APPENDIX: D
Countywide Pedestrian Survey

The saying “those who are counted, count” is a quick way to convey that data gathering and presentation influence policy proposals, and funding allocations. Data helps underscore the importance and enhances the legitimacy of a subject.

Walking is one of the activities that communities across the country have done a poor job of understanding and quantifying. It may be the case that everyone is a pedestrian at some point in their daily travels, but we have far more information historically about how, when, where, and why people drive in Montgomery County than how people walk or roll using a mobility device. For many roads within Montgomery County, we know how many cars use them annually (and at what speed), where, and when they get congested, etc. The same cannot be said for our knowledge of pedestrian movement. The Planning Department is currently making a model of pedestrian activity, but we are playing catch-up. This data disparity is a choice, and its consequences are on display every time county residents and visitors have to take circuitous pedestrian routes to get to destinations, walk in the street after a snow event, or wait a decade for a sidewalk to be built on their street.

The U.S. Census and the Metropolitan Washington Council of Governments’ Regional Travel Survey both provide information about pedestrian travel in Montgomery County but have their drawbacks. The U.S. Census 2019 American Community Survey identifies that 75% of commute trips in Montgomery County are taken by car.[1] Compared to the 2.5% of commutes that take place on foot, the outsized attention and funding historically paid to creating and maintaining a car-centric transportation system appears reasonable. However, Census data paint an incomplete picture. First, the Census approach is to count the transportation mode responsible for the longest distance as the transportation mode for the trip. This may work well when considering automobile travel, but it is less helpful in understanding pedestrian trip-making. That’s because, in addition to walking the entire distance to work, walking is also a major way people access public transportation. Second, the commute is just one of many trips taken. Most trip purposes (recreation, running errands, going to the library, etc.) take place within a walkable distance of where people live. Given the appropriate conditions, these trips are more likely to be pedestrian trips than commute trips.

The recently completed Metropolitan Washington Council of Governments’ decennial 2017-2018 Regional Travel Survey (RTS) provides a broader understanding of the transportation landscape beyond the commute. Randomly selected households (approximately 16,000) across the region completed a one-day “travel diary” for all members of their household as part of the RTS. Through appropriate weighting based on demographics, vehicle ownership, income, and other factors, these responses are used to approximate trip frequency, travel mode, travel purpose, trip distance, and other data points for the Washington region and for local communities. The RTS approach does not collect information on trips made on weekends and does not attempt to model weekend trips or mode share. Because the majority of weekend trips are for non-commute purposes, the RTS likely underestimates pedestrian mode share. The RTS found that 6% of trips beginning or ending in Montgomery County were walk trips[2] (4.2% for commutes and 6.8% for non-commutes).

[1] U.S. Census Bureau (2019). *Sex of Workers by Means of Transportation to Work American Community Survey 1-year estimates.* Retrieved from <https://censusreporter.org> >

[2] https://www.mwcog.org/file.aspx?&A=bbPWVcV2KLG0i2cvfbjsOrEaTLZBAtKhawdKkQz4X%2FY%3D

In October and November 2020, the Pedestrian Master Plan team built on this regional dataset by releasing a first-of-its-kind countywide survey to better understand pedestrian attitudes and travel behaviors, as well as to serve as a benchmark for future surveys to analyze trends. Survey results paint a more nuanced picture of pedestrian travel in Montgomery County and will be used to develop potential plan recommendations.

Methodology

Survey Design and Sampling

The Pedestrian Master Plan team worked closely with survey consultant Resource Systems Group, Inc. (RSG) to develop a survey that included questions related to:

- Walking/rolling trip details (e.g. number of trips, frequency, trip purpose)
- Most/least important improvements to the pedestrian environment the county should prioritize
- Satisfaction with various elements of the pedestrian environment
- Understanding of traffic laws related to pedestrians
- Personal safety and street harassment experience
- Demographics

Once the questionnaire content was finalized, the survey was translated into Spanish and Simplified Chinese and programmed into RSG's rSurvey software. The survey was password-protected so each responding household could only take the survey once. All responses were stored in a secure Microsoft Azure cloud-based server.

Recruitment for the countywide survey used Address-based Sampling (ABS), sending postcards to randomly selected mailing addresses in Montgomery County. A sampling plan was created to achieve 1,200 completed responses. With an assumed overall response rate of two percent, 60,000 addresses received postcards. To maximize response rates, a reminder postcard was sent to all respondents and a raffle of ten $100 e-gift cards was administered for those who completed the survey.

Figure 1: Survey Postcard Front

The sampling plan was further disaggregated into three sub-areas of Montgomery County to both ensure wide participation across the county and allow enough responses to provide for analysis within and between different land use types. For each of the three geographies, the target margin of error was five percent with 400 completed surveys. A margin of error is the number of percentage points a survey answer could differ from the real value for the population being surveyed. A margin of error of five percent at a 95 percent confidence interval means that the survey answer will be within five percent of the real population value 95 percent of the time. Smaller margins of error are better than larger ones.

The 60,000 total addresses were split evenly across the three geographies, representing three different land use types:

1) Urban: Downtown and town center areas
2) Transit Corridor: Areas outside urban areas within a half-mile of existing transit corridors with peak hour headways of every 20 minutes or better.
3) Exurban/Rural: Areas outside of the urban and transit corridor areas.

The survey did not include addresses from Rockville or Gaithersburg because they have independent planning authority.

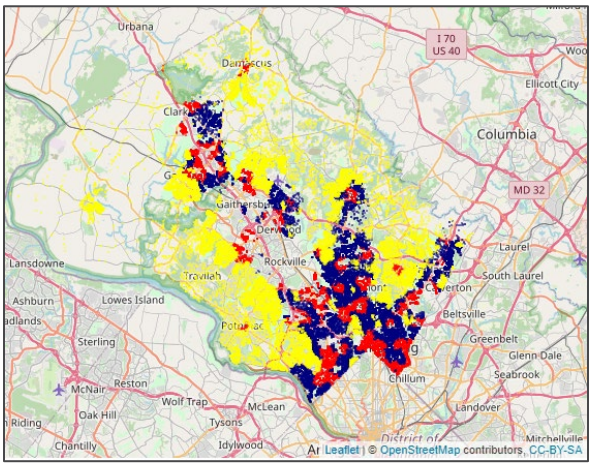

Figure 2: Postcard Sampling Addresses by Geography

The initial postcards were mailed on Monday, October 26, 2020 with reminder postcards mailed on Friday, November 6, 2020. The survey remained open from October 26, 2020 through December 10, 2020. Expecting only 1,200 total responses, the project team was pleasantly surprised to receive 2,438 for a response rate of 4.1%. The better-than-expected response rate resulted in a 2% countywide survey margin of error, a 3% exurban/rural margin of error, a 3% transit corridor margin of error, and a 4% urban margin of error.

	Urban	**Transit**	**Exurban/ Rural**	**Total**
Invitations	20,000	20,000	20,000	60,000
Survey Completes	772	815	851	2,438
Spanish Completes	7	18	3	28
Chinese Completes	2	3	7	12
Overall Response Rate	3.9%	4.1%	4.3%	4.1%
Margin of Error (95% CI)	4%	3%	3%	2%

Figure 3: Survey Response Summary

Weighting

The survey records were weighted to better represent the actual population in the Montgomery County Planning Department's jurisdiction within Montgomery County. The survey records were separated for weighting by the same three geographies used in sampling: urban, transit, and exurban/rural. The data were weighted using 2018 American Community Survey (ACS), five-year estimates (U.S. Census Bureau) of income, race and Hispanic, Spanish, or Latino origin distributions for each geography. To account for survey respondents who preferred to not provide their 2019 household income, race or Hispanic, Spanish, or Latino origin, the category was treated separately and the ACS distributions were adjusted accordingly (in other words, the proportion of "prefer not to answer" responses were kept the same).

The income and race/ethnicity variables were not imputed for respondents who chose not to answer because, a) there was no distinguishable pattern to these respondent's survey responses compared to the overall sample, b) the final number of affected respondents was relatively low, and c) given the first two points there was no reason to introduce unnecessary estimated adjustments through the imputation process.

All analysis of the dataset was conducted using weighted data to ensure that the results are representative of the county population.

The specific weighting adjustments can be reviewed on page 73 of the complete survey report.[3].

Max Difference (MaxDiff) Analysis

A key part of the survey was to capture resident sentiment about their pedestrian experience. For this, a unique survey approach called "Max Difference" (MaxDiff) was used. MaxDiff allowed the project team to assess how respondents value elements of the pedestrian experience in absolute terms and also relative to other elements. In the MaxDiff approach, respondents are asked about 21 statements over 12 individual questions, choosing which statement is most important and which statement is least important to them (e.g. more places to safely cross the street versus better overhead lighting at street crossings). The results are modeled using a Hierarchical Bayes estimation software to produce individual utilities for each statement. RSG rescaled these utilities using min-max normalization so each utility falls from zero to 100. The final dataset contains the normalized utilities as well as variables that "flag" each statement with a utility over 60, representing a reasonable cutoff for "high" priority statements. Each respondent's normalized utilities are combined and averaged to provide insights into countywide and area-specific priorities.

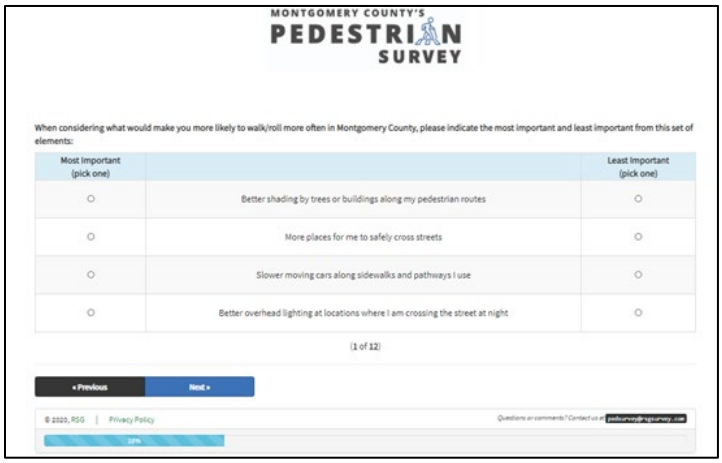

Figure 4: MaxDiff Experiment from Survey Instrument

Findings

Survey findings provide insights into three broad topic areas:

1) Understanding existing pedestrian activities and attitudes
2) Highlighting the most important pedestrian improvements
3) Identifying COVID-19-specific travel behavior changes

High-level findings are described below. More detailed analysis and responses to more questions can be found in the complete survey report[4].

[3] The complete survey report can be found here: https://montgomeryplanning.org/wp-content/uploads/2021/03/M-NCPPC-Ped-Survey-Final-Report.pdf
[4] *Ibid*.

Existing Pedestrian Activities and Attitudes

Walk Purpose

Survey respondents were asked why they went out for a walk or roll (using a wheelchair or other mobility device) in the past month. With only two percent of respondents not walking for any purpose, 98 percent of respondents walked at least once in the past month. The most popular reason people walk is exercise/recreation. Ninety-one percent of respondents walked/rolled for these purposes in the month prior. Grocery/food shopping was the second-most popular walk/roll purpose (51 percent), followed by personal business (42 percent), and entertainment (26 percent).

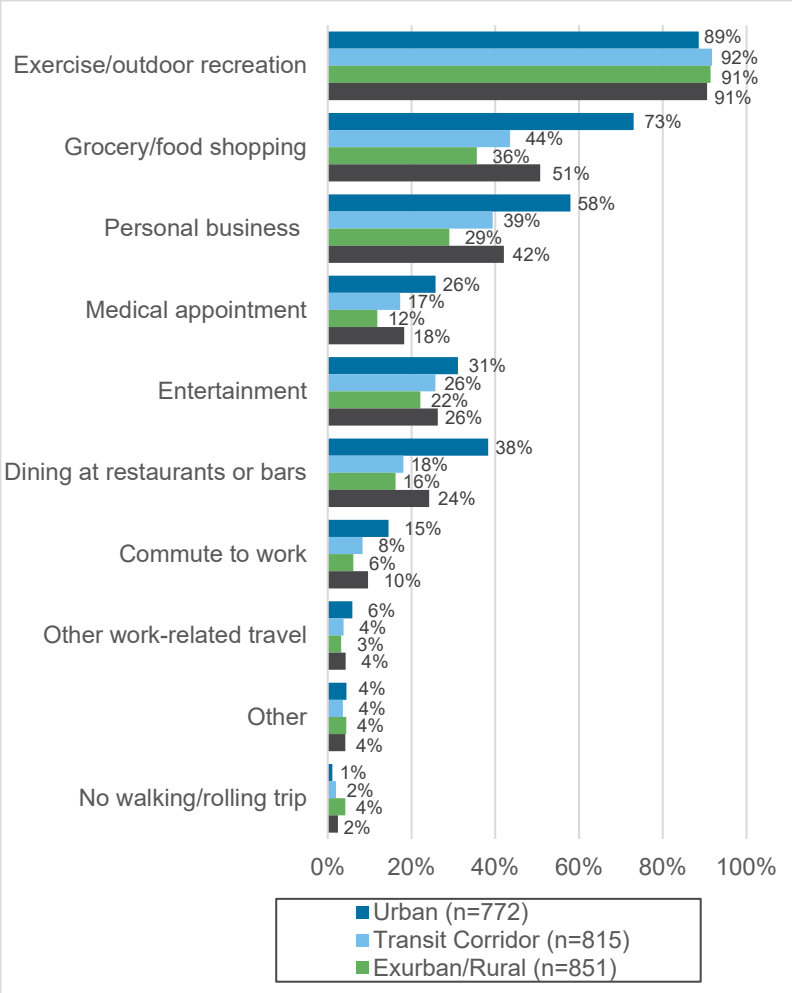

Figure 5: Walk Trip Purposes in Past Month

Comparing responses by geographic area, it is clear that there is a relationship between land use and walk purpose. Respondents in urban areas are more likely than those in other areas to walk/roll for all non-exercise/recreation purposes. Likewise, respondents in transit corridor areas are more likely to walk/roll for all non-exercise/recreation purposes than those in exurban/rural areas, though the difference is not as stark as between urban areas and the others. This relationship likely exists because more destinations are within walking distance in urban areas, so more types of trips are made on foot. To a certain extent, there may be some self-selection at play where people interested in walking for more trip-purposes live in places where such purposeful walking can be done.

Another finding that is important to note – while 2.5 percent of people commuted on foot according to the 2019 U.S. Census American Community survey and 4.2 percent commuted on foot in the MWCOG RTS, 10 percent of respondents reported commuting on foot at least once in the prior month. While fewer may commute on foot daily, walking is a more common commute mode in Montgomery County than other data sources may suggest.

Reported disability is an illuminating lens through which to view many of the survey findings. For trip purpose, the survey identified that utilitarian trips were a greater percentage of total pedestrian trips for those with reported disabilities than those without. Forty-eight percent of trips for those with reported disabilities were for utilitarian (non-exercise/recreation) purposes, while 41 percent of pedestrian trips for those without reported disabilities were for utility.

Trip Frequency

Not only are respondents more likely to have taken exercise/recreation pedestrian trips in the prior month, but those trips are also the most frequent trips taken. Fifty-eight percent of pedestrian travel in the time period was for a recreational purpose. There is a marked difference between the number of pedestrian trips taken and the types of trips taken in urban areas compared to the rest of the county. Urban area respondents take about 32 percent more pedestrian trips than those in transit corridors and 27 percent more than those in rural/exurban areas. Also, contrary to the latter two areas, the majority of trips taken in urban areas were for a utilitarian purpose, (53 percent) compared to 37 percent in transit corridors and 32 percent in rural/exurban areas.

Those with reported disabilities take fewer pedestrian trips overall than respondents without, with about 81 percent of the trips taken by the latter group.

Trip Duration

Countywide, exercise/recreational walking trips are longer than utilitarian trips. Eighty-six percent of recreational trips are longer than 20 minutes, while the majority of grocery/food shopping trips, personal business trips, medical appointments, entertainment, dining, and commuting are 20 minutes or less. This makes intuitive sense when we consider that the purpose of a recreational walk is the walk itself, while for other trip types, the purpose is to reach a destination. The longer a utilitarian pedestrian trip would take, the more likely it is that the trip will be by car or other means of transportation.

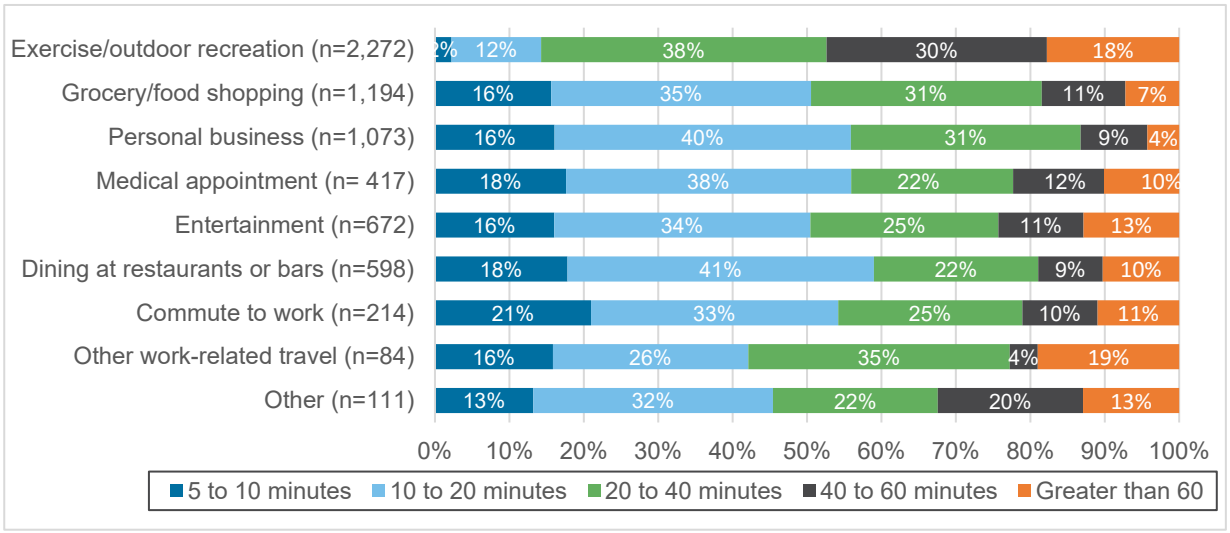

Figure 6: Duration of Walking Trips

Travel-time differences are also apparent between urban areas and the rest of the county. Looking at grocery stores and food shopping as an example, 62% of trips for this purpose in urban areas are 20 minutes or less. Along transit corridors, this is true for 39% of trips. In rural/exurban areas, this is true for 42% of trips. So, not only are there more pedestrian trips taken to grocery stores in urban areas, these trips are also shorter.

Knowledge of Pedestrian Traffic Laws

Respondents are aware of certain pedestrian traffic laws. Specifically, 98 percent of respondents understand that drivers turning right on red must yield to pedestrians, that drivers are responsible for not being distracted when driving, and that drivers must stop for pedestrians in crosswalks. There is less unanimity on the other questions asked. Ten percent of respondents believe it is legal for drivers to stop in the crosswalk at a traffic light; 10 percent also believe it is legal for drivers to pass a vehicle stopped for a pedestrian crossing the street as long as there are no marked crosswalks present. Neither of these two assertions are correct.

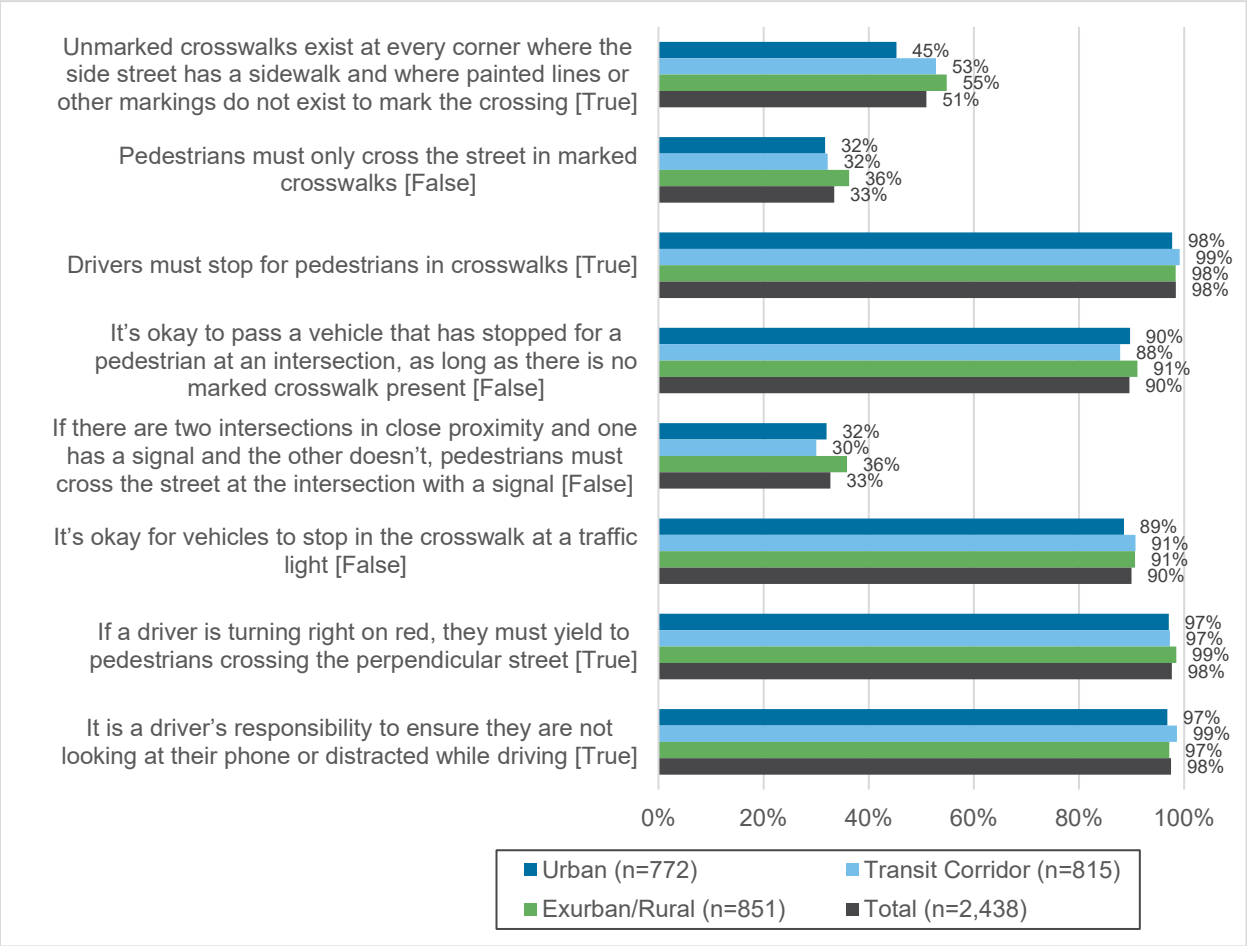

Figure 7: Pedestrian Laws Correctly Answered

Respondents generally do not understand unmarked crosswalks. Only 51 percent of respondents correctly answered the question about their existence and even fewer (33 percent) correctly stated that pedestrians could cross streets at locations other than marked crosswalks. The same percentage of respondents correctly stated that pedestrians did not need to cross at a signalized intersection if an unsignalized one was also present.

Comfort in Public Spaces

Feeling comfortable moving through public spaces as a pedestrian is about more than just feeling safe from traffic hazards. It extends to feelings of personal safety as well. The Countywide Pedestrian Survey asked several questions aimed at understanding different aspects of personal safety. One of those

questions asked respondents to agree or disagree with the statement: “I feel safe while walking/rolling in public spaces.” In total, 73 percent of respondents “agree” or “strongly agree” with that statement. However, among respondents identifying as Hispanic, only 66 percent “agree” or “strongly agree”. This 9 percent difference is outside the 8 percent margin of error for Hispanic response and indicates people identifying as Hispanic are less likely to agree with this statement. Breaking the same question down by other racial and ethnic groups did not reveal any statistically significant differences.

This was not the case when respondents were asked to agree or disagree with the statement: “I feel more comfortable when I see police in public space.” Fifty-seven percent of respondents agreed or strongly agreed with this statement. While Hispanic respondents were slightly more likely to agree or strongly agree (though within the margin of error), Black respondents were less likely to agree (outside the margin of error).

Being a victim of harassment and physical violence are experiences that may deter someone from walking/rolling in public spaces. Nineteen percent of respondents have seen harassment or violence when walking and 16 percent have experienced harassment or violence. There was no statistically significant difference in response to these questions when comparing by gender. Of those who observed or experienced harassment or violence in public spaces, the vast majority have adjusted their behavior in response. From paying more attention to surroundings (73 percent of respondents) to shifting travel to a private car (25 percent) or deciding not to make trips (22 percent), behavior change varies but only 12 percent of affected respondents did not change their behavior.

Satisfaction/Importance of Different Elements of the Pedestrian Experience

Satisfaction

Slightly more than half of respondents are satisfied with the pedestrian experience in Montgomery County. Countywide, 52 percent of respondents report being either “satisfied” or “very satisfied” with the overall pedestrian experience in the county. Breaking responses down by geography, respondents in urban areas are more satisfied (60 percent) than those living along transit corridors (50 percent) and those in exurban or rural areas (46 percent). There is not a tremendous amount of variation in pedestrian satisfaction across race or ethnicity, or household income. However, there is a noticeable difference between satisfaction for the population as a whole and among those with reported disabilities. Only 43 percent of respondents with disabilities are satisfied with the pedestrian experience in Montgomery County, compared to 53 percent of those without a reported disability. This disparity speaks to the challenging and often inaccessible or minimally accessible pedestrian conditions that exist in much of the county that deter many pedestrians, and especially those with disabilities from traveling comfortably and safely.

Keeping in mind that a bare majority of respondents are satisfied with their pedestrian experience (52 percent), respondents are satisfied with various individual elements of their experience to varying degrees. For instance, 52 percent of respondents are satisfied with their personal safety while walking. This is the only individual element that had a satisfaction percentage above 50 percent. At the opposite end of the spectrum, only 21 percent of respondents were satisfied with how fast cars move parallel to sidewalks and paths. Taken as a whole, it is safe to say that respondents are generally unsatisfied with their pedestrian experience in the county. There is a lot of room for improvement.

Importance

The survey consultant used the MaxDiff utilities described earlier to identify the most important elements of the pedestrian environment highlighted in the prior section. The statements seen as most important by respondents (with associated utility scores) are:

1) New sidewalks along my pedestrian routes (73)
2) I feel safer while walking (66)
3) Drivers more consistently stop for me (64)
4) More places for me to safely cross streets (64)
5) Walk on sidewalks that are further away from cars (62)

The statements seen as least important are:

1) Fewer driveways crossing sidewalks (25)
2) More clear directional signage (27)
3) Access more businesses without walking through parking lots (30)
4) Shorter distance for me to cross the street (33)
5) I have a shorter wait for a pedestrian walk signal (34)

There statements vary in importance based on geography. For instance, transit corridor and rural/exurban respondents find new sidewalks significantly more important than respondents from urban areas, with utilities of 80 and 72, respectively, compared to 66. In terms of race and ethnicity, Hispanic respondents found better overhead lighting and clear directional signage more important than non-Hispanic respondents (utility scores of 60 compared to 52 and 40 compared to 25, respectively). A major concern for respondents with a reported disability is more reliable snow removal, signified by a utility score of 62, while those without a reported disability assigned this statement a score of 45. This large difference is likely due to how detrimental snow-covered sidewalks and curb ramps are to people using wheelchairs and other mobility devices.

Satisfaction/Importance Quad Charts

Understanding the relative satisfaction and importance of individual elements of the pedestrian experience can help the project team identify priorities for improvement. The quad chart below illustrates the relationship between satisfaction and importance for pedestrian elements for all survey respondents. Similar charts for the different sub geographies discussed can be found in the survey appendix. The upper right corner identifies statements with relatively high satisfaction and importance. The lower right corner identifies statements with low satisfaction and high importance. The upper left corner identifies statements with relatively high satisfaction and low importance, and the lower left corner identifies statements with low satisfaction and low importance. Those elements that are the most salient for planners to address are those that respondents are not satisfied with, but also find very important – the upper right quadrant. For all respondents, elements like drivers stopping for crossing pedestrians, the distance between sidewalks and moving cars, the number of vehicles cutting across marked crosswalks when pedestrians are using them, and overhead lighting (both at crossings and along pathways) all fall into this quadrant.

Comparing relative satisfaction and importance between respondents with reported disabilities and those without reported disabilities provides insight into the unique needs and preferences of the former group. For instance, respondents with disabilities are equally satisfied with snow removal in the county,

but nearly 20 percent more of such respondents find snow removal more important than non-disabled respondents. Similarly, disabled-respondent satisfaction with crossing time at traffic signals is 10 percent lower, and importance is 21 percent higher than among non-disabled respondents. Likewise, satisfaction is about 13 percent lower when it comes to the distance required to cross the street, and importance is nearly 12 percent higher. For a few other statements, satisfaction is essentially the same for both disabled and non-disabled respondents, but importance is about 10 percent higher for disabled respondents. These include:

- the number of places to safely cross the street;
- drivers stopping for pedestrians while crossing the street; and,
- the number of marked crosswalks.

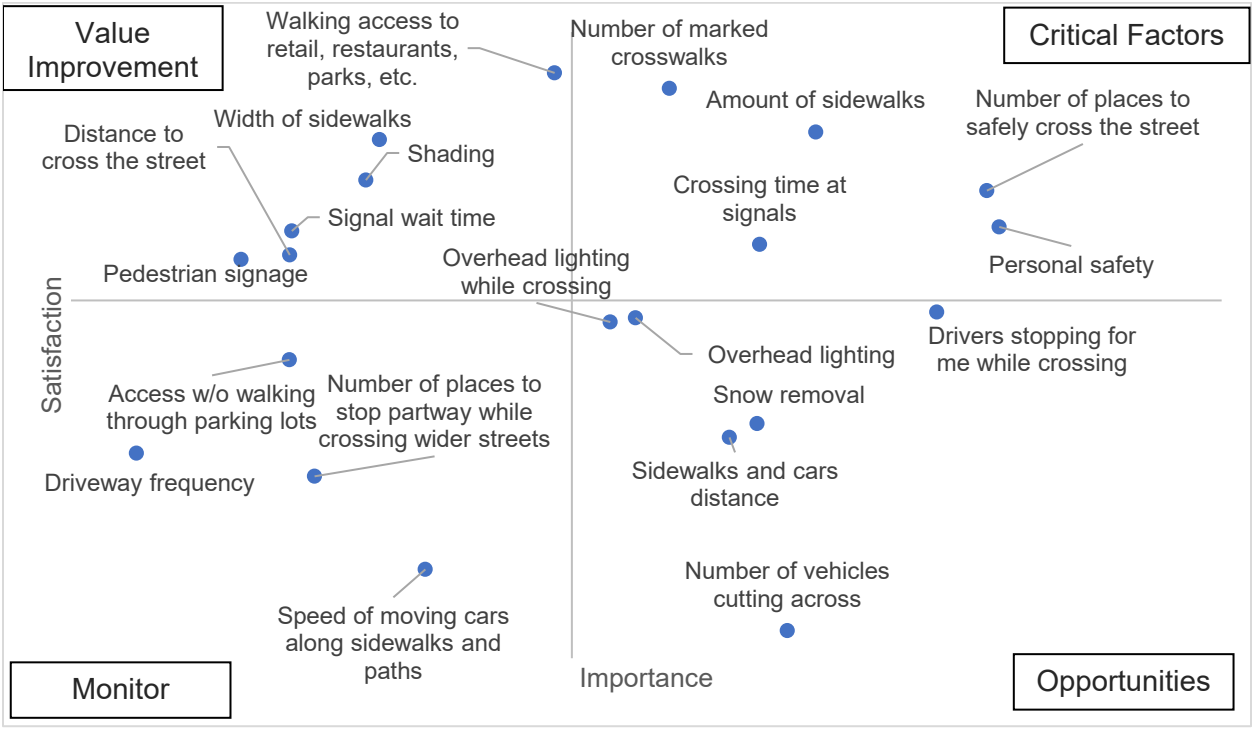

Figure 8: Reported Disability Quad Chart

There are also a couple of statements that stand out in the opposite direction. While satisfaction is similar, the importance of walking access to retail, restaurants, parks, etc. is 11.5 percent lower among disabled respondents and the importance of sidewalk availability is 14 percent lower.

COVID-19-Specific Questions

Travel Changes

Survey respondents made it clear that COVID-19 changed how many people travel around the county. Fifty-one percent of respondents reported walking more for exercise and recreation during the pandemic, but 66 percent are walking less to restaurants and bars. Fifty-three percent are commuting to work on foot less and 50 percent are taking fewer pedestrian trips to entertainment. This tracks to anecdotal evidence the planning team hears about increased park patronage, the success of open streets/parkways in the county, and obviously reduced capacity at private businesses and food establishments.

Telework

The COVID-19 pandemic has changed commute patterns and frequency for many workers, both in Montgomery County and across the country. Whether those altered travel behaviors will continue as the pandemic recedes is an open question, but many respondents anticipate the continued ability to telework in the months and years ahead. Before the pandemic, only 30% of respondents reported teleworking at least one day per week. During the pandemic, 74% reported doing so. After the pandemic, 54% expect to continue teleworking at least one day per week. If this increase in teleworking is borne out, travel patterns, especially in the AM and PM rush hours, will likely change, creating opportunities to reimagine our roadway network and make changes to our transit system to better support off-peak travel.

Using the Survey Moving Forward

The Pedestrian Plan team will use the countywide survey in a number of ways. First, responses about the importance/satisfaction with different pedestrian experience elements will inform recommendation development. Second, survey responses will act as a benchmark for future pedestrian survey efforts. The Pedestrian Plan has several performance measures to help understand progress being made in achieving master plan goals and objectives. Several performance measure metrics rely on the countywide survey for their data. As follow-up pedestrian surveys are conducted in the future, Planning staff will be able to compare survey results and understand changes in behavior, satisfaction, and knowledge of traffic laws.