Montgomery Planning

2021 Travel Monitoring Report

Table of Contents

Table of Figures

Introduction

The 2021 Travel Monitoring Report (TMR) provides residents, developers, and decision makers insights into various aspects of Montgomery County's transportation system. The TMR is a continuation and rebranding of the former Mobility Assessment Report (MAR) and continues the legacy of monitoring transportation performance and usage throughout the county. As with each edition of the TMR, the report strives to explore and leverage new alternative transportation datasets and analytical tools that help provide a clearer vision of how the county is meeting its transportation goals, objectives, and metrics defined in master plans and functional plans as well as the Growth and Infrastructure Policy. These goals, objectives, and metrics are rapidly evolving as the county strives to create a more balanced, equitable and safer transportation system. With each subsequent edition of the TMR, it is the aim of staff to better align this report's findings with metrics that drive policy decisions and discussions within the Planning Department including those described in Table 1, below.

Table 1: Transportation Metrics and Progress Measures as Identified by Various Policy Documents

Source	Metric/Progress Measure	Included in This Edition
Vision Zero Work Program	Number of serious and fatal injury crashes along the High Injury Network	Partial
	Number of total intersections with new traffic safety treatments	No
	Miles of separated bicycle facilities built	Yes
	Linear feet of sidewalk built	No
	Annual vehicle miles traveled	Yes
	Travel mode split	Yes
	Percent of transit stops along multi-lane roads found at or near a protected crossing	No
Thrive 2050 (Pending)	Non-Auto Driver Mode Share (NADMS)	Yes
	Person Trip accessibility for pedestrians and bicyclists	No
	Number of traffic-related severe injuries and fatalities	Yes
	Transportation system's GHG emissions	No
	Miles of auto travel lanes per capita	No
	Teleworking	Yes
	Motor vehicle parking per unit of development	No

Source	Metric/Progress Measure	Included in This Edition
Bicycle Master Plan	Percentage of transit boardings during the AM peak period where the transportation mode of access is bicycle	Pending Bicycle Monitoring Report Update
	Percentage of potential bicycle trips that will be able to be made on a low-stress bicycling network by policy area	Pending Bicycle Monitoring Report Update
	Percentage of dwelling units within 2 miles of various points of interest on a low-stress bicycling network	Pending Bicycle Monitoring Report Update
Growth and Infrastructure Policy	Vehicle System Adequacy: Intersection Level of Service (Delay and CLV)	Yes
	Pedestrian System Adequacy: Pedestrian Level of Comfort (PLOC) completeness, Street Lighting Coverage, and ADA Compliance	Pending Completion of the Pedestrian Master Plan
	Bicycle System Adequacy: Level of Traffic Stress (LTS) Completeness	Partial
	Bus Transit System Adequacy: Bus shelter coverage	Partial

In addition to this summary document, the 2021 TMR is supplemented by a set of online and interactive data dashboards intended to provide users with a new tool to better explore the numerous transportation datasets that are managed by the Montgomery Planning Department and other transportation agencies in the region. The metrics and analysis that are included in these dashboards were selected based on their inclusion in past TMR reports and their relevance to transportation goals identified in the policy documents noted in Table 1. Also included are dashboard interfaces to explore the latest transportation survey data provided in the US Census and the 2017/2018 Metropolitan Washington Council of Governments Household Travel Survey.

Moving Beyond Vehicular Level of Service Metrics

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

Single occupancy vehicles (SOVs) cause many negative externalities that create costs borne by society. These externalities cause inefficiencies in the transportation sector as the private costs to vehicle users are artificially lowered causing a demand for single occupancy vehicles that exceed the socially efficient number of vehicles. One of the biggest negative externalities of this artificial inflation of SOV demand is congestion. In 2019, congestion on Montgomery County's roads cost users approximately $356,887,081.[1] A simple application of microeconomics to a hypothetical travel corridor illustrates the difference between the equilibrium demand for SOV travel and the socially optimal demand for traffic volume (Table 2).

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

Volume	Trip Time (Min)	Private Trip Cost	Increase in Time Caused by One Additional Vehicle (Min)	Increase in Total Travel Time for all Vehicles (Min)	External Trip Cost	Social Trip Cost
400	10	$8.74			$0.00	$8.74
599	10.476					
600	10.48	$8.88	0.004	2.4	$0.72	$9.59
1,199	15.268					
1,200	15.28	$10.31	0.012	14.4	$4.29	$14.61
1,399	17.985					
1,400	18	$11.12	0.015	21.0	$6.26	$17.39
1,599	21.262					
1,600	21.28	$12.10	0.018	28.8	$8.59	$20.69
1,799	25.1					
1,800	25.12	$13.25	0.020	36.0	$10.74	$23.99

In this hypothetical example, travel along a 10-mile corridor takes approximately 10 minutes at free-flow speed. Travel time, however, begins to increase as more cars enter the corridor causing delay not only to the driver entering the corridor, but also to all other vehicles previously traveling on the roadway. The private trip cost (third column) is comprised of a monetary travel cost (57.5 cents/mile) and an opportunity time cost (30 cents/min). Once the volume surpasses 400 vehicles, an increase in travel time is incurred with every additional vehicle. The rows highlighted in blue illustrate the marginal impacts from one additional vehicle entering the corridor. These impacts are the total increase in travel time (total vehicles on the corridor multiplied by the increase in travel time caused by the additional vehicle), external trip cost (the additional cost external to the private driver caused by them entering the corridor) and the total social cost of each trip for an additional vehicle entering at that volume

[1] Analysis conducted by University of Maryland RITIS' Probe Data Analytics Suite. A cost of $17.91/HR and $100.47/HR for passenger and commercial vehicles were used respectively (Texas Transportation Institute). Time spent in congestion begins to accrue when the speed falls below the historic average.

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

threshold. The social cost is a combination of the private vehicle cost and the external trip cost borne by society.

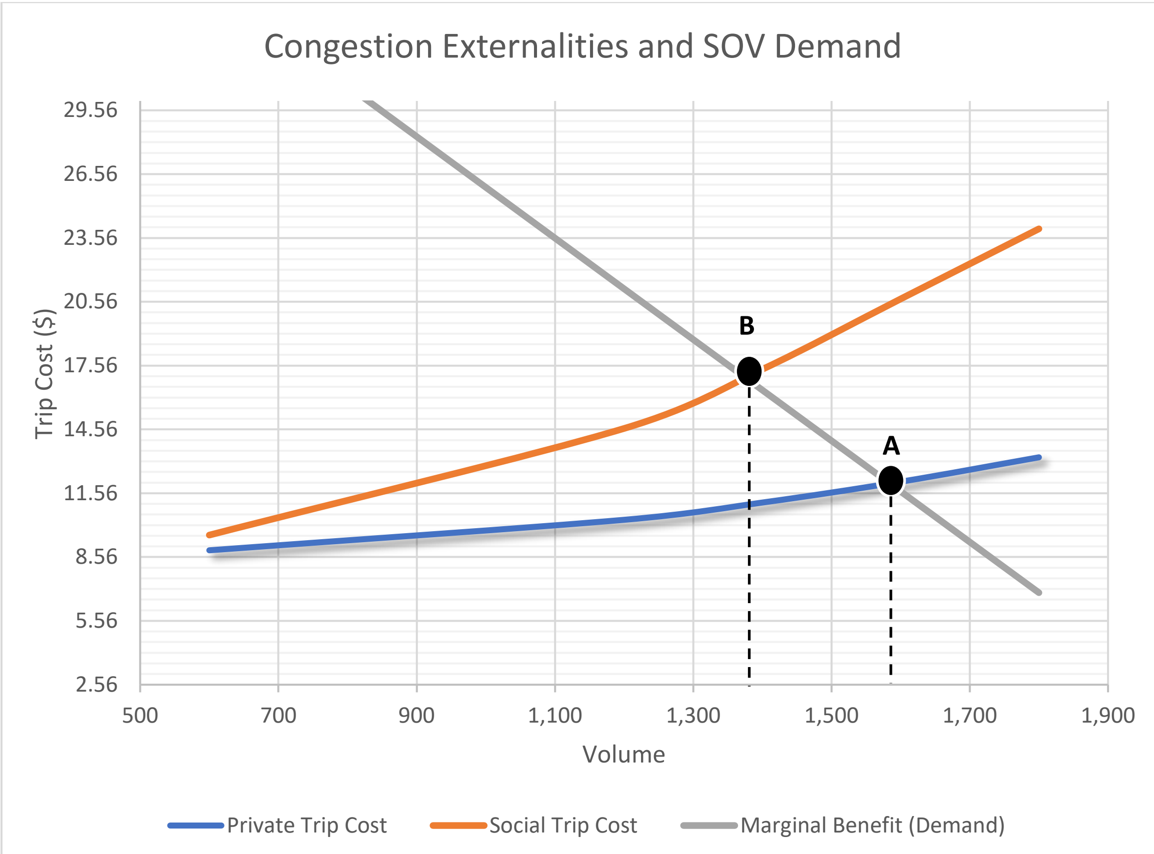

Figure 1: Graphical Representation of Congestion Externalities and Inflated SOV Demand

Without internalizing the costs of congestion (private trip cost curve) equilibrium is reached at point A (approximately 1,600 vehicles). By internalizing the costs of congestion, however, the socially efficient number of vehicles (point B) is much lower at approximately 1,375 and a cost of $17.56 per trip. This example illustrates only one negative externality of SOV travel. Others include air pollution, noise pollution, opportunity costs of more productive land uses, property damage, injuries, and deaths associated with accidents, and issues of equity. If these externalities and opportunity costs were internalized, the demand for SOV travel would dramatically shift.

COVID-19 and Recent Travel Trends

As will be shown in subsequent sections, the COVID-19 pandemic had obvious and profound impacts on the demand for transportation services in Montgomery County. What is less obvious, however, is if a post-pandemic world will mean a return to pre-pandemic transportation behavior. Recent observations indicate that transit ridership and service availability is beginning to rebound. March and April 2021 both saw consecutive increases in Metro and Ride-On unlinked passenger trips (Figure 2). Service availability, as indicated by monthly vehicle revenue miles, plummeted during the heart of the pandemic and has yet to reach pre-pandemic levels as of April 2021 (Figure 4). According to Ride-On, ridership increased this past April by about 10% over March of 2021 causing some overcrowding where service has been reduced. Rail entries all Red Line Stations in the county, although still well below FY 2019 levels, have seen consecutive increases during each of the first 4 months of 2021 (Figure 3).

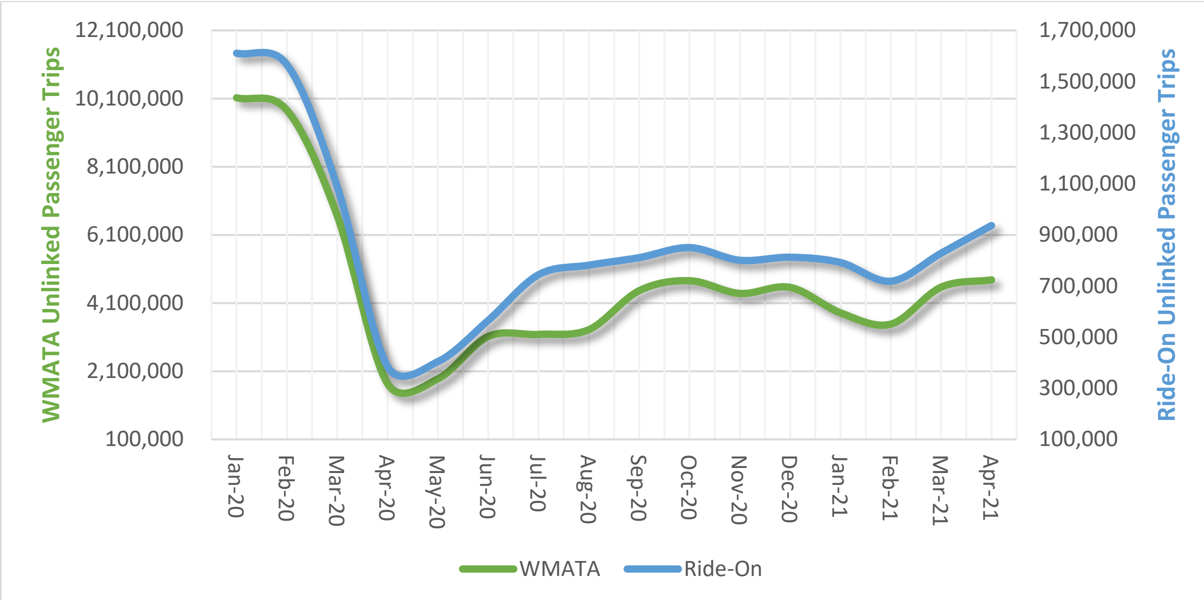

Figure 2: Ride-On and WMATA Unlinked Bus Passenger Trips[3]

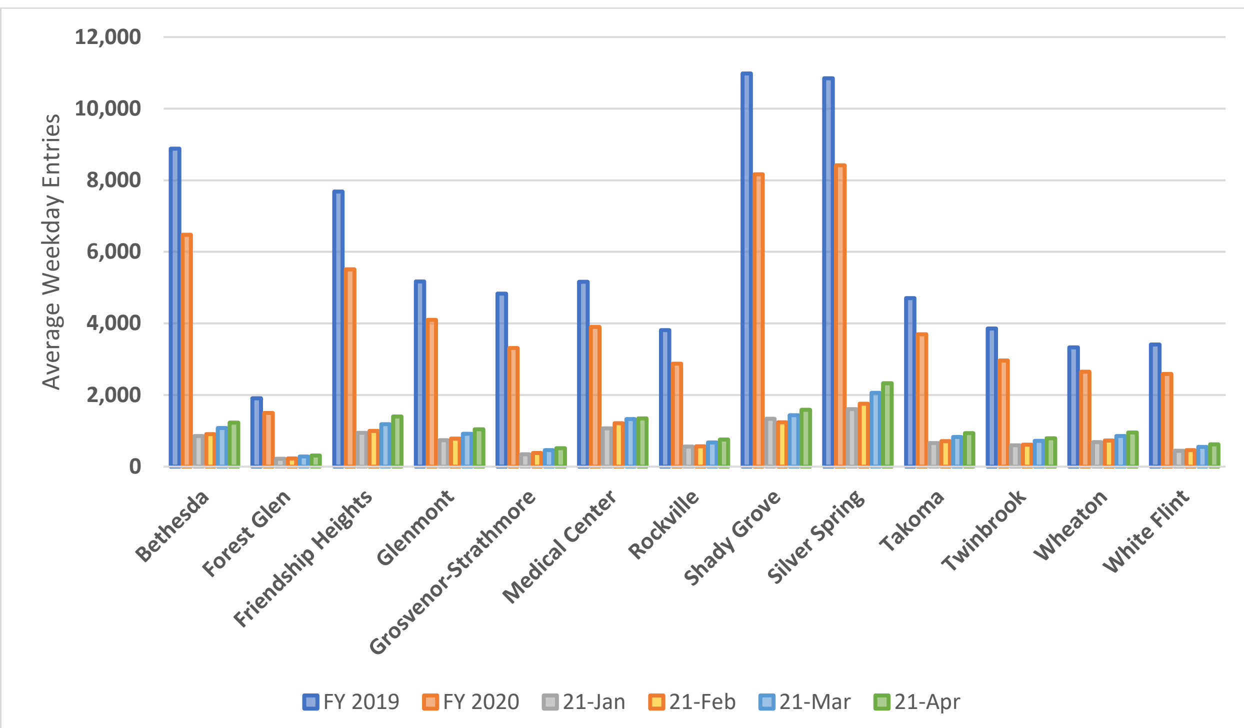

Figure 3: Average Weekday Rail Station Entries[4]

[3] Source: National Transit Database: https://www.transit.dot.gov/ntd; WMATA trips are system wide
[4] Source: WMATA Ridership Data Portal: https://www.wmata.com/initiatives/ridership-portal/

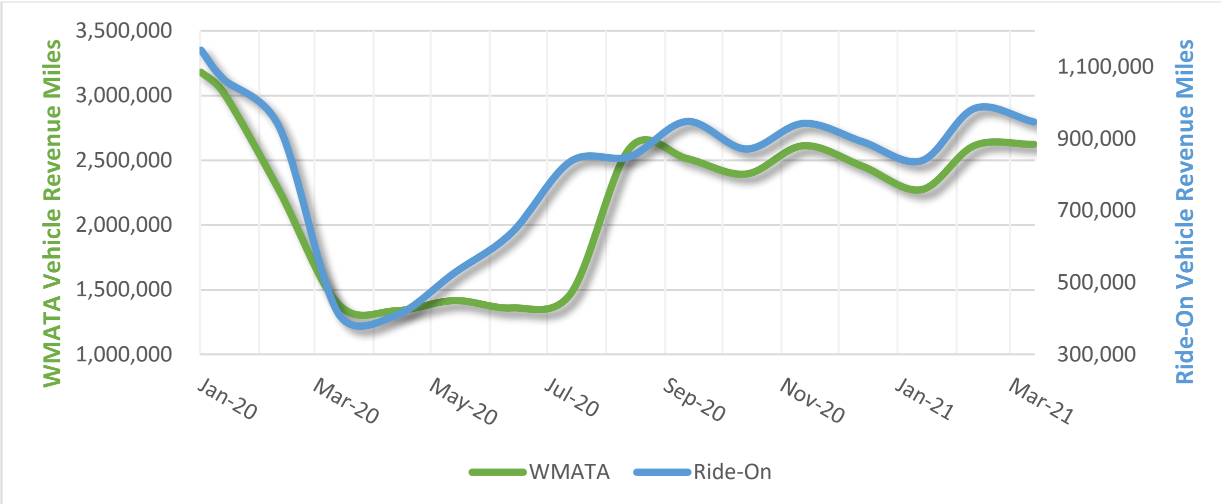

Figure 4: Vehicle Revenue Miles[5]

Vehicular volumes also plummeted during 2020. Annual average daily traffic (number of vehicles expected to pass a given location on an average day of the year) decreased just under 20 percent in 2020 as compared to 2019 (Table 3) at Maryland State Highway's permanent counter locations. The difference would likely be larger if January, February, and March are removed from the analysis.

Table 3: 2019 and 2020 Traffic Volumes at SHA Permanent Counter Locations[6]

Location	2019 AADT	2020 AADT	Change
I-270 South of MD 121	111,270	93,772	-15.7%
I-495 at Persimmon Tree Rd	231,287	175,735	-24.0%
I-495 West of MD 650	215,614	178,006	-17.4%
I-270 South of Middlebrook Rd	175,352	144,437	-17.6%
Total	**733,523**	**591,950**	**-19.3%**

In addition to lower traffic volumes, the traditional dichotomous peak travel patterns were also flattened during 2020, although in recent months they appear to be returning to the traditional AM and PM peak patterns. Figures 5 and 6 illustrate this phenomenon by comparing the average measured weekday speed as a percentage of free-flow speed for the month of May in 2019, 2020, and 2021. Although not a direct measure of volume, this speed ratio is a good surrogate of congestion and hence volume. The lower the percentage, one can assume the higher the volume.

The solid lines in Figures 5 and 6 illustrate the traditional peak direction/period traffic pattern that occurred in May of 2019. The dashed lines, however, show that the peak periods were largely flattened with a longer and shallower convex curve across a 24-hour period during May of 2020. Peak traffic in May of 2020 seemed to occur during the afternoon hours rather than the traditional morning and evening peak periods. Finally, the dotted lines represent travel patterns observed during May of 2021.

[5] Source: National Transit Database: https://www.transit.dot.gov/ntd; WMATA revenue miles are system wide
[6] Source: Maryland State Highway's Internet traffic Monitoring System (https://maps.roads.maryland.gov/itms_public/)

This analysis seems to indicate that the traditional peak direction/period pattern of travel is returning to Montgomery County.

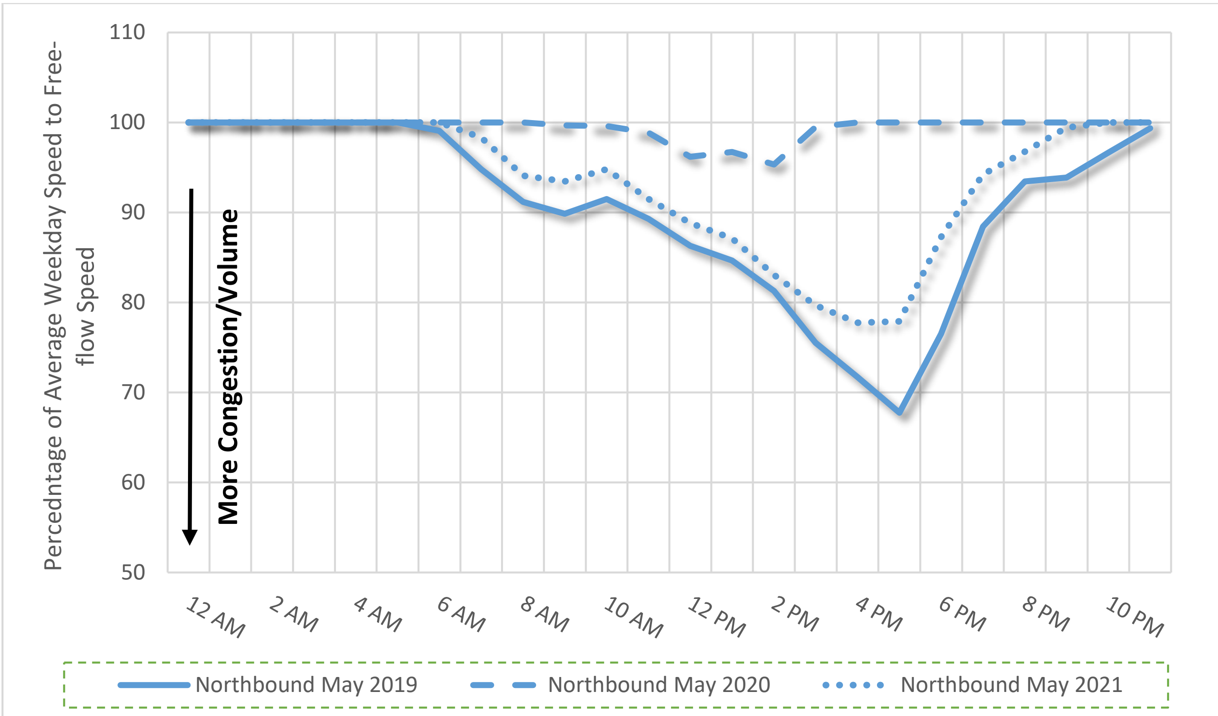

Figure 5: Average Weekday Speed as a Percentage of Free-Flow Speed (Northbound)

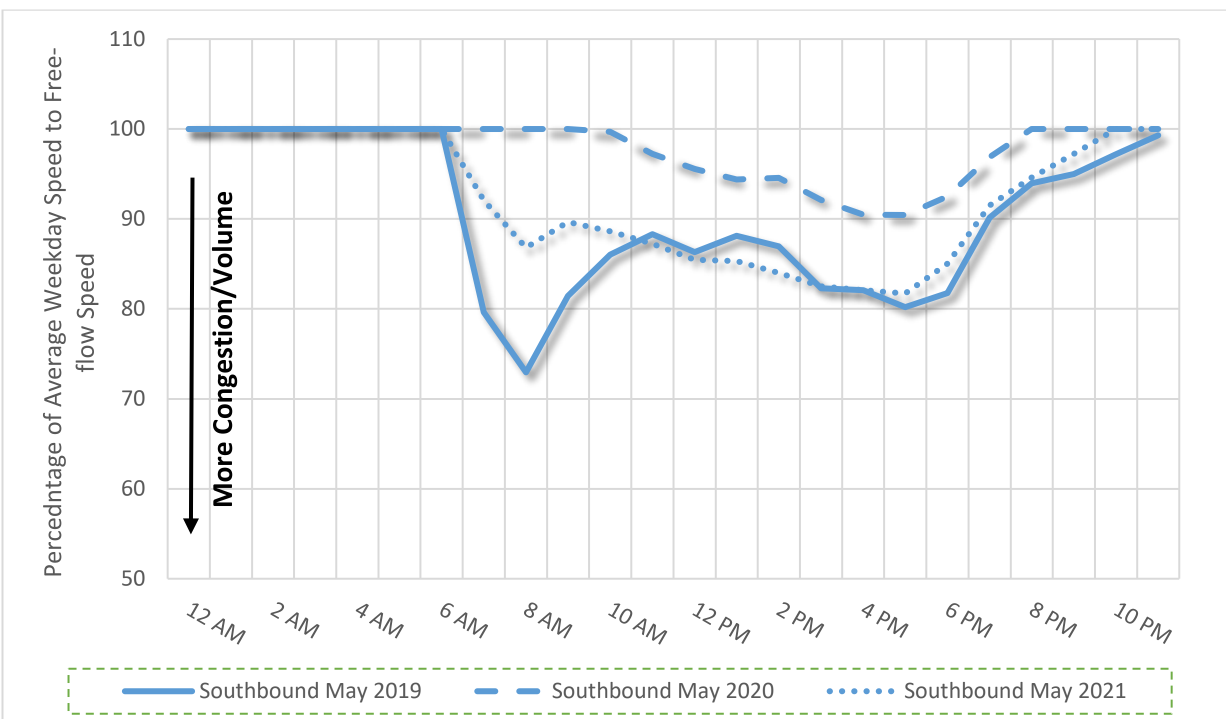

Figure 6: Average Weekday Speed as a Percentage of Free-Flow Speed (Southbound)

While the demand for transit and private automobile sharply declined during the heart of the pandemic, the demand for micromobility steadily increased through the summer months of 2020. After a steady decline in the number of monthly trips from October 2019 through April of 2020, both the number of trips and the average trip distance steadily increased from May of 2020 through July of 2020 during the heart of the pandemic. This may suggest that micromobility provided a valuable mobility option for citizens that still needed to work and travel during the pandemic. What is especially telling is the significant rise in the average trip length during these months. Again, this may be an indication that micromobilty vehicles were being used for complete trips rather than last mile connections to transit hubs.

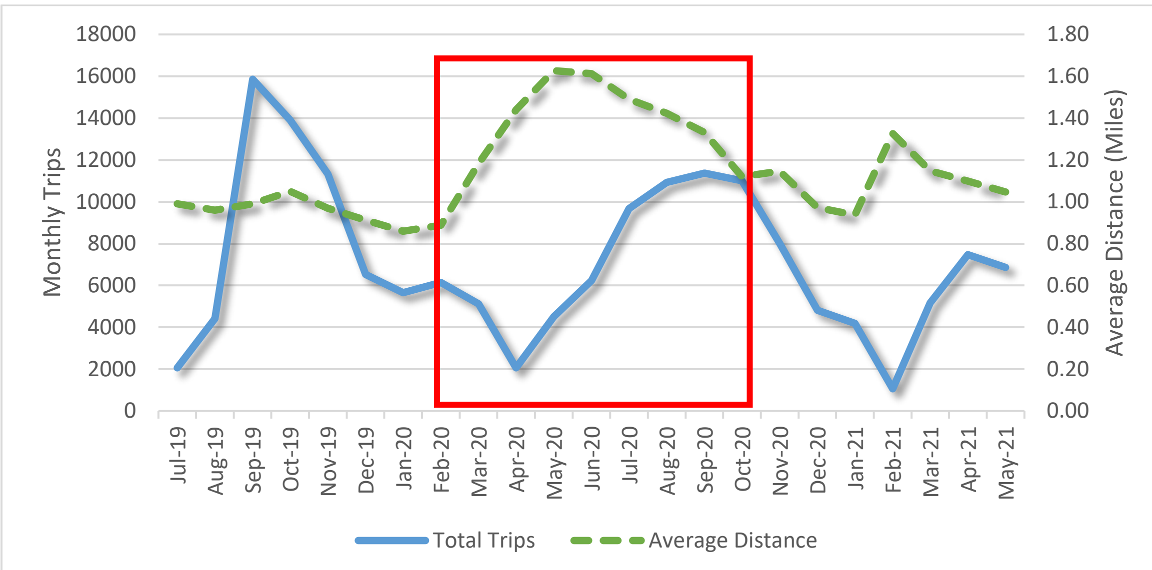

Figure 7: Micromobility Usage in Montgomery County July 2019 - May 2021 (Excluding Capital Bikeshare)[7]

[7] Source: Remix Shared Mobility Data Platform (subscription service)

Summary of Countywide Transportation Trends and Performance

Commute Time and Mode Split

According to US Census American Community Survey 5-year summary data, approximately 60% of commuters in Montgomery County have a travel time to work of 30 minutes or more with average times remaining consistent between 2015 and 2019. During that period, however, the percent of commuters who traveled 20-24 minutes and 30-34 minutes fell by a combined 0.7% while those commuting 60 minutes or more increased from 16.2% to 17% (Figure 8).

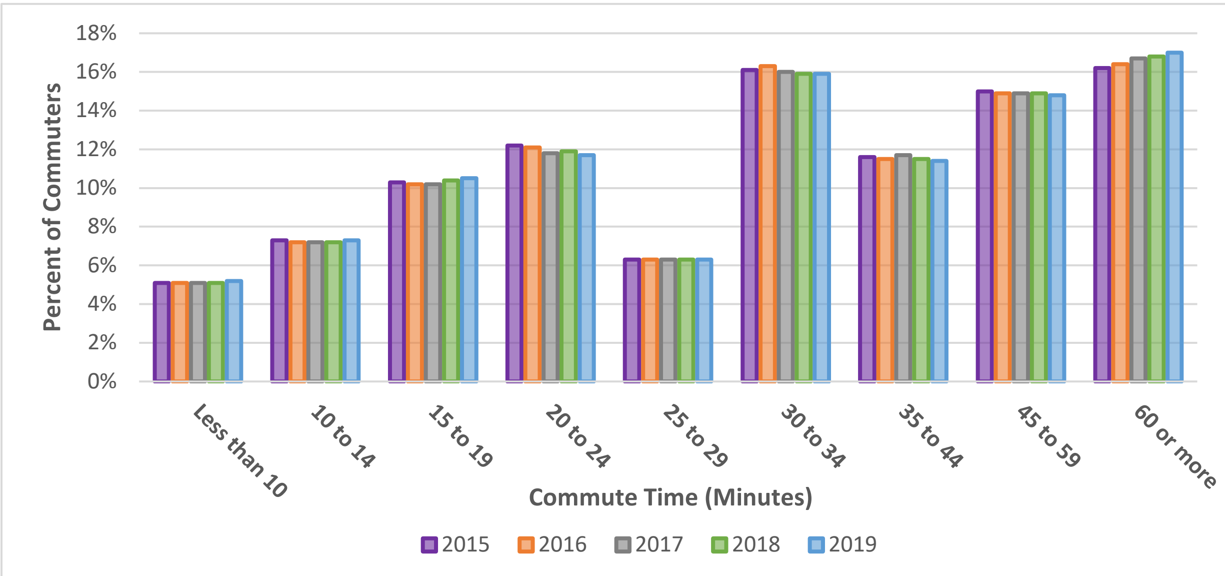

Figure 8: Breakdown of Commute Time

Further, data indicates that driving alone along with car-pooling make up about 75% of all commute trips within Montgomery County. Public transit accounts for a distant 15% while walking and cycling make up around 2.8% of trips. This trend has remained consistent with a slight increase in teleworking rates and decrease in transit's share of commuting trips (Figure 9).

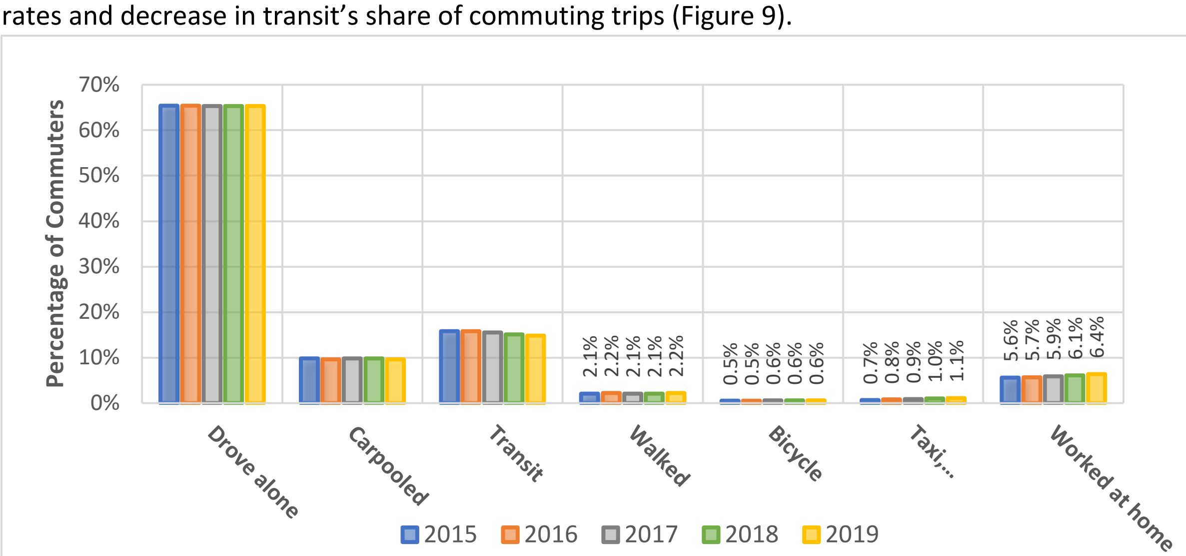

Figure 9: Commute Mode Share

Finally, when viewing commute time by mode, one can see that the burden of long commute times unfavorably falls on transit users. Between 2015 and 2019, the average travel time for transit riders was about 15 minutes longer than the average for all modes and nearly 20 minutes longer than for those commuters who traveled in an automobile. Riders of public transit tend to be from lower income brackets without access to a private vehicle. Closing the travel time gap between the private automobile and transit is key in advancing an equitable transportation system and improving transit ridership.

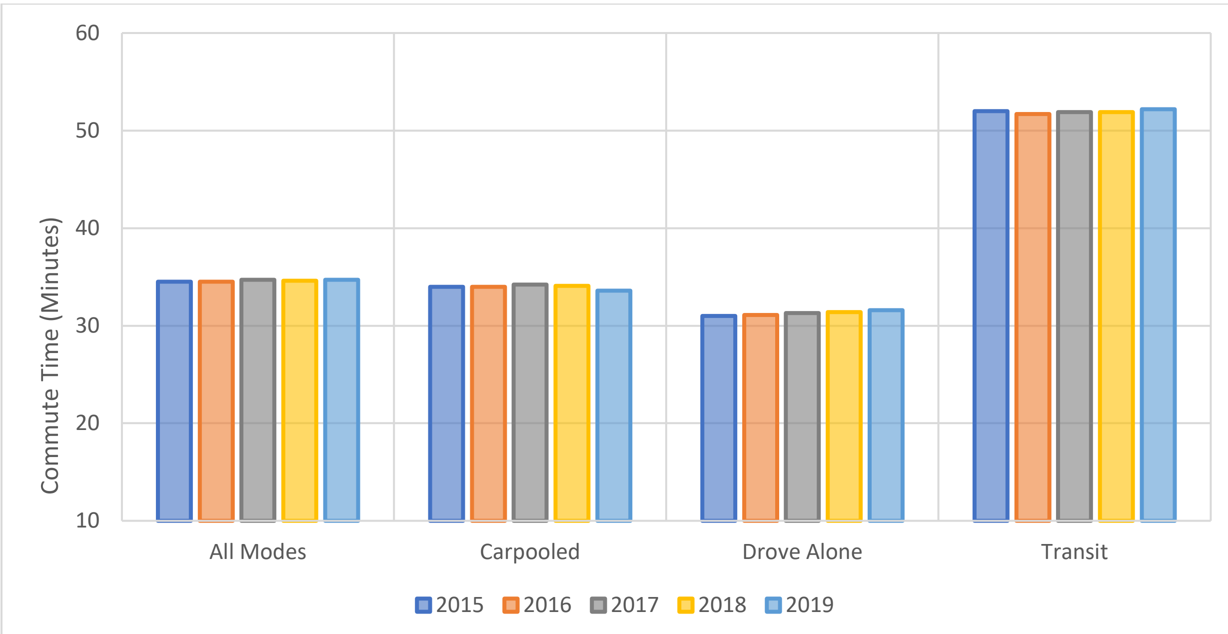

Figure 10: Average Commute Time by Mode

Vehicle Trends and Performance

Analysis of motor vehicle mobility within Montgomery County shows that vehicle miles traveled (VMT) has continued to increase from a low during the recession of the early 2010s. While total VMT has continued to rise, VMT per capita has shown some stagnation and remains around 2010 levels. VMT Maryland state statistics for 2020 were not available at the county level, but it is expected that due to the COVID-19 lockdowns, unemployment, and continued teleworking, VMT will have experienced a significant drop. It is important to consider that this VMT estimation is derived from physical counters placed on primarily state roads and then extrapolated to estimate annual vehicle miles traveled. VMT estimated here therefore represents traffic from both residents and non-residents. Compared to the State of Maryland and the nation as a whole (9,947 and 10,984, respectively), Montgomery County had a significantly lower annual VMT per capita in 2019.

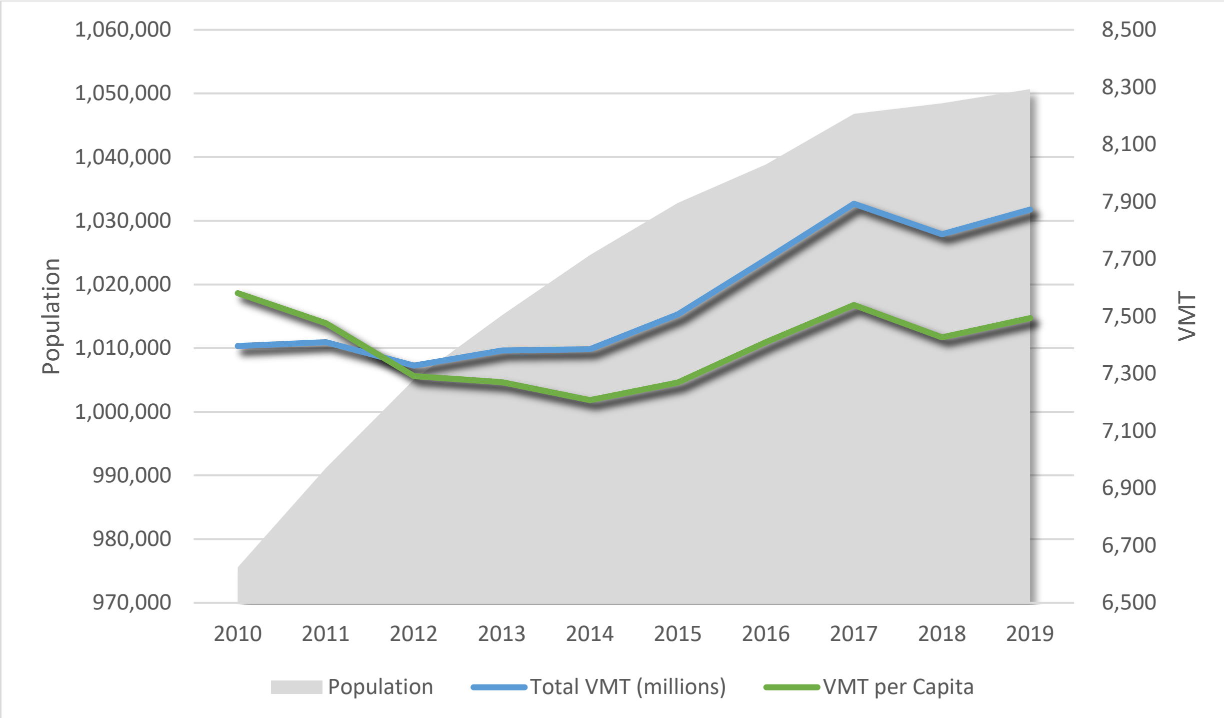

Figure 11: Total Annual VMT, Annual VMT per Capita, and Population for Montgomery County[8]

Roadway Performance

The ubiquitous adoption of smart phones and other GPS devices allows for the constant monitoring of traffic conditions throughout the county. Congestion and travel time reliability are often operationalized using the travel time index (TTI) and planning time index (PTI), respectively. The TTI is the measured travel time represented as a percentage of the "ideal" travel time (Travel Time / Free-flow Travel Time). A value of 1.6 indicates the completion of a trip took 60 percent longer than it would have at free-flow speeds. For example, a TTI of 1.60 means that a 20-minute trip in light traffic took 32 minutes at the measured timepoint (20 minutes x 1.60 = 32 minutes).

The PTI is the total travel time that should be planned to guarantee an on-time arrival 95% of the time (95% Travel Time / Free-flow Travel Time). The PTI includes reoccurring delay as well as unexpected delay because it includes the 95th percentile travel time. Thus, the PTI compares near-worst case travel time to a travel time in light or free-flow traffic. For example, a planning time index of 1.60 means that, for a 20-minute trip in light traffic, the total time that should be planned for the trip is 32 minutes (20 minutes x 1.60 = 32 minutes) to ensure an on-time arrival 95 percent of the time.

The average weekday PTI and TTI across time for the previous four years demonstrates the impact of the COVID-19 pandemic on vehicular travel. Southbound travel time reliability was lowest during the 8 AM hour during 2014, 2016, and 2018. In 2020, however, the PTI is fairly stable and gradually increases between 8 AM and 6 PM reaching its pinnacle at 5 PM (Figure 12). The same pattern emerges when looking at the TTI, an indicator of congestion. Overall congestion appears to have improved since 2014 with declines in peak hour/peak direction TTI values even before the COVID-19 pandemic. Additional PTI

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

and TTI charts for northbound, eastbound, and westbound non-interstate directions of travel are provided in Appendix A.

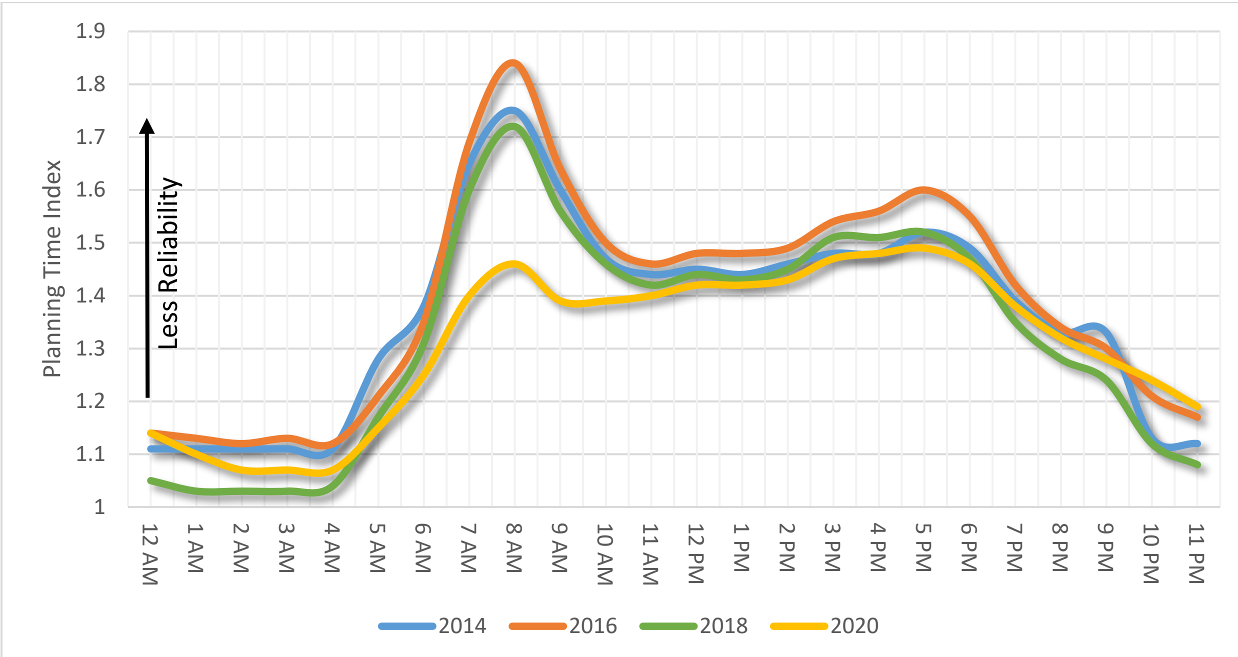

Figure 12: Non-Interstate Average Weekday Planning Time Index (Southbound)

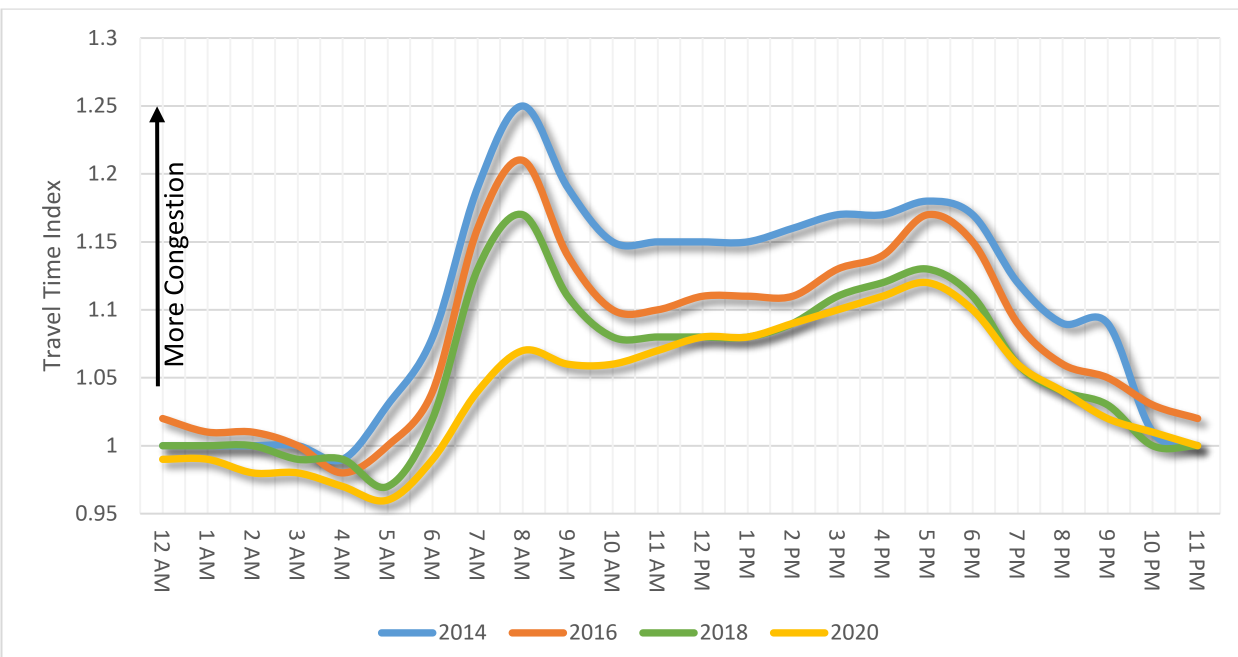

Figure 13: Non-Interstate Average Weekday Travel Time Index (Southbound)

The Federal Highway Administration (FHWA) has finalized six interrelated performance rulemakings to implement the transportation performance monitoring framework established by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation (FAST) Act. One such metric is the annual hours of peak hour excessive delay per capita. The metric represents the amount of time a roadway experiences significant congestion per year divided by the population of that region. The metric is designed to track progress towards the goals of the Congestion Mitigation and Air Quality Improvement (CMAQ) program. Excessive delay in Montgomery County appears to disproportionally occur on roads adjacent to disadvantaged communities as identified by the Planning Department's Equity Focus Areas (Figure 13). This can have significant impacts on the air quality in these communities and the quality of non-vehicular modes of travel. The disproportionality of impact of also appears to be growing wider in recent years with 28.7, 34.7, and 50.2 percent of additional excessive delay per capita occurring in Equity Focus Areas in 2016, 2018, and 2020 respectively. It should be noted that major roads often form the boundaries of Equity Focus Areas and Non-Equity Focus Areas. In these instances, the hours of excessive congestion on the "shared" roadway is included in both calculations.

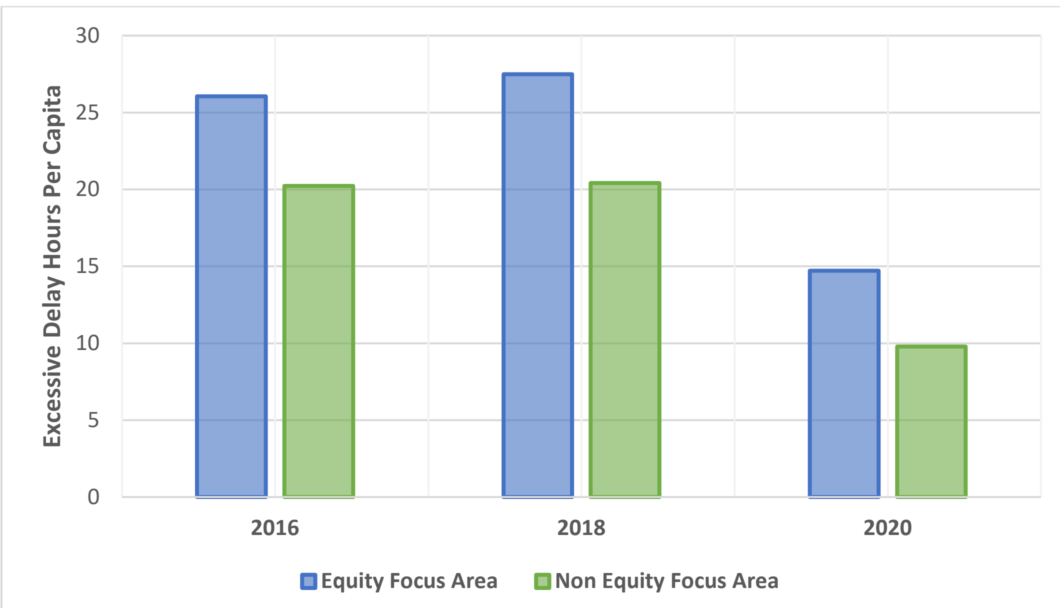

Figure 14: Non-Interstate Annual hours of peak hour excessive delay per Capita[9]

Intersections & Bottlenecks

Bottlenecks

A bottleneck delay analysis was conducted using the RITIS Vehicle Probe Project Suite (VPPS) online tool. The tool synthesizes big data collected from GPS units and smart phones. A bottleneck's ranking is based on total queue length over time weighted by the difference between free-flow travel time and observed travel time (excessive travel time) multiplied by the average daily volume (AADT). It is intended to identify chokepoints in the transportation system. For this analysis, the overall bottleneck ranking is an average of the weighted impact in each of the analysis years (2012, 2014, 2106, 2018, and 2020). The

[9] Analysis conducted by University of Maryland RITIS' Probe Data Analytics Suite.

higher the ranking, the more impactful a bottleneck is. The top 20 bottlenecks are displayed in Table 4. Six of the top 20 bottlenecks in the county occur on the US 29 South Corridor, followed by the MD 355 South and New Hampshire South Corridors with three each. Many bottlenecks in the overall top 20 list saw significant declines in their 2020 rankings due to the COVID-19 pandemic. Bottlenecks organized by corridors and a description of each corridor's extent can be found in Appendix A.

Table 4: Top 20 Bottlenecks

Corridor	Dir	Bottleneck	Overall Rank	2012 Rank	2014 Rank	2016 Rank	2018 Rank	2020 Rank
Connecticut Ave	SB	MD-410/EAST-WEST HWY	1	1	4	2	2	30
US 29 South	SB	MD-193/UNIVERSITY BLVD	2	54	8	1	1	41
MD 355 South	SB	MD-191/BRADLEY LN	3	12	3	5	7	8
Connecticut Ave	NB	JONES BRIDGE RD	4	2	7	9	9	13
US 29 South	SB	I-495	5	4	1	13	40	226
New Hampshire Ave South	NB	POWDER MILL RD	6	6	2	29	28	16
US 29 South	SB	MD-384/COLESVILLE RD	7	11	6	8	3	136
MD 355 South	NB	CEDAR LN	8	7	9	7	16	10
US 29 North	NB	CHERRY HILL RD/RANDOLPH RD	9	15	12	4	5	62
US 29 South	NB	MD-650/NEW HAMPSHIRE AVE	10	9	19	3	18	145
Georgia Ave South	SB	MD-391/COLUMBIA BLVD/SEMINARY RD	11	8	20	12	4	71
MD 355 South	SB	MD-183/MONTROSE RD/RANDOLPH RD	12	5	5	6	115	247
University Blvd	EB	MD-320/PINEY BRANCH RD	13	53	35	14	12	2
US 29 South	NB	MD-384/COLESVILLE RD	14	57	15	11	20	29
US 29 South	NB	MD-391/DALE DR	15	25	21	10	13	142
New Hampshire Ave South	NB	I-495	16	17	37	63	6	20
Georgia Ave South	NB	I-495/CAPITAL BELT/I-495 OUTER LOOP	17	18	14	21	26	85
Randolph Rd	WB	MD-97/GEORGIA AVE	18	21	22	27	11	298
New Hampshire Ave South	SB	POWDER MILL RD	19	46	18	15	22	435
Georgia Ave North	NB	MD-183/RANDOLPH RD	20	10	27	122	37	44

Intersections

Critical lane volume (CLV) has long been used as an indicator of intersection adequacy. CLV provides a simple screening tool to evaluate if an intersection may be operating at or below capacity. For many years, the Local Area Transportation Review (LATR) guidelines have set CLV standards that vary by policy area across the county. Projects that exceed a particular impact to the transportation network are required to demonstrate that the proposed development will not cause adjacent intersections to exceed the applicable CLV standard for the policy area. Over time, as part of the development review process and Maryland State Highway Administration's ongoing Traffic Monitoring System, the planning department has amassed a database of more than 2,970 individual counts for 786 intersections. Also included in this edition of the TMR is information regarding intersection delay. Intersection delay was introduced as a metric to evaluate vehicle adequacy in the 2016-2020 Subdivision Staging Policy (since renamed the Growth and Infrastructure Policy). Depending on the location of the project, the applicant may be required to determine vehicle system adequacy using the delay methodology in lieu of CLV. With the adoption of the 2020 Growth and Infrastructure Policy, intersection level of service analysis is no longer required in Red policy areas.

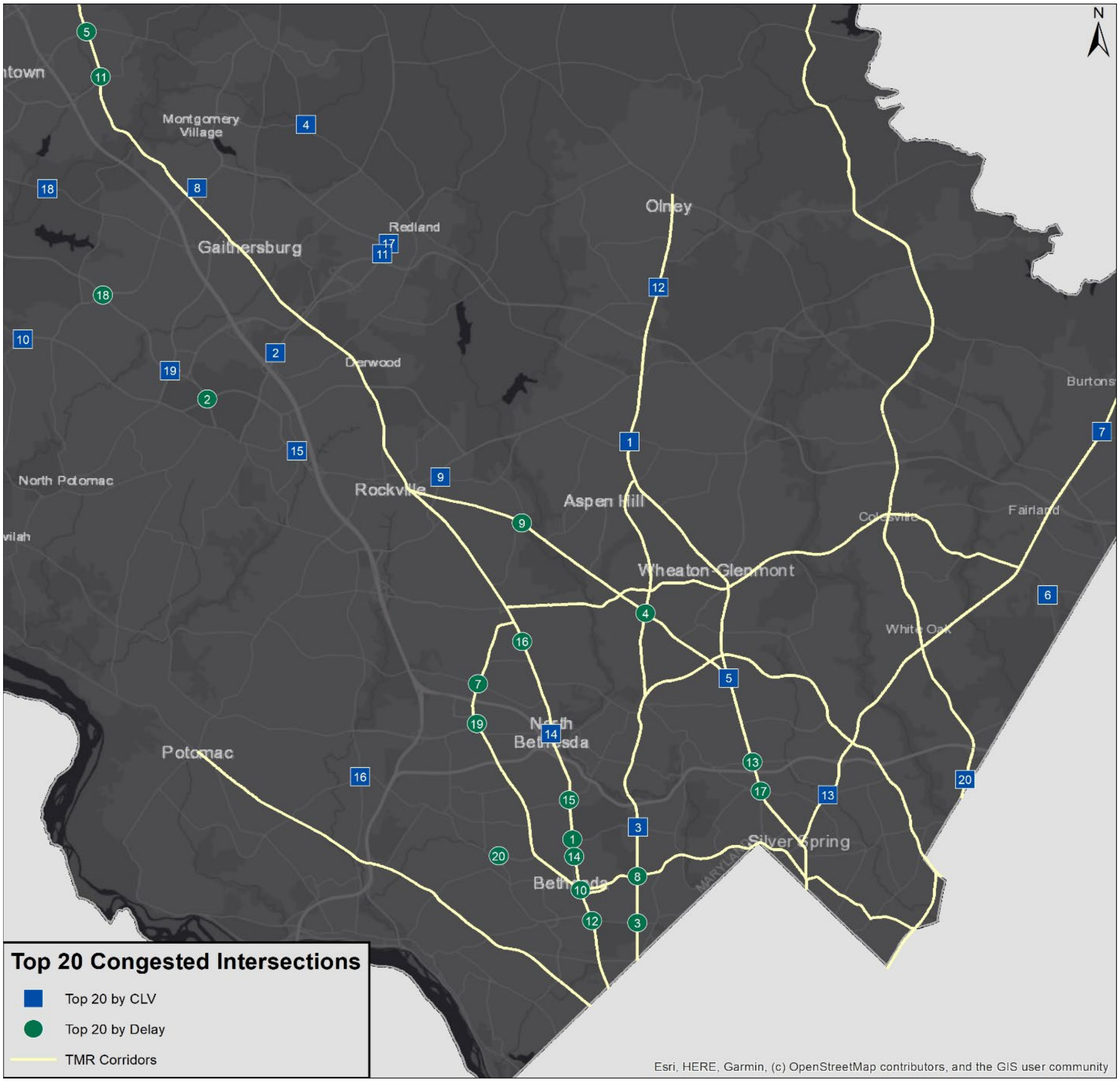

Figure 15: Top 20 worst performing Intersections in terms of CLV and Average Delay

During 2020, there were 43 intersections in the database that exceed their applicable CLV threshold and 9 intersections that exceed their applicable delay threshold based on the congestion standards adopted in the 2020 Growth and Infrastructure Policy (Table 5). Figure 15 shows the locations of the top 20 worst performing intersections ranked by CLV and Delay. Sixteen of the top 20 intersections as measured by delay fall along TMR corridors, with 8 of these falling along the MD 355 corridor. Eight of the top 20 CLV intersections fall along TMR corridors. A complete list of the worst performing intersections in terms of CLV and delay is provided in Appendix A.

Table 5: Number of Intersections Exceeding Adequacy Threshold based on latest available count by Policy Area

Policy Area	CLV Exceedance	Delay Exceedance
Aspen Hill	3	0
Bethesda/Chevy Chase	0	1
Clarksburg	1	0
Derwood	4	0
Fairland/Colesville	6	0
Gaithersburg City	10	2
Germantown East	1	2
Germantown West	1	0
Kensington/Wheaton	0	1
Montgomery Village/Airpark	2	0
North Bethesda	0	2
North Potomac	1	0
Olney	1	0
Potomac	3	0
R&D Village	1	0
Rockville City	4	1
Rural East	2	0
Silver Spring/Takoma Park	2	0
White Oak	1	0

Bicycle and Pedestrian Network Quality

The Bicycle Master Plan (adopted in November of 2018) and Pedestrian Master Plan (in progress) mark a significant shift in how Montgomery County assesses the performance of its roadway network. Foremost, they address a culture that has prioritized automobile travel and mobility over walking, bicycling, and safety for much of the past 70 years. The Bicycle Mater Plan introduced the Level of Traffic Stress metric, a new approach to quantifying accessibility on our roadways. A similar approach is being developed for the Pedestrian Master Plan.

Changes in the Bicycle Network 2019-2021

Level of Traffic Stress (LTS) is an approach that quantifies the amount of stress that bicyclists feel due to the proximity of vehicular traffic. This methodology assigns a numeric stress level to streets (and other places where people can bicycle, like trails) based on attributes like traffic speed, traffic volume, number of lanes, frequency of parking turnover, ease of intersection crossings and other characteristics.

When a street has a moderate or high level of stress, it may be a sign that bicycle infrastructure, like separated bike lanes or shared use paths, is needed to make it a place where more people will feel comfortable riding. Overall, about 77% of the bicycle network has a LTS that is considered low or acceptable for most child and adult cyclists (Table 6). However, the majority of this is found on residential streets (which tend to have slower speeds, fewer travel lanes, and less traffic) in "islands of connectivity." These "islands" within the county are separated by high-stress, unsafe arterial roads and environmental features that prohibit the completion of many trips.

Table 6: Quality breakdown of Existing Bicycle Network

Network Quality	2019	Current
Comfortable for Most Children	66.8%	66.9%
Comfortable for Most Adults	9.7%	9.9%
Uncomfortable	23.5%	23.3%

The Planning Department created a bicycle network database that tracks changes and progress over time. The database allows for planners to extract the county's bike network based on a specific date to analyze and visualize changes. For example, between 2019 and 2021, 27 miles of low-stress bikeway were added to the network. While this is a step in the right direction towards improving the safety and comfort of cyclists, the effect this may have towards improving accessibility across the county is unknown. Further analysis will be needed and may be expected as part of the Bicycle Mater Plan Biennial Monitoring Report to be released later this year.

As mentioned previously, there have been 27 miles of low-stress bikeway added to the network since 2019. Much of that is due to the construction of over 14 miles of new bicycle facilities, including (Table 7):

- 8.0 miles of sidepath
- 2.9 miles of separated bike lanes
- 2.2 miles of conventional striped bike lanes
- 0.8 miles of buffered bike lanes

Table 7: Selected Bicycle Facilities Added between 2019 and 2021 (Miles)

Facility Type	2019	2021	Delta
Bikeable Shoulders	11.9	11.9	0.0
Buffered Bike Lanes	0.0	0.8	0.8
Contra-Flow Bike Lane	0.3	0.3	0.0
Conventional Bike Lane (One-Way)	1.8	1.8	0.0
Conventional Bike Lanes	52.3	54.5	2.2
Neighborhood Connector	17.7	17.7	0.0
Off-Street Trail	120.7	121.0	0.3
Park Trail	35.7	35.7	0.0
Separated Bike Lanes	3.0	5.9	2.9
Sidepath	175.9	183.9	8.0
Stream Valley Park Trail	27.9	27.9	0.0
Total Miles of Bike Facilities	447.9	462.3	14.2

Pedestrian Network

A pedestrian Level of Comfort (PLOC) network is currently in development. This tool will allow Planning Staff to track improvements to pedestrian facilities along roadways and to perform analysis on pedestrian accessibility in a manner similar to the bicycle network database.

Public Transportation Ridership

WMATA Metrobus

Between 2015 and 2019, annual average weekday ridership fell 18% on WMATA Bus routes that serve Montgomery County. In 2020 ridership fell a further 40% from the previous year due to the COVID-19 pandemic. As discussed in a previous section, however, bus boardings have seen consecutive increases in the first few months of 2021. The strongest performing WMATA routes continue to be routes serving east-west connections along with north/south connections in the eastern part of the county (Table 8).

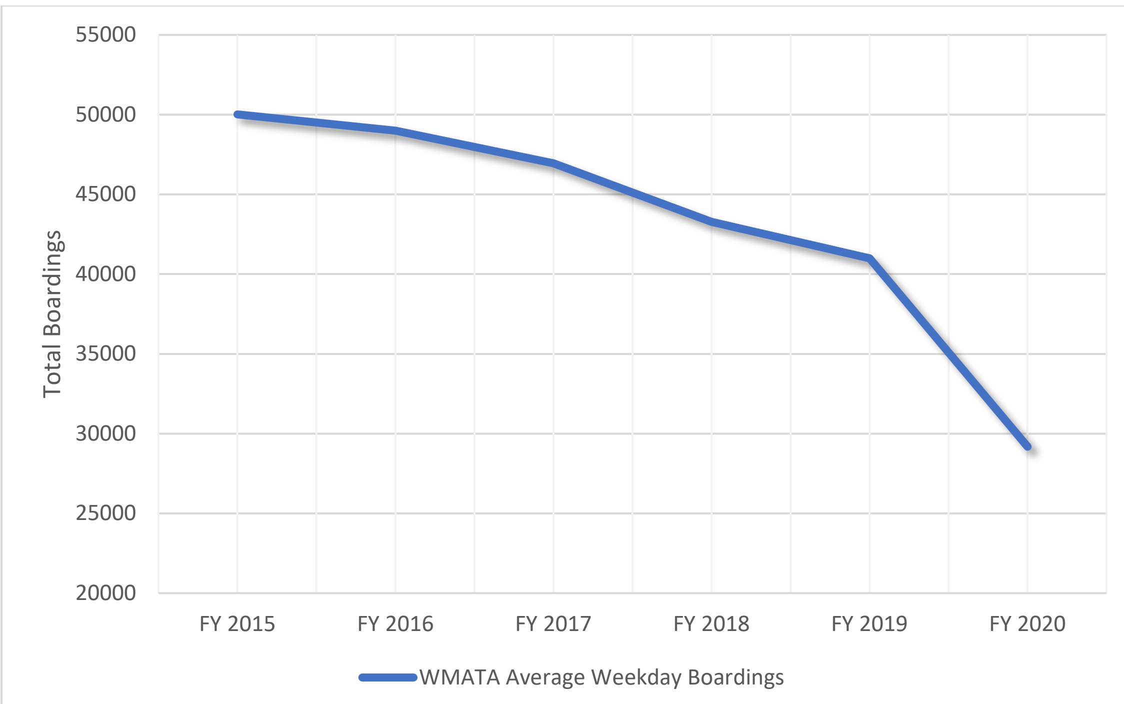

Figure 16: WMATA Metro Bus Average Weekday Boardings[10]

[10] Routes C2, C4, C8, J1, J2, K6, L8, Q1, Q2, Q4, Q5, Q6, T2, Y2, Y7, Y8, Z2, Z6, Z7, Z8. Source: WMATA Ridership Data Portal: https://www.wmata.com/initiatives/ridership-portal/

Table 8: Top 10 WMATA Routes Ordered by FY 2020 Average Weekday Boardings

Route Name	Corridor	FY 2015	FY 2020	Percent Change
C4	Greenbelt-Twinbrook	6,409	3,667	-42.79
K6	New Hampshire Ave-Maryland	5,769	3,469	-39.87
J2	Bethesda-Silver Spring	4,295	2,956	-31.18
C2	Greenbelt-Twinbrook	4,132	2,317	-43.93
Z8	Fairland	3,027	1,859	-38.59
Y7	Georgia Ave-Maryland	3,198	1,782	-44.28
Q4	Veirs Mill Road	3,218	1,682	-47.73
Q6	Veirs Mill Road	2,803	1,508	-46.20
Z6	Calverton-Westfarm	2,472	1,504	-39.16
C8	College Park - White Flint	2,275	1,477	-35.08

Ride-On Bus

Annual average weekday ridership fell by 23% between FY 2013 and FY 2019 across the entire Ride-On network (Figure 17). Many of the top performing Ride-On routes serve the 355 corridor, east/west connections, and the eastern portion of the county (Table 8). While FY20 experienced a significant drop in ridership compared to FY19 due to the pandemic, prior to March 2020 ridership had increased by about 1-2% over FY19. This was primarily due to the expansion of the Kids Ride Free program. Ride-On will be increasing service in July of 2021 by about 1% (currently at 80% of pre-COVID levels) targeting heavier ridership trips and route segments. Ride-On will expand service in September and then again in January growing to just about their pre-pandemic service levels

Table 9: Top 10 Ride-On Routes Ordered by FY 2019 Average Weekday Boardings

Route Name	Corridor	FY 2015	FY 2019	Percent Change
55	Rockville-Germantown Transit Ctr	7,748	5,453	-29.62
46	Montgomery College-Rockville-Medical Ctr	3,381	2,947	-12.84
59	Rockville-Montgomery Village	3,682	2,723	-26.05
26	Montgomery Mall-Glenmont	2,877	2,685	-6.67
15	Silver Spring-Langley Park	3,294	2,657	-19.34
20	Silver Spring-Hillandale	2,846	2,534	-10.96
16	Silver Spring-Takoma	3,222	2,289	-28.96
34	Aspen Hill-Friendship Heights	2,484	2,254	-9.26
10	Twinbrook Station-Hillandale	2,399	2,229	-7.09
61	Shady Grove-Germantown Transit	2,595	2,208	-14.91

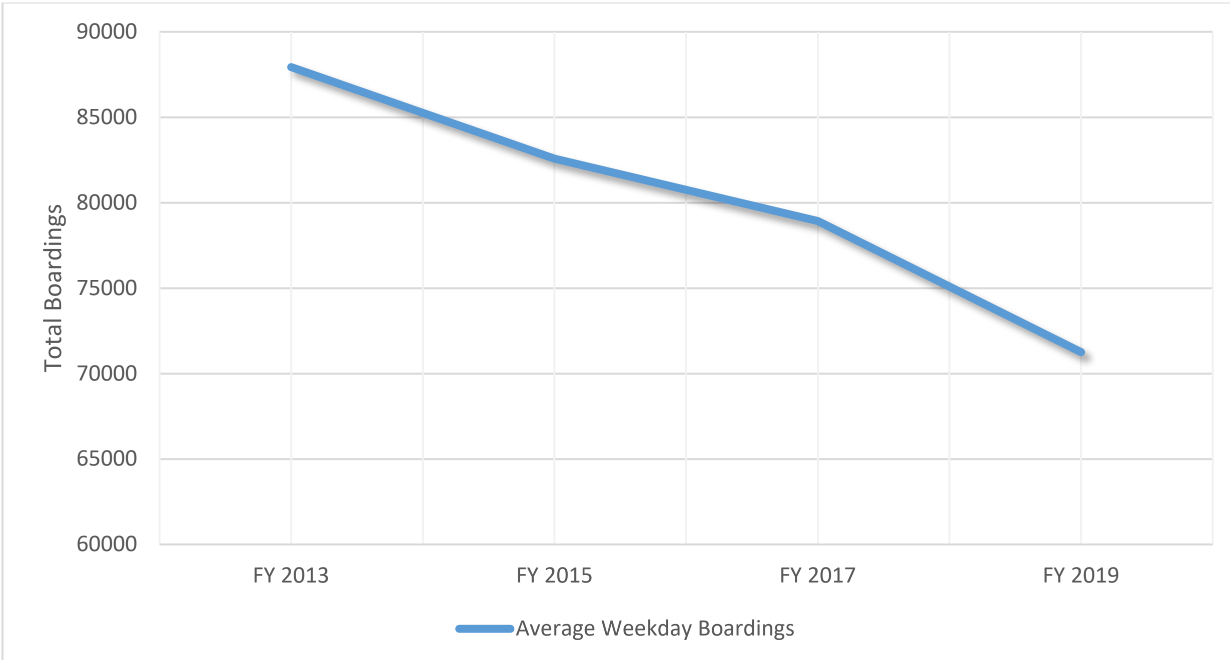

Figure 17: Ride-On Bus Average Weekday Boardings

WMATA Metrorail

Systemwide station weekday entries in Montgomery County fell by approximately 13% between FY 2015 and FY 2019 and 34.6% between FY 2015 and FY 2020. The largest declines in terms of percentage in rail ridership between FY 2015 and FY 2019 occurred at Wheaton, Friendship Heights, and Forest Glen. Unsurpisingly, many higher density and terminus stations continue to see the highest ridership levels.

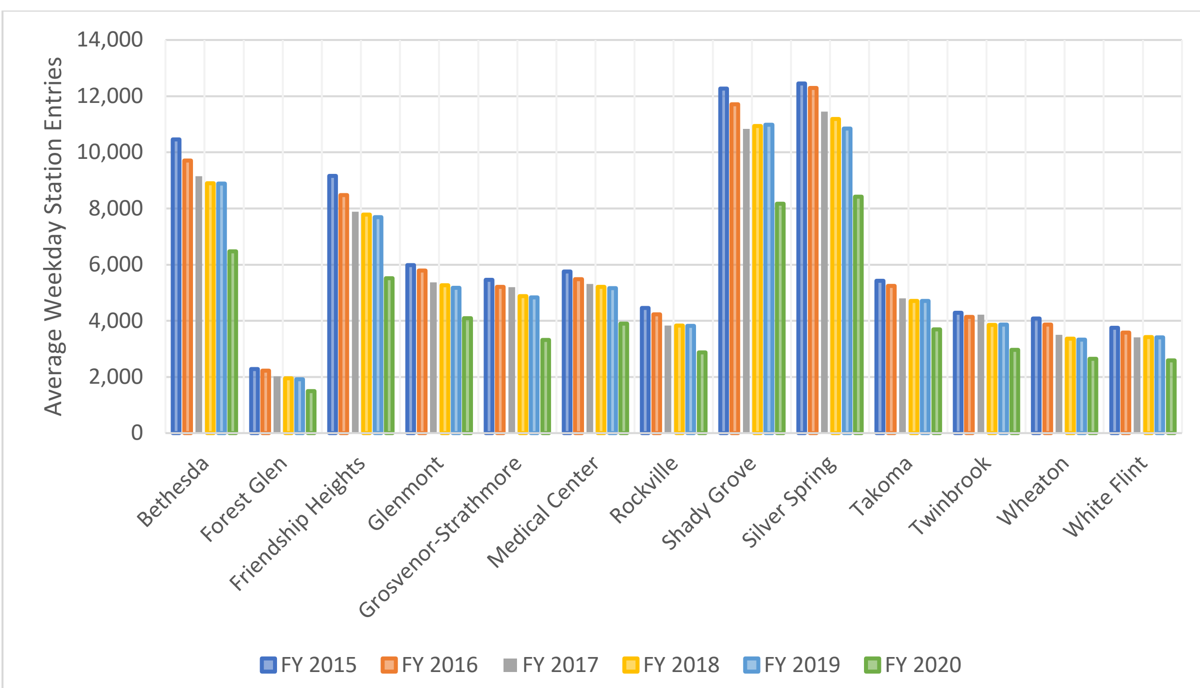

Figure 18: Red Line Average Weekday Station Entries by Station

Transit Performance

Public Transportation Coverage

One method to evaluate transit performance is to quantitatively measure access to transit services based on walk distance and trip frequency. This report creates quarter mile network buffers around transit stops (MARC Rail, WMATA Rail, WMATA Bus, and Ride-On Bus) and then summarizes the number of unique transit trips per hour reachable within each walkshed. The output is a spatial representation of transit coverage throughout Montgomery County (Figure 19). Once transit coverage is spatially identified, anlaysis can be conducted to compare the transit coverage of various geographies. For this analysis, transit coverage during midday was summarized by policy area category and Equity Focus Area (EFA) designation (Figure 20).

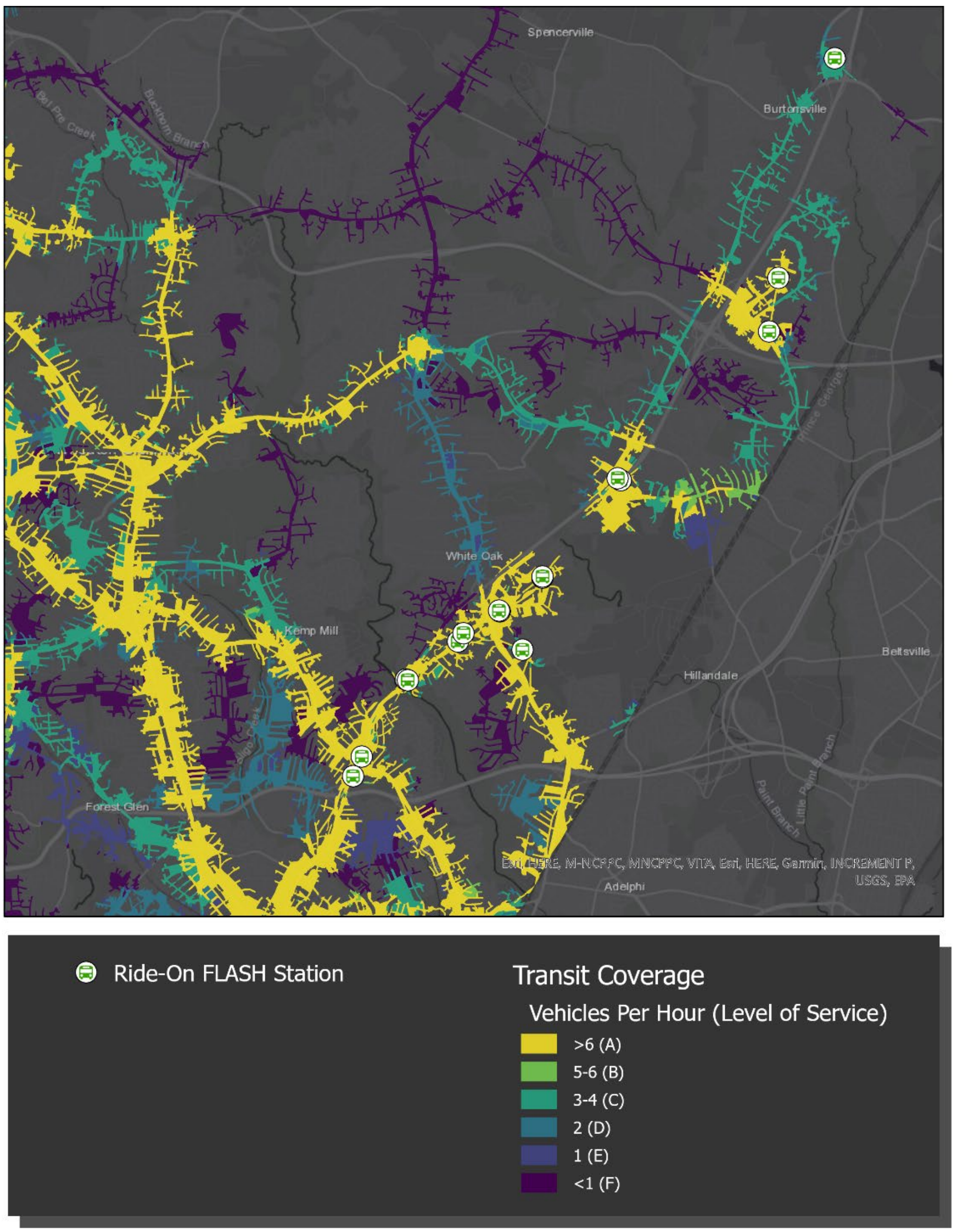

Figure 19: Transit Service Reachable Within Quarter Mile Walkshed (Midday)

Although Orange and Red policy areas that are not identified as EFAs have higher overall midday transit coverage, EFAs in these regions experience more higher quality coverage (greater than 6 trips an hour). Transit coverage in yellow areas identified as EFAs have far greater transit coverage than yellow policy areas that are not identified as disadvantaged. Somewhat surprisingly, yellow policy areas identified as EFAs have even greater transit coverage than orange policy areas. This is largely due to the new FLASH service in the White Oak area and high frequency transit in the Aspen Hill and Germantown areas. It should be noted that this analysis may be generous in assigning level of service categories. This is because, at this time, differentiation is not made between direction of travel. Bus stops servicing both inbound and outbound directions for a particular route may be reachable from a single location. Transit frequency is typically observed for one direction of travel, however, this level of specificity is not considered in this analysis.

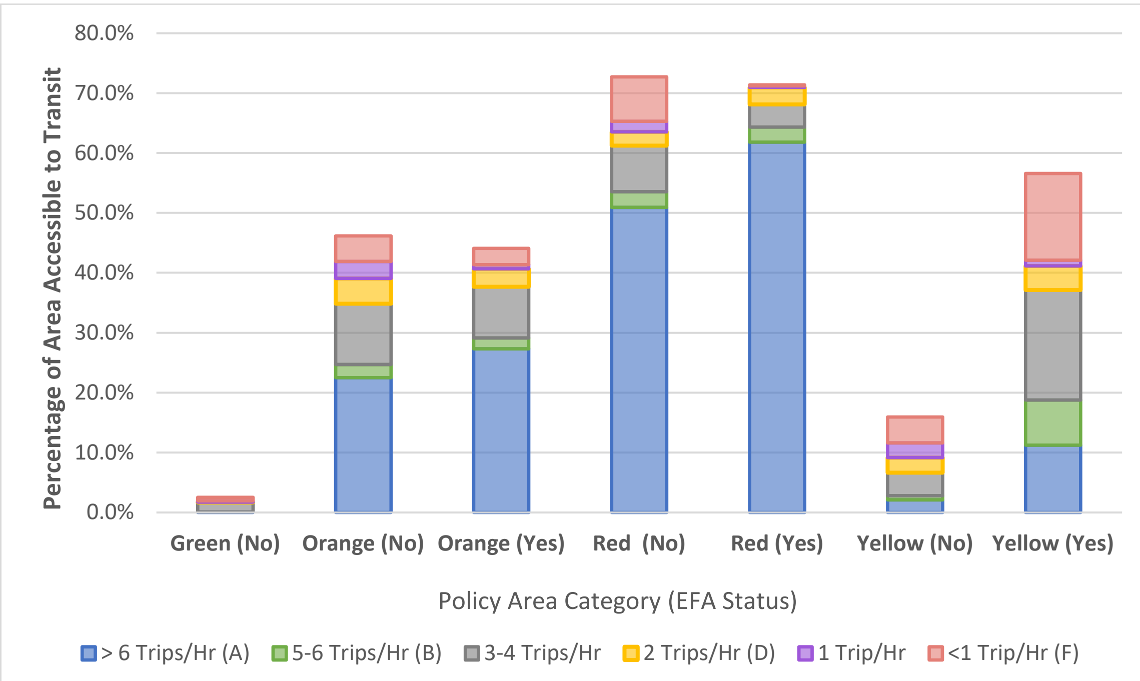

Figure 20: Transit Coverage Summarized by Policy Area and EFA Designation (midday)

Job Accessibility

Another method to evaluate transit quality is the number of jobs accessible by time-of-day (Figure 21). Transit service is highly dynamic and changing minute by minute. The number of jobs and points of interest accessible from a particular origin via transit is constantly changing. Higher frequency transit along with properly timed transfers should result in smoother changes to job access across time. Access to jobs from all major transit hubs in the county exponentially increases beginning at 4:30 AM as transit services ratchet up. Access to jobs remains between 4 and 4.5 million between 7 AM and 6:15 PM before declining through the 11:00 PM hour. Transit hubs include all Metro and MARC Rail Stations in addition to all the FLASH stations. Jobs are counted for each accessible station and may be represented in the total for a particular time point many times. This analysis shows that low-income people who work alternative work schedules may face challenges in using transit to meet their mobility demands.

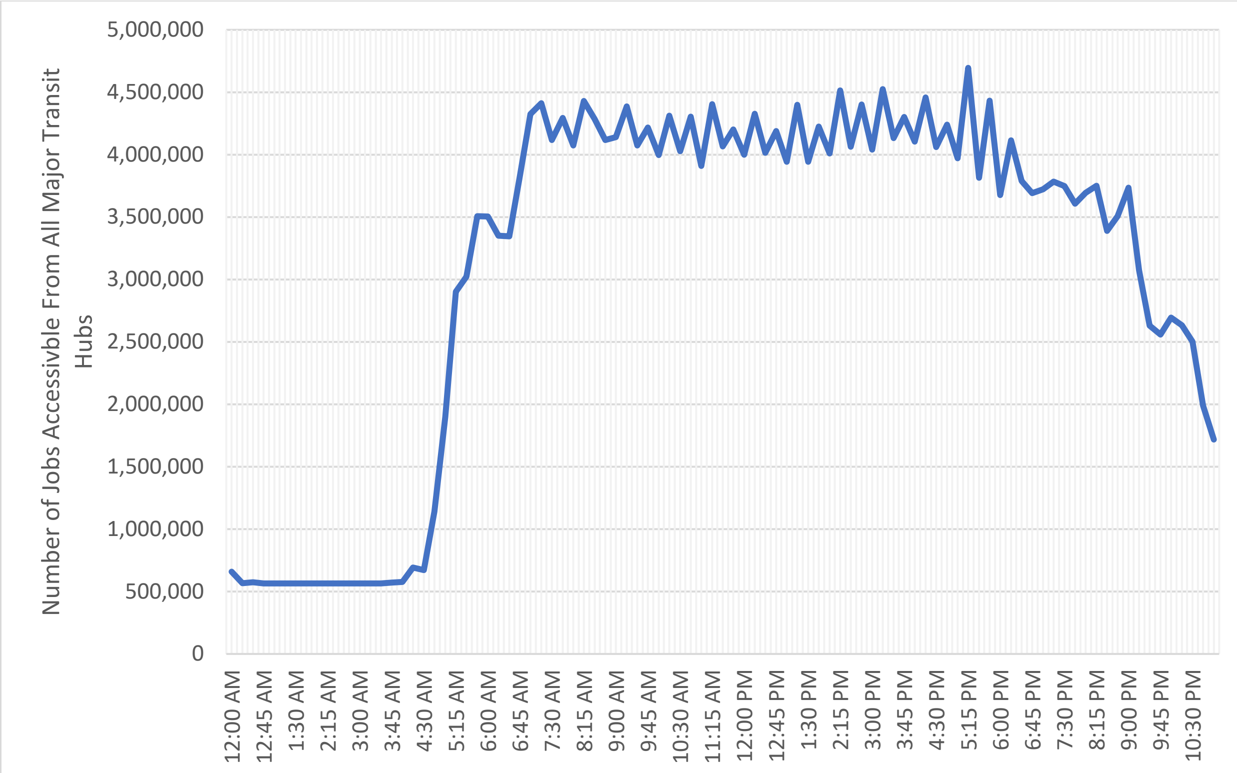

Figure 21: Number of jobs accessible within 30 transit travel time from major transit hubs in Montgomery County

Next Steps

It is envisioned that the Travel Monitoring Report will continue to evolve with the changing dynamics of more inclusive transportation performance metrics that drive policy and decision making within the Planning Department. The hope is to provide transparency to the public and decision makers regarding how budget allocations are impacting the county's ability to meet vetted transportation goals, objectives, and metrics. Future monitoring reports will strive to introduce additional awareness to important transportation concepts such as estimating corridor person throughput and excessive capacity when taking transit into consideration as an alternative to measuring vehicular adequacy just in terms of critical lane volume and delay. Additional pedestrian metrics will be introduced as the Pedestrian Master Plan is completed in the coming months. Finally, it is ultimately envisioned that the Travel Monitoring Report and associated dashboards will provide a "one-stop shop" where the public and decision makes can come to find information regarding all the Planning Department's Planning initiatives including Vision Zero and Master Plan specific monitoring efforts.

Appendix A: Ancillary Data and Information

Table 10: Bottlenecks organized by Corridor

	Intersections exceeding CLV Standard	Countywide Bottleneck Ranking by Year				
		Average	2020	2018	2016	2014
University Blvd	0					
MD-193 E at MD-320/PINEY BRANCH RD		13	2	12	14	35
MD-193 W at MD-320/PINEY BRANCH RD		22	3	79	64	45
MD-193 W at MD-586/VEIRS MILL RD		45	7	69	89	137
Georgia Ave North	2					
MD-97 N at MD-183/RANDOLPH RD		20	44	37	122	27
MD-97 N at ARCOLA AVE		31	40	70	38	53
MD-97 N at MD-185/CONNECTICUT AVE		93	36	114	176	125
Georgia Ave South	0					
MD-97 S at MD-391/COLUMBIA BLVD/SEMINARY RD		11	71	4	12	20
MD-97 N at I-495/CAPITAL BELT/I-495 OUTER LOOP		17	85	26	21	14
US-29 S at THAYER AVE		47	96	32	25	118
New Hampshire Ave North	1					
MD-650 S at RANDOLPH RD		67	48	82	73	91
New Hampshire Ave South	1					
MD-650 N at POWDER MILL RD		6	16	28	29	2
MD-650 N at I-495		16	20	6	63	37
MD-650 S at ADELPHI RD		19	435	22	15	18
East West Hwy	0					
No bottleneck on East West Hwy fell within the countywide top 50 between 2014-2020.						
MD 355 North	4					
MD-355 S at ODENDHAL AVE		27	19	24	34	50
MD-355 N at REDLAND RD		41	317	33	70	87
MD-355 N at MD-124/MONTGOMERY VILLAGE AVE		43	11	46	57	99
MD 355 South	0					
MD-355 S at MD-191/BRADLEY LN		3	8	7	5	3
MD-355 N at CEDAR LN		8	10	16	7	9
MD-355 S at MD-183/MONTROSE RD/RANDOLPH RD		12	247	115	6	5
US 29 North	2					
US-29 N at CHERRY HILL RD/RANDOLPH RD		9	62	5	4	12
US-29 N at GREENCASTLE RD		21	124	8	36	62
US-29 S at GREENCASTLE RD		40	170	31	49	71

	Intersections exceeding CLV Standard	Countywide Bottleneck Ranking by Year				
		Average	2020	2018	2016	2014
US 29 South	1					
US-29 S at MD-193/UNIVERSITY BLVD		2	41	1	1	8
US-29 S at I-495		5	226	40	13	1
US-29 S at MD-384/COLESVILLE RD		7	136	3	8	6
Randolph Rd	0					
MD-183 W at MD-97/GEORGIA AVE		18	298	11	27	22
RANDOLPH RD E at US-29/COLUMBIA PIKE		116	45	99	226	196
RANDOLPH RD W at MD-650/NEW HAMPSHIRE AVE		119	33	235	154	242
Veirs Mill Rd	0					
MD-586 E at MD-97/GEORGIA AVE		105	31	262	264	75
MD-586 W at MD-193/UNIVERSITY BLVD W		129	50	230	261	255
Connecticut Ave	0					
MD-185 S at MD-410/EAST-WEST HWY		1	30	2	2	4
MD-185 N at JONES BRIDGE RD		4	13	9	9	7
MD-185 S at JONES BRIDGE RD		28	303	88	172	102
Old Georgetown Rd	0					
MD-187 N at W CEDAR LN/OAKMONT AVE		34	207	48	19	64
MD-187 S at TUCKERMAN LN		35	193	77	46	24
MD-187 S at DEMOCRACY BLVD		56	49	203	127	25
River Rd	1					
MD-190 W at BURDETTE RD		33	321	29	41	51
MD-190 E at WESTERN AVE		90	332	345	121	23

Table 11:Top 25 Intersections Ordered by CLV Based on Latest Count Available. Rows in blue indicate an updated count is available since the last TMR publication.

TMR Rankings				Intersection Name	Previous MAR Count Date	Previous MAR CLV	Current Count Date	Current CLV	CLV Standard	Policy Area
2020	2016	2013	2011							
1	158	157	68	Georgia Ave at Bel Pre Rd	12/3/2014	1,322	11/8/2018	1,874	1475	Aspen Hill
2	2	5	3	Shady Grove Rd at Choke Cherry Ln	5/19/2010	1,853	5/19/2010	1,853	1500	Rockville City
3	4	21	8	Connecticut Ave at Jones Bridge Rd/Kensington Pkwy	2/4/2015	1,827	2/4/2015	1,827	1800	Chevy Chase Lake
4	6	171	175	Snouffer School Rd at Centerway Rd	11/5/2014	1,816	11/5/2014	1,816	1425	Montgomery Village/Airpark
5	14	359	336	Georgia Ave at Veirs Mill Rd	10/15/2014	1,766	10/15/2014	1,766	1800	Wheaton CBD
6	16	128	138	Cherry Hill Rd at Broadbirch Dr/Calverton Blvd	5/27/2015	1,747	5/27/2015	1,747	1600	White Oak
7	18	38	37	Columbia Pike at Greencastle Rd	2/19/2014	1,738	2/19/2014	1,738	1475	Fairland/Colesville
9	22	13	40	First St at Baltimore Rd	6/6/2012	1,718	6/6/2012	1,718	1800	Rockville Town Center
10	23	4	2	Darnestown Rd at Riffle Ford Rd	9/10/2015	1,715	9/10/2015	1,715	1450	North Potomac
11	24	15	13	Shady Grove Rd at Epsilon/Tupelo	2/11/2009	1,704	2/11/2009	1,704	1475	Derwood
12	25	*	*	Georgia Ave (MD 97) at Georgia Ave/Emory Church Rd	12/17/2014	1,700	12/17/2014	1,700	1450	Olney
13	35	33	32	Colesville Rd at Sligo Creek Pkwy/St Andrews Way	3/6/2008	1,624	10/10/2017	1,699	1600	Silver Spring/Takoma Park
14	348	374	251	Rockville Pk at Grosvenor/Beach	5/23/2012	1,079	4/2/2019	1,680	1800	Grosvenor
15	27	311	197	W Montgomery Ave (MD.28) at Research Blvd	6/23/2015	1,666	6/23/2015	1,666	1500	Rockville City
16	30	94	103	Seven Locks Rd at Bradley Blvd	10/15/2015	1,651	10/15/2015	1,651	1450	Potomac
17	31	28	26	Shady Grove Rd at Midcounty Hwy	11/18/2010	1,644	11/18/2010	1,644	1475	Derwood
18	32	29	*	Clopper Rd at Waring Station Rd	6/2/2011	1,636	6/2/2011	1,636	1425	Germantown West
19	8	8	7	Great Seneca Hwy at Muddy Branch Rd	4/25/2013	1,791	5/22/2019	1,628	1425	Gaithersburg City

TMR Rankings				Intersection Name	Previous MAR Count Date	Previous MAR CLV	Current Count Date	Current CLV	CLV Standard	Policy Area
2020	2016	2013	2011							
20	33	146	153	New Hampshire Ave at Adelphi Rd/Dilston Rd	1/29/2015	1,626	1/29/2015	1,626	1600	Silver Spring/Takoma Park
21	15	26	106	Frederick Rd at Shady Grove Rd	10/1/2014	1,765	10/3/2018	1,612	1800	Shady Grove Metro Station
22	36	36	35	Aspen Hill Rd at Arctic Ave	11/6/2008	1,609	11/6/2008	1,609	1475	Aspen Hill
23	228	*	*	Quince Orchard Rd at Firstfield Rd	7/10/2014	1,225	10/25/2017	1,595	1425	Gaithersburg City
24	39	42	43	Democracy Blvd at Falls Rd/S Glen Rd	4/1/2009	1,594	4/1/2009	1,594	1450	Potomac
25	163	152	158	Frederick Rd (MD 355) at Germantown Rd	10/1/2014	1,315	4/10/2019	1,583	1425	Germantown East

Table 12: Top 25 Intersections Ordered By Average Delay Based on Latest Count Available

Ranking	Intersection Description	Count Date	Critical Delay	Policy Area	Delay Standard
1	Rockville Pike at Jones Bridge/Center Dr	5/15/2019	162.2	Medical Center	90
2	Great Seneca Hwy at Key West Ave	5/22/2019	115.5	R&D Village	55
3	Connecticut Ave at Bradley Ln	5/15/2019	113.9	Bethesda/Chevy Chase	80
4	Connecticut Ave at Veirs Mill Rd	4/27/2016	103.4	Kensington/Wheaton	80
5	Frederick Rd (MD 355) at Germantown Rd	4/10/2019	102.3	Germantown East	51
6	Great Seneca Hwy at Muddy Branch Rd	5/22/2019	98.3	Gaithersburg City	51
7	Old Georgetown Rd at Tuckerman Ln	2/7/2019	81.8	North Bethesda	71
8	Connecticut Ave at East West Hwy	5/15/2019	78.1	Chevy Chase Lake	90
9	Veirs Mill Rd at Twinbrook Pkwy	10/19/2016	77.7	North Bethesda	71
10	Wisconsin Ave at East-West Hwy/Old Georgetown Rd	5/15/2019	75.1	Bethesda CBD	90
11	MD 355 at Middlebrook (N)	4/10/2019	74	Germantown East	51
12	Wisconsin Ave at Bradley Blvd	5/15/2019	67.8	Bethesda CBD	90
13	Georgia Ave at Forest Glen Rd	9/5/2019	67.4	Forest Glen	90
14	Wisconsin Ave at Battery Ln/Rosedale Ave	5/15/2019	67.1	Bethesda CBD	90
15	Rockville Pike at W Cedar Ln	5/15/2019	65	Medical Center	90
16	Rockville Pike at Nicholson Ln	5/22/2019	62.3	White Flint	90
17	Georgia Ave at Columbia Blvd/Seminary Ln	11/13/2019	61.3	Forest Glen	90
18	Great Seneca Hwy at Quince Orchard Rd	5/22/2019	60.5	Gaithersburg City	51

Ranking	Intersection Description	Count Date	Critical Delay	Policy Area	Delay Standard
19	Old Georgetown Rd at Democracy Blvd	5/17/2018	57.6	North Bethesda	71
20	Bradley Blvd at Huntington Pkwy	5/7/2019	53.7	Bethesda/Chevy Chase	80
21	Randolph Rd at Nebel St	5/22/2019	52.9	White Flint	90
22	Democracy Blvd at Rockledge Dr	5/23/2018	52.8	North Bethesda	71
23	Old Georgetown Rd at Rock Spring Dr	5/15/2018	52.2	North Bethesda	71
24	Rockville Pike at Old Georgetown Rd	5/22/2019	49.6	White Flint	90
25	Old Georgetown Rd at Executive Blvd	5/22/2019	49.5	White Flint	90

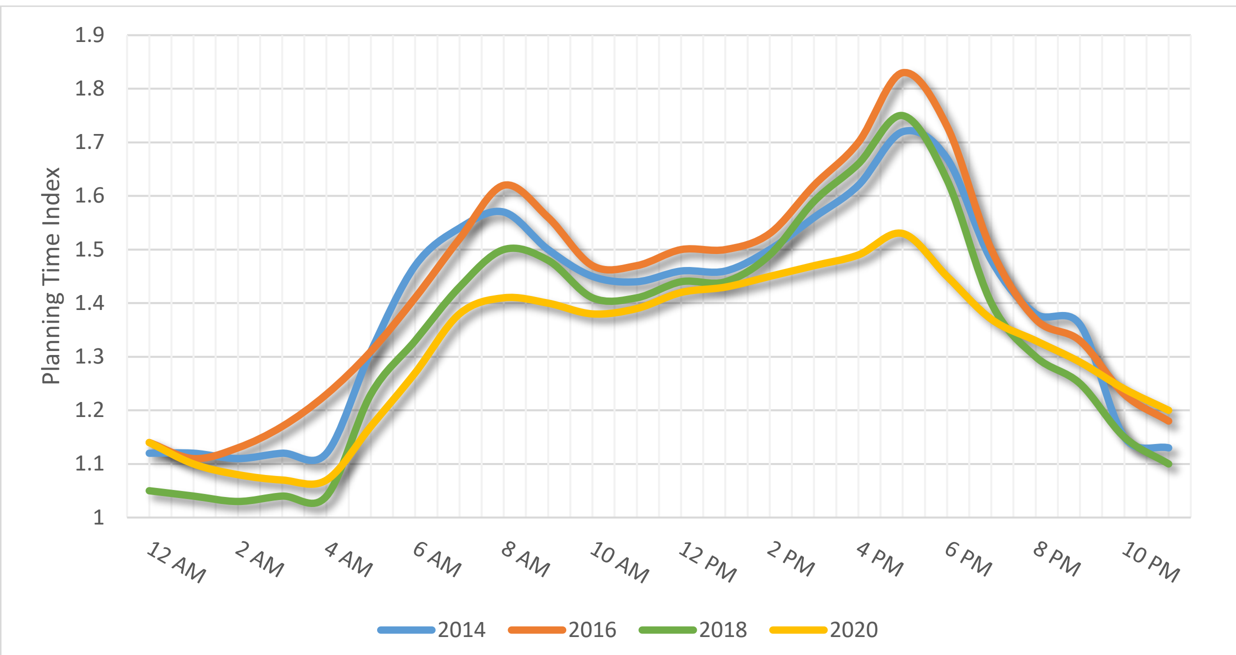

Figure 22: Non-Interstate Average Weekday Planning Time Index (Northbound)

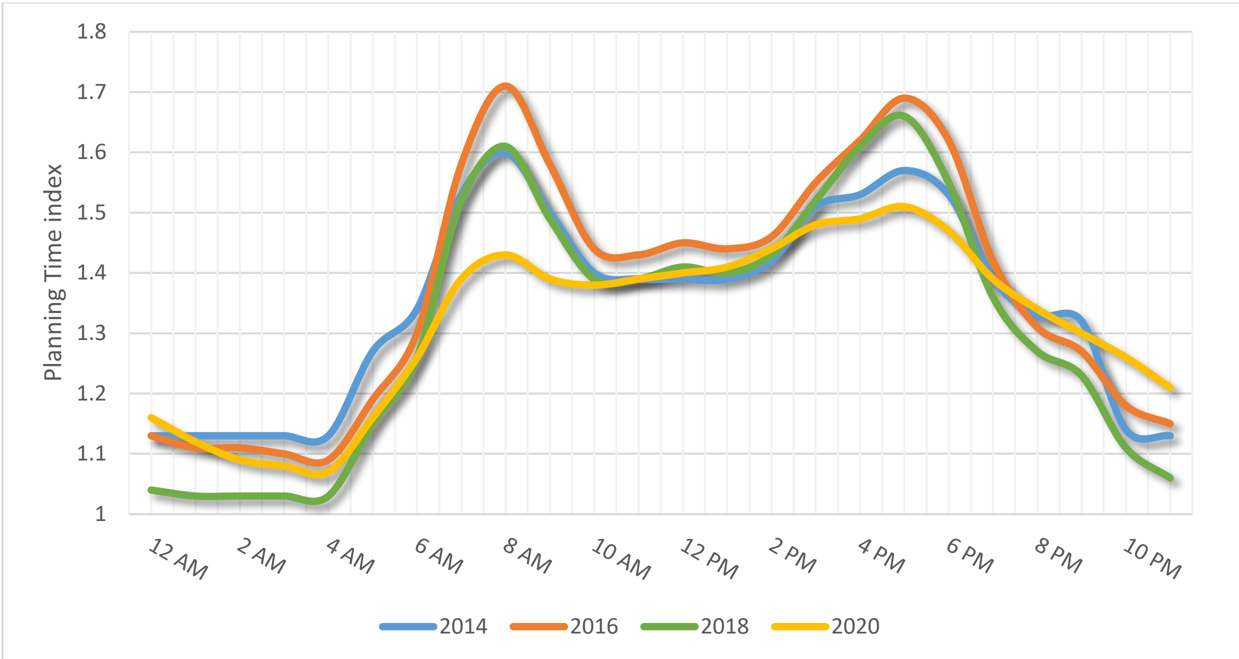

Figure 23: Non-Interstate Average Weekday Planning Time Index (Eastbound)

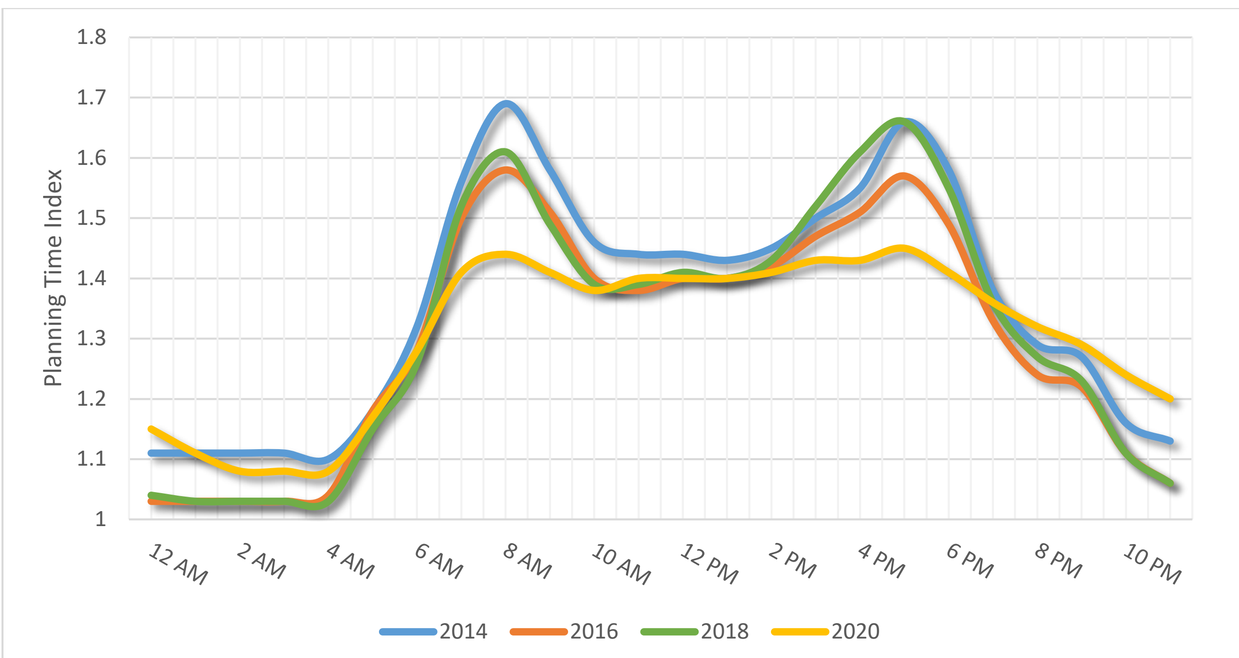

Figure 24: Non-Interstate Average Weekday Planning Time Index (Westbound)

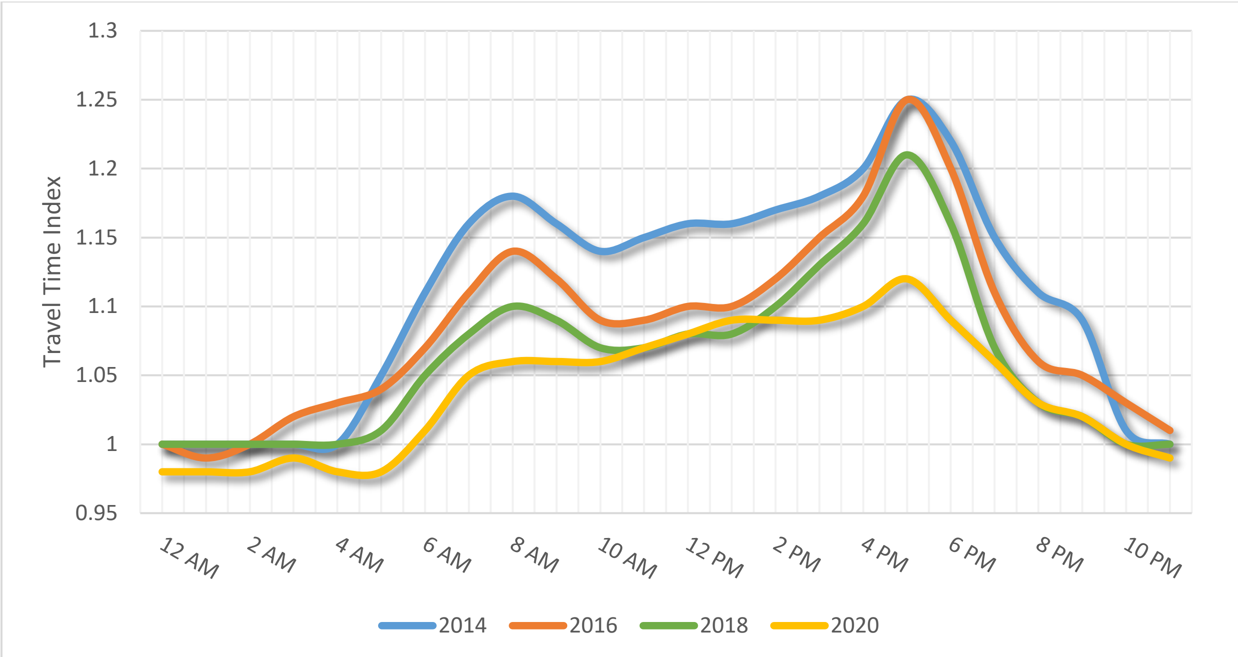

Figure 25: Non-Interstate Average Weekday Travel Time Index (Northbound)

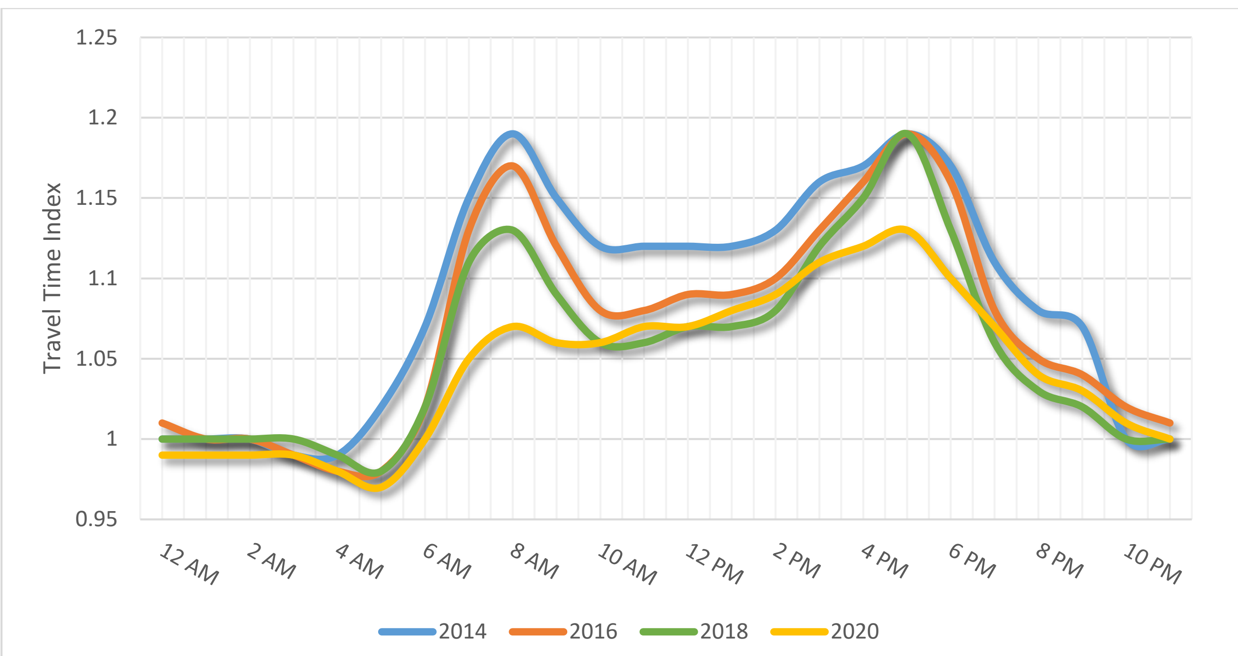

Figure 26: Non-Interstate Average Weekday Travel Time Index (Eastbound)

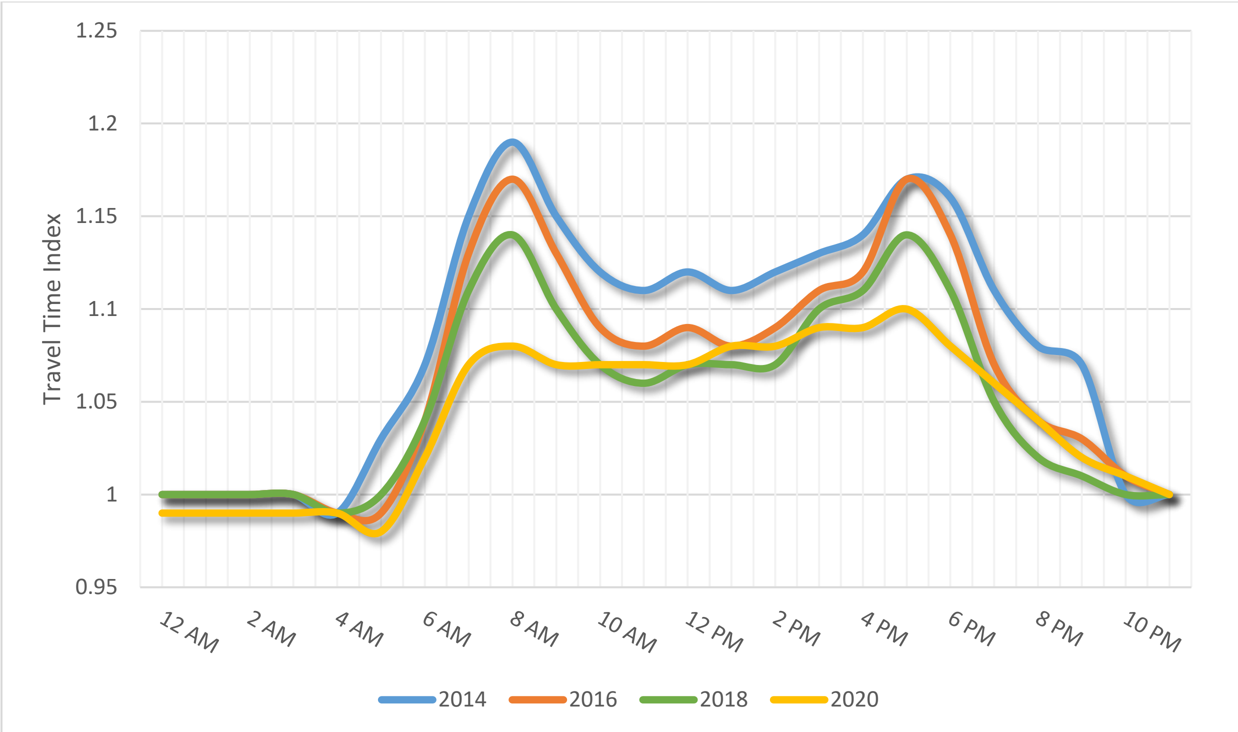

Figure 27: Non-Interstate Average Weekday Travel Time Index (Westbound)

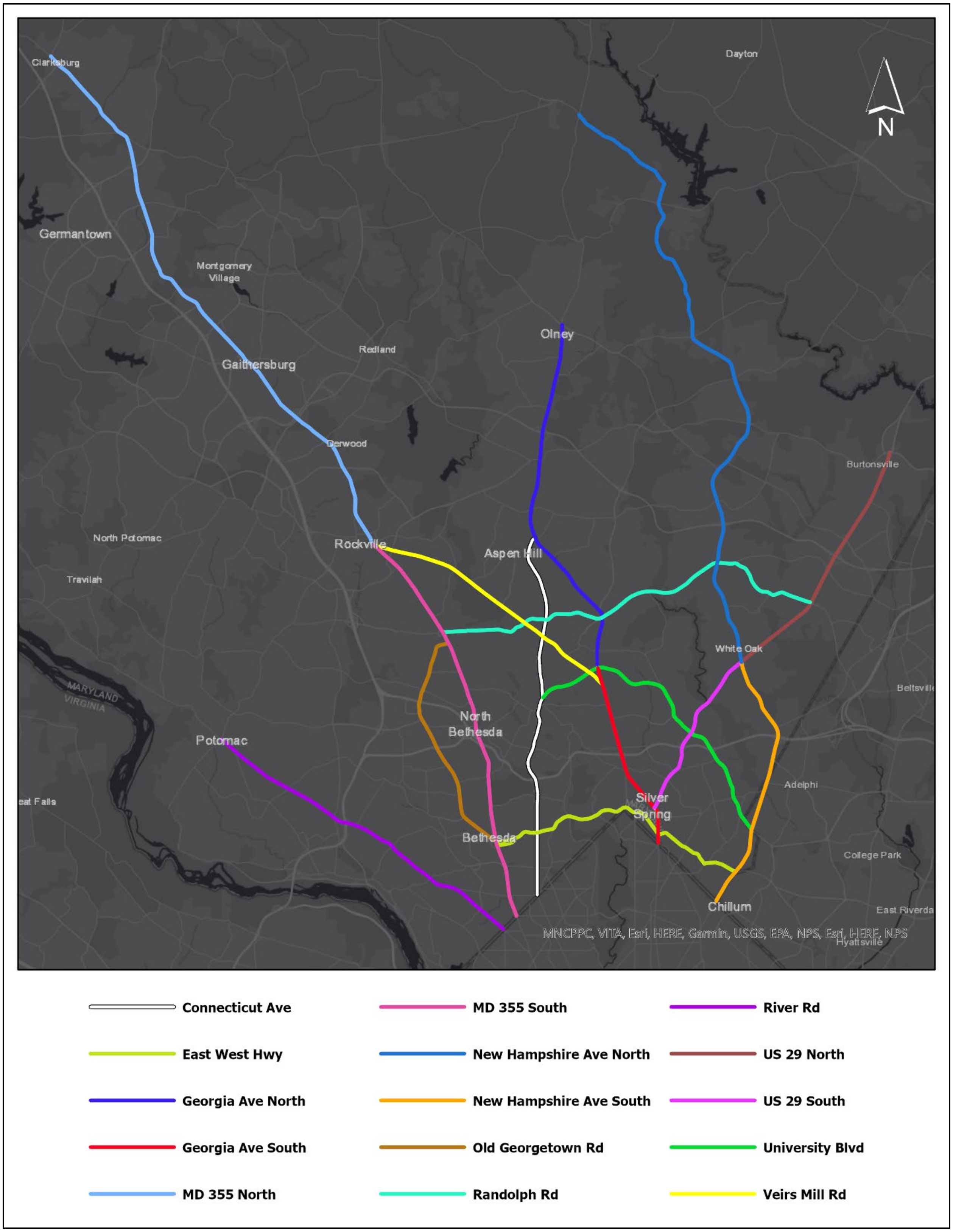

Figure 28: Defined Corridors for the Travel Monitoring Report