mode. Since 2020, activity has moderated to around 2019 levels. Cycling activity in 2022 was down 13%, but pedestrian activity is up approximately 5% compared with 2019.

[11] Capital Bikeshare System Data: https://capitalbikeshare.com/system-data. Note only locatable trips are included in this analysis. Undocked trips are not included.

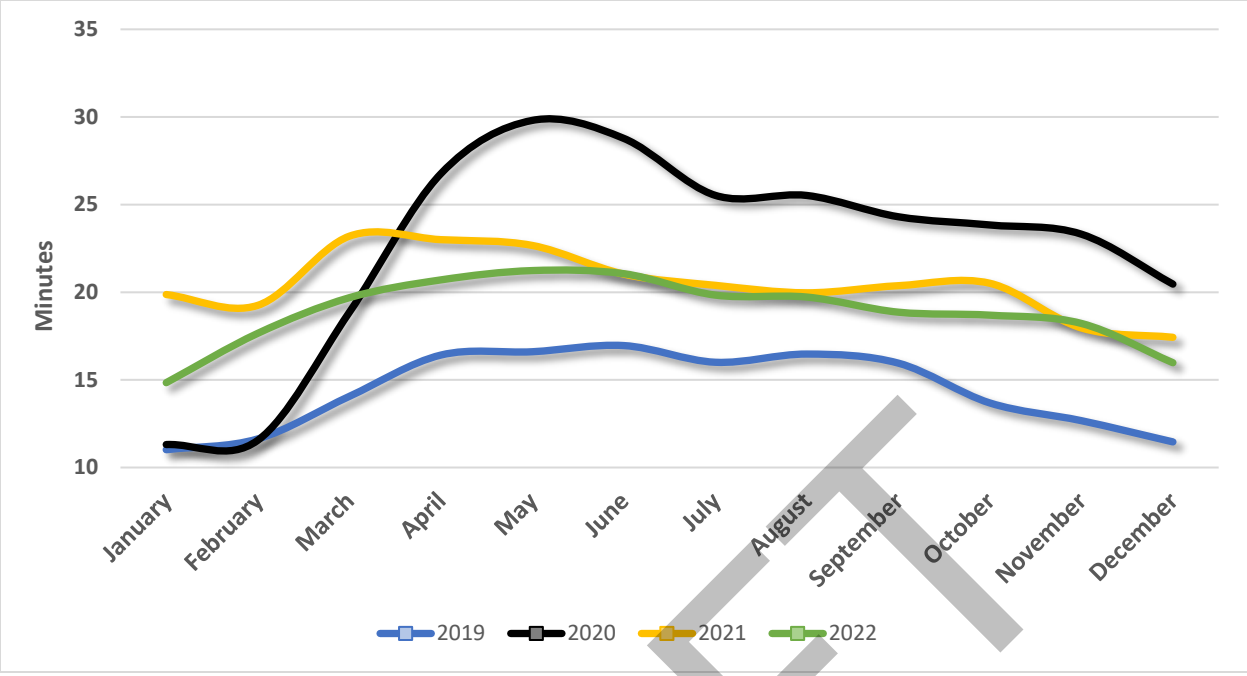


Figure 9: Average Duration (Minutes) of Locatable Capital Bikeshare Trips Beginning or Ending in Montgomery County[12]

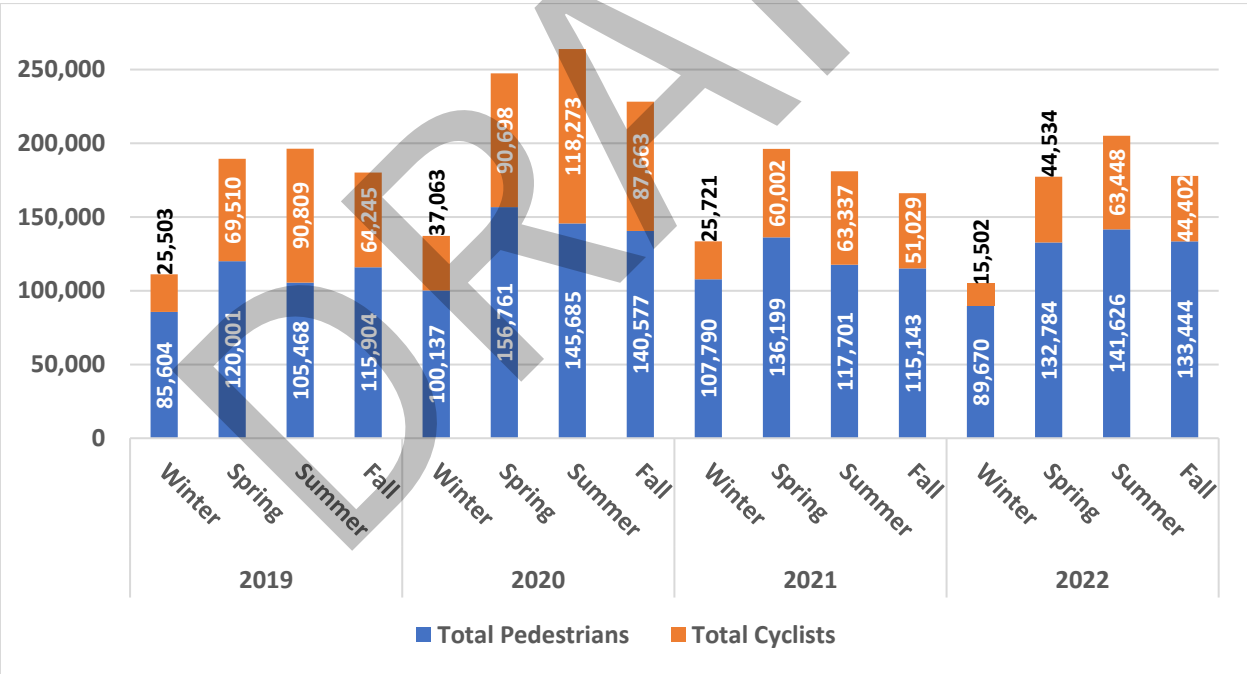


Figure 10: Seasonal Pedestrian and Cyclist Counts on the Capital Crescent Trail at Bethesda Avenue in Bethesda

[12] Capital Bikeshare System Data: https://capitalbikeshare.com/system-data. Note only locatable trips are included in this analysis. Undocked trips are not included. Outliers have been removed.

Chapter 3: Thrive Montgomery 2050 Transportation Monitoring

On October 25, 2022, the Montgomery County Council approved *Thrive Montgomery 2050* (Thrive). Thrive is an update to the County's General Plan and serves as the policy foundation and framework moving forward. Thrive's framework is centered around achieving three overarching objectives: economic competitiveness, racial and social equity, and environmental sustainability. To support achieving these objectives, it includes recommendations organized into various chapters. Each chapter explains how its recommendations serve the broader objectives of Thrive and provides suggested measures to gauge progress in implementing the chapter's ideas. Below is a list of recommended transportation-related policies from Thrive's "Transportation and Communication Networks: Connecting People, Places, and Ideas" chapter.

- Develop a safe, comfortable, and appealing network for walking, biking, and rolling.
- Build a frequent, fast, convenient, reliable, safe, and accessible transit system.
- Adapt policies to reflect the economic and environmental costs of driving alone, recognizing that car-dependent residents and industries will remain.

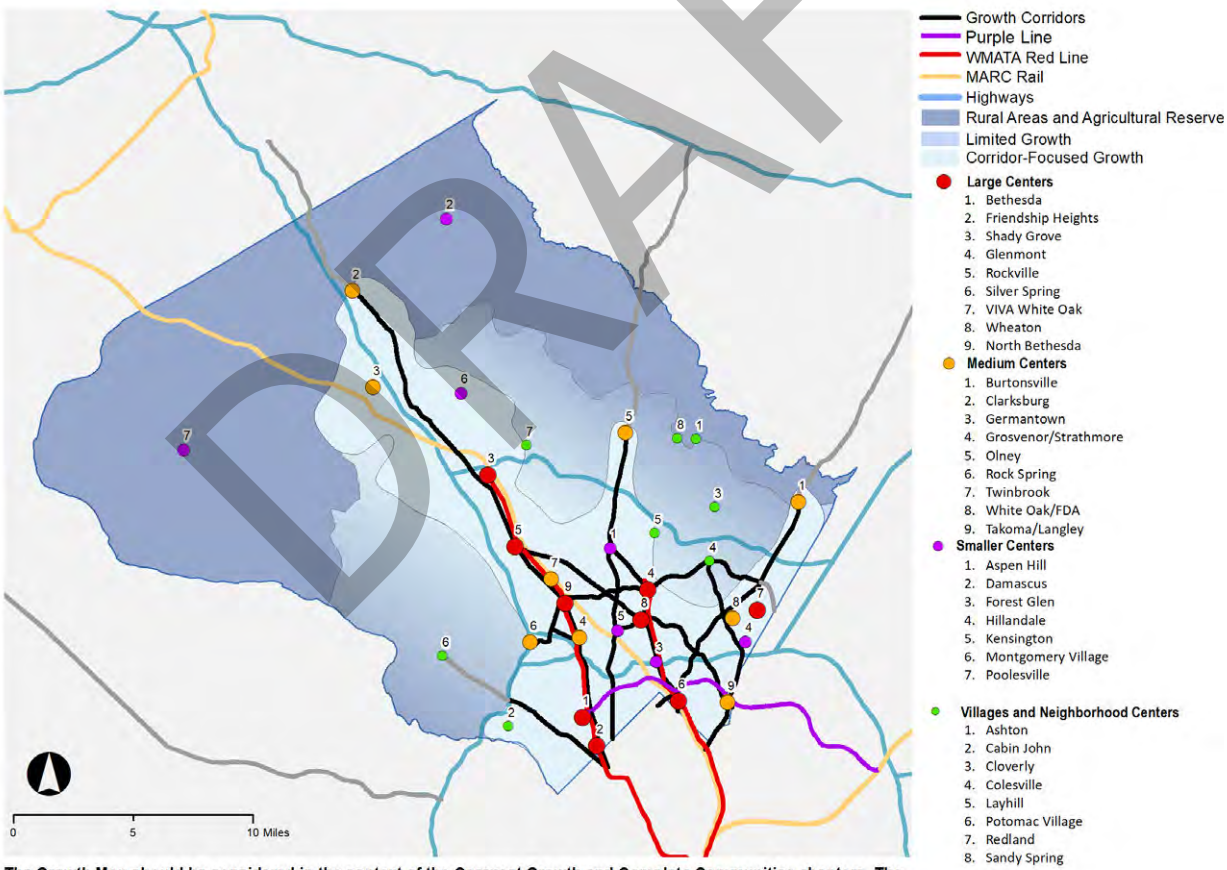


Figure 11: Thrive Montgomery 2050 Growth Map

Thrive Performance Measures

A core tenet of Thrive is to focus growth along established corridors and activity centers. Thrive's Growth Map helps illustrate this principle (Figure 11). The remainder of this chapter summarizes several performance measures recommended in the "Transportation and Communication Networks Connecting People, Places, and Ideas" chapter. Where possible, measures are summarized according to main components of Thrive's Growth Map (corridors, growth areas, and activity centers). Some measures are summarized according to other geographies due to technical limitations or where it makes practical sense. Some of the performance measures presented in Thrive are simple to operationalize, while others require some interpretation. For example, "Person Trip Accessibility for Pedestrians and Bicyclists" can be interpreted various ways and is covered in the *Bicycle Master Plan* and *Pedestrian Master Plan* Monitoring sections of this report.

The metrics presented here do not fully cover Thrive's recommended measures; however, they do represent data and methodologies that are widely available and repeatable. The Planning Department is likely to adjust these methodologies in the future, as it is scheduled to convene a formal review of Thrive's implementation metrics in FY 2024. "Thrive Corridor Profiles" are presented at the conclusion of this chapter that include additional data points summarized by each Thrive Growth Corridor.

Vehicle Miles Traveled (VMT)

VMT has long been used to measure vehicle travel demand and evaluate transportation projects, policies, and decisions. VMT is an estimate of the total number of miles traveled by all motor vehicles along a roadway or within a region over a certain period. For this exercise, VMT is estimated by the Maryland State Highway Administration's (SHA's) traffic monitoring system. SHA collects vehicle counts on a rotating 3-year cycle throughout the county. Counts that were not conducted in certain locations for a given year are adjusted based on permanent counters positioned on Maryland's interstates. These counts are extrapolated to sections of roadways and summarized by the desired extent or geography. It is important to consider that these estimates do not differentiate between travel conducted by Montgomery County citizens and pass-through travel conducted by others.

Lower VMT indicates that the demand for SOVs is decreasing. This may occur if travelers are utilizing other modes of travel that provide competitive travel times and accessibility similar to SOVs. It could also indicate that the travel distance required to satisfy everyday needs is shorter due to the development of complete communities. It is important, however, to view VMT in the broader context of the economy. As we can see from Figure 12, VMT per capita dropped precipitously in 2020 due to the pandemic. Prior to the pandemic, VMT per capita remained steady, although it has been slowly increasing since 2014. For a complete list of estimated VMT along Thrive Growth Corridors, please see the Thrive Growth Corridor Profiles at the end of this chapter.

Data Sources: Maryland State Highway Administration & Census American Community Survey (ACS) 1-Year Estimates (2020 uses the 5-year estimate).

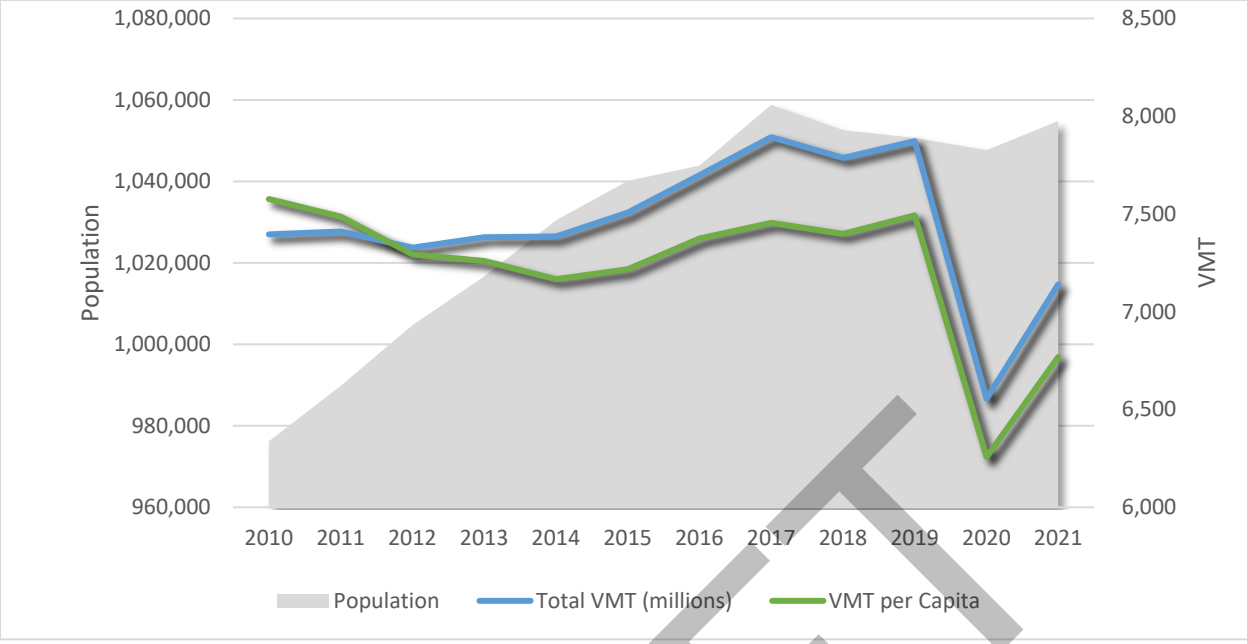


Figure 12: Total Annual VMT, Annual VMT per Capita, and Population for Montgomery County[13]

Non-Auto Driver Mode Share (NADMS)

NADMS is the percentage of commuters who did not drive for a majority of their commuting needs, including teleworkers. A higher NADMS percentage indicates that commuters are able and willing to rely on alternative modes of travel for their commuting needs or can telework. Five-Year Census American Community Survey commuting data have been summarized by Thrive's Growth Map areas and are presented below (Figure 13). Countywide, NADMS hovered around 30% between 2013 and 2019. Broken out by Thrive's growth areas, however, the data reveal that areas outside the corridor-focused growth areas have a much lower commuting NADMS.

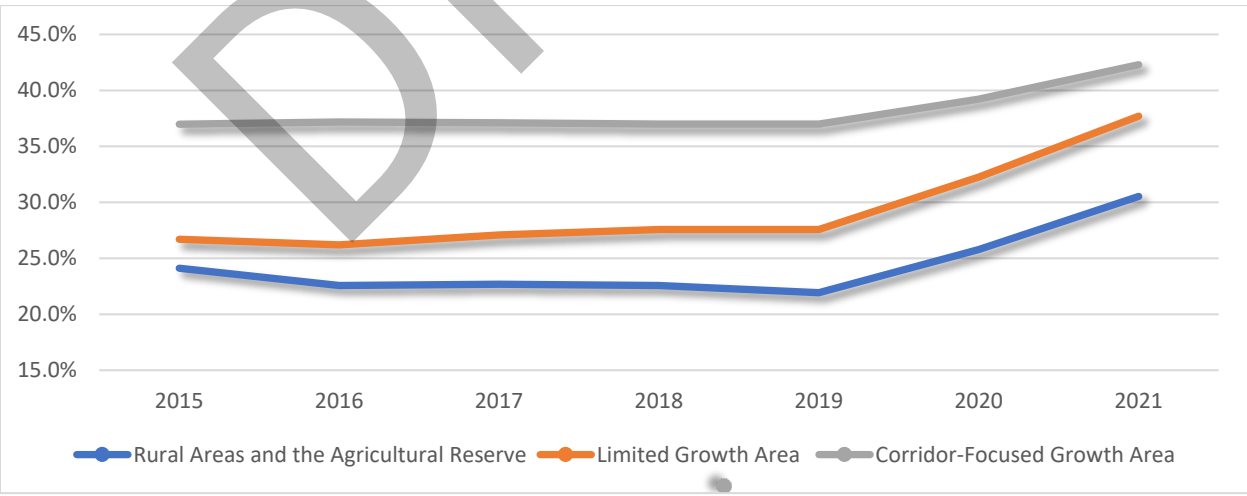


Figure 13: NADMS by Thrive Growth Map Area and Year

[13] https://www.roads.maryland.gov/OPPEN/Vehicle_Miles_of_Travel.pdf; https://data.census.gov/cedsci/

The spike in NADMS in 2020 is explained by the pandemic's impact on the rise of teleworking throughout the country. Please note that these data are disaggregated from the 5-year ACS estimates due to higher statistical robustness and therefore that they mask some of the recent abrupt changes in teleworking. For example, the 2021 1-year ACS estimates NADMS to be 52.5%. This is primarily due to the 37.1% of commuters who reported that they telework for a majority of the workweek. For reference, the 2019 estimate of teleworkers was 6.7%.

Data Sources: ACS 5-Year Estimates (Census) & Parcel Data (Planning).

Average Commute Time

Shorter commute times can indicate a good job-housing balance. They can also indicate that people can afford to live near where they work, a luxury that is often only available to higher income earners. Complete communities and affordable housing are a core Thrive strategy to accomplish its objectives. When viewing commute time by mode, one can see that the current burden of long commute times falls disproportionately on transit users (Figure 14). In 2021, the average commute time for transit riders was about 22 minutes longer than that of commuters who traveled in an automobile. This is a slight increase from 20.6 minutes in 2019. Overall commute times have decreased; however, these decreases have largely benefited auto drivers due to lower vehicle volumes from increases in teleworking. Riders of public transit tend to be from lower income brackets and to lack access to a private vehicle.

Closing the travel time gap between the private automobile and transit is key in advancing an equitable transportation system and improving transit ridership. Both Ride-On and Washington Metropolitan Area Transit Authority (WMATA) have recently taken steps to increase transit frequency and coverage. For example, Ride-On now offers on-demand transit in certain zones (Ride-On Flex) and increased frequency along the US-29 corridor via its Flash Service. Expanding these frequent and flexible services is intended to close the commuting time gap between SOVs and transit.

Data Source: ACS 1-Year Estimates (Census)

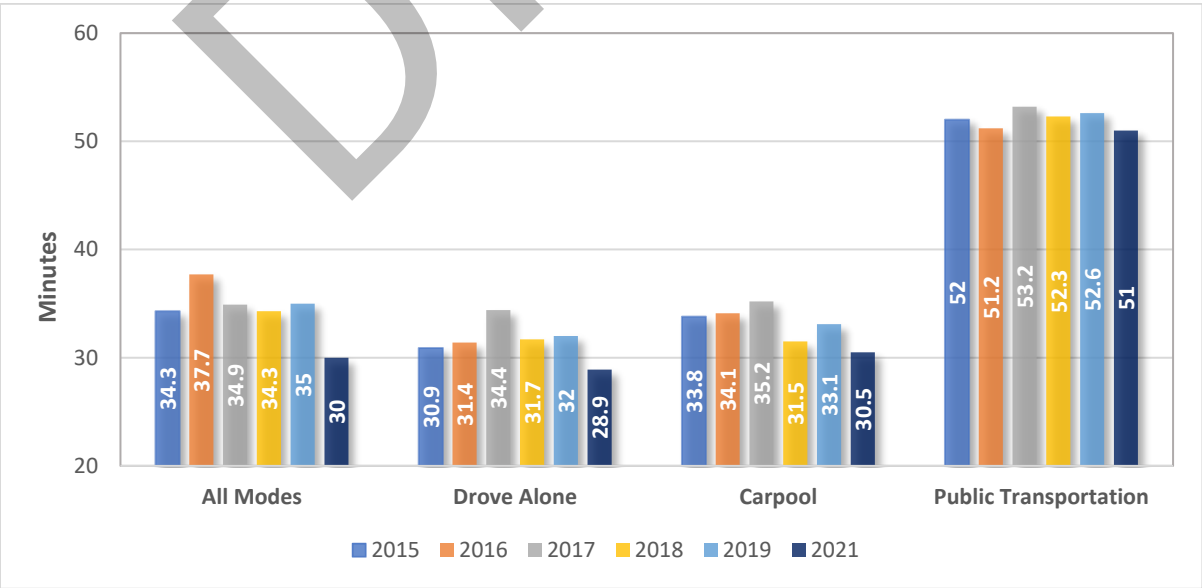


Figure 14: Average Commute Time by Mode

Transit Travel Time, Accessibility, and Coverage

The next three metrics are not explicitly stated in Thrive as measures of progress; however, they may be worth tracking over time. As stated earlier, an explicit policy and practice of Thrive is to "Build a frequent, fast, convenient, reliable, safe, and accessible transit system." The following metrics attempt to operationalize this stated policy by measuring several aspects of the county's transit system. The results from this exercise should be considered as a baseline and represent transit schedules as of March 2023.

Transit Coverage

One method to evaluate transit performance is to quantitatively measure access to transit services based on walk distance and trip frequency. This report creates quarter-mile network buffers around transit stops (MARC Rail, WMATA Rail, WMATA Bus, and Ride-On Bus) and then summarizes the average number of unique transit trips per hour per route reachable within each walkshed. The output is a generalized spatial representation of transit coverage throughout Montgomery County (Figure 15). Once transit coverage is spatially identified, a comparison of transit coverage among various geographies is made. For this analysis, transit coverage during four time periods was summarized by Transportation Policy Area (policy area) category (Red, Orange, Yellow, or Green) and Equity Focus Area (EFA) designation (Figure 16).

A policy area is a geographic sub-area of the county delineated by the Planning Board and adopted by the County Council in the Growth and Infrastructure Policy for the purpose of growth management analysis. Each policy area is categorized by its predominant development form and transit availability. Below is a description of each color category:

- Red: Downcounty central business districts characterized by high-density development and the availability of premium transit service (e.g., Metrorail, MARC).
- Orange: Corridor cities, town centers, and emerging transit-oriented development (TOD) areas where premium transit service (e.g., Purple Line and bus rapid transit) is planned.
- Yellow: Lower density areas of the county characterized by mainly residential neighborhoods, that include community-serving commercial areas with more limited transit availability.
- Green: The county's Agricultural Reserve and rural areas.

EFAs are parts of Montgomery Equity Focus Areas are parts of Montgomery County that are characterized by high concentrations of lower-income people of color, who may also speak English less than very well. Montgomery Planning developed a data-driven tool to identify and map these areas in the county in order to assess potential racial and social inequities. This includes access to resources and opportunities for employment, transportation, education, health, and government services that support a good quality of life. Please see Appendix B for a map that compares these two areas.

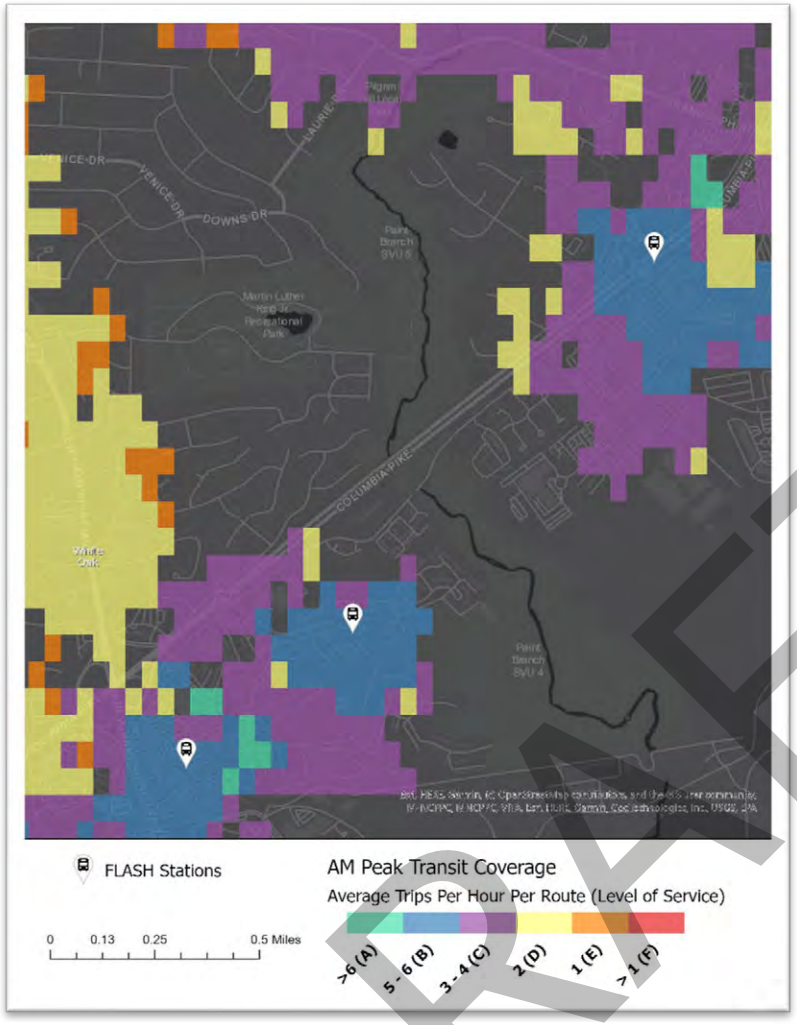


Figure 15 :Transit Service Reachable Within Quarter Mile Walkshed (AM Peak)

For the a.m. peak period, all portions of policy areas that are identified as EFAs in Red Policy Areas have slightly higher overall a.m. peak transit coverage.[14] For the most part, EFAs in these regions also experience higher quality coverage (greater than or equal to five trips an hour). Transit coverage in Yellow Policy Areas identified as EFAs have far greater transit coverage than Yellow Policy Areas that are not identified as disadvantaged. Somewhat surprisingly, Yellow Policy Areas identified as EFAs have very similar coverage as Orange Policy Areas. This is largely due to the frequent FLASH service in the White Oak area and high frequency transit in the Aspen Hill and Germantown policy areas. For coverage comparisons of other time periods, please see Appendix B. It should be noted that this analysis may be generous in assigning level of service categories. This is because, there is currently no differentiation between direction of travel. Bus stops servicing both inbound and outbound directions for a particular route may be reachable from a single location. Transit frequency is typically observed for one direction of travel; however, this analysis does not consider this level of specificity.

Data Sources: Regional General Transit Feed Specification files (WMATA), Equity Focus Areas (Planning), Transportation Policy Areas (Planning)

[14] The a.m. peak period is defined as 7 a.m. to 9 a.m.

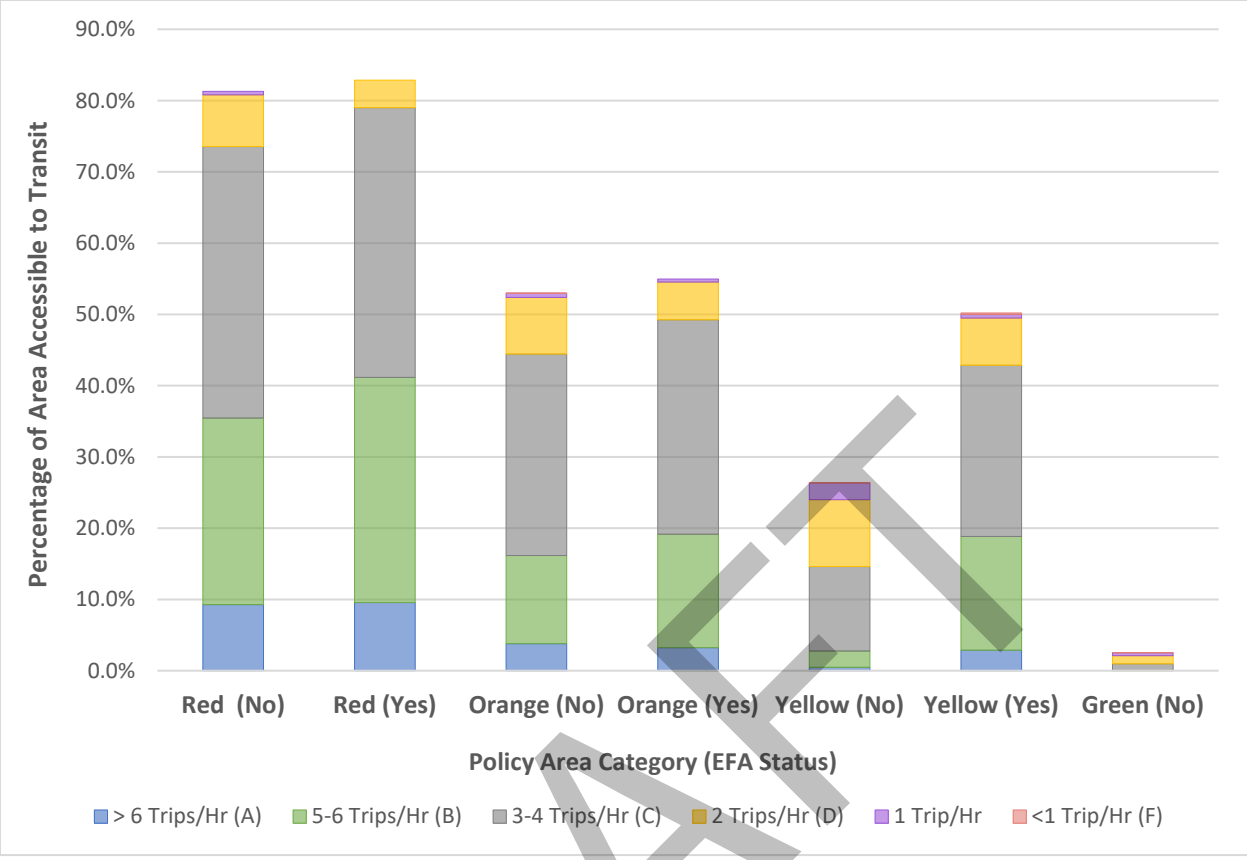


Figure 16: Transit Coverage Summarized by Policy Area and EFA Designation (AM Peak)

Job Accessibility by Transit

A second method to evaluate transit quality is to identify the number of jobs accessible by time-of-day. Accessibility of a location by transit is highly dynamic and changes minute by minute. Higher frequency transit, along with properly timed transfers, should result in smoother access to jobs across time. To capture this variability, this report calculates the number of jobs accessible within 45 minutes via transit from each of Thrive's activity centers for four periods (AM Peak, Midday, PM Peak, and Evening). Variability is measured within each period by determining the number of jobs accessible at 15-minute intervals.

Column A in Table 4 represents the total jobs accessible from a particular Activity Center within the period at least once during the time window. In the case of the AM Peak period, this would be the number of jobs accessible at least once during the 8–15-minute intervals between 7 a.m. and 9 a.m. Column B represents the number of jobs reachable at least 50% of the 15-minute interval start times within the period. Activity Centers with frequent service, particularly those serviced by Metrorail, have stable job accessibility with each time window. For example, job accessibility stability for Bethesda, Forest Glen, Friendship Heights, Grosvenor/Strathmore, Silver Spring, and Wheaton is at least 78%. This indicates that there are numerous opportunities to reach the expected "universe" of jobs within a 45-minute transit ride throughout the AM Peak period. Other Activity Centers, however, such as Burtonsville, Clarksburg, Germantown, Kensington, and VIVA White Oak / FDA, all have job

Table 4: Job Accessibility via Transit from a Portion of Thrive's Activity Centers

Activity Center	AM Peak		Midday		PM Peak		Evening	
	Total Jobs Reachable (A)	% Total Jobs Reachable 50% of Time (B)	Total Jobs Reachable (A)	% Total Jobs Reachable 50% of Time (B)	Total Jobs Reachable (A)	% Total Jobs Reachable 50% of Time (B)	Total Jobs Reachable (A)	% Total Jobs Reachable 50% of Time (B)
Aspen Hill	193,653	67%	164,882	43%	282,477	67%	264,115	47%
Bethesda	1,078,069	86%	1,044,082	87%	1,059,179	87%	1,045,044	87%
Burtonsville	53,103	33%	17,249	96%	68,059	58%	41,463	11%
Clarksburg	17,365	46%	19,685	27%	22,424	44%	19,565	21%
Damascus	13,274	26%	29,002	23%	6,181	36%	6,462	29%
Forest Glen	840,056	82%	839,292	75%	840,765	74%	864,090	74%
Friendship Heights	1,020,778	86%	994,305	87%	1,003,574	87%	1,006,931	86%
Gaithersburg / Shady Grove	380,488	68%	289,746	72%	358,748	78%	234,018	60%
Germantown	185,056	44%	110,735	55%	188,172	33%	125,771	25%
Glenmont	617,180	56%	603,279	48%	635,315	50%	650,607	58%
Grosvenor/Strathmore	955,901	81%	936,837	85%	950,019	81%	916,198	76%
Hillandale	143,329	59%	147,106	56%	125,367	66%	148,611	55%
Kensington	488,394	43%	282,828	61%	400,845	56%	398,414	50%
Montgomery Village	130,543	52%	104,369	47%	136,405	48%	122,030	26%
Olney	103,672	15%	12,989	61%	134,933	10%	86,307	17%
Poolesville	4,941	18%	876	100%	10,460	8%	876	100%
Rock Spring	284,129	61%	286,580	60%	350,482	55%	343,144	54%
Rockville	565,088	70%	500,073	64%	531,183	66%	600,829	57%
Silver Spring	917,094	84%	896,118	84%	958,371	79%	905,776	84%
Takoma/Langley	539,535	47%	502,537	47%	532,417	51%	647,042	46%
Twinbrook	776,303	68%	741,589	72%	767,294	74%	682,516	68%
VIVA White Oak / FDA	81,476	34%	52,024	52%	77,056	37%	56,866	43%
Westbard	627,017	37%	644,043	62%	698,001	52%	729,860	27%
Wheaton	890,494	78%	832,602	79%	865,188	80%	862,607	72%
White Flint	743,239	66%	731,417	69%	725,356	73%	678,995	66%

accessibility stability below 50%. This indicates that transit patrons traveling from these areas have far fewer opportunities to reach the universe of reachable jobs and must carefully consider scheduling when planning their commutes.

Data Sources: Regional General Transit Feed Specification files (WMATA), Longitudinal Employer-Household Dynamics (LEHD) Data (Census)

Transit Travel Time Comparison

A third method to evaluate the quality of transit is to evaluate travel times. Most individuals seek to maximize their utility, and therefore to minimize travel time, when making economic decisions. To shift demand from SOVs to transit, travel time must be competitive (along with parking costs and congestion pricing). This report compares the average transit travel time between the region's Activity Centers (those identified in Thrive and others in the region) to the average vehicle travel time for four time periods. (For a complete list of Activity Centers, please see Appendix B.) Please note that travel times for transit are based on transit scheduling information, and travel time for vehicles is based on historical congestion data. Vehicle travel times tend to be optimistic and represent "the best-case scenario" for each time period.

An analysis of auto and transit travel times reveals that, on average, transit is not competitive with auto travel. For example, the average transit travel time from Montgomery Village to all other destinations in the analysis during the PM Peak Period is 88 minutes. The average vehicle travel time during the same period is 33 minutes. Overall, average transit times leaving from Thrive Activity Centers are approximately 2.7 times longer than the average auto times during the AM Peak and 2.4 times longer during the PM Peak. For a complete comparison of average transit and auto travel times between the complete list of Activity Centers, please see the TMR dashboard.

Data Sources: Regional General Transit Feed Specification files (WMATA), Regional Activity Centers (Washington Council of Governments), Thrive Activity Centers (Montgomery Planning), and time-enabled vehicle routing network (Esri)

Table 5: Average Auto and Transit Travel Times and Their Ratios Leaving from Thrive's Activity Centers to All Other Activity Centers

Activity Center (Leaving From)	AM Peak			PM Peak		
	Transit TT	Auto TT	Ratio	Transit TT	Auto TT	Ratio
Aspen Hill	72	27	2.7	62	28	2.2
Bethesda	53	22	2.4	49	27	1.8
Burtonsville	107	35	3.1	86	33	2.6
Clarksburg	112	43	2.6	104	37	2.8
Damascus	106	47	2.3	117	45	2.6
Forest Glen	60	22	2.8	57	24	2.3
Friendship Heights	57	23	2.5	53	28	1.9
Gaithersburg / Shady Grove	69	28	2.4	64	29	2.2
Germantown	84	37	2.3	82	34	2.4
Glenmont	64	27	2.4	58	28	2.1
Grosvenor/Strathmore	57	22	2.6	52	26	2.0
Hillandale	83	28	2.9	74	26	2.9
Kensington	68	23	2.9	60	26	2.3
Montgomery Village	89	33	2.7	88	33	2.7
Olney	86	33	2.6	81	33	2.5
Poolesville	185	45	4.1	119	45	2.6
Rock Spring	72	21	3.4	66	26	2.6
Rockville	60	25	2.4	59	28	2.1
Silver Spring	58	24	2.5	52	27	2.0
Takoma/Langley	72	28	2.5	68	28	2.4
Twinbrook	58	24	2.4	54	28	2.0
VIVA White Oak / FDA	97	32	3.0	90	30	3.0
Westbard	72	23	3.2	67	27	2.4
Wheaton	58	24	2.4	54	26	2.1
White Flint	61	23	2.6	57	27	2.1
White Oak	75	28	2.7	66	27	2.4

Table 6: Average Auto and Transit Travel Times and Their Ratios Arriving to Thrive's Activity Centers from All Other Activity Centers

Activity Center (Arriving To)	AM Peak			PM Peak		
	Transit TT	Auto TT	Ratio	Transit TT	Auto TT	Ratio
Aspen Hill	68	25	2.7	66	30	2.2
Bethesda	52	26	2.0	49	26	1.9
Burtonsville	107	31	3.5	97	38	2.6
Clarksburg	114	33	3.4	107	42	2.5
Damascus	120	41	2.9	104	49	2.1
Forest Glen	57	23	2.5	56	28	2.0
Friendship Heights	55	27	2.1	52	26	2.0
Gaithersburg / Shady Grove	68	26	2.6	64	32	2.0
Germantown	89	31	2.9	82	39	2.1
Glenmont	61	25	2.4	60	30	2.0
Grosvenor/Strathmore	54	23	2.4	51	26	2.0
Hillandale	75	24	3.1	77	31	2.5
Kensington	63	24	2.6	61	27	2.3
Montgomery Village	92	30	3.1	84	37	2.2
Olney	86	31	2.8	82	36	2.3
Poolesville	272	45	6.1	117	47	2.5
Rock Spring	68	22	3.0	67	25	2.7
Rockville	60	25	2.4	56	29	1.9
Silver Spring	55	24	2.3	55	28	1.9
Takoma/Langley	70	26	2.7	71	32	2.2
Twinbrook	57	24	2.4	54	28	1.9
VIVA White Oak / FDA	93	28	3.4	95	35	2.7
Westbard	68	26	2.6	65	26	2.5
Wheaton	56	24	2.3	54	28	1.9
White Flint	57	23	2.4	55	27	2.0
White Oak	69	25	2.7	71	31	2.3

Thrive Growth Corridor Profiles

Thrive introduces the concept of Growth Corridors, which, in combination with Activity Centers, are intended to be the focus of future growth in the county. The following section contains several metrics organized according to the 10 Growth Corridors identified in Thrive. The intent is to create Growth Corridor "profiles" that can be used by planners and other decision makers to quickly access general vehicle travel trends and show how each corridor is meeting the intent and vision articulated in the County's Complete Streets Design Guide (CSDG). Below is a description of each metric and/or a description of how to interpret the infographic.

1. **Vehicle Miles Traveled (VMT):** VMT between 2015 and 2022 is presented in line-graph form for each Growth Corridor. (Source: Maryland SHA aggregated to Thrive Corridors by the Planning Department.)

2. **Travel Time Index (TTI):** TTI is a common method to operationalize and measure congestion. The TTI is the measured travel time represented as a percentage of the "ideal" travel time (Travel Time / Free-Flow Travel Time). A value of 1.6 indicates that a trip took 60% longer than it would have at free-flow speeds. For example, a TTI of 1.60 indicates that what would have been a 20-minute trip in light traffic took 32 minutes at the measured timepoint (20 minutes x 1.60 = 32 minutes). The larger the value, the more congestion likely was present. TTI between 2019 and 2022 is presented in bar-chart form for each direction and peak period along the corridor. (Source: Inrix travel time data summarized using RITIS' Probe Data Analytics Suite.)

3. **Protected Crossing Spacing:** Having sufficient and context-driven protected crossings is an important design principle of complete streets. The county's CSDG recommends maximum protected crossing spacing (in feet) for various street types. Protected crossings include signals, stop signs, and pedestrian hybrid beacons. The average protected crossing spacing was measured for each corridor according to the recommended CSDG area type. The recommended protected crossing spacing for each area type is represented by the top number above each signal in the infographic. Each signal represents an area along the specified corridor. The measured average protected crossing spacing can be found below each signal. Below is an explanation of the color coding for each measured location along the corridor. (Source: Planning Department.)

    = measured / target protected crossing spacing ratio of less than 2

    = measured / target protected crossing spacing ratio of greater than 2 but less than 3

    = measured / target protected crossing spacing ratio of greater than 3

4. **BMP Completeness:** For the *Bicycle Master Plan* (BMP), the percentage of the master planned bicycle network built, under construction, or forthcoming (through development approval or Capital Improvements Program) immediately adjacent to each corridor is presented in line-graph form for each CSDG area type. (Source: Planning Department.)

5. **Grid Completeness**: A street grid is a pattern of intersecting roads that form a network of blocks and streets. There are several benefits associated with a well-designed street grid, including efficient transportation, improved accessibility / connectivity, simplified navigation, safety, enhanced emergency response, economic development opportunities, flexibility for growth, and increased community interaction. While Montgomery County's older neighborhoods were constructed on a grid, much of the development since the 1950s was built using meandering networks of streets with many dead ends. One way to evaluate the build-out of a grid of streets is to compare a desired number of blocks with the actual number of blocks in an area:
    a. Desired Blocks: The square footage of an area divided by the square of the desired block size (400 feet in downtowns and 600 feet in town centers).
    b. Actual Blocks: A block has streets on all sides.
    c. Ratio: An area with a perfect grid of streets would have a ratio of 100%, whereas an area with half the desired blocks would have a ratio of 50%.
    d. Note: While the ratio may show a well-developed grid of streets, this is an average that may mask the large size of some blocks. For example, while Kensington Town Center's grid of streets ratio is 111%, there are some large blocks in the town center that exceed the desired dimensions.

    (Source: Planning Department.)

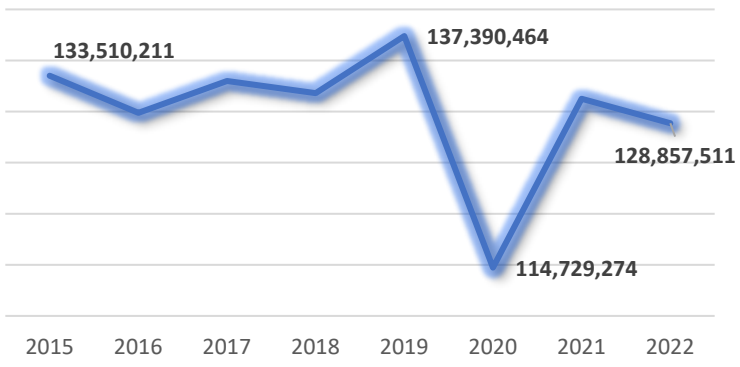
    The CSDG area types presented in each profile are included due to their proximity to the corridor, but the metric includes blocks from all public roadways within each area and compares that with the desired number of blocks. The green number at the top of the grid in the grid completeness infographic represents the desired number of blocks for each CSDG area type. The black number below is the actual number of blocks. The ratio of the actual to desired number of blocks is presented in each heading labeling the area type. Please note that the area types included in each corridor profile are only a subset. For a complete list of grid completeness ratios in the county, please see Appendix B.

6. **Pedestrian Pathway Comfort:** The percentage of acceptable pathways for pedestrians (sidewalks, side paths, trails, and where appropriate, streets) -graph form. A pedestrian pathway is deemed acceptable if its pedestrian level of comfort (PLOC) is 2 or less.[15] Each data point along the line graph represents a CSDG area type along the corridor. (Source: Planning Department.)

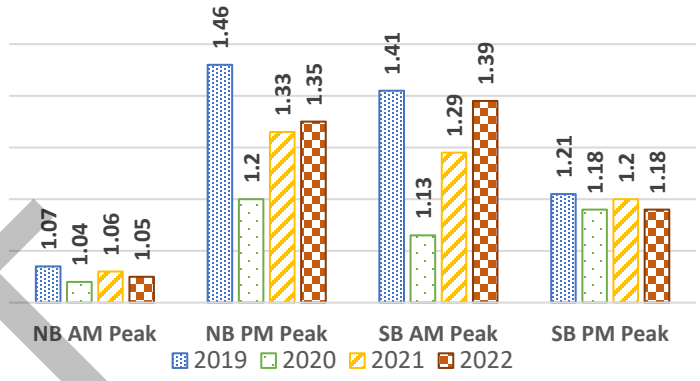
[15] https://mcatlas.org/pedplan/images/FINAL_PLOC_Methodology_APPENDIX.pdf

Connecticut Avenue Growth Corridor Profile

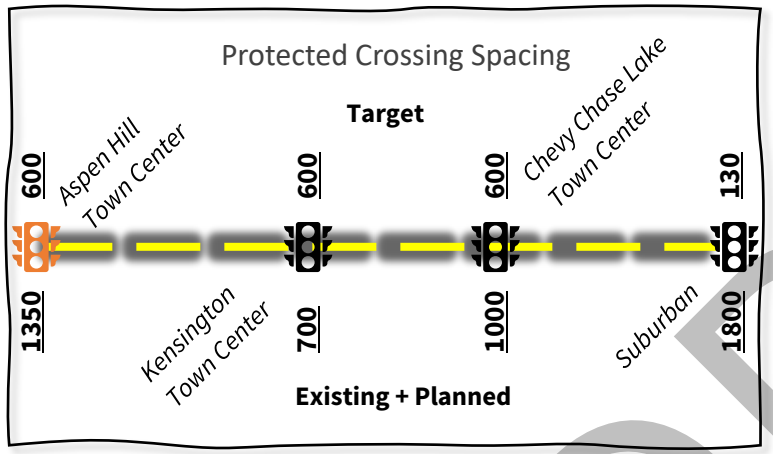
Vehicle Miles Traveled



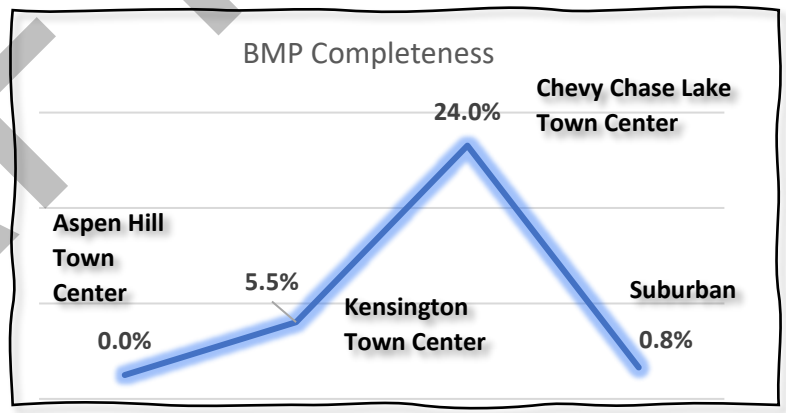
Travel Time Index



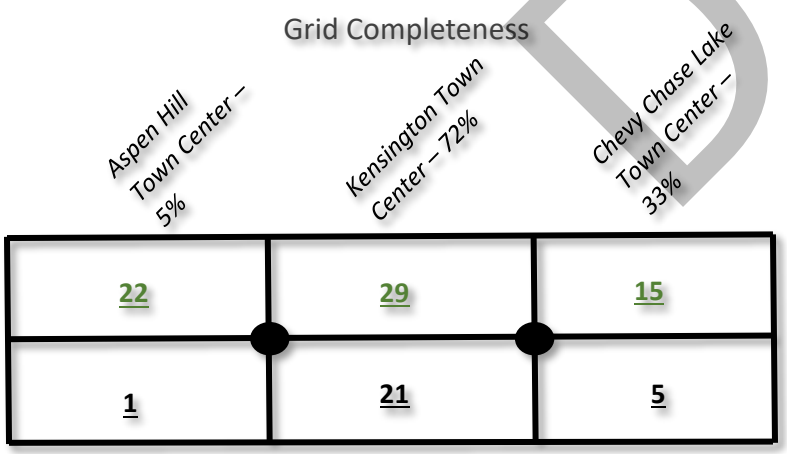
Protected Crossing Spacing



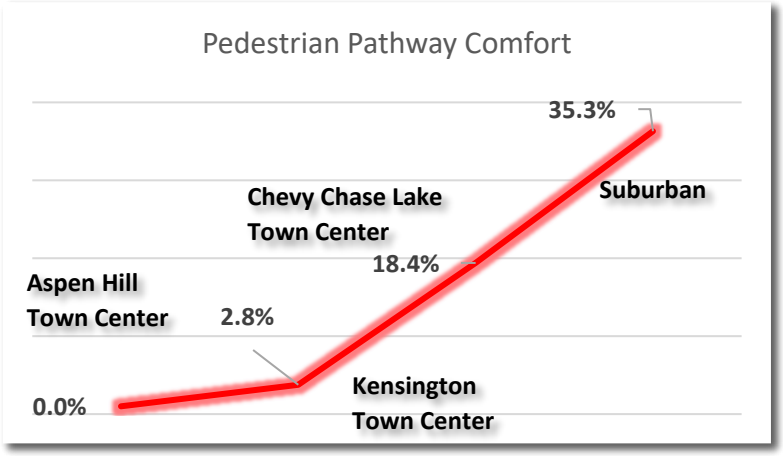
BMP Completeness



Grid Completeness

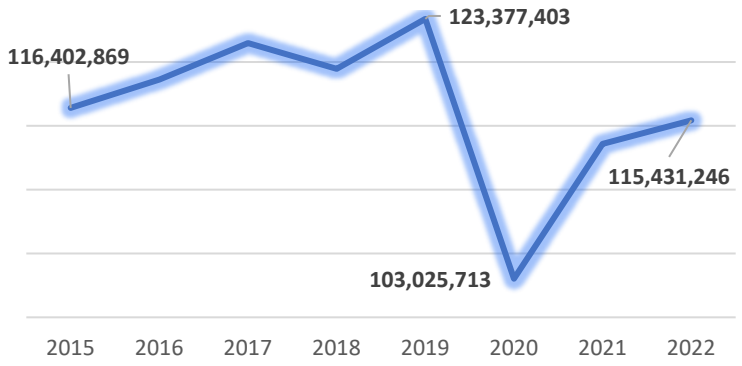


Pedestrian Pathway Comfort

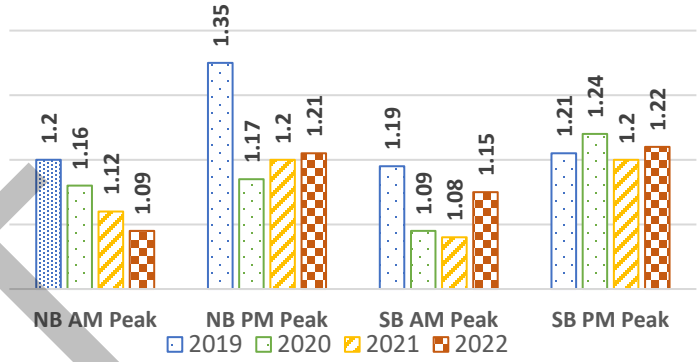


Georgia Avenue Growth Corridor Profile (North Section)

Vehicle Miles Traveled



Travel Time Index



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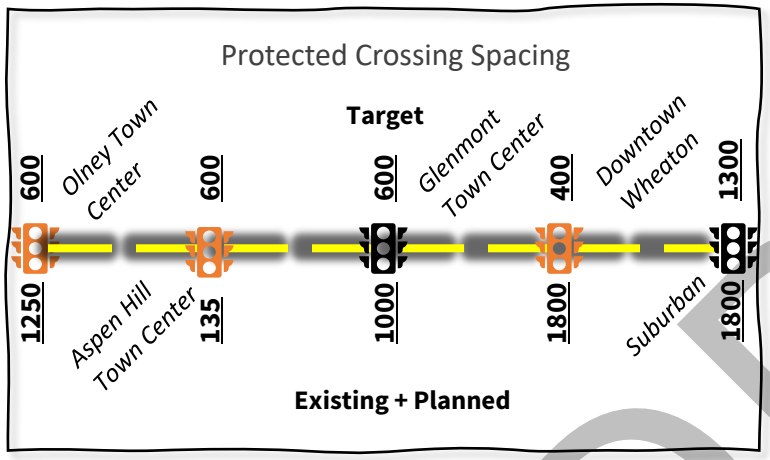

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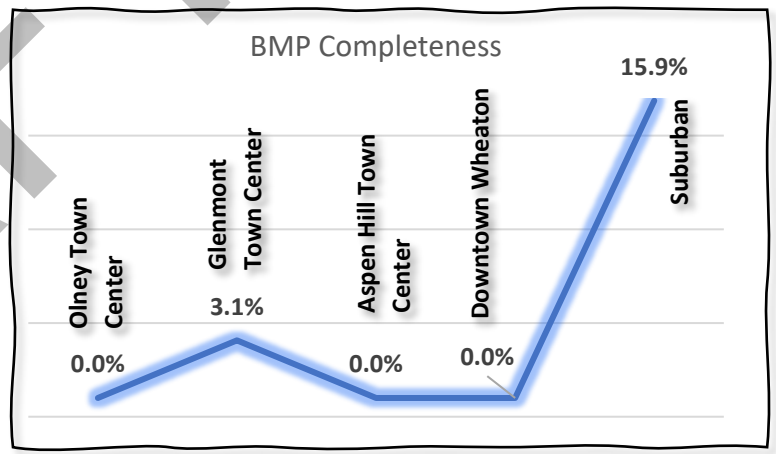
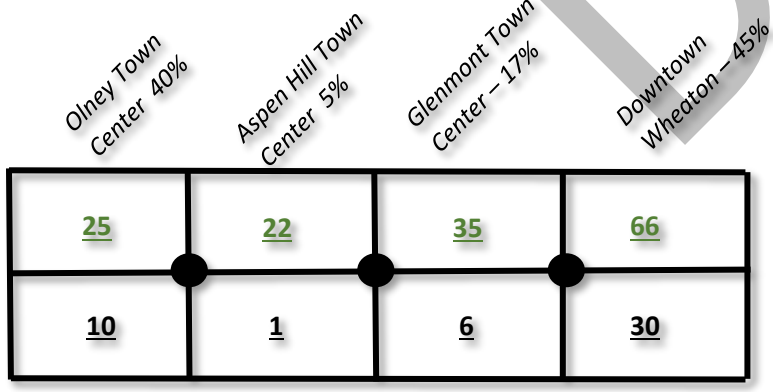
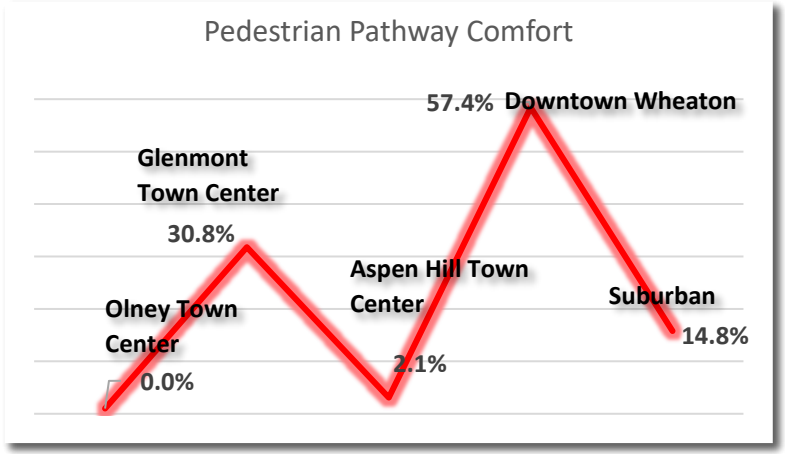


Grid Completeness

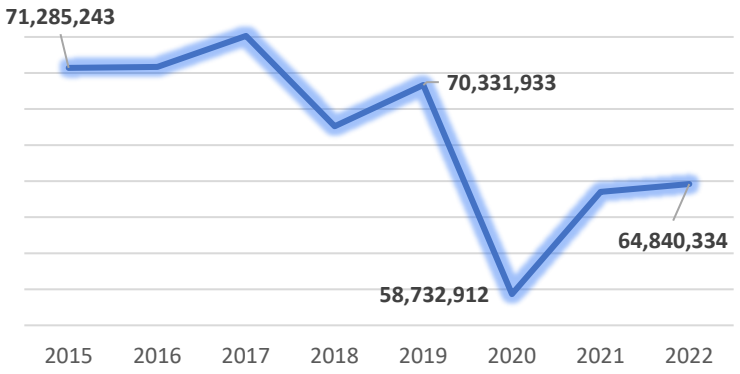


Pedestrian Pathway Comfort

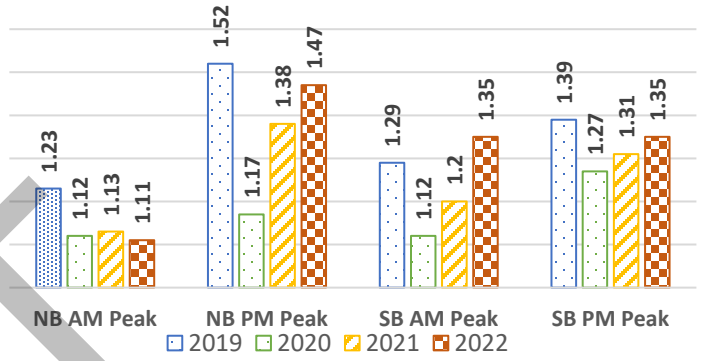


Georgia Avenue Growth Corridor Profile (South Section)

Vehicle Miles Traveled



Travel Time Index



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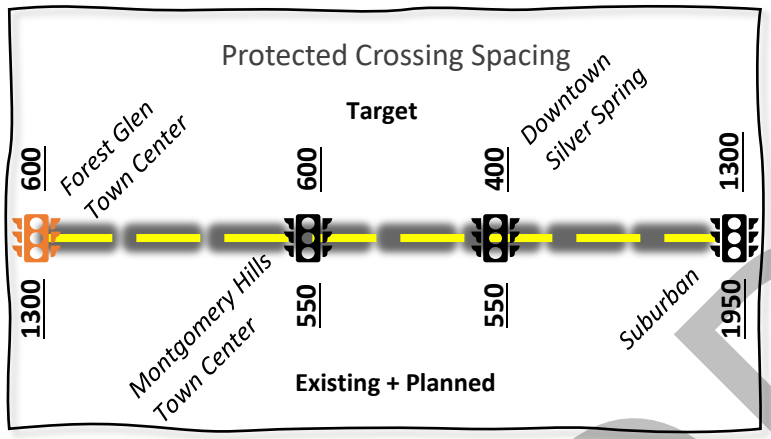

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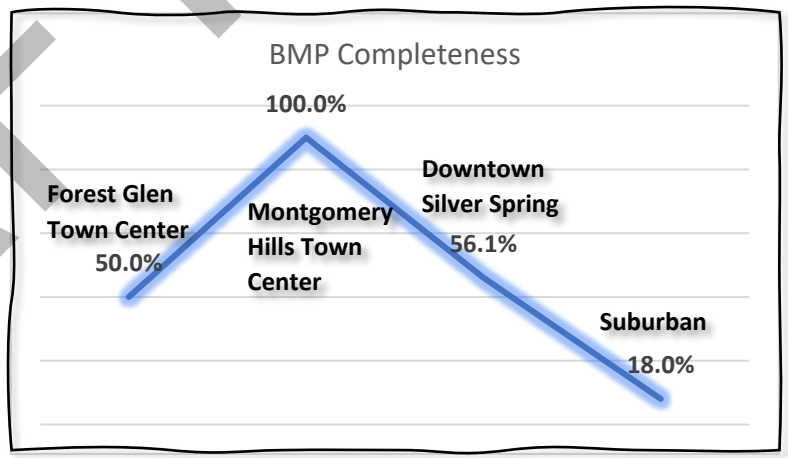
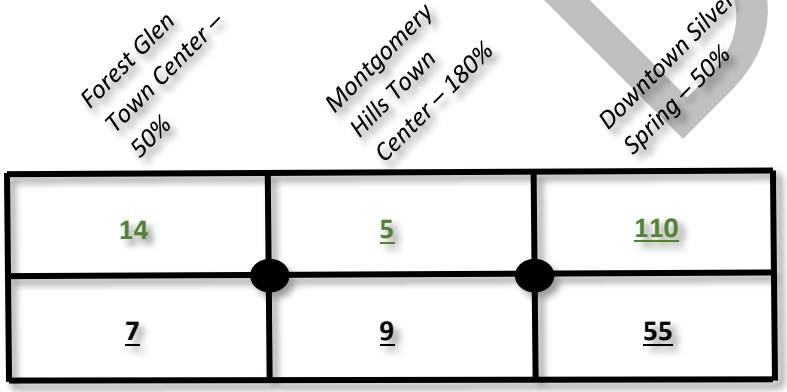
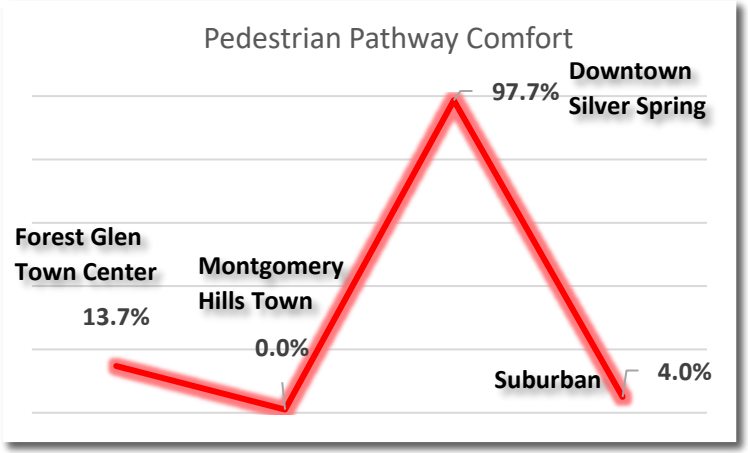


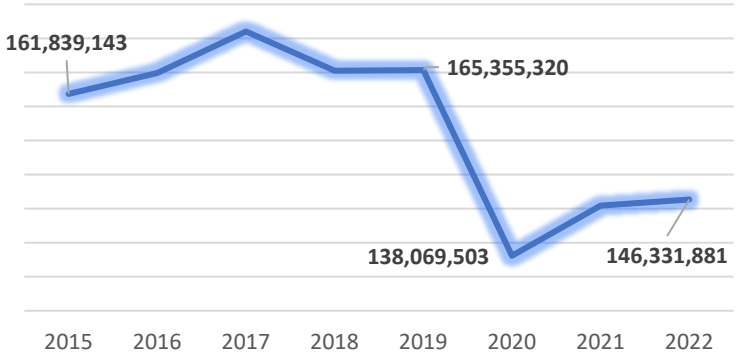
Grid Completeness



Pedestrian Pathway Comfort

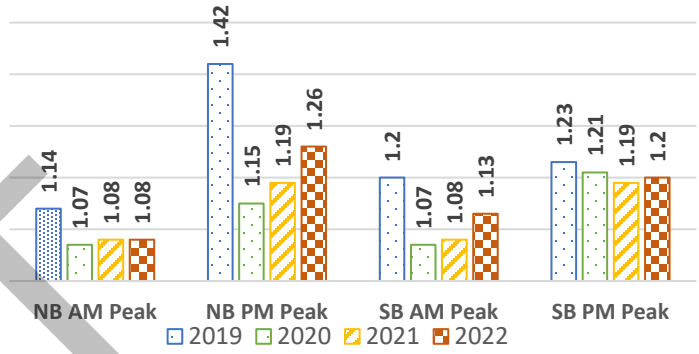


Vehicle Miles Traveled



MD 355 Growth Corridor Profile (North Section)

Travel Time Index



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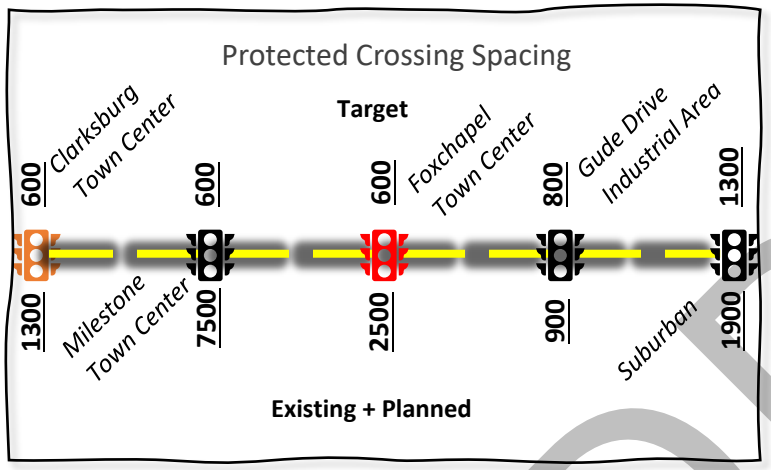
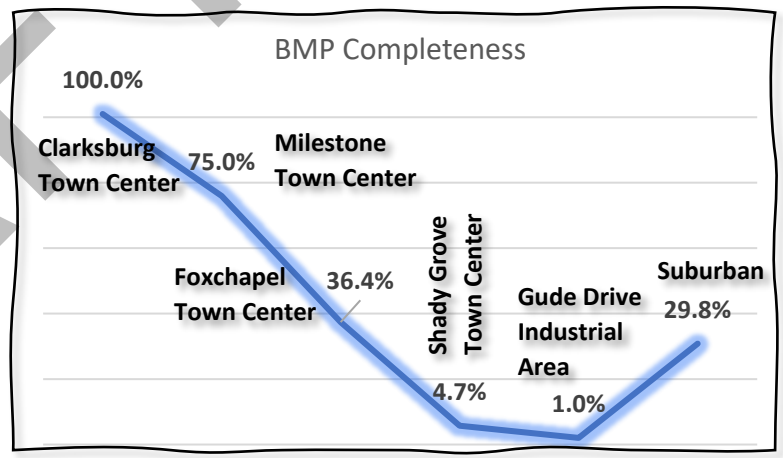
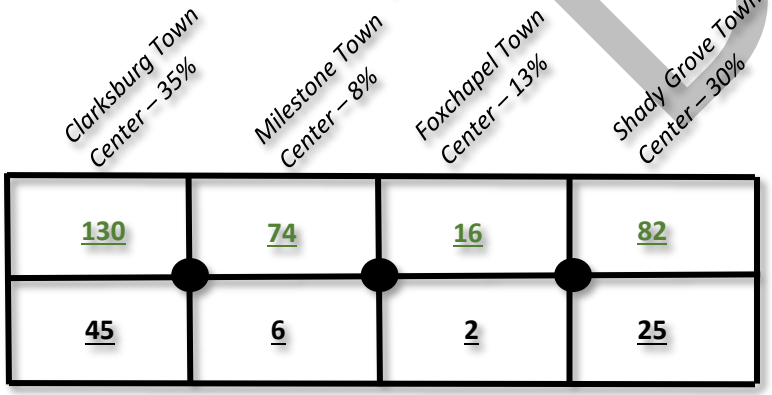


BMP Completeness



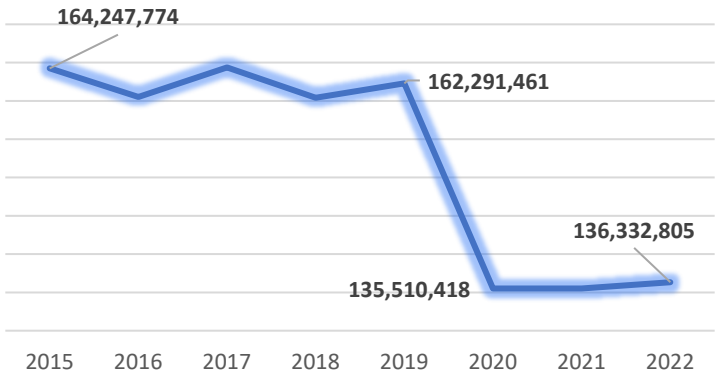
Grid Completeness



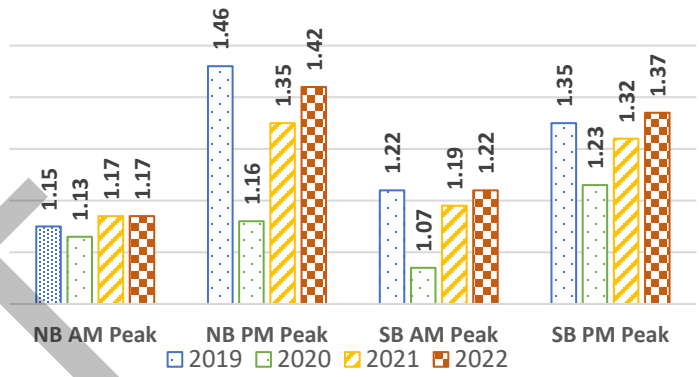
Pedestrian Pathway Comfort

MD 355 Growth Corridor Profile (South Section)

Vehicle Miles Traveled



Travel Time Index



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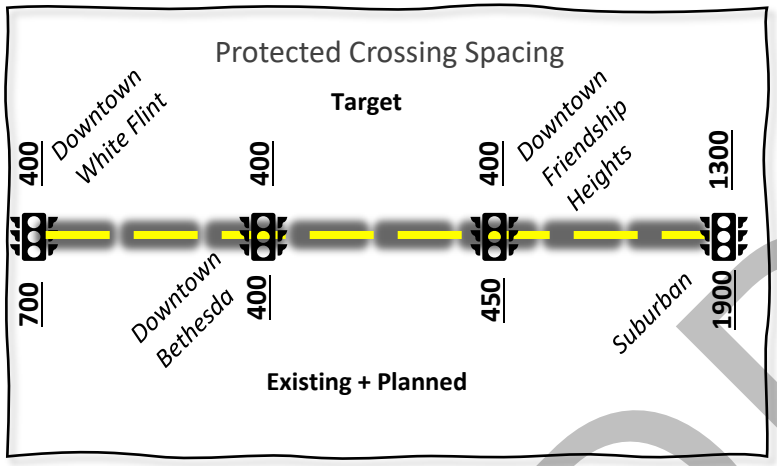

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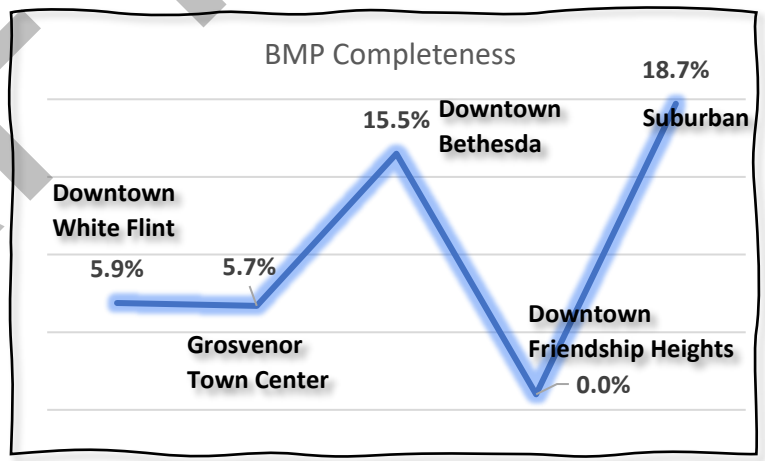
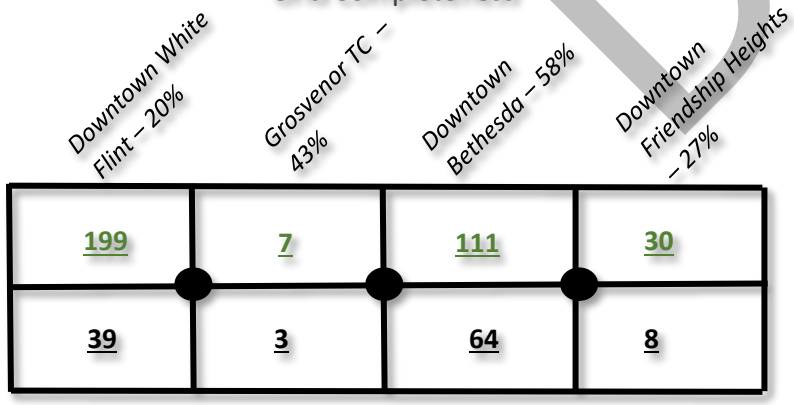
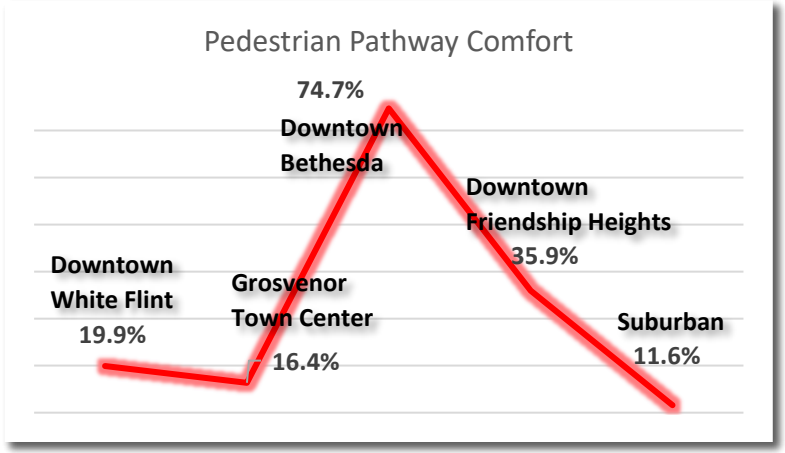


Grid Completeness

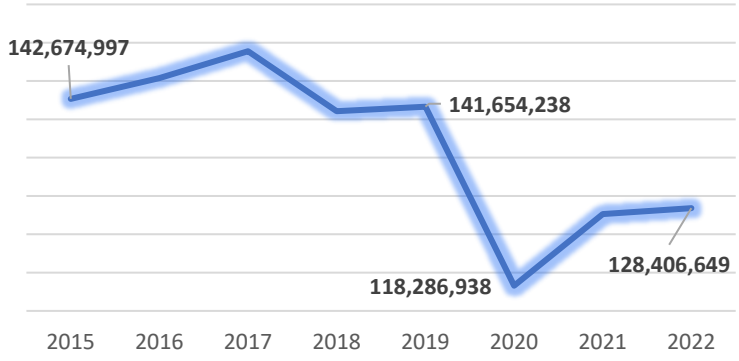


Pedestrian Pathway Comfort

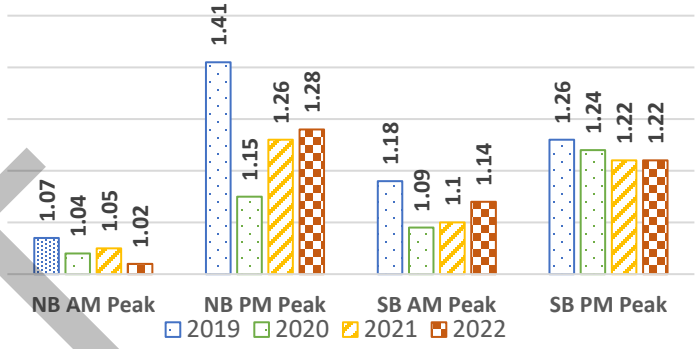


New Hampshire Avenue Growth Corridor Profile

Vehicle Miles Traveled



Travel Time Index



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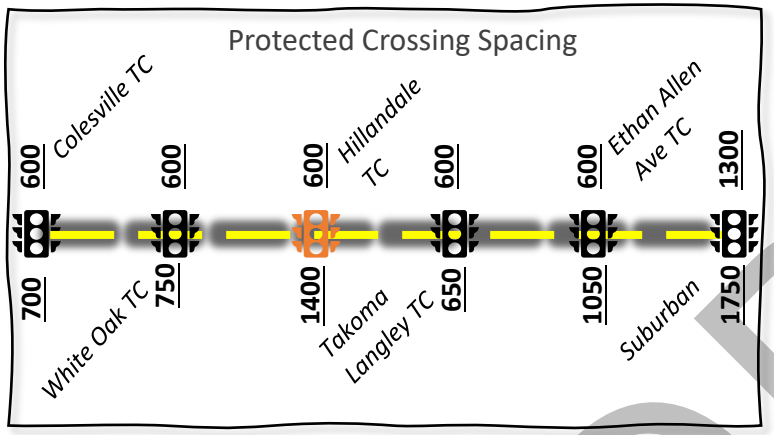

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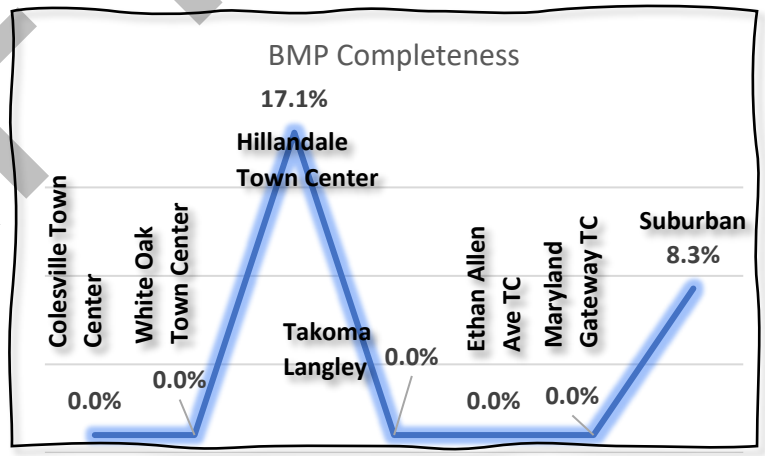

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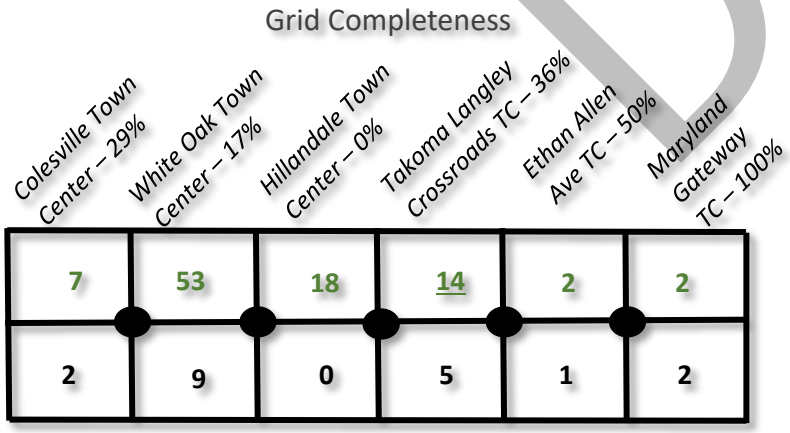
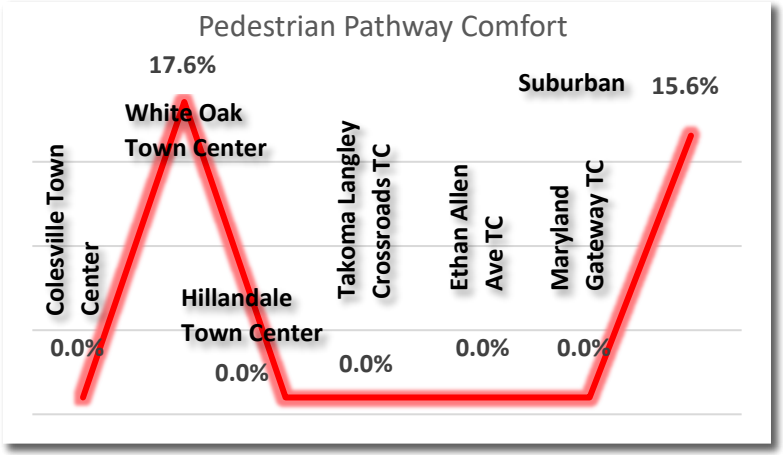
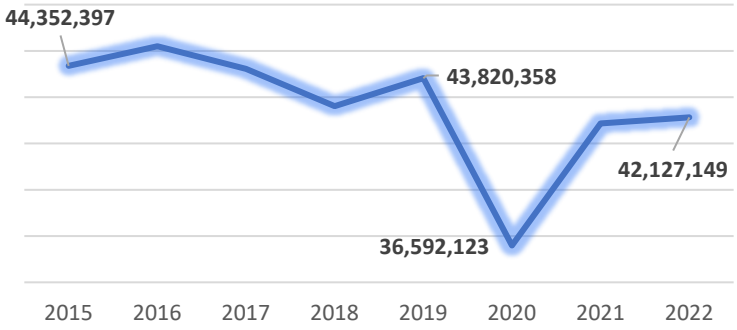


Pedestrian Pathway Comfort

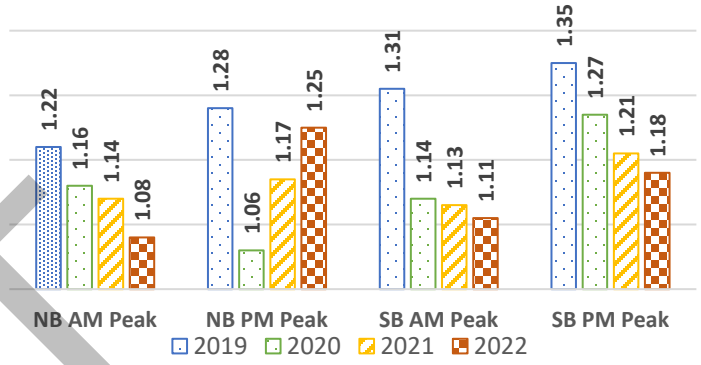


Vehicle Miles Traveled

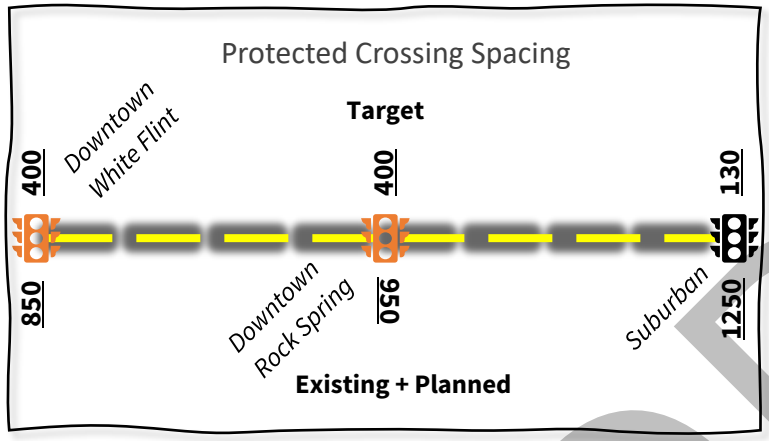


Old Georgetown Road Growth Corridor Profile

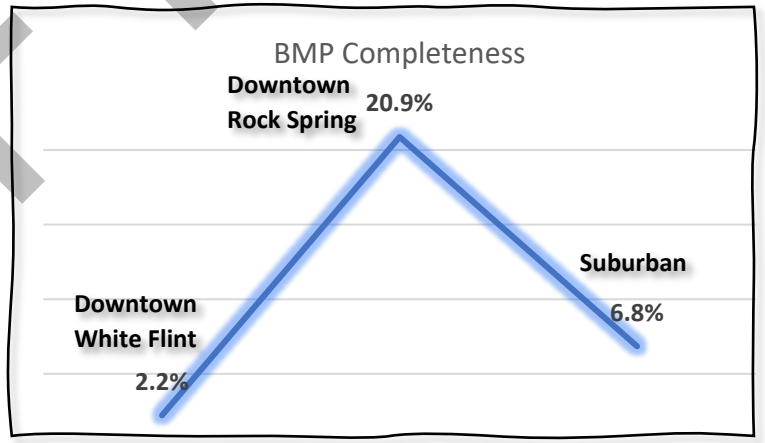
Travel Time Index



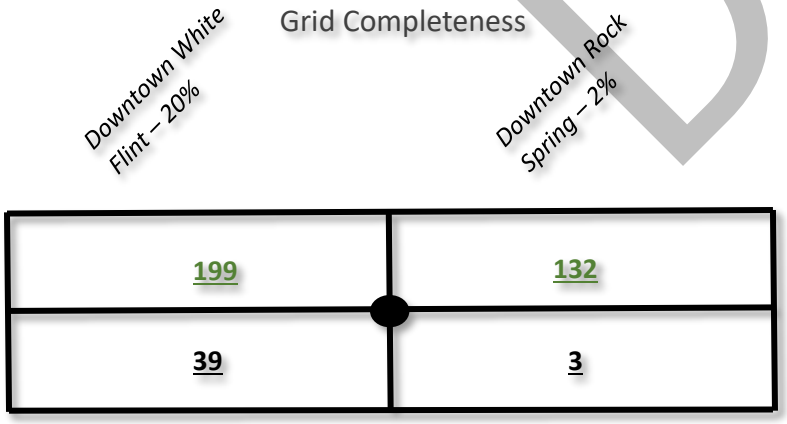
Protected Crossing Spacing



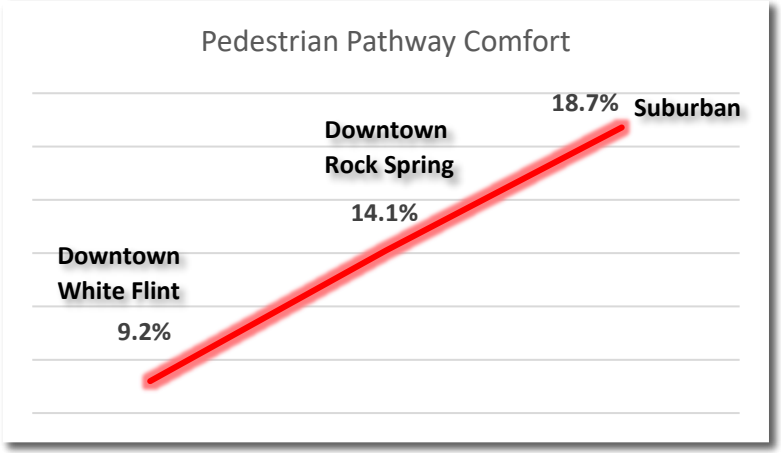
BMP Completeness



Grid Completeness

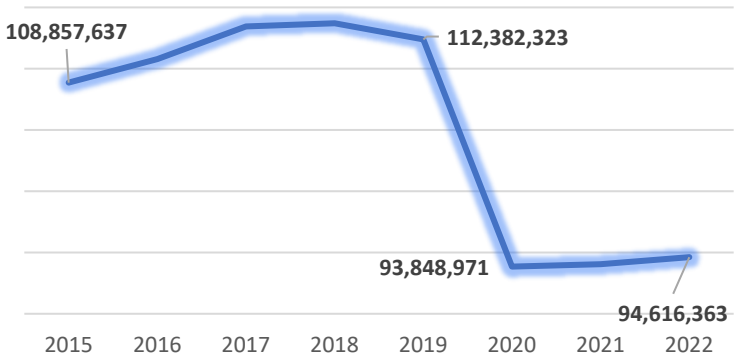


Pedestrian Pathway Comfort

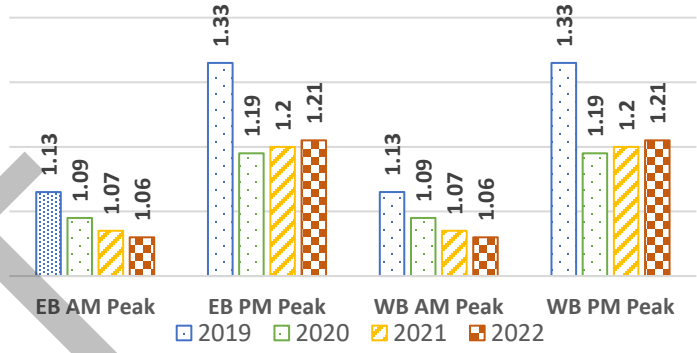


Randolph Road Growth Corridor Profile

Vehicle Miles Traveled



Travel Time Index



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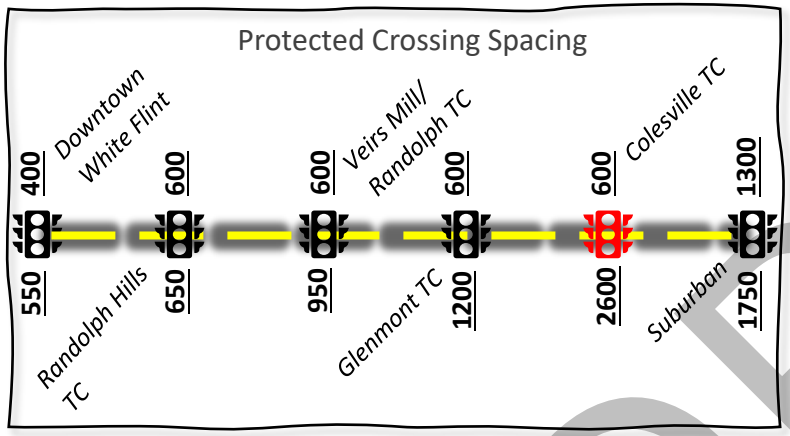
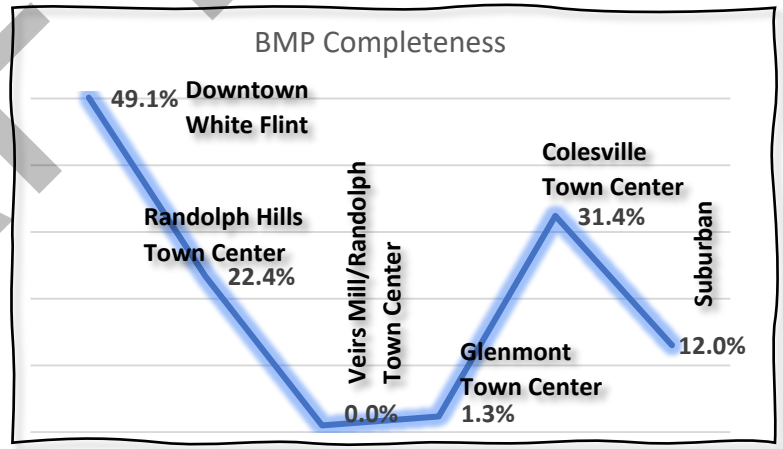
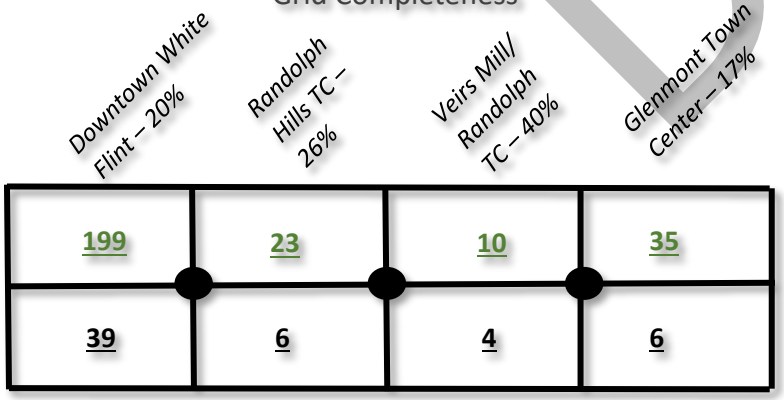


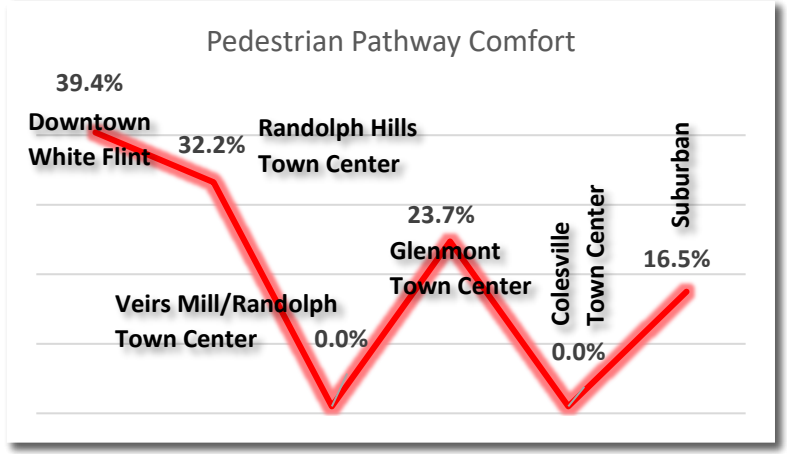
BMP Completeness



Grid Completeness

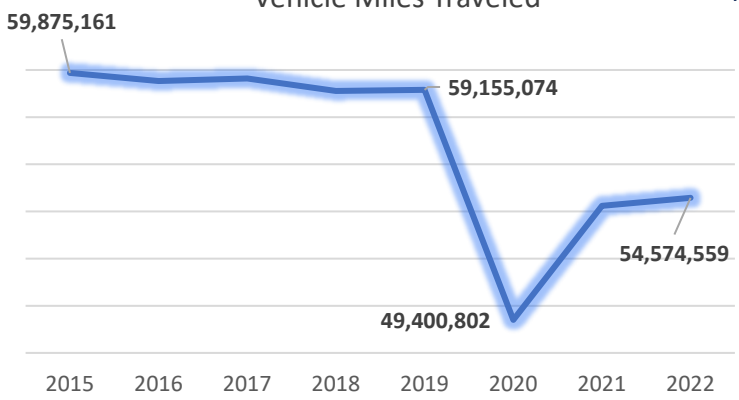


Pedestrian Pathway Comfort

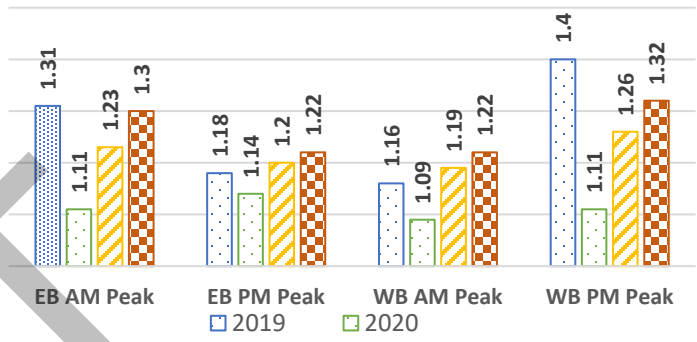


River Road Growth Corridor Profile

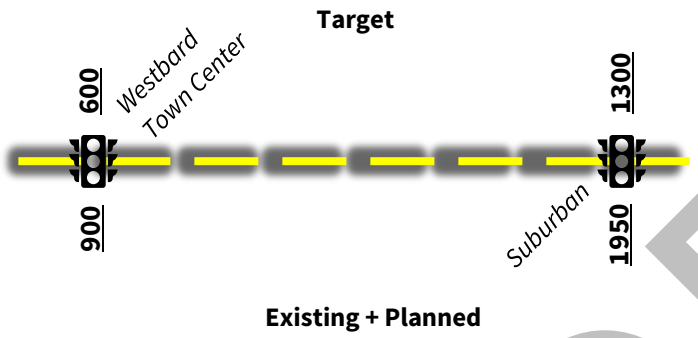
Vehicle Miles Traveled



Travel Time Index



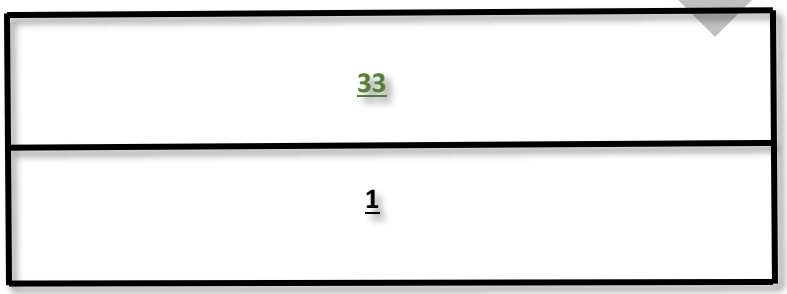
Protected Crossing Spacing



BMP Completeness

Grid Completeness

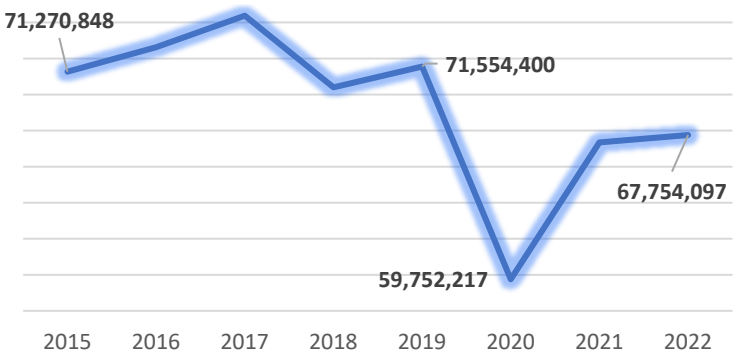
Westbard Town Center – 3%



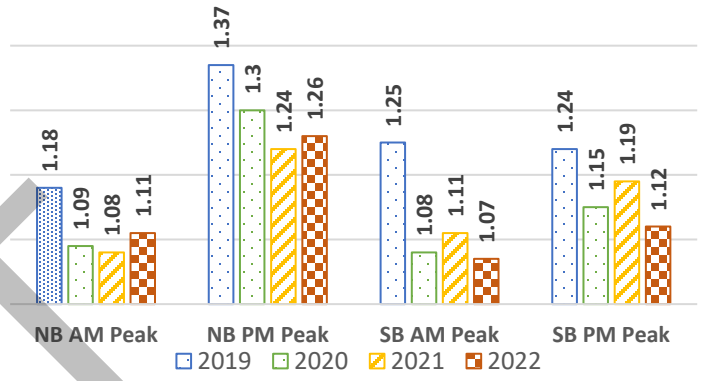
Pedestrian Pathway Comfort

University Boulevard Growth Corridor Profile

Vehicle Miles Traveled



Travel Time Index



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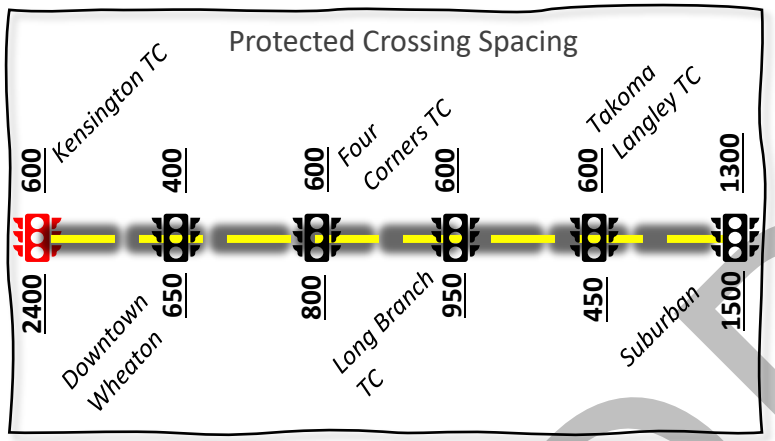
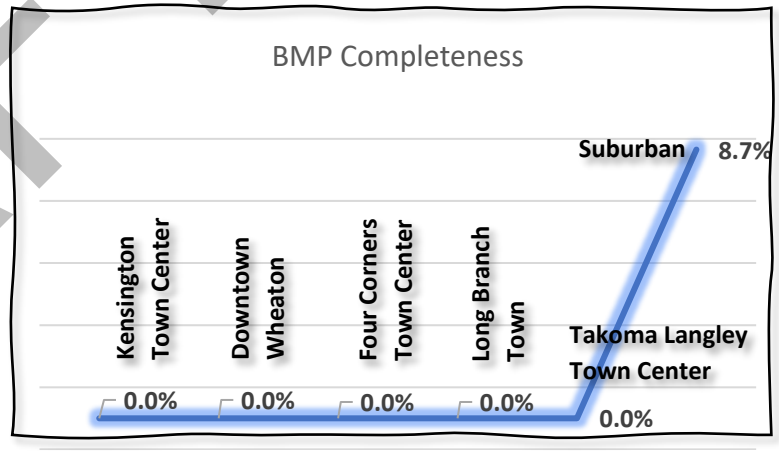
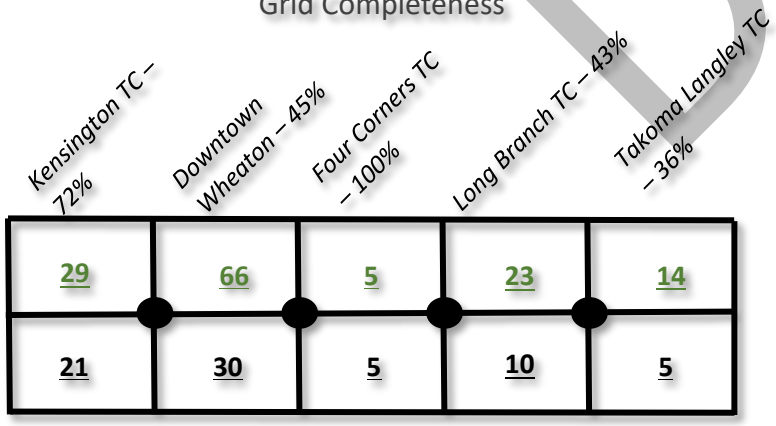


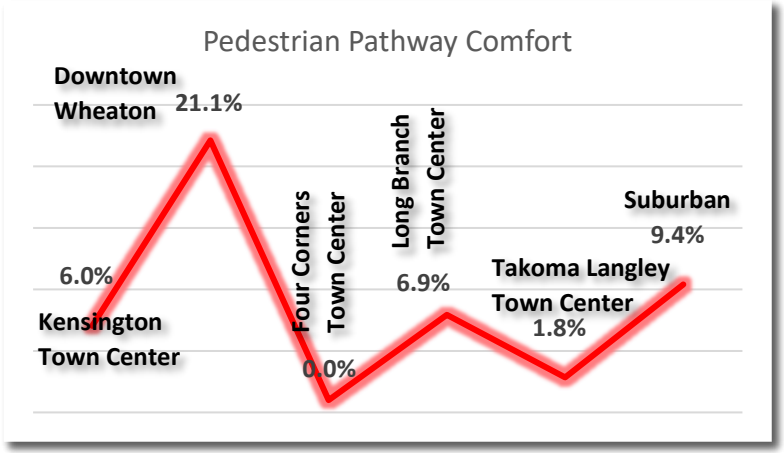
BMP Completeness



Grid Completeness

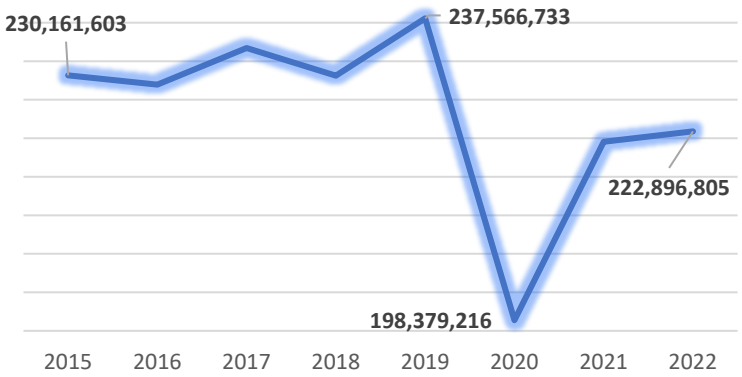


Pedestrian Pathway Comfort

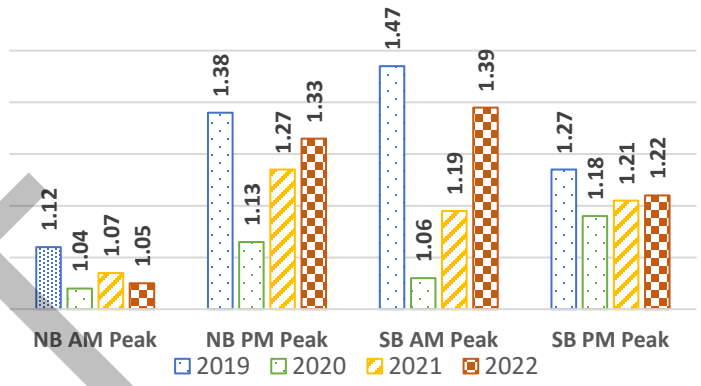


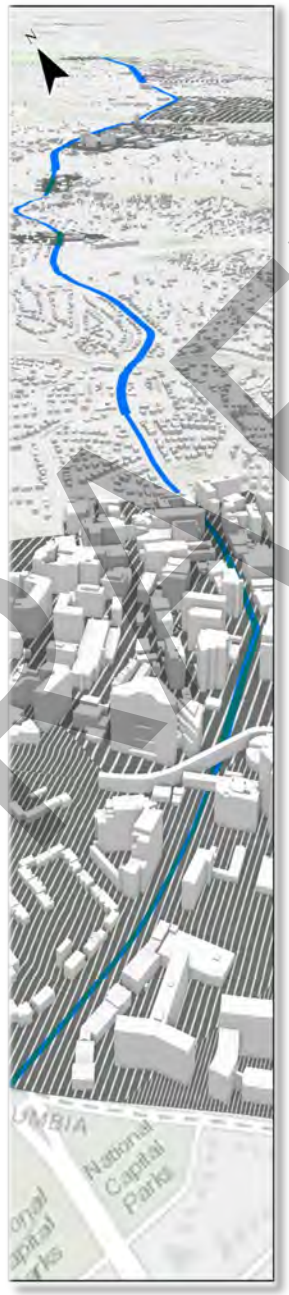
US 29 Growth Corridor Profile

Vehicle Miles Traveled

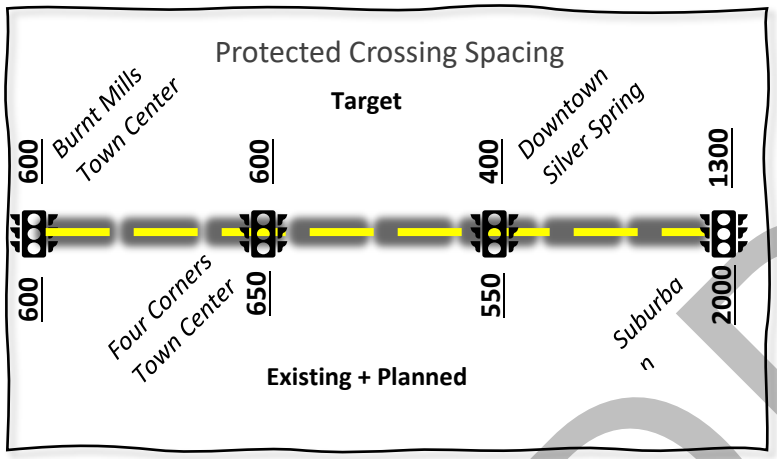


Travel Time Index

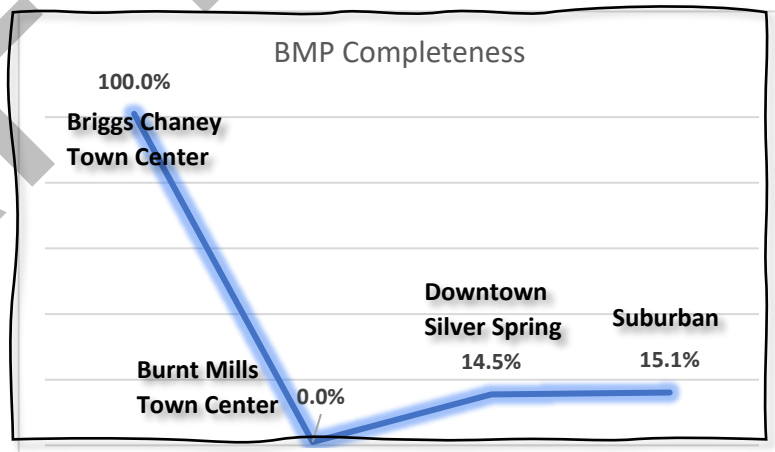




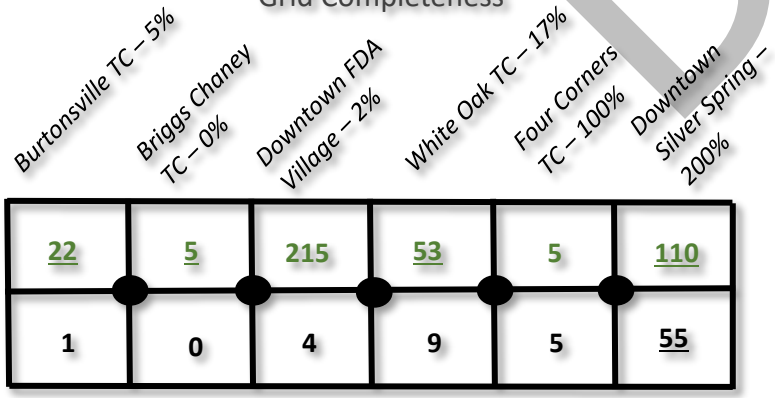
Protected Crossing Spacing



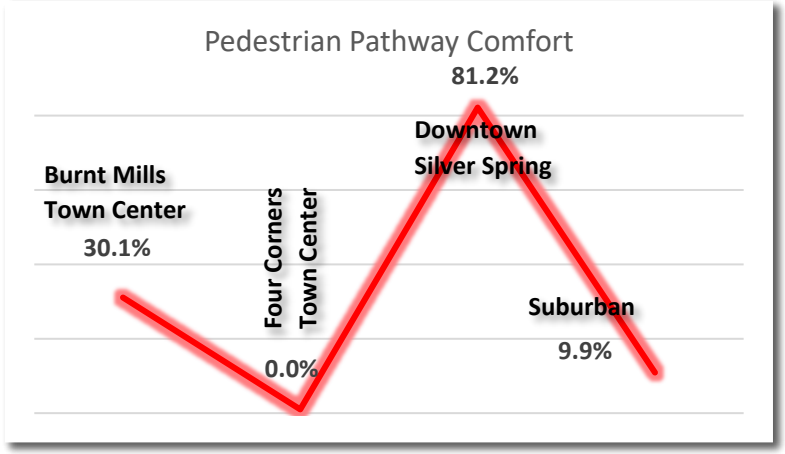
BMP Completeness



Grid Completeness

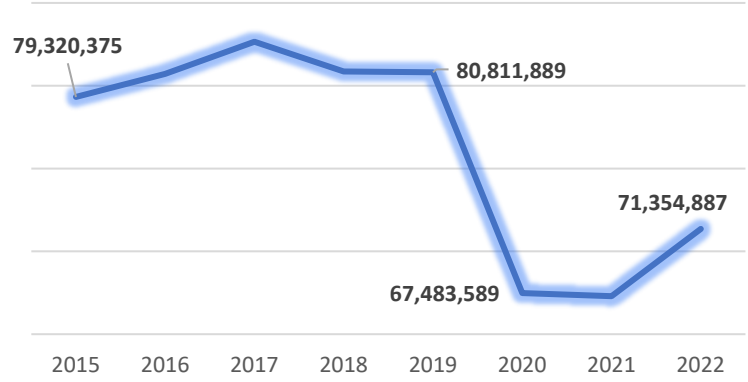


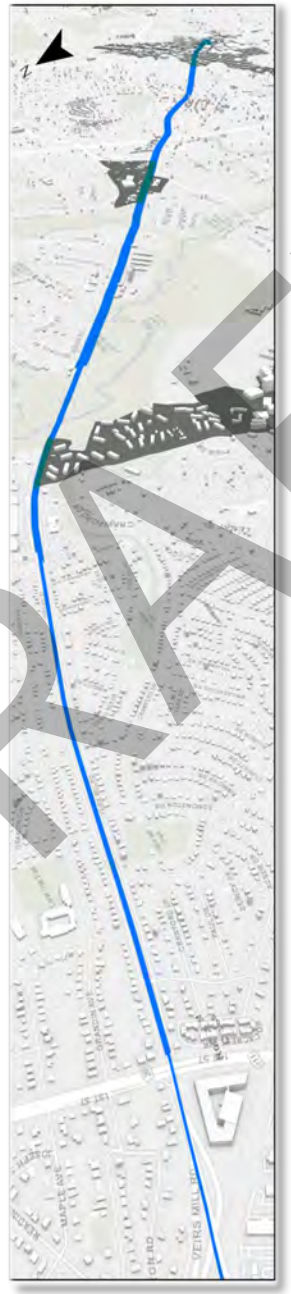
Pedestrian Pathway Comfort



Veirs Mill Road Growth Corridor Profile

Vehicle Miles Traveled





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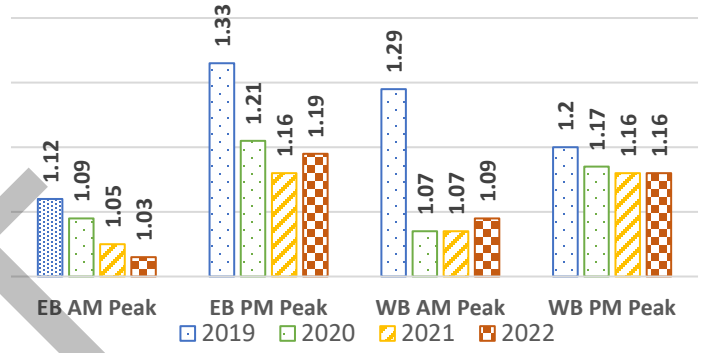
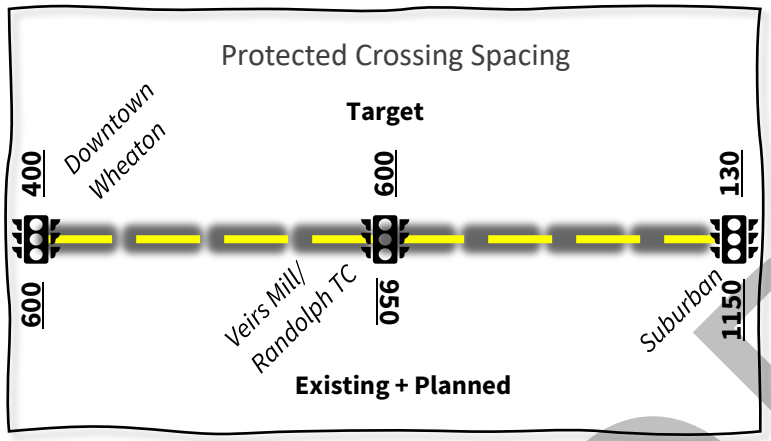


Protected Crossing Spacing



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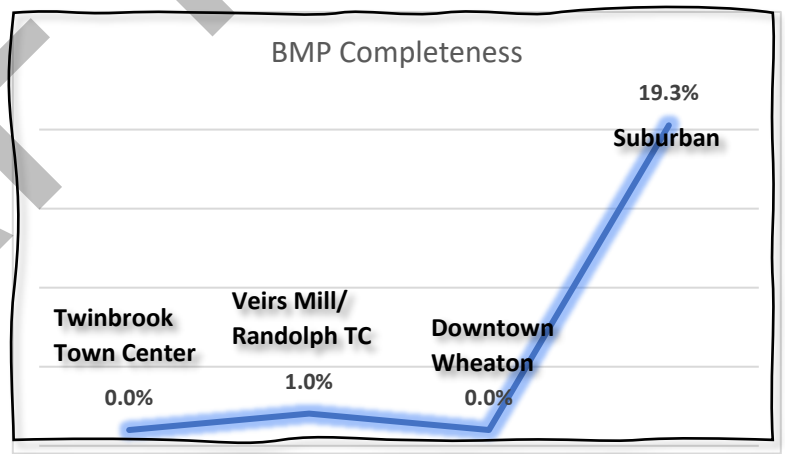
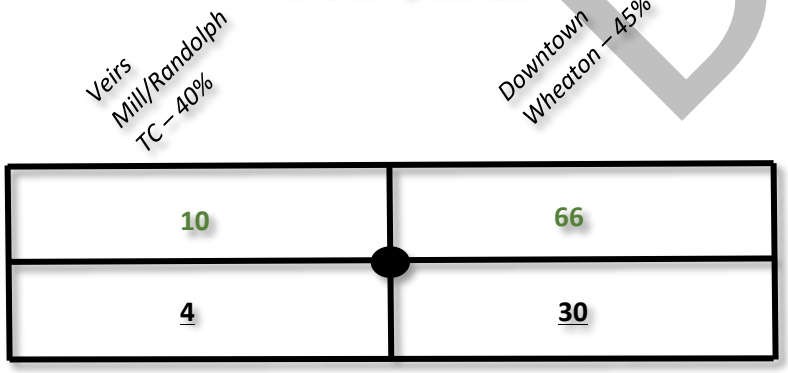
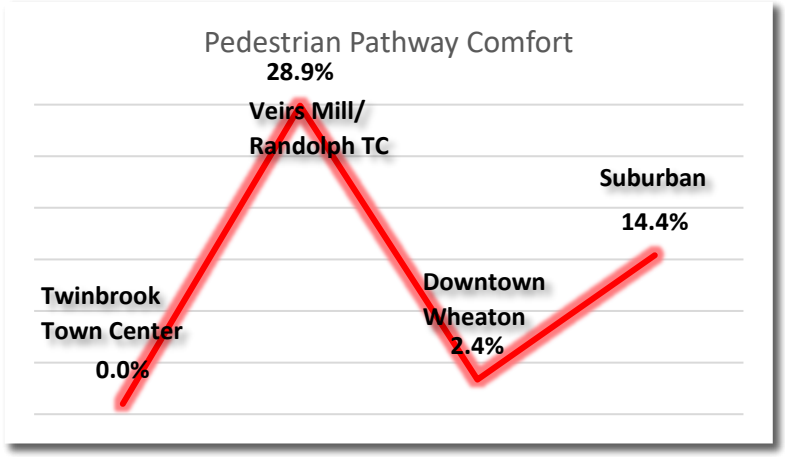


Grid Completeness



Pedestrian Pathway Comfort



Thrive Growth Corridor Recommendations and Summary

The following recommendations are based on the evaluation in the Growth Corridor profiles and are intended to improve protected crossing spacing, build out a grid of streets, and build out the walking and bicycling networks.

Protected Crossing Spacing

Table 7 recommends several locations along Thrive Montgomery 2050 Growth Corridors that should be considered for new protected crossings. These locations have some of the highest ratios between the actual distance between protected crossings and the target distance between protected crossings identified in the Complete Streets Design Guide, and many are Equity Focus Areas (EFAs). For a complete list of protected crossing spacing along the county's Growth Corridors, please see Appendix B.

Table 7: Recommended New Protected Crossings Along Thrive Growth Corridors

Location	Area	Actual	Target	Ratio
Connecticut Avenue Growth Corridor				
Maplefield Dr to Denfeld Ave	Suburban	3,000	1,300	2.3
Saul Rd to Beach Dr	Suburban	2,800	1,300	2.2
Washington St to Saul Rd	Suburban	2,700	1,300	2.1
Matthew Henson Trail to Weller Rd	Suburban	2,700	1,300	2.1
Georgia Avenue Growth Corridor				
August Dr to Forest Glen Dr	Forest Glen Town Center	2,100	600	3.5
Arcola Ave to Blueridge Ave	Downtown Wheaton	1,400	400	3.5
Rossmoor Blvd to Bel Pre Rd	Suburban	3,200	1,300	2.5
16th St to Spring St	Suburban	3,100	1,300	2.4
Norbeck Rd to Rossmoor Blvd	Suburban	2,900	1,300	2.2
MD 355 Growth Corridor				
Germantown Rd to Middlebrook Rd	Foxchapel Town Center	4,000	600	6.7
Gunner's Branch Rd to Plummer Dr	Foxchapel Town Center	2,500	600	4.2
Little Seneca Pkwy to W. Old Baltimore Rd	Suburban	3,600	1,300	2.8
New Hampshire Avenue Growth Corridor				
Chalmers Rd to Powder Mill Rd	Hillandale Town Center	3,200	600	5.3
Wolf Dr to Venice Dr	Suburban	4,600	1,300	3.5
Jackson Rd to Heartfields Dr	Suburban	2,800	1,300	2.2

Location	Area	Actual	Target	Ratio
Old Georgetown Road Growth Corridor				
Rockledge Dr to Fernwood Rd	Downtown Rock Spring	1,500	400	3.8
Randolph Road Growth Corridor				
New Hampshire Ave to Locksley Ln	Colesville Town Center	3,000	600	5.0
Lauderdale Dr to Gaynor Rd	Randolph Hills Town Center	2,800	600	4.7
Glenallan Ave to Garden Gate Rd	Glenmont Town Center	2,000	600	3.3
Colie Dr to Connecticut Ave	Veirs Mill/Randolph Town Center	1,800	600	3.0
Hawkesbury Ln to Locksley Ln	Suburban	3,800	1,300	2.9
University Boulevard Growth Corridor				
Newport Mill Rd to Valley View Ave	Kensington Town Center	3,800	600	6.3
Caddington Ave to Dennis Ave	Suburban	2,900	1,300	2.2
US 29 Growth Corridor				
Greencastle Rd to Briggs Chaney Rd	Suburban	5,300	1,300	4.1
Veirs Mill Road Growth Corridor				
Aspen Hill Rd to Robindale Dr	Suburban	3,500	1,300	2.7

Grid of Streets

Appendix B includes a summary of block ratios in Montgomery County's eight existing and emerging downtowns and 47 town centers. To build out a grid of streets in Downtowns, in Town Centers, and along Growth Corridors, with block sizes based on the protected crossing spacing standards in the Complete Streets Design Guide, complete the following tasks:

- Capital Projects: Continue to advance projects in the capital budget to build out the street grid, including North High Street Extended (CIP # 502310) in Olney and Summit Avenue Extension (CIP # 502311) in Kensington.
- Development Projects: Develop tools to reduce the size of blocks through the development approval process.
- Master Plans: Identify opportunities to expand the street grid in Downtowns, in Town Centers, and along Growth Corridors.

Pedestrian Network Comfort

Table 8 shows the percentage of walkways on Growth Corridors that are acceptable for pedestrians. While the overall average is 17%, many corridors have lower rates of acceptable walkways. Therefore,

Montgomery County should focus on upgrading the walkway network along all Growth Corridors, with a particular focus on those with below average percentages of acceptable walkways, including:

- Old Georgetown Road
- Veirs Mill Road
- New Hampshire Avenue
- MD 355 North
- University Boulevard
- River Road

Table 8: Pedestrian Walkway Evaluation Along Growth Corridors

Growth Corridor	% Acceptable	% Unacceptable	% Gaps
Connecticut Avenue	31%	69%	0%
Georgia Avenue South	30%	70%	0%
MD 355 South	26%	72%	2%
US 29	18%	43%	39%
Georgia Avenue North	17%	82%	1%
Randolph Road	17%	83%	0%
Old Georgetown Road	16%	84%	0%
Veirs Mill Road	14%	56%	30%
New Hampshire Avenue	13%	82%	5%
MD 355 North	11%	70%	19%
University Boulevard	9%	91%	0%
River Road	1%	34%	65%
Average	**17%**	**72%**	**11%**

Bicycle Network Completeness

Table 9 shows the percentage of master-planned bikeways along Growth Corridors that are existing, under construction, or funded. While the overall average is 15%, most corridors are at or below the average, the exceptions being the Georgia Avenue South and MD 355 North Growth Corridors, both of which are making substantial progress toward implementing master-planned bikeways. Therefore, Montgomery County should continue focusing on upgrading the bikeway network along all Growth Corridors, with a particular focus on:

- Veirs Mill Road
- Randolph Road
- US 29
- MD 355 South
- Georgia Avenue North
- Old Georgetown Road
- New Hampshire Avenue

Table 9: Bikeway Completion Evaluation Along Thrive Growth Corridors

Growth Corridor	% Existing	% Under Construction	% Funded	% Total
Georgia Avenue South	19%	0%	35%	53%
MD 355 North	29%	0%	2%	31%
Veirs Mill Road	3%	0%	12%	15%
Randolph Road	15%	0%	0%	15%
US 29	15%	0%	0%	15%
MD 355 South	13%	0%	1%	15%
Georgia Avenue North	13%	0%	1%	14%
Old Georgetown Road	0%	0%	10%	10%
New Hampshire Avenue	5%	2%	1%	7%
University Boulevard	4%	0%	1%	6%
Connecticut Avenue	1%	0%	0%	2%
River Road	0%	0%	0%	0%
Average	**12%**	**0%**	**3%**	**15%**

Chapter 4: *Pedestrian Existing Conditions*

The *Pedestrian Master Plan* will be Montgomery County's first countywide master plan to make recommendations to holistically improve the pedestrian experience. An important element in the county's *2017 Vision Zero Action Plan* and *2021 Climate Action Plan*, the Planning Board Draft *Pedestrian Master Plan* supports the *Thrive Montgomery 2050* goal to "develop a safe, comfortable and appealing network for walking, biking and rolling." The draft plan documents the pedestrian experience in Montgomery County today and makes recommendations that are in line with national and international best practices to improve the pedestrian experience in the years to come.

The draft plan envisions a county where walking (and rolling using a mobility device) is safer, more comfortable, more convenient, and more accessible for pedestrians of all ages and abilities. To achieve this vision, the draft plan includes the following goals:

1) Increase Walking Rates and Pedestrian Satisfaction
2) Create a Comfortable, Connected, Convenient Pedestrian Network
3) Enhance Pedestrian Safety
4) Build an Equitable and Just Pedestrian Network

Findings

This monitoring report tracks how well the draft plan vision is being achieved through implementation of recommendations and progress toward the performance measure targets that are identified in the draft plan's goals and objectives. This edition of the TMR represents the "baseline" conditions for the draft plan. For the complete pedestrian existing conditions report, please see Appendix C.

Walking Rates and Satisfaction

Overall, 7.5% of weekday trips are made by walking (Table 10) and 1.8% of commute trips are made by walking in Montgomery County. Walking rates vary greatly by land use type, with a greater share of trips made by walking in urban areas (11.3%) compared with transit corridors (7.3%) and exurban/rural areas (4.6%). In addition, residents in urban areas make up a greater share of commute trips by walking (3.2%) than those in transit corridors (1.5%) or exurban/rural areas (1.0%).

Walking rates also vary depending on whether an area is an Equity Focus Area (EFA). Residents in EFAs make 9.6% of trips by walking, while residents in non-EFAs make 7.0% of trips by walking. The share of commute trips made by walking is only slightly greater in EFAs (1.9%) than in non-EFAs (1.8%).

Table 10: Pedestrian Mode Share by Area Types

	Total	Land-Use Type			Equity Focus Areas	
		Urban	Transit Corridor	Exurban/ Rural	EFAs	Non-EFAs
Overall Weekday Trips*	**7.5%**	11.3%	7.3%	4.6%	9.6%	7.0%
Commute Trips**	**1.8%**	3.2%	1.5%	1.0%	1.9%	1.8%

Overall, 12% of Montgomery County Public School students walk to school and 16% walk from school. Walking is most prevalent among elementary school students, with 16% of arrivals made by walking and 18% of departures made by walking (Table 11). Walking is least prevalent among high school students, with 8% of arrivals made by walking and 12% of departures made by walking.

Table 11: Walking Arrivals and Departures by School Level

School Level	Arrival	Departure
Elementary School	16%	18%
Middle School	11%	16%
High School	8%	12%
Total	**12%**	**16%**

As shown in Figure 17, 52% of respondents are satisfied with the overall pedestrian experience in Montgomery County, with respondents in urban areas reporting the highest rates of satisfaction (60%) and those in exurban/rural areas reporting the lowest satisfaction (46%).

Figure 17: Satisfaction with the Overall Pedestrian Experience

As shown in Figure 17, only 43% of pedestrians with reported disabilities are satisfied with their overall pedestrian experience in Montgomery County, compared with 53% of respondents without reported disabilities. However, there are notable differences based on land-use type, with respondents in urban areas reporting the same level of satisfaction whether they have a reported disability (59%) or not (60%). In contrast, respondents with reported disabilities in transit corridors are substantially less satisfied (33%) than respondents without reported disabilities (52%). Respondents with reported disabilities in exurban/rural areas are also less satisfied (36%) than respondents without reported disabilities (47%), but the differences are less pronounced.

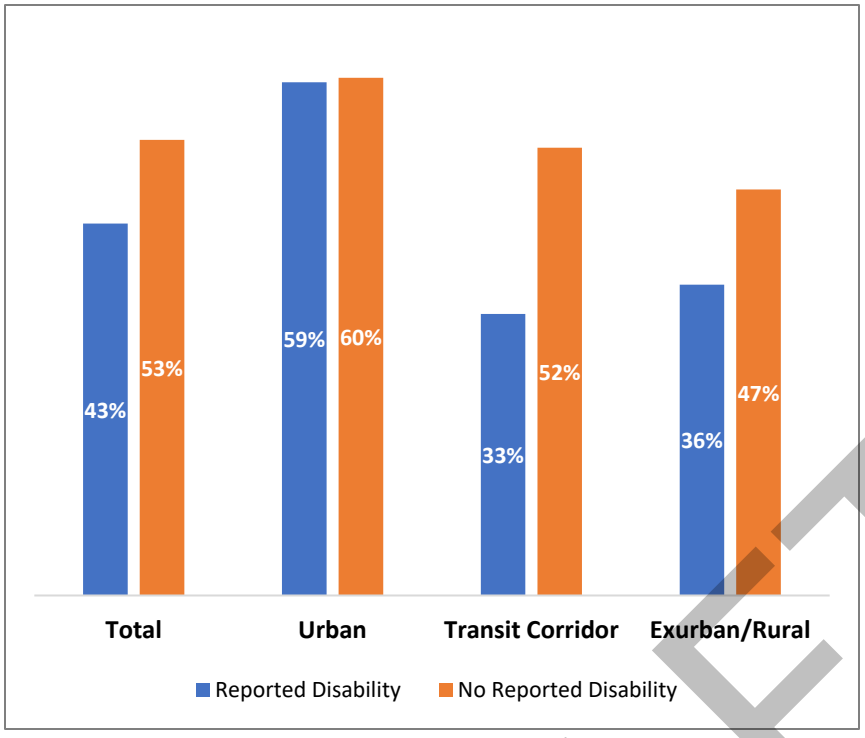


Figure 18: Overall Satisfaction by Reported Disability Status and Land-Use Type

A Comfortable, Connected, Convenient Pedestrian Network

Countywide, there are about 2,500 miles of sidewalks (primarily on local—or residential—streets) and 220 miles of sidewalk gaps on non-local streets. These sidewalk gaps are not evenly distributed across the county; 79% of the sidewalk gap mileage is in the exurban/rural part of the county. The highlighted cells in Table 12 call out those sidewalk gaps in urban and transit corridor communities along busier, faster streets and locations with more pedestrian activity.

Table 12: Sidewalk Gap Mileage by Street Classification and Land Use[16]

Street Classification	Existing Sidewalks (miles)	Gap Mileage			
		Urban	Transit Corridor	Exurban/ Rural	Total
Controlled Major Highway	20	1	0	0	**1**
Major Highway	205	4	7	38	**49**
Parkway	3	0	0	0	**0**
Arterial	202	4	10	84	**98**
Minor Arterial	63	0	2	5	**7**
Business	81	2	0	0	**2**
Primary Residential	228	3	8	47	**58**
Industrial	12	0	0	1	**1**
Country Road	2	0	0	3	**3**
Rustic Road	2	0	0	0	**0**
Exceptional Rustic Road	0	0	0	1	**1**
Local Streets	1,622	N/A	N/A	N/A	**N/A**
Total	**2,438**	**14**	**27**	**179**	**220**

[16] Missing sidewalks on local streets are not classified as sidewalk gaps.

Street buffer width is the distance between the pathway and the curb. Street buffers separate moving vehicles from pedestrians, and wide enough buffers may contain large street trees to provide robust physical separation from traffic, shade canopy, and a sense of enclosure for pedestrians. Of the 2,438 miles of county sidewalks, most (51%) have at least a six-foot buffer between the sidewalk and the street. However, nearly half (47%) of sidewalks along major highways like Georgia Avenue are missing buffers. By contrast, 20% of arterial sidewalks, 11% of primary residential sidewalks, and 18% of local street sidewalks are missing buffers (Table 13).

Table 13: Street Buffer Width by Street Classification

Street Classification	Buffer Width		
	No Buffer	Less than Six Feet	Six Feet or Greater
Controlled Major Highway	3%	74%	23%
Major Highway	47%	34%	19%
Parkway	4%	36%	61%
Arterial	20%	35%	45%
Minor Arterial	21%	34%	45%
Business	28%	44%	28%
Primary Residential	11%	23%	66%
Industrial	14%	27%	59%
Country Road	0%	4%	96%
Rustic Road	7%	33%	60%
Exceptional Rustic Road	52%	27%	21%
Local Street	18%	26%	56%

Sidewalks in EFAs are less likely to have buffers than those outside of EFAs. While 27% of sidewalks in EFAs are missing street buffers, only 18% of those in non-EFAs lack sidewalks (Figure 19).

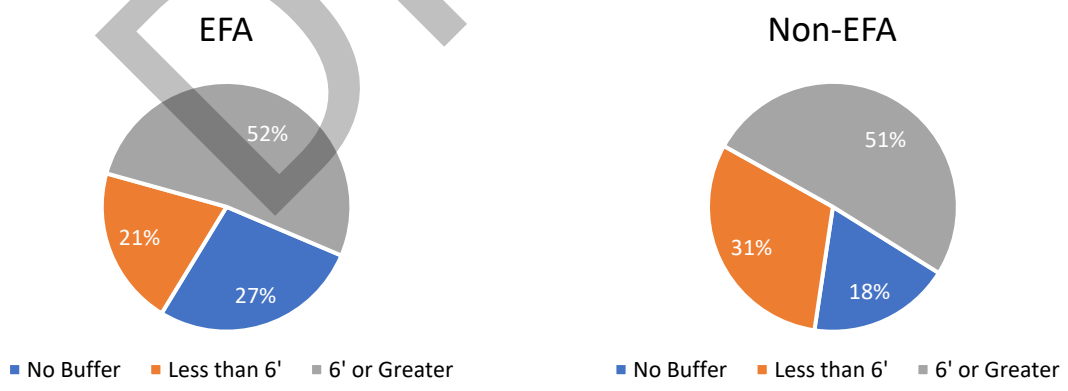


Figure 19: Street Buffer Width by Street Classification

Overall, 61% of pathway distance and 42% of crossing distance in the county is “very comfortable” or “somewhat comfortable” (Table 14).

Table 14: Overall Pedestrian Comfort on Streets and at Crossings

PLOC Score	Pathway Distance	Crossing Distance
Very Comfortable	25%	10%
Somewhat Comfortable	36%	32%
Uncomfortable	21%	38%
Undesirable	17%	19%

An analysis of pedestrian conditions along all streets and crossings in the county indicates that there are large areas of the county where it is uncomfortable to walk and many locations where it is undesirable to do so. Figure 20 summarizes pedestrian comfort along pathways. Comfort levels in urban (67%) and transit corridors (71%) are greater than in exurban/rural (52%) areas of the county. Pathway comfort levels are substantially higher in EFAs (71%) than non-EFAs (60%).

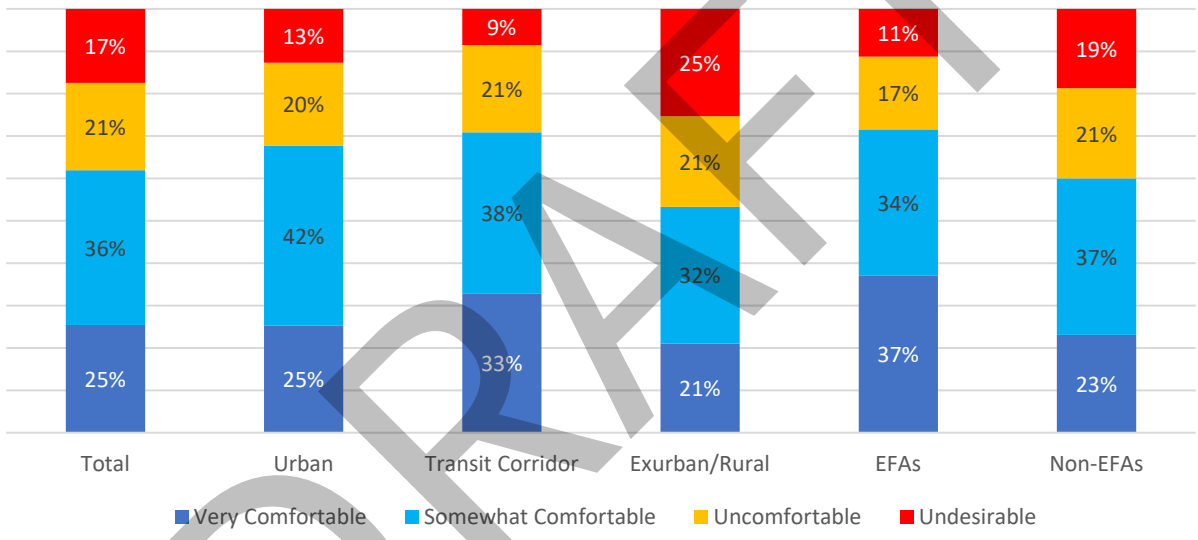


Figure 20: Overall Pedestrian Comfort Along Pathways

Table 15 provides comfortable access scores for walking to community destinations (libraries, recreation centers, and parks) and transit stations broken out by pathway and crossing mileage. While all libraries and recreation centers were scored, only two types of parks (regional and recreational) were included in the analysis. Overall, the pathways are the most comfortable part of the walk to these destinations. Crossing streets is generally less comfortable. While there are disparities between pathway comfort and crossing comfort for most destinations, the difference for parks is the greatest at 35%. Only 35% of the crossing distance between residences and parks was comfortable, lower than every other destination in Table 15.

Table 15: Comfortable Pedestrian Access to Community Destinations and Transit Stations

	Pathway Distance	Crossing Distance
Community Destinations		
Libraries	80%	66%
Recreation Centers	78%	66%
Parks	70%	35%
Transit Stations		
Red Line	88%	66%
Purple Line	76%	70%
Brunswick Line	90%	72%

Regarding walking to schools, Table 16 shows that walking to elementary schools tends to be more comfortable, with 55% comfortable access walking along streets, and 43% comfortable access at crossings. In contrast, walking to high schools tends to be the least comfortable, with only 27% comfortable access along pathways and 13% comfortable access at crossings.

Table 16: Comfortable Pedestrian Access to School

School Types	Streets	Crossings
Elementary Schools	55%	43%
Middle Schools	38%	23%
High Schools	27%	13%

Pedestrian Safety

While users of all transportation modes suffer fatalities and severe injuries, pedestrians are particularly vulnerable. Figure 21 shows that pedestrians were involved in only 4% of total crashes between 2015 and 2022, but they accounted for 26% of severe injuries and fatalities.

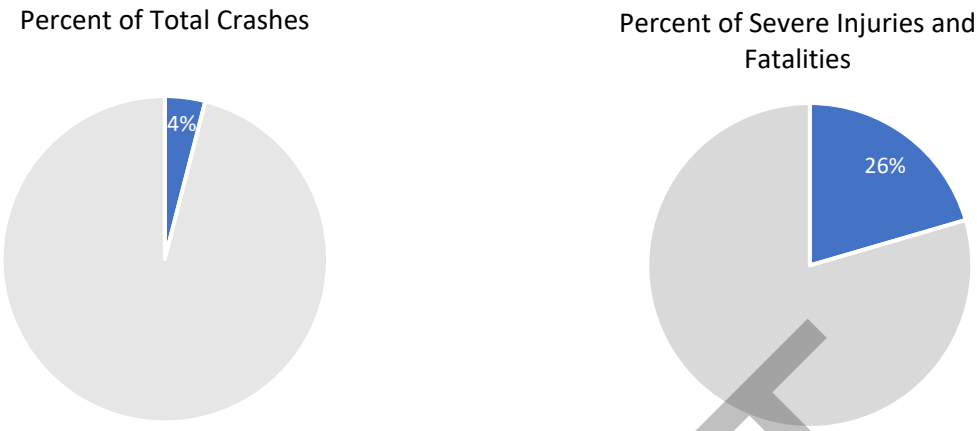


Figure 21: Pedestrian Crashes as a Percent of Total Crashes and Severe Injuries and Fatalities

Higher classification roads such as controlled major highways and major highways, as well as business streets, disproportionately account for pedestrian crashes that result in severe injuries or fatalities. Table 17 shows that while controlled major highways, major highways, and business streets make up only 8% of roadway mileage, they account for 57% of pedestrian crashes and 63% of pedestrian severe injuries and fatalities.

Table 17: Pedestrian Crashes by Roadway Type

Street Classification	Percent of Roadway Miles	Percent of Pedestrian Crashes	Percent of Pedestrian Severe Injuries and Fatalities
Controlled Major Highway	1%	3%	5%
Major Highway	5%	33%	40%
Parkway	0%	0%	0%
Arterial	8%	11%	11%
Minor Arterial	2%	5%	3%
Business	2%	21%	18%
Primary Residential	7%	16%	15%
Industrial	0%	1%	0%
Country Arterial	2%	0%	0%
Country Road	1%	0%	0%
Rustic & Exceptionally Rustic	6%	0%	1%
Local	67%	10%	8%
Total	**100%**	**100%**	**100%**

An Equitable and Just Pedestrian Network

Addressing equity and social justice first requires understanding the disparities that exist around pedestrian issues. Throughout the report, the analysis and results are supplemented with data about how specific topics pertain to historically disadvantaged people and areas of the county. The equity findings described throughout the previous sections are summarized below.

Walking Rates and Satisfaction

- **Overall and commute walking rates are higher in EFAs:** Residents in EFAs make 9.6% of trips by walking, compared with residents of non-EFAs who made 7.0% of trips by walking. The share of commute trips made by walking is only slightly greater in EFAs (1.9%) than in non-EFAs (1.8%).
- **Walk-to-school rates are slightly higher for Title I/Focus schools and those with a high number of students enrolled in Free and Reduced Meals (FARM):** Students at designated schools have walk mode shares to and from school of 13% and 17% respectively, compared with 11% and 15% arrival and departure walk shares for non-designated schools. Many of the schools with the highest walking rates are designated as Title I/Focus or have a high FARM rate.
- **Pedestrian satisfaction is lower for people with reported disabilities:** Only 43% of pedestrians with reported disabilities are satisfied with their overall pedestrian experience, compared with 53% of respondents without reported disabilities. Respondents in transit corridors and exurban/rural are less satisfied if they report having a disability (33% and 36%, respectively) than respondents without reported disabilities (52% and 47%, respectively).

A Comfortable, Connected, Convenient Pedestrian Network

- Crossing comfort accessing community destinations tends to be worse in EFAs, while pathway comfort is better.
- Title I/Focus elementary schools have more comfortable access than their more affluent counterparts. Pathway comfort for Title I/Focus Schools is 10% greater than it is for other elementary schools (60% vs. 50%). Crossing comfort for these schools is 11% greater (50% vs. 39%).
- Less comfortable pathways in urban and transit corridor EFAs have less tree-canopy coverage than similar pathways outside EFAs. “Somewhat comfortable” pathways in EFAs in urban areas have 5.7% less canopy coverage than non-EFAs. In transit corridor areas, these same pathways have 5.4% less coverage. Generally, people traveling along less comfortable sidewalks in EFA communities experience higher temperatures as a result of climate change than will people in other parts of the county.

Pedestrian Safety

- Crashes and injuries are overrepresented in EFAs. While EFAs contain only 14% of roadway miles in the county, they account for 41% of all pedestrian-involved vehicular crashes and 45% of such crashes that result in a fatality or severe injury.

Recommendations

The Planning Board draft of the Pedestrian Master Plan includes recommendations related to pedestrian satisfaction, comfort, safety and equity. Below are recommendations that address the data in this report.

Goal 1: Increase Walking Rates and Walking Satisfaction in Montgomery County.

- Address Issues that Pedestrians with Disabilities Face: Improve the pedestrian experience for residents with disabilities, particularly in transit corridors and exurban/rural areas.
- Improve Pedestrian Satisfaction Along Streets: Address issues with low levels of pedestrian satisfaction throughout the county, with a focus on transit corridors and exurban/rural areas. Elements with countywide satisfaction below 40% include speed of cars alongside sidewalks and paths (21%), snow removal (28%), distance between sidewalks and cars (31%), how often driveways cross sidewalks (35%), and shading by trees or buildings (39%).
- Improve Pedestrian Satisfaction at Crossings: Address issues with low levels of pedestrian satisfaction throughout the county, with a focus on transit corridors and exurban/rural areas. Topics with countywide satisfaction below 40% include the number of vehicles cutting across the crosswalk (22%), places to stop partway while crossing (33%), and drivers stopping when pedestrians cross the street (34%).

Goal 2: Create a Comfortable, Connected, Convenient Pedestrian Network in Montgomery County.

- Fill Sidewalk Gaps: Repair sidewalks that are missing sections, with a focus on major highways, arterials, and primary residential streets in areas of the county where they will improve connectivity comfort to schools, parks, transit stations, and other community destinations.
- Prioritize Buffers on High-Speed Streets: Provide a buffer between the sidewalk and the street, prioritizing roads with speeds greater than 40 miles per hour; 30% of sidewalks on these streets are missing a traffic buffer.
- Provide Pedestrian Refuges: Increase the number of pedestrian refuges to improve crossing comfort, particularly on roads with six or more lanes of traffic. Today, only 19% of crossings with six or more lanes have pedestrian refuges that are ADA-compliant.
- Focus on Crossing Improvements: Prioritize improvements to the comfort and safety of crossings, as crossings are less comfortable than street segments and result in a greater number of pedestrian crashes that involve severe injuries and fatalities.
- Improve Comfortable Access to Elementary Schools: While elementary schools already have the highest connectivity comfort, this connectivity should be enhanced further. Improving comfortable access to elementary schools will increase the number of students walking to school, reduce busing costs, and make it more comfortable for all pedestrians to travel in school areas.
- Prioritize Safer Crossings to Parks: Improve the comfort of crossings to parks, as parks have less comfortable pedestrian access than recreation centers and libraries (35% vs. 66%).

Goal 3: Enhance Pedestrian Safety

- Reduce High-Speed Pedestrian Crashes: Identify strategies to reduce pedestrian crashes on high-speed roads, given the correlation between vehicle speeds and pedestrian crash severity.
- Address Safety Disparities: Concentrate safety improvements in EFAs, given the overrepresentation of crashes and severe injuries and fatalities in these communities. EFAs comprise only 14% of the county's roadway miles, but they experience 41% of the county's pedestrian crashes and 45% of the county's pedestrian severe injuries and fatalities.
- Improve Lighting: Identify strategies to improve pedestrian visibility in dark conditions (e.g., lighting at intersections and along streets).
- Communicate Permitted Pedestrian Activity: Given the lower understanding of permitted pedestrian behavior, relative to driver behavior, improve education and communication about where and how pedestrians are permitted to travel.

Chapter 5: *Bicycle Master Plan*

The *Bicycle Master Plan* sets forth a transformative vision for transportation in Montgomery County, encouraging people of all ages and bicycling abilities to meet their daily needs by bicycle. The Plan envisions a community where bicycling to work, stores, schools, and transit or going for a leisurely ride on the weekend is so embedded in our way of life that bicycling becomes an integral mode of transportation in the daily lives of the county's residents. The *Bicycle Master Plan* creates a framework for this transformation, with recommendations to build an extensive network of low-stress bikeways connecting the county's downtowns and town centers, transit stations and public facilities, and a plethora of secure and convenient bicycle parking and bicycle-supportive programs and policies.

To ensure transparency and accountability of implementation, the Plan requires the Planning Department to produce a biennial monitoring report to track how well the vision of the Plan is being fulfilled. The report is reviewed by the Planning Board and County Council. This document meets the *2018 Bicycle Master Plan* requirement for a biennial monitoring report and provides recommendations to the Planning Board and County Council for implementing the vision of the plan. It evaluates progress made in advancing the goals and objectives of the Plan as well as recommendations for bikeways and bicycle parking, and bicycle-supportive programs and policies. For the complete Bicycle Monitoring Report, please see Appendix D.

Implementing *Bicycle Master Plan* Recommendations

The *Bicycle Master Plan* recommends a robust network of bikeways and bicycle parking and identifies numerous policy and programmatic recommendations. Highlights in implementing these recommendations over the past two years include:

Bikeways

During the two-year period ending on December 31, 2022:

- 5.3 miles of master-planned bikeways were built, including 3.9 miles of sidepaths and 0.9 miles of separated bike lanes. An additional 5.6 miles of non-master planned bikeways were built during this time (for example, the separated bike lanes on Old Georgetown Road).
- 8.2 miles of new master-planned bikeways were under construction on December 31, 2022, including 4.9 miles of off-street trails (largely the Capital Crescent Trail), 1.9 miles of sidepaths, 0.7 miles of bikeable shoulders and 0.4 miles of separated bike lanes.
- 15.6 miles of master-planned bikeways were funded in the county's capital budget but not yet constructed, including 7.0 miles of sidepaths, 4.6 miles of neighborhood greenways, 3.2 miles of separated bike lanes and 0.5 miles of off-street trails. An additional 5.9 miles of non-master planned bikeways were funded in the county's capital budget.
- 3.9 miles of master-planned bikeways were conditioned in development projects approved by the Montgomery County Planning Board but not yet constructed, including 2.5 miles of sidepaths and 1.2 miles of separated bike lanes. An additional 3.7 miles of non-master planned bikeways were conditioned in development approvals.

Bicycle Parking

Three bicycle parking stations are advancing, including the 460-space station at the Bethesda Purple Line station, which was constructed by the 7272 Wisconsin development project; the 74-space Dixon Lane bicycle parking station in downtown Silver Spring, which was in design at the end of 2020; and the 100+ bicycle parking station at Grosvenor station, which was a condition of approval for a development project.

Programs

The Planning Department's Bikeway Branding project, an effort to create a recognizable brand for Montgomery County's emerging bicycling system, was nearing completion in December 2022.

Polices

The County Council amended the county code to reflect guidance in the Complete Streets Design Guide with the enactment of bills 24-22 and 34-22.

Findings

Metrics help to tell the story of the bicycling network. Salient findings over the past two years include improvements in low-stress connectivity, a reduction in the equitable distribution of low-stress bicycling and slight improvements in the provision of bicycle parking.

Low-Stress Connectivity

Countywide Connectivity is the overall measure of low-stress connectivity and measures the percentage of potential bicycling trips that will be able to be made on a low-stress bicycling network. This metric grew slightly between December 2020 and December 2022 from 15% to 16%. Upon completion of projects that were under construction in December 2022, this will grow to 17% and with the completion of projects in the capital improvements program or development projects approved in 2021 and 2022, countywide connectivity will grow to 20% (Figure 22).

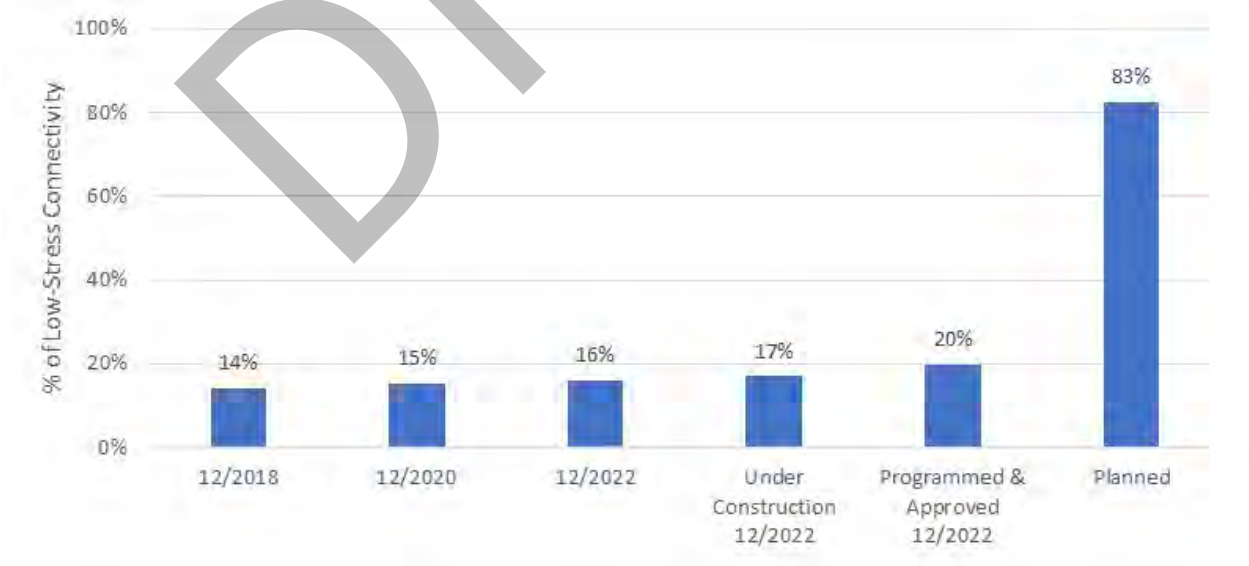


Figure 22: Growth in Countywide Connectivity

Equity

Equitable access to low-stress bicycling has decreased since the *Bicycle Master Plan* was approved. EFAs had 84% of the low-stress connectivity that non-EFAs experience in December 2022, down from 87% in December 2020 and from 89% in December 2018 (Figure 22). When projects that are under construction, funded in the capital improvement program and conditions of development approvals are completed, the metric will improve to 87%. Still more progress is needed to address inequitable access to low-stress bicycling.

Figure 23: Equitable Access to Low-Stress Bicycling

Bicycle Parking at Public Facilities

In 2022, existing bicycle parking that conforms to industry standards provided 8% of the total needed bicycle parking at public schools. While this is an increase from 5% in 2016, substantial improvements are needed to upgrade existing bicycle parking and provide more bicycle parking at public schools.

Recommendations

The monitoring report provides the opportunity to offer recommendations to address some of the challenges that have arisen since the Plan was approved and to provide thoughts on how to proceed over the next few years. While fiscal capacity may limit the county's ability to implement all the recommendations in the next two years, the following recommendations should be considered as implementation of the *Bicycle Master Plan* proceeds:

1. Bikeways: Prioritize construction of the bikeway projects (Table 18) to improve connectivity to downtowns, upgrade the county's temporary neighborhood greenways to permanent neighborhood greenways, and improve access to low-stress bicycling in EFAs. To improve equity, focus on implementing bikeways along the following roads:

   a. Montgomery Village Avenue, providing synergies with the coming redevelopment of Lakeforest Mall.
   b. Castle Boulevard, connecting to existing bikeways on Briggs Chaney Road.
   c. Tech Road/Broadbirch Drive, providing connections to the US 29 FLASH station, Adventist Hospital, and the future VIVA White Oak development.
2. Bicycle Parking at Public Schools: To improve bicycle parking:
   a. Over the next two years, prioritize funding to upgrade bicycle parking at the following schools: Dr. Ronald A. McNair ES, Glenallan ES, Bells Mill ES, Poolesville ES, Sligo Creek ES, Olney ES, Thomas W. Pyle MS, Silver Spring International MS, North Bethesda MS, Rosa M. Parks MS, Westland MS, Bethesda-Chevy Chase HS, Quince Orchard HS, Walt Whitman HS, and Walter Johnson HS.
   b. Over the next six years, prioritize funding to upgrade bicycle parking at the following Title I/Focus schools and schools with high FARM rates: Rolling Terrace ES, Stedwick ES, South Lake ES, Arcola ES, Roberto W. Clemente MS, Forest Oak MS, Eastern MS, White Oak MS, Sligo MS, and Gaithersburg HS.
   c. Provide Montgomery County Public Schools (MCPS) with an annual funding program for installing bicycle parking.
   d. MCPS should develop bike rack standards that correspond with standards identified in Montgomery County's zoning code.
3. Bicycle Parking Stations: Fund a bicycle parking station at the Glenmont Metrorail station to expand the reach of transit and develop the organizational capacity to operate bicycle parking stations, including those at the Bethesda Purple Line station and the Silver Spring Transit Center, which are already funded.
4. Design Standards: Develop comprehensive design standards for bicycle facilities.
5. Travel Survey: Fund and conduct a biennial travel monitoring survey in support of the *Bicycle Master Plan* and forthcoming *Pedestrian Master Plan* to measure travel behavior and attitudes about walking and bicycling.

Table 18: High-Priority Bicycle Projects

Policy Area	Street	From	To	Bikeway Type
Bethesda CBD	Arlington Rd	Old Georgetown Rd	Bradley Blvd	Separated Bike Lanes
Bethesda CBD	Edgemoor La	Arlington Rd	Bethesda Metro Station	Separated Bike Lanes
Bethesda CBD	Woodmont Ave	Battery Ln	Old Georgetown Rd	Separated Bike Lanes
Bethesda CBD	Woodmont Ave	Strathmore Ave	Wisconsin Ave	Separated Bike Lanes
Fairland / Colesville	Castle Blvd	Castle Ridge Cir	Briggs Chaney Rd	Separated Bike Lanes

Policy Area	Street	From	To	Bikeway Type
Friendship Heights	Friendship Blvd	Willard Ave	District of Columbia	Separated Bike Lanes
Germantown East	MD 355 (West Side)	Germantown Rd	Shakespeare Blvd	Sidepath
Germantown Town Center, Germantown West	Wisteria Dr	Father Hurley Blvd	Great Seneca Hwy	Sidepath or Separated Bike Lanes
Kensington / Wheaton, Glenmont	Holdridge Rd	Matthew Henson Trail	Georgia Ave	Neighborhood Greenway
Montgomery Village	Lost Knife Rd	City of Gaithersburg	Odendhal Ave	Separated Bike Lanes
Montgomery Village	Montgomery Village Ave (East Side)	Stewartown Rd	City of Gaithersburg	Sidepath
North Bethesda	Old Georgetown Rd (MD 187)	Towne Rd	Tuckerman Ln	Breezeway
Silver Spring	13th St / Burlington Ave	District of Columbia	Fenton St	Separated Bike Lanes
Silver Spring / Takoma Park	Woodland Dr	Columbia Blvd	Spring St	Neighborhood Greenway
Wheaton CBD	Grandview Ave	Blueridge Ave	Reedie Dr	Separated Bike Lanes
White Flint	Marinelli Rd	Executive Blvd	Woodglen Dr	Separated Bike Lanes
White Oak	Broadbirch Dr	Tech Rd	Cherry Hill Rd	Separated Bike Lanes
White Oak	Cherry Hill Rd	Columbia Pike	Prince George's County	Separated Bike Lanes
White Oak	Old Columbia Pike	Tech Rd	White Oak Shopping Ctr	Sidepath
White Oak	Tech Rd	Columbia Pike	Industrial Pkwy	Separated Bike Lanes

Appendix A: Bus Ridership

Table 19: Metrobus Average Weekday Daily Riders by Route and Fiscal Year

Route	2015	2016	2017	2018	2019	2020	2021	2022
C2	4,373	4,023	3,886	3,528	3,244	2,547	1,008	2,152
C4	6,704	6,279	5,841	5,353	4,966	3,638	1,736	2,985
C8	2,388	2,358	2,285	2,043	2,132	2,050	196	911
F4	6,978	6,551	6,108	5,471	5,004	3,723	1,538	2,946
J1	798	697	695	651	654	621	111	276
J2	4,366	4,174	3,625	3,366	4,080	3,076	1,020	2,228
K6	5,973	5,745	5,632	5,293	4,994	3,594	1,907	3,128
K9	1,125	1,231	1,280	1,173	1,069	1,112	23	308
L8	2,420	2,268	2,155	2,089	1,893	1,792	456	796
Q1	327	278	232	236	219	218	163	117
Q2	1,556	1,414	1,232	1,059	963	912	240	393
Q4	3,369	2,984	2,883	2,682	2,476	1,771	580	1,167
Q5	179	204	187	171	156	135	164	79
Q6	3,007	2,667	2,440	2,122	2,032	2,044	447	954
T2	1,674	1,548	1,396	1,181	1,061	1,037	216	446
Y2	1,770	2,290	2,256	2,013	1,927	1,412	557	1,079
Y7	2,972	3,131	3,030	2,940	2,583	2,462	862	1,318
Y8	3,666	2,356	2,138	1,849	1,725	1,363	646	1,125
Z2	1,005	934	873	790	676	662	85	168
Z6	2,556	2,541	2,627	2,504	2,350	2,038	416	1,005
Z7	N/A	557	554	527	426	418	94	183
Z8	3,082	2,994	3,559	2,885	2,464	1,897	560	989

Table 20: Ride-On Average Daily Riders by Route and Fiscal Year

Route	Route Description	2015	2017	2019	2021
1	Silver Spring-Leland St.-Friendship Heights	2,460	1,910	1,558	522
2	Lyttonsville-Silver Spring	910	883	727	323
4	Wheaton-Kensington-Silver Spring	239	210	234	38
5	Twinbrook-Kensington-Silver Spring	1,970	2,008	1,990	714
6	Grosvenor-Parkside-Montgomery Mall Loop	253	255	206	67
7	Forest Glen-Wheaton	58	73	72	12
8	Wheaton-Forest Glen-Silver Spring	668	607	722	242
9	Wheaton-Four Corners-Silver Spring	1,174	1,186	1,203	560
10	Twinbrook-Glenmont-White Oak-Hillandale	2,191	2,399	2,131	1,277
11	Silver Spring-East/West Hwy-Friendship Heights	808	823	764	195
12	Takoma-Flower Ave.-Wayne Ave.-Silver Spring	1,760	1,517	1,451	460
13	Takoma-Manchester Rd.-Three Oaks Dr.-Silver Spring	302	298	285	146
14	Takoma-Piney Branch Road-Franklin Ave.-Silver Spring	802	719	678	112
15	Langley Park-Wayne Ave.-Silver Spring	3,555	3,294	3,052	1,868
16	Takoma-Langley Park-Silver Spring	3,410	3,222	3,091	1,783
17	Langley Park-Maple Ave.-Silver Spring	1,313	1,191	1,103	544
18	Langley Park-Takoma-Silver Spring	739	713	635	188
19	Northwood-Four Corners-Silver Spring	172	137	159	19
20	Hillandale-Northwest Park-Silver Spring	3,182	2,846	2,827	1,148
21	Briggs Chaney-Tamarack-Dumont Oaks-Silver Spring	207	247	246	65
22	Hillandale-White Oak-FDA-Silver Spring	423	397	588	74
23	Tech Rd.-Washington Adventist Hospital-Hillandale	684	600	546	150
24	Hillandale-Northwest Park-Takoma	318	243	314	68
25	Langley Park-Washington Adventist Hospital-Maple Ave.-Takoma	453	499	468	43
26	Glenmont-Aspen Hill-Twinbrook-Montgomery Mall	3,124	2,877	2,668	1,421
28	Silver Spring Downtown (VanGo)	751	598	635	196

Route	Route Description	2015	2017	2019	2021
29	Bethesda-Glen Echo-Friendship Heights	699	696	645	152
30	Medical Center-Pooks Hill-Bethesda	641	636	577	82
31	Glenmont-Kemp Mill Rd.-Wheaton	150	101	111	29
32	Naval Ship R&D-Cabin John-Bethesda	227	254	262	52
33	Glenmont-Kensington-Medical Center	345	340	383	82
34	Aspen Hill-Wheaton-Bethesda-Friendship Heights	2,790	2,484	2,512	1,101
36	Potomac-Bradley Blvd.-Bethesda	369	521	418	60
37	Potomac-Tuckerman La.-Grosvenor-Wheaton	295	240	233	42
38	Wheaton-North Bethesda	783	805	877	308
39	Briggs Chaney-Glenmont	226	331	333	117
41	Aspen Hill-Weller Rd.-Glenmont	744	772	757	181
42	North Bethesda-Montgomery Mall	535	371	374	92
43	Traville TC-Shady Grove Hospital-Shady Grove	814	757	903	332
44	Twinbrook-Hungerford-Rockville	125	105	126	41
45	Fallsgrove-Rockville Senior Center-Rockville-Twinbrook	959	974	957	244
46	Montgomery College-Rockville Pike-Medical Center	3,812	3,381	3,070	1,313
47	Rockville-Montgomery Mall-Bethesda	1,578	1,436	1,417	484
48	Wheaton-Bauer Dr.-Rockville	2,283	2,046	2,072	953
49	Glenmont-Layhill-Rockville	2,235	2,273	2,219	826
51	Norbeck P&R-Hewitt Ave.-Glenmont	241	257	255	56
52	MedStar Montgomery-Olney-Rockville	153	169	156	39
53	Shady Grove-MGH-Olney-Glenmont	296	325	267	75
54	Lakeforest-Washingtonian Blvd-Rockville	2,084	1,886	1,642	806
55	GTC-Milestone-MC,G-Lakeforest-Shady Grove-MC,R-Rockville	8,091	7,748	7,231	3,217
56	Lakeforest-Quince Orchard-Shady Grove Hospital-Rockville	2,110	2,149	1,897	816
57	Lakeforest-Washington Grove-Shady Grove	2,291	2,008	1,798	705
58	Lakeforest-Montgomery Village-East Village-Shady Grove	1,754	1,339	1,363	473
59	Montgomery Village-Lakeforest-Shady Grove-Rockville	3,938	3,682	3,250	1,353
60	Montgomery Village-Flower Hill-Shady Grove	348	275	335	58

Route	Route Description	2015	2017	2019	2021
61	GTC-Lakeforest-Watkins Mill-Shady Grove	2,937	2,595	2,423	1,129
63	Shady Grove-Gaither Road-Piccard Dr.-Rockville	621	710	662	167
64	Montgomery Village-Quail Valley-Emory Grove-Shady Grove	1,321	1,365	1,260	511
65	Montgomery Village-Shady Grove	220	189	196	25
66	Shady Grove-Piccard Drive-Shady Grove Hospital-Traville TC	113	191	174	57
67	Traville TC-North Potomac-Shady Grove	142	118	111	32
70	Milestone-Medical Center-Bethesda Express	737	630	636	232
71	Kingsview-Dawson Farm-Shady Grove	332	371	306	54
73	Clarksburg-Old Baltimore-Shady Grove	N/A	N/A	N/A	56
74	GTC-Great Seneca Hwy.-Shady Grove	1,017	1,046	1,051	477
75	Clarksburg-Correctional Facility-Milestone-GTC	439	479	484	327
76	Poolesville-Kentlands-Shady Grove	883	737	818	130
78	Kingsview-Richter Farm-Shady Grove	394	237	265	115
79	Clarksburg-Skylark-Scenery-Shady Grove	228	376	458	50
81	Rockville-Tower Oaks-North Bethesda	196	157	153	23
83	Germantown MARC-GTC-Waters Landing-Milestone-Holy Cross	495	516	604	108
90	Milestone-Damascus-Woodfield Rd.-Airpark Shady Grove	902	886	755	309
96	Montgomery Mall-Rock Spring-Grosvenor	599	438	452	57
97	GTC-Germantown MARC-Waring Station-GTC	644	658	581	358
98	GTC-Kingsview-GCC-Cinnamon Woods	444	449	413	147
100	GTC-Shady Grove	2,340	2,215	2,266	623
101	EXTRA-Lakeforest-Medical Center	N/A	N/A	N/A	481
301	Tobytown-Rockville	N/A	N/A	N/A	57
Flash	US29 BRT	N/A	N/A	N/A	1,687

Appendix B: Thrive Montgomery 2050 Metrics

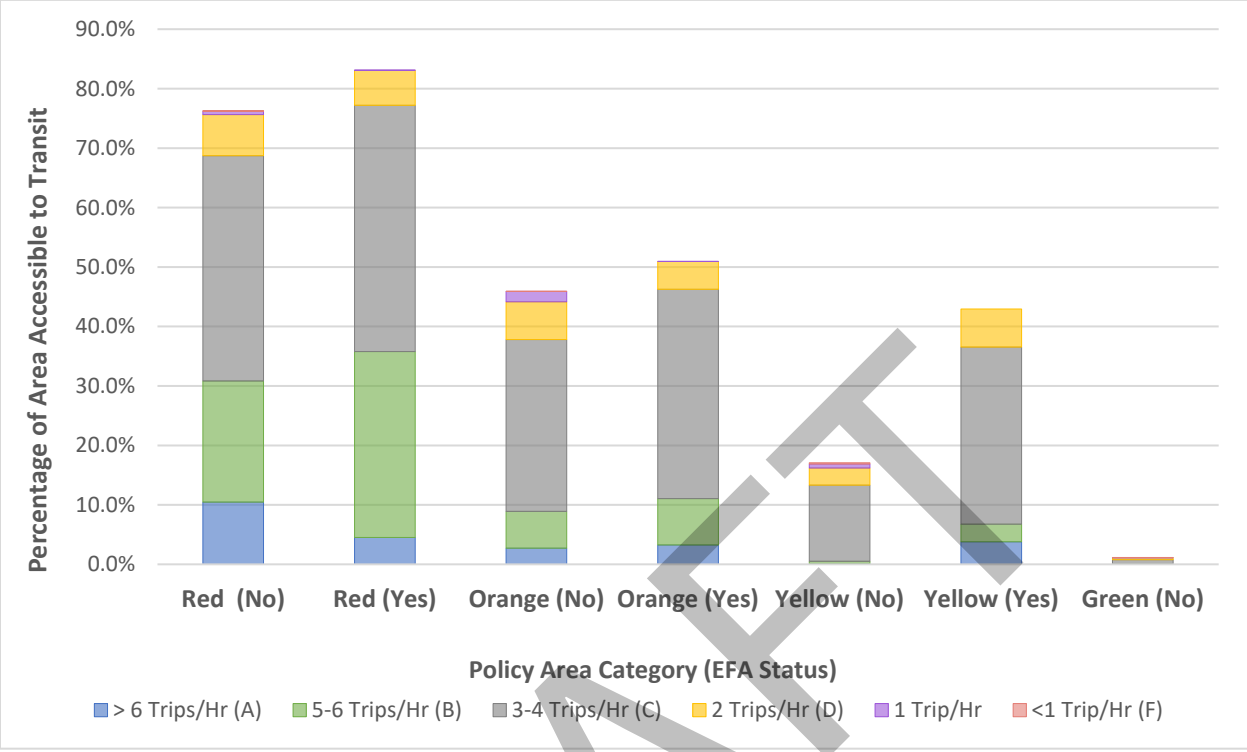


Figure 24: Transit Coverage Summarized by Policy Area and Equity Focus Area (EFA) Designation (Midday)

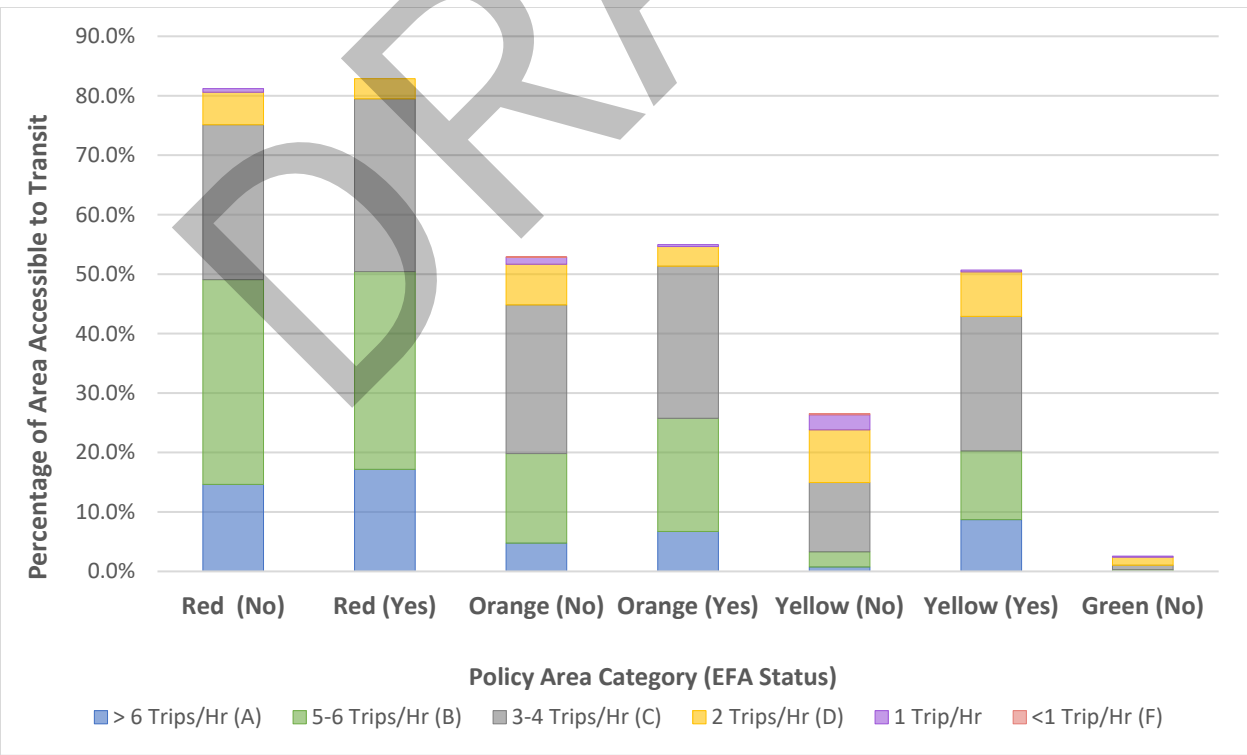


Figure 25: Transit Coverage Summarized by Policy Area and Equity Focus Area (EFA) Designation (PM Peak)

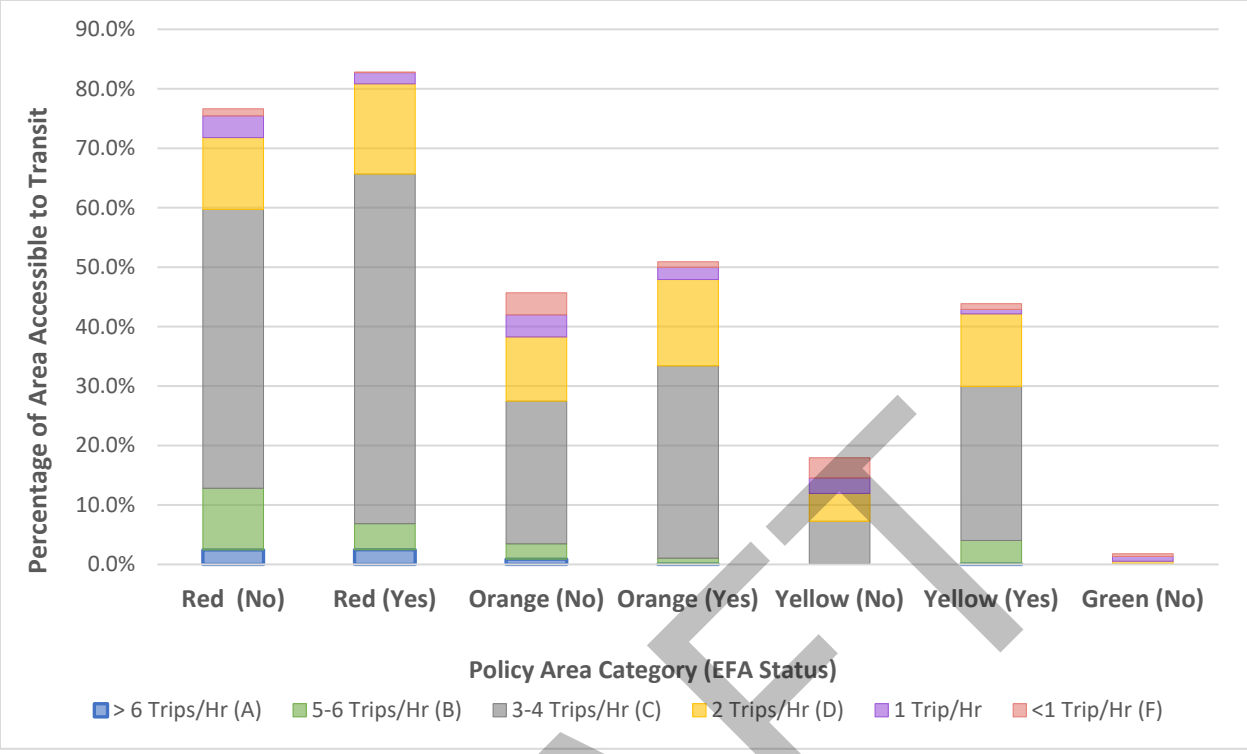


Figure 26: Transit Coverage Summarized by Policy Area and Equity Focus Area (EFA) Designation (Evening)

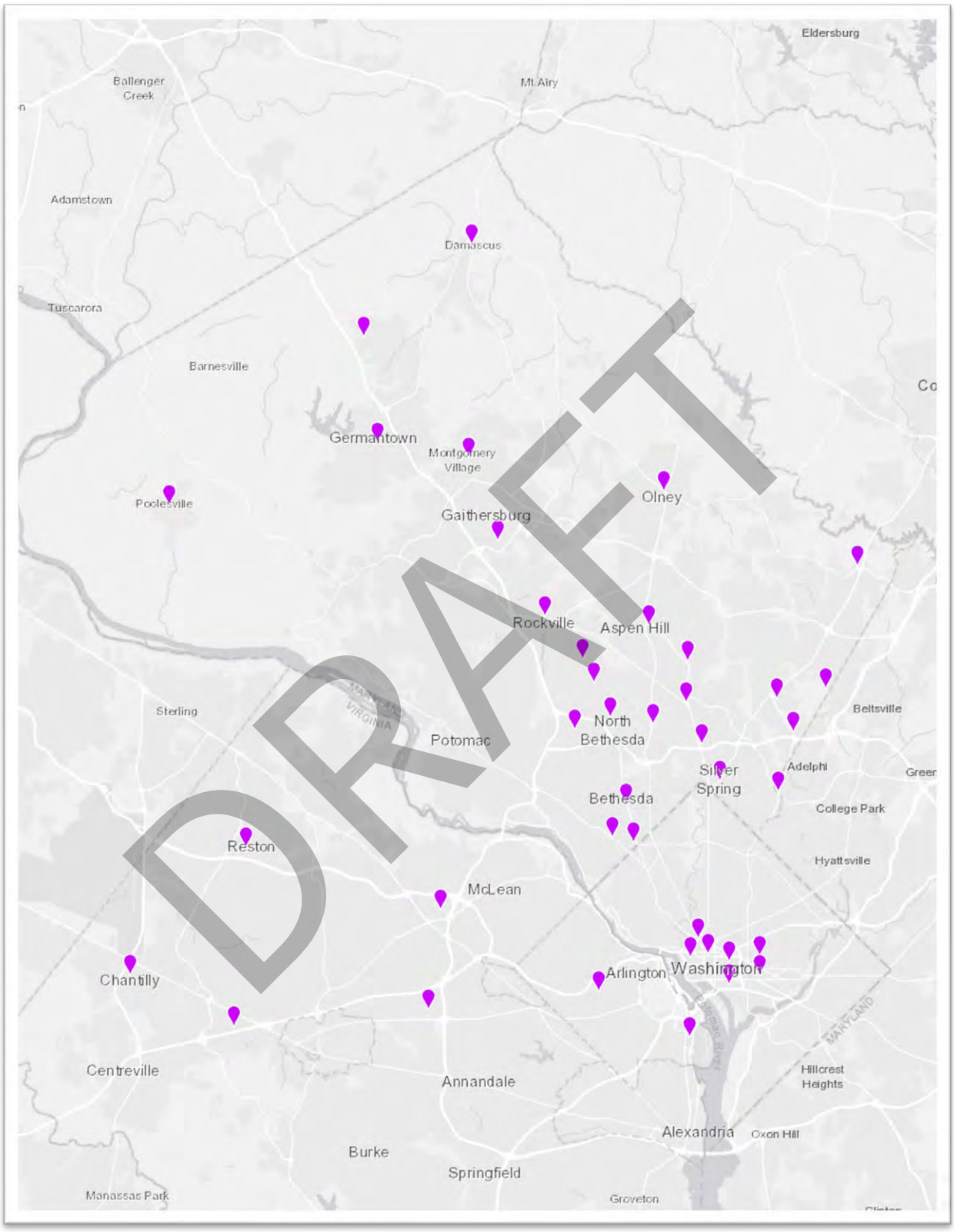


Figure 27: Map of Activity Centers Used in the Transit vs. Auto Travel Time Analysis

Table 21: Table of Activity Centers Used in the Transit vs. Auto Travel Time Analysis

Activity Center Name	Jurisdiction
Ballston	Arlington County, VA
Capitol Hill	Washington, DC
Crystal City	Arlington County, VA
Downtown DC	Washington, DC
Dulles South	Fairfax County, VA
Dunn Loring-Merrifield	Fairfax County, VA
Dupont	Washington, DC
Fairfax Center	Fairfax County, VA
Farragut Square	Washington, DC
Monumental Core	Washington, DC
NoMa	Washington, DC
Reston Town Center	Fairfax County, VA
Tysons Central 123	Fairfax County, VA
West End	Washington, DC
Bethesda	Montgomery County
Friendship Heights	Montgomery County
Gaithersburg / Shady Grove	Montgomery County
Glenmont	Montgomery County
Rockville	Montgomery County
Silver Spring	Montgomery County
VIVA White Oak / FDA	Montgomery County
Wheaton	Montgomery County
White Flint	Montgomery County
Burtonsville	Montgomery County
Clarksburg	Montgomery County
Germantown	Montgomery County
Grosvenor/Strathmore	Montgomery County
Olney	Montgomery County
Rock Spring	Montgomery County
Takoma/Langley	Montgomery County
Twinbrook	Montgomery County
White Oak	Montgomery County
Aspen Hill	Montgomery County
Damascus	Montgomery County
Forest Glen	Montgomery County
Hillandale	Montgomery County
Kensington	Montgomery County
Montgomery Village	Montgomery County
Poolesville	Montgomery County
Westbard	Montgomery County

Table 22: Grid Completeness Ratio for All Analyzed Complete Streets Design Guide (CSDG) Areas

CSDG Area Name	Area Type	Desired Blocks	Actual Blocks	Ratio
Takoma Junction Town Center	Town Center	1	2	200%
Montgomery Hills Town Center	Town Center	5	9	180%
Takoma Old Town Town Center	Town Center	3	4	133%
Maryland Gateway Town Center	Town Center	2	2	100%
Four Corners Town Center	Town Center	5	5	100%
Kensington Town Center	Town Center	29	21	72%
Downtown Bethesda	Downtown	111	64	58%
Downtown Silver Spring	Downtown	110	55	50%
Ethan Allen Avenue Gateway Town Center	Town Center	2	1	50%
Park Potomac Town Center	Town Center	10	5	50%
Forest Glen Town Center	Town Center	14	7	50%
Downtown Wheaton	Downtown	66	30	45%
Long Branch Town Center	Town Center	23	10	43%
Grosvenor Town Center	Town Center	7	3	43%
Redland Town Center	Town Center	10	4	40%
Veirs Mill - Randolph Town Center	Town Center	10	4	40%
Olney Town Center	Town Center	25	10	40%
Rock Creek Village Town Center	Town Center	13	5	38%
Cabin Branch Town Center	Town Center	111	40	36%
Takoma Langley Crossroads Town Center	Town Center	14	5	36%
Clarksburg Town Center	Town Center	130	45	35%
Chevy Chase Lake Town Center	Town Center	15	5	33%
Shady Grove Town Center	Town Center	82	25	30%
Colesville Town Center	Town Center	7	2	29%
Hyattstown Town Center	Town Center	7	2	29%
Germantown Town Center	Town Center	159	45	28%
Downtown Friendship Heights	Downtown	30	8	27%
Randolph Hills Town Center	Town Center	23	6	26%
Twinbrook Town Center	Town Center	42	10	24%
Traville / USG Town Center	Town Center	49	10	20%
Cloverly Town Center	Town Center	5	1	20%
16th Street Station Town Center	Town Center	15	3	20%
Damascus Town Center	Town Center	45	9	20%
Washingtonian Town Center	Town Center	10	2	20%
Downtown White Flint	Downtown	199	39	20%
Layhill Town Center	Town Center	16	3	19%
Glenmont Town Center	Town Center	35	6	17%
White Oak Town Center	Town Center	53	9	17%
Potomac Town Center	Town Center	6	1	17%
Lyttonsville Town Center	Town Center	12	2	17%
Montgomery Village Town Center	Town Center	13	2	15%

CSDG Area Name	Area Type	Desired Blocks	Actual Blocks	Ratio
Foxchapel Town Center	Town Center	16	2	13%
Lower Village Town Center	Town Center	37	3	8%
Milestone Town Center	Town Center	74	6	8%
Downtown Life Sciences Center	Downtown	194	11	6%
Aspen Hill Town Center	Town Center	22	1	5%
Burtonsville Town Center	Town Center	22	1	5%
Westbard Town Center	Town Center	33	1	3%
Downtown Rock Spring	Downtown	132	3	2%
Downtown Life Sciences / FDA Village	Downtown	215	4	2%
Ashton Town Center	Town Center	9	0	0%
Briggs Chaney Town Center	Town Center	5	0	0%
Burnt Mills Town Center	Town Center	4	0	0%
Hillandale Town Center	Town Center	18	0	0%
Sandy Spring Town Center	Town Center	11	0	0%

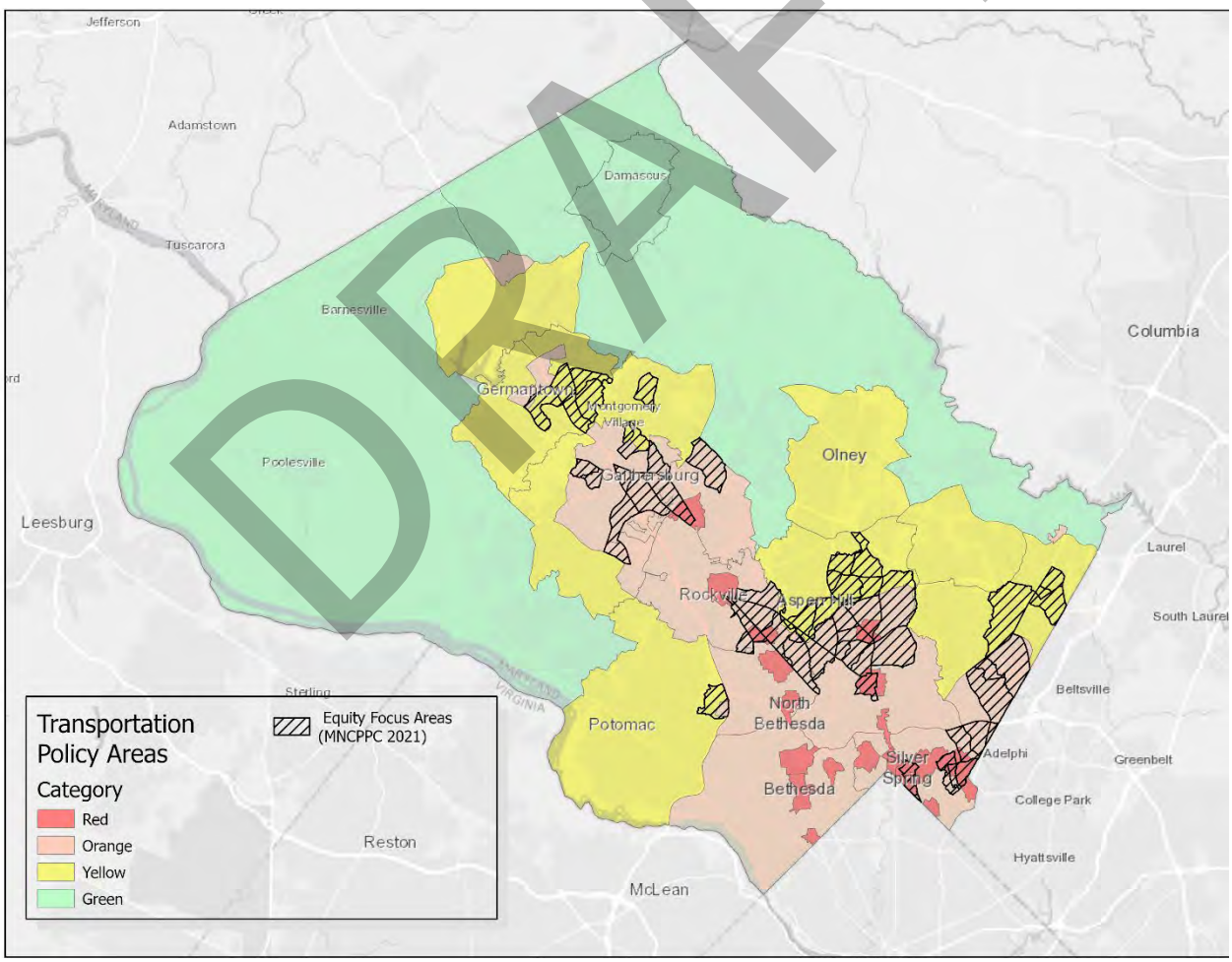


Figure 28: Map of Transportation Policy Areas and Equity Focus Areas

Table 23: Complete List of Protected Crossing Spacing (feet) Along Thrive's Growth Corridors

Growth Corridor / CSDG Area	Average Spacing (feet)			Ratio		
	Target	Existing	Future	Existing	Future	Change
Connecticut Avenue Growth Corridor	**1,050**	**1,550**	**1,550**	**1.5**	**1.5**	**0.0**
Aspen Hill Town Center	600	1,350	1,350	2.3	2.3	0.0
Chevy Chase Lake Town Center	600	1,000	1,000	1.7	1.7	0.0
Kensington Town Center	600	700	700	1.2	1.2	0.0
Suburban	1,300	1,800	1,800	1.4	1.4	0.0
Georgia Avenue Growth Corridor	**750**	**1,300**	**1,250**	**1.7**	**1.7**	**0.1**
Aspen Hill Town Center	600	1,350	1,350	2.3	2.3	0.0
Downtown Silver Spring	400	550	550	1.4	1.4	0.0
Downtown Wheaton	400	1,050	1,050	2.6	2.6	0.0
Forest Glen Town Center	600	1,300	1,300	2.2	2.2	0.0
Glenmont Town Center	600	1,000	1,000	1.7	1.7	0.0
Montgomery Hills Town Center	600	750	550	1.3	0.9	0.3
Olney Town Center	600	1,250	1,250	2.1	2.1	0.0
Suburban	1,300	1,950	1,950	1.5	1.5	0.0
MD 355 Growth Corridor	**750**	**1,150**	**1,150**	**1.5**	**1.5**	**0.0**
Clarksburg Town Center	600	1,300	1,300	2.2	2.2	0.0
Downtown Bethesda	400	450	400	1.1	1.0	0.1
Downtown Friendship Heights	400	450	450	1.1	1.1	0.0
Downtown White Flint	400	700	700	1.8	1.8	0.0
Foxchapel Town Center	600	2,500	2,500	4.2	4.2	0.0
Industrial	800	900	900	1.1	1.1	0.0
Milestone Town Center	600	750	750	1.3	1.3	0.0
Suburban	1,300	1,900	1,900	1.5	1.5	0.0
New Hampshire Avenue Growth Corridor	**900**	**1,300**	**1,300**	**1.4**	**1.4**	**0.0**
Colesville Town Center	600	700	700	1.2	1.2	0.0
Ethan Allen Avenue Gateway Town Center	600	1,050	1,050	1.8	1.8	0.0
Hillandale Town Center	600	1,400	1,400	2.3	2.3	0.0
Suburban	1,300	1,750	1,750	1.3	1.3	0.0
Takoma Langley Crossroads Town Center	600	650	650	1.1	1.1	0.0
White Oak Town Center	600	900	900	1.5	1.5	0.0
Old Georgetown Road Growth Corridor	**650**	**1,150**	**1,100**	**1.8**	**1.7**	**0.1**
Downtown Rock Spring	400	950	950	2.4	2.4	0.0
Downtown White Flint	400	850	850	2.1	2.1	0.0
Suburban	1,300	1,400	1,250	1.1	1.0	0.1
Randolph Road Growth Corridor	**900**	**1,550**	**1,500**	**1.7**	**1.7**	**0.1**
Colesville Town Center	600	2,600	2,600	4.3	4.3	0.0
Downtown White Flint	400	550	550	1.4	1.4	0.0
Glenmont Town Center	600	1,200	1,200	2.0	2.0	0.0

Growth Corridor / CSDG Area	Average Spacing (feet)			Ratio		
	Target	Existing	Future	Existing	Future	Change
Randolph Hills Town Center	600	1,150	1,150	1.9	1.9	0.0
Suburban	1,300	1,850	1,750	1.4	1.3	0.1
Veirs Mill - Randolph Town Center	600	950	950	1.6	1.6	0.0
River Road Growth Corridor	**1,200**	**1,800**	**1,800**	**1.5**	**1.5**	**0.0**
Suburban	1,300	1,950	1,950	1.5	1.5	0.0
Westbard Town Center	600	900	900	1.5	1.5	0.0
University Boulevard Growth Corridor	**800**	**1,200**	**1,100**	**1.5**	**1.4**	**0.1**
Downtown Wheaton	400	650	650	1.6	1.6	0.0
Four Corners Town Center	600	800	800	1.3	1.3	0.0
Kensington Town Center	600	2,400	2,400	4.0	4.0	0.0
Long Branch Town Center	600	1,400	950	2.3	1.6	0.8
Suburban	1,300	1,500	1,500	1.2	1.2	0.0
Takoma Langley Crossroads Town Center	600	600	450	1.0	0.8	0.3
US 29 Growth Corridor	**1,050**	**1,500**	**1,400**	**1.4**	**1.3**	**0.1**
Burnt Mills Town Center	600	1,200	600	2.0	1.0	1.0
Downtown Silver Spring	400	550	550	1.4	1.4	0.0
Four Corners Town Center	600	900	650	1.5	1.1	0.4
Suburban	1,300	2,000	2,000	1.5	1.5	0.0
Veirs Mill Road Growth Corridor	**800**	**1,350**	**1,000**	**1.7**	**1.3**	**0.4**
Downtown Wheaton	400	600	600	1.5	1.5	0.0
Suburban	1,300	1,500	1,150	1.2	0.9	0.3
Veirs Mill - Randolph Town Center	600	1,700	950	2.8	1.6	1.3

= Areas where the measured to actual protected crossing spacing ratio exceeds 3.0

= Areas where the measured to actual protected crossing spacing ratio is between 2.0 and 3.0

Appendix C: Pedestrian Existing Conditions

The Planning Board Draft of the Pedestrian Master Plan establishes an ambitious vision for future pedestrian conditions in the county, supported by four goals and 20 objectives. But what does the pedestrian experience look like today? The draft plan provides an in-depth look at the state of walking in Montgomery County in 2019 and 2020 based on the plan's goals and objectives.

In addition to various national and regional data sources, the analysis includes several data sources developed specifically for this planning effort, including:

- A statistically valid pedestrian survey to document pedestrian activity for the county as a whole and for different land use types, sent to 60,000 randomly selected households countywide
- A student travel tally to understand how students arrive to and depart from school on a daily basis, completed by over 70,000 Montgomery County Public School (MCPS) students
- A Pedestrian Level of Comfort (PLOC) analysis cataloguing pedestrian conditions along the entirety of the pedestrian transportation network in Montgomery County
- A pedestrian crash analysis to understand the circumstances surrounding pedestrian-involved crashes occurring between 2015 and 2020

In addition to analyzing existing conditions at the countywide level, this section also identifies more specific distinctions based on land use and equity.

Land use is categorized as urban, transit corridor, or exurban/rural. These are defined below and illustrated in Figure 29.

Urban areas include the county's downtowns and town centers, as well as their immediate surroundings. Downtowns are envisioned as Montgomery County's highest-intensity areas with dense, transit-oriented development and a walkable street grid. Town centers are similar to downtowns but generally feature less intensive development and cover a smaller geographic area.

Transit corridors are more suburban and include areas within a half-mile of Washington Metropolitan Area Transit Authority and MCDOT RideOn transit services arriving at least every 20 minutes during the busiest time of day.

The remainder of the county, apart from the cities of Rockville and Gaithersburg (shown in dark brown in Figure 29), is defined as **exurban/rural**.[17]

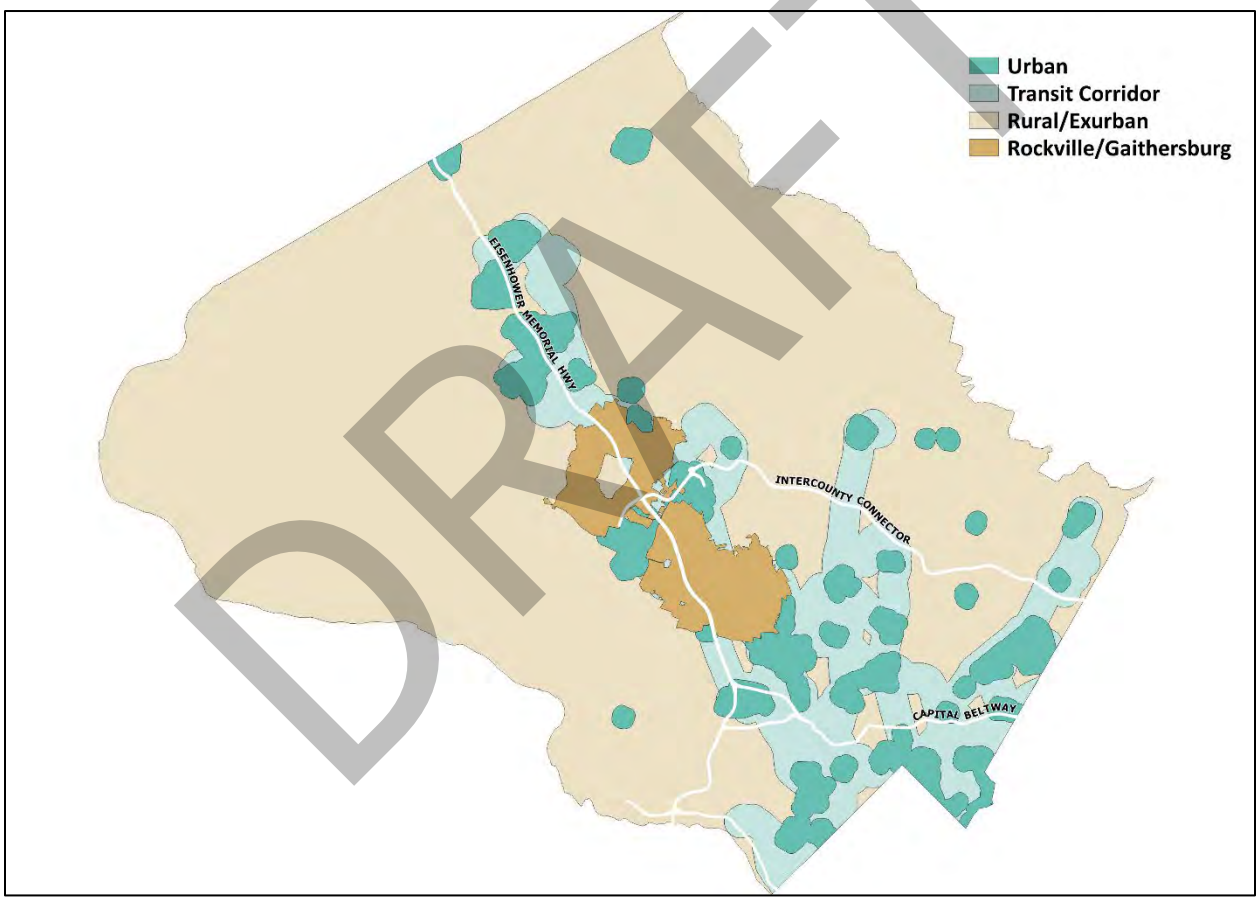


Figure 29: Land Use Area Types

[17] Rockville and Gaithersburg have been excluded from the analysis except where noted, as Montgomery Planning does not have planning authority in these jurisdictions.

Equity

Equity is typically analyzed by comparing Equity Focus Areas (EFAs)[18] with the rest of the county on several metrics (Figure 30) to highlight any disparities that may exist. Additionally, for school access measures, high Free and Reduced Meal Services (FARMS) rates and Title I/Focus School status are used to make equity comparisons (Figure 31). Lastly, some of the results from the countywide pedestrian survey are broken out based on reported disability status. Because equity is a foundational goal of the draft plan, equity analyses are highlighted in blue throughout this section.

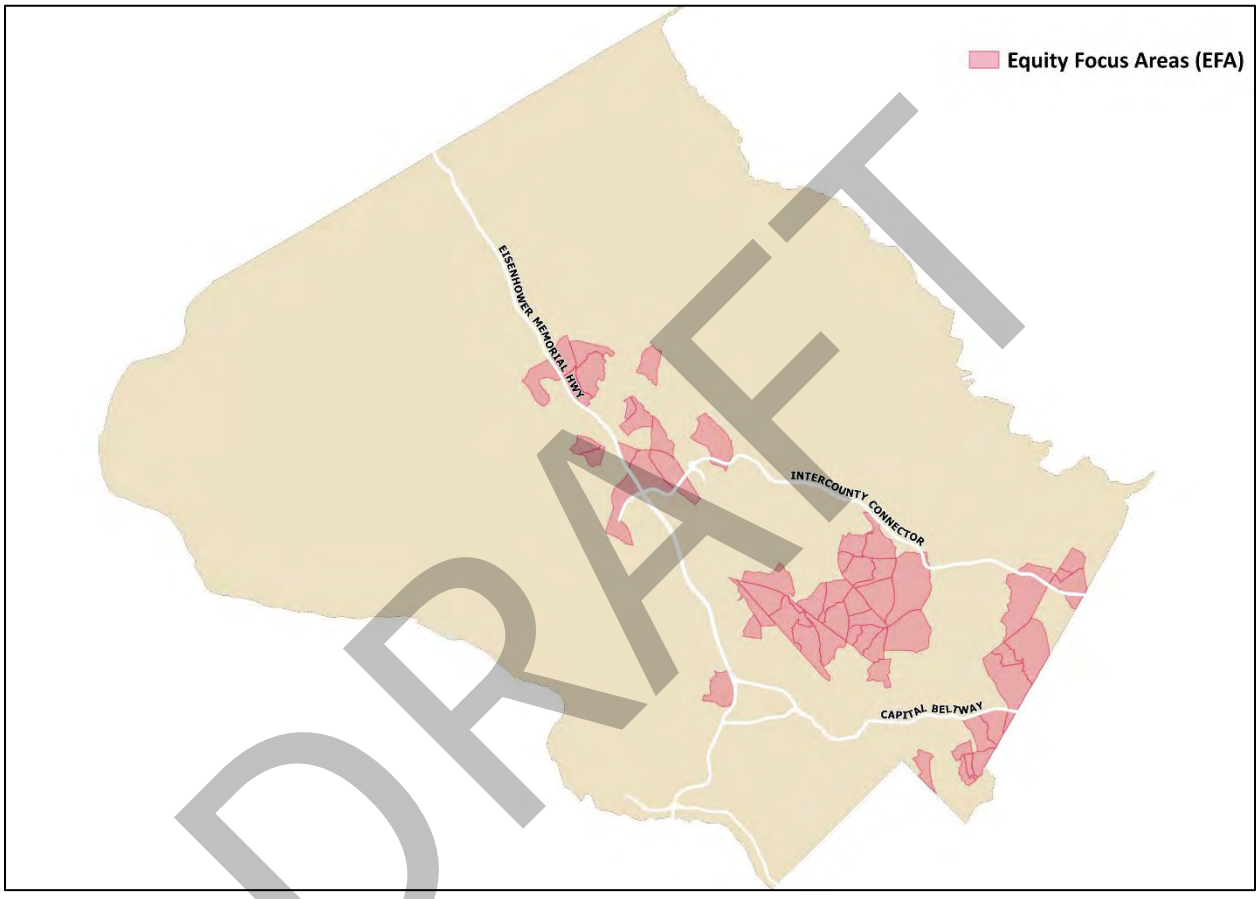


Figure 30: Equity Focus Areas (2021)

[18] Equity Focus Areas (EFAs) are parts of Montgomery County that are characterized by high concentrations of lower-income people of color who may also report speaking English less than "very well." About 26% of the county's population live in EFAs.

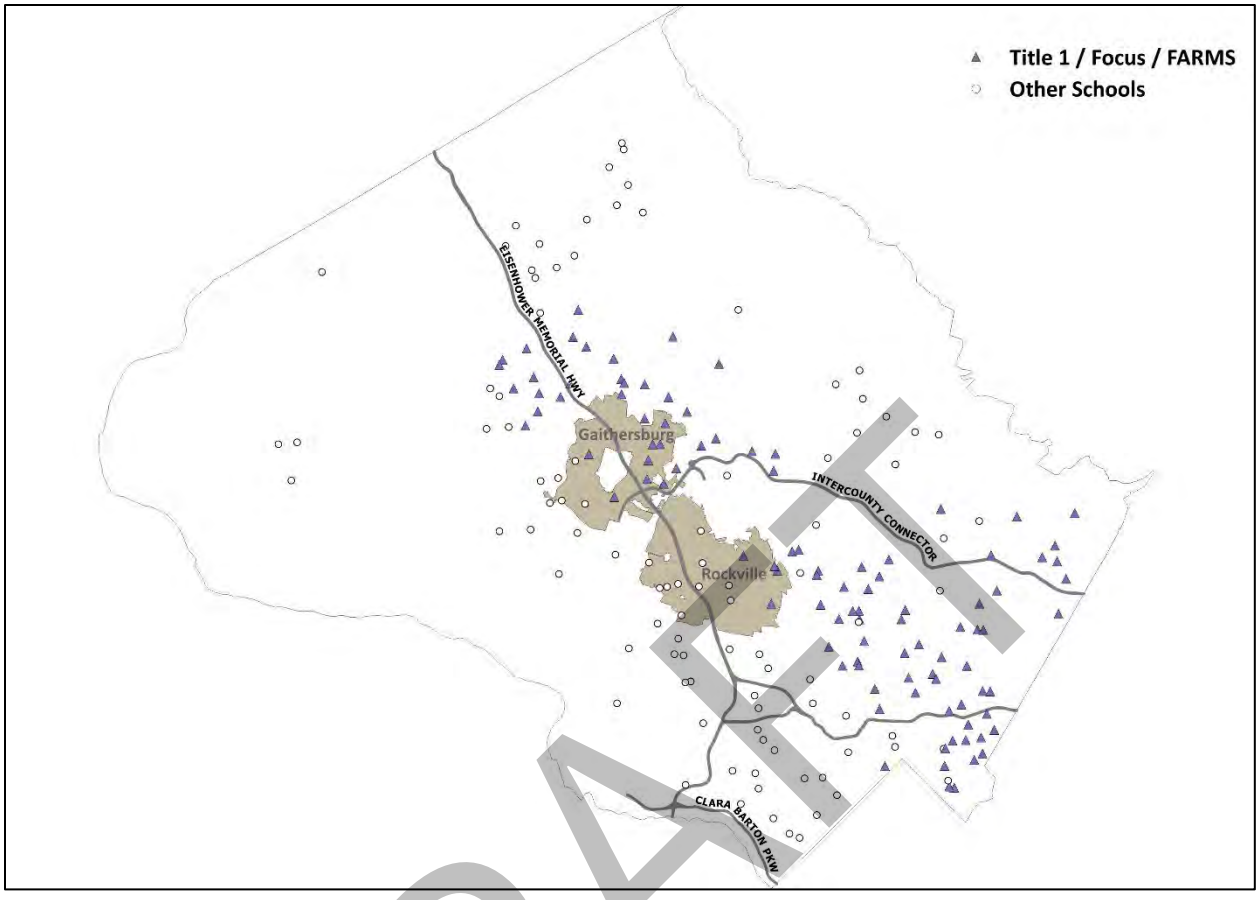


Figure 31: Title I, Focus, and High FARMS Schools

Existing Conditions Findings

The existing conditions analysis is organized around the draft Pedestrian Master Plan goals described in the previous section.

Walking Rates and Satisfaction

The draft Pedestrian Master Plan aims to increase the number of trips made by walking and rolling (using a mobility device). The following is a summary of current pedestrian behavior, including what portion of trips residents—and students, specifically—make by walking, for what purposes residents walk, and resident satisfaction with the pedestrian environment.

Mode Share

The Countywide Pedestrian Survey found that 98% of respondents had taken at least one pedestrian trip in the past month.

Overall, 7.5% of weekday trips are made by walking (Table 24) and 2.2% of commute trips are made by walking in Montgomery County. Walking rates vary greatly by land use type, with a greater share of trips made by walking in urban areas (11.3%) compared with transit corridors (7.3%) and exurban/rural areas (4.6%). In addition, residents in urban areas make up a greater share of commute trips by walking (3.7%) than those in transit corridors (1.8%) or exurban/rural areas (1.1%).

Walking rates also vary depending on whether an area is an EFA. Residents in EFAs make 9.6% of trips by walking, while residents in non-EFAs make 7.0% of trips by walking. The share of commute trips by walking is only slightly greater in EFAs (2.4%) than in non-EFAs (2.1%).

Table 24. Pedestrian Mode Share by Area Types

	Total	Land Use Type			Equity Focus Areas	
		Urban	Transit Corridor	Exurban/ Rural	EFAs	Non-EFAs
Overall Weekday Trips*	**7.5%**	11.3%	7.3%	4.6%	9.6%	7.0%
Commute Trips**	**1.8%**	3.2%	1.5%	1.0%	1.9%	1.8%

* Regional Travel Survey, 2017-2018
** American Community Survey, 2021 Five-Year Estimates
Note: County mode share (the percentage of trips made by different travel modes) includes Rockville and Gaithersburg.

While the county's pedestrian commuter mode share is low, it is higher than all other counties in the region, except Arlington County (Table 25). In urban areas such as the City of Rockville and Silver Spring Census Designated Place, commuter mode share is higher. For instance, the 2021 American Community Survey reports that the rate of walking is 2.3% in Rockville and 2.8% in Silver Spring.[19]

[19] Silver Spring Census Designated Place includes Downtown Silver Spring, East Silver Spring, Woodside, Woodside Park, Lyttonsville, North Hills Sligo Park, Long Branch, Indian Spring, Goodacre Knolls, Franklin Knolls, Montgomery Knolls, Clifton Park Village, New Hampshire Estates, and Oakview.

Table 25. Commute Mode Share of Jurisdictions in the Metropolitan Washington Region

Jurisdiction	Pedestrian Mode Share
Washington, D.C.	6.7%
Arlington County, VA	4.3%
Montgomery County, MD	**1.8%**
Frederick County, MD	1.8%
Prince George's County, MD	1.7%
Fairfax County, VA	1.4%
Howard County, MD	0.9%

Source: American Community Survey, 2019 Five-Year Estimates
Note: County mode share (the percentage of trips made by different travel modes) includes Rockville and Gaithersburg.

In addition to evaluating travel to work, Montgomery Planning also analyzed travel to school. Figure 32 shows that walking is the third-most common mode of transportation to and from school, with 12% of students arriving and nearly 16% of students departing on foot, compared with 52% arriving and 55% departing by school bus and 27% arriving and 19% departing by family car. Students are more likely to walk in the afternoon. This is the case for students at every grade level from kindergarten to 12th grade.

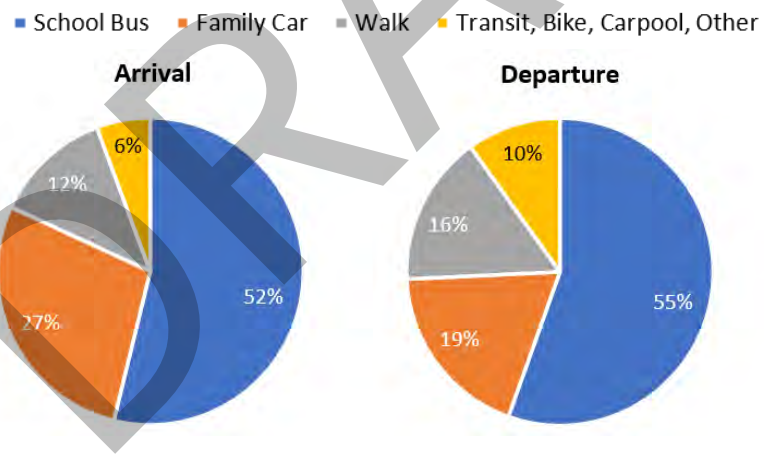


Figure 32: Student Mode Share by Arrivals and Departures

Source: Montgomery County Student Travel Tally
Note: Analysis includes schools in Rockville and Gaithersburg.

Walking is most prevalent with elementary school students, with 16% of arrivals by walking and 18% of departures by walking (Table 26). Walking is least prevalent with high school students, with 8% of arrivals by walking and 12% of departures by walking. By comparison, surveys of other jurisdictions in the region found the following rates of walking to school: 23% of Washington, D.C., public school

students in 2017[20]; 21% of Alexandria public school students in 2019[21]; and 20% of students in Arlington in 2019.[22] These communities are more compact than Montgomery County, but their walk mode shares provide context for the county's own results.

Table 26. Walking Arrivals and Departures by School Level

School Level	Arrival	Departure
Elementary School	16%	18%
Middle School	11%	16%
High School	8%	12%
Total	12%	16%

Source: Montgomery County Student Travel Tally
Note: Data include schools in Rockville and Gaithersburg.

Walking rates to school vary slightly based on whether schools are designated as Title I/Focus or have a high FARMS rate. For elementary school students, those at designated schools have higher walk rates both to school (18% vs. 13%) and from school (21% vs. 15%) than at non-designated schools (Table 27). For middle school and high school students, non-designated schools have slightly higher rates of walking. Overall, walk rates are higher at designated schools than non-designated schools.

Table 27. Walking Arrivals and Departures for Title I/Focus and High FARMS Rate Schools and Non-Designated Schools

School Level	Title I/Focus and High FARMS Schools		Non-Title I/Focus and Low FARMS Schools	
	Arrival	Departure	Arrival	Departure
Elementary School	18%	21%	13%	15%
Middle School	10%	14%	13%	18%
High School	7%	11%	8%	12%
Total	13%	17%	11%	15%

Note: Data include schools in Rockville and Gaithersburg.

While walking departure rates from school are generally below 20%, there is wide variation in walking rates among individual schools. In some cases, walking rates exceed 30 or 40% of school access mode share. Table 28 shows those elementary, middle, and high schools with the highest walking departure rates. Many of the schools with the highest walking rates are schools designated as Title I/Focus or high FARMS rate schools. High walking rates may be related to shorter walking distances, neighborhood conditions conducive to comfortably and safely walking to/from school, and whether

[20] "How Many Public School Students in DC Could Walk to Their School?" 10/2019. dme.dc.gov/sites/default/files/dc/sites/dme/publication/attachments/DME_Edsight%20Distance%20to%20School%20FINAL.pdf
[21] "Student Travel Tally Report: Combining Schools in One Data Collection Season," Fall 2019. virginiadot.org/programs/resources/safe_routes/2016-2017/Resources/STTW-2019/Fall_2019_STTW_Alexandria.pdf
[22] "Arlington County Public Schools Student Travel Tally," 2/21/2020. virginiadot.org/programs/resources/safe_routes/2016-2017/Resources/STTW-2019/Fall_2019_STTW_Arlington.pdf

walking is the only option because busing is not provided (within a certain distance of the school) and parents or guardians are not available to drive the student.

Table 28. Schools with the Highest Walking Departure Rates by School Type

Schools	Walk Mode Share
Elementary Schools	
Glen Haven Elementary School	50%
Snowden Farm Elementary School	49%
Gaithersburg Elementary School	48%
New Hampshire Estates Elementary School	43%
Middle Schools	
Montgomery Village Middle School	46%
Hallie Wells Middle School	43%
Takoma Park Middle School	36%
Gaithersburg Middle School	34%
High Schools	
Bethesda-Chevy Chase High School	24%
Wheaton High School	20%
Albert Einstein High School	19%
Rockville High School	17%

Source: Montgomery County Student Travel Tally
Note: Data include schools in Rockville and Gaithersburg.
Italics indicates that a school is designated as a Title I/Focus and high FARMS rate school.

Table 29 lists those elementary, middle, and high schools that have the lowest walking departure rates.[23]

Table 29. Schools with the Lowest Walking Departure Rates by School Type

Schools	Walk Mode Share
Elementary Schools	
Luxmanor Elementary School	<1%
Bel Pre Elementary School	1%
Cedar Grove Elementary School	1%
Maryvale Elementary School	1%
Middle Schools	
William H. Farquhar Middle School	1%
Redland Middle School	2%
Briggs Chaney Middle School	3%
Benjamin Banneker Middle School	4%
High Schools	
Col. Zadok Magruder High School	2%
James Hubert Blake High School	2%
Sherwood High School	4%
Paint Branch High School	5%

Source: Montgomery County Student Travel Tally
Note: Data include schools in Rockville and Gaithersburg.
Italics indicates that a school is designated as a Title I/Focus or high FARMS rate school.

Walk Purpose

Pedestrian trips are made for many reasons, from recreational walking and exercise to walking to work or to complete errands. Figure 33 summarizes why respondents have taken trips in the past month. No matter the land use type, exercise and outdoor recreation are the most common reasons for walking. More than 90% of respondents walked for recreation in the past month.

Utilitarian pedestrian trips—where the purpose of walking is accomplishing errands or getting to a destination—are more common for residents in urban areas (shown in blue in Figure 33) than residents of transit corridors or exurban/rural areas (shown in orange and grey, respectively).

[23] Schools included in this table have established walk zones where school bus service is not provided by MCPS.

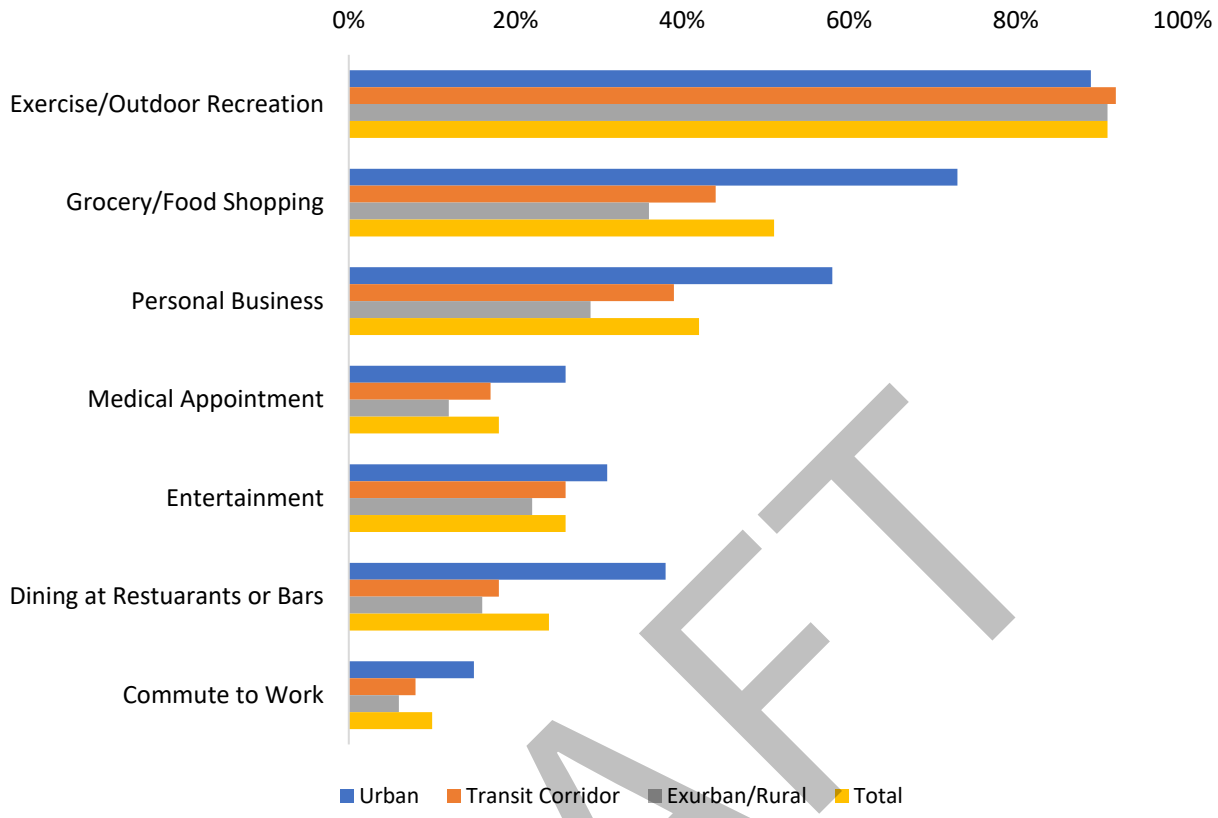


Figure 33: Pedestrian Trip Purpose by Land Use Type in the Prior Month

Source: Countywide Pedestrian Survey, 2020

Respondents with reported disabilities were more likely to walk for non-recreational trips than people without reported disabilities, as seen in Figure 34. In fact, respondents with disabilities were twice as likely as others to walk to a medical appointment (35% to 17%), significantly more likely to walk to the grocery store/food shopping (67% to 50%) and to dine at restaurants (32% to 24%). However, respondents with disabilities take 16% fewer trips for exercise or outdoor recreation than respondents without reported disabilities (76% to 92%).

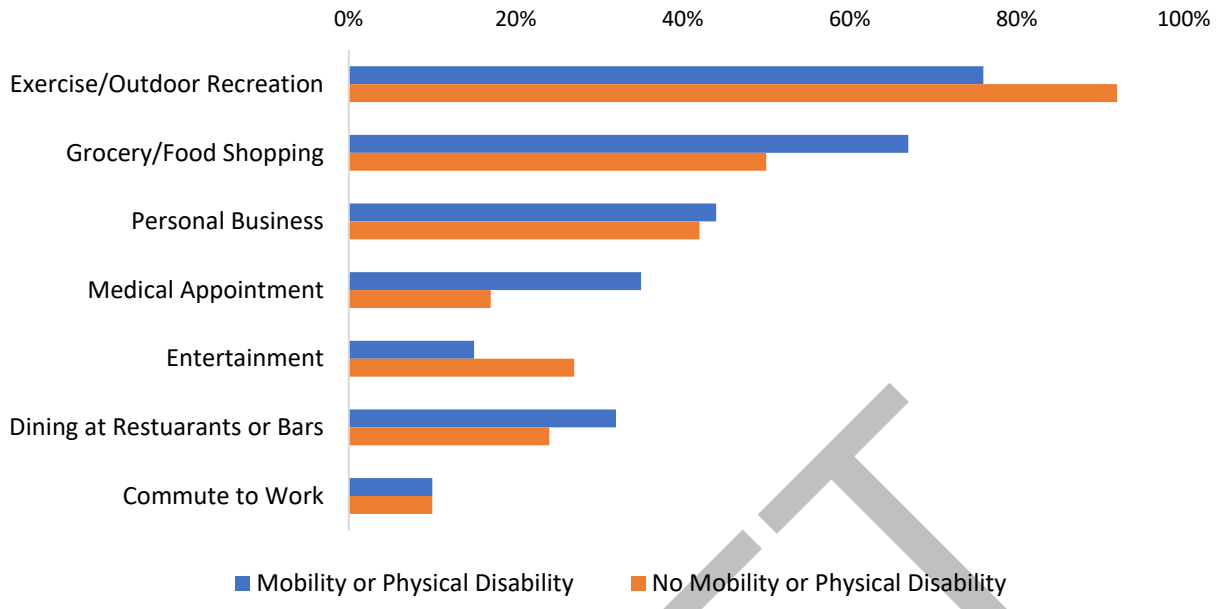


Figure 34: Pedestrian Trip Purpose by Reported Disability

Source: Countywide Pedestrian Survey, 2020

Trip Frequency and Length

Exercise/recreation trips are also the most frequently made pedestrian trip. Overall, 58% of pedestrian travel was for exercise or recreation.

There is a marked difference between urban areas and the rest of the county when it comes to the number of pedestrian trips taken and their purpose. Urban area respondents take about 32% more pedestrian trips than those in transit corridors and 27% more than those in exurban/rural areas. Also, the majority of trips taken in urban areas were for a utilitarian purpose: 53% compared with 37% in transit corridors and 32% in exurban/rural areas.

Countywide, exercise/recreational walking trips are longer than utilitarian trips. While 86% of recreational trips are longer than 20 minutes, the majority of trips for grocery/food shopping, personal business, medical appointments, entertainment, dining, and commuting are 20 minutes or less. This makes intuitive sense because the purpose of a recreational walk is the walk itself, while for other trip types, the purpose is to reach a destination. If a utilitarian pedestrian trip takes too long, it's likely the trip will not be taken or would instead become a car or transit trip.

Travel-time differences are also apparent between urban areas and the rest of the county. For example, 62% of trips for grocery/food shopping in urban areas are 20 minutes or less, while in transit corridors and exurban/rural areas, 39% and 42% of these trips are 20 minutes or less, respectively. So, not only are there more pedestrian trips to grocery/food stores in urban areas but these trips are also shorter. With more destinations within that 20-minute walking distance in the more urban areas of the county, it makes sense that residents are taking more of these trips.

Satisfaction

The Countywide Pedestrian Survey also included questions about how satisfied respondents are with different elements of the pedestrian experience. As shown in , 52% of respondents are satisfied with the overall pedestrian experience in Montgomery County, with respondents in urban areas reporting the highest rates of satisfaction (60%) and those in exurban/rural areas reporting the lowest (46%). Higher satisfaction rates in urban areas are not surprising, considering that these areas are the best endowed with both pedestrian accommodations and destinations.

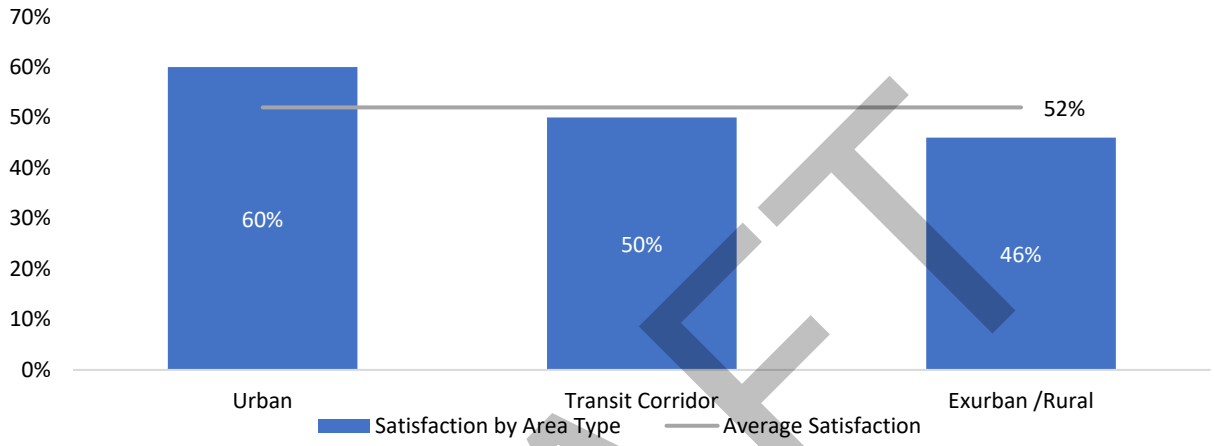


Figure 35: Satisfaction with the Overall Pedestrian Experience

Source: Countywide Pedestrian Survey, 2020

As shown in Figure 36, only 43% of pedestrians with reported disabilities are satisfied with their overall pedestrian experience in Montgomery County, compared with 53% of respondents without reported disabilities. However, there are notable differences based on land use type with respondents in urban areas reporting the same level of satisfaction whether they have a reported disability (59%) or not (60%). In contrast, respondents with reported disabilities in transit corridors are substantially less satisfied (33%) than respondents without reported disabilities (52%). Respondents with reported disabilities in exurban/rural areas are also less satisfied (36%) than respondents without reported disabilities (47%), but the differences are less pronounced.

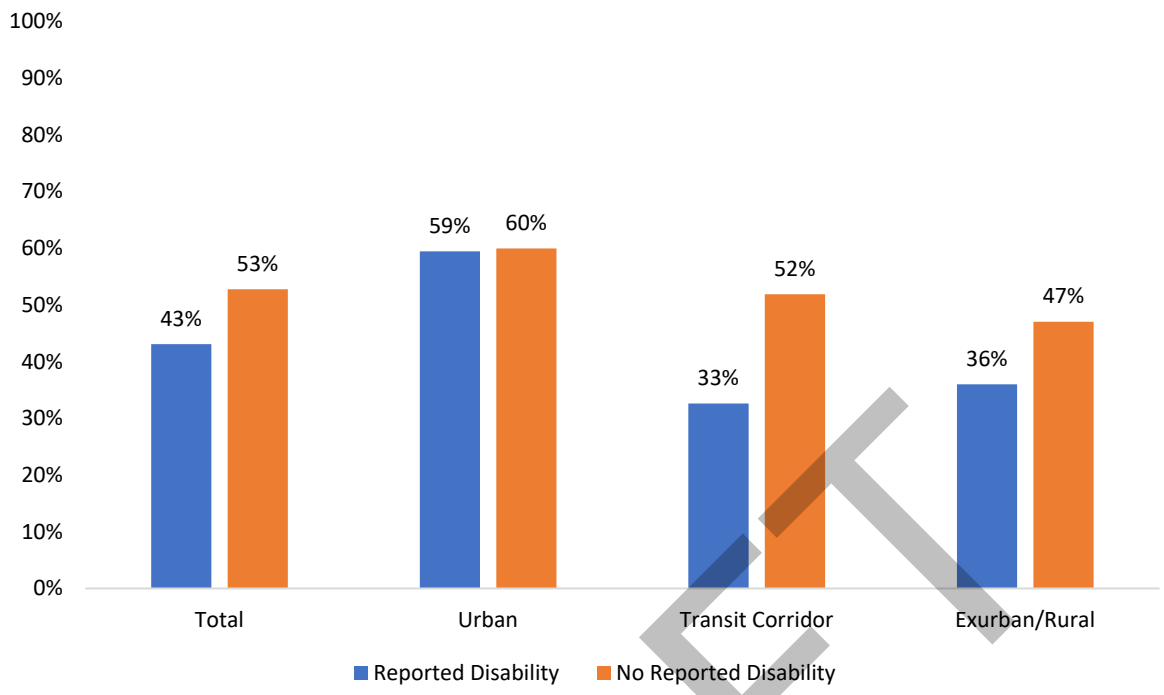


Figure 36: Overall Satisfaction by Reported Disability Status and Land Use Type

Source: Countywide Pedestrian Survey, 2020

In addition to overall satisfaction, the Countywide Pedestrian Survey broke down the pedestrian experience into different elements:

- access to destinations
- the experience walking and rolling along streets
- the pedestrian experience at intersections and crossings
- the presence of lighting

Access to Destinations

As shown in Figure 37, 44% of respondents are satisfied with walking to retail, restaurants, parks, etc., with respondents in urban areas reporting the highest rates of satisfaction (63%) and respondents in exurban/rural areas reporting the least satisfaction (29%).

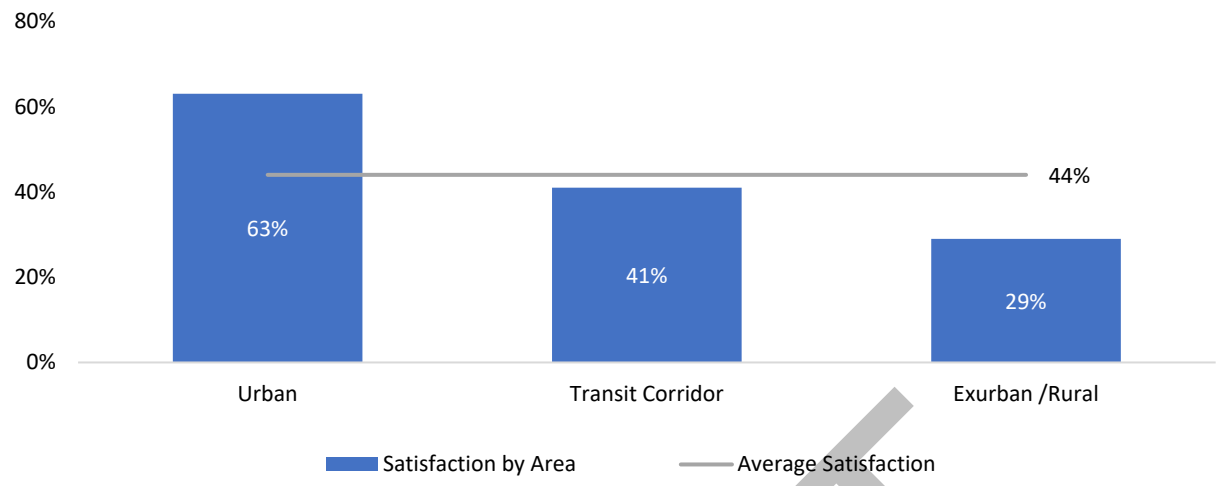


Figure 37: Pedestrian Satisfaction with Access to Retail, Restaurants, Parks, Etc.

Source: Countywide Pedestrian Survey, 2020

Walking Along a Street

Several elements define the experience of walking along a street: the amount and width of pathways along a route, the distance between sidewalks and cars, and the speed of those vehicles. Table 30 compares pedestrian satisfaction while walking along the street in different areas of the county.

While satisfaction rates for this experience are less than 50%, county residents are most satisfied with the "amount of sidewalks on their route" (44%) and the "width of sidewalks" (44%) but least satisfied with the "speed of cars along sidewalks and paths" (21%) and "snow removal" (28%). Satisfaction levels across land use types are generally similar, except that urban residents express greater satisfaction with the "amount of sidewalk on their route" (55%) than transit corridor (45%) and exurban/rural (31%) residents.

Table 30. Pedestrian Satisfaction Walking Along the Street

Experience Walking Along the Street	Urban	Transit Corridor	Exurban/ Rural	Total
Amount of sidewalks on pedestrian route	55%	45%	31%	**44%**
Width of sidewalks	45%	45%	43%	**44%**
Shading by trees or buildings	39%	42%	38%	**39%**
How often driveways cross sidewalks	36%	34%	34%	**35%**
Distance between sidewalks and cars	33%	31%	28%	**31%**
Snow removal	28%	30%	26%	**28%**
Speed of cars along sidewalks and paths	23%	19%	22%	**21%**

Source: Countywide Pedestrian Survey, 2020.

Pedestrian Experience at Intersections and Crossings

Similar to the experience walking along the street, the crossing/intersection experience is made up of several elements. Table 31 compares pedestrian satisfaction at intersections and crossings in different areas of the county. As with walking along the street, the majority of residents expressing

dissatisfaction with all elements of intersections and crossings that they were asked about. Survey respondents indicated that they are most satisfied with the "distance to cross the street" (49%) and the "time to cross the street at pedestrian signals" (47%) and are least satisfied with the "number of vehicles cutting across the crosswalk" (22%), "places to stop partway while crossing" (33%), and "drivers stopping for me when I cross the street" (34%).

While urban respondents tend to have greater levels of satisfaction than exurban/rural respondents for "number of places to safely cross the street," "number of marked crosswalks," "distance to cross the street," and "places to stop partway while crossing," respondents in transit corridors have slightly higher levels of satisfaction with the "time to cross the street at pedestrian signals" and the "wait time for a pedestrian walk signal" than urban or exurban/rural respondents.

Table 31. Pedestrian Satisfaction at Intersections and Crossings

Experience at Intersections and Crossings	Urban	Transit Corridor	Exurban/ Rural	Total
Distance to cross the street	53%	50%	45%	**49%**
Time to cross the street at pedestrian signals	47%	52%	43%	**47%**
Number of marked crosswalks	50%	48%	39%	**46%**
Wait time for a pedestrian walk signal	43%	47%	43%	**44%**
Number of places to safely cross the street	46%	43%	35%	**42%**
Drivers stopping for me when I cross the street	32%	34%	35%	**34%**
Places to stop partway while crossing	39%	32%	27%	**33%**
Number of vehicles cutting across the crosswalk	20%	22%	23%	**22%**

Source: Countywide Pedestrian Survey, 2020

Lighting

While survey respondents expressed low satisfaction with lighting levels along sidewalks/pathways and at crossings (32% and 31%), urban respondents (40% and 39%) are more satisfied with lighting than transit corridor (30% and 28%) or exurban/rural (28% and 26%) respondents (Table 32).

Table 32. Pedestrian Satisfaction with Lighting

Lighting Experience	Urban	Transit Corridor	Exurban/ Rural	Total
Overhead lighting along sidewalks and pathways	40%	30%	28%	**32%**
Overhead lighting at crossings	39%	28%	26%	**31%**

Source: Countywide Pedestrian Survey, 2020

From the pedestrian satisfaction responses from the Countywide Pedestrian Survey, it is clear that there is room for improvement. While a slim majority of respondents were satisfied overall with their experience as pedestrians, when asked to consider the elements that define that overall experience, they reported much lower satisfaction.

A Comfortable, Connected, Convenient Pedestrian Network

Montgomery County's current walking rates and degree of satisfaction with the pedestrian experience may be, in part, explained by the low level of comfort that pedestrians experience when walking and rolling in the county. This section details the specific pedestrian accommodations and resulting pedestrian comfort levels that exist along streets, trails, and at roadway crossings.

Comfort is described using the Pedestrian Level of Comfort (PLOC) methodology. A variety of pathway and crossing factors are considered to determine a comfort score for each crossing and street segment. The four main scores are: undesirable, uncomfortable, somewhat comfortable, and very comfortable.[24]

"Comfort" is not the same as "safety." While safety will always be the bedrock principle of the transportation system (and is the focus of Goal 3), increasing pedestrian comfort can also help create a pedestrian experience in Montgomery County that residents and visitors enjoy and look forward to, *not just tolerate or overcome*.

Pedestrian Accommodations

Pedestrian accommodations are the parts of the environment that pedestrians use to travel. They include elements along roads, like sidewalks or sidepaths; elements that cross roads, such as marked crosswalks and pedestrian refuge islands; and elements away from roads, like trails and connections between culs-de-sac.

Pedestrian Accommodations Along the Street

Table 33 summarizes sidewalk mileage by street classification,[25] as well as where there are sidewalk gaps (sections of missing sidewalk). Countywide, there are about 2,500 miles of sidewalks (primarily on local—or residential—streets) and 221 miles of sidewalk gaps on non-local streets. Many of these gaps are located on roads that connect people to destinations, including major highways, arterials, and primary residential streets.

[24] The existing pedestrian network can be viewed on the Pedestrian Level of Comfort Map at mcatlas.org/pedplan.

[25] A street's classification is determined by the *Master Plan of Highways and Transitways,* which was comprehensively updated in 2018. A street's classification reflects its function in the county's transportation network. Some streets, like local streets, exist to provide access to/from residences, while others, like major highways, facilitate higher-speed travel between regional destinations and provide access to businesses. Other streets balance access and mobility in different ways.

Table 33. Sidewalk Mileage by Street Classification

Street Classification	Street Mileage	Existing Sidewalks (miles)	Sidewalk Gaps (miles)
Controlled Major Highway	19	20	1
Major Highway	159	205	49
Parkway	9	3	0
Arterial	243	202	98
Minor Arterial	48	63	7
Business	50	81	2
Primary Residential	215	228	58
Industrial	7	12	1
Country Road	35	2	3
Rustic Road	149	2	0
Exceptional Rustic Road	40	0	1
Local Streets	2,121	1,622	N/A
Total	**3,095**	**2,438**	**220**

Source: Pedestrian Level of Comfort Analysis

Note: Missing sidewalks on local streets are not classified as sidewalk gaps because traffic volumes and speed limits often allow for a comfortable experience for those pedestrians traveling in the roadway.

These sidewalk gaps are not evenly distributed across the county; 79% of the sidewalk gap mileage is in the exurban/rural part of the county. The highlighted cells in Table 34 call out those sidewalk gaps in urban and transit corridor communities along busier, faster streets and locations with more pedestrian activity.

Table 34. Sidewalk Gap Mileage by Street Classification and Land Use

Street Classification	Existing Sidewalks (miles)	Gap Mileage			
		Urban	Transit Corridor	Exurban/ Rural	Total
Controlled Major Highway	20	1	0	0	**1**
Major Highway	205	4	7	38	**49**
Parkway	3	0	0	0	**0**
Arterial	202	4	10	84	**98**
Minor Arterial	63	0	2	5	**7**
Business	81	2	0	0	**2**
Primary Residential	228	3	8	47	**58**
Industrial	12	0	0	1	**1**
Country Road	2	0	0	3	**3**
Rustic Road	2	0	0	0	**0**
Exceptional Rustic Road	0	0	0	1	**1**
Local Streets	1,622	N/A	N/A	N/A	**N/A**
Total	**2,438**	**14**	**27**	**179**	**220**

Source: Pedestrian Level of Comfort Analysis

Note: Missing sidewalks on local streets are not classified as sidewalk gaps.

Not all sidewalks are equal. Factors such as how wide a sidewalk is and how far away it is from a parallel street affect the pedestrian experience. Wider sidewalks and wider buffers are associated with greater comfort. As depicted in Figure 38, over half the sidewalks in the county are less than five feet wide (53%). Of the remaining sidewalks, most are five- to eight-feet wide (35%).[26]

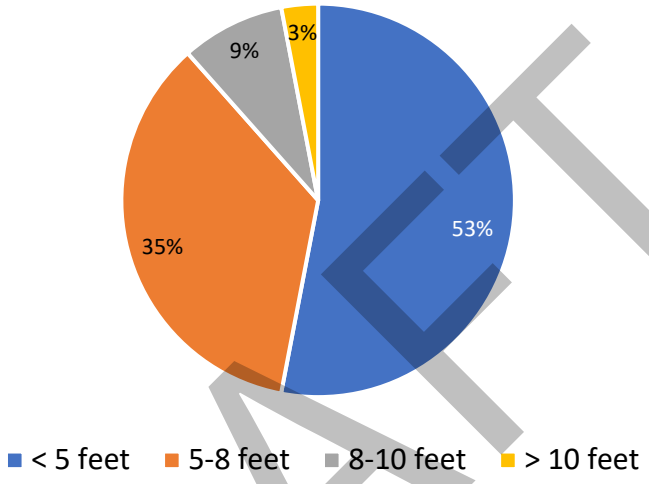


Figure 38: Sidewalk Width

As Table 35 highlights, local streets tend to have narrower sidewalks: 62% of sidewalks along local streets are less than five feet wide. While higher classification streets tend to have wider sidewalks, there are still many sidewalks along major highways (23%), arterials (26%), business streets (17%) and similar streets that are narrower than five feet.

Table 35. Sidewalk Width by Street Classification

Street Classification	Mileage	Sidewalk Width			
		3.5' to < 5'	>= 5' to <8'	>=8' to <10'	>=10'
Controlled Major Highway	20	17%	40%	38%	5%
Major Highway	205	23%	54%	18%	5%
Parkway	3	3%	47%	8%	42%
Arterial	202	26%	47%	24%	3%
Minor Arterial	63	56%	40%	3%	1%

[26] Sidewalks less than five feet wide are less likely to be compliant with the Americans with Disabilities Act. While these narrower sidewalks (three feet or more) are allowed, five-foot wide passing spaces every 200 feet or less must be constructed. The proposed Public Rights-of-Way Accessibility Guidelines (PROWAG) increases the minimum allowable sidewalk width to four feet from the current three. The county's *Complete Streets Design Guide* includes a six-foot default sidewalk width for all street types.

Street Classification	Mileage	Sidewalk Width			
		3.5' to < 5'	>= 5' to <8'	>=8' to <10'	>=10'
Business	81	17%	58%	14%	12%
Primary Residential	228	74%	21%	5%	0%
Industrial	12	14%	68%	12%	6%
Country Road	2	0%	18%	82%	0%
Rustic Road	2	0%	97%	0%	3%
Exceptional Rustic Road	0	48%	52%	0%	0%
Local Street	1,622	62%	31%	5%	2%
Total Mileage	**2,438**	**1,328**	**851**	**196**	**63**

Source: Pedestrian Level of Comfort Analysis

As Figure 39 indicates, sidewalks in EFAs tend to be somewhat narrower than sidewalks in other areas of the county. In EFAs, 59% of sidewalks are between three and a half and five feet wide, while 53% of sidewalks outside EFAs are in this category. At the other end of the spectrum, non-EFA sidewalks are more likely to be between eight and 10 feet (9% vs. 5%) and greater than 10 feet (3% vs. 2%).

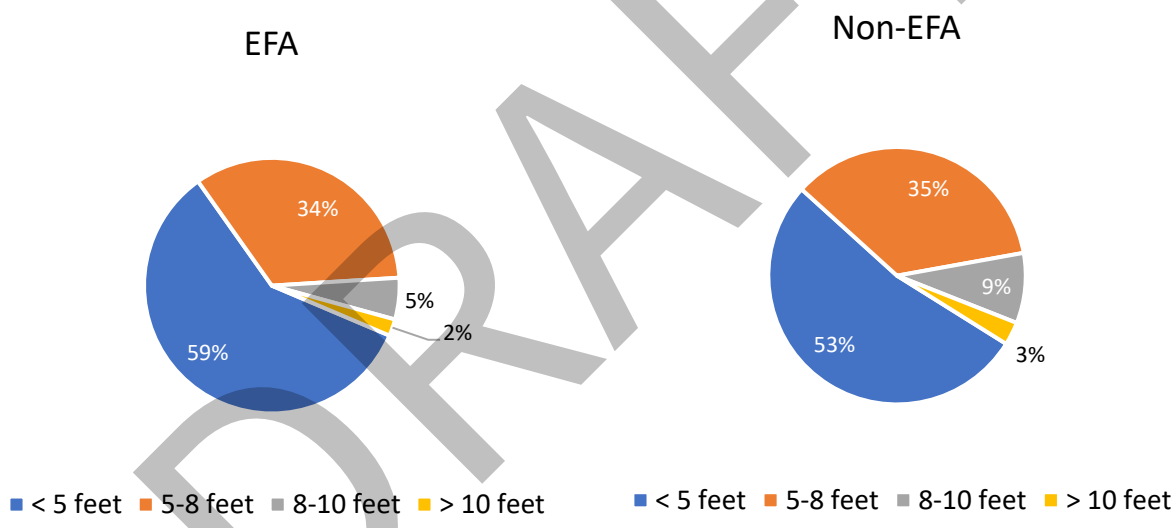


Figure 39: Sidewalk Width by EFA Status

Street buffer width is the distance between the pathway and the curb. Street buffers separate moving vehicles from pedestrians, and they may allow the planting of larger street trees to provide robust physical separation from traffic, shade canopy, and a sense of enclosure for pedestrians. Without a buffer, pedestrians may "shy away" from adjacent travel lanes, effectively using part of the pathway as a buffer from the road, reducing the pathway's effective width.

Of the 2,438 miles of county sidewalks, most (51%) have at least a six-foot buffer between the sidewalk and the street. However, nearly half (47%) of sidewalks along major highways like Georgia Avenue are missing buffers. By contrast, 20% of arterial sidewalks, 11% of primary residential sidewalks, and 18% of local street sidewalks are missing buffers (Table 36).

Table 36. Street Buffer Width by Street Classification

Street Classification	Buffer Width		
	No Buffer	Less than Six Feet	Six Feet or Greater
Controlled Major Highway	3%	74%	23%
Major Highway	47%	34%	19%
Parkway	4%	36%	61%
Arterial	20%	35%	45%
Minor Arterial	21%	34%	45%
Business	28%	44%	28%
Primary Residential	11%	23%	66%
Industrial	14%	27%	59%
Country Road	0%	4%	96%
Rustic Road	7%	33%	60%
Exceptional Rustic Road	52%	27%	21%
Local Street	18%	26%	56%

Source: Pedestrian Level of Comfort Analysis

Sidewalks in EFAs are less likely to have buffers than those outside of EFAs. While 27% of sidewalks in EFAs are missing street buffers, only 18% outside are (Figure 40).

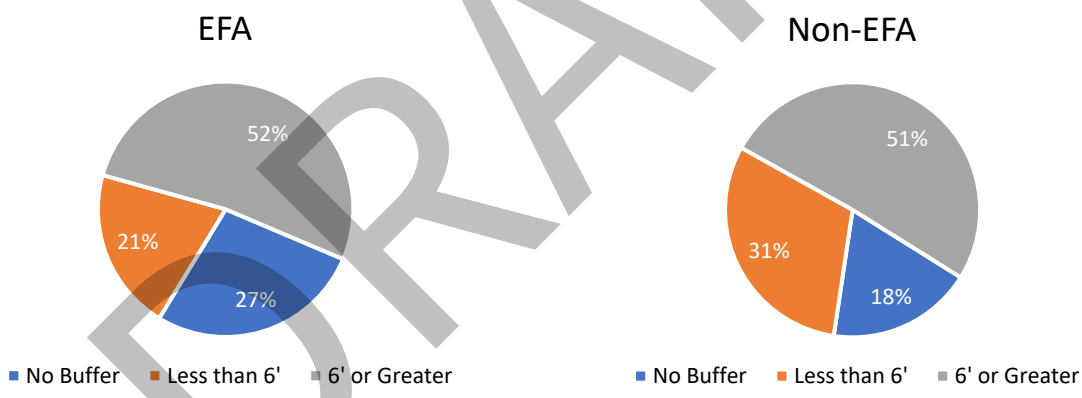


Figure 40: Street Buffer Width by EFA Status

Wider street buffers are more important along roads with higher speeds, but the higher the roadway speed limit, the less likely there is to be a wide buffer between the sidewalk and the street (Table 37). The widest buffers are found on the slowest streets. Along streets with speed limits less than 30 mph, 64% of buffers are six feet or greater, while along streets with speed limits above 40 mph, this number drops to 30%. Sidewalks along the fastest streets are the ones least likely to have a buffer from traffic.

Table 37. Sidewalk Buffer by Posted Speed Limit

Posted Speed Limit	No Buffer	Less than Six Feet	Six Feet or Greater
Less than 30 mph	18%	26%	55%
30-40 mph	27%	34%	39%
Greater than 40 mph	30%	43%	27%
Total	**21%**	**28%**	**51%**

Source: Pedestrian Level of Comfort Analysis

Pedestrian Accommodations Crossing the Street

Pedestrian comfort at crossings is largely a function of five factors: traffic control, the posted speed limit, the number of lanes of the street being crossed, median type, and crosswalk type.

There are three different approaches to crosswalks on county roads. Unmarked crossings have no pavement markings to denote the crosswalk.[27] Standard crosswalk markings include stamped concrete, parallel lines, and dashed marking patterns. High-visibility crosswalks have proven pedestrian safety benefits over standard crosswalk markings and include continental, ladder, zebra, and solid designs. Table 38 summarizes the crosswalk types by street classification. Countywide, 69% of legal crossings are unmarked, while 15% have a standard marked crosswalk and 17% have a high-visibility crosswalk. The highest portion of marked crosswalks (standard or high-visibility) are on high-volume, higher-order roadways, such as controlled major highways, major highways, and parkways.

Table 38. Crossing Type by Street Classification

Street Classification	Unmarked	Standard	High-Visibility
Controlled Major Highway	28%	34%	38%
Major Highway	33%	28%	39%
Parkway	29%	16%	55%
Arterial	47%	16%	37%
Minor Arterial	57%	15%	28%
Business	28%	24%	47%
Primary Residential	69%	14%	17%
Industrial	50%	19%	31%
Country Arterial	100%	0%	0%
Country Road	100%	0%	0%
Rustic Road	83%	4%	13%
Exceptional Rustic Road	89%	11%	0%
Local	77%	13%	10%
Total	**69%**	**15%**	**17%**

Source: Pedestrian Level of Comfort Analysis

[27] According to MD Transportation Code Ann. § 21-101 (2020), a crosswalk without lines or other markings is defined as "the part of a roadway that is . . . within the prolongation or connection of the lateral lines of sidewalks at any place where 2 or more roadways of any type meet or join, measured from the curbs or in the absence of curbs, from the edges of the roadway."

The PLOC evaluates crossings based on the highest posted speed limit where the crossing is located (typically at an intersection but also at mid-block crossings). Marked crosswalks, and specifically high-visibility crosswalks, are more prevalent on higher speed streets (Table 39). Marked crossings of all types are more common in urban areas than in transit corridors and more common in transit corridors than in exurban/rural areas.

Table 39. Crossing Type by Roadway Speed by Land Use

Posted Speed Limit	Urban			Transit Corridor			Exurban/Rural		
	Unmarked	Standard	High Visibility	Unmarked	Standard	High Visibility	Unmarked	Standard	High Visibility
Less than 30 mph	64%	14%	21%	74%	15%	11%	80%	11%	8%
30-40 mph	33%	23%	44%	50%	14%	36%	67%	11%	22%
Greater than 40 mph	21%	24%	56%	29%	25%	46%	47%	26%	27%

Source: Pedestrian Level of Comfort Analysis

Having a place to stop between directions of motor vehicle traffic improves pedestrian comfort. Medians are categorized as either a pedestrian refuge island (greater than six feet) or as a raised median less than six feet wide/hardened centerline. While raised pedestrian refuge islands have the greatest crossing safety and comfort benefits, medians that do not meet the criteria for a refuge may also be beneficial. Figure 41 highlights how prevalent different median treatments are based on the number of lanes pedestrians have to cross. On streets with two or three travel lanes, the crossing distance is short and there are few medians. As roadways widen beyond three lanes, medians become more prevalent; medians are present at 51% of four- to five-lane street crossings and 88% of crossings on streets with six or more lanes.

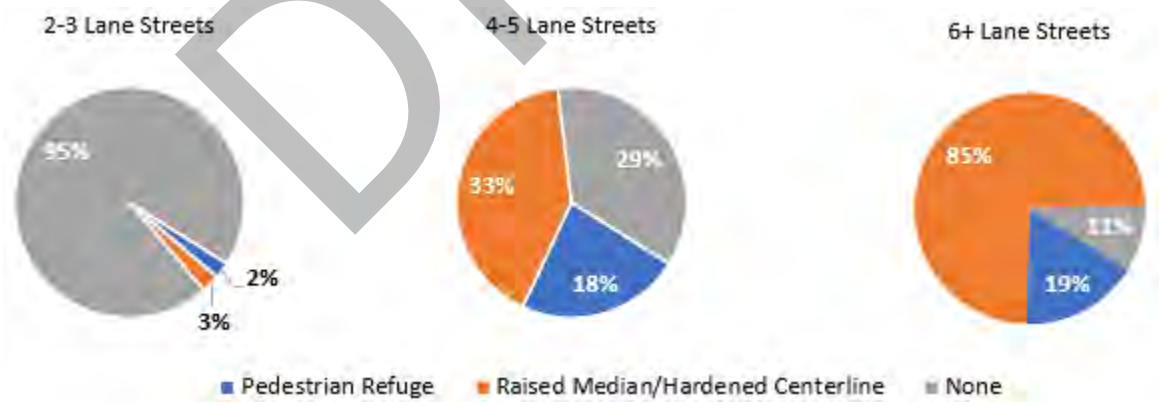


Figure 41: Median Treatment by Number of Lanes

Source: Pedestrian Level of Comfort Analysis

Overall Pedestrian Comfort

Montgomery Planning's PLOC analysis finds that 61% of pathway distance and 42% of crossing distance in the county is comfortable (Table 40). This means they meet either the "very comfortable" or "somewhat comfortable" threshold.

Table 40. Overall Pedestrian Comfort on Streets and at Crossings

PLOC Score	Pathway Distance	Crossing Distance
Very Comfortable	25%	10%
Somewhat Comfortable	36%	32%
Uncomfortable	21%	38%
Undesirable	17%	19%

Source: Pedestrian Level of Comfort Analysis

An analysis of pedestrian conditions along all streets and crossings in the county indicates that there are large areas of the county where it is uncomfortable to walk and many locations where it is undesirable to do so. Figure 42 summarizes pedestrian comfort along pathways. Comfort levels in urban (67%) and transit corridors (71%) are greater than in exurban/rural (52%) areas of the county.

Pathway comfort levels are substantially higher in EFAs (71%) than non-EFAs (60%), likely due to where these areas are located and when they were developed.

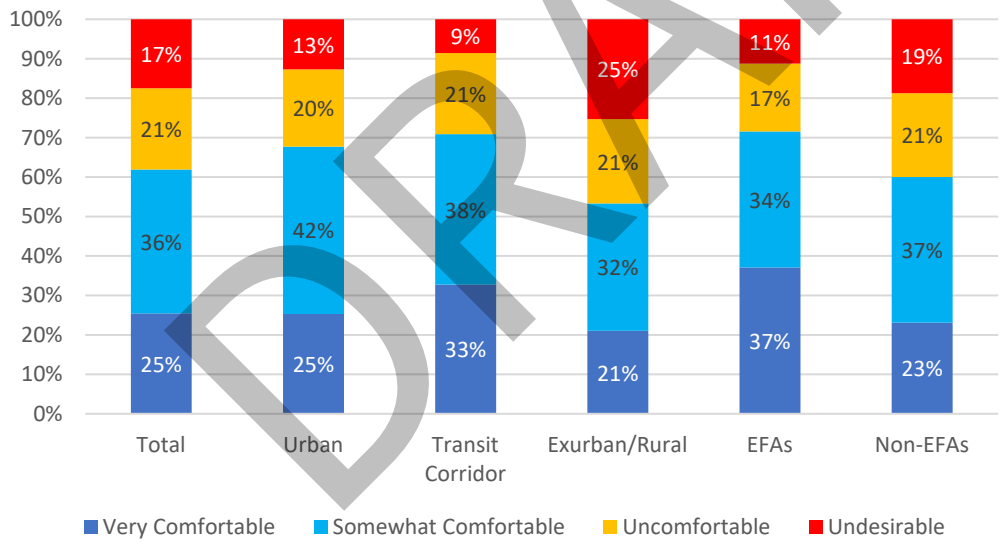


Figure 42: Overall Pedestrian Comfort Along Pathways

Source: Pedestrian Level of Comfort Analysis

Figure 43 summarizes pedestrian conditions at crossings. Overall, only 42% of crossings are comfortable for pedestrians. Crossings in transit corridors tend to be slightly more comfortable (45% comfortable) while crossings in urban and exurban/rural areas tend to be somewhat less comfortable (41% comfortable).

The comfort of crossings is similar between EFAs and non-EFAs.

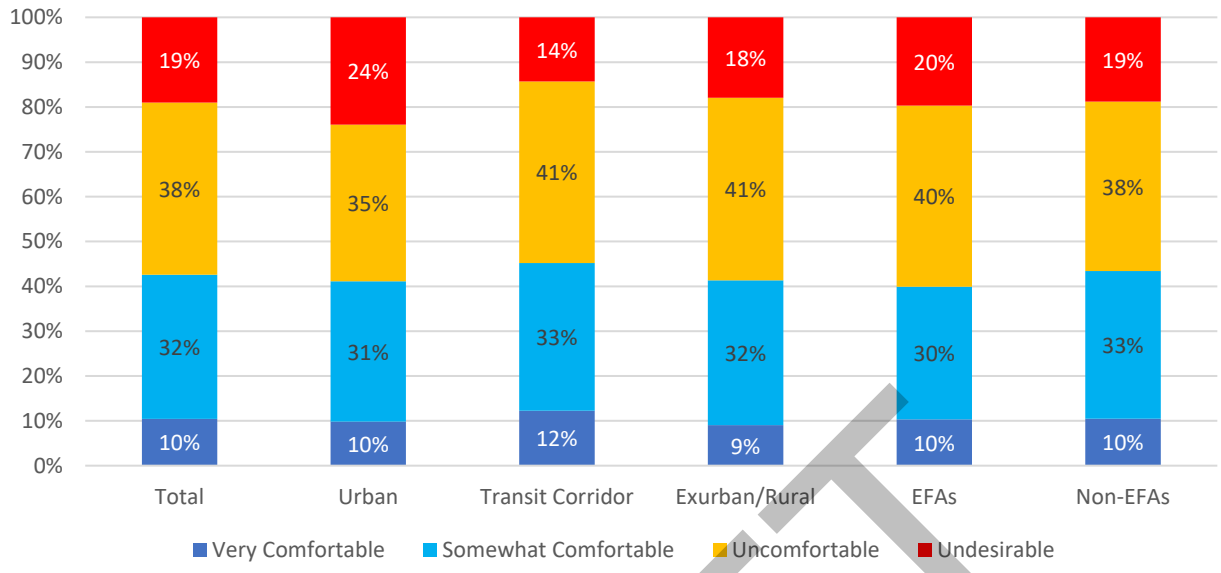


Figure 43: Overall Pedestrian Comfort at Crossings

Source: Pedestrian Level of Comfort Analysis

Access to Destinations

An important aspect of understanding pedestrian comfort is evaluating access to common destinations. While many people walk for recreation, as summarized under Goal 1, many people also walk for practical reasons like getting to community destinations, transit stations, or schools. The PLOC data were used to better understand how comfortable it is to get to these destinations. Analysis is described in the footnote.[28]

Table 41 provides the comfortable access scores for walking to community destinations (libraries, recreation centers, and parks) and transit stations broken out by pathway and crossing mileage. While all libraries and recreation centers were scored, only two types of parks (regional and recreational) were included in the analysis. Overall, the pathways are the most comfortable part of the walk to these destinations. Crossing streets is generally less comfortable. While there are disparities between pathway comfort and crossing comfort for most destinations, the difference for parks is the greatest at 35%. Only 35% of the crossing distance between residences and parks was comfortable, lower than every other destination in Table 41.

[28] A one-mile walkshed was created around each public facility (community destination or transit station). Trips between each residence and destination were modeled using the most direct route along the PLOC network. The comfortable access percentage is the sum of all the comfortable portions of the trips divided by the total trip distance.

$$comfortable\ access = \frac{total\ comfortable\ distance\ of\ all\ residential\ trips\ to\ the\ respective\ destination}{total\ distance\ of\ all\ residential\ trips\ to\ the\ respective\ destination}$$

Table 41. Comfortable Pedestrian Access to Community Destinations and Transit Stations

	Pathway Distance	Crossing Distance
Community Destinations		
Libraries	80%	66%
Recreation Centers	78%	66%
Parks	70%	35%
Transit Stations		
Red Line	88%	66%
Purple Line	76%	70%
Brunswick Line	90%	72%

Source: Pedestrian Level of Comfort Analysis

Comfortable access to community destinations and transit stations varies based on area types, but the results are not consistent across each type of destination or transit service. Table 42 breaks down comfortable access for these different destinations. Across area types, pathway comfort tends to exceed crossing comfort. Libraries are most comfortable to access in urban areas, while parks are most comfortable to access in exurban/rural areas. Transit corridors and urban areas have similar comfortable connectivity to recreation centers. Comfortable connectivity to Red Line and Purple Line stations is better in urban areas than in transit corridors, while people living in exurban/rural areas within one mile of the stations have the most comfortable Brunswick Line access.

As noted in the table, not all community destinations or transit stations are present in the different area types (e.g., there are no Red Line stations in exurban/rural areas).

Table 42. Comfortable Access to Community Destinations and Transit Stations by Area Types

		Community Destinations			Transit Stations		
		Libraries	**Recreation Centers**	**Parks**	**Red Line**	**Purple Line**	**Brunswick Line**
Urban	Pathways	81%	82%	N/A	87%	76%	83%
	Crossings	71%	66%	N/A	67%	72%	70%
Transit Corridor	Pathways	72%	85%	63%	76%	69%	N/A
	Crossings	45%	51%	30%	51%	82%	N/A
Exurban/ Rural	Pathways	81%	62%	76%	N/A	N/A	91%
	Crossings	40%	46%	41%	N/A	N/A	89%

Note: The approach for calculating access to destinations for land use type is based on where the community destination or transit station is located (urban area, transit corridor, etc.).
Source: Pedestrian Level of Comfort Analysis

Comfortable access to community destinations and transit stations also varies by whether the walkshed (the distance around the destination from which people walk) is within an EFA. Table 43 illustrates that crossing comfort tends to be worse in EFAs, while pathway comfort is better.

Table 43. Comfortable Access to Community Destinations by EFA Status

		Community Destinations			Transit Stations		
		Libraries	Recreation Centers	Parks	Red Line	Purple Line	Brunswick Line
EFAs	Pathways	80%	83%	71%	92%	75%	94%
	Crossings	61%	48%	36%	65%	73%	80%
Non-EFAs	Pathways	79%	77%	69%	87%	76%	87%
	Crossings	67%	65%	35%	67%	67%	69%

Note: The approach for calculating access to destinations for EFAs is based on where residences within the walksheds for each community destination or transit station within or outside of an EFA.
Source: Pedestrian Level of Comfort Analysis

Table 44 shows that walking to elementary schools tends to be more comfortable,[29] with 50% comfortable access walking along streets, and 43% comfortable access at crossings. In contrast, walking tends to be the least comfortable to high schools, with only 27% comfortable access along pathways and 13% comfortable access at crossings.

While the percentage of students walking to school also decreases as school type changes, the relationship between comfort and mode share is likely correlated but not causative. The decline in both metrics is more likely a function of the distance between a residence and the school. As that distance gets farther (as it tends to when transitioning from an elementary to a middle or from a middle to a high school), the amount of walking declines, and pedestrian comfort also declines because it is more likely at least one (and likely more) of the pathways and crossings used to get to school score "uncomfortable" or "undesirable."

[29] Like other community destinations, schools were also evaluated for comfortable access, but with two main differences. First, rather than a uniform one-mile distance, the walkshed for each school was defined by the school's attendance boundary and the walking distance established by MCPS for the school type—one mile for elementary schools, one and a half miles for middle schools, and two miles for high schools. Second, it is not reasonable to expect or encourage school-aged children to walk along undesirable pathways or crossings. Therefore, trips requiring travel along such a segment were counted as part of the total distance traveled to that particular school but comfortable portions of a trip that included an undesirable segment were not included in the total comfortable distance traveled to that school.

$$comfortable\ school\ access$$

$$= \frac{total\ comfortable\ distance\ of\ all\ residential\ trips\ to\ the\ respective\ school\ (without\ travel\ along\ undesirable\ segments)}{total\ distance\ of\ all\ residential\ trips\ to\ the\ respective\ school\ (including\ those\ traveling\ along\ undesirable\ segments)}$$

The implication of this scoring change is that schools will tend to score worse than other community destinations.

Table 44. Comfortable Pedestrian Access to School

School Types	Streets	Crossings
Elementary Schools	55%	43%
Middle Schools	38%	23%
High Schools	27%	13%

Source: Pedestrian Level of Comfort Analysis

Comfortable pedestrian access to schools varies by land use type. While elementary and high schools located in transit corridors have the most comfortable pedestrian access, middle schools have the most comfortable access in exurban/rural areas (Table 45).

Title I/Focus designated elementary schools have greater comfortable pedestrian access than non-designated schools, while comfortable access is similar across FARMS and non-FARMS schools for middle schools and high schools.

Table 45. Comfortable Pedestrian Access to School by Area Types and Designation

Public Facility	Land Use Type						Title I/Focus and High FARMS Rate Schools			
	Urban		Transit Corridor		Exurban/ Rural		Yes		No	
	Pathways	Crossings	Pathways	Crossings	Pathways	Crossings	Pathways	Crossings	Pathways	Crossings
Elementary Schools	36%	28%	56%	51%	50%	54%	60%	47%	50%	39%
Middle Schools	12%	6%	28%	21%	38%	33%	35%	23%	42%	24%
High Schools	9%	11%	23%	15%	14%	11%	27%	9%	28%	16%

Source: Pedestrian Level of Comfort Analysis

Tree Canopy

Unshaded sidewalks and pathways can reach high and, at times, dangerous levels of heat in the summer. Analysis for the Silver Spring Central Business District (CBD) revealed a significant temperature difference between shaded and unshaded sidewalks.[30] While the amount of tree-canopy cover needed to counteract higher temperatures associated with impervious surface cover is not known, one study found that in urban areas, daytime air temperatures were substantially reduced when tree-canopy cover and shade were greater than 40%.[31] Tree canopy cover will only become more important as climate change increases temperatures over time. The Countywide Pedestrian Survey found 39% satisfaction countywide with existing shading by trees or buildings.

[30] *Silver Spring Downtown and Adjacent Communities Plan–Environment Appendix.* Montgomery Planning. (2022) montgomeryplanning.org/wp-content/uploads/2022/01/SSDAC-Appendix-E-Environment.pdf

[31] Ren, Z., Zhao, H., Fu, Y. et al. Effects of urban street trees on human thermal comfort and physiological indices: a case study in Changchun city, China. J. For. Res. (2021). doi.org/10.1007/s11676-021-01361-5

Currently, about 28% of all sidewalk miles in the county are shaded.[32] Transit corridor sidewalks have a canopy coverage of 33%, followed by urban area sidewalks at 30%, and exurban/rural area sidewalks at 24%.[33]

Breaking down these area statistics further by the pathway PLOC score, no matter the area, pathways that are more comfortable are also likely to have better tree canopy (Figure 44). For instance, in transit corridors, there is twice as much canopy coverage along a very comfortable pathway as along an undesirable one. Thus, pedestrians walking on narrow sidewalks along higher-speed roads without buffers (see Table 37) are also more likely to be doing so in unshaded conditions.

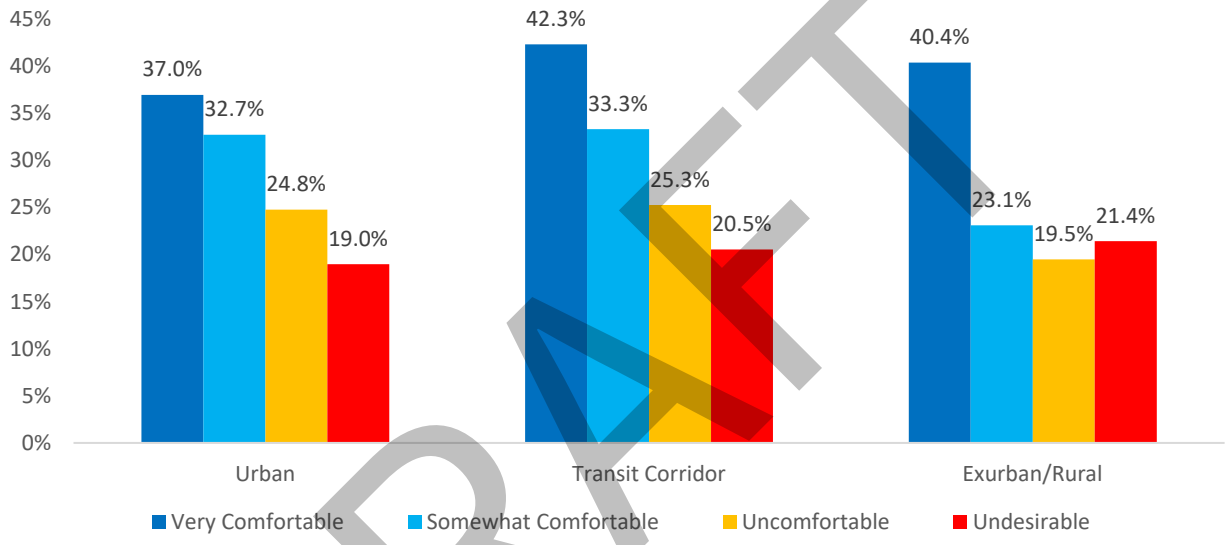


Figure 44: Tree Canopy Coverage by Land Use by PLOC Score

Undesirable pathways are more likely to be along wider, faster roadways like Georgia Avenue or University Boulevard where landscape panels that buffer the sidewalk (if they exist at all) may not be sufficiently wide or have enough soil volume to support the growth of canopy trees. Table 46 shows that canopy coverage tends to be greater along pedestrian pathways with wider buffers. Pathways with at least a six-foot buffer have nearly twice the canopy coverage as those without buffers.

[32] To estimate the percentage of county sidewalks shaded with trees, Montgomery Planning overlayed the Pedestrian Level of Comfort pathway linework and tree canopy cover data. While shade from buildings is also important, data were not readily available at the countywide level.

[33] These are general averages and do not represent full shade conditions, tree size or health, density of cover, and street orientation, which significantly affect temperature reductions and cooling effect. Additionally, the tree-canopy cover GIS maps used indicate the amount of shade cast on the sidewalk at noon is significantly greater than other times of the day when the sun's angle casts different tree-canopy shadow shade.

Table 46. Canopy Coverage by Buffer Width

Buffer Width	Canopy Coverage
None	22.2%
Less than Six Feet	30.1%
Six Feet or More	39.5%

Communities within EFAs have less canopy coverage than their non-EFA counterparts along the less-comfortable roads ("somewhat comfortable" through "undesirable") in urban and transit corridor areas, as shown in Figure 45. For example, somewhat comfortable pathways in EFAs in urban areas have 5.7% less canopy coverage than in urban areas in non-EFAs. In transit corridor areas, these same pathways have 5.4% less coverage.

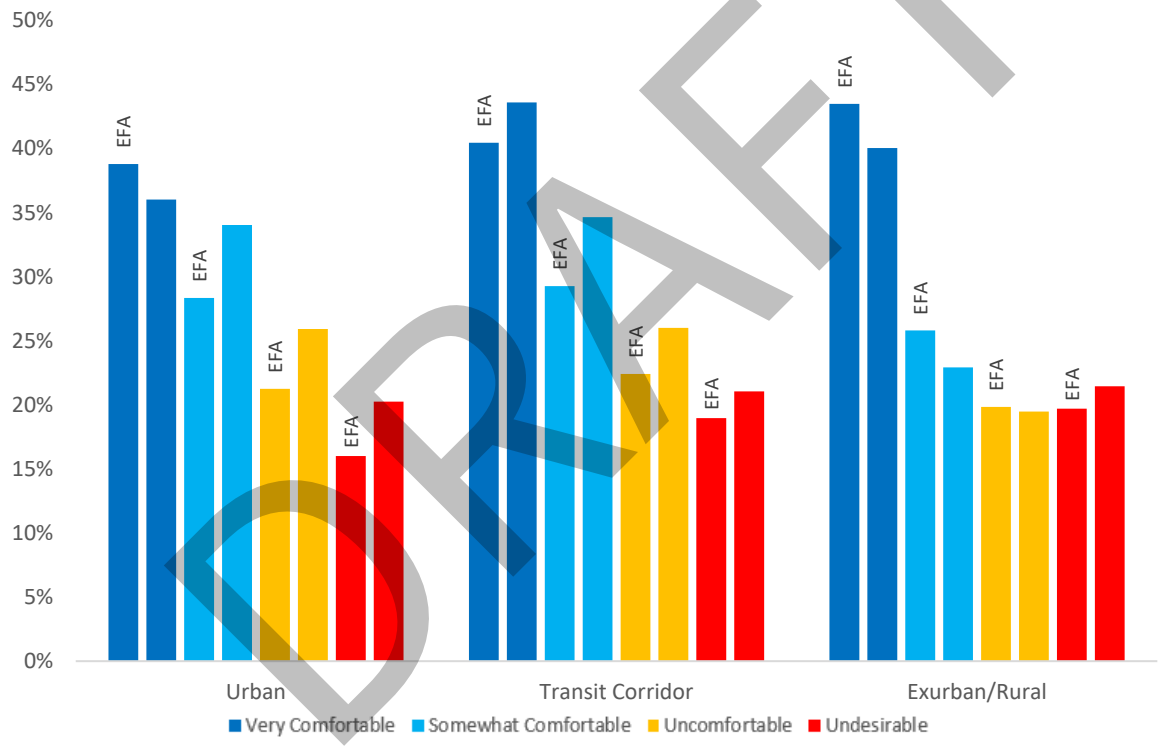


Figure 45: Canopy Coverage by Land Use by EFA

Pedestrian Safety

Through its 2016 Vision Zero resolution, Montgomery County committed to eliminating traffic fatalities and severe injuries.[34] This commitment represented the beginning of a fundamental change in how the county plans and designs roads, shifting from a focus on maximizing motor vehicle efficiency to ensuring that the transportation system is safe for all, regardless of travel mode. Vision Zero recognizes that people will sometimes make mistakes and that roads should be designed to ensure those inevitable mistakes do not result in severe injuries or fatalities.

This section describes Montgomery County pedestrian crash trends between 2015 and 2020 by examining different factors, including where and when crashes occurred. Data for this section originally comes from the Montgomery County Open Data Portal unless otherwise noted. The location of specific crashes have been adjusted to better reflect their location based on the information provided. Additionally, manual changes to crash severity and crash type have been implemented to correct errors in the underlying data.

Pedestrian Crashes by Severity

While users of all transportation modes suffer fatalities and severe injuries, pedestrians are particularly vulnerable. Figure 46 shows pedestrians were only involved in 4% of total crashes between 2015 and 2020, but they accounted for 27% of severe injuries and fatalities. Pedestrian crashes disproportionally result in severe injuries and fatalities because while motor vehicles provide drivers and passengers protection from crashes, pedestrians do not have similar protection. A collision between vehicles may result in minor injuries to passengers, but a crash involving a pedestrian is more likely to result in a severe injury or a fatality.

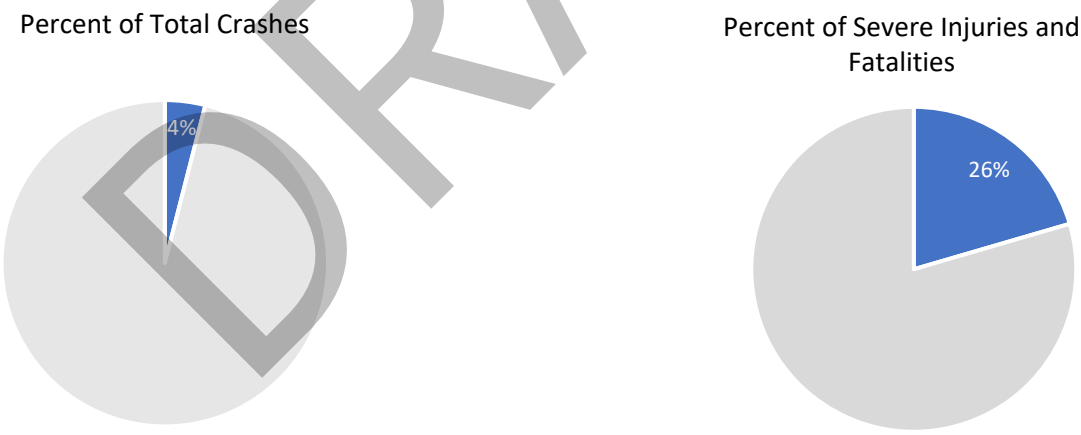


Figure 46: Pedestrian Crashes as a Percent of Total Crashes and Severe Injuries and Fatalities

Note: Data includes crashes in Rockville and Gaithersburg.

[34] "Resolution to adopt Vision Zero in Montgomery County and urge the State of Maryland to also adopt Vision Zero." Montgomery County Council. February 2, 2016. montgomerycountymd.gov/COUNCIL/Resources/Files/res/2016/20160202_18-390.pdf

Speed is a factor in pedestrian crash severity. While 30% of crashes involving pedestrians on streets with a posted speed limit of 45-mph or higher result in a severe injury or fatality, only 11% of crashes on streets with a 25-mph posted speed limit result in a severe injury or fatality (Figure 47).

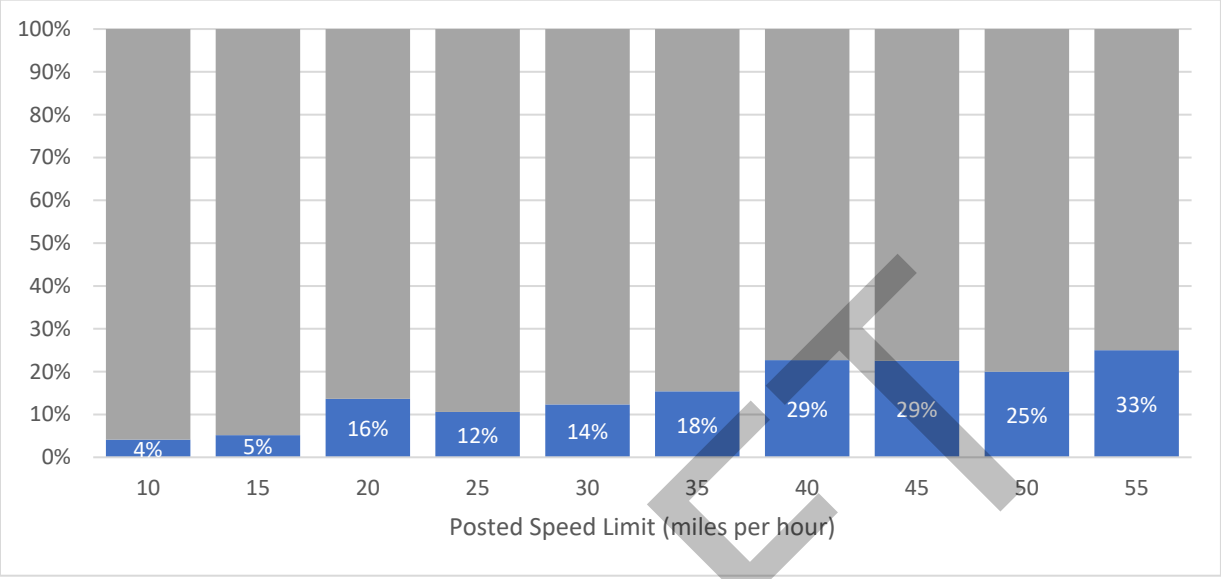


Figure 47: Percent of Pedestrian Crashes Resulting in a Severe Injury or a Fatality by Speed Limit

Note: Data include crashes in Rockville and Gaithersburg.

Crash Location

Crashes occur at different rates on different types of streets and in different land use contexts throughout the county. This section explores crash trends to identify where pedestrian crashes occur and where they result in severe injuries and fatalities.

Figure 48 depicts roadway mileage, pedestrian crashes, and pedestrian fatalities and severe injuries by land use type. While over half (54%) of the roadway miles in the county are in exurban/rural areas, these areas only comprise 11% of pedestrian crashes and 12% of pedestrian severe injuries or fatalities. In contrast, urban areas only comprise 21% of roadway miles, while making up about two thirds of pedestrian crashes (68%) and pedestrian severe injuries and fatalities (62%).

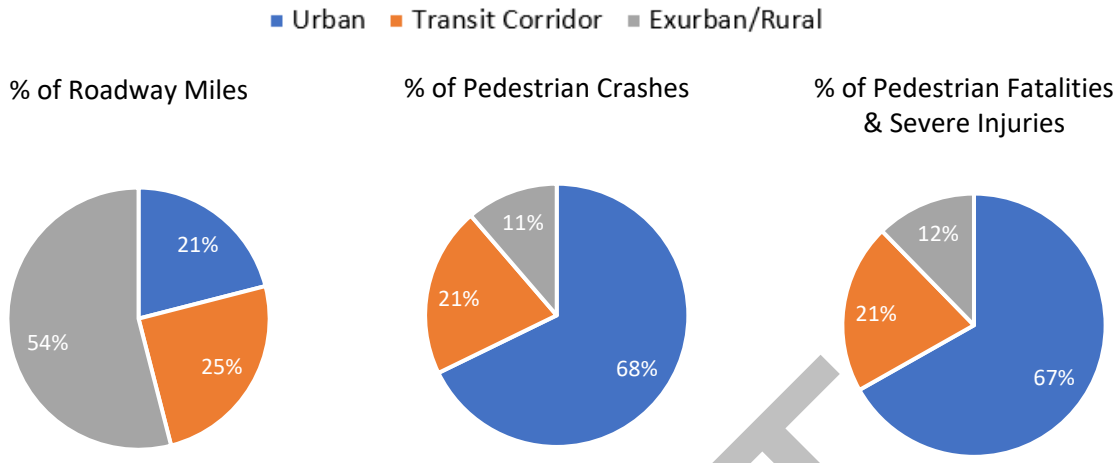


Figure 48: Pedestrian Crashes by Area Type

Note: Data include crashes in Rockville and Gaithersburg.

While data are not available to indicate whether low-income residents of color are disproportionately impacted by pedestrian crashes, Figure 49 shows that streets in EFAs have higher crash rates. While EFAs contain only 14% of roadway miles in the county, they account for 41% of all pedestrian crashes and 45% of pedestrian crashes that result in a fatality or severe injury. Additionally, Black Montgomery County residents had an emergency room admission rate for motor vehicle crashes 136% higher than Asian/Pacific Islander residents and 104% higher than white, non-Hispanic residents.[35]

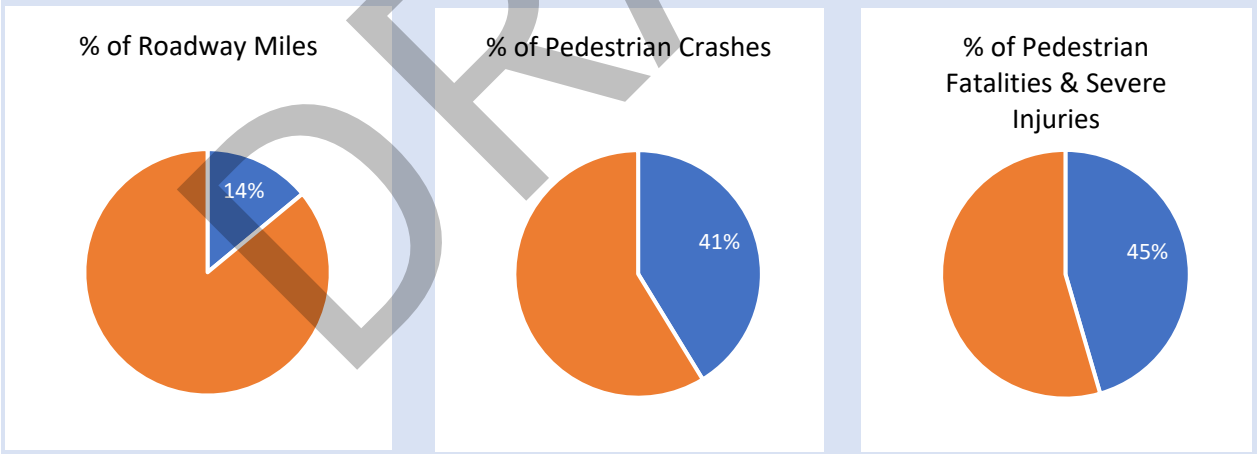


Figure 49: Pedestrian Crashes in Equity Focus Areas

Note: Data include crashes in Rockville and Gaithersburg.

Beyond land use types, the safety analysis zooms into the specific locations and street types where crashes occur. Table 47 shows that pedestrian crashes along a street (rather than at an intersection) are disproportionately likely to result in a severe injury or fatality. At the same time, while 19% of

[35] Montgomery County Vision Zero Action Plan, FY 22-23 Work Plan, 2021.

pedestrian crashes happen in parking lots, they are less likely to be severe or fatal. The difference between these two crash types may be due to motor-vehicle speed, as motor vehicles are likely traveling faster when they collide with pedestrians along street segments than in parking lots.

Table 47. Pedestrian Crashes by Location

Location	Percent of Pedestrian Crashes	Percent of Pedestrian Severe Injuries and Fatalities (KSI)
Signalized Intersection	21%	20%
Stop-Controlled Intersection	5%	4%
Uncontrolled Intersection	20%	23%
Along a Street	27%	38%
Off-road	5%	2%
Parking Lot	19%	10%
Driveway	4%	3%
Total	**100%**	**100%**

Note: Data include crashes in Rockville and Gaithersburg.

There is no meaningful difference between the crash locations in Table 47 based on whether they are in an EFA.

Higher classification roads such as controlled major highways and major highways, as well as business streets, disproportionately account for pedestrian crashes resulting in severe injuries or fatalities. Table 48 shows that while controlled major highways, major highways, and business streets make up 8% of roadway mileage, they account for 57% of pedestrian crashes and 63% of pedestrian severe injuries and fatalities.

Table 48. Pedestrian Crashes by Roadway Type

Street Classification	Percent of Roadway Miles	Percent of Pedestrian Crashes	Percent of Pedestrian Severe Injuries and Fatalities (KSI)
Controlled Major Highway	1%	3%	5%
Major Highway	5%	33%	40%
Parkway	0%	0%	0%
Arterial	8%	11%	11%
Minor Arterial	2%	5%	3%
Business	2%	21%	18%
Primary Residential	7%	16%	15%
Industrial	0%	1%	0%
Country Arterial	2%	0%	0%
Country Road	1%	0%	0%
Rustic & Exceptionally Rustic	6%	0%	1%
Local	67%	10%	8%
Total	**100%**	**100%**	**100%**

Breaking the same data down by area type (Table 49), it is clear the majority of the pedestrian severe injuries and fatalities (KSI) along those roads occur in urban areas. For instance, even though 0.4% of total roadway miles are controlled major highways in urban areas, those roads account for 4% of total pedestrian KSI countywide. Similarly, urban major highways represent 2% of total roadway mileage but account for 25% of pedestrian KSI countywide. The relationship is similarly disproportionate for business and primary residential streets.

Table 49. Pedestrian KSI by Area Type by Roadway Type

	Urban		Transit Corridor		Rural		Total	
Street Classification	**% Roadway Mileage**	**% KSI**	**% Roadway Mileage**	**% KSI**	**% Roadway Mileage**	**% KSI**	**% Roadway Mileage**	**% KSI**
Controlled Major Highway	0.4%	4%	0.2%	1%	0.1%	0%	0.6%	5%
Major Highway	2.0%	26%	1.3%	9%	1.8%	4%	5.0%	40%
Arterial	1.8%	6%	1.2%	3%	4.7%	2%	7.7%	11%
Country Arterial	0.0%	0%	0.0%	0%	1.8%	0%	1.8%	0%
Minor Arterial	0.5%	2%	0.6%	1%	0.5%	0%	1.5%	3%
Business	1.6%	18%	0.0%	0%	0.0%	0%	1.6%	18%
Country Road	0.0%	0%	0.0%	0%	1.1%	0%	1.1%	0%
Industrial	0.0%	0%	0.1%	0%	0.1%	0%	0.2%	0%
Parkway	0.0%	0%	0.1%	0%	0.2%	0%	0.3%	0%
Local	13.6%	4%	19.4%	2%	34.3%	1%	67.4%	8%
Primary Residential	1.3%	7%	1.9%	5%	3.7%	3%	6.8%	15%
Exceptional Rustic Road	0.0%	0%	0.0%	0%	1.3%	0%	1.3%	0%
Rustic Road	0.1%	0%	0.1%	0%	4.6%	1%	4.7%	1%

Crashes by Time of Day and Lighting Conditions

Time of day is also an important factor when it comes to pedestrian-involved crashes. As shown in Figure 50, most crashes occur during the day, peaking during the evening rush hour.

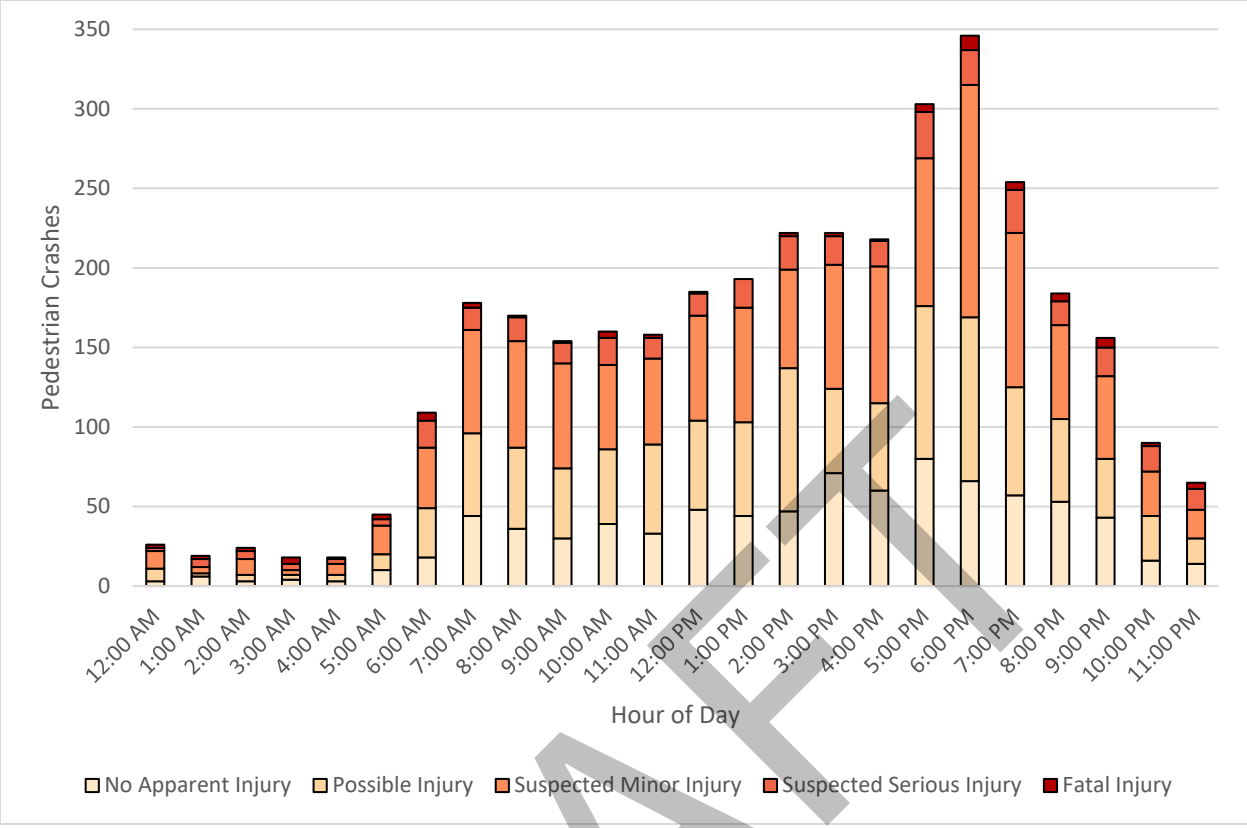


Figure 50: Pedestrian Crashes by Time of Day

Note: Data include crashes in Rockville and Gaithersburg.

While fewer pedestrian crashes occur in the overnight hours, those crashes are more likely to result in severe or fatal injuries (Figure 51). For instance, while 11% of pedestrian crashes between 6:00 a.m. and 9:59 p.m. are severe or fatal, that percentage jumps to 24% between 10:00 p.m. and 5:59 a.m. In addition to increased vehicle speeds common at night due to reduced congestion and lighting-related visibility issues, impairment may also play a role in the increased likelihood of fatal and severe crashes during these time periods.

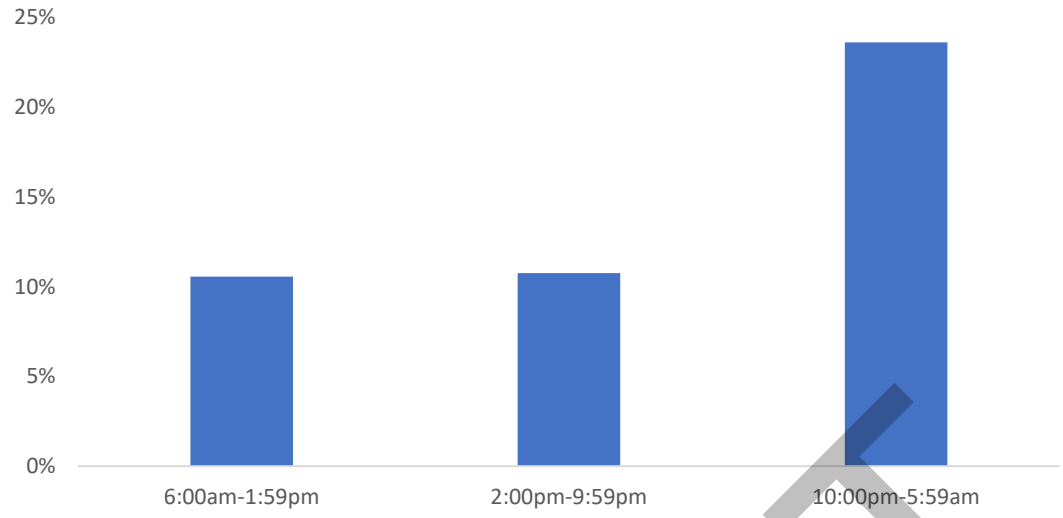


Figure 51: Crashes Resulting in KSI as a Percentage of All Pedestrian Crashes by Time of Day

Note: Data include crashes in Rockville and Gaithersburg.

Lighting conditions are related to pedestrian crashes. During the months with longer nights, the number of pedestrian crashes increases. As shown in Figure 52, while the number of daylight pedestrian crashes tends to be higher during months with more daylight hours, there is a noticeable jump in pedestrian crashes occurring in darkness beginning in October and ending in February when there are fewer hours of daylight. In fact, in November, December, and January, the majority of pedestrian crashes take place when it is dark outside. Most of these nighttime crashes take place in areas with existing streetlights. Perhaps it is because there is more street lighting in places with greater pedestrian volumes or that the existing lighting does not provide sufficient illumination to ensure pedestrians and drivers are visible to each other.

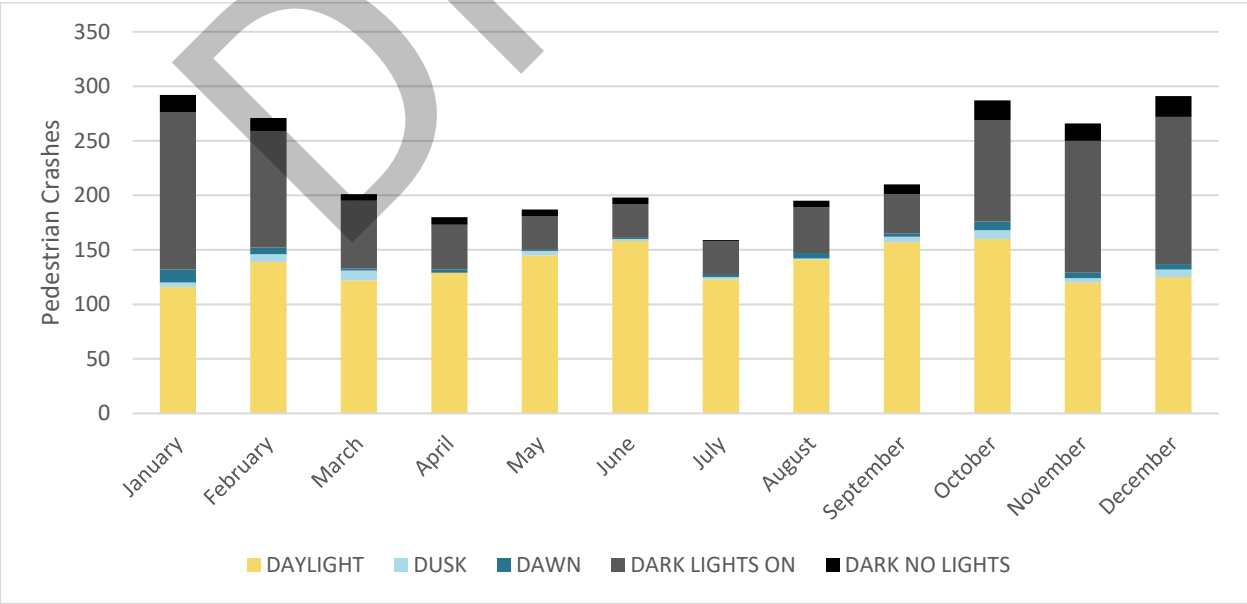


Figure 52: Pedestrian Crashes by Lighting Conditions

Note: Data include crashes in Rockville and Gaithersburg.

Knowledge of Traffic Laws

Knowledge of traffic laws specifically focused on pedestrian behavior is mixed. As part of the Countywide Pedestrian Survey, participants were asked to decide whether statements about traffic laws were true or false. Table 50 includes the survey questions and the portion of respondents who responded correctly to the prompt. While over 90% of respondents answered questions about driver responsibilities correctly, respondents answered questions about pedestrian responsibilities correctly only between 33% and 51% of the time. This is concerning, as creating an environment where motorists know where to expect pedestrians to be crossing the street influences their readiness to stop or yield to pedestrians. The lack of understanding about where pedestrians are permitted to cross the street may be a factor in pedestrian crashes and perpetuates the motor vehicle's perceived dominance over the shared transportation system.

Table 50. Knowledge of Traffic Laws

Survey Questions (True or False)	% Correct
Drivers must stop for pedestrians in crosswalks (TRUE)	98%
It's okay to pass a vehicle that has stopped for a pedestrian at an intersection, as long as there is no marked crosswalk present (FALSE)	90%
It's okay for vehicles to stop in the crosswalk at a traffic light (FALSE)	90%
If a driver is turning right on red, they must yield to pedestrians crossing the perpendicular street (TRUE)	98%
It is a driver's responsibility to ensure they are not looking at their phone or distracted while driving (TRUE)	98%
Unmarked crosswalks exist at every corner where the side street has a sidewalk and where painted lines or other markings do not exist to mark the crossing (TRUE)	51%
Pedestrians must only cross the street in marked crosswalks (FALSE)	33%
If there are two intersections in close proximity, and one has a signal and the other doesn't, pedestrians must cross the street at the intersection with a signal (FALSE)	33%

An Equitable and Just Pedestrian Network

The fourth goal of the draft Pedestrian Master Plan addresses racial equity and social justice. In 2019, the Montgomery County Council passed Bill 27-19 to establish a racial equity and social justice program. The bill amended County Code Section 33A-14 and requires the Planning Board to "consider the impact of the plan on racial equity and social justice in the county."

Addressing equity and social justice first requires understanding the disparities that exist around pedestrian issues. Throughout the existing conditions chapter, the analysis and results have been supplemented with data about how specific topics pertain to historically disadvantaged people and areas of the county. The equity findings described throughout the previous sections are summarized below.

Walking Rates and Satisfaction

- **Overall and commute walking rates are higher in EFAs:** Residents in EFAs make 9.6% of trips by walking compared with 7.0% of trips by walking in non-EFAs. The share of commute trips by walking is only slightly greater in EFAs (1.9%) than non-EFAs (1.8%).
- **Walk-to-school rates are slightly higher for Title I/Focus and high FARMS rate schools:** Students at designated schools have walk mode shares to and from school of 13% and 17% respectively, compared with 11% and 15% arrival and departure walk shares for non-designated schools. Many of the schools with the highest walking rates are schools designated as Title I/Focus or high FARMS rate schools.
- **Travelers with disabilities are more likely to make utilitarian pedestrian trips:** In fact, respondents with disabilities are twice as likely as others to walk to a medical appointment (35% to 17%) and significantly more likely to walk to the grocery store (67% to 50%) and to dine at restaurants (32% to 24%).
- **Pedestrian satisfaction is lower for people with reported disabilities:** Only 43% of pedestrians with reported disabilities are satisfied with their overall pedestrian experience, compared with 53% of respondents without reported disabilities. Respondents in transit corridors and exurban/rural are less satisfied if they report having a disability (33% and 36%, respectively) than respondents without reported disabilities (52% and 47%, respectively).

A Comfortable, Connected, Convenient Pedestrian Network

- Crossing comfort accessing community destinations tends to be worse in EFAs, while pathway comfort is better.
- Title I/Focus elementary schools have more comfortable access than their more affluent counterparts. Pathway comfort for Title I/Focus Schools is 10% greater than it is for other elementary schools (60% vs. 50%). Crossing comfort is 11% greater (50% vs. 39%).
- Less comfortable pathways in urban and transit corridor EFAs have less tree-canopy coverage than similar pathways outside EFAs. "Somewhat comfortable" pathways in EFAs in urban areas have 5.7% less canopy coverage than non-EFAs. In transit corridor areas, these same pathways have 5.4% less coverage. Generally, people traveling along less comfortable sidewalks in EFA communities will experience higher temperatures as a result of climate change than will people in other parts of the county.

Pedestrian Safety

- Crashes and injuries are overrepresented in EFAs. While EFAs contain only 14% of roadway miles in the county, they account for 41% of all pedestrian-involved vehicular crashes and 45% of such crashes that result in a fatality or severe injury.

Appendix D: Bicycle Monitoring Report Attachment


THE BICYCLE MASTER PLAN
Biennial Monitoring Report
2021 - 2022
DRAFT
Montgomery Planning

Abstract

This report meets the 2018 *Bicycle Master Plan* requirement for a biennial monitoring report and provides recommendations to the Planning Board and County Council for implementing the vision of the plan. It evaluates progress made in advancing the goals and objectives of the plan as well as recommendations for bikeways and bicycle parking, and bicycle-supportive programs and policies.

Sources of Copies

The Montgomery County Planning Department
The Maryland-National Capital Park and Planning Commission
2425 Reedie Drive
Wheaton, MD 20902

Online at
https://montgomeryplanning.org/bikeplan

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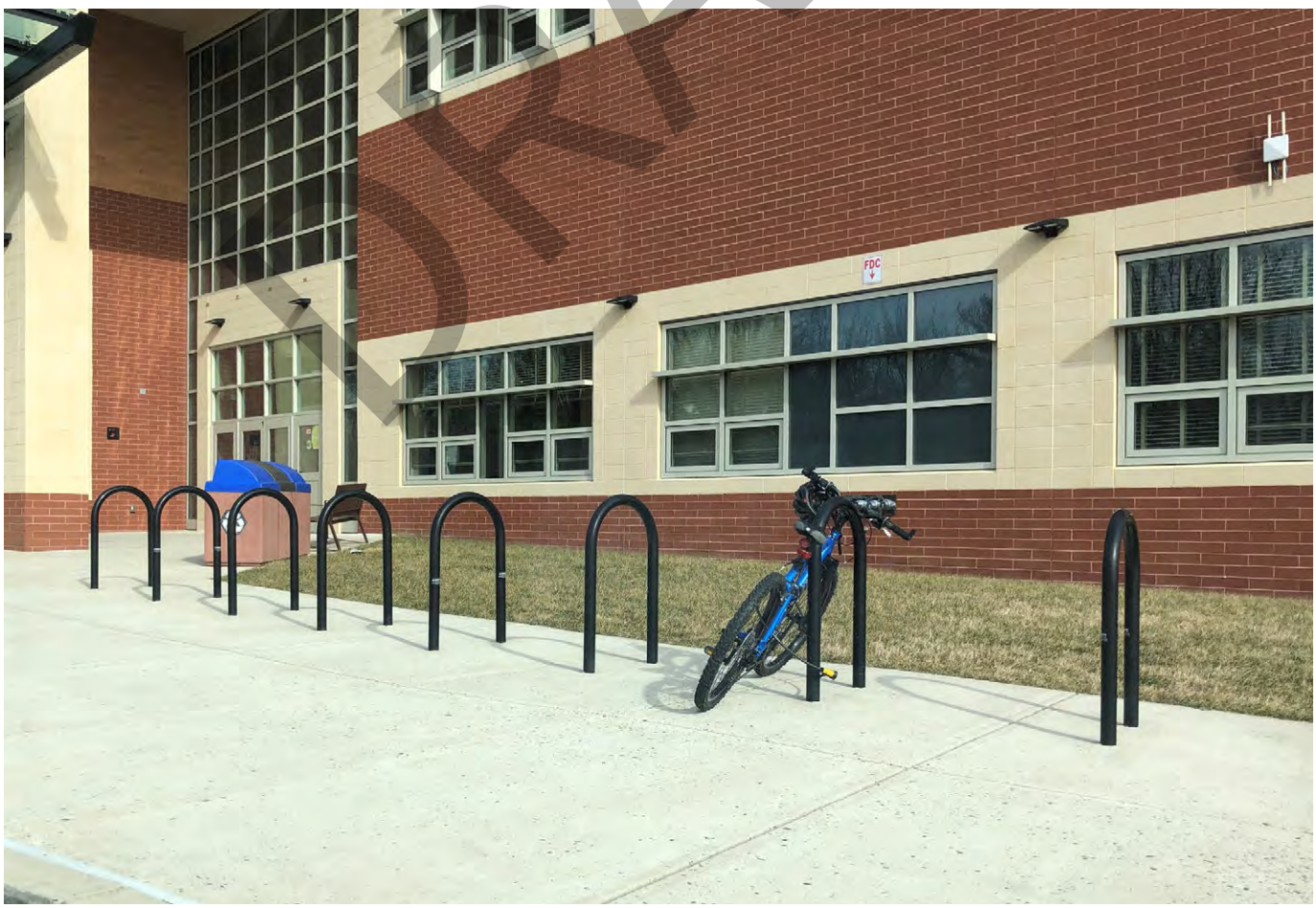
1 INTRODUCTION

The COVID-19 pandemic fundamentally changed how people travel and recreate. Due to unprecedented challenges resulting from efforts to control the spread of the virus, more and more people took to bicycling and walking for physical activity and travel. In response, Montgomery Parks launched the Open Roadways Initiative, and the Montgomery County Department of Transportation (MCDOT) created its Shared Streets program to promote bicycling and walking. But the county's efforts didn't stop there. In fact, substantial efforts by MCDOT, Montgomery Parks, the Planning Department and developers continued to advance implementation of the *Bicycle Master Plan*. This report summarizes those efforts during 2021 and 2022.

Over the past two years, several of the recommendations in the *Bicycle Master Plan Biennial Monitoring Report, 2019 – 2020*, have advanced, including the following bikeway projects that are funded for design:

- Cherry Hill Road Separated Bike Lanes
- Cedar/Bonifant/Grove/Sligo/Woodbury Neighborhood Greenway
- Grandview/Mason Neighborhood Greenway
- Grandview (Arcola to Blueridge) Neighborhood Greenway
- Greenwood (Piney Branch to Wabash) Neighborhood Greenway
- Greenwood (Wabash to Division) Neighborhood Greenway



2 Background

What is Low-Stress Bicycling?

A low-stress bicycling network is one that is comfortable and safe for people of all ages and bicycling abilities. Low-stress bicycling reflects the context of the road. For example, low-stress bikeways include sidepaths with wide buffers from the street along high-volume and high-speed suburban highways, separated bike lanes on downtown streets, and bicycling in the road on very low-volume and low-speed residential streets.

The *Bicycle Master Plan* sets forth a transformative vision for transportation in Montgomery County, encouraging people of all ages and bicycling abilities to meet their daily needs by bicycle. The Plan envisions a community where bicycling to work, stores, schools and transit or going for a leisurely ride on the weekend is so embedded in our way of life that bicycling becomes an integral mode of transportation in the daily lives of the county's residents. The *Bicycle Master Plan* creates a framework for this transformation, with recommendations to build an extensive network of low-stress bikeways connecting the county's downtowns and town centers, transit stations and public facilities and a plethora of secure and convenient bicycle parking, and bicycle-supportive programs and policies.

The *Bicycle Master Plan* paves the way for safe, comfortable, and accessible bicycling throughout Montgomery County. Appropriate bikeways are recommended in response to the amount of stress people experience bicycling on each street type. On busy streets, bicyclists will have dedicated space separated from traffic. On residential streets, they will be able to comfortably share the road. Between downtowns and town centers, people will be able to travel comfortably and efficiently on a "breezeway network," where faster moving bicyclists are able to travel with fewer delays, and where all users – including slower moving bicyclists and pedestrians – can safely and comfortably coexist. In rural areas of the county, a network of bikeable shoulders is recommended for recreational bicyclists who prefer to ride on the road.

Recognizing that providing a comfortable bicycling network is insufficient if people do not have secure places to store their bicycles at their destinations, the Plan also recommends an extensive supply of bicycle parking. This includes short-term bicycle parking provided with "U" racks at public facilities, such as parks, libraries, recreational centers, and short-term bicycle parking serving commercial areas. It also includes long-term bicycle parking provided in bicycle rooms and bicycle cages for residents, students, employees, and others who store their bicycles for several hours or longer. Long-term bicycle parking in secure bicycle parking stations within or directly adjacent to transit stations, including all Red Line stations and the higher-demand MARC, Purple Line, and U.S. 29 FLASH stations, is also recommended.

The *Bicycle Master Plan* also recommends bicycle-supportive programs and policies. Programmatic recommendations include dedicated funding programs for specific needs, such as neighborhood greenways and a bicycle parking program, teaching children how to bicycle in public school and a BikeMontgomery outreach program to encourage bicycling. It also includes legal and policy recommendations, such as updating the county's road design standards, updating the bicycle parking provisions in the zoning code, and consolidating driveways along bikeways.

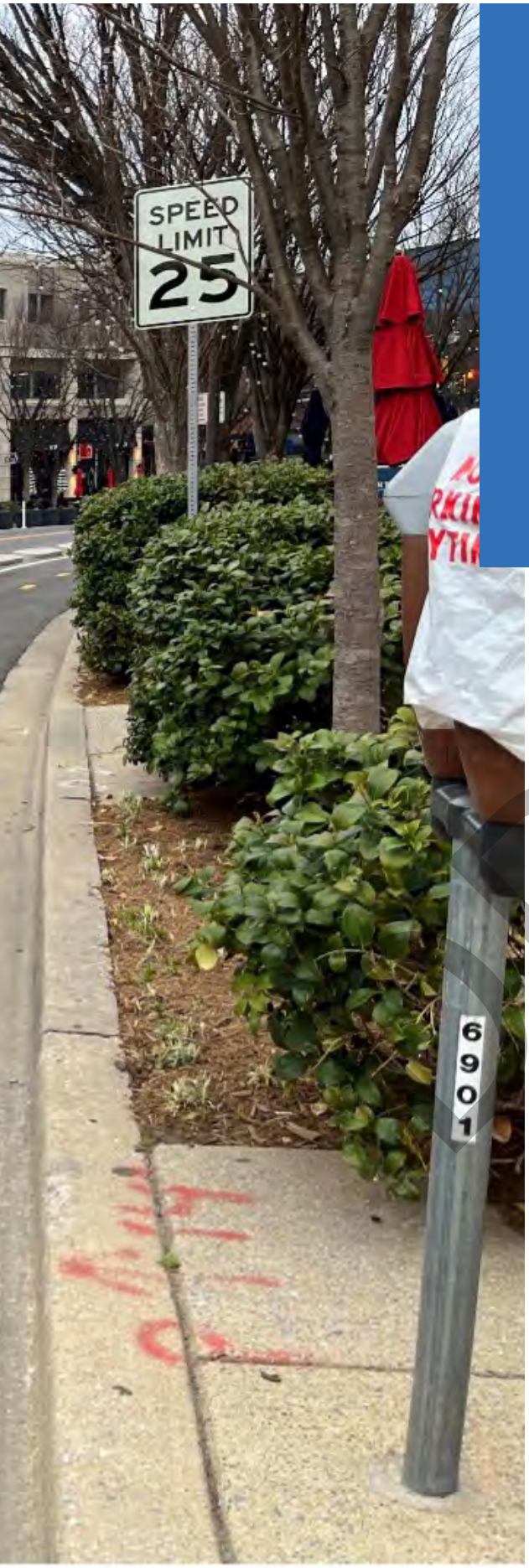
To ensure transparency and accountability of implementation, the Plan requires the Planning Department to produce a biennial monitoring report to track how well the vision of the Plan is being fulfilled. The report is reviewed by the Planning Board and approved by the County Council. This report includes six main sections:

- Goals and Objectives
- Bikeways
- Bicycle Parking
- Bicycle-Supportive Programs
- Bicycle-Supportive Legal and Policy Framework
- Recommendations

The appendix of this document provides a detailed evaluation of metrics and the status of bikeway projects.

3

Goals & Objectives



The *Bicycle Master Plan* envisions a future where Montgomery County is a world-class bicycling community in which everyone will be able to travel by bicycle on a comfortable, safe, and connected bicycling network. This vision is defined by four goals. The first goal measures the results – whether more people are bicycling. The other goals measure the process and represent things that can be done to improve the chance that the first goal is advanced. The four goals are:

- **Goal 1: Increase Bicycling Rates in Montgomery County**
- **Goal 2: Create a Highly Connected, Convenient and Low-Stress Bicycling Network**
- **Goal 3: Provide Equal Access to Low-Stress Bicycling for all Members of the Community**
- **Goal 4: Improve the Safety of Bicycling**

Defining a vision for the *Bicycle Master Plan* does not simply mean stating the goals on paper. It also lays the foundation for a comprehensive monitoring program, which supports the implementation of the Plan by providing an ongoing assessment of how effective Montgomery County is in meeting the Plan's goals and objectives over time. This section of the report discusses the extent to which each of the four goals in the *Bicycle Master Plan* have advanced over the past two years. Table 3 compares the results of each metric every two years with targets that were established in the Plan. A detailed discussion of each of the metrics is included in the *Bicycle Master Plan.*

A note about rounding: The metrics reported in this document are rounded, which means that in some instances the results may appear to be off by 1%.

3.1 GOAL 1 | Increase Bicycling Rates in Montgomery County

One of the most important measures of success for the *Bicycle Master Plan* is the increase in bicycling in Montgomery County. The objectives for Goal 1 evaluate how bicycling increases over time among different groups of people, destinations, and trip types. Success in advancing this goal is largely driven by success in advancing the other three goals of the Plan, as well as the program and policy recommendations in the Plan.

Bicycling rates are likely to have been heavily impacted by the COVID-19 pandemic and may not provide a reliable measure of the bicycling rates in the county. On the one hand, the surge in teleworking and temporary virtual schooling reduced daily trips, especially commute trips and trips to school, which are the most likely type of trips to be made by bicycling. On the other hand, health-related restrictions on gatherings coupled with supportive programs like Montgomery Park's Open Roadways Initiative and MCDOT's Shared Streets program increased recreational bicycling.

The Percentage of Residents who Commute by Bicycle (Objective 1.1) remained constant from 2019 to 2021 at 0.5%.

Bicycling Rates to the Transportation Management Districts (Objective 1.2) were collected during thr fall of 2022, and compared to 2020, show a slight increase in bicycle travel to downtown Bethesda (from 0.8% in 2020 to 1.4% in 2022), Friendship Heights (from 0.4% in 2020 to 0.6% in 2022), Greater Shady Grove (from 0.0% in 2020 to 0.1% in 2022) and North Bethesda (from 0.3% in 2020 to 0.4% in 2022), but a reduction in downtown Silver Spring (from 1.8% in 2020 to 1.6% in 2022). Results were provided in White Oak for the first time and showed a bicycling rate of 0.4%.

Bicycle Rates to Transit (Objective 1.3), collected for the WMATA Metrorail Red Line in the fall of 2022, show that 1.6% of passengers accessed the Red Line by bicycle. While the bicycling rates to Red Line stations remained consistent for many of the stations, the rates grew substantially for the Forest Glen station (1.6% to 4.7%) and dropped at Medical Center (4.5% to 3.4%) and North Bethesda (2.7% to 0.0%).

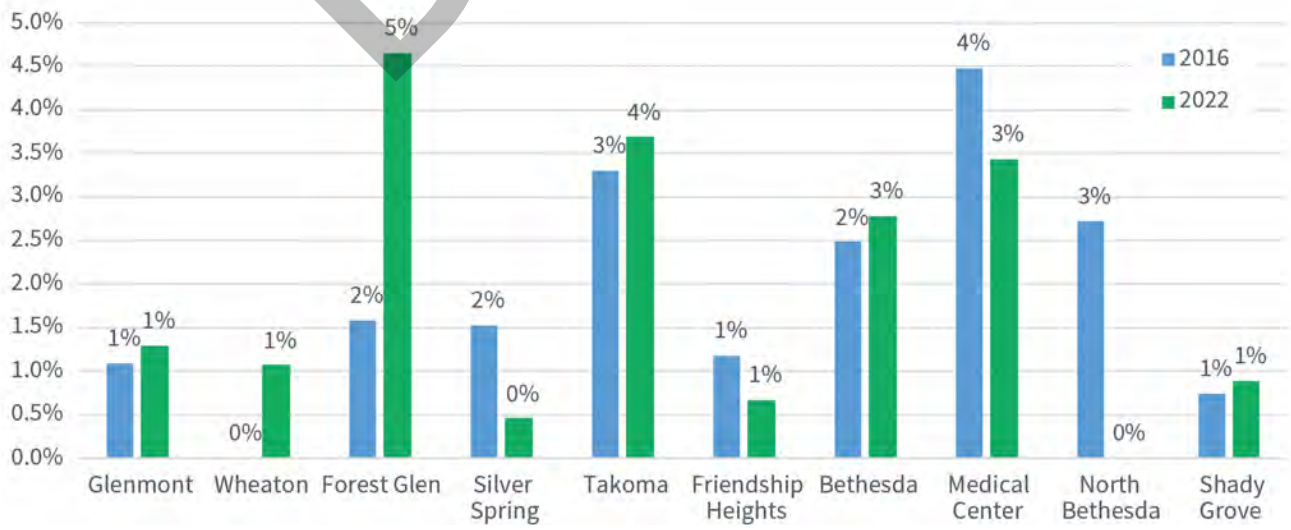


Figure 3: Bicycling Rates to Transit by Station, 2016 and 2022

Source: WMATA Ridership Surveys, 2016 and 2022

No recent surveys were conducted for the MARC Brunswick Line. Bicycling rates to transit by station appear in Appendix A.2.

Bicycle Rates to Schools (Objective 1.4) were last collected in the fall of 2019 and show that bicycling rates were about 2.5% for elementary schools, 1.7% for middle schools and 1.7% for high schools. Plans for a fall 2020 survey were put on hold by the pandemic. Schools with the highest rates of bicycling in fall 2019 include:

- High School: Bethesda-Chevy Chase (11%)
- Middle Schools: Thomas Pyle (8%), Hallie Wells (5%)
- Elementary Schools: Piney Branch (14%), Weller Road (11%), Bradley Hills (9%), Gibbs (9%)

Bicycling rates for each public school can be found in Appendix A.3 (elementary schools), Appendix A.4 (middle schools), and Appendix A.5 (high schools).

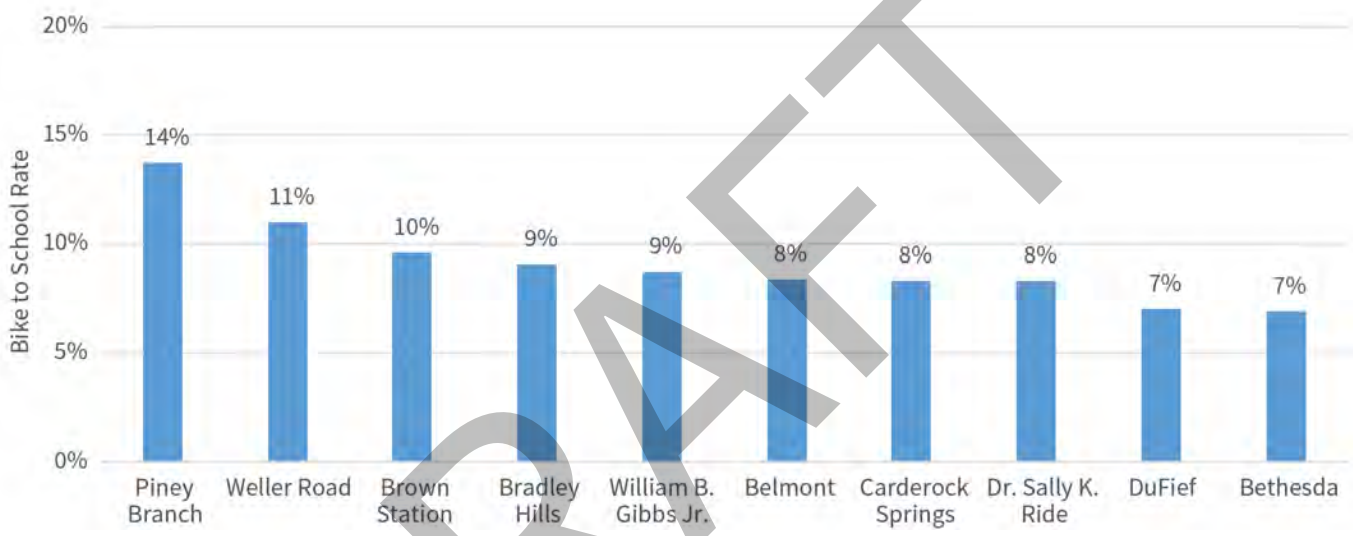


Figure 4: Top 10 Bicycle to Elementary School Rates, 2019

Source: Montgomery County Public Schools, Fall 2019

3.2 Goal 2 | Create a Highly Connected, Convenient, and Low-Stress Bicycling Network

The objectives for Goal 2 capture how well destinations are connected on a low-stress bicycling network. It also evaluates the availability of bicycle parking.

LOW-STRESS BICYCLING METRICS

Bicycling is more likely to become a mainstream mode of transportation in Montgomery County if a low-stress network is developed that enables people to travel by bicycle to the places they want and need to go safely and comfortably. While about 75% of the roads in the county are already low-stress, they are often surrounded by high-speed and high-volume roads or difficult intersections, effectively creating islands of connectivity. Where feasible, reductions in traffic lanes and speeds can link these islands; where infeasible, bicycle infrastructure, such as sidepaths, separated bike lanes and conventional bike lanes, are needed to connect the network. Four metrics evaluate the availability of low-stress bicycling:

- Countywide Connectivity (Objective 2.1)
- Connectivity to Transit Stations (Objective 2.2)
- Connectivity to Public Schools (Objective 2.3)
- Connectivity to Public Facilities (Objective 2.4)

Countywide Connectivity (Objective 2.1) is the overall measure of low-stress connectivity and measures the percentage of potential bicycling trips that will be able to be made on a low-stress bicycling network. This metric grew slightly between December 2020 and December 2022 from 15% to 16%. Upon completion of projects that were under construction in December 2022, this will grow to 17% and with the completion of projects in the capital improvements program or development projects approved in 2021 and 2022, countywide connectivity will grow to 20%.

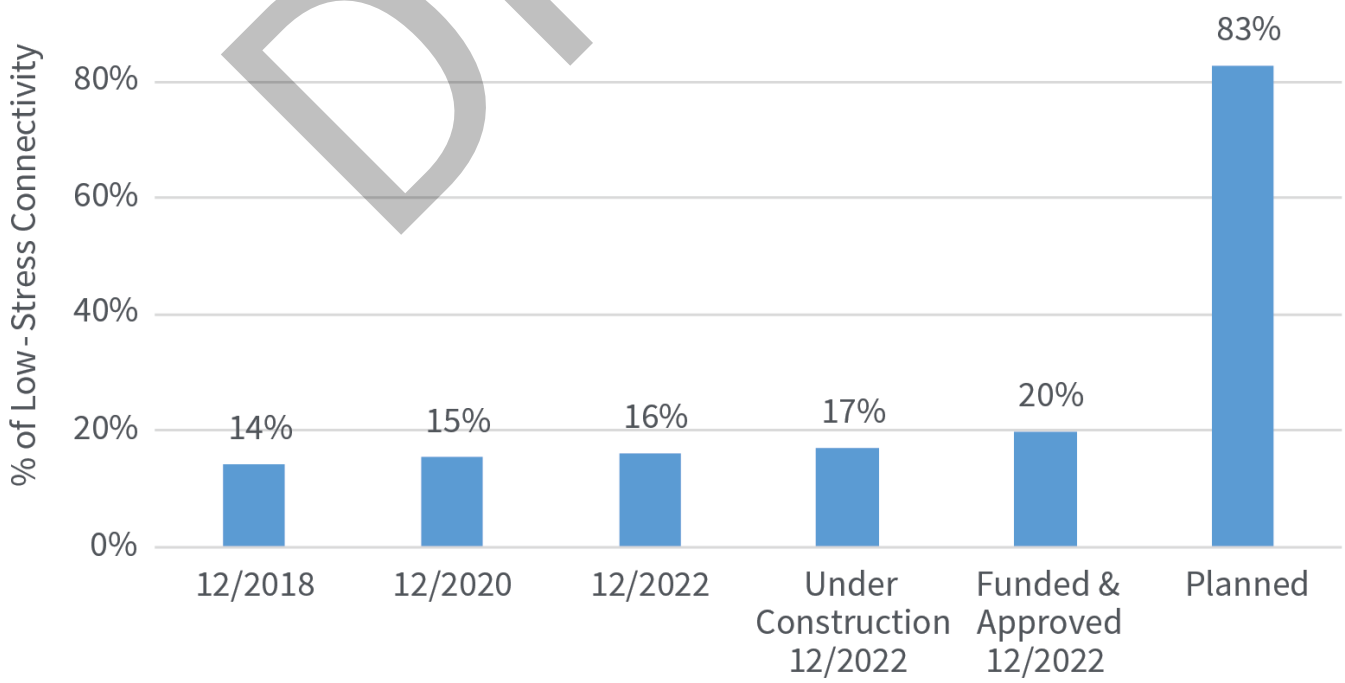


Figure 5: Growth in Countywide Connectivity

The experience of individual policy areas shows greater improvements in some areas of the county. Between December 2020 and December 2022, connectivity to the Clarksburg policy area grew 7%, the Olney policy area grew 4% and the Clarksburg Town Center grew 3%. The following policy areas will experience the largest future growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed:

- Silver Spring CBD will increase 27%, from 7% to 34%
- Clarksburg Town Center will increase 24%, from 27% to 51%
- Chevy Chase Lake will increase 23%, from 4% to 27%
- Lyttonsville will increase 21%, from 29% to 50%

Policy areas with the highest and lowest bicycle connectivity after all projects under construction, funded in the capital budget and conditions of development approval are constructed are shown in Figure 6. Bicycle connectivity rates for each policy area can be found in Appendix A.6. The methodology for evaluating Objective 2.1 is documented in the *Bicycle Master Plan* Appendix E.

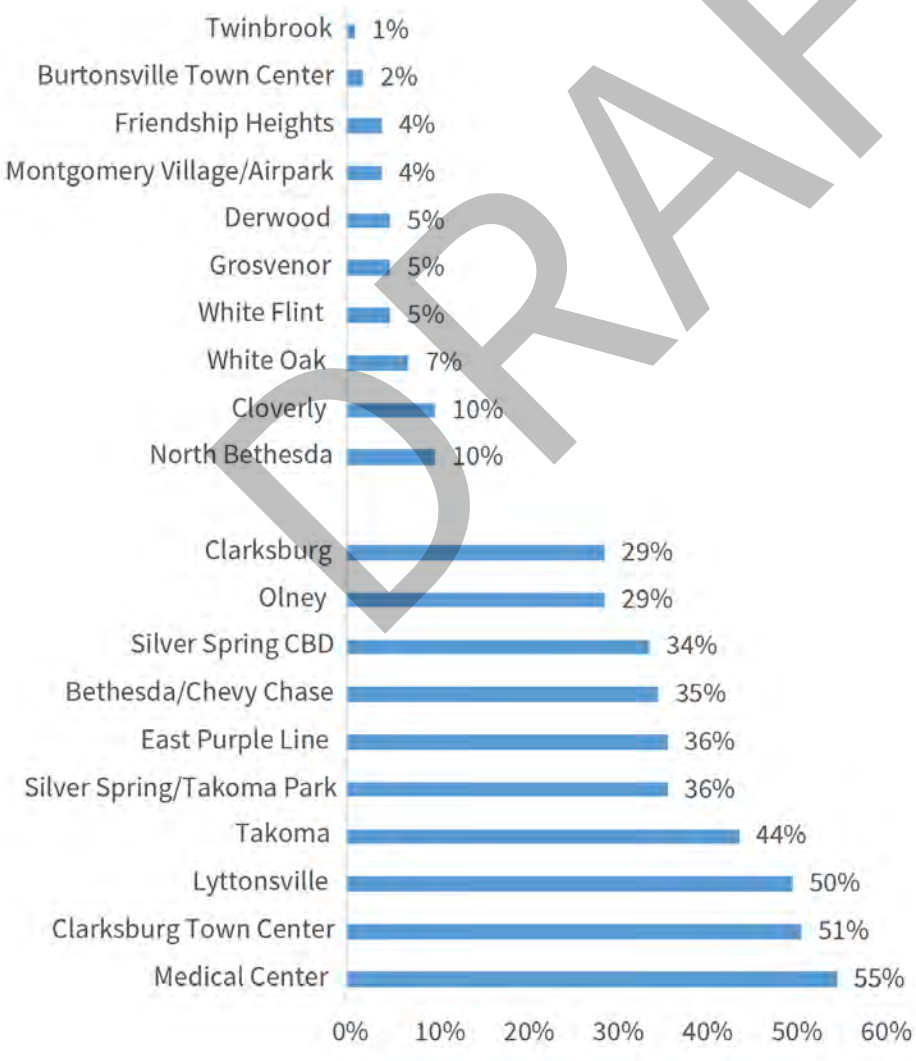


Figure 6: Policy Areas with the Highest and Lowest Bicycle Connectivity including Funded and Approved Projects

Connectivity to Transit Stations (Objective 2.2) evaluates the percentage of dwelling units within two "network distance" miles of each transit station that are connected to the public facility on a low-stress bicycling network. Between December 2020 and December 2022 this metric grew from 3% to 7% for Purple Line stations and remained the same for Red Line stations (10%), MARC stations (14%) and U.S. 29 FLASH stations (6%).

Red Line Stations: Overall, connectivity remained at 10% between December 2020 and December 2022. It will grow to 14% with projects under construction as of December 2022 and to 19% with projects that are funded or conditions of development projects. Between December 2020 and December 2022, connectivity to the Bethesda station grew 2%. These Red Line stations will experience the largest future growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed:

- Silver Spring station will increase 31%, from 4% to 35%, due to the completion of the Capital Crescent Trail project and the Silver Spring Green Trail project, and with the future construction of the Metropolitan Branch Trail, Fenton Street cycle track and Dixon Lane separated bike lanes.
- Takoma station will increase 17%, from 22% to 39% due to the completion of the Metropolitan Branch Trail.
- Bethesda station will increase 17%, from 2% to 19% due to the completion of the Capital Crescent Trail (Phase 1) and the Montgomery Avenue/Montgomery Lane Separated Bike Lanes (Phase 1 and 2A) and the future construction of the Montgomery Avenue/Montgomery Lane Separated Bike Lanes (Phase 2C), the Capital Crescent Trail Tunnel, the Capital Crescent Surface Trail (Phase 2), the Woodmont Avenue Cycle Track (Phase 2), the Cheltenham Separated Bike Lanes and the Battery Lane Separated Bike Lanes (to be constructed by the Battery District development project).
- Medical Center station will increase 10%, from 23% to 33% due to improvements to the Jones Bridge Road shared use path and future construction of the Battery District development project.

Low-stress bicycle connectivity to Red Line stations after all projects under construction, funded in the capital budget and conditions of development approval are constructed are shown in Figure 7.

Brunswick Line Stations: Overall, connectivity remained unchanged at 14% between December 2020 and December 2022. It will grow to 20% with projects under construction as of December

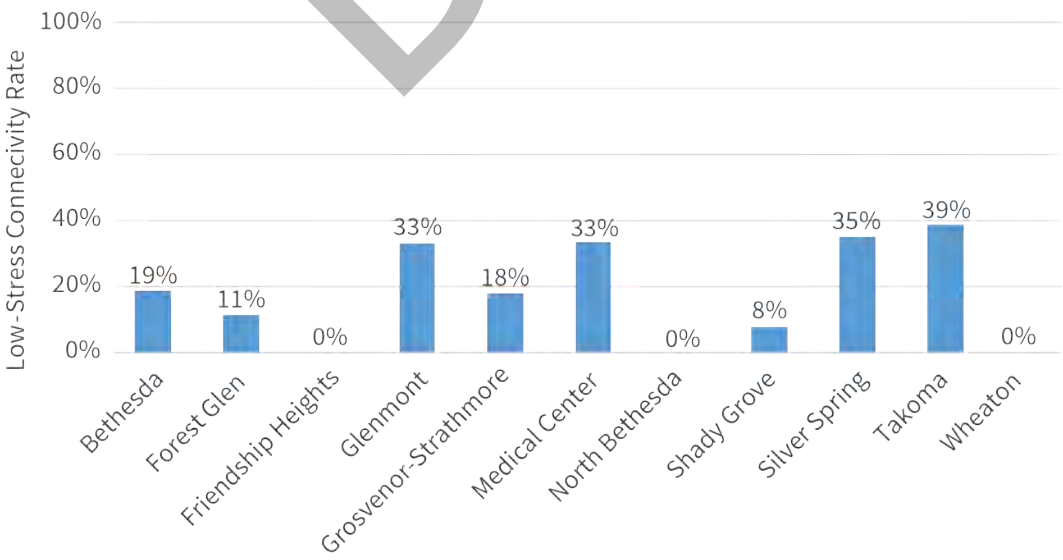


Figure 7: Low-Stress Bicycle Connectivity to Red Line Stations including Funded and Approved Projects

2022 and to 23% with projects that are funded or conditions of development projects. These Silver Spring station will experience the largest future growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed, growing 30%, from 0% to 30%.

Purple Line Stations: Overall, connectivity to future Purple Line stations grew from 3% to 7% between December 2020 and December 2022. It will grow to 11% with projects under construction as of December 2022 and to 20% with projects that are funded or conditions of development projects. These Purple Line stations will experience the largest future growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed:

- Silver Spring Library station will increase to 40%, from 0% to 40% due to completion of the Capital Crescent Trail project and Silver Spring Green Trail project, and with the future construction of the Metropolitan Branch Trail, Fenton Street cycle track and Dixon Lane separated bike lanes.
- Silver Spring Transit Center station will increase 28%, from 4% to 32% for the same reasons at the Silver Spring Library station.
- Lyttonsville station will increase 25%, from 0% to 25% upon completion of the Capital Crescent Trail.
- Connecticut Avenue station will increase 22%, from 0% to 22%, upon completion of the Capital Crescent Trail, the Chevy Chase Lake development project, and the Crescent at Chevy Chase Lake development project.
- Bethesda station will increase 16%, from 2% to 18% due to the completion of the Capital Crescent Trail (Phase 1) and the Montgomery Avenue/Montgomery Lane Separated Bike Lanes (Phase 1 and 2A) and the future construction of the Montgomery Avenue/Montgomery Lane Separated Bike Lanes (Phase 2C), the Capital Crescent Trail Tunnel, the Capital Crescent Surface Trail (Phase 2), the Woodmont Avenue Cycle Track (Phase 2), the Cheltenham Separated Bike Lanes and the Battery Lane Separated Bike Lanes (to be constructed by the Battery District development project).

Low-stress bicycle connectivity to future Purple Line stations after all projects under construction, funded in the capital budget and conditions of development approval are constructed are shown in Figure 8.

Figure 8: Low-Stress Bicycle Connectivity to Future Purple Line Stations including Funded and Approved Projects

U.S. 29 FLASH: Overall, connectivity to U.S. 29 FLASH bus stations remained unchanged at 6% between December 2020 and December 2022. It will grow to 8% with projects under construction as of December 2022 and to 18% with projects that are funded or conditions of development projects.

Bicycle connectivity rates for each transit station can be found in Appendix A.7 (Red Line), Appendix A.8(Brunswick Line), Appendix A.9 (Purple Line), and Appendix A.10 (U.S. 29 FLASH).

Connectivity to Public Schools (Objective 2.3) evaluates the percentage of dwelling units within one mile of elementary schools, 1.5 miles of middle schools and 2 miles of high schools that are connected to each school on a very low-stress bicycling network[1]. This metric grew slightly between December 2020 and December 2022 from 13% to 14% for high schools, from 21% to 22% for middle schools and remained the same for elementary schools (37%).

Elementary Schools: Overall, connectivity to elementary schools remained at 37% between December 2010 and December 2022. It will grow to 38% with projects that are funded or conditions of development projects. These elementary schools will experience the future largest growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed:

- Little Bennett Elementary School will increase 16%, from 48% to 64% with completion of Overlook Park Drive and the future construction of the MD 355/Clarksburg Shared Use Path, Clarksburg Road/MD 355 project and the Clarksburg Road/Snowden Farm Parkway project.
- Woodlin Elementary School will increase 19%, from 7% to 26% when ongoing construction of the Capital Crescent Trail is complete.
- Rolling Terrace Elementary School will increase 12%, from 72% to 84%.

Middle Schools: Overall, connectivity to middle schools remained at 20% between December 2020 and December 2022. The following middle schools will experience the future largest growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed:

- Briggs Chaney Middle School will increase 10%, from 38% to 48% with the completion of the Good Hope Road Shared Use Path project.
- Takoma Park Middle School will increase 10%, from 23% to 33%.

High Schools: Overall, connectivity to high schools remained at 10% between December 2020 and December 2022. It will grow to 12% with projects under construction as of December 2022. This high school will experience the largest future growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed:

- Bethesda Chevy Chase High School will increase 7%, from 4% to 11% when ongoing construction of the Capital Crescent Trail is complete.

Bicycle connectivity rates for each public school can be found in Appendix A.11 (elementary schools), Appendix A.12 (middle schools) and Appendix A.13 (high schools).

Connectivity to Public Facilities (Objective 2.4) evaluates the percentage of dwelling units within two "network distance" miles of public libraries, recreation centers, and regional and recreational parks that are connected to these public facilities

1 This is based on an "as the crow flies" distance from each public school, as that is how Montgomery County Public Schools determines its busing zones.

on a low-stress bicycling network. This metric grew slightly between December 2020 and December 2022: from 8% to 9% for public libraries and remained the same for recreation centers (14%) and regional and recreational parks (27%).

Public Libraries: Overall, connectivity to public libraries grew from 8% to 9% between December 2020 and December 2022. It will grow to 14% with projects that are funded or conditions of development projects. This public library will experience the largest future growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed:

- Silver Spring Library will grow 40%, from 0% to 40% due to completion of the ongoing Capital Crescent Trail project and the Ripley II development project, and with the future construction of the Metropolitan Branch Trail and the Fenton Street cycle track.

Recreation Centers: Overall, connectivity to recreation centers remained at 14% between December 2020 and December 2022. It will grow to 17% with the completion of projects that were under construction in December 2022. The following recreation centers will experience the largest future growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed:

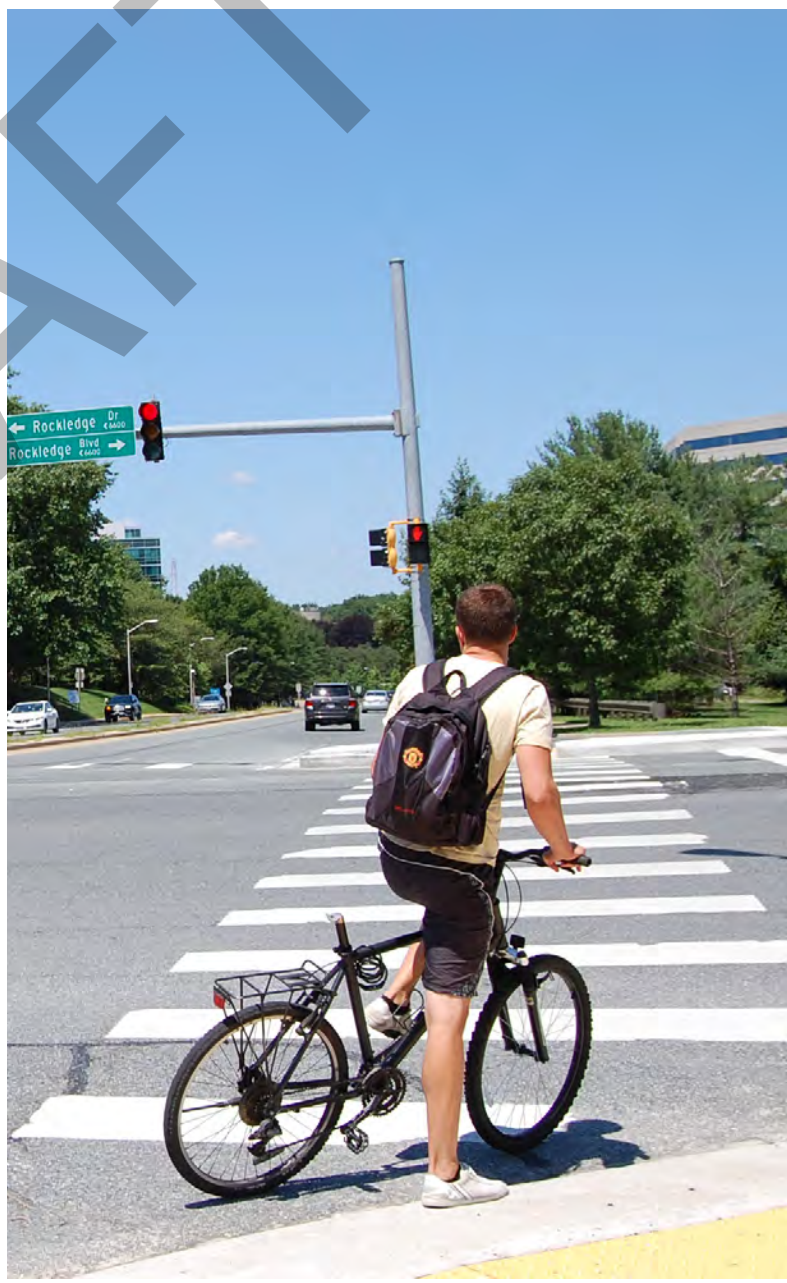
- Gwendolyn E. Coffield Recreation Center will grow 15%, from 12% to 28% upon completion of the Capital Crescent Trail.

- Leland Community Recreation Center will grow 15%, from 6% to 21% upon completion of the Capital Crescent Trail.

Recreational and Regional Parks: Overall, connectivity to recreational and regional parks remained at 27% between December 2020 and December 2022. This park will experience the largest future growth in connectivity once all projects under construction at the end of 2022 and projects in the capital improvement program and development approvals are completed:

- Rock Creek Regional Park will grow 3%, from 32% to 35% due to completion of the Capital Crescent Trail.

Bicycle connectivity rates for each public facility can be found in Appendix A.14 (public libraries), Appendix A.15 (recreation center) and Appendix A.16 (regional and recreational parks).




DRAFT

BICYCLE PARKING METRICS

Simply providing a comfortable bicycling network is insufficient if people do not have a secure place to store their bicycles when they get to their destinations. Objectives for this goal examine bicycle parking at major destinations, such as transit stations, commercial areas and public facilities, including schools, libraries and recreation centers. Four metrics evaluate the availability of low-stress bicycling:

- Rail Stations with Bicycle Parking Stations (Objective 2.5)
- Sufficient Bicycle Parking at Public Schools (Objective 2.6)
- Sufficient Bicycle Parking in Bicycle-Pedestrian Priority Areas (Objective 2.7)
- Sufficient Bicycle Parking at Public Facilities (Objective 2.8)

In this report, only the changes to Objective 2.5 and Objective 2.6 are measured.

Rail Stations with Bicycle Parking Stations (Objective 2.5): Currently, three bicycle parking stations are advancing, including a 460-space station at the Bethesda South station[2], a 74-space station in Downtown Silver Spring and a 100-space bicycle parking station at the Grosvenor Metrorail station provided by the Strathmore Square development project.

Sufficient Bicycle Parking at Public Schools (Objective 2.6): This metric evaluates the adequacy of bicycle parking and is defined as the existing proportion of needed bicycle parking spaces that meet industry standards. In 2022, existing bicycle parking that met industry standards provided 8% of the total needed bicycle parking. This is an increase from 5% in 2016.

2 The Bethesda South station is the location of the new southern entrance to the Bethesda Metrorail station and the Bethesda Purple Line station at 7272 Wisconsin Avenue.

Elementary Schools: In 2022, the proportion of bicycle parking spaces that met industry standards provided 6% of needed parking. This is an increase from 4% in 2016. At Title I/Focus schools, industry-standard bicycle parking met 6% of the total need in 2022, increased from 5% in 2016. At non-Title I/Focus schools, industry-standard parking met 6% of total need in 2022, increased from 3% in 2016.

Middle Schools: In 2022, the proportion of bicycle parking spaces that met industry standards provided 12% of needed parking. This is an increase from 5% in 2016. At schools with above average proportion of students qualifying for FARMS, industry-standard bicycle parking met 0% of the total need in both 2022 and 2016. At non-FARMS schools, industry-standard parking met 25% of total need in 2022, increased from 10% in 2016.

High Schools: In 2022, the proportion of bicycle parking spaces that met industry standards provided 2% of needed parking. This is an increase from just under 2% in 2016. At schools with above average proportion of students qualifying for FARMS, industry-standard bicycle parking met 3% of the total need in both 2022 and 2016. At non-FARMS schools, industry-standard parking met 1% of total need in 2022, increased from 0% in 2016.

3.3 Goal 3 | Provide Equal Access to Low-Stress Bicycling for all Members of the Community

Montgomery County's Racial Equity and Social Justice Act went into effect March 2020 and requires the Planning Board to consider racial equity and social justice impacts when preparing master plans. While completion of the *Bicycle Master Plan* predated this law, one of the Plan's goals is to provide equal access to low-stress bicycling for all members of the community. The Planning Department is committed to incorporating equity into its work efforts and

includes the following metrics focused on equity:

- Connectivity to Equity Focus Areas (Objective 3.1)
- Connectivity to Title I/Focus FARMS Public Schools (Objective 3.2)

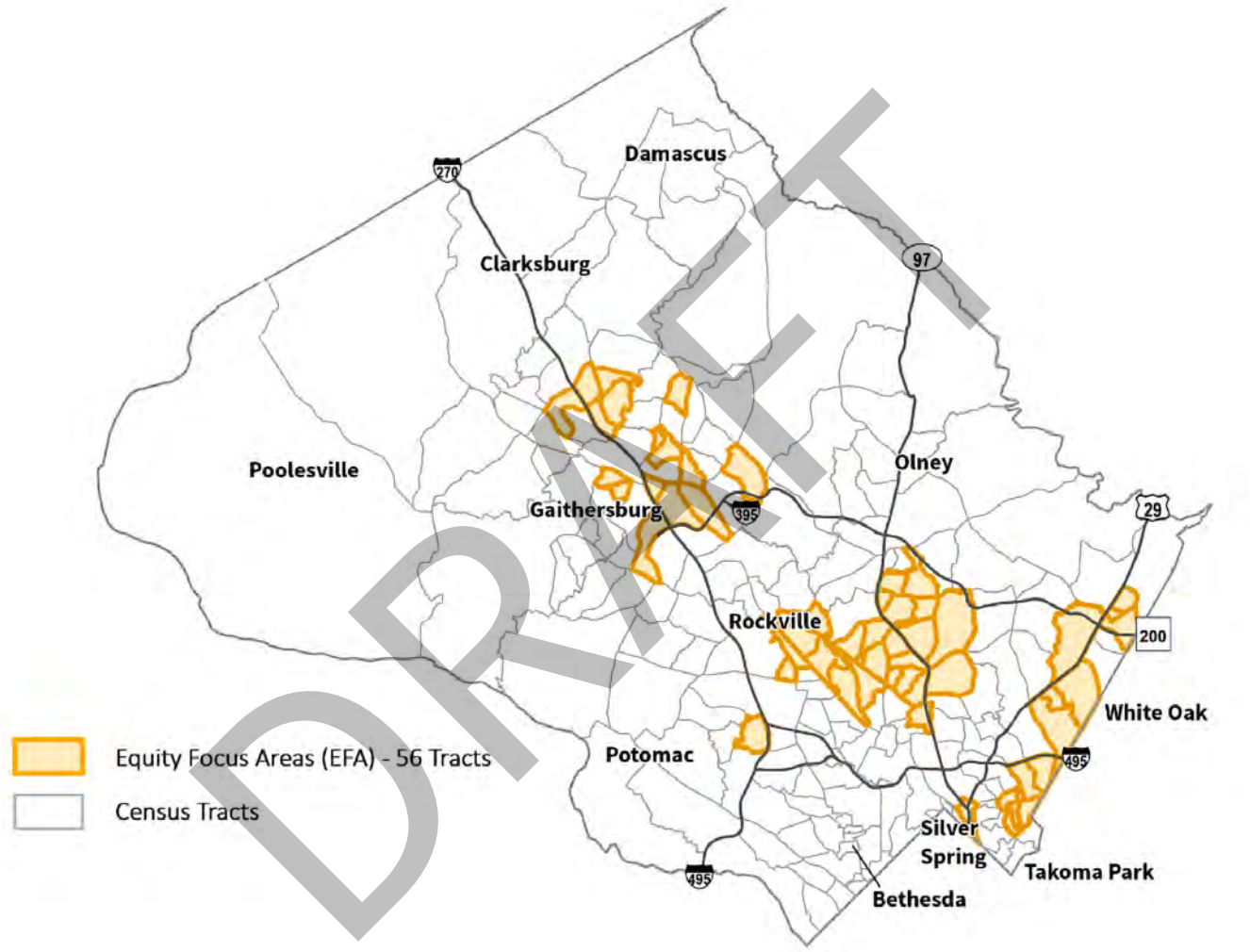


Figure 9: Equity Focus Areas

Connectivity to Equity Focus Areas (Objective 3.1) compares the percentage of potential bicycling trips that could be made on a low-stress bicycling network in all EFAs compared to all non-EFAs. A result of 100% would indicate that there is parity in the low-stress connectivity between EFAs and non-EFAs overall. A result of 50% would indicate that EFAs have half the low-stress connectivity of non-EFAs. The disparity in low-stress connectivity has increased since 2020.

EFAs had 84% of the low-stress connectivity that non-EFAs experience in December 2022, down from 87% in December 2020 and from 89% in December 2018. When projects that are under construction, funded in the capital improvement program or approved for development are completed, the metric will return to 2020 levels (87%).

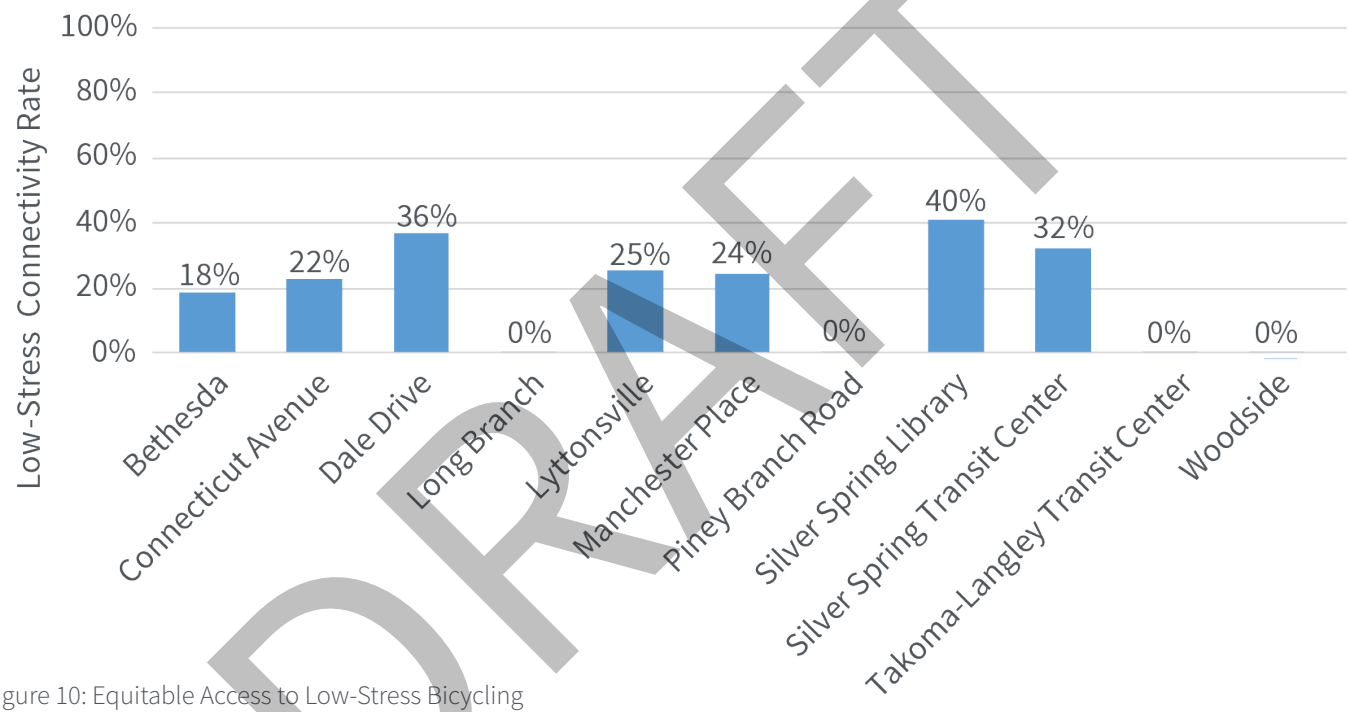


Figure 10: Equitable Access to Low-Stress Bicycling

A map showing the geographic distribution of low-stress bicycling compared with EFAs is included in Figure 11.

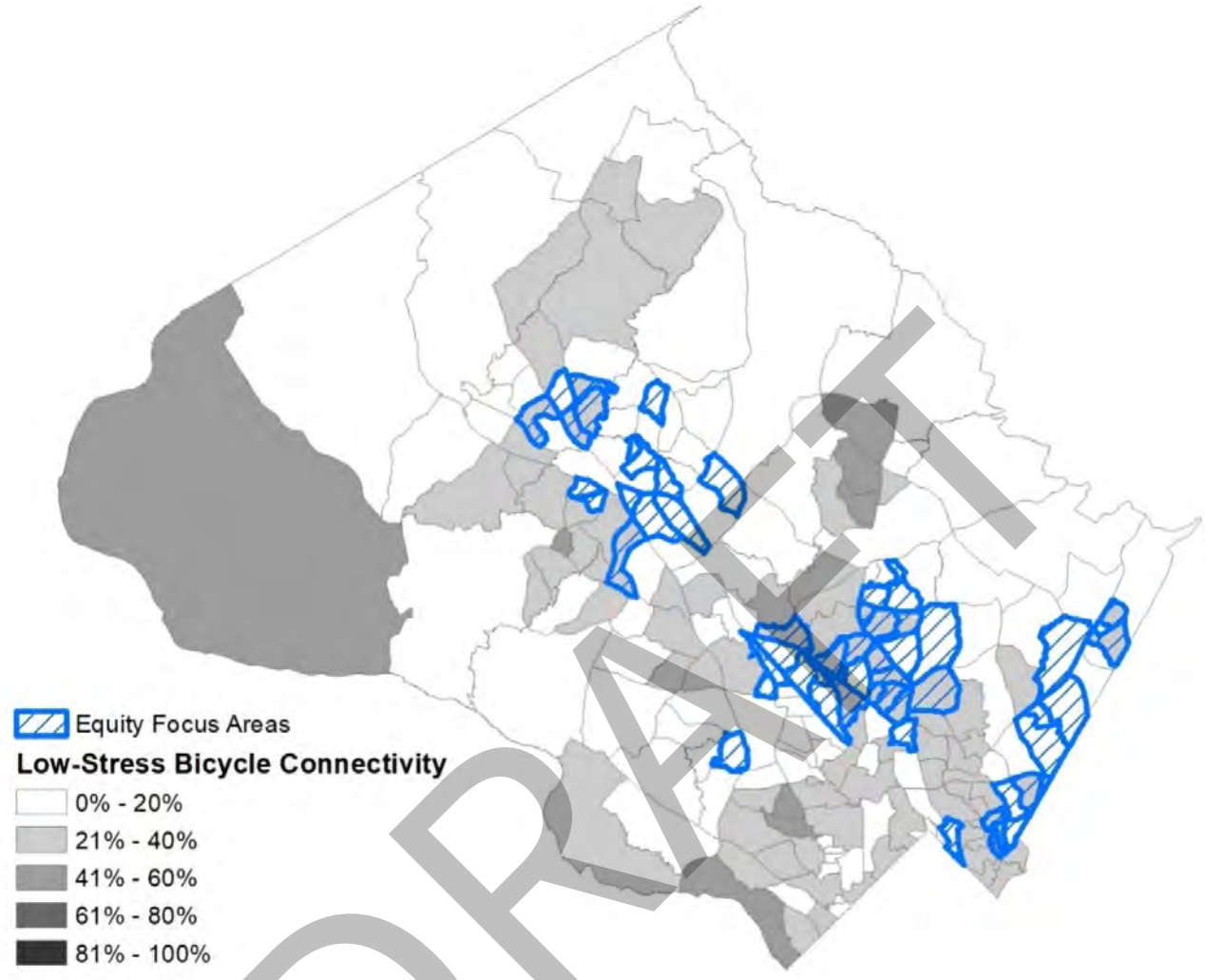


Figure 11: Low-Stress Bicycle Connectivity by Equity Focus Areas

On the other hand, for **Connectivity to Public Schoolswith Title I/Focus or High FARMS Rates (Objective 3.2),** schools that serve high numbers or high percentages of children from low-income families are better connected, on average, by low-stress bicycling than non-Title I and non-Focus schools or schools with low FARMS rates. For instance, in December 2022, the low-stress connectivity to Title I/Focus elementary schools was 41%, compared to 33% for all other elementary schools. Similarly, the low-stress connectivity to middle schools that serve families with low incomes was 22%, compared to 21% for all other middle schools. For high schools the low-stress connectivity to schools that serve families with low incomes was 18%, compared to 10% for all other high schools. This finding does not mean that connectivity to schools is sufficient, it just means that on average, schools that serve equity populations are better connected by low-stress bicycling than non-Title I/Focus schools and schools with smaller shares of FARMS-qualifying students.

3.4 Goal 4 | Improve the Safety of Bicycling

The intent of this goal is to make bicycling safe by eliminating serious injuries and fatalities. While safety can be improved by taking active measures to reduce travel speeds and providing separation from traffic, this goal will be evaluated by reactive metrics based on crash reports. Two metrics evaluate the safety of bicycling:

- Bicycling Fatalities and Serious Injuries per Year (Objective 4.1)
- Bicycling Fatalities and Serious Injuries per Year in Equity Focus Areas (Objective 4.2)

Bicycling Fatalities and Serious Injuries per Year (Objective 4.1): There were zero fatalities and 12 serious injuries among bicyclists in 2021, and four fatalities and 13 serious injuries among bicyclists in 2022.

Bicycling Fatalities and Serious Injuries per Year in Equity Focus Areas (Objective 4.2): While the goal is to eliminate all serious injuries and fatalities, it is known that serious and fatal transportation crashes are overrepresented among Black and Hispanic populations. Since race and ethnicity are not available in the crash data, this analysis reviews crash locations to see if a disproportionate number occur in EFAs compared to non-EFAs. In 2018, three of 13 serious and fatal bicyclist crashes occurred in EFAs. In 2020, none of the 11 serious and fatal bicyclist crashes occurred in EFAs. In 2022, three of 14 serious and fatal bicyclist crashes occurred in EFAs. Controlling for population size, this means that EFAs were less likely to experience serious injuries and fatalities among bicyclists than non-EFAs. In 2018, there were 0.83 fatalities and serious injuries among bicyclists in EFAs for every serious injury and fatality among bicyclists in non-EFAs, controlling for population size. In 2020 this dropped to zero. In 2022, there were 0.60 fatalities and serious injuries among bicyclists in EFAs for every serious injury and fatality among bicyclists in non-EFAs, controlling for population size.

Table 2: Evaluation of Goals and Objectives

Objective	Metric		12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 2021 / 2022	Target (Tier 4)
Goal 1: Increasing Bicycling Rates in Montgomery County								
1.1	Percentage of Residents who Commute by Bicycle.		0.6% (2018)	0.5% (2019)	0.5% (2021)	--	--	8%
1.2	Bicycling Rates to Transportation Management Districts	Downtown Bethesda	0.7%	0.8%	1.4%	--	--	15%
		Downtown Silver Spring	1.4%	1.8%	1.6%	--	--	12%
		Friendship Heights	1.4%	0.4%	0.6%	--	--	10%
		Greater Shady Grove	1.5%	0.0%	0.1%	--	--	10%
		North Bethesda	1.0%	0.3%	0.4%	--	--	10%
		White Oak	N/A	N/A	0.4%	--	--	10%

Objective	Metric		12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 2021 / 2022	Target (Tier 4)
1.3	Bicycle Rates to Transit	Red Line	1.6% (2016)	N/A	1.6%	--	--	10%
		Brunswick Line	N/A	N/A	N/A	--	--	N/A
		Purple Line	--	--	--	--	--	N/A
		US 29 FLASH	N/A	N/A	N/A	--	--	N/A
1.4	Bicycle Rates to Schools	Elementary Schools	N/A	2.5% (fall 2019)	N/A	--	--	10%
		Middle Schools	N/A	1.7% (fall 2019)	N/A	--	--	10%
		High Schools	N/A	1.7 (fall 2019)	N/A	--	--	10%
Goal 2: Create a Highly Connected, Convenient and Low-Stress Bicycling Network								
2.1	Countywide Connectivity		14%	15%	16%	17%	20%	50%
2.2	Connectivity to Transit Stations	Red Line	8%	10%	10%	14%	19%	65%
		Brunswick Line	14%	14%	14%	20%	23%	65%
		Purple Line	2%	3%	7%	11%	20%	70%
		U.S. 29 FLASH	3%	6%	6%	8%	18%	65%
2.3	Connectivity to Public Schools	Elementary Schools	37%	37%	37%	37%	38%	60%
		Middle Schools	21%	21%	22%	22%	22%	55%
		High Schools	12%	13%	14%	15%	15%	35%
2.4	Connectivity to Public Facilities	Public Libraries	8%	8%	9%	9%	14%	55%
		Recreation Centers	14%	14%	14%	17%	17%	40%
		Recreational and Regional Parks	27%	27%	27%	27%	28%	50%
2.5	Rails Stations with Bicycle Parking Stations	Red Line	0	0	0	1	3	11
		MARC Brunswick Line	0	0	0	0	0	5
		Purple Line	0	0	0	0	2	7
2.6	Sufficient Bicycle Parking at Public Schools	Elementary Schools	4% (2016)	N/A	6%	N/A	N/A	100%
		Middle Schools	5% (2016)	N/A	12%	N/A	N/A	100%
		High Schools	2% (2016)	N/A	2%	N/A	N/A	100%
2.7	Sufficient Bicycle Parking in Bicycle-Pedestrian Priority Areas		15%	N/A	N/A	N/A	N/A	40%

Objective	Metric		12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 2021 / 2022	Target (Tier 4)
2.8	Sufficient Bicycle Parking at Public Facilities	Public Libraries	74% (2016)	N/A	63%[3]	N/A	N/A	100%
		Recreation Centers	67% (2016)	N/A	85%	N/A	N/A	100%
Goal 3: Provide equal access to low-stress bicycling for all members of the community								
	Connectivity to Equity Focus Areas		89%	87%	84%	84%	87%	100%
3.2	Connectivity to Title I/Focus FARMS Public Schools (EFA/non-EFA)	Elementary Schools	41% / 32%	41% / 32%	41% / 33%	41% / 33%	41% / 34%	EFA > non-EFA
		Middle Schools	22% / 21%	22% / 21%	22% / 21%	22% / 21%	22% / 22%	EFA > non-EFA
		High Schools	15% / 10%	17% / 10%	18% / 10%	18% / 12%	18% / 12%	EFA > non-EFA
Goal 4: Improve the safety of bicycling								
4.1	The Number of Bicycling Fatalities and Serious Injuries		13	11	17	--	--	0
4.2	Ratio of EFA to non-EFA Fatalities and Serious Injuries among Bicyclists, Controlling for Population		0.83	0.00	0.60	--	--	<=1.00

-- = Metric cannot be calculated

N/A = Data was not available in 2022

3 Loss of spaces is due to Purple Line construction at Silver Spring library in 2022.

4

Bikeways

Although many trips are short enough to be made by bicycle, most are made by private motor vehicles. One barrier to bicycling is what is known as "traffic stress." The concept of traffic stress is that people have a certain tolerance for bicycling near traffic, and if that tolerance is exceeded even for a short distance, they may be deterred from bicycling. To attract the broadest segment of the population to bicycle, the *Bicycle Master Plan* recommends bikeways that create low-stress networks of bikeways.

4.1 Bikeway Implementation

As shown in Table 3, the *Bicycle Master Plan* recommends about 1,150 miles of bikeways, of which 285 miles, or about one-quarter, existed as of December 31, 2022. The largest category of recommended bikeways comprises sidepaths (603 miles), followed by off-street trails (174 miles), bikeable shoulders (128 miles), separated bike lanes (99 miles) and neighborhood greenways (51 miles).

Table 3: Status of Master-Planned Bikeway Recommendations as of December 31, 2022 (miles)[4]

Facility Type[5]	Bikeway Type	Existing	Unbuilt	Total
Trails	Off-Street Trails	98.4	76.0	174.4
	Stream Valley Park Trails	27.8	0.8	28.7
	Neighborhood Connectors	12.8	2.2	15.0
Separated Bikeway	Separated Bike Lanes	4.1	95.2	99.3
	Sidepaths	118.4	484.8	603.1
Striped Bikeways	Buffered Bike Lanes	0.0	6.5	6.5
	Conventional Bike Lanes	13.5	21.3	34.8
	Contra-Flow Bike Lane	0.0	4.9	4.9
Bikeable Shoulders	Bikeable Shoulders	9.9	118.1	128.0
Shared Roads	Shared Streets	0.0	1.1	1.2
	Neighborhood Greenways	0.4	50.9	51.2
	Priority Shared Lane Markings	0.0	5.2	5.2
Total	**Total**	**285.4**	**867.0**	**1,152.4**

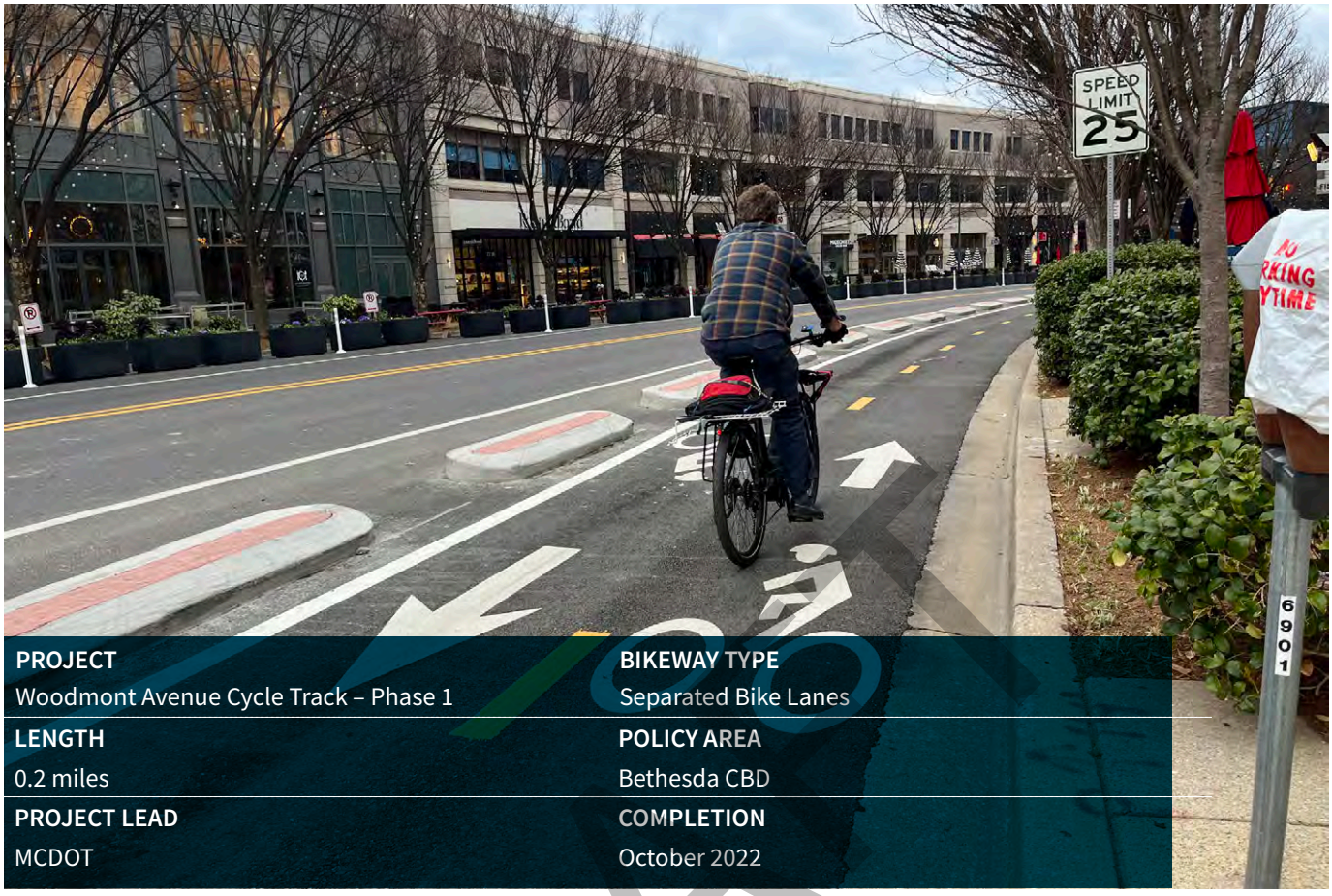
4 Miles of bikeways includes amendments to the Bicycle Master Plan that have occurred since its approval. The existing miles of bikeways includes bikeways that have been completed since the plan's approval.
5 Descriptions of each bikeway type can be found in the Glossary.

During 2021 and 2022, 5.3 miles of new master-planned bikeways were completed (Table 5). This includes 3.3 miles by the public sector and 2.0 miles by developers. Sidepaths (3.9 miles) and separated bike lanes (0.9 miles) represent nearly all the bikeway mileage constructed during this time. See Appendix B.1 and Appendix B.2 for a list of specific bikeways constructed by capital projects and development projects in 2021 and 2022.

Table 4: Master-Planned Bikeways Completed in 2021 & 2022 (miles)

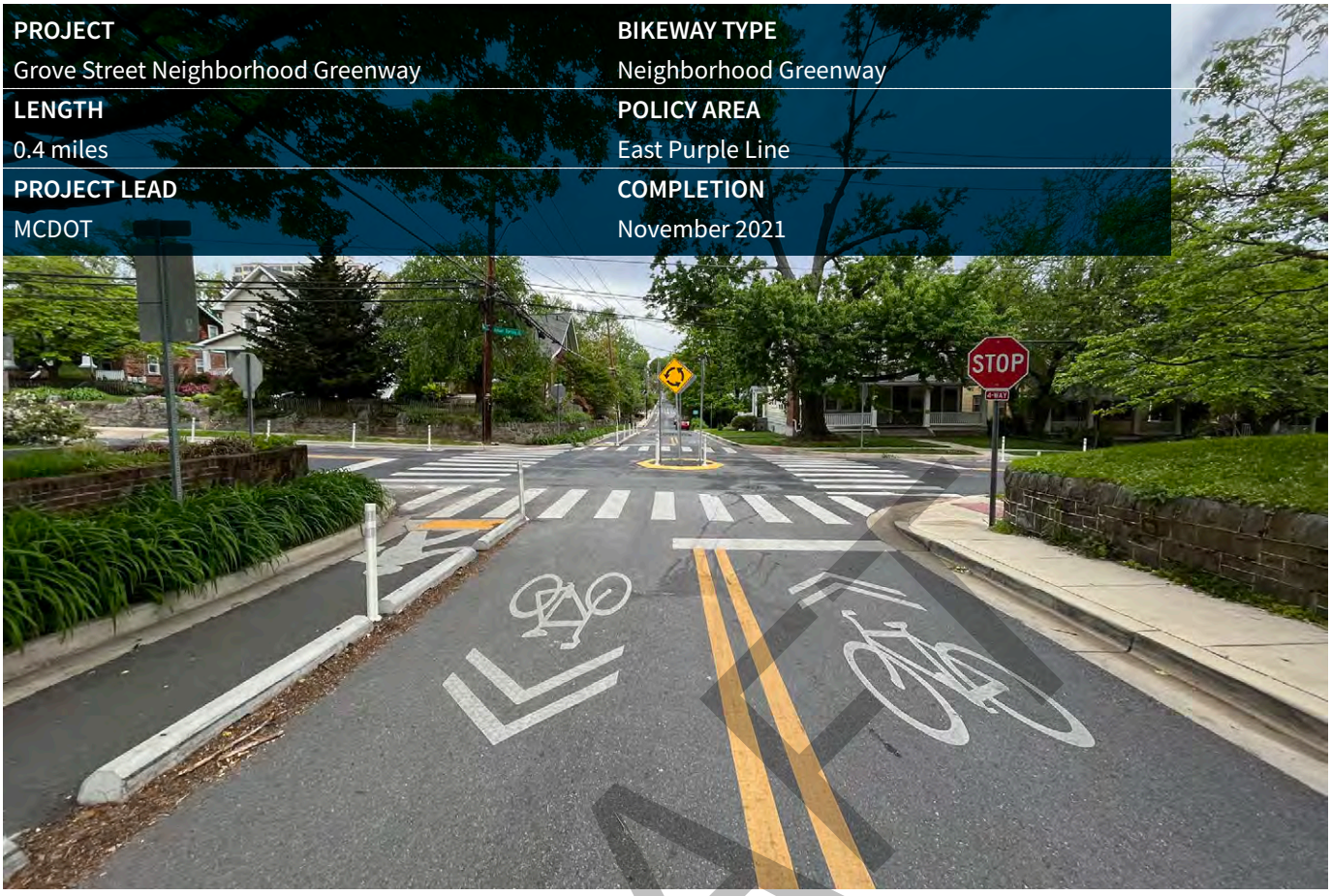
Facility Type	Bikeway Type	Capital Projects	Development Projects	Total
Trails	Off-Street Trails	0.0	0.2	0.2
	Stream Valley Park Trails	0.0	0.0	0.0
	Neighborhood Connectors	0.0	0.0	0.0
Separated Bikeway	Separated Bike Lanes	0.6	0.4	0.9
	Sidepaths	2.4	1.5	3.9
Striped Bikeways	Buffered Bike Lanes	0.0	0.0	0.0
	Conventional Bike Lanes	0.0	0.0	0.0
	Contra-Flow Bike Lane	0.0	0.0	0.0
Bikeable Shoulders	Bikeable Shoulders	0.0	0.0	0.0
Shared Roads	Shared Streets	0.0	0.0	0.0
	Neighborhood Greenways	0.4	0.0	0.4
	Priority Shared Lane Markings	0.0	0.0	0.0
Total	**Total**	**3.3**	**2.0**	**5.3**

The following pages provide information on some of the bikeway projects completed in 2021 and 2022.



PROJECT Woodmont Avenue Cycle Track – Phase 1	**BIKEWAY TYPE** Separated Bike Lanes
LENGTH 0.2 miles	**POLICY AREA** Bethesda CBD
PROJECT LEAD MCDOT	**COMPLETION** October 2022

PROJECT Frederick Road Bike Path	**BIKEWAY TYPE** Sidepath
LENGTH 1.6 miles	**POLICY AREA** Clarksburg, Clarksburg Town Center
PROJECT LEAD MCDOT	**COMPLETION** July 2021



PROJECT
Grove Street Neighborhood Greenway

BIKEWAY TYPE
Neighborhood Greenway

LENGTH
0.4 miles

POLICY AREA
East Purple Line

PROJECT LEAD
MCDOT

COMPLETION
November 2021

PROJECT
Snouffer School Road North

BIKEWAY TYPE
Sidepath & Conventional Bike Lanes

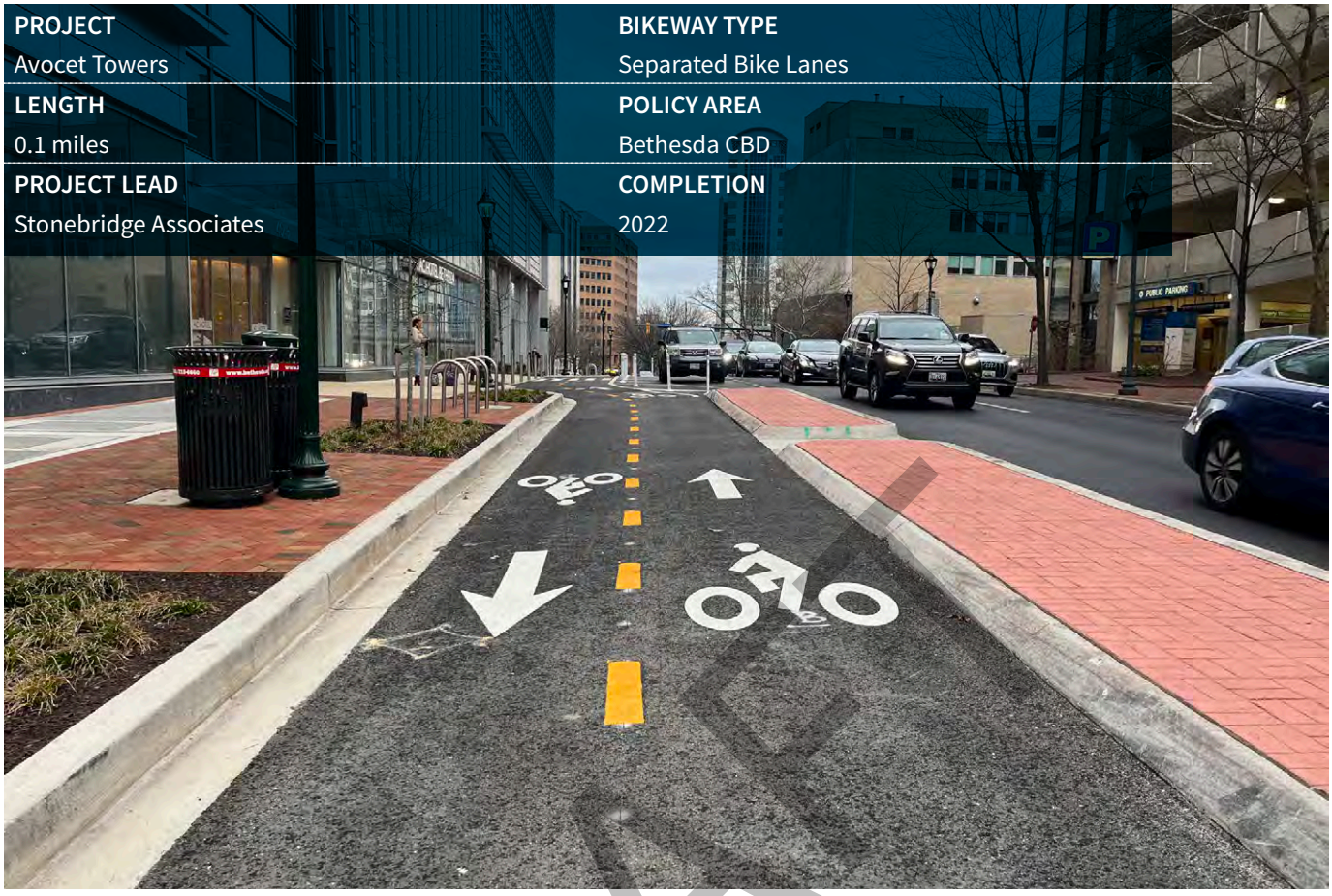
LENGTH
0.5 miles

POLICY AREA
Montgomery Village/Airpark

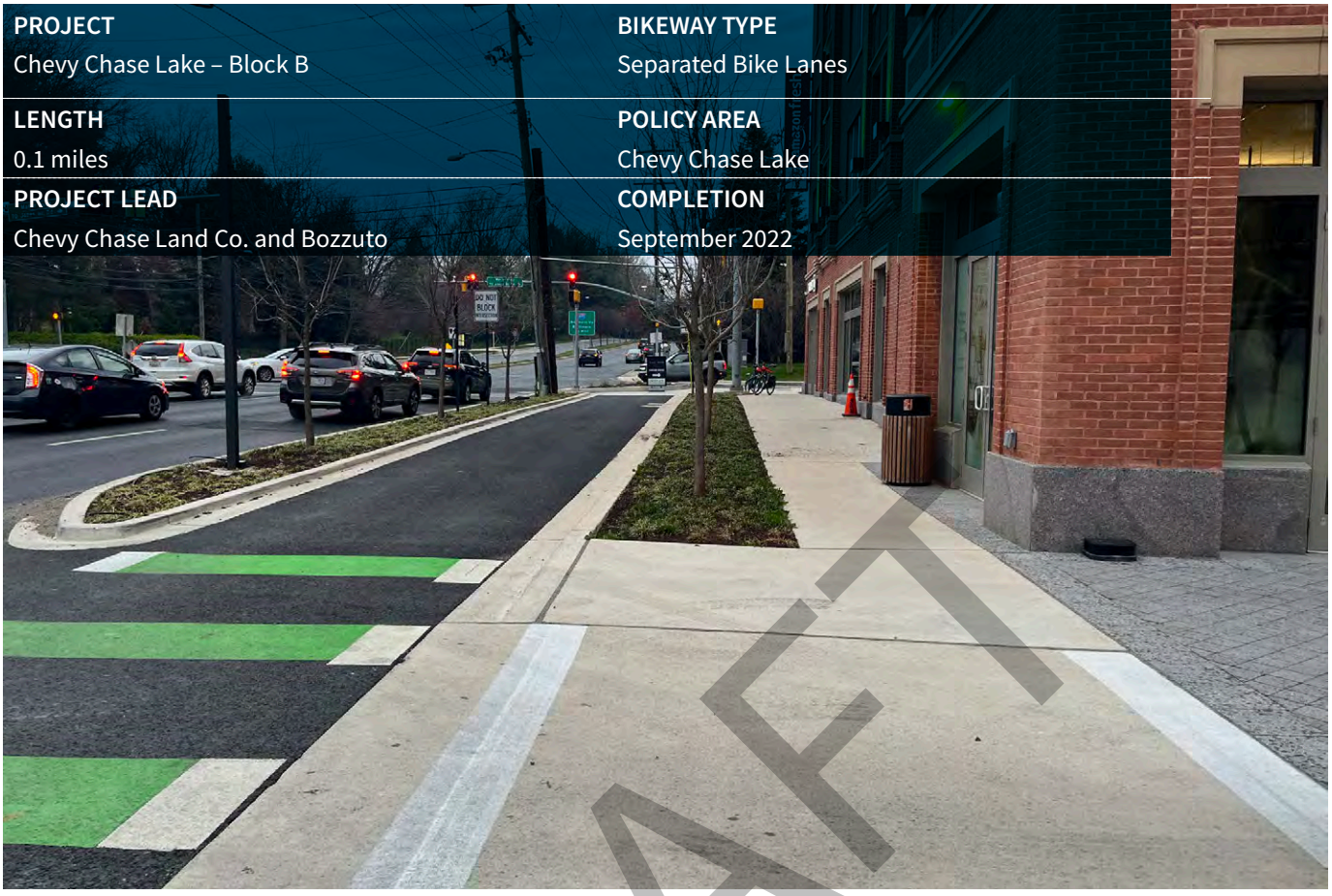
PROJECT LEAD
MCDOT

COMPLETION
March 2021

PROJECT Avocet Towers	**BIKEWAY TYPE** Separated Bike Lanes
LENGTH 0.1 miles	**POLICY AREA** Bethesda CBD
PROJECT LEAD Stonebridge Associates	**COMPLETION** 2022



PROJECT Brookeville Preserve	**BIKEWAY TYPE** Sidepath
LENGTH 0.3 miles	**POLICY AREA** Olney
PROJECT LEAD DRB Homes	**COMPLETION** June 2022



PROJECT
Chevy Chase Lake – Block B

BIKEWAY TYPE
Separated Bike Lanes

LENGTH
0.1 miles

POLICY AREA
Chevy Chase Lake

PROJECT LEAD
Chevy Chase Land Co. and Bozzuto

COMPLETION
September 2022

PROJECT
Ripley II

BIKEWAY TYPE
Off-Street Trail & Separated Bike Lanes

LENGTH
0.2 miles

POLICY AREA
Montgomery Village/Airpark

PROJECT LEAD
Clark Construction Group

COMPLETION
September 2022

Table 5 shows that an additional 8.2 miles of new master-planned bikeways were under construction as of December 31, 2022. This includes 8.0 miles by the public sector and 0.2 miles by developers. There were 4.9 miles of off-street trails (largely the Capital Crescent Trail) and 1.9 miles of sidepaths under construction at this time.

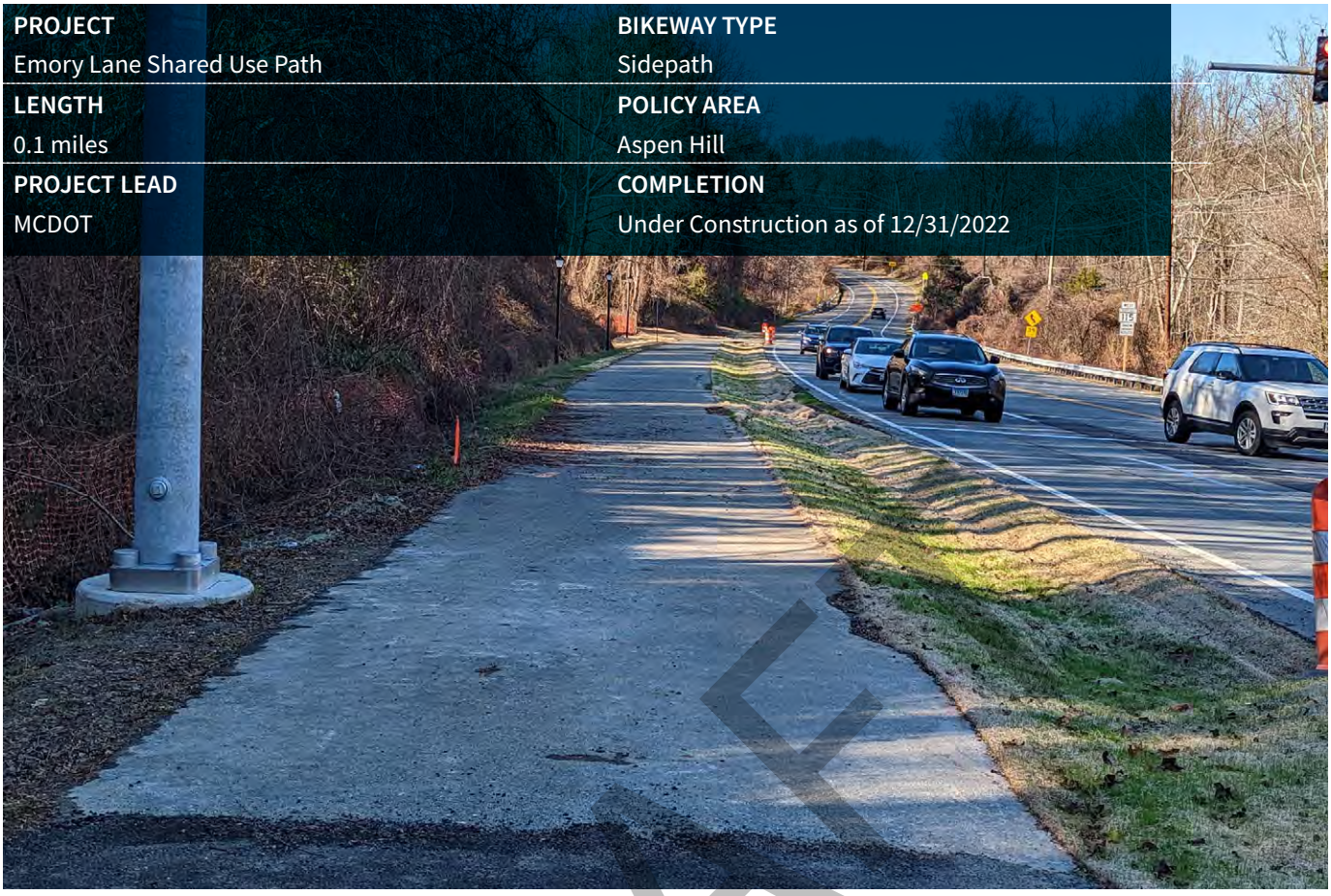
See Appendix B.3 and Appendix B.4 for a list of specific bikeways under construction by capital projects and development projects as December 31, 2022.

Table 5: Master-Planned Bikeways Under Construction as of 12/31/2022 (miles)

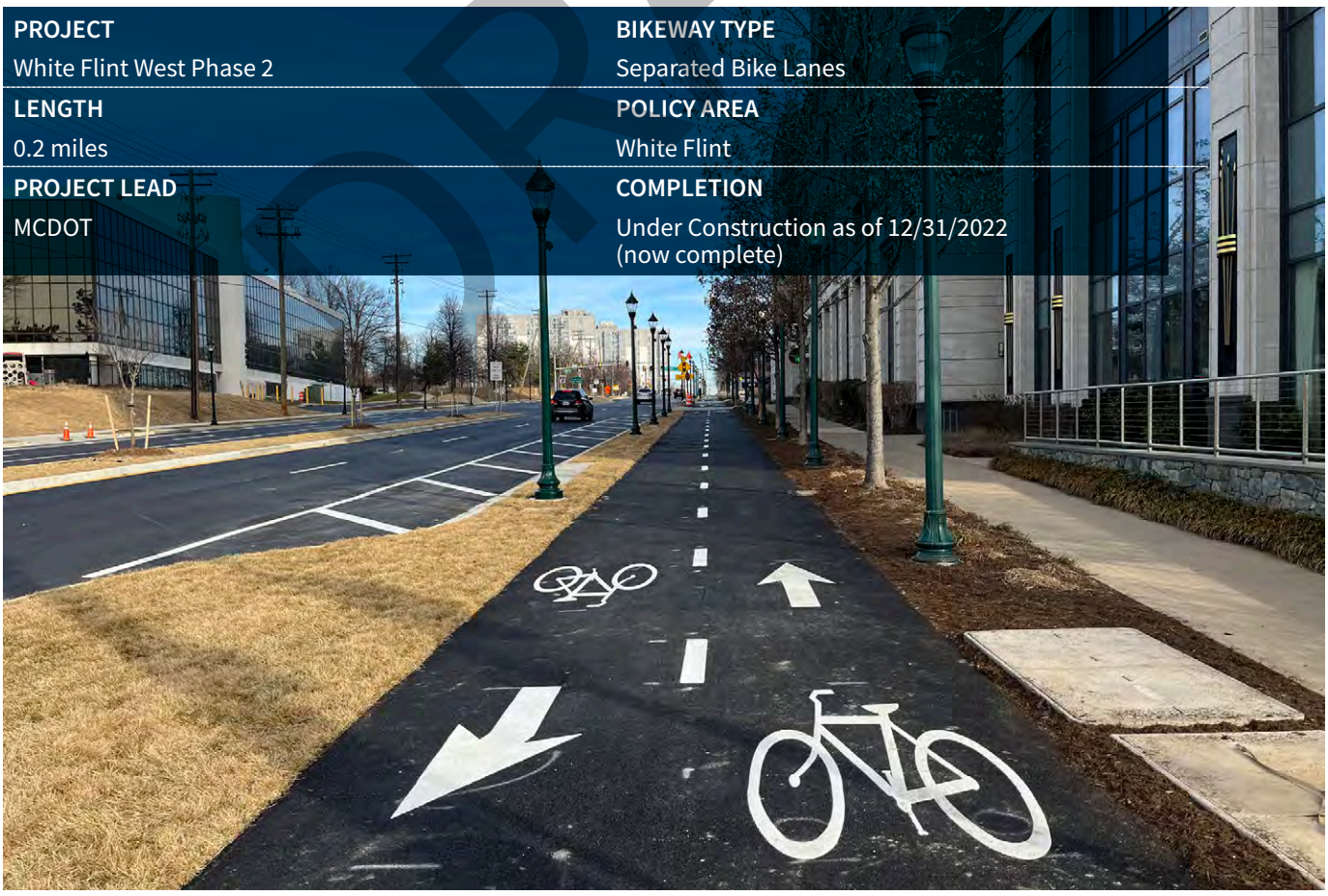
Facility Type	Bikeway Type	Capital Projects	Development Projects	Total
Trails	Off-Street Trails	4.9	0.0	4.9
	Stream Valley Park Trails	0.0	0.0	0.0
	Neighborhood Connectors	0.0	0.0	0.0
Separated Bikeway	Separated Bike Lanes	0.4	0.0	0.4
	Sidepaths	1.8	0.2	1.9
Striped Bikeways	Buffered Bike Lanes	0.0	0.0	0.0
	Conventional Bike Lanes	0.3	0.0	0.3
	Contra-Flow Bike Lane	0.0	0.0	0.0
Bikeable Shoulders	Bikeable Shoulders	0.7	0.0	0.7
Shared Roads	Shared Streets	0.0	0.0	0.0
	Neighborhood Greenways	0.0	0.0	0.0
	Priority Shared Lane Markings	0.0	0.0	0.0
Total	**Total**	**8.0**	**0.2**	**8.2**

The following pages provide information on some of the bikeway projects that were under construction at the end of 2020.

PROJECT Emory Lane Shared Use Path	**BIKEWAY TYPE** Sidepath
LENGTH 0.1 miles	**POLICY AREA** Aspen Hill
PROJECT LEAD MCDOT	**COMPLETION** Under Construction as of 12/31/2022



PROJECT White Flint West Phase 2	**BIKEWAY TYPE** Separated Bike Lanes
LENGTH 0.2 miles	**POLICY AREA** White Flint
PROJECT LEAD MCDOT	**COMPLETION** Under Construction as of 12/31/2022 (now complete)



PROJECT
Hillandale Local Park Renovation

BIKEWAY TYPE
Sidepath

LENGTH
0.2 miles

POLICY AREA
White Oaks

PROJECT LEAD
Montgomery Parks

COMPLETION
Under Construction as of 12/31/2022

PROJECT
Crescent at Chevy Chase Lake

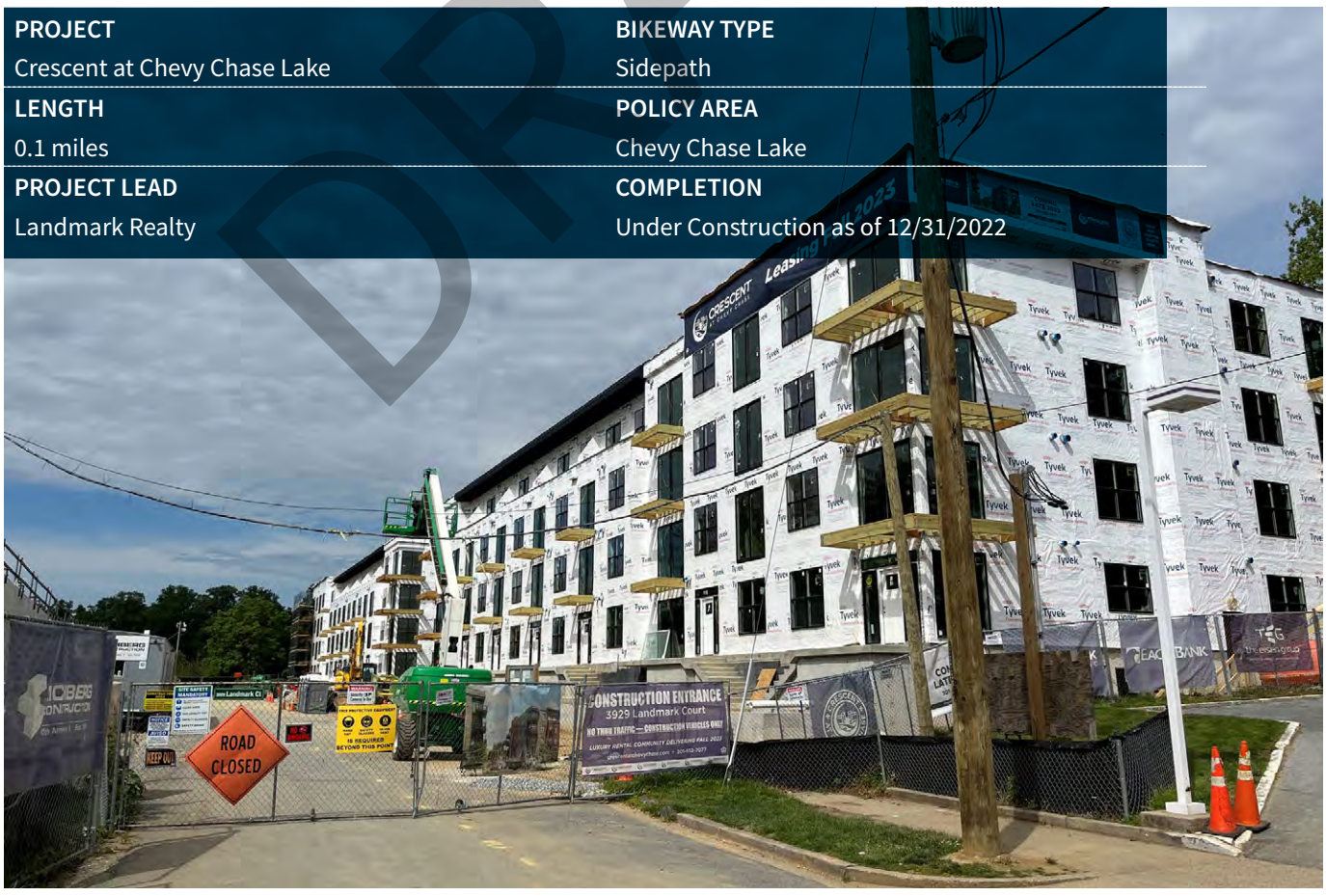
BIKEWAY TYPE
Sidepath

LENGTH
0.1 miles

POLICY AREA
Chevy Chase Lake

PROJECT LEAD
Landmark Realty

COMPLETION
Under Construction as of 12/31/2022



PROJECT
Montgomery Avenue/Lane Cycle Track Phase 1 & 2A

BIKEWAY TYPE
Separated Bike Lanes

LENGTH
0.2 miles

POLICY AREA
Bethesda CBD

PROJECT LEAD
MCDOT

COMPLETION
Under Construction as of 12/31/2022

PROJECT
Capital Crescent Trail

BIKEWAY TYPE
Off-Street Trail

LENGTH
4.9 miles

POLICY AREA
Multiple

PROJECT LEAD
Maryland Transit Administration

COMPLETION
Under Construction as of 12/31/2022

As shown in Table 6, several new master-planned bikeways are on the horizon. This includes 15.6 miles of bikeways funded in the capital budget and 3.9 miles of bikeways conditioned in approved development projects. This includes 9.5 miles of sidepaths, 4.6 miles of neighborhood greenways and 4.4 miles of separated bike lanes. See Appendix B.5 and Appendix B.6 for a list of funded bikeways and bikeways that will be delivered as part of development projects.

Table 6: Master-Planned Bikeways Funded in the Capital Improvements Program or to be Constructed by Developers as of 12/31/2022 (miles)

Facility Type	Bikeway Type	Capital Projects	Development Projects	Total
Trails	Off-Street Trails	0.5	0.0	0.5
	Stream Valley Park Trails	0.0	0.0	0.0
	Neighborhood Connectors	0.0	0.1	0.1
Separated Bikeway	Separated Bike Lanes	3.2	1.2	4.4
	Sidepaths	7.0	2.5	9.5
Striped Bikeways	Buffered Bike Lanes	0.0	0.2	0.2
	Conventional Bike Lanes	0.3	0.0	0.3
	Contra-Flow Bike Lane	0.0	0.0	0.0
Bikeable Shoulders	Bikeable Shoulders	0.0	0.0	0.0
Shared Roads	Shared Streets	0.0	0.0	0.0
	Neighborhood Greenways	4.6	0.0	4.6
	Priority Shared Lane Markings	0.0	0.0	0.0
Total	**Total**	**15.6**	**3.9**	**19.5**

4.2 Fee-in-Lieu

While for the most part it is preferable to require a developer to construct a master-planned bikeway as part of its project, in some instances, the Planning Board determines that it is more appropriate to take a financial contribution from a developer in lieu of having the developer construct the project. The fee-in-lieu contributions in 2021 and 2022 were made by five projects and were valued at over $458,000, or roughly $91,000 per project.

Table 7: Fee-in-Lieu Contributions in 2021 and 2022

Project	Amount
Block F Kilmarock	$6,912
Fawsett Farms	$23,040
The Claiborne	$127,000
Kilmain ETC (Parcel P440)	$128,000
Park Montgomery	$172,595
Total	**$457,547**

4.3 Bikeway Prioritization

Recognizing that the network of bikeways recommended in the *Bicycle Master Plan* is extensive and that funding is limited, the Plan establishes priorities for implementation by the county. The approach to prioritizing construction of the bikeway network is based on reaching the targets established for each metric in the Goals, Objectives, Metrics and Targets section of this Plan. The priorities focus on increasing bicycling in the county as quickly as possible by focusing initial efforts on constructing networks of bikeways in places that the Montgomery County Council has designated as Bicycle and Pedestrian Priority Areas (BiPPAs), and on completing connections between downtowns and ensuring that low-stress bicycling is equitably distributed. Also prioritized are filling gaps in the existing low-stress bicycling network and low-cost bikeways, such as neighborhood greenways, which will funnel bicyclists to the BiPPAs.

The *Bicycle Master Plan* groups bikeways into four groups.

- Tier 1 projects are recommended to be substantially completed in the near-term following approval of the *Bicycle Master Plan*. These projects include:
    - Bikeways located in seven BiPPAs (Bethesda, Friendship Heights, Life Sciences Center, Silver Spring, Wheaton, White Flint, White Oak).
    - Neighborhood greenways feeding into these BiPPA areas.
    - High-demand bikeways that were included in the Capital Improvements Program at the time of approval.
    - Other county priorities.
- Tier 2 projects include bikeways located in the remaining BiPPAs.
- Tier 3 projects include:
    - Remaining neighborhood greenways.
    - Highest-demand bikeways located outside of the BiPPAs.
    - High-demand recreational bicycling routes.
- Tier 4 projects include:
    - All remaining bikeways that are recommended for completion within the life of the plan.
    - Several heavily used recreational bicycling routes.

All other projects are not prioritized for implementation within the life of the Plan but may be implemented as opportunities arise.

The *Bicycle Master Plan* identifies several Tier 1 projects as having the highest priority. Table 8 shows the status of implementing these high priority projects.

However, as the evaluation of Objective 3.1 on page 26 indicates that the disparity in access to low-stress bicycling in EFAs compared to non-EFAs has worsened since 2020, a change in prioritization is warranted. The recommendations section of this report identifies four high-priority bikeway projects in Equity Focus Areas that should be advanced in the near term.

Table 8: Status of Tier 1 Bikeway Projects

Project	From	To	Bikeway	Length (mi)	Status
2nd Avenue / Wayne Avenue	Spring Street	Georgia Avenue	Separated Bike Lanes	0.5	Complete
Arlington Road	Old Georgetown Road	Bradley Boulevard	Separated Bike Lanes	0.7	Not yet started
Bethesda Trolley Trail	Battery Lane	Rugby Avenue	Off-Street Trail	0.1	Complete
Broadbirch Drive	Tech Road	Cherry Hill Road	Separated Bike Lanes	0.7	Not yet started
Capital Crescent Trail Breezeway	Woodmont Avenue	Elm Street Park	Off-Street Trail	0.2	Partially Complete & Funded
Cherry Hill Road	Prosperity Drive	Prince George's County	Separated Bike Lanes	1.3	Not yet started
City of Rockville to Friendship Heights Breezeway (via Bethesda Trolley Trail, Woodmont Avenue and MD 355)	Rockville Pike	Woodglen Drive	Separated Bike Lanes	0.1	Not yet started
	NIH Property Line	Battery Lane	Off-Street Trail	0.1	Development Condition
	Battery Ln	Old Georgetown Rd	Separated Bike Lanes	0.5	Not yet started
	Old Georgetown Road	Strathmore Street	Separated Bike Lanes	0.5	Partially Funded & Under Construction
Dixon Avenue	Wayne Avenue	Georgia Avenue	Separated Bike Lanes	0.3	Funded
Edgemoor Lane	Exeter Road	Arlington Road	Neighborhood Greenway	0.2	Not yet started
Edgemoor Lane	Arlington Road	Bethesda Metrorail Station	Separated Bike Lanes	0.2	Not yet started
Fenton Street	Ellsworth Drive	Wayne Avenue	Separated Bike Lanes	0.1	Funded
Fenton Street	Wayne Avenue	King Street	Separated Bike Lanes	0.6	Funded
Friendship Boulevard	Willard Avenue	District of Columbia	Separated Bike Lanes	0.2	Not yet started
Glenmont to Silver Spring Breezeway (via Amherst Avenue)	Blueridge Avenue	University Boulevard	Separated Bike Lanes	0.2	In Design
	University Boulevard	Windham Lane	Separated Bike Lanes	0.7	In Design
Glenmont to Silver Spring Breezeway (via Fenton Street)	Planning Dept.	Cameron Street	Separated Bike Lanes	0.3	Complete
	Cameron Street	Ellsworth Drive	Separated Bike Lanes	0.5	Funded
Grandview Ave	Blueridge Ave	University Boulevard	Separated Bike Lanes	0.1	In Design
	University Boulevard	Reedie Drive	Separated Bike Lanes	0.2	In Design

Project	From	To	Bikeway	Length (mi)	Status
Life Sciences Center Loop	Key West Avenue	Great Seneca Highway	Separated Bike Lanes	1.1	Development Condition
	Great Seneca Highway	Key West Avenue	Separated Bike Lanes	0.5	Funded
Marinelli Road	Executive Boulevard	Woodglen Drive	Separated Bike Lanes	0.2	Not yet started
	Rockville Pike	Nebel Street	Separated Bike Lanes	0.4	Funded
Medical Center Drive (Outer Side)	Great Seneca Highway	Key West Avenue	Separated Bike Lanes	0.5	Development Condition
Montgomery Ave	Wisconsin Avenue	East West Highway	Separated Bike Lanes	0.4	Partially Funded & Complete
Montgomery Ln	Woodmont Avenue	Wisconsin Avenue	Separated Bike Lanes	0.1	Under Construction
Veirs Mill Road to White Oak Breezeway (via Cherry Hill Road)	Columbia Pike	Prosperity Drive	Separated Bike Lanes	0.1	Not yet started
Woodmont Avenue	Strathmore Street	Wisconsin Avenue	Separated Bike Lanes	0.1	Not yet started


DRAFT

5

Bicycle Parking

The availability of secure and convenient bicycle parking is an important factor when considering a trip by bicycle. No matter how well connected the bikeway network is, many people will forgo bicycling if their destinations lack safe places to secure their bicycles. An adequate supply of bicycle parking encourages bicycling while reducing theft and improper use of trees and street furniture for bicycle parking.

Whether traveling to work, school, shopping, or home, people must feel confident that their bicycles will not be stolen or vandalized when stored. The length of time that a bicycle will be parked largely determines the level of security that is needed. The longer the time period, the more secure the bicycle parking needs to be.

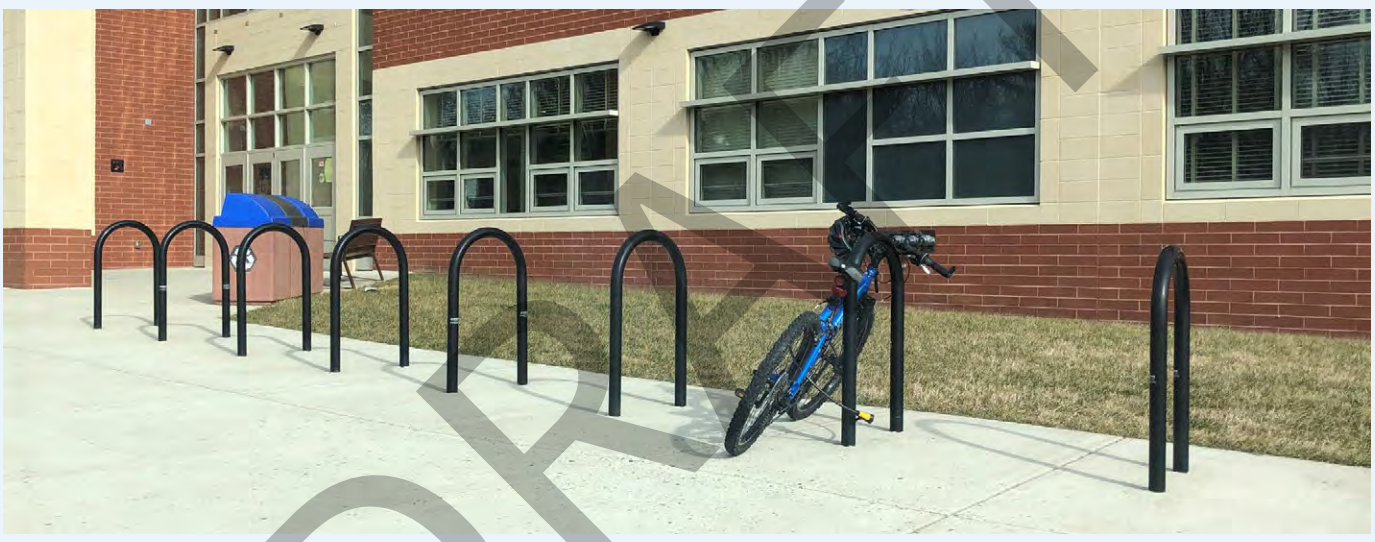
The following sections review bicycle parking at public facilities, such as schools, libraries, recreation centers, and transit stations.

INDUSTRY STANDARDS FOR ADEQUATE BICYCLE PARKING

Industry-standard, short-term bicycle parking provides at least two points of contact to support a bicycle in an upright position and allows locking the frame and one or both wheels with a U-lock—which is more difficult to cut through than cable locks or chains. The image below, from Silver Creek Middle School, shows an example of an adequate form of short-term bicycle parking—an "inverted-U" rack.

Other bicycle racks, such as the undulating (or "wave") racks and the schoolyard (or "wheel bender") racks shown in the image below, provide only one point of contact with a bicycle, and, thus, do not meet industry standards. Most bicycle parking at public facilities in the county are one of these two types of inadequate racks.

Long-term bicycle parking, usually for over two hours, similarly requires at least two points of contact, but are usually provided in a sheltered or enclosed space that provides additional security. These also include bicycle lockers or secured, shared spaces—such as a bicycle room or cage.



Silver Creek Middle School Bicycle Racks

Garrett Park Middle School (left) and Walter Johnson High School (right) Bicycle Racks

5.1 Bicycle Parking at Public Facilities

Schools, Libraries, and Recreation Centers

A study conducted in 2016 for the *Bicycle Master Plan*, and now updated in 2022 for this report, compared the availability of bicycle parking spaces at each school, public library, and recreation center with the estimated need for bicycle parking.

As shown in Table 9, the 2022 update found that only 652 of 4,432 bicycle spaces at these public facilities adhere to industry standards, such as "inverted-U" racks. While there are more bicycle parking spaces today than in 2016, most racks still do not provide industry-standard safety or ease of use. However, some progress has been made. Today, of all existing bicycle parking spaces, almost 15% meet industry standards; this is improved from about 11% of spaces in 2016.

Table 9: Existing Bicycle Parking Spaces at Public Facilities in 2022[6]

Public Facility Type	Existing Spaces	Adequate Spaces	Inadequate Spaces
Elementary Schools	2,031	235	1,796
Middle Schools	1,075	242	833
High Schools	837	50	787
Public Libraries	190	54	136
Recreation Centers	299	71	228
Totals	**4,432**	**652**	**3,780**

To meet existing needs, 8,085 spaces need to be added or upgraded to meet industry standards, as shown in Table 10. The second column provides a breakdown of industry-based estimates[7] for parking required at each type of facility, and the last column shows the total adequate bicycle spaces needed for each type of facility.

Table 10: Shortage of Bicycle Parking Spaces at Public Facilities in 2022

Public Facility Type	Industry Estimate of Need	Existing Adequate Spaces	Total Shortage of Adequate Spaces[8]
Elementary Schools	3,928	235	3,699
Middle Schools	1,994	242	1,776
High Schools	2,540	50	2,490
Public Libraries	86	54	58
Recreation Centers	84	71	62
Total	**8,632**	**652**	**8,085**

6 Data is from a 2022 inventory of bicycle parking at public facilities.
7 The industry-based estimate of need is from the Association of Pedestrian and Bicycle Professionals Bicycle Parking Guidelines, 2nd Edition. It is based on 1 space per 20 student capacity and 1 space per 8,000 square feet of gross floor area for libraries and recreation centers.
8 Some schools have provided more existing adequate spaces than are required by industry standards, so the Total Shortage of Adequate Spaces is greater than simply the difference between Industry Estimate of Need and the number of Existing Adequate Spaces.

BICYCLE PARKING STATIONS

The *Bicycle Master Plan* recommends bicycle parking stations at all WMATA Metrorail Red Line stations, higher-demand MARC stations, and future Purple Line stations to increase the numbers of bicyclists traveling to these transit hubs. The Plan groups these recommendations into four tiers of implementation. Table 11 summarizes the status of the planned Tier 1 bicycle parking stations. Currently, two of the Tier 1 bicycle parking stations are advancing, including a 460-space station at the Bethesda South station and a 74-space station in downtown Silver Spring. Additionally, the Strathmore Square development project is constructing a 100-space bicycle parking station at the Grosvenor Metrorail station, a Tier 2 recommendation.

Table 11: Status of Planned Tier 1 Bicycle Parking Stations at Transit Hubs

Station	Long-Term Spaces	Short-Term Spaces	Status
Bethesda South Station	330	130	Funded, 460 spaces
Forest Glen Station	300	100	
Glenmont Station	400	150	
Shady Grove Station	330	110	
Silver Spring Station	600	170	In Design, 74 spaces
Wheaton Station	400	100	
White Flint Station	250	50	

5.2 Bicycle Parking Provided Through Development and Capital Projects

As shown in Table 12, progress was also made toward implementing short-term and long-term bicycle parking in the county. In particular, between 2021 and 2022 over 300 short-term bicycle parking spaces were conditioned with development approvals and two spaces were installed by MCDOT. Additionally, nearly 1,500 long-term bicycle parking spaces were conditioned with development approvals.

Table 12: Bicycle Support Facilities in 2021 and 2022

Bicycle Parking and Repair Stations	Conditioned with Development Approvals	Installed by MCDOT
Short-Term Bike Parking Spaces	313	2
Long-Term Bike Parking Spaces	1,475	
Bicycle Repair Stations	6	

Grosvenor – Strathmore Metrorail Station

The Strathmore Square development project is required to provide at least 110 long-term and 50 short-term bicycle parking spaces at the Grosvenor – Strathmore Metrorail station and bus loop. The facility was nearing completion in December 2022.

6

Bicycle-Support Programs

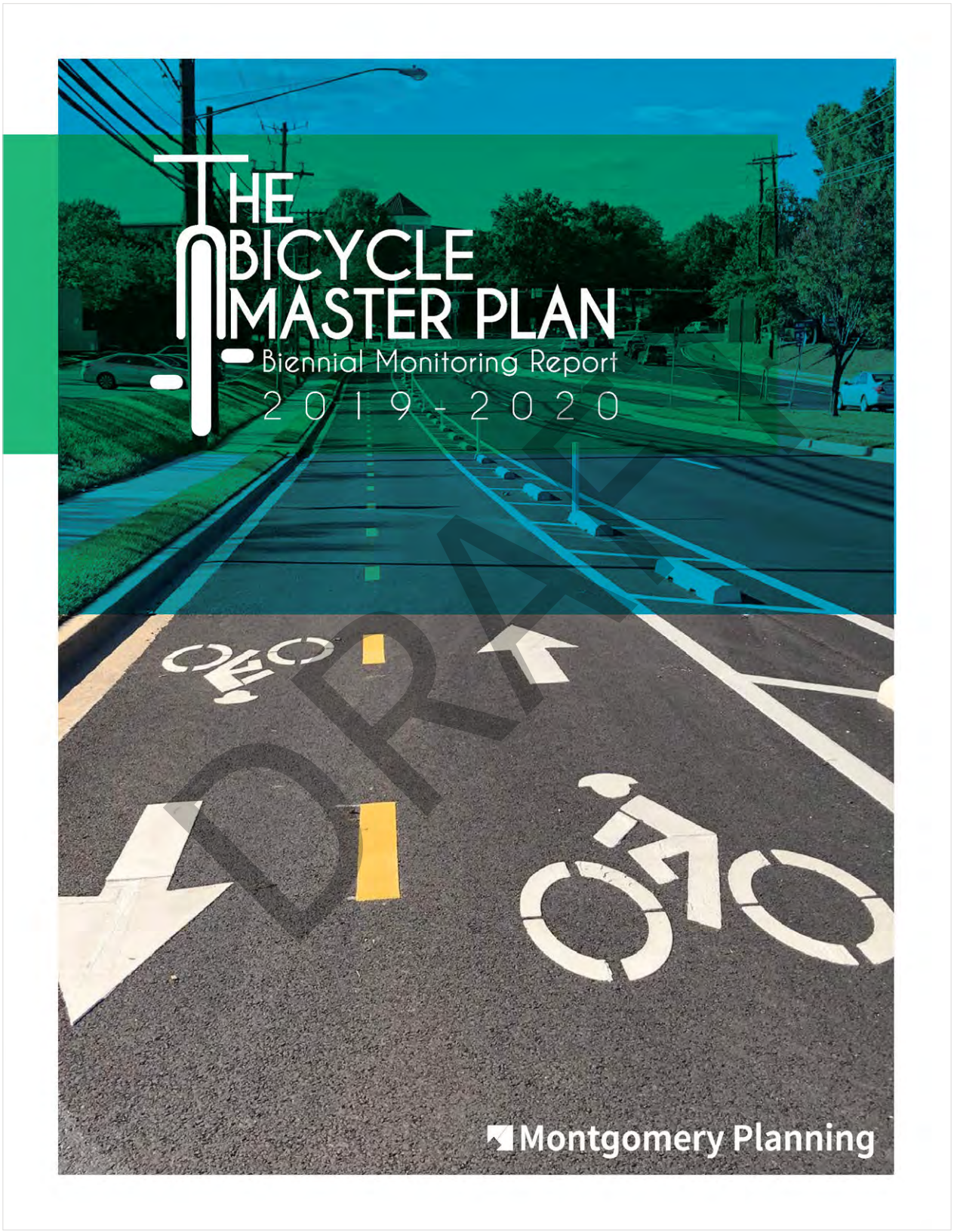
The *Bicycle Master Plan* recommends 12 bicycle-supportive programs. Progress has been made in all of them (see Table 13).

Table 13: Status of Program Recommendations

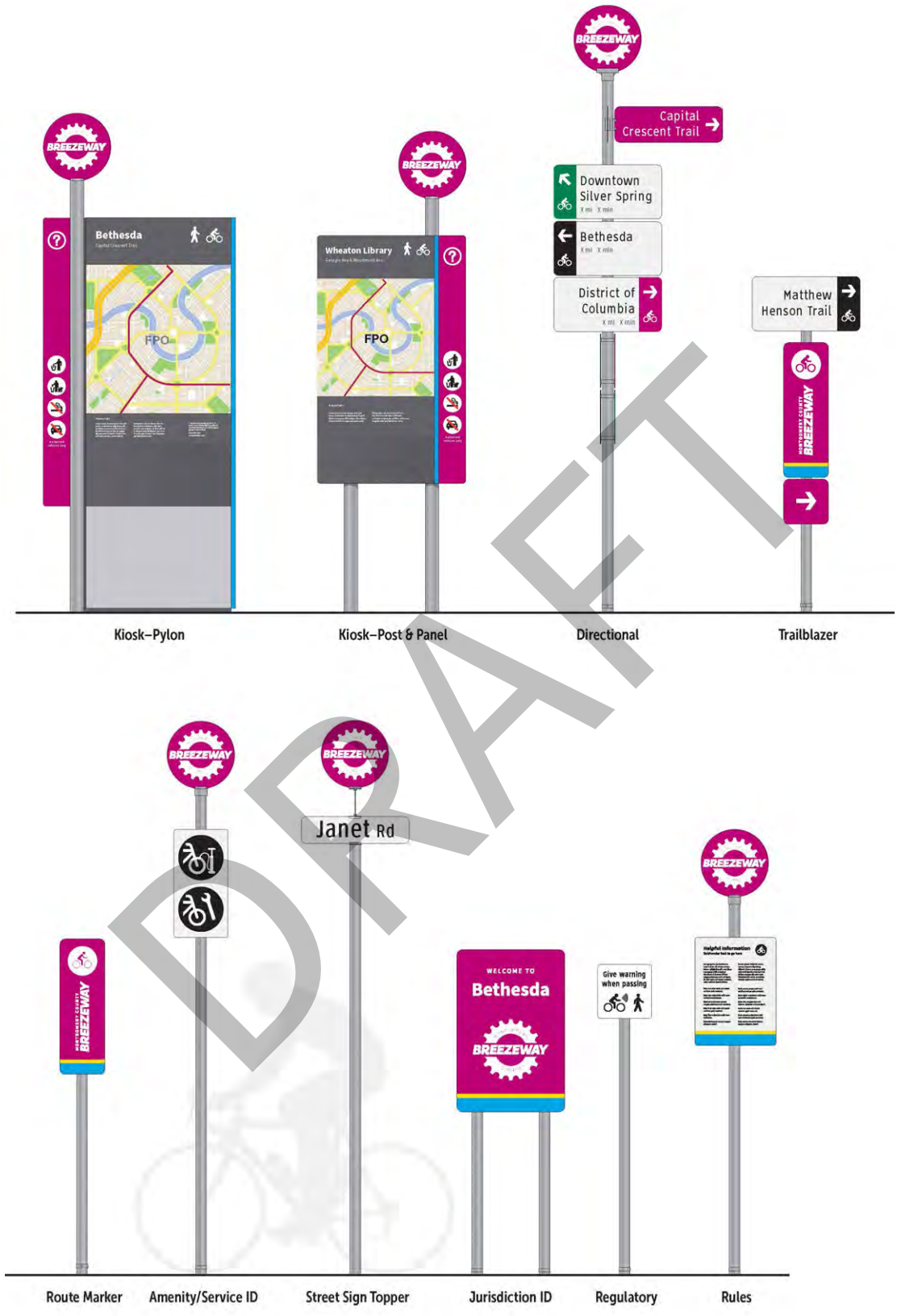
Program Recommendation		Lead Agency	Progress	Status	Recommended Timeframe
2.1	Bikeways Program – Minor Projects: Fund Neighborhood Connectors	MCDOT	No change. The Bikeways Program - Minor Projects (507596) project includes funds that can be used to implement Neighborhood Connector projects, but this funding source has not been used to upgrade Neighborhood Connectors since the approval of the Bicycle Master Plan.	Ongoing	Short Term
2.2	Roadway- and Bikeway-Related Maintenance	MCDOT	On-road and shared use path maintenance and clearance is performed by the Division of Highway Services and by the Urban Districts. Residents can also report maintenance and clearance issues through MC311.	Ongoing	Medium Term
2.3	Snow Removal/Wind/ Rain Storms	MCDOT	The MCDOT Division of Highway Services has equipment to clear on-road, separated bike lanes. MCDOT also clears 100 miles of sidewalk.	Ongoing	Medium Term
2.4	Resurfacing: Primary/ Arterial and Sidewalk & Curb Replacement	MCDOT	As roadways and curbs are replaced, bikeways in the right-of-way are also refreshed.	Ongoing	Medium Term
3.1	BikeMontgomery Outreach Program	MCDOT	MCDOT partners with public schools and public libraries for a variety of events that encourage bicycling. MCDOT partners with the Washington Area Bicyclist Association (WABA) for adult learn-to-ride classes, MCDOT Safe Routes to School program hosts bike rodeos teaching elementary school aged students safe biking skills.	Ongoing	Medium Term
3.2	Bicycle Master Plan Monitoring Report	Planning	The second biennial monitoring report will be published in June 2023.	Ongoing	Ongoing
3.3	Neighborhood Greenway Program	MCDOT	Six Neighborhood Greenway projects are funded in the capital budget through the BiPPA-General, BiPPA-Wheaton and BiPPA-Purple Line programs: Cedar/Bonifant/Grove/ Sligo/Woodbury, Grandview/Mason (Arcola to Georgia), Grandview (Arcola to Blueridge), Greenwood (Piney Branch to Wabash), Greenwood (Wabash to Division), and Domer/ Barron/Gilbert.	Ongoing	Short Term
3.4	Bicycle Parking Program	MCDOT	Installed a bike rack at Kings Local Park.	Ongoing	Short Term
3.5	Public School Bicycle Education	MCPS	MCDOT partners with public schools for bicycle safety events including bicycle rodeos, Walking (and biking) Wednesdays, and Bike to School Day. Over time, the hope is MCPS will add a more comprehensive bicycle training program to their PE curriculum.	Ongoing	Medium Term
3.6	Bicycle Facility Education	MCDOT	MCDOT continues its Lookout campaign to educate residents on new bicycle facilities.	Ongoing	Short Term
3.7	Bicycle Count Program	MCDOT	Completed manual bike counts at 50 locations in 2021 and 79 locations in 2022. Installed 11 new automated bike counters in 2022.	Ongoing	Short Term
3.8	Countywide Wayfinding Plan	MCDOT	The Planning Department's Bikeway Branding project was 90% complete in December 2022.	Partially Complete	Medium Term

Program 3.2: *Bicycle Master Plan* Biennial Monitoring Report

The first *Bicycle Master Plan* Biennial Monitoring Report, 2019 – 2020, was published in November 2021.



The 2019 – 2020 Bicycle Master Plan Biennial Monitoring Report



Program 3.8: Countywide Wayfinding Plan

The Bikeway Branding Project created a “sign family” for bicycling routes designated as Breezeways.

7 Bicycle-Supportive Legal and Policy Framework

The *Bicycle Master Plan* recommends 22 bicycle-supportive legal and policy recommendations. Substantial progress has been made in all of them (see Table 14).

Table 14: Status of Policy Recommendations

Policy Recommendation		Lead Agency	Progress	Status	Recommend-ed Time-frame
2.1	Authorize Lower Posted Speed Limits	MCG	Lower default Target Speeds per Complete Streets were signed into law on November 7, 2022.	Complete	Ongoing
2.2	Repeal the Mandatory Use Law (requires bicyclists to ride in marked bike lanes)	MCG	Not currently a legislative priority.	Not yet started	Ongoing
2.3	Conduct a "Rules of the Road" Assessment	Multiple	The Complete Streets Design Guide bills 24-22 and 34-22 were signed into law on November 7, 2022 and December 27, 2022, respectively, with accompanying regulations still in development as of March 2023; Safe Streets Act had a County Council Committee worksession on March 30, 2023. Neither of these explicitly addresses this action item in detail but are all related to it.	Partially Complete	Short Term
2.4	Replace the State's Marked Bike Lane Policy	MCG	While the state's marked bike lane policy remains in effect, MDOT/SHA's Context Driven 1.0 guide permits protected bicycle lanes to be evaluated in areas defined as urban contexts (Bethesda, Rockville, Silver Spring and Wheaton).	Partially Complete	Ongoing
2.5	Develop a County Policy on E-Bikes	MCG	No change - County policy and law are that e-bikes (and e-scooters and other motorized vehicles except ADA-related ones) are not permitted on sidewalks. To promote use and increase safety for riders of e-bikes and e-scooters, MCDOT is considering amending the law to allow these motorized vehicles on sidewalks where the adjoining roadway has posted speed limits exceeding 35 mph and consists of more than two lanes. An analysis has been done to identify locations where these criteria are met. In many such areas there are very low numbers of pedestrians. Bicycling on the sidewalk would not be permitted in denser activity centers. MCDOT plans to examine practice and policy/legislation in other similar jurisdictions prior to proposing this change.	Partially Complete	Short Term
2.6	Establish Level of Traffic Stress Targets	Planning / MCDOT	Established in Growth and Infrastructure Policy for development projects on November 16, 2020. Not yet established for capital projects.	Partially Complete	Short Term
2.7	Update Context Sensitive Road Design Standards	MCDOT	The Complete Streets Design Guide bills 24-22 and 34-22 were signed into law on November 7, 2022 and December 27, 2022, respectively, fully authorizing the guide.	Partially Complete	11/2019

Policy Recommendation		Lead Agency	Progress	Status	Recommended Timeframe
2.8	Compare all Designed Projects Against Best Practices	MCDOT	MCDOT is refreshing the Falls Road Bikeway and Pedestrian Facility project (500905), the Seven Locks Bikeway and Safety Improvements project (501303) and the Bradley Boulevard Improvements project (501733) to reflect best practices.	Partially Complete	Short Term
2.9	Make Separated Bikeways the Preferred Bikeway Facility Type	MCDOT	The Complete Streets Design Guide was completed in 2021. It includes recommendations to make separated bike lanes and sidepaths the default bikeway type on all street types except neighborhood streets (Neighborhood Connectors, Neighborhood Streets and Neighborhood Yield Streets).	Complete	Short Term
2.10	Extending Separated Bike Lanes Through Intersections	MCDOT	The Complete Streets Design Guide was completed in 2021. Protected intersections are required at all intersections with existing or planned separated bike lanes, sidepaths, buffered bike lanes, or conventional bike lanes. The Planning Department completed the Protected Intersection Checklist and conducted a training on the checklist with county staff and members of the development community.	Complete	Short Term
2.11	Consolidate Driveways along Master-Planned Bikeways	MCG	The Planning Department completed the Access Management Study in 2022 and will be initiating implementation of the study in 2023 and 2024.	Partially Complete	Short Term
2.12	Develop a Shared Lane Marking Policy	MCDOT / SHA	The Complete Streets Design Guide will need to explicitly state that shared lane markings are not appropriate on specific street types. "Shared Lane Markings reinforce bicyclists' right to bicycle in the center of the lane and can serve a wayfinding function. They are appropriate where the Bicycle Master Plan recommends a Neighborhood Greenways or Priority Shared Lane Markings. They may be appropriate on Neighborhood Streets and Neighborhood Yield Streets. Shared lane markings are not appropriate on Downtown Boulevards, Downtown Streets, Boulevards, Town Center Boulevards, Town Center Streets, Neighborhood Connectors, Industrial Streets, Country Connectors, Country Roads or Major Highways."	Not yet started	Short Term
2.13	Develop Bicycle Parking Standards for County Facilities	MCDGS	The Montgomery County, Maryland Building Design Standards: Planning, Design & Construction of Public Facilities, Version 2020-7, requires the use of "U" racks on county properties.	Complete	Short Term
2.14	Reassess Road Code Urban Area Boundaries	Planning	The Draft Pedestrian Master Plan proposes changes to the Complete Streets Design Guide area types, the successor to the Road Code Urban Areas.	Complete	Short Term

Policy Recommendation		Lead Agency	Progress	Status	Recommend-ed Time-frame
2.15	Establish Standards for Trail Crossings at Major Roads	MCDOT / Parks / SHA	Montgomery Parks has continued to upgrade between eight and 12 park trail crossings and implementing traffic calming measures on park roads each year as part of its Vision Zero efforts. Upgrades have targeted the highest priority crossings, based on speed limit, number of lanes of traffic, lack of existing traffic control devices, trail usage, and Park Police and resident input.	Ongoing	Short Term
2.16	Develop Protocols for Bicycle Facility Closures and Detours	MCDOT	Bill 38-19, signed into law on March 27, 2020, requires the County Executive to adopt regulations regarding permits to close shared use paths in the public rights-of-way, among other things.	Complete	Short Term
2.17	School Site Selection	MCPS		Not yet started	Short Term
2.18	Enable Traffic Calming and Access Restrictions on Neighborhood Greenways	MCDOT	MCDOT staff has determined that this policy change is not needed. Design efforts are underway as part of Aspen Hill and Grove Street neighborhood greenway projects that will pilot traffic calming and access restrictions for assessment.	Complete	Short Term
2.19	Update the Zoning Code (Bicycle Parking Requirements)	Planning	ZTA 19-08 was adopted by the Council on July 21, 2020.	Complete	Short Term
2.20	Revise the Bicycle to School Policy	MCPS	MCPS principals retain the authority to determine when students can bicycle to school.	Not yet started	Short Term
2.21	Abandonments	MCDOT	No action needed.	Complete	Short Term
2.22	Loading Zones	Planning	The proposed Curbside Management Project was not funded in FY 24.	Partially Complete	Short Term

8

Recommendations

Implementation of the *Bicycle Master Plan* continues to ramp up as more and more bikeways are funded for design and construction, bicycle parking is installed, and programmatic and policy changes are implemented to support bicycling. Looking to the coming years, the monitoring report provides the opportunity to offer recommendations to address some of the challenges that have arisen since the Plan was approved and to provide recommendations on how to proceed over the coming years. This section presents six recommendations that are related to bicycle facilities, bicycle standards and toolkits, and monitoring. While fiscal capacity may limit the county's ability to implement all of the recommendations in the next two years, the following recommendations should be considered as implementation of the *Bicycle Master Plan* proceeds.

8.1 High Priority Bikeways

Substantial progress has been made on funding and constructing bikeway projects since the *Bicycle Master Plan* was approved in December 2018, many of which were identified by the Plan (page 154) as high priorities. Every few years the Plan supports reevaluating these priorities, stating that "the bikeway and bicycle parking station prioritization in this Plan are guidelines based on the best available information at the time the Plan was approved by the Montgomery County Council. This prioritization should be reassessed every few years based on available resources, lessons learned and to ensure consistency with the goals of the Plan and to ensure continuity of the bicycling network."

The bikeways shown in Table 15 should be considered as part of the next round of bikeway projects, upon completion of the projects currently included in the Capital Improvements Program. These include projects that are:

- In the Capital Improvements Program but that do not have construction funding.
- On the *Bicycle Master Plan's* (page 15) high-priority list that have not yet been funded.
- Temporary neighborhood greenways initiated as part of the Shared Streets program that should be upgraded to permanent neighborhood greenways.
- Projects located in Equity Focus Areas, which, as Table 2 (Objective 3.1) showed, have only about 84% of the low-stress connectivity that non-EFAs experience.

RECOMMENDATION:

Prioritize construction of the bikeway projects in Table 15 to improve connectivity to downtowns, upgrade the county's temporary neighborhood greenways to permanent neighborhood greenways, and improve access to low-stress bicycling in Equity Focus Areas. The projects with the greatest benefit for EFAs, and therefore the highest priority, include:

- **Montgomery Village Avenue Sidepath from Stewartown Road to City of Gaithersburg**
- **Tech Road Separated Bike Lanes from Columbia Boulevard to Industrial Parkway**
- **Broadbirch Drive Separated Bike Lanes from Tech Road to Cherry Hill Road**
- **Castle Boulevard Separated Bike Lanes from Castle Ridge Circle to Briggs Chaney Road**

Table 15: High Priority Projects for Next Few Years

Policy Area	Street	From	To	Bikeway Type
Bethesda CBD	Arlington Road	Old Georgetown Road	Bradley Boulevard	Separated Bike Lanes
Bethesda CBD	Edgemoor Lane	Arlington Road	Bethesda Metro Station	Separated Bike Lanes
Bethesda CBD	Woodmont Avenue	Battery Lane	Old Georgetown Road	Separated Bike Lanes
Bethesda CBD	Woodmont Avenue	Strathmore Avenue	Wisconsin Avenue	Separated Bike Lanes
Fairland/Colesville	Castle Boulevard	Castle Ridge Circle	Briggs Chaney Road	Separated Bike Lanes
Friendship Heights	Friendship Boulevard	Willard Avenue	District of Columbia	Separated Bike Lanes
Germantown East	MD 355 (West Side)	Germantown Road	Shakespeare Boulevard	Sidepath
Germantown Town Center, Germantown West	Wisteria Drive	Father Hurley Boulevard	Great Seneca Highway	Sidepath or Separated Bike Lanes
Kensington/Wheaton, Glenmont	Holdridge Road	Matthew Henson Trail	Georgia Avenue	Neighborhood Greenway
Montgomery Village	Lost Knife Road	City of Gaithersburg	Odenhal Avenue	Separated Bike Lanes
Montgomery Village	Montgomery Village Avenue (East Side)	Stewartown Road	City of Gaithersburg	Sidepath
North Bethesda	Old Georgetown Road (MD 187)	Towne Road	Tuckerman Lane	Breezeway
Silver Spring	13th Street/Burlington Avenue	District of Columbia	Fenton Street	Separated Bike Lanes
Silver Spring / Takoma Park	Woodland Drive	Columbia Boulevard	Spring Street	Neighborhood Greenway
Wheaton CBD	Grandview Avenue	Blueridge Avenue	Reedie Drive	Separated Bike Lanes
White Flint	Marinelli Road	Executive Boulevard	Woodglen Drive	Separated Bike Lanes
White Oak	Broadbirch Drive	Tech Road	Cherry Hill Road	Separated Bike Lanes
White Oak	Cherry Hill Road	Columbia Pike	Prince George's County	Separated Bike Lanes
White Oak	Old Columbia Pike	Tech Road	White Oak Shopping Center	Sidepath
White Oak	Tech Road	Columbia Pike	Industrial Parkway	Separated Bike Lanes

8.2 Bicycle Parking at Public Facilities

Based on a 2022 survey, over 8,000 bicycle parking spaces are needed at public schools, libraries, and recreation centers; the vast majority are needed at schools. As shown in Table 16, the estimated cost to upgrade and expand bicycle parking at these public facilities is under $3.3 million. While the cost of installing bicycle racks is high, another challenge will be identifying appropriate places to install them.

Table 16: Estimated Cost to Address Bicycle Parking Needs at Public Facilities

Facility Type	Bicycle Racks Needed	Estimated Cost[9]
Elementary Schools	3,699	$ 1,450,000
Middle Schools	1,776	$ 686,000
High Schools	2,490	$ 1,142,000
Public Libraries	58	$ 7,000
Recreation Centers	62	$ 8,000
Total	**8,085**	**$ 3,294,000**

9 Cost includes the "replacement" of inadequate existing racks and the installation of "new" racks to meet calculated need. Cost calculation estimates that "replacement" racks do not need new concrete pads; only "new" racks would require installation of concrete pads.

To prioritize investments in bicycle parking, Planning Department Staff conducted additional analysis to determine schools with the greatest need. Priority criteria are included in the following list, and all data are from 2022 unless otherwise noted.

- Above average bicycle-to-school rates (determined by a Planning Department survey administered to all schools in fall 2019).
- Above average shortage of industry-standard bicycle parking spaces.
- No existing industry-standard bicycle parking spaces.
- No bicycle parking installed since 2016.

The 15 schools meeting all the criteria are listed in the table below—first by school type, then by highest "Bike-to-School" rate. Estimated costs to install the bicycle parking are included in the table.

Table 17: Highest Priority Schools for Bicycle Parking Upgrades with Estimated Costs

School Type	School Name	Title I/Focus or High FARMS Rate	Bike-to-School Rate (2018)	Shortage of Adequate Bicycle Parking Spaces	Estimated Cost
Elementary School	Dr. Ronald A. McNair	N	6.2%	32	$3,000
Elementary School	Glenallen	Y	5.8%	38	$18,000
Elementary School	Bells Mills	N	5.4%	32	$11,000
Elementary School	Poolesville	N	4.6%	28	$12,000
Elementary School	Sligo Creek	N	3.9%	34	$20,000
Elementary School	Olney	N	3.1%	32	$8,000
Middle School	Thomas W. Pyle	N	8.3%	76	$24,000
Middle School	Silver Spring International	Y	4.4%	54	$28,000
Middle School	North Bethesda	N	3.8%	62	$23,000
Middle School	Rosa M. Parks	N	2.6%	48	$17,000
Middle School	Westland	N	2.0%	54	$13,000
High School	Bethesda-Chevy Chase	N	11.3%	124	$54,000
High School	Quince Orchard	N	3.2%	90	$49,000
High School	Walt Whitman	N	3.0%	112	$26,000
High School	Walter Johnson	N	2.0%	114	$40,000
Total	**N/A**	**N/A**	**N/A**	**930**	**$346,000**

RECOMMENDATION: Over the next two years, prioritize funding to upgrade bicycle parking at the following schools: Dr. Ronald A. McNair ES, Glenallen ES, Bells Mills ES, Poolesville ES, Sligo Creek ES, Olney ES, Thomas W. Pyle MS, Silver Spring International MS, North Bethesda MS, Rosa M. Parks MS, Westland MS, Bethesda-Chevy Chase HS, Quince Orchard HS, Walt Whitman HS, and Walter Johnson HS.

Importantly, many Title I/Focus or schools with high FARMS rates did not respond to the Planning Department's survey about bicycling to school. Therefore, there are no recorded bicycling-to-school rates for these schools. However, ten of these schools met all other priority criteria and should be considered for priority funding. The schools are listed in the table below, by school type, along with estimated costs.

Table 18: Priority Title I/Focus or Schools with High FARMS Rate and No Bike-to-School Rates Available

School Type	School Name	Title I/Focus or High FARMS Rate	Shortage of Adequate Bicycle Parking Spaces	Estimated Cost
Elementary School	Rolling Terrace	Y	36	$16,000
Elementary School	Stedwick	Y	36	$22,000
Elementary School	South Lake	Y	34	$20,000
Elementary School	Arcola	Y	32	$17,000
Middle School	Roberto W. Clemente	Y	60	$26,000
Middle School	Forest Oak	Y	48	$23,000
Middle School	Eastern	Y	50	$21,000
Middle School	White Oak	Y	50	$21,000
Middle School	Sligo	Y	48	$5,000
High School	Gaithersburg	Y	124	$60,000
Total	**N/A**	**N/A**	**518**	**$231,000**

RECOMMENDATION: Over the next six years, prioritize funding to upgrade bicycle parking at the following Title I/Focus schools and schools with high FARMS rates: Rolling Terrace ES, Stedwick ES, South Lake ES, Arcola ES, Roberto W. Clemente MS, Forest Oak MS, Eastern MS, White Oak MS, Sligo MS, and Gaithersburg HS.

Furthermore, while MCDOT may be the most qualified agency to install bicycle parking, it is firmly the role of MCPS to install these facilities. Currently, MCPS does not have a separate funding source for bicycle parking. Therefore, upgrades to bicycle parking usually occur either when a school is newly constructed, renovated or expanded and not necessarily where the greatest need exists.

RECOMMENDATION: Provide MCPS with an annual funding program for installing bicycle parking.

When MCPS installs bicycle parking, it sometimes installs out-of-date "wave" style racks.

RECOMMENDATION: MCPS should develop bike rack standards that correspond with standards identified in Montgomery County's zoning code.

8.3 High Priority Bicycle Parking Stations

The *Bicycle Master Plan* recommends bicycle parking stations at all WMATA Metrorail Red Line stations, higher-demand MARC stations, and future Purple Line stations to increase the numbers of bicyclists traveling to these transit hubs. Currently, bicycle parking stations are funded at the Bethesda Metrorail and Purple Line station and Silver Spring Transit Center. A developer is also constructing a station at the Grosvenor Metrorail station. An additional bicycle parking station should be pursued at the Glenmont Metrorail station, as this station is in an Equity Focus Area, has a large catchment area as an end-of-the-line station and is already connected to much of the surrounding community by low-stress bicycling.

RECOMMENDATION: Fund a bicycle parking station at the Glenmont Metrorail station to expand the reach of transit and develop the organizational capacity to operate bicycle parking stations, including those at the Bethesda Purple Line station and the Silver Spring Transit Center, which are already funded.

8.4 Bikeway Standards

A challenge for successfully implementing the *Bicycle Master Plan*'s vision is a lack of design standards for bicycle facilities. While the Plan includes a bikeways toolkit and the Complete Streets Design Guide also provides guidance, specific design standards are still needed for certain components of the bicycling network. Therefore, MCDOT, in partnership with the Planning Department, should develop comprehensive design standards for bicycle facilities included in Montgomery Planning's Bicycle Facility Design Toolkit and the Complete Streets Design Guide. Among other things, this includes:

- Protected intersections
- Pavement standards for breezeways and sidepaths
- Standards for creating a world-class network of separated bike lanes
- Dimensions for sidepaths on bridges
- Treatments for separated bike lanes crossing driveways

RECOMMENDATION: Develop comprehensive design standards for bicycle facilities.

8.5 Monitoring

Data sources that were available during the development of the *Bicycle Master Plan* generally focused on bicycling as part of the commute to work. However, travel to work represents only about 20% of all trips, so a more nuanced understanding of travel by bicycle is needed to track changes in travel behavior and attitudes. To capture this information, a biennial travel survey is proposed to monitor implementation of both the *Bicycle Master Plan* and the forthcoming Pedestrian Master Plan. This survey will require biennial funding from County Council.

RECOMMENDATION: Fund and conduct a biennial travel monitoring survey to measure travel behavior and attitudes toward walking and bicycling.

9

Appendix

Appendix A: Metrics

A.1 BICYCLING RATES TO TRANSPORTATION MANAGEMENT DISTRICTS

Objective 1.2: Percentage of people who commute by bicycle to a Transportation Management District

Transportation Management District	2018	2020	2022
Downtown Bethesda	0.7%	0.8%	1.4%
Downtown Silver Spring	1.4%	1.8%	1.6%
Friendship Heights	1.4%	0.4%	0.6%
Greater Shady Grove	1.5%	0.0%	0.1%
North Bethesda	1.0%	0.3%	0.4%
White Oak	N/A	N/A	0.4%

A.2 BICYCLING RATES TO TRANSIT STATIONS

Objective 1.3: Percentage of passengers who access a Red Line station by bicycle

Red Line Stations	2016	2022
Glenmont	1.1%	1.3%
Wheaton	0.0%	1.1%
Forest Glen	1.6%	4.7%
Silver Spring	1.5%	0.5%
Takoma	3.3%	3.7%
Friendship Heights	1.2%	0.7%
Bethesda	2.5%	2.8%
Medical Center	4.5%	3.4%
North Bethesda	2.7%	0.0%
Shady Grove	0.7%	0.9%
Average	**1.6%**	**1.6%**

A.3 BICYCLING RATES TO ELEMENTARY SCHOOLS

Objective 1.4: Percentage of elementary school students who bicycle to school (fall 2019)

School	# of Bike Riders	# of Responses	Bike-to-School Rate
Arcola	n/a	n/a	--
Ashburton	2	663	0%
Bannockburn	13	361	4%
Bayard Rustin	7	289	2%
Bel Pre	3	415	1%
Bells Mill	30	555	5%
Belmont	27	323	8%
Bethesda	11	159	7%
Beverly Farms	2	268	1%
Bradley Hills	30	330	9%
Brooke Grove	n/a	n/a	--
Brookhaven	5	244	2%
Burning Tree	8	261	3%
Burnt Mills	n/a	n/a	--
Burtonsville	11	229	5%
Candlewood	5	318	2%
Cannon Road	5	199	3%
Captain James E. Daly	7	495	1%
Carderock Springs	12	144	8%
Cashell	4	146	3%
Cedar Grove	1	311	0%
Chevy Chase	22	444	5%
Clarksburg	2	560	0%
Clearspring	n/a	n/a	--
Clopper Mill	7	262	3%
Cloverly	n/a	n/a	--
Cold Spring	n/a	n/a	--
Cresthaven	n/a	n/a	--
Damascus	1	237	0%
Darnestown	n/a	n/a	--
Dr. Charles R. Drew	n/a	n/a	--
Dr. Sally K. Ride	10	120	8%
DuFief	10	142	7%
East Silver Spring	n/a	n/a	--
Fairland	10	276	4%
Farmland	8	368	2%
Fields Road	3	321	1%
Flora M. Singer	n/a	n/a	--
Flower Hill	7	384	2%
Flower Valley	n/a	n/a	--
Forest Knolls	9	576	2%
Fox Chapel	5	497	1%
Galway	2	122	2%
Garrett Park	21	658	3%
Georgian Forest	3	331	1%
Germantown	3	63	5%
Glen Haven	11	402	3%
Glenallan	13	226	6%
Goshen	5	200	3%
Great Seneca Creek	n/a	n/a	--
Greencastle	7	312	2%

School	# of Bike Riders	# of Responses	Bike-to-School Rate
Greenwood	3	90	3%
Harmony Hills	4	409	1%
Highland	9	359	3%
Highland View	n/a	n/a	--
Jackson Road	8	567	1%
JoAnn Leleck at Broad Acres	n/a	n/a	--
Jones Lane	n/a	n/a	--
Judith A. Resnik	7	268	3%
Kemp Mill	1	257	0%
Kensington Parkwood	n/a	n/a	--
Lake Seneca	11	327	3%
Laytonsville	5	303	2%
Little Bennett	8	457	2%
Lois P. Rockwell	2	286	1%
Lucy V. Barnsley	6	689	1%
Luxmanor	8	197	4%
Mill Creek Towne	5	357	1%
Monocacy	1	139	1%
Montgomery Knolls	4	323	1%
New Hampshire Estates	7	217	3%
North Chevy Chase	8	229	3%
Oak View	5	344	1%
Oakland Terrace	n/a	n/a	--
Olney	12	382	3%
Pine Crest	3	257	1%
Piney Branch	36	262	14%
Poolesville	10	216	5%
Potomac	3	315	1%
Rock Creek Forest	8	517	2%
Rock Creek Valley	6	154	4%
Rock View	10	563	2%
Rolling Terrace	n/a	n/a	--
Ronald McNair	28	454	6%
Roscoe R. Nix	6	214	3%
Rosemary Hills	3	404	1%
S. Christa McAuliffe	7	472	1%
Sargent Shriver	7	623	1%
Sequoyah	5	335	1%
Seven Locks	1	126	1%
Sherwood	1	216	0%
Sligo Creek	18	463	4%
Snowden Farm	11	355	3%
Somerset	29	489	6%
South Lake	n/a	n/a	--
Spark M. Matsunaga	n/a	n/a	--
Stedwick	n/a	n/a	--
Stone Mill	n/a	n/a	--
Stonegate	4	350	1%
Strathmore	4	396	1%
Strawberry Knoll	2	166	1%
Takoma Park	5	482	1%
Thurgood Marshall	4	502	1%
Travilah	1	93	1%
Viers Mill	n/a	n/a	--
Washington Grove	3	168	2%
Waters Landing	n/a	n/a	--
Watkins Mill	n/a	n/a	--
Wayside	3	435	1%
Weller Road	17	155	11%
Westbrook	n/a	n/a	--
Westover	10	219	5%
Wheaton Woods	6	221	3%
Whetstone	n/a	n/a	--
William B. Gibbs Jr.	9	103	9%
William Tyler Page	8	422	2%
Wilson Wims	15	663	2%
Wood Acres	9	476	2%
Woodfield	n/a	n/a	--
Woodlin	n/a	n/a	--
Wyngate	n/a	n/a	--
Total	**748**	**29,697**	**3%**

A.4 BICYCLING RATES TO MIDDLE SCHOOLS

Objective 1.4: Percentage of middle school students who bicycle to school (fall 2019)

School	# of Bike Riders	# of Responses	Bike-to-School Rate
A. Mario Loiederman	5	782	1%
Argyle	2	671	0%
Benjamin Banneker	6	635	1%
Briggs Chaney	5	531	1%
Cabin John	6	898	1%
Col. E. Brooke Lee	6	394	2%
Dr. Martin Luther King Jr.	2	614	0%
Earle B. Wood	1	779	0%
Eastern	n/a	n/a	--
Francis Scott Key	0	632	0%
Hallie Wells	40	789	5%
Herbert Hoover	9	856	1%
John Poole	12	358	3%
John T. Baker	n/a	n/a	--
Kingsview	17	808	2%
Montgomery Village	11	575	2%
Neelsville	0	142	0%
Newport Mill	n/a	n/a	--
North Bethesda	41	1,083	4%
Parkland	3	1,054	0%
Redland	1	495	0%
Ridgeview	4	574	1%
Roberto W Clemente	n/a	n/a	--
Rocky Hill	1	747	0%
Rosa Parks	20	756	3%
Shady Grove	1	492	0%
Silver Creek	15	739	2%
Silver Spring International	36	814	4%
Sligo	n/a	n/a	--
Takoma Park	18	467	4%
Thomas W. Pyle	43	516	8%
Tilden	n/a	n/a	--
Westland	12	599	2%
White Oak	n/a	n/a	--
William H. Farquhar	2	576	0%
Total	**319**	**18,376**	**2%**

A.5 BICYCLING RATES TO HIGH SCHOOLS

Objective 1.4: Percentage of high school students who bicycle to school (fall 2019)

School	# of Bike Riders	# of Responses	Bike-to-School Rate
Albert Einstein	4	995	0%
Bethesda-Chevy Chase	103	911	11%
Blake	0	571	0%
Clarksburg	7	1,460	0%
Damascus	1	1,041	0%
Kennedy	2	1,090	0%
Magruder	6	984	1%
Montgomery Blair	n/a	n/a	--
Northwest	n/a	n/a	--
Northwood	13	946	1%
Paint Branch	2	984	0%
Poolesville	15	612	2%
Quince Orchard	30	934	3%
Seneca Valley	n/a	n/a	--
Sherwood	5	1,495	0%
Springbrook	10	547	2%
Walter Johnson	32	1,582	2%
Watkins Mill	n/a	n/a	--
Wheaton	8	749	1%
Whitman	48	1,587	3%
Winston Churchill	n/a	n/a	--
Total	**286**	**16,488**	**2%**

A.6 COUNTYWIDE CONNECTIVITY

Objective 2.1: Percentage of potential bicycle trips that will be able to be made on a low-stress bicycling network by policy area

Policy Area	12/2018	12/2020	12/2021	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Aspen Hill	20%	21%	22%	22%	22%	77%
Bethesda CBD	5%	9%	11%	13%	22%	86%
Bethesda/Chevy Chase	25%	28%	30%	32%	35%	89%
Burtonsville Town Center	1%	2%	2%	2%	2%	96%
Chevy Chase Lake	1%	4%	4%	23%	27%	85%
Clarksburg	18%	18%	25%	26%	29%	72%
Clarksburg Town Center	22%	24%	27%	30%	51%	64%
Cloverly	9%	9%	9%	9%	10%	89%
Damascus	19%	19%	19%	19%	19%	76%
Derwood	4%	5%	5%	5%	5%	64%
East Purple Line	23%	24%	25%	30%	36%	87%
Fairland/Colesville	15%	15%	15%	15%	15%	92%
Forest Glen	14%	14%	14%	14%	24%	88%
Friendship Heights	4%	4%	4%	4%	4%	72%
Germantown East	19%	18%	19%	19%	20%	79%
Germantown Town Center	11%	15%	16%	16%	16%	85%
Germantown West	16%	18%	18%	18%	18%	82%
Glenmont	14%	14%	15%	15%	15%	94%
Grosvenor	3%	3%	3%	3%	5%	86%
Kensington/Wheaton	21%	22%	22%	23%	26%	93%
Lyttonsville	29%	29%	29%	44%	50%	87%
Medical Center	37%	48%	49%	53%	55%	96%
Montgomery Village/Airpark	4%	4%	4%	4%	4%	70%
North Bethesda	6%	7%	7%	7%	10%	89%
North Potomac	21%	22%	22%	22%	22%	73%
Olney	21%	21%	25%	25%	29%	88%
Potomac	11%	11%	12%	12%	15%	85%
R&D Village	21%	21%	21%	21%	24%	77%
Rural East	5%	7%	8%	8%	11%	59%
Rural West	22%	22%	22%	22%	22%	51%
Shady Grove Metro Station	12%	12%	12%	12%	13%	70%
Silver Spring CBD	4%	7%	7%	16%	34%	73%
Silver Spring/Takoma Park	25%	25%	25%	29%	36%	83%
Takoma	33%	33%	33%	34%	44%	83%
Twinbrook	1%	1%	1%	1%	1%	72%
Wheaton CBD	11%	11%	12%	12%	17%	95%
White Flint	3%	4%	4%	4%	5%	91%
White Oak	7%	7%	7%	7%	7%	88%
Woodside	8%	10%	10%	16%	22%	74%
Total	**14%**	**15%**	**16%**	**17%**	**20%**	**83%**

A.7 CONNECTIVITY TO RED LINE STATIONS

Objective 2.2: Percentage of dwelling units within two miles of each Red Line station that are connected to the transit station on a low-stress bicycling network

Red Line Station	12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Bethesda	0%	0%	2%	6%	19%	55%
Forest Glen	11%	11%	11%	11%	11%	74%
Friendship Heights	0%	0%	0%	0%	0%	52%
Glenmont	32%	32%	33%	33%	33%	86%
Grosvenor-Strathmore	18%	18%	18%	18%	18%	63%
Medical Center	8%	22%	23%	26%	33%	63%
Shady Grove	7%	8%	8%	8%	8%	78%
Silver Spring	1%	4%	4%	25%	35%	69%
Takoma	22%	22%	22%	22%	39%	69%
Wheaton	0%	0%	0%	0%	0%	84%
White Flint	0%	0%	0%	0%	0%	58%
Total	**8%**	**10%**	**10%**	**14%**	**19%**	**67%**

A.8 CONNECTIVITY TO BRUNSWICK LINE STATIONS

Objective 2.2: Percentage of dwelling units within two miles of each Brunswick Line station that are connected to the transit station on a low-stress bicycling network

Brunswick Line Station	12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Barnesville	0%	0%	0%	0%	0%	0%
Boyds	2%	2%	2%	2%	2%	16%
Dickerson	4%	4%	4%	4%	4%	4%
Garrett Park	33%	33%	34%	34%	34%	75%
Germantown	14%	14%	14%	14%	14%	76%
Kensington	22%	22%	22%	22%	22%	68%
Silver Spring	0%	0%	0%	22%	30%	58%
Washington Grove	6%	6%	6%	6%	6%	10%
Total	**14%**	**14%**	**14%**	**20%**	**23%**	**59%**

A.9 CONNECTIVITY TO PURPLE LINE STATIONS

Objective 2.2: Percentage of dwelling units within two miles of each Purple Line station that are connected to the transit station on a low-stress bicycling network

Purple Line Station	12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Bethesda	0%	0%	2%	2%	18%	48%
Connecticut Avenue	0%	0%	0%	15%	22%	61%
Dale Drive	0%	0%	27%	31%	36%	77%
Long Branch	0%	0%	0%	0%	0%	73%
Lyttonsville	0%	0%	0%	23%	25%	68%
Manchester Place	20%	20%	22%	22%	24%	77%
Piney Branch Road	0%	0%	0%	0%	0%	77%
Silver Spring Library	0%	0%	0%	0%	40%	75%
Silver Spring Transit Center	0%	4%	4%	22%	32%	64%
Takoma-Langley Transit Center	0%	0%	0%	0%	0%	75%
Woodside	0%	0%	0%	0%	0%	70%
Total	**2%**	**3%**	**7%**	**11%**	**20%**	**70%**

A.10 CONNECTIVITY TO U.S. 29 FLASH STATIONS

Objective 2.2: Percentage of dwelling units within two miles of each U.S. 29 FLASH station that are connected to the transit station on a low-stress bicycling network

Purple Line Station	12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Burtonsville Park & Ride	0%	0%	0%	0%	0%	83%
Briggs Chaney Park & Ride	31%	31%	31%	31%	31%	84%
Castle Blvd	4%	4%	4%	4%	4%	83%
Tech Road (NB)	0%	0%	0%	0%	0%	70%
Tech Road (SB)	0%	0%	0%	0%	0%	74%
April Lane (NB)	25%	25%	25%	25%	25%	80%
April Lane (SB)	0%	25%	25%	25%	25%	79%
White Oak (NB)	0%	0%	0%	0%	0%	65%
White Oak (SB)	0%	0%	0%	0%	0%	65%
Oak Leaf (NB)	7%	7%	7%	7%	7%	72%
Oak Leaf (SB)	7%	7%	7%	7%	8%	73%
Burnt Mills (NB)	0%	0%	0%	0%	0%	75%
Burnt Mills (SB)	0%	0%	0%	0%	0%	74%
Four Corners (NB)	3%	21%	21%	21%	22%	63%
Four Corners (SB)	0%	0%	0%	0%	0%	0%
Fenton St (NB)	0%	0%	0%	0%	34%	63%
Fenton St (SB)	0%	0%	0%	0%	33%	67%
Silver Spring Transit Center	0%	4%	4%	22%	32%	64%
Total	**3%**	**6%**	**6%**	**8%**	**13%**	**47%**

A.11 CONNECTIVITY TO ELEMENTARY SCHOOLS

Objective 2.3: Percentage of dwelling units within one mile of elementary schools that are connected to the schools on a very low-stress bicycling network

Elementary School	12/2018	12/2020	12/2022	Under Con-struction 12/2022	Funded & Approved 12/2022	Planned
Arcola	46%	46%	46%	46%	47%	79%
Ashburton	35%	35%	35%	35%	35%	66%
Bannockburn	16%	16%	16%	16%	17%	16%
Barnsley	73%	73%	73%	73%	73%	77%
Bayard Rustin	21%	21%	21%	21%	21%	23%
Bel Pre	60%	60%	60%	60%	60%	65%
Bells Mill	57%	57%	57%	57%	57%	71%
Belmont	100%	100%	100%	100%	100%	100%
Bethesda	5%	5%	5%	5%	5%	8%
Beverly Farms	57%	57%	57%	57%	57%	90%
Bradley Hills	66%	66%	66%	66%	66%	75%
Brooke Grove	17%	17%	17%	17%	17%	76%
Brookhaven	0%	0%	0%	0%	0%	96%
Burning Tree	39%	39%	39%	39%	39%	40%
Burnt Mills	12%	12%	12%	12%	12%	11%
Burtonsville	0%	0%	0%	0%	0%	9%
Candlewood	17%	17%	17%	17%	17%	17%
Cannon Road	78%	78%	78%	78%	78%	77%
Carderock Springs	56%	56%	56%	56%	56%	72%
Cashell	26%	26%	26%	26%	26%	60%
Cedar Grove	0%	0%	0%	0%	0%	0%
Chevy Chase	31%	31%	31%	31%	31%	31%
Clarksburg	37%	37%	35%	35%	35%	98%
Clearspring	34%	34%	34%	34%	34%	34%
Clopper Mill	0%	0%	0%	0%	0%	54%
Cloverly	34%	34%	34%	34%	36%	59%
Cold Spring	86%	86%	86%	86%	86%	89%
Cresthaven	32%	32%	32%	32%	33%	45%
Daly	1%	1%	1%	1%	1%	2%
Damascus	0%	0%	0%	0%	0%	0%
Darnestown	1%	1%	1%	1%	1%	1%
Drew	74%	74%	74%	74%	74%	72%
DuFief	75%	75%	75%	75%	75%	75%
East Silver Spring	35%	35%	35%	35%	38%	39%
Fairland	13%	13%	13%	13%	13%	55%
Farmland	59%	59%	62%	62%	62%	72%
Fields Road	0%	0%	0%	0%	0%	0%
Flower Hill	80%	80%	80%	80%	80%	86%
Flower Valley	52%	52%	52%	52%	52%	50%
Forest Knolls	85%	85%	85%	85%	85%	93%

Elementary School	12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Fox Chapel	40%	40%	40%	40%	40%	41%
Galway	40%	40%	40%	40%	40%	42%
Garrett Park	27%	27%	27%	27%	27%	76%
Georgian Forest	39%	39%	39%	39%	39%	66%
Germantown	53%	53%	53%	53%	53%	68%
Glen Haven	91%	91%	91%	91%	91%	94%
Glenallan	9%	9%	9%	9%	9%	40%
Goshen	6%	6%	6%	6%	6%	35%
Great Seneca Creek	16%	16%	16%	16%	16%	22%
Greencastle	55%	55%	55%	55%	55%	60%
Greenwood	57%	57%	57%	57%	57%	71%
Harmony Hills	26%	26%	26%	26%	26%	87%
Harriet Tubman	14%	14%	14%	14%	14%	14%
Highland	82%	82%	82%	82%	82%	85%
Highland View	91%	91%	91%	91%	90%	95%
Jackson Road	45%	45%	45%	45%	45%	70%
JoAnn Leleck	37%	37%	37%	37%	37%	37%
Jones Lane	4%	4%	4%	4%	4%	16%
Kemp Mill	85%	85%	85%	85%	85%	87%
Kensington-Parkwood	84%	84%	84%	84%	84%	88%
Lake Seneca	80%	80%	80%	80%	80%	96%
Laytonsville	0%	0%	0%	0%	0%	0%
Little Bennett	41%	48%	48%	48%	64%	58%
Luxmanor	0%	0%	13%	13%	13%	15%
Marshall	72%	72%	72%	72%	75%	72%
Matsunaga	11%	11%	11%	11%	11%	58%
McAuliffe	25%	25%	25%	25%	25%	21%
McNair	8%	8%	8%	8%	8%	32%
Mill Creek Towne	44%	44%	44%	44%	44%	54%
Monocacy	0%	0%	0%	0%	0%	0%
Montgomery Knolls	48%	48%	48%	48%	48%	67%
New Hampshire Estates	16%	16%	16%	16%	16%	58%
North Chevy Chase	0%	0%	0%	0%	0%	49%
Oak View	51%	51%	51%	51%	50%	81%
Oakland Terrace	68%	68%	68%	68%	68%	84%
Olney	63%	63%	63%	63%	63%	87%
Page	51%	51%	51%	51%	51%	70%
Pine Crest	39%	39%	39%	39%	39%	39%
Piney Branch	41%	41%	41%	41%	41%	65%
Poolesville	32%	32%	32%	32%	32%	32%
Potomac	9%	9%	9%	9%	9%	10%
Resnik	52%	52%	52%	52%	52%	52%
Ride	91%	91%	91%	91%	91%	90%
Rock Creek Forest	14%	14%	14%	14%	14%	14%

Elementary School	12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Rock Creek Valley	87%	87%	87%	87%	87%	89%
Rock View	83%	83%	83%	83%	83%	83%
Rockwell	18%	18%	18%	18%	18%	50%
Rolling Terrace	72%	72%	72%	72%	84%	87%
Roscoe R. Nix	24%	24%	24%	24%	25%	29%
Rosemary Hills	46%	46%	46%	46%	46%	100%
Sargent Shriver	50%	50%	50%	50%	50%	57%
Sequoyah	38%	38%	38%	38%	38%	38%
Seven Locks	5%	5%	5%	5%	5%	46%
Sherwood	10%	10%	10%	10%	10%	23%
Singer	37%	37%	37%	37%	37%	55%
Sligo Creek	12%	12%	20%	20%	26%	36%
Snowden Farm	55%	55%	55%	55%	55%	55%
Somerset	16%	16%	18%	18%	16%	19%
South Lake	7%	7%	7%	7%	7%	74%
Stedwick	26%	26%	26%	26%	26%	89%
Stone Mill	55%	55%	55%	55%	55%	66%
Stonegate	85%	85%	85%	85%	85%	84%
Strathmore	33%	33%	33%	33%	33%	33%
Strawberry Knoll	39%	38%	38%	38%	38%	69%
Takoma Park	44%	44%	44%	44%	44%	60%
Travilah	0%	0%	0%	0%	0%	22%
Viers Mill	87%	90%	90%	90%	90%	91%
Washington Grove	13%	13%	13%	13%	13%	13%
Waters Landing	17%	17%	17%	17%	17%	60%
Watkins Mill	27%	27%	27%	27%	27%	36%
Wayside	52%	52%	52%	52%	52%	55%
Weller Road	61%	61%	61%	61%	61%	65%
Westbrook	25%	25%	25%	25%	25%	26%
Westover	70%	70%	70%	70%	70%	66%
Wheaton Woods	82%	82%	82%	82%	81%	53%
Whetstone	10%	10%	10%	10%	10%	59%
William B. Gibbs Jr.	26%	26%	26%	26%	26%	98%
Wilson Wims	52%	52%	52%	52%	52%	56%
Wood Acres	19%	19%	19%	19%	19%	25%
Woodfield	50%	50%	50%	50%	50%	64%
Woodlin	7%	7%	7%	7%	26%	64%
Wyngate	71%	71%	71%	71%	71%	73%
Total	**37%**	**37%**	**37%**	**37%**	**38%**	**53%**

A.12 CONNECTIVITY TO MIDDLE SCHOOLS

Objective 2.3: Percentage of dwelling units within 1.5 miles of middle schools that are connected to the schools on a very low-stress bicycling network

Middle School	12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Argyle	5%	5%	5%	5%	5%	39%
Baker	0%	0%	0%	0%	0%	3%
Banneker	2%	2%	2%	2%	2%	42%
Briggs Chaney	38%	38%	38%	38%	48%	74%
Cabin John	40%	40%	40%	40%	40%	58%
Clemente	7%	7%	7%	7%	7%	54%
Eastern	7%	7%	7%	7%	7%	57%
Farquhar	11%	12%	12%	12%	12%	12%
Hallie Wells	55%	55%	55%	55%	55%	54%
Hoover	38%	38%	38%	38%	38%	71%
Key	12%	12%	12%	12%	12%	17%
King	40%	40%	40%	40%	40%	73%
Kingsview	0%	0%	0%	0%	0%	11%
Loiederman	26%	26%	26%	26%	26%	38%
Montgomery Village	6%	6%	6%	6%	6%	43%
Neelsville	0%	0%	0%	0%	0%	0%
Newport Mill	62%	62%	64%	64%	64%	80%
North Bethesda	22%	22%	22%	22%	22%	48%
Parkland	52%	52%	52%	52%	52%	65%
Poole	53%	53%	53%	53%	53%	53%
Pyle	14%	14%	14%	14%	14%	52%
Redland	0%	0%	0%	0%	0%	0%
Ridgeview	46%	46%	46%	48%	48%	69%
Rocky Hill	20%	20%	20%	20%	20%	66%
Rosa Parks	57%	57%	57%	57%	57%	86%
Shady Grove	0%	0%	0%	0%	0%	0%
Shannon	14%	14%	14%	14%	14%	28%
Silver Creek	23%	23%	23%	25%	25%	54%
Silver Spring International	18%	18%	19%	21%	21%	54%
Sligo	29%	29%	29%	29%	29%	81%
Takoma Park	23%	23%	23%	23%	33%	54%
Tilden	12%	12%	13%	13%	13%	19%
Westland	0%	0%	0%	0%	0%	22%
White Oak	28%	28%	28%	28%	28%	60%
Wood	61%	61%	61%	61%	61%	75%
Total	**21%**	**21%**	**22%**	**22%**	**22%**	**46%**

A.13 CONNECTIVITY TO HIGH SCHOOLS

Objective 2.3: Percentage of dwelling units within two miles of high schools that are connected to the schools on a very low-stress bicycling network

High School	12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Bethesda-Chevy Chase	4%	4%	4%	11%	11%	11%
Blair	0%	0%	0%	0%	0%	0%
Blake	46%	46%	46%	46%	46%	46%
Churchill	36%	36%	36%	36%	36%	36%
Clarksburg	31%	29%	35%	35%	35%	35%
Damascus	0%	0%	0%	0%	0%	0%
Einstein	58%	58%	65%	65%	65%	65%
Kennedy	18%	18%	18%	18%	18%	18%
Magruder	4%	4%	4%	4%	4%	4%
Northwest	11%	11%	11%	11%	11%	11%
Northwood	31%	31%	31%	31%	31%	31%
Paint Branch	0%	0%	0%	0%	0%	0%
Poolesville	40%	40%	40%	40%	40%	40%
Quince Orchard	0%	0%	0%	0%	0%	0%
Seneca Valley	0%	14%	14%	14%	14%	14%
Sherwood	8%	8%	8%	8%	8%	8%
Springbrook	1%	1%	1%	1%	1%	1%
Walter Johnson	0%	0%	0%	0%	0%	0%
Watkins Mill	1%	1%	1%	1%	1%	1%
Wheaton	25%	25%	25%	25%	25%	25%
Whitman	17%	17%	19%	19%	20%	20%
Total	**12%**	**13%**	**14%**	**15%**	**15%**	**15%**

A.14 Connectivity to Public Libraries

Objective 2.4: Percentage of dwelling units within two miles of public libraries that are connected to the public library on a low-stress bicycling network

Public Library	12/2018	12/2020	12/2022	Under	Funded & Approved 12/2022	Planned
Aspen Hill	0%	0%	0%	0%	0%	86%
Bethesda	12%	14%	14%	14%	15%	57%
Chevy Chase	1%	1%	1%	1%	1%	48%
Damascus	1%	1%	1%	1%	1%	49%
Davis/Special Needs	8%	8%	8%	8%	8%	93%
Fairland	0%	0%	0%	0%	0%	71%
Germantown	3%	3%	3%	3%	3%	45%
Kensington Park	0%	0%	0%	0%	0%	62%
Little Falls	0%	0%	0%	0%	0%	56%
Long Branch	22%	22%	26%	26%	26%	75%
Noyes Library for Young Children	19%	19%	19%	19%	19%	45%
Olney	41%	41%	49%	49%	50%	91%
Poolesville	10%	10%	10%	10%	10%	10%
Potomac	19%	19%	19%	19%	19%	65%
Quince Orchard	0%	0%	0%	0%	0%	0%
Silver Spring	0%	0%	0%	0%	40%	74%
Wheaton	10%	11%	11%	11%	11%	86%
White Oak	11%	11%	11%	11%	11%	81%
Total	**8%**	**8%**	**9%**	**9%**	**14%**	**66%**

A.15 Connectivity to Recreation Centers

Objective 2.4: Percentage of dwelling units within two miles of recreation centers that are connected to the recreation centers on a low-stress bicycling network

Recreation Center	12/2018	12/2020	12/2022	Under	Funded & Approved 12/2022	Planned
Bauer Drive	0%	0%	0%	0%	0%	82%
Charles W Gilchrist	0%	0%	0%	0%	0%	0%
Clara Barton	32%	32%	34%	38%	38%	93%
Damascus Community	0%	0%	0%	0%	0%	24%
East County Community	31%	31%	31%	31%	31%	83%
Fairland Community	0%	0%	0%	0%	0%	77%
Friendship Heights Village	0%	0%	0%	0%	0%	0%
Germantown	0%	0%	0%	0%	0%	79%
Good Hope Neighborhood	0%	0%	0%	0%	0%	77%
Gwendolyn E. Coffield	12%	12%	12%	28%	28%	68%
Heffner Park	27%	27%	27%	35%	35%	68%
Kensington	14%	14%	14%	14%	14%	22%
Lake Marion	0%	0%	0%	0%	0%	24%
Leland	6%	6%	6%	21%	21%	53%
Long Branch	21%	21%	22%	22%	22%	78%
Longwood	39%	39%	39%	38%	38%	76%
Mid County	13%	13%	13%	13%	13%	79%
North Creek	14%	14%	14%	17%	17%	64%
North Potomac	19%	19%	19%	19%	19%	39%
Plum Gar	23%	23%	23%	23%	23%	82%
Potomac	6%	6%	6%	6%	6%	68%
Ross Boddy	0%	0%	0%	0%	0%	0%
Sam Abbott	37%	37%	37%	38%	38%	72%
Scotland	2%	2%	2%	2%	2%	2%
Stedwick	7%	7%	7%	7%	7%	67%
Takoma Park	51%	51%	51%	51%	51%	84%
Upper County	0%	0%	0%	0%	0%	31%
Wheaton	12%	11%	11%	11%	11%	83%
Whetstone	3%	3%	3%	3%	3%	41%
Total	**14%**	**14%**	**14%**	**17%**	**17%**	**56%**

A.16 CONNECTIVITY TO REGIONAL / RECREATIONAL PARKS

Objective 2.4: Percentage of dwelling units within two miles of regional/recreational parks that are connected to the parks on a low-stress bicycling network

Recreation Center	12/2018	12/2020	12/2022	Under Construction 12/2022	Funded & Approved 12/2022	Planned
Black Hill Regional Park	27%	24%	24%	24%	24%	85%
Cabin John Regional Park	0%	0%	0%	0%	0%	49%
Damascus Recreational Park	64%	64%	64%	64%	64%	73%
Fairland Recreational Park	29%	29%	29%	29%	29%	73%
Laytonia Recreational Park	0%	0%	0%	0%	0%	0%
Little Bennett Regional Park	0%	0%	0%	0%	0%	0%
MLK Jr. Recreational Park	25%	25%	25%	25%	25%	79%
Northwest Branch Recreational Park	19%	19%	19%	19%	19%	82%
Olney Manor Recreational Park	11%	11%	11%	11%	11%	72%
Ovid Hazen Wells Recreational Park	51%	51%	52%	52%	52%	54%
Ridge Road Recreational Park	31%	31%	31%	31%	31%	83%
Rock Creek Regional Park	27%	32%	32%	32%	35%	50%
South Germantown Recreational Park	40%	40%	40%	40%	40%	72%
Wheaton Regional Park	35%	35%	35%	35%	36%	83%
Total	**27%**	**27%**	**27%**	**27%**	**28%**	**68%**

A.17 SUMMARY STATISTICS FOR BICYCLE PARKING AT PUBLIC FACILITIES

Objective 2.6: Number of Existing Bicycle Parking Spaces in 2022 by Rack Type

Public Facility Type	Inverted-U (adequate)	Locker (adequate)	Other (adequate)	Wave (inadequate)	Wheel Bender (inadequate)	Other (inadequate)
Elementary Schools	233	0	2	873	919	4
Middle Schools	230	0	12	315	518	0
High Schools	48	2	0	509	254	24
Public Libraries	32	0	22	74	46	16
Recreation Centers	56	0	15	214	14	0
Total	**599**	**2**	**51**	**1,985**	**1,751**	**44**

Objective 2.6: Bicycle Parking Space Change, 2016-2022

Public Facility Type	Bicycle Space Additions	Bicycle Space Loss[10]	Increase in Adequate Spaces	Loss of Adequate Spaces [11]	Inadequate Bicycle Spaces Added[12]
Elementary Schools	543	-177	74	0	471
Middle Schools	311	-42	149	0	194
High Schools	112	-16	10	0	106
Public Libraries	32	-32	30	-32	2
Recreation Centers	25	0	15	0	14
Total	**1,023**	**-267**	**278**	**-32**	**787**

A.18 BICYCLE PARKING AT ELEMENTARY SCHOOLS

Objective 2.6: Summary of Bicycle Parking at Elementary Schools

Elementary School Name	Student Capacity 2022-2023	Industry-Established Need	Adequate Existing Spaces	Inadequate Existing Spaces	Total Existing Spaces	Shortage	Cost
Arcola	656	32	0	4	4	32	$17,000
Ashburton	789	40	0	10	10	40	$19,000
Bannockburn	389	20	0	10	10	20	$7,000
Bayard Rustin	790	40	24	0	24	16	$10,000
Beall	663	34	0	52	52	34	$4,000
Bel Pre	634	32	0	20	20	32	$9,000
Bells Mill	626	32	0	16	16	32	$11,000
Belmont	401	20	0	60	60	20	$2,000
Bethesda	561	28	0	28	28	28	$3,000
Beverly Farms	722	36	26	0	26	10	$6,000
Bradley Hills	687	34	0	30	30	34	$6,000
Brooke Grove	515	26	0	40	40	26	$3,000
Brookhaven	508	26	0	10	10	26	$11,000
Brown Station	754	38	0	14	14	38	$16,000
Burning Tree	388	20	0	20	20	20	$2,000
Burnt Mills	387	20	0	0	0	20	$12,000
Burtonsville	498	24	0	0	0	24	$14,000
Candlewood	521	26	0	38	38	26	$3,000
Cannon Road	507	26	20	0	20	6	$4,000
Captain James Daly	586	30	0	0	0	30	$18,000
Carderock Springs	430	22	0	39	39	22	$2,000
Cashell	341	18	0	16	16	18	$3,000
Cedar Grove	425	22	0	0	0	22	$13,000
Chevy Chase	473	24	0	40	40	24	$3,000
Clarksburg	352	18	0	0	0	18	$11,000
Clearspring	618	30	0	14	14	30	$11,000
Clopper Mill	511	26	0	10	10	26	$11,000

10 Losses were generally wheel bender-type bicycle racks, which do not meet industry standards
11 Due to Purple Line construction which is underway at Silver Spring Library during the writing of this report
12 Most inadequate spaces added were wave-type racks—which often replaced older wheel bender racks

Elementary School Name	Student Capacity 2022-2023	Industry-Established Need	Adequate Existing Spaces	Inadequate Existing Spaces	Total Existing Spaces	Shortage	Cost
Cloverly	484	24	0	8	8	24	$11,000
Cold Spring	481	24	0	33	33	24	$3,000
College Gardens	718	36	0	58	58	36	$4,000
Cresthaven	467	24	20	0	20	4	$2,000
Damascus	324	16	0	0	0	16	$10,000
Darnestown	403	20	0	0	0	20	$12,000
Diamond	680	34	0	10	10	34	$16,000
Dr. Charles R. Drew	512	26	0	20	20	26	$6,000
Dr. Ronald A. McNair	650	32	0	40	40	32	$3,000
Dr. Sally K. Ride	505	26	0	6	6	26	$13,000
Dufief	437	22	0	0	0	22	$13,000
East Silver Spring	602	30	0	4	4	30	$16,000
Fairland	648	32	0	20	20	32	$9,000
Fallsmead	561	28	0	8	8	28	$13,000
Farmland	737	36	16	0	16	20	$12,000
Fields Road	457	22	3	0	3	19	$11,000
Flora M. Singer	598	30	0	17	17	30	$10,000
Flower Hill	511	26	0	10	10	26	$11,000
Flower Valley	463	24	0	8	8	24	$11,000
Forest Knolls	581	30	0	10	10	30	$13,000
Fox Chapel	665	34	0	0	0	34	$20,000
Gaithersburg	783	40	0	0	0	40	$24,000
Galway	759	38	0	4	4	38	$21,000
Garrett Park	777	38	0	32	32	38	$7,000
Georgian Forest	675	34	12	0	12	22	$13,000
Germantown	292	14	0	10	10	14	$4,000
Glen Haven	569	28	0	10	10	28	$12,000
Glenallan	762	38	0	10	10	38	$18,000
Goshen	594	30	0	20	20	30	$8,000
Great Seneca Creek	556	28	0	38	38	28	$3,000
Greencastle	582	30	0	0	0	30	$18,000
Greenwood	562	28	0	10	10	28	$12,000
Harmony Hills	775	38	0	0	0	38	$23,000
Harriet R. Tubman	674	34	24	0	24	10	$6,000
Highland	601	30	0	13	13	30	$12,000
Highland View	326	16	0	0	0	16	$10,000
Jackson Road	712	36	0	8	8	36	$18,000
JoAnn Leleck	723	36	6	0	6	30	$18,000
Jones Lane	513	26	0	16	16	26	$8,000
Judith A. Resnik	526	26	0	36	36	26	$3,000
Kemp Mill	470	24	0	20	20	24	$5,000
Kensington Parkwood	786	40	0	25	25	40	$12,000
Lake Seneca	425	22	0	40	40	22	$2,000
Lakewood	566	28	0	20	20	28	$7,000

Elementary School Name	Student Capacity 2022-2023	Industry-Established Need	Adequate Existing Spaces	Inadequate Existing Spaces	Total Existing Spaces	Shortage	Cost
Laytonsville	487	24	0	10	10	24	$10,000
Little Bennett	620	32	0	10	10	32	$14,000
Lois P. Rockwell	548	28	0	12	12	28	$11,000
Lucy V. Barnsley	685	34	0	20	20	34	$11,000
Luxmanor	746	38	0	20	20	38	$13,000
Maryvale	655	32	0	32	32	32	$3,000
Meadow Hall	356	18	24	0	24	0	$0
Mill Creek Towne	354	18	0	10	10	18	$6,000
Monocacy	218	10	0	0	0	10	$6,000
Montgomery Knolls	703	36	0	20	20	36	$12,000
New Hampshire Estates	511	26	0	0	0	26	$16,000
North Chevy Chase	381	20	0	10	10	20	$7,000
Oak View	335	16	0	10	10	16	$5,000
Oakland Terrace	511	26	0	20	20	26	$6,000
Olney	607	30	0	20	20	30	$8,000
Pine Crest	667	34	0	10	10	34	$16,000
Piney Branch	611	30	24	0	24	6	$4,000
Poolesville	562	28	0	10	10	28	$12,000
Potomac	479	24	16	0	16	8	$5,000
Rachel Carson	716	36	0	0	0	36	$22,000
Ritchie Park	411	20	10	0	10	10	$6,000
Rock Creek Forest	676	34	0	18	18	34	$12,000
Rock Creek Valley	451	22	0	15	15	22	$6,000
Rock View	675	34	0	16	16	34	$13,000
Rolling Terrace	729	36	0	12	12	36	$16,000
Roscoe R. Nix	491	24	0	0	0	24	$14,000
Rosemary Hills	641	32	0	0	0	32	$19,000
Rosemont	602	30	0	10	10	30	$13,000
S. Christa McAuliffe	732	36	0	14	14	36	$15,000
Sargent Shriver	663	34	0	0	0	34	$20,000
Sequoyah	450	22	0	16	16	22	$5,000
Seven Locks	447	22	0	10	10	22	$8,000
Sherwood	519	26	0	10	10	26	$11,000
Sligo Creek	687	34	0	0	0	34	$20,000
Snowden Farm	762	38	0	20	20	38	$13,000
Somerset	540	28	0	24	24	28	$5,000
South Lake	694	34	0	0	0	34	$20,000
Spark M. Matsunaga	591	30	0	20	20	30	$8,000
Stedwick	713	36	0	0	0	36	$22,000
Stone Mill	713	36	0	15	15	36	$14,000
Stonegate	385	20	0	0	0	20	$12,000
Strathmore	462	24	0	8	8	24	$11,000
Strawberry Knoll	501	26	0	15	15	26	$8,000
Summit Hall	497	24	0	6	6	24	$12,000

Elementary School Name	Student Capacity 2022-2023	Industry-Established Need	Adequate Existing Spaces	Inadequate Existing Spaces	Total Existing Spaces	Shortage	Cost
Takoma Park	611	30	0	20	20	30	$8,000
Thurgood Marshall	552	28	0	20	20	28	$7,000
Travilah	526	26	0	0	0	26	$16,000
Twinbrook	629	32	0	10	10	32	$14,000
Viers Mill	752	38	0	20	20	38	$13,000
Washington Grove	629	32	0	6	6	32	$16,000
Waters Landing	768	38	0	20	20	38	$13,000
Watkins Mill	732	36	0	20	20	36	$12,000
Wayside	631	32	0	16	16	32	$11,000
Weller Road	792	40	0	50	50	40	$4,000
Westbrook	638	32	0	20	20	32	$9,000
Westover	266	14	0	10	10	14	$4,000
Wheaton Woods	724	36	0	50	50	36	$4,000
Whetstone	788	40	8	0	8	32	$19,000
William B. Gibbs Jr.	748	38	0	16	16	38	$15,000
William T. Page	377	18	0	10	10	18	$6,000
Wilson Wims	739	36	0	20	20	36	$12,000
Wood Acres	752	38	0	10	10	38	$18,000
Woodfield	365	18	0	0	0	18	$11,000
Woodlin	463	24	0	0	0	24	$14,000
Wyngate	778	38	2	0	2	36	$22,000
Total	**78268**	**3928**	**235**	**1796**	**2031**	**3699**	**$1,450,000**

A.19 BICYCLE PARKING AT MIDDLE SCHOOLS

Objective 2.6: Summary of Bicycle Parking at Middle Schools

Middle School Name	Student Capacity 2022-2023	Industry-Established Need	Adequate Existing Spaces	Inadequate Existing Spaces	Total Existing Spaces	Shortage	Cost
A. Mario Loiederman	986	50	0	30	30	50	$15,000
Argyle	897	44	0	40	40	44	$7,000
Benjamin Banneker	799	40	0	40	40	40	$4,000
Briggs Chaney	927	46	0	20	20	46	$18,000
Cabin John	1125	56	0	30	30	56	$19,000
Dr. Martin Luther King, Jr	914	46	0	20	20	46	$18,000
Earle B. Wood	936	46	0	20	20	46	$18,000
Eastern	1012	50	0	18	18	50	$21,000
Forest Oak	955	48	0	12	12	48	$23,000
Francis Scott Key	961	48	0	36	36	48	$11,000
Gaithersburg	996	50	0	10	10	50	$25,000
Hallie Wells	969	48	0	30	30	48	$14,000
Herbert Hoover	1139	56	0	39	39	56	$14,000
John Poole	478	24	0	63	63	24	$3,000
John T. Baker	762	38	0	0	0	38	$23,000
Julius West	1432	72	0	34	34	72	$27,000
Kingsview	1041	52	16	0	16	36	$22,000
Lakelands Park	1147	58	14	0	14	44	$27,000
Montgomery Village	844	42	0	56	56	42	$5,000
Neelsville	965	48	0	0	0	48	$29,000
Newport Mill	837	42	0	20	20	42	$15,000
North Bethesda	1233	62	0	30	30	62	$23,000
Odessa Shannon	897	44	0	40	40	44	$7,000
Parkland	982	50	0	0	0	50	$30,000
Redland	757	38	0	4	4	38	$21,000
Ridgeview	988	50	0	16	16	50	$22,000
Robert Frost	1051	52	16	0	16	36	$22,000
Roberto W. Clemente	1218	60	0	20	20	60	$26,000
Rocky Hill	1012	50	0	10	10	50	$25,000
Rosa M. Parks	945	48	0	24	24	48	$17,000
Shady Grove	846	42	0	9	9	42	$21,000
Silver Creek	894	44	68	0	68	0	$0
Silver Spring International	1082	54	0	10	10	54	$28,000
Sligo	958	48	0	50	50	48	$5,000
Takoma Park	1330	66	54	0	54	12	$7,000
Thomas W. Pyle	1523	76	0	44	44	76	$24,000
Tilden	1244	62	60	0	60	2	$1,000
Westland	1073	54	0	40	40	54	$13,000
White Oak	992	50	0	18	18	50	$21,000
William H. Farquhar	816	40	14	0	14	26	$16,000
Total	**39963**	**1994**	**242**	**833**	**1075**	**1776**	**$686,000**

A.20 BICYCLE PARKING AT HIGH SCHOOLS

Objective 2.6: Summary of Bicycle Parking at High Schools

High School Name	Student Capacity 2022-2023	Industry-Established Need	Adequate Existing Spaces	Inadequate Existing Spaces	Total Existing Spaces	Shortage	Cost
Albert Einstein	1602	80	0	20	20	80	$38,000
Bethesda-Chevy Chase	2475	124	0	41	41	124	$55,000
Clarksburg	2034	102	0	26	26	102	$49,000
Col. Zadok Magruder	1885	94	0	6	6	94	$54,000
Damascus	1543	78	0	4	4	78	$45,000
Gaithersburg	2474	124	0	30	30	124	$60,000
James Hubert Blake	1743	88	0	20	20	88	$43,000
John F. Kennedy	2159	108	0	16	16	108	$57,000
Montgomery Blair	2867	144	40	0	40	104	$63,000
Northwest	2291	114	6	38	44	108	$46,000
Northwood	1526	76	0	20	20	76	$36,000
Paint Branch	1985	100	0	160	160	100	$11,000
Poolesville	1170	58	0	30	30	58	$20,000
Quince Orchard	1800	90	0	10	10	90	$49,000
Richard Montgomery	2250	112	0	44	44	112	$46,000
Rockville	1525	76	2	10	12	74	$40,000
Seneca Valley	2520	126	0	40	40	126	$56,000
Sherwood	2152	108	0	0	0	108	$65,000
Springbrook	2117	106	0	12	12	106	$58,000
Thomas S. Wootton	2120	106	0	27	27	106	$51,000
Walt Whitman	2231	112	0	84	84	112	$26,000
Walter Johnson	2291	114	0	59	59	114	$40,000
Watkins Mill	1742	88	0	16	16	88	$45,000
Wheaton	2237	112	2	50	52	110	$42,000
Winston Churchill	1991	100	0	24	24	100	$48,000
Total	**50,730**	**2,540**	**50**	**787**	**837**	**2,490**	**$1,142,000**

A.21 BICYCLE PARKING AT LIBRARIES

Objective 2.8: Summary of Bicycle Parking at Libraries

Library Name	Calculated Ground Floor Area (ft2)	Industry-Established Need	Adequate Existing Spaces	Inadequate Existing Spaces	Total Existing Spaces	Shortage	Cost
Aspen Hill	16,131	4	0	12	12	4	$400
Bethesda	24,402	4	0	10	10	4	$400
Chevy Chase	16,306	4	0	10	10	4	$400
Damascus	15,725	2	0	10	10	2	$200
Davis/Special Needs	19,542	4	0	6	6	4	$400
Gaithersburg	49,495	8	20	0	20	0	$0
Germantown	49,183	8	0	16	16	8	$900
Kensington Park	14,858	2	0	6	6	2	$200
Little Falls	13,214	2	0	10	10	2	$200
Long Branch	20,615	4	0	10	10	4	$400
Marilyn J. Praisner	16,930	4	0	6	6	4	$400
Noyes Library for Young Children	1,085	2	0	0	0	2	$1,200
Olney	21,085	4	0	16	16	4	$400
Poolesville	7,000	2	0	6	6	2	$200
Potomac	16,986	4	0	8	8	4	$400
Quince Orchard	18,468	4	0	4	4	4	$400
Silver Spring	79,678	10	12	0	12	0	$0
Wheaton	78,572	10	22	0	22	0	$0
White Oak	20,728	4	0	6	6	4	$400
Total	**N/A**	**86**	**54**	**136**	**190**	**58**	**$7,300**

A.22 BICYCLE PARKING AT RECREATION CENTERS

Objective 2.8: Summary of Bicycle Parking at Recreation Centers

Community or Recreation Center Name	Calculated Ground Floor Area (ft2)	Industry-Established Need	Adequate Existing Spaces	Inadequate Existing Spaces	Total Existing Spaces	Shortage	Cost
Bauer Drive	20,364	4	4	0	4	0	$0
Clara Barton	23,205	4	0	4	4	4	$400
Damascus	33,624	6	4	12	16	2	$200
East County	27,700	4	0	10	10	4	$400
Germantown	24,463	4	40	0	40	0	$0
Gwendolyn E. Coffield	28,394	4	0	10	10	4	$400
Jane E. Lawton	18,533	4	0	10	10	4	$400
Leonard D. Jackson	2,184	2	0	0	0	2	$1,000
Long Branch	26,922	4	0	10	10	4	$400
Longwood	20,420	4	0	6	6	4	$400
Marilyn J. Praisner	31,294	4	0	8	8	4	$400
Mid County	31,086	4	0	24	24	4	$400
North Potomac	48,084	8	0	40	40	8	$900
Plum Gar Neighborhood	19,583	4	0	8	8	4	$400
Potomac	29,772	4	8	0	8	0	$0
Scotland Neighborhood	13,039	2	0	4	4	2	$200
Upper County Neighborhood	17,848	4	0	32	32	4	$400
Wheaton	13,428	2	3	0	3	0	$0
White Oak	54,022	8	0	50	50	8	$900
Wisconsin Place	18,102	4	12	0	12	0	$0
Total	**N/A**	**84**	**71**	**228**	**299**	**62**	**$8,000**

Appendix B : Status of Bikeway Project

B.1 BIKEWAY PROJECTS COMPLETED BY PUBLIC SECTOR IN 2021 AND 2022

Table B.1: Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
Cameron Street to Planning Place Cycle Track Connection	Separated Bike Lanes	0.1	MCDOT	Silver Spring CBD
Capital Crescent Surface Trail (Phase 1)	Separated Bike Lanes	0.2	MCDOT	Bethesda CBD
Frederick Road Bike Path	Sidepath	1.6	MCDOT	Clarksburg, Clarksburg Town Center, Germantown East
Grove Street Neighborhood Greenway - Phase 1	Neighborhood Greenway	0.4	MCDOT	East Purple Line
MD 355 Intersection Improvements at West Old Baltimore Road	Sidepath	0.3	MCDOT	Clarksburg
Snouffer School Road North Road Widening & Sidepath	Sidepath	0.5	MCDOT	Montgomery Village/Airpark
Snouffer School Road South Road Widening & Sidepath	Sidepath	0.1	MCDOT	Montgomery Village/Airpark
Woodmont Avenue Cycle Track - Phase 1	Separated Bike Lanes	0.2	MCDOT	Bethesda CBD

Table B.2: Non-Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
MD 187 (Old Georgetown Road) from Nicholson Lane to I-495	Separated Bike Lanes	4.8	MDOT/SHA	Bethesda/Chevy Chase, North Bethesda
MD 187 (Old Georgetown Road) from I-495 to Cedar Lane	Separated Bike Lanes	1.2	MDOT/SHA	Bethesda/Chevy Chase
MD 190 (River Road) & Pyle Road Traffic Signal	Sidepath	0.2	MDOT/SHA	Bethesda/Chevy Chase
Snouffer School Road South Road Widening & Sidepath	Conventional Bike Lanes	1.1	MCDOT	Montgomery Village/Airpark

Table B.3: Upgrades to Existing Bikeways

Project	Bikeway	Length (ft)	Lead Agency	Policy Area
Beach Drive over Silver Creek Bridge	Stream Valley Park Trail	0.1	Parks	Kensington/Wheaton

B.2 BIKEWAY PROJECTS COMPLETED BY DEVELOPERS IN 2021 AND 2022

Table B.4: Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
7272 Wisconsin Avenue	Off-Street Trail	0.1	Developer	Bethesda CBD
9800 Medical Center Drive	Sidepath	0.2	Developer	R&D Village
Avocet Towers/7359 Wisconsin Avenue	Separated Bike Lanes	0.1	Developer	Bethesda CBD
Brightview Grosvenor	Sidepath	0.1	Developer	North Bethesda
Brookeville Preserve	Sidepath	0.3	Developer	Olney
Cabin Branch	Sidepath	0.3	Developer	Clarksburg
Chevy Chase Lake - Block B	Separated Bike Lanes	0.0	Developer	Chevy Chase Lake
East Village at North Bethesda Gateway	Separated Bike Lanes	0.1	Developer	White Flint
Marriott International Headquarters	Separated Bike Lanes	0.1	Developer	Bethesda CBD
Montgomery Village Whetstone Center	Sidepath	0.1	Developer	Montgomery Village/Airpark
Mt. Prospect	Sidepath	0.5	Developer	North Potomac, Rural West
Ripley II	Off-Street Trail	0.1	Developer	Silver Spring CBD
Ripley II	Separated Bike Lanes	0.1	Developer	Silver Spring CBD

Table B.5: Non-Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
9800 Medical Center Drive	Sidepath	0.1	Developer	R&D Village
9950 Medical Center	Sidepath	0.1	Developer	R&D Village
Black Hill - Viasat	Off-Street Trail	0.2	Developer	Germantown West
Chevy Chase Lake - Block B	Sidepath	0.0	Developer	Chevy Chase Lake
Dowden's Station	Off-Street Trail	0.1	Developer	Clarksburg
Knowles Manor	Sidepath	0.0	Developer	Kensington/Wheaton
Shady Grove Metro West	Conventional Bike Lanes	0.1	Developer	Shady Grove Metro Station

B.3 PROJECTS UNDER CONSTRUCTION BY PUBLIC SECTOR ON 12/31/2022

Table B.6: Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
Brookeville Bypass	Bikeable Shoulders	0.7	MDOT / SHA	Olney, Rural East
Capital Crescent Trail from Elm Street Park to Silver Spring Transit Center	Off-Street Trail	4.9	MTA	Multiple
Clarksburg Road/Snowden Farm Pkwy	Conventional Bike Lanes	0.3	MCDOT	Clarksburg Town Center
Clarksburg Road/Snowden Farm Pkwy	Sidepath	0.3	MCDOT	Clarksburg Town Center
Emory Lane Shared Use Path	Sidepath	0.1	MCDOT	Aspen Hill
Hillandale Local Park Renovation	Sidepath	0.2	Parks	White Oak
MD 185 (Connecticut Avenue) at Jones Bridge Road and Kensington Parkway Phase 3	Sidepath	0.5	MDOT / SHA	Chevy Chase Lake
Montgomery Lane/Avenue Cycle Track Phase 1 & 2A	Separated Bike Lanes	0.2	MCDOT	Bethesda CBD
Silver Spring Green Trail	Sidepath	0.7	MTA	East Purple Line, Silver Spring CBD
White Flint West Phase 2	Separated Bike Lanes	0.2	MCDOT	White Flint

Table B.7: Non-Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
Silver Spring Green Trail	Sidepath	0.1	MTA	Silver Spring CBD, East Purple Line
White Flint West Phase 2	Conventional Bike Lanes	0.2	MCDOT	White Flint

B.4 PROJECTS UNDER CONSTRUCTION BY DEVELOPERS ON 12/31/2022

Table B.8: Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
Century	Sidepath	0.1	Developer	Germantown Town Center
Crescent at Chevy Chase	Sidepath	0.1	Developer	Chevy Chase Lake
New Hampshire Avenue Restaurant Redevelopment	Sidepath	0.0	Developer	Cloverly

Table B.9: Non-Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
8015 Old Georgetown Road	Off-Street Trail	0.1	Developer	Bethesda CBD

B.5 PROJECTS FUNDED IN THE CAPITAL IMPROVEMENT PROGRAM AS OF 12/31/2022

Table B.10: Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
Amherst Avenue Cycle Track	Separated Bike Lanes	1.1	MCDOT	Kensington/Wheaton, Wheaton CBD
Aspen Hill Neighborhood Greenway	Neighborhood Greenway	0.5	MCDOT	Aspen Hill, Kensington/Wheaton
Bowie Mill Road Bikeway	Sidepath	2.0	MCDOT	Olney, Rural East
Boyds Transit Center	Sidepath	0.1	MCDOT	Rural West
Capital Crescent Surface Trail (Phase 2)	Sidepath	0.1	MCDOT	Bethesda CBD
Capital Crescent Trail Under MD 355	Off-Street Trail	0.1	MCDOT	Bethesda CBD
Cedar / Bonifant / Grove / Sligo / Woodbury Neighborhood Greenway	Neighborhood Greenway	0.3	MCDOT	East Purple Line
Charles W. Woodward High School Reopening	Sidepath	0.2	MCPS	North Bethesda
Cheltenham Separated Bike Lanes	Neighborhood Greenway	0.1	MCDOT	Bethesda CBD
Cheltenham Separated Bike Lanes	Separated Bike Lanes	0.3	MCDOT	Bethesda CBD
Clarksburg Road at MD 355	Sidepath, Conventional Bike Lanes	0.9	MCDOT	Clarksburg Town Center
Dale Drive Shared Use Path and Safety Improvements	Sidepath	0.9	MCDOT	Silver Spring/Takoma Park
Dennis Avenue Bridge	Sidepath	0.0	MCDOT	Kensington/Wheaton
Dixon Lane Separated Bike Lanes	Separated Bike Lanes	0.3	MCDOT	Silver Spring CBD
Domer/Barron/Gilbert Neighborhood Greenway	Neighborhood Greenway	0.5	MCDOT	East Purple Line
Fenton Street at MD 410	Separated Bike Lanes	0.1	MCDOT	Silver Spring CBD
Fenton Street Cycle Track	Separated Bike Lanes	0.7	MCDOT	Silver Spring CBD
Garrett Park Road Bridge over Rock Creek	Sidepath	0.2	MCDOT	Kensington/Wheaton, North Bethesda

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
Good Hope Road Shared Use Path	Sidepath	0.3	MCDOT	Cloverly
Grandview Avenue Neighborhood Greenway (Arcola Avenue to Blueridge Avenue)	Neighborhood Greenway	0.3	MCDOT	Wheaton CBD
Grandview Avenue Neighborhood Greenway (Georgia Avenue to Arcola Avenue)	Neighborhood Greenway	0.7	MCDOT	Kensington/Wheaton
Greenwood Road Neighborhood Greenway (Piney Branch Road to Wabash Avenue)	Neighborhood Greenway	0.3	MCDOT	East Purple Line
Greenwood Road Neighborhood Greenway (Wabash Avenue to Division Street)	Neighborhood Greenway	0.5	MCDOT	East Purple Line, Silver Spring/ Takoma Park
Heritage Trail Triangle Phase 1 (Dr. Bird/ Norwood Road) Shared Use Path	Sidepath	0.6	MCDOT	Rural East
Life Sciences Center Loop Trail	Sidepath	1.4	MCDOT	R&D Village
Marinelli Road Separated Bike Lanes	Separated Bike Lanes	0.8	MCDOT	White Flint
McComas Avenue Neighborhood Greenway	Neighborhood Greenway	1.2	MCDOT	Kensington/Wheaton, Wheaton CBD
MD 355 Clarksburg Shared Use Path	Sidepath	0.5	MCDOT	Clarksburg Town Center
MD 355 Shared Use Path and Sidewalk (Grosvenor)	Sidepath	0.2	MCDOT	Grosvenor, North Bethesda
MD 97 (Georgia Avenue) Montgomery Hills Road Reconstruction	Separated Bike Lanes	0.6	MDOT / SHA	Forest Glen, Woodside
MD 97 (Georgia Avenue) Montgomery Hills Road Reconstruction	Sidepath	0.1	MDOT / SHA	Forest Glen
Metropolitan Branch Trail from Silver Spring Transit Center to King St	Off-Street Trail	0.3	MCDOT	Silver Spring CBD
Montgomery Lane/Avenue Cycle Track Phase 2C	Separated Bike Lanes	0.1	MCDOT	Bethesda CBD
Northwood High School Additional/ Facility Upgrades	Sidepath	0.1	MCPS	Kensington/Wheaton
Upton Drive Neighborhood Greenway	Neighborhood Greenway	0.2	MCDOT	Kensington/Wheaton, Wheaton CBD
Veirs Mill Road BiPPA Project	Sidepath	1.1	MCDOT	Aspen Hill, Kensington/Wheaton
Woodmont Avenue Cycle Track - Phase 1	Separated Bike Lanes	0.0	MCDOT	Bethesda CBD
Woodmont Avenue Cycle Track - Phase 2	Separated Bike Lanes	0.3	MCDOT	Bethesda CBD

Table B.11: Non-Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
Aspen Hill Neighborhood Greenway	Neighborhood Greenway	1.3	MCDOT	Kensington/Wheaton, Wheaton CBD
Bowie Mill Road Bikeway	Sidepath	1.5	MCDOT	Olney, Rural East
Clarksburg Road at MD 355	Sidepath	0.1	MCDOT	Clarksburg Town Center
Dale Drive Shared Use Path and Safety Improvements	Sidepath	0.2	MCDOT	Silver Spring/Takoma Park
Fenton Street at MD 410	Separated Bike Lanes	0.1	MCDOT	Silver Spring CBD
Fenton Street at MD 410	Sidepath	0.0	MCDOT	Silver Spring CBD
Fenton Street Cycle Track	Separated Bike Lanes	0.2	MCDOT	Silver Spring CBD
Goldsboro Road Sidewalk and Bikeway	Sidepath	1.2	MCDOT	Bethesda/Chevy Chase
Good Hope Road Shared Use Path	Sidepath	0.6	MCDOT	Cloverly
Life Sciences Center Loop Trail	Sidepath	1.4	MCDOT	R&D Village
Marinelli Road Separated Bike Lanes	Separated Bike Lanes	0.1	MCDOT	White Flint
MD 355 Clarksburg Shared Use Path	Sidepath	0.0	MCDOT	Clarksburg Town Center
North Branch Trail	Off-Street Trail	0.4	Parks	Aspen Hill, Rural East
Veirs Mill Road BiPPA Project	Sidepath	0.2	MCDOT	Aspen Hill, Kensington/Wheaton

Table B.12: Upgrades to Existing Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
MacArthur Boulevard Shared Use Path Phase 3	Bikeable Shoulders	2.5	MCDOT	Bethesda/Chevy Chase
MacArthur Boulevard Shared Use Path Phase 3	Sidepath	2.3	MCDOT	Bethesda/Chevy Chase
Spring Street Separated Bike Lane Upgrades	Separated Bike Lanes	0.3	MCDOT	East Purple Line, Silver Spring CBD

B.6 PROJECTS TO BE CONSTRUCTED BY DEVELOPERS AS OF 12/31/2022

Table B.13: Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
12710 Twinbrook Parkway	Separated Bike Lanes	0.0	Developer	Twinbrook
1910 University Senior Housing	Neighborhood Connector	0.1	Developer	Wheaton CBD
4725 Cheltenham Drive	Separated Bike Lanes	0.1	Developer	Bethesda CBD
4910/4920 Strathmore	Sidepath	0.4	Developer	Grosvenor, North Bethesda
9545 River Road	Sidepath	0.1	Developer	Potomac
Burtonsville Crossing Shopping Center	Separated Bike Lanes	0.1	Developer	Burtonsville Town Center
Crossroads of Kensington	Separated Bike Lanes	0.1	Developer	Kensington/Wheaton
ELP Bethesda at Rock Spring	Separated Bike Lanes	0.1	Developer	North Bethesda
Hillandale Gateway	Separated Bike Lanes	0.1	Developer	White Oak
Hillmead	Sidepath	0.0	Developer	Bethesda/Chevy Chase
Iglesia Vida Nueva Church	Sidepath	0.1	Developer	Fairland/Colesville
Liberty Mill Road	Sidepath	0.1	Developer	Germantown West
LIDL Germantown	Sidepath	0.2	Developer	Germantown Town Center
Miles Coppola	Sidepath, Buffered Bike Lanes	0.5	Developer	Clarksburg, Clarksburg Town Center
Milestone Senior Germantown	Sidepath	0.1	Developer	Germantown East
Olney Theatre Center	Sidepath	0.1	Developer	Olney
PSTA Site	Separated Bike Lanes	0.9	Developer	R&D Village
PSTA Site	Sidepath	0.3	Developer	R&D Village
Snowdens Manor	Sidepath	0.0	Developer	Cloverly
Traville Parcel N. Building A	Sidepath	0.2	Developer	R&D Village
Village at Cabin Branch	Sidepath	0.1	Developer	Clarksburg
Village at Cabin Branch Phase 2	Sidepath	0.4	Developer	Clarksburg

Table B.14: Non-Master-Planned Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
Burtonsville Crossing Shopping Center	Sidepath	0.2	Developer	Burtonsville Town Center
ELP Bethesda at Rock Spring	Separated Bike Lanes	0.2	Developer	North Bethesda
Johns Hopkins Medical Office & Surgery Center at B	Separated Bike Lanes	0.2	Developer	R&D Village
Johns Hopkins Medical Office & Surgery Center at B	Sidepath	0.1	Developer	R&D Village
King Souder Property	Off-Street Trail	0.2	Developer	Damascus
King Souder Property	Sidepath	0.1	Developer	Damascus
LIDL Germantown	Sidepath	0.1	Developer	Germantown Town Center
Linthicum West	Sidepath	0.9	Developer	Clarksburg
Miles Coppola	Sidepath	0.4	Developer	Clarksburg, Clarksburg Town Center
Milestone	Sidepath	0.2	Developer	Germantown East
Montgomery College Germantown	Sidepath	0.2	Developer	Germantown East
PSTA Site	Sidepath	0.5	Developer	R&D Village
Seneca Property	Sidepath	0.1	Developer	Rural West
White Oak Apartments	Sidepath	0.1	Developer	White Oak
White Oak Town Center	Sidepath	0.3	Developer	White Oak

Table B.15: Upgrades to Existing Bikeways

Project	Bikeway	Length (mi)	Lead Agency	Policy Area
FAES - Social and Academic Center	Sidepath	0.1	Developer	Bethesda/Chevy Chase

Glossary

Bicycle and Pedestrian Priority Areas (BiPPA): Defined in the Maryland state code as a geographical area where the enhancement of bicycle and pedestrian traffic is a priority. Montgomery County has designated 34 BPPAs and has established a funding program for pedestrian and bicycle improvements with these areas. A map of BiPPAs is shown here.

Bicycle Parking: The availability of secure and convenient bicycle parking is an important factor when considering making a trip by bicycle. No matter how well-connected the bikeway network, many people will forgo bicycling if their destinations lack safe places to secure their bicycles. An adequate supply of bicycle parking encourages bicycling while reducing theft and improper use of trees and street furniture for bicycle parking. Whether traveling to work, school, shopping, or home, people must feel confident that their bicycles will not be stolen or vandalized when stored. The length of time that a bicycle will be parked largely determines the level of security that is needed. The longer the time period, the more secure the bicycle parking needs to be. The *Bicycle Master Plan* recommends three types of bicycle parking:

- **Bicycle Parking Stations:** Secure bicycle storage areas often located adjacent to transit stations or in downtown areas.
- **Long-Term Bicycle Parking:** Long-term bicycle parking is intended to provide sheltered and secure bicycle storage for residents, students, employees, and long-term visitors who are leaving their bicycles for several hours or longer. It is typically provided in a fixed, safe, and weather-protected setting, including bike stations, bike rooms, or cages inside buildings and stand-alone bike lockers.
- **Short-Term Bicycle Parking:** Short-term bicycle parking prioritizes convenience and is located at entrances to public buildings, such as schools, libraries, recreation centers, and on commercial blocks. It is typically provided with "U" racks for users to quickly store and retrieve their bicycle.

Bikeways: Bikeways provide physical infrastructure to improve the comfort and safety of bicycling. They are organized into five facilities classifications based on their level of separation from traffic, ranging from trails (the most separation from traffic) to shared roads (no separation from traffic). These five classifications are then subdivided into bikeway types:

Trails: paths that are located outside of the road right-of-way. They provide two-way travel designated for walking, bicycling, jogging and skating.

- **Off-Street Trails:** shared use paths located outside of the road right-of-way that provide two-way travel for people walking, bicycling and using other non-motorized modes.
- **Stream Valley Park Trails**: shared use paths located within a M-NCPPC stream valley park that provide two-way travel for people walking, bicycling, and using other non-motorized modes of transportation.
- **Neighborhood Connectors:** short paths that provide critical connections in the residential walking and bicycling network. They create shortcuts and often bypass or minimize the amount of travel along higher-stress streets.

Separated Bikeways: Separated bikeways provide physical separation from traffic.

- **Sidepaths:** shared use paths located parallel to and within the road right-of-way. They provide two-way travel routes designated for walking, bicycling, jogging, and skating.
- **Separated Bike Lanes:** Also known as protected bike lanes or cycle tracks, they provide exclusive bikeways that combine the user experience of a sidepath with the on-street infrastructure of a conventional bike lane. They are physically separated from motor vehicle traffic and distinct from the sidewalk. They operate one-way or two-way.

Striped Bikeways: designated spaces for bicycling that are distinguished from traffic lanes and shoulders by striping and pavement markings.

- **Buffered Bike Lanes:** conventional bike lanes paired with a designated buffer space separating the bicycle lane from the adjacent vehicle travel lane and/or parking lane to increase the comfort of bicyclists.
- **Conventional Bike Lanes**: (or simply bike lanes) are portions of the street that have been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists.
- **Contra-Flow Bike Lane:** bike lanes designed to allow bicyclists to ride in the opposite direction of motor vehicle traffic.

Bikeable Shoulders: portions of the roadway that accommodate stopped or parked vehicles, emergency use, bicycles and motor scooters, and pedestrians where sidewalks do not exist.

Shared Roads: bikeways that share space with automobiles.

- **Shared Streets:** an urban design approach where pedestrians, bicycles, and motor vehicles can comfortably coexist. They prioritize pedestrian and bicycle movement by slowing vehicular speeds and communicating clearly through design features that motorists must yield to all other users. Motorists are considered "guests" in this environment.
- **Neighborhood Greenways:** streets with low motorized traffic volumes and speeds, designed and designated to give walking and bicycling priority. They 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.
- **Priority Shared Lane Markings:** communicate bicyclist priority within a shared lane and guide bicyclists to ride outside of the door zone. Colored backgrounds and more frequent spacing make priority shared lane markings more conspicuous than standard shared lane markings (also known as sharrows). This treatment does not improve most bicyclists' comfort in shared lanes with traffic.

Breezeways: the arterial bikeway network.

Capital Improvements Program (CIP):
A six-year comprehensive statement of the objectives of capital programs with cost estimates and proposed construction schedules for specific projects. The proposed Montgomery County CIP is submitted by the County Executive to the County Council every two years and a general amendment is typically submitted in the off years.

Complete Streets Design Guide: A document that provides policy and design guidance on the planning, design, and operation of county roadways to provide safe, accessible, and healthy travel for all users of the roadway system, including pedestrians, bicyclists, transit riders, and motorists.

Equity Focus Area (EFA): Parts of Montgomery County that are characterized by high concentrations of lower-income people of color, who may also speak English "less than very well".

Fee-in-Lieu: a payment collected by Montgomery County as an alternative to meeting the requirements of county laws and policies.

Level of Traffic Stress (or Traffic Stress): the concept that people have a certain tolerance for bicycling near traffic, and if that tolerance is exceeded even for a short distance, they may be deterred from bicycling.

Low-Stress Bicycling Network: A bicycling network that is comfortable and safe for people of all ages and bicycling abilities. Low-stress bicycling reflects the context of the road. For example, on high-volume and high-speed suburban highways, a shared-use path with a wide buffer from the road, on downtown streets, a network of separated bike lanes, and on low-volume residential streets, bicycling in the road with traffic may be appropriate.

Transportation Management Districts (TMD): County organizations that provide concentrated services to encourage the use of transit and other commuting options in Montgomery County's major business districts. Currently, TMDs exist in Friendship Heights, downtown Bethesda, downtown Silver Spring, Greater Shady Grove, North Bethesda, and White Oak.

Vision Zero: A proven approach to preventing roadway-related deaths and serious injuries that represents a fundamental change in how we plan and design our roads, shifting from a focus on maximizing motor vehicle efficiency to ensuring that our roads are safe regardless of whether travel is by car, bus, bicycle, or foot. Vision Zero recognizes that people will sometimes make mistakes and that our roads should be designed to ensure those inevitable mistakes do not result in serious injuries or fatalities.

THE BICYCLE MASTER PLAN

Biennial Monitoring Report

2021 - 2022

Montgomery Planning