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**.[1]

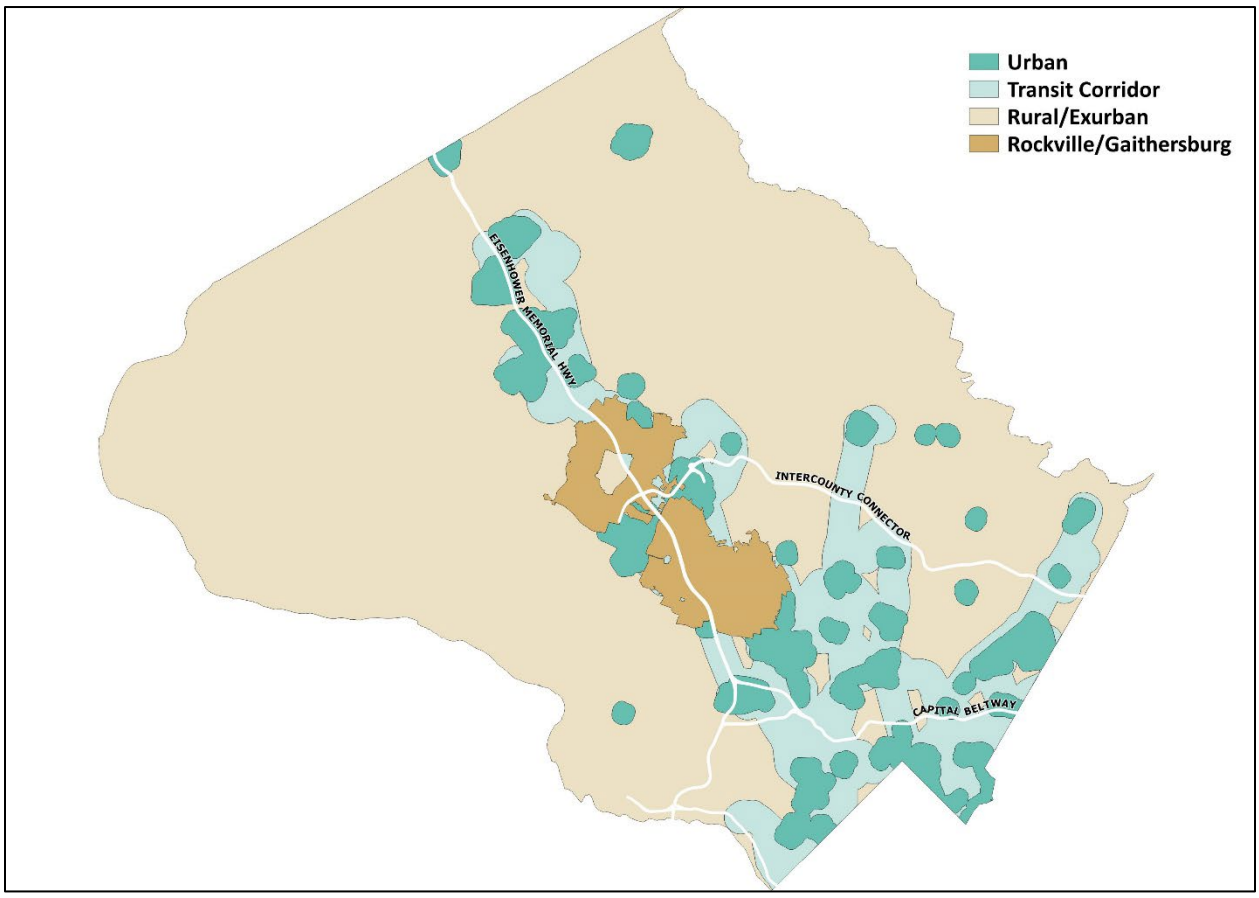

Figure 6: Land Use Area Types

[1] 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)[2] 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.

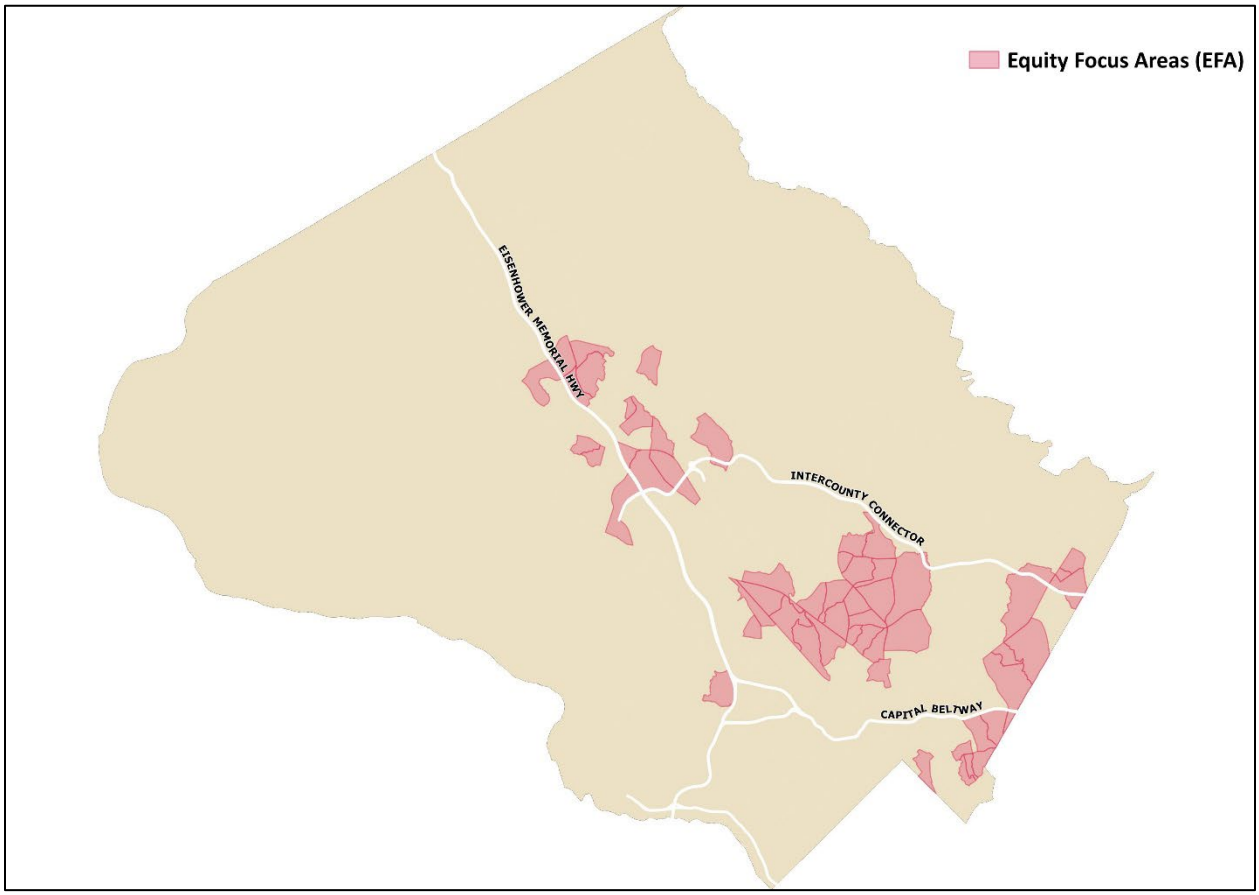

Figure 7: Equity Focus Areas (2021)

[2] 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.

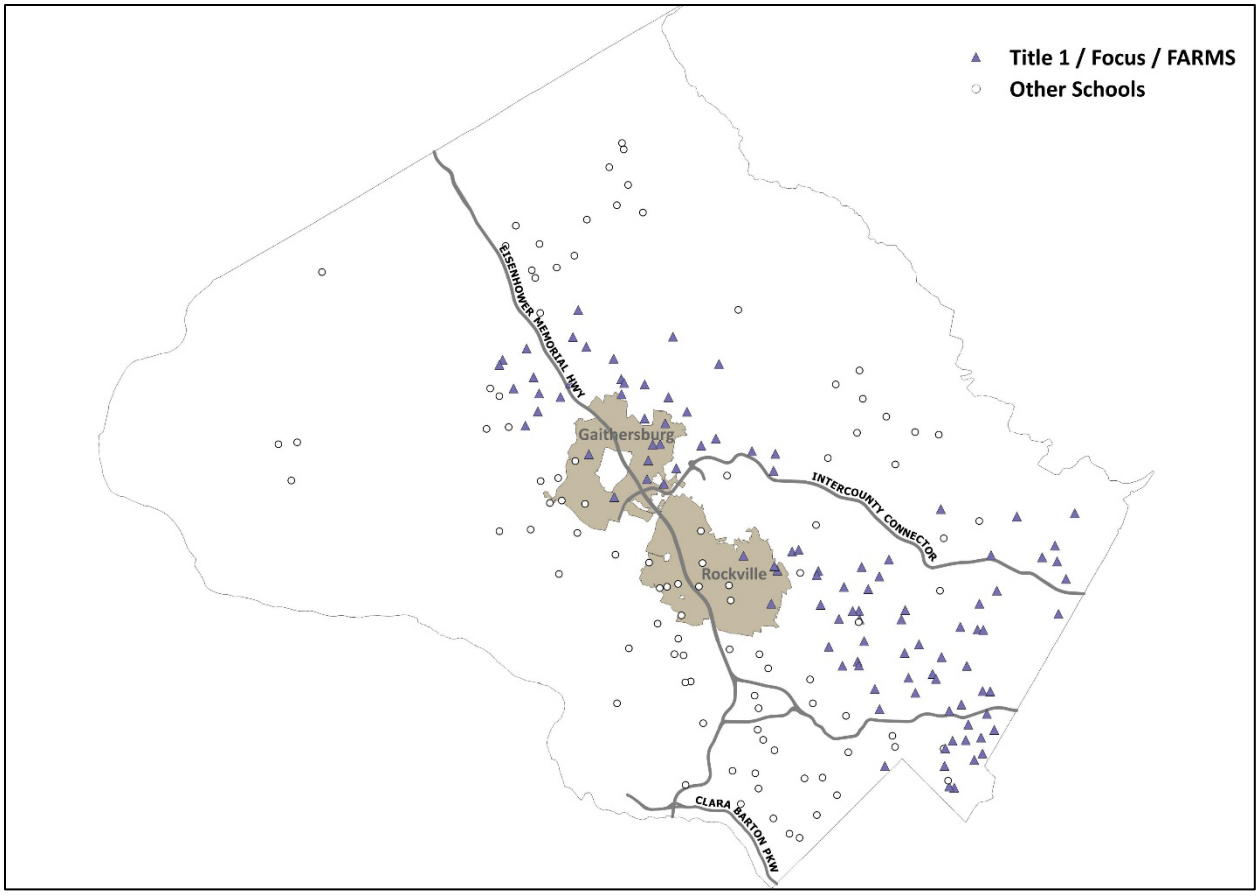

Figure 8: Title I, Focus, and High FARMS Schools

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 6: 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.[3]

[3] 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 7: 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.

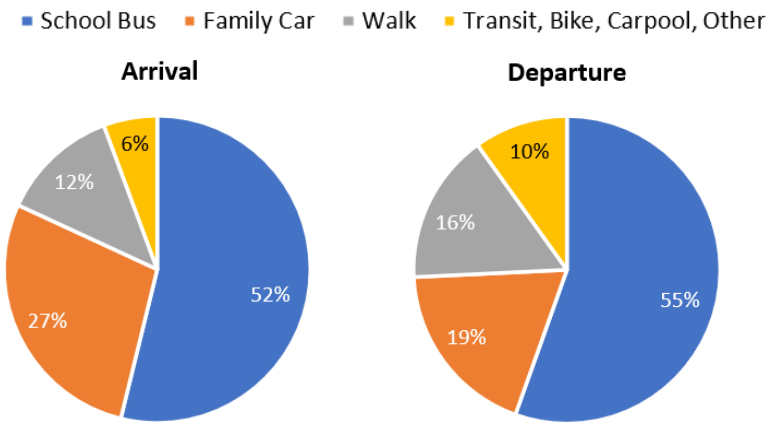

Figure 9: Student Mode Share by Arrivals and Departures

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[4]; 21% of Alexandria public school students in 2019[5]; and 20% of students in Arlington in 2019.[6] These communities are more compact than Montgomery County, but their walk mode shares provide context for the county's own results.

Table 8: 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 9: 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

[4] "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
[5] "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
[6] "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 10: 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.[7]

Table 11: 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).

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

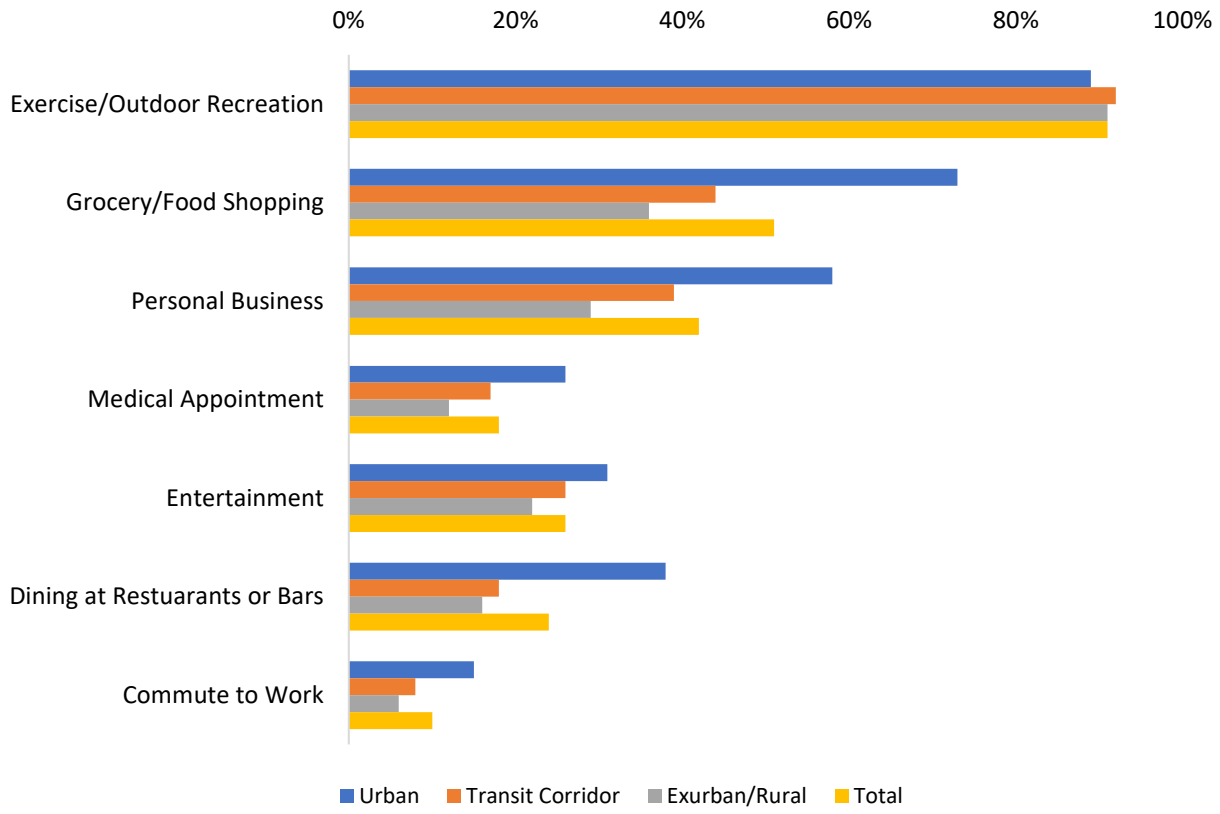

Figure 10: Pedestrian Trip Purpose by Land Use Type in the Prior Month

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%).

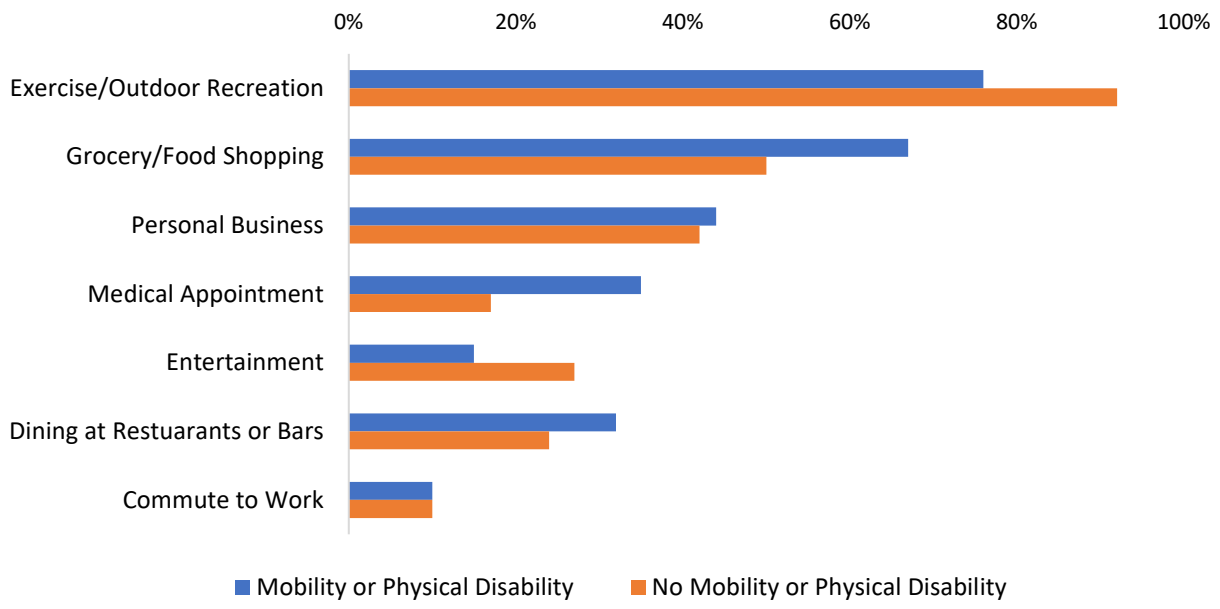

Figure 11: Pedestrian Trip Purpose by Reported Disability

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.

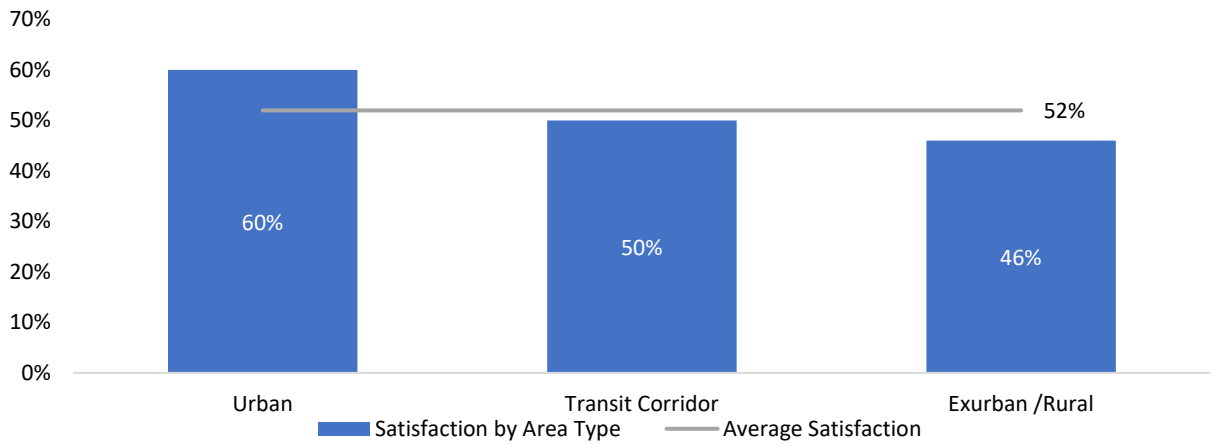

Figure 12: Satisfaction with the Overall Pedestrian Experience

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.

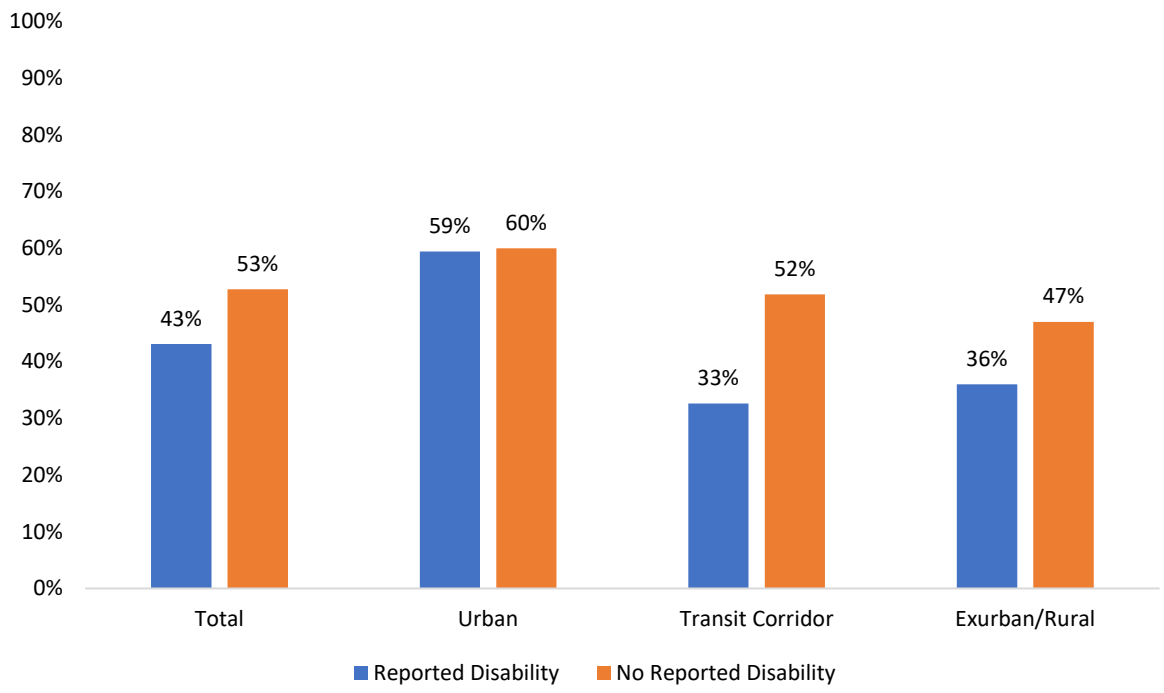

Figure 13: Overall Satisfaction by Reported Disability Status and Land Use Type

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%).

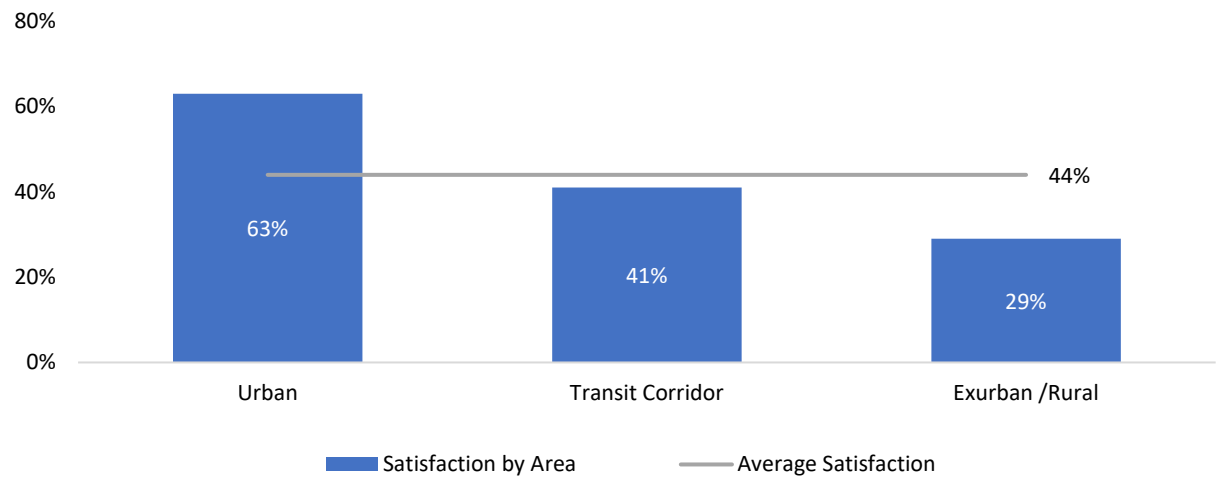

Figure 14: Pedestrian Satisfaction with Access to Retail, Restaurants, Parks, Etc.

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 12: 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 13: 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 14: 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.[8]

"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,[9] 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.

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

[9] 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 15: 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 16: 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%).[10]

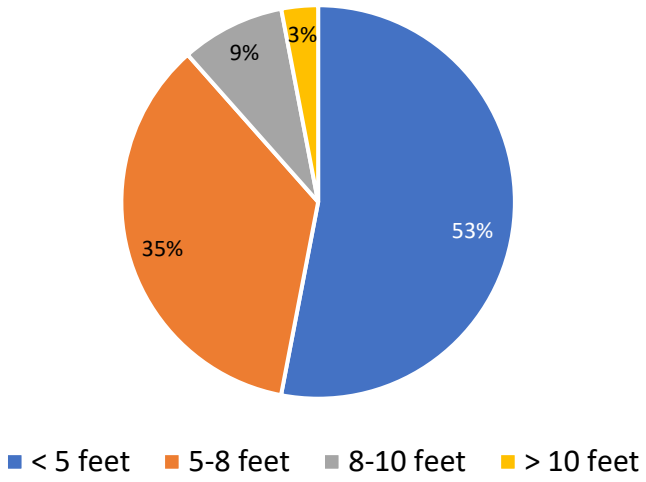

Figure 15: Sidewalk Width

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 17: 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%
Business	81	17%	58%	14%	12%

[10] 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'
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%).

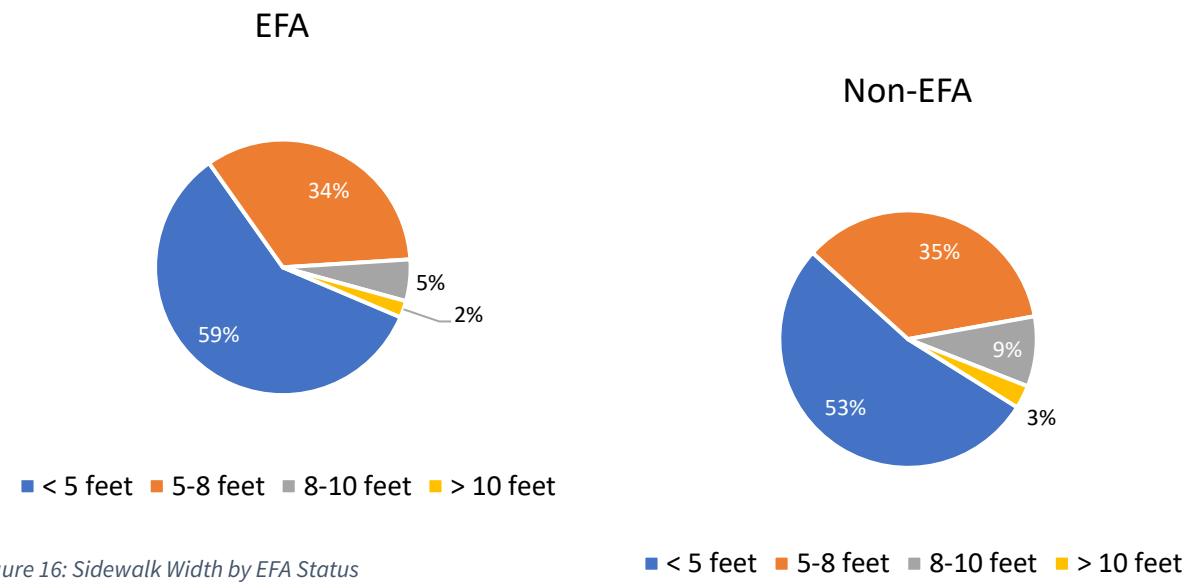

Figure 16: Sidewalk Width by EFA Status

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 18: 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).

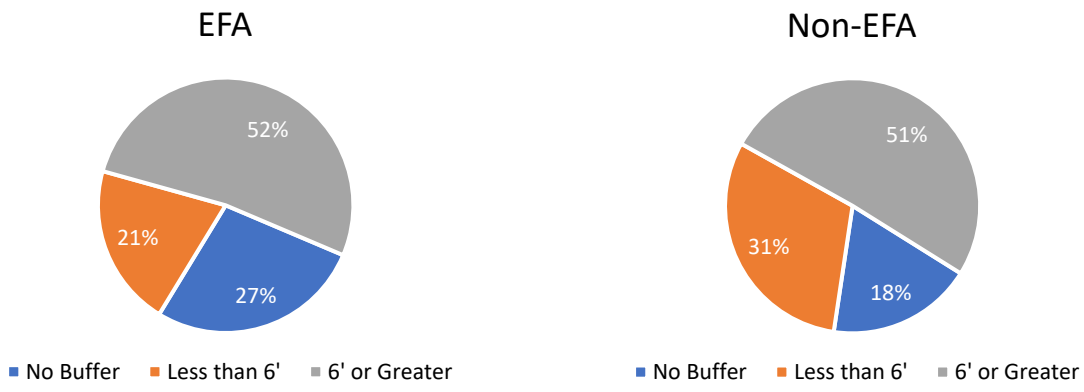

Figure 17: Street Buffer Width by EFA Status

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 19: 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.[11] 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 20: 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

[11] 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 21: 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.

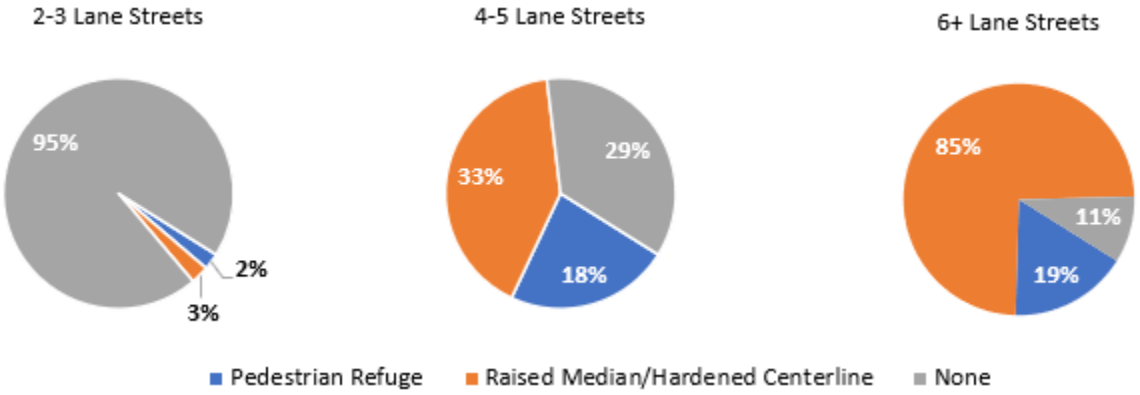

Figure 18: Median Treatment by Number of Lanes

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 22: 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.

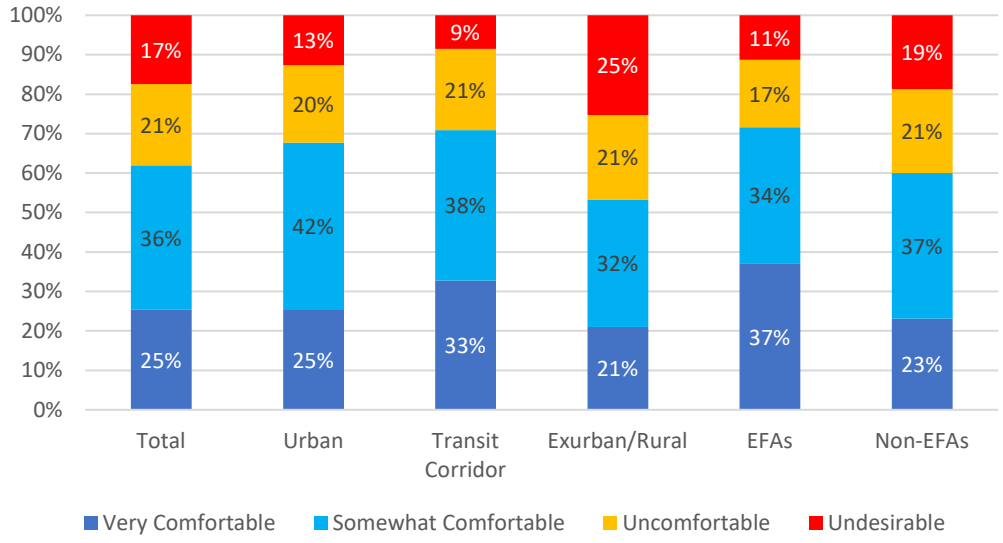

Figure 19: Overall Pedestrian Comfort Along Pathways

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.

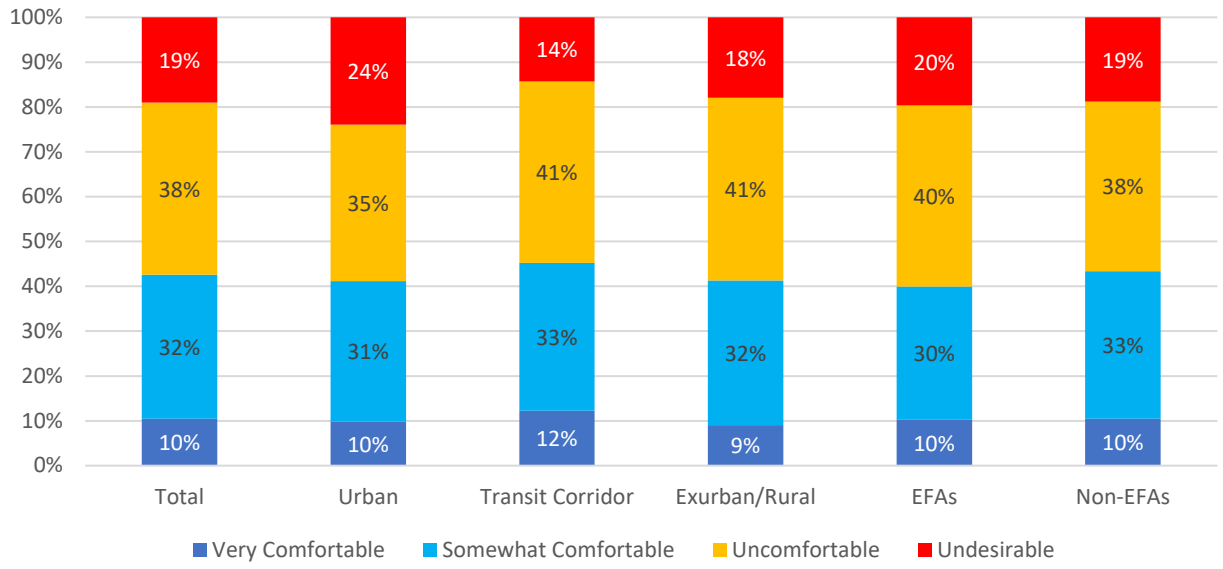

Figure 20: Overall Pedestrian Comfort at Crossings

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.[12]

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.

[12] 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 23: 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 24: 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 25: 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,[13] 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."

[13] 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 26: 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 27: 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.[14] 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%.[15] 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.

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

[15] 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.[16] Transit corridor sidewalks have a canopy coverage of 33%, followed by urban area sidewalks at 30%, and exurban/rural area sidewalks at 24%.[17]

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.

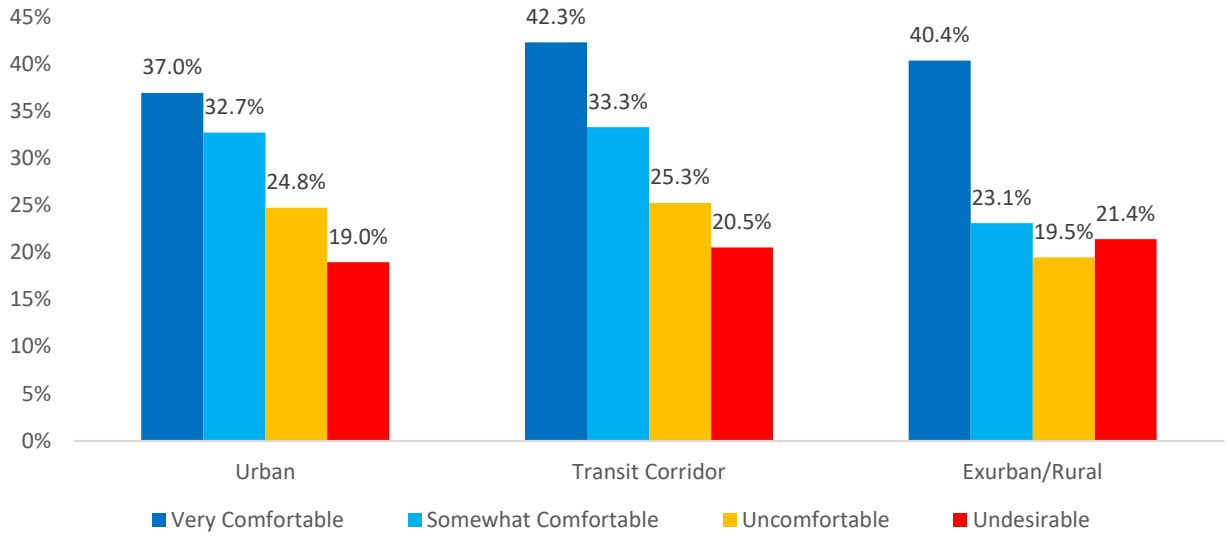

Figure 21: Tree Canopy Coverage by Land Use by PLOC Score

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.

[16] 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.

[17] 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 28: 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.

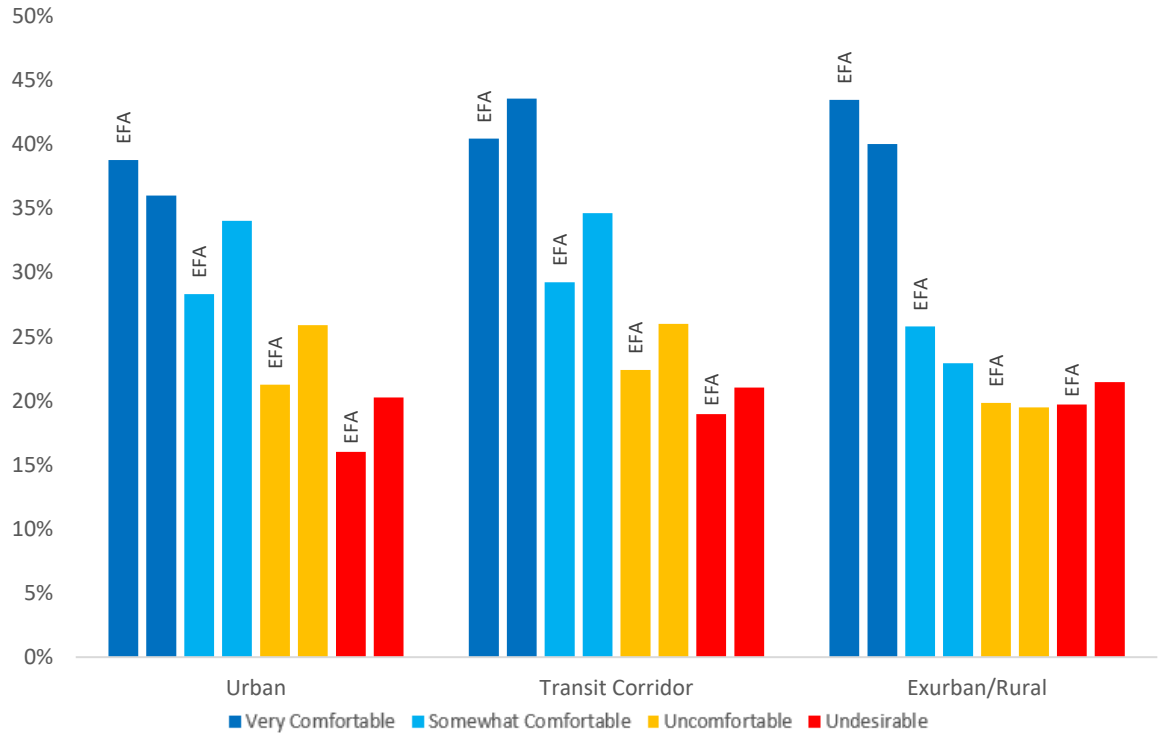

Figure 22: Canopy Coverage by Land Use by EFA

Pedestrian Safety

Through its 2016 Vision Zero resolution, Montgomery County committed to eliminating traffic fatalities and severe injuries.[18] 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 23: Pedestrian Crashes as a Percent of Total Crashes and Severe Injuries and Fatalities

Note: Data includes crashes in Rockville and Gaithersburg.

[18] "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).

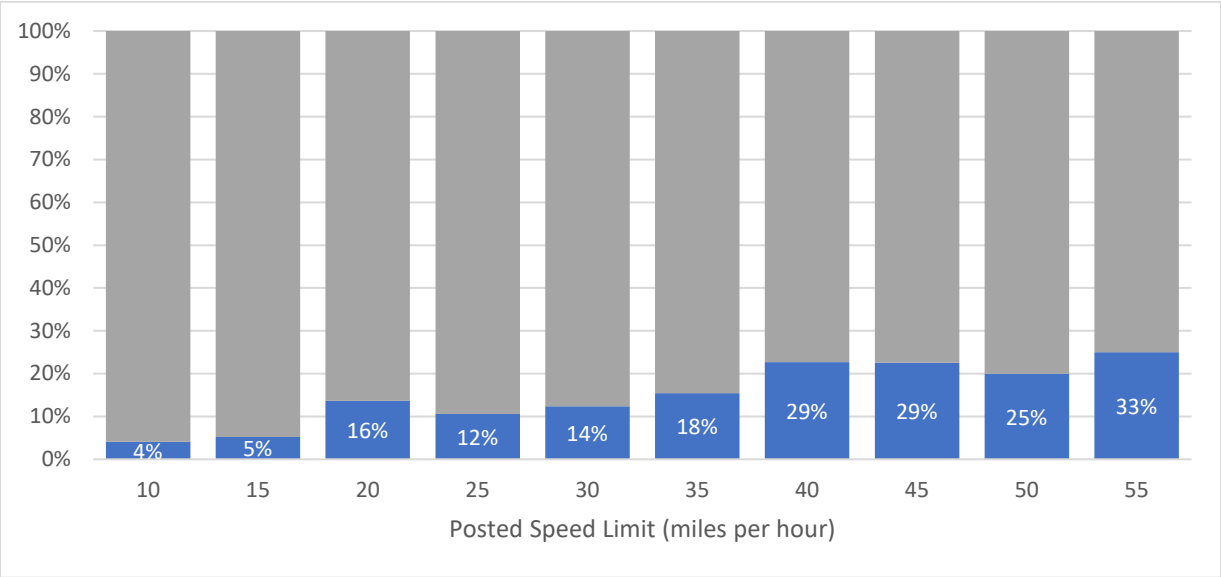

Figure 24: Percent of Pedestrian Crashes Resulting in a Severe Injury or a Fatality by Speed Limit

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.

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%).

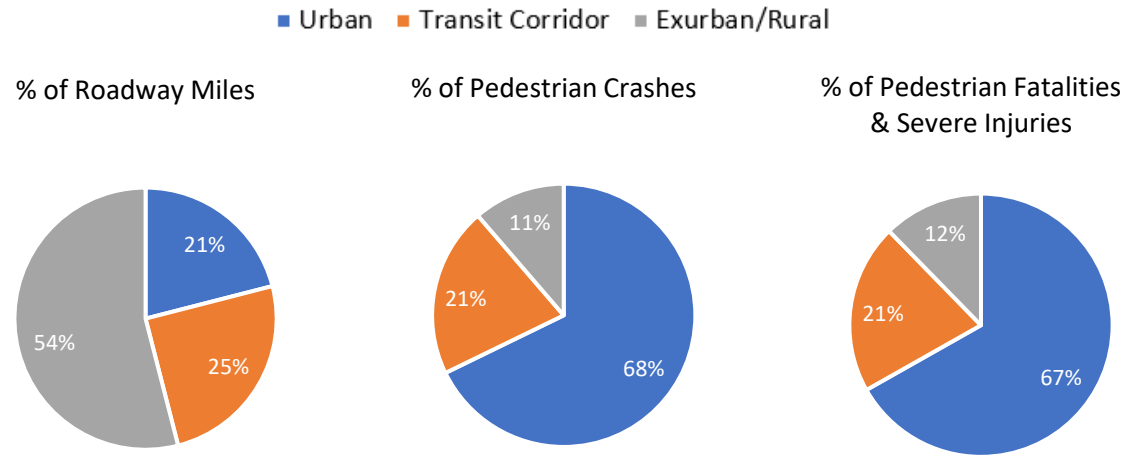

Figure 25: Pedestrian Crashes by Area Type

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.[19]

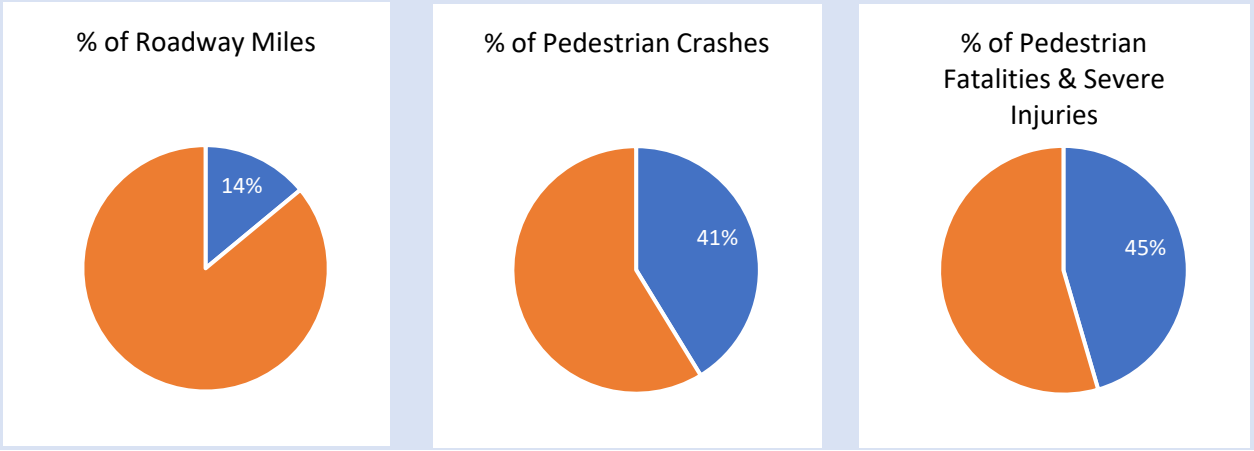

Figure 26: Pedestrian Crashes in Equity Focus Areas

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

[19] 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 29: 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 30: 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 31: 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.

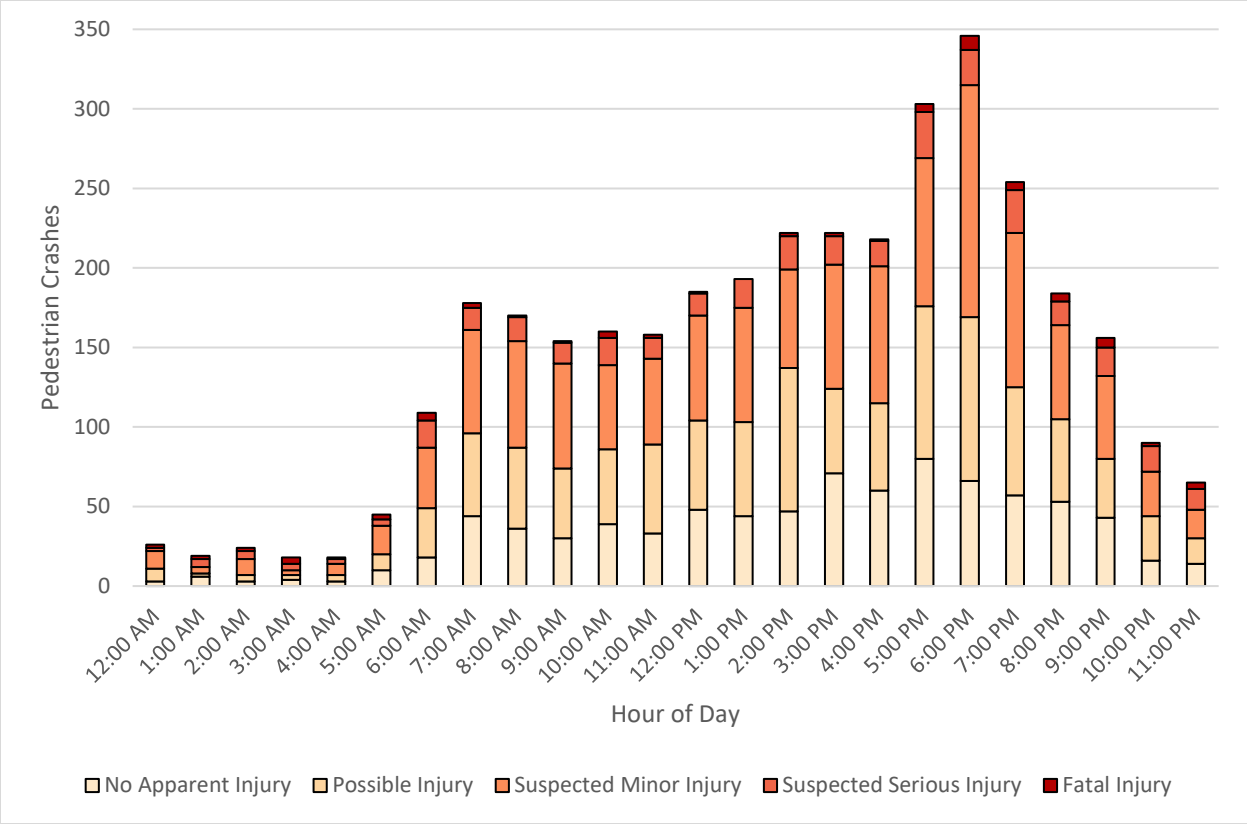

Figure 27: Pedestrian Crashes by Time of Day

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.

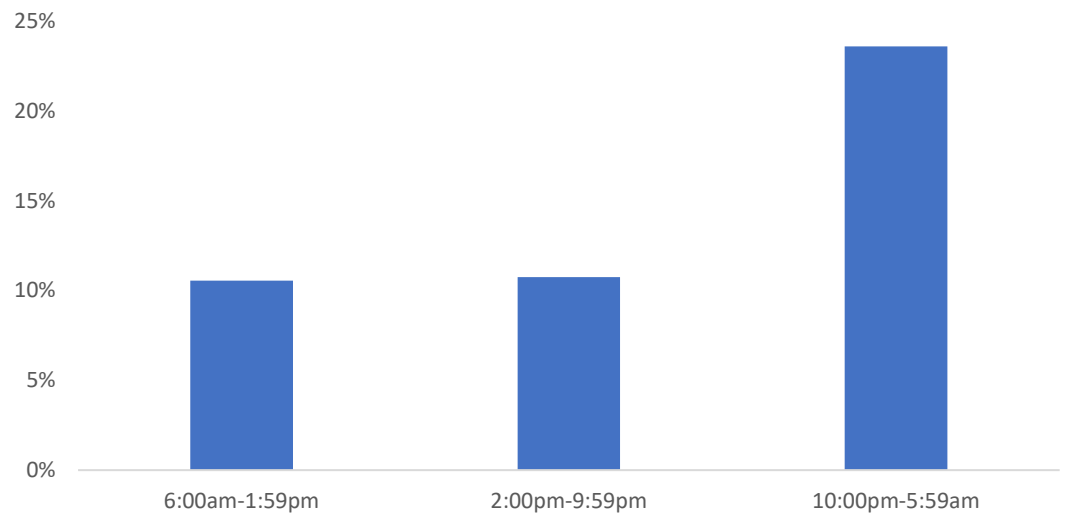

Figure 28: Crashes Resulting in KSI as a Percentage of All Pedestrian Crashes by Time of Day

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.

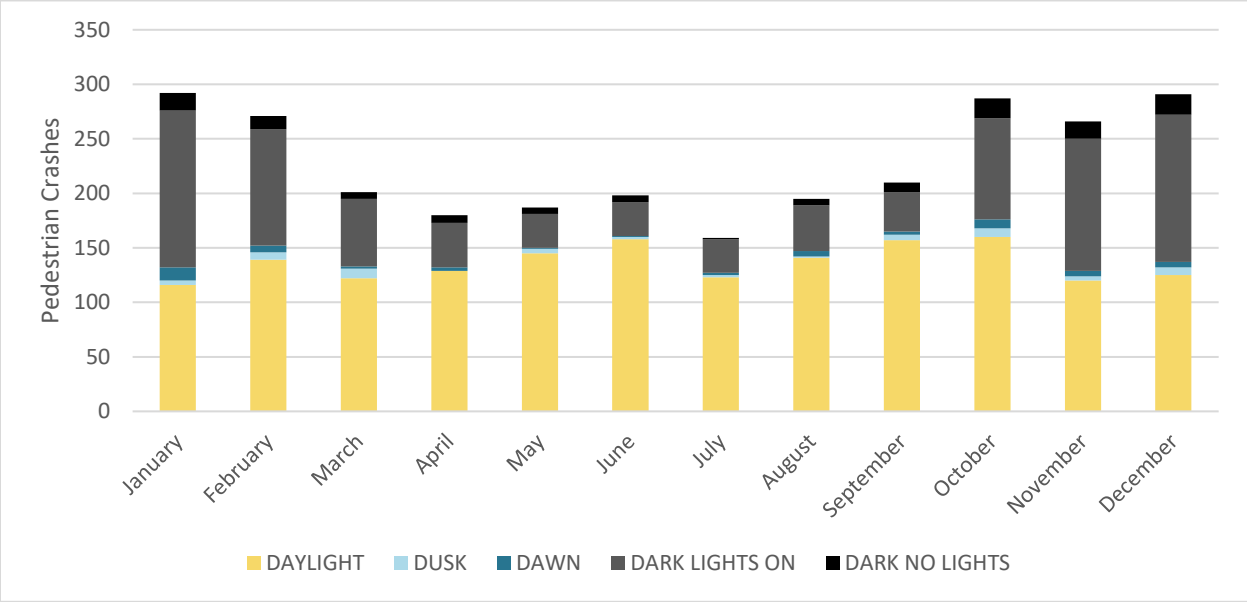

Figure 29: Pedestrian Crashes by Lighting Conditions

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 32: 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.