june 2009

MONTGOMERY COUNTY, MARYLAND

highway mobility report

Maryland-National Capital Park and Planning Commission

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I. EXECUTIVE SUMMARY

Recommendations from Staff

Staff recommends that the Planning Board support the following actions regarding the 2009 Highway Mobility Report:

- Transmit the 2009 Highway Mobility Report (HMR) to the County Council, to provide background information for the consideration of recommended modifications to the County's Capital Improvement Program (CIP) priorities.
- Incorporate the Highway Mobility Report congested corridors into the ranking system for FY 2011-2016 Capital Improvement Program prioritization efforts, as incorporated in the Staff Draft of the 2009-2011 Growth Policy.
- Pursue further development and integration of multimodal measures of effectiveness into the next Highway Mobility Report, scheduled for production in Spring 2011 as part of the next biennial Growth Policy and CIP development cycle.

Key Findings

The Highway Mobility Report contains information and data about patterns of mobility in the County. The current report, confirms many of the findings in the 2008 report; congestion is generally most severe in down-county areas, the "priority corridors" continue to experience the most significant levels of congestion and should be targeted for congestion relief, and between 15 and 20 percent of the intersections in the County have congestion levels that are worse than their current Local Area Transportation Review (LATR) Growth Policy standards.

- National and regional trends indicating a decline in travel and congestion since 2006 are less prevalent on the Montgomery County arterial system than they are for national data, due in part to the fact that the County has weathered the economic effects of the recession better than many other parts of the region and the Country.
- The overall level of arterial system traffic volumes, travel speeds, and intersection congestion in spring 2009 is essentially unchanged from 2008 (observed reductions of up to one percent per year).
- Priority corridors for mobility improvements include the radial routes MD 355, Connecticut Avenue, Georgia Avenue and US 29 throughout the County. East-west priority routes include Veirs Mill Road and MD 28. Eight of this year's "top ten" most congested intersections are along these routes. The Intercounty Connector (ICC) is expected to provide congestion relief for MD 28.
- The Growth Policy definition of a three-hour peak period remains appropriate.
- While auto travel has decreased slightly during the current recession, transit travel has increased, with total Metrorail boardings in Montgomery County 5% higher in 2009 than in 2006.
- Observed pedestrian activity on the arterial system is concentrated along roadways with high transit ridership, particularly in the Veirs Mill Road and University Boulevard corridors connecting Rockville, Wheaton, and Takoma Park.

Highlights

At the direction of staff, and in concert with this report, 130 intersection counts were taken during the late winter and early spring of 2009. The infusion of these counts into the Transportation Division intersection database has provided an update to older counts at key intersections in the County. In addition to the importance of the new data at intersections monitored in past reports, these counts also provide some new information for locations not previously counted. The expanded breadth of the intersection data has both confirmed previous congestion trends, and highlighted the conditions near and around several intersections that are routinely the most congested in the County.

In accordance with findings in the 2008 HMR, infrastructure improvements including grade-separations and widening have made a significant impact on conditions at many of the county's most congested intersections. Congestion continues to be most severe along priority corridors in the County. Scheduled improvements at locations along these congested primary arterials including US 29 (Colesville Road/Columbia Pike), MD 355 (Wisconsin Avenue/Rockville Pike) and MD 185 (Connecticut Avenue) will play an important role in the nature of congestion at these locations in the future. The addition of bus rapid transit along priority corridors (e.g. Veirs Mill Road/MD 586) is also expected to help address locations of chronic congestion.

Critical Lane Volume (CLV) to Local Area Transportation Review (LATR) standards ratios at signalized intersections indicate more congestion than in the 2008 report with 16 percent of intersections exceeding their LATR standard in 2009 compared with 14 percent in 2008. Current year data is not the most severe on record, however. Roughly 22 percent of intersections in 2005 had a CLV to LATR standards ratio greater than 1.00 (where the CLV exceeds the LATR standard).

Travel time samples based on Global Positioning System (GPS) surveys of arterial roadways in the 2009 report continue to demonstrate the importance of high frequency sampling in the peak travel period. Data for 2009 includes roughly twice the number of measurements included in the 2008 report (and conducted in the summer of 2007). Roadway segments sampled in 2009 are also longer than in 2008, and therefore illustrate the change in conditions across Policy Areas (2008 samples were confined to Policy Area boundaries for the most part). The enhanced data set in this report has enabled the creation of both travel time versus distance graphs and travel time versus time of day graphs for each priority corridor. The time of day graphs help to illustrate the nature of peak travel along the corridors while the distance graphs detail locations of congestion for each corridor segment.

Beyond auto based mobility measurements, significant analysis is included in this document relating to transit and pedestrian activity. Analysis of vehicle miles traveled is coordinated with the discussion of transit mobility. As noted in the Key Findings section above, Metrorail ridership has increased in recent years despite the down turn in the economy and declines in overall vehicle miles traveled.

Purpose

The purpose of the Highway Mobility Report (HMR) is to document the Department's annual analysis of barriers and constraints to mobility within Montgomery County. Constraints to mobility are represented here in the form of historical, current, and future motor vehicle traffic congestion trends and patterns. Current congestion measurements included in this study are Critical Lane Volume (CLV) and arterial travel time for priority intersections and corridors in the County. Future congestion data is derived from volume to capacity ratios (V/C) as portrayed by the Department's regional transportation model, TRAVEL/3. These transportation indicators are intended for use by the Planning Board and County

Council to inform their commentary on this year's State Consolidated Transportation Program (CTP) project priorities. The last version of this report was completed in May of 2008.

Historically, this report has focused on vehicular mobility. In order to describe a more holistic analysis of transportation in the report, pedestrian count, bus movement and other transit data have been identified. These new data sources will become integrated into this mobility report, as the constraints and validity of the data are vetted by Department staff. Broader mobility measurements will therefore be incorporated in the Highway Mobility Report on an ongoing basis.

Changes from 2008 HMR Report

Several changes to the 2008 report format were made in 2009. Beyond vehicular mobility covered in previous HMR reports, this document contains analysis of transit data including Montgomery County Ride On bus and Metrorail information as well as pedestrian crossing counts. A discussion of national, state and local trends in vehicle miles traveled has also been added. Other enhancements to the 2009 HMR include more extensive travel time analysis with greater number of samples along on priority corridors, improving the quality of the data and ensuring that peak travel time is captured, and new traffic counts at roughly 130 key intersections (as identified by MNCPPC staff) which were conducted in support of this report in the late winter and early spring of 2009.

II. CURRENT CONGESTION

Measures of Congestion

The status of congestion on the County's major highway and arterials is a primary indicator of vehicle mobility. For this reason, two key performance measurements were used to report on current congestion; Critical Lane Volumes (CLVs), and GPS-based Arterial Travel Times and Speeds.

Observed Critical Lane Volumes (CLVs): The Department's Intersection Traffic Count Database contains the essential data needed to calculate and identify levels of congestion at signalized intersections throughout the County. The CLV is calculated mathematically using the following variables for a particular intersection: (a) throughput and conflicting movement traffic volume data, (b) geometric configuration information, and (c) traffic signal phasing specifications. This calculation uses the lane configuration and lane use factors for each of the intersection's approach legs to determine the north/south and east/west peak direction flow of traffic, which are also referred to as the "critical movements". The intersection's signal phasing then specifies whether or not the approach traffic on a specific leg of the intersection moves independently from the traffic approaching from the opposite direction. This information is used to determine whether or not a potential turning movement (i.e. left turn) conflict exists. These conflicting movements are taken into consideration for the purpose of calculating the intersection's CLV.

Observed Travel Times and Speeds: During February and March of 2009, roughly 85% of the County's major State highways (excluding roads located in the rural policy areas) were surveyed via GPS-equipped probe vehicles in order to obtain PM peak-period travel time and speed samples. This type of data has been collected for the Department since 2004 for congestion monitoring purposes in various sample sizes. This data continues to be a useful resource in terms of measuring levels of congestion along some of the County's most heavily traveled routes and corridors, and is used to represent the degree of mobility observed along various roadway sections, also referred to as "arterial mobility". Arterial Mobility is determined by comparing the congested travel time along a particular roadway to the uncongested travel time, hence the need to also observe non-peak period travel times and speeds. In

order to economize on the sampling, travel time data was only collected during the PM peak period. As with the 2008 version of the HMR report, calculated travel times, associated with the posted speed limits along a roadway, were used as a proxy to represent the values of uncongested travel time.

Critical Lane Volumes (CLVs at Signalized Intersections)

Description of data parameters

The Intersection Traffic Count database maintained by the MNCPPC Transportation Division contains recent counts for 592 of the 772 (existing and planned) signalized intersections in Montgomery County. Many more counts are archived in the database for historical record. Counts are entered into the system as a mandatory part of the development review process, from counts maintained by the State Highway Administration and via consultant data coordinated with requests made by MNCPPC for special studies including the Highway Mobility Report. Excluding counts that are archived, the oldest count in the database is from March 1, 2001. For the purposes of this report, and in keeping with precedent set in previous HMR reports, intersection counts for the past three years are included in the 2009 HMR. Due to the early date of analysis in 2009 (late winter/early spring) counts were included if they fall between the beginning of fiscal year 2007 (July 1, 2006) and May 2009. The total number of intersection counts analyzed for the 2009 HMR is therefore 360 including the roughly 130 special counts made in support of the HMR during February, March, April and May 2009.

Comparison of CLV data with LATR standards

Intersection CLV to LATR ratios have changed somewhat when compared with 2008 analysis. Data for 2009 indicates a two percent increase in intersections with a ratio above 1.00 (from 14 percent to 16 percent) while intersections with a ratio of 0 – 0.60 exhibited a decline of five percent. The breakdown of intersection CLV to LATR ratios in 2008 was nearly the same as 2006, so the new ratios depicted in Figure 2.2 indicate a change in ratio trends rather than a confirmation of previously observed data. At first glance, the 2009 data seems to be out of synch with known reduction or leveling off of vehicle miles traveled in the County (discussed later in this document) over the past year. A chief contributor to this shift in ratio results is the infusion of 2009 data collected specifically for this report. Following the recommendation of the 2008 HMR, new 2009 counts were taken at 130 intersections, yielding an influx of new data targeted to some of the busiest intersections in the County. Of these 130 intersections, approximately 70 percent have CLV/LATR ratios greater than 0.8, compared with 48 percent in the entire 2006 to 2009 sample.

Figure 2.1 illustrates the location of intersections in the County where the PM peak hour C LV/LATR ratios are above 0.80. Red dots indicate locations where the intersection exceeds the LATR standard, and orange dots indicate locations where the CLV/LATR standard is between 0.80 and 1.00. The size of the dot indicates volume of vehicles passing through the intersection. Intersections that exceed their standard are primarily located along the major arterial corridors (e.g. US 29, Colesville Road/Columbia Pike and MD 355, Wisconsin Ave/Rockville Pike/Hungerford Road/Frederick Road).

Figure 2.1: PM Peak Hour CLV/LATR Ratios by Total Volume

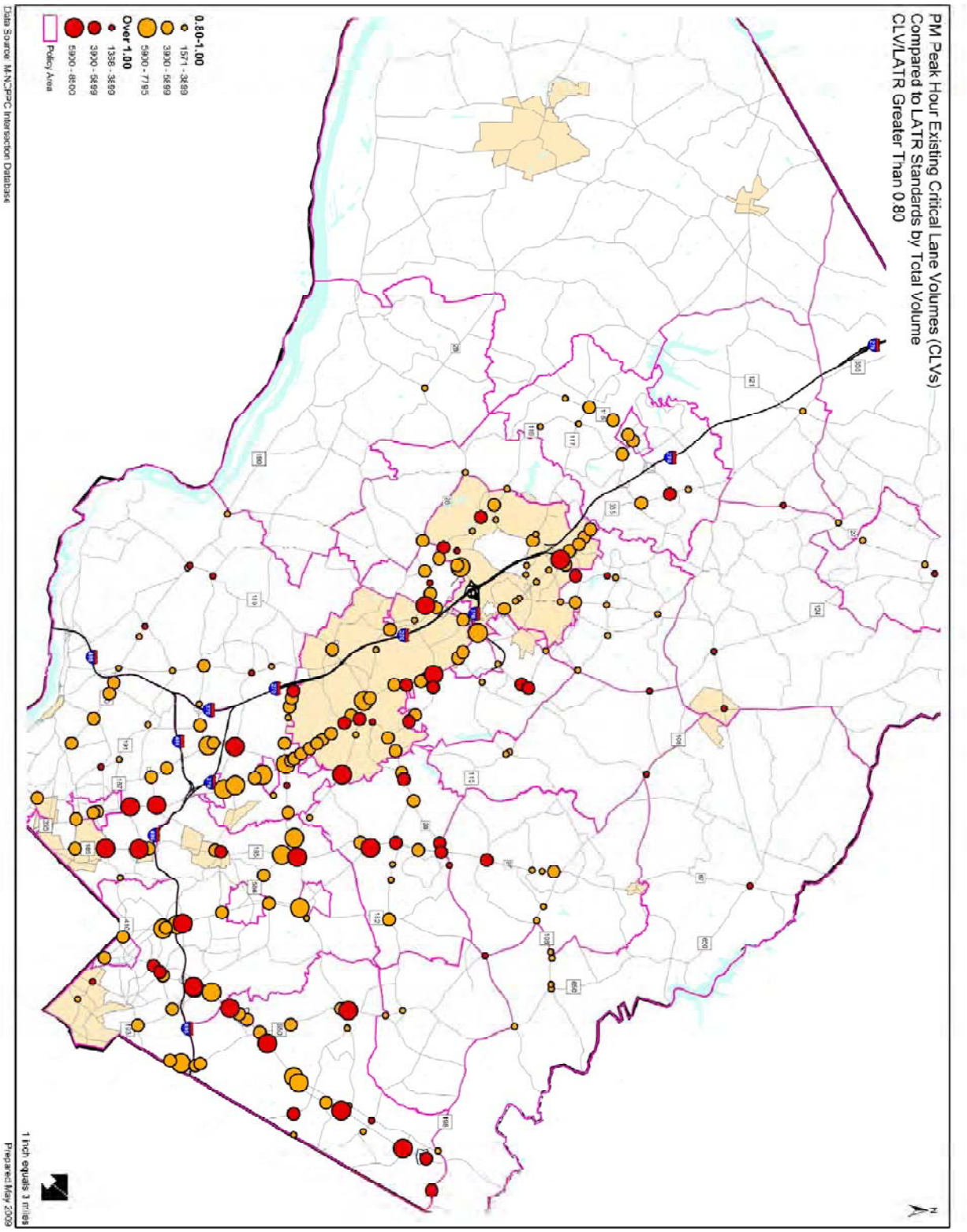


Figure 2.2: CLV/LATR Ratio Categorization (N=360)

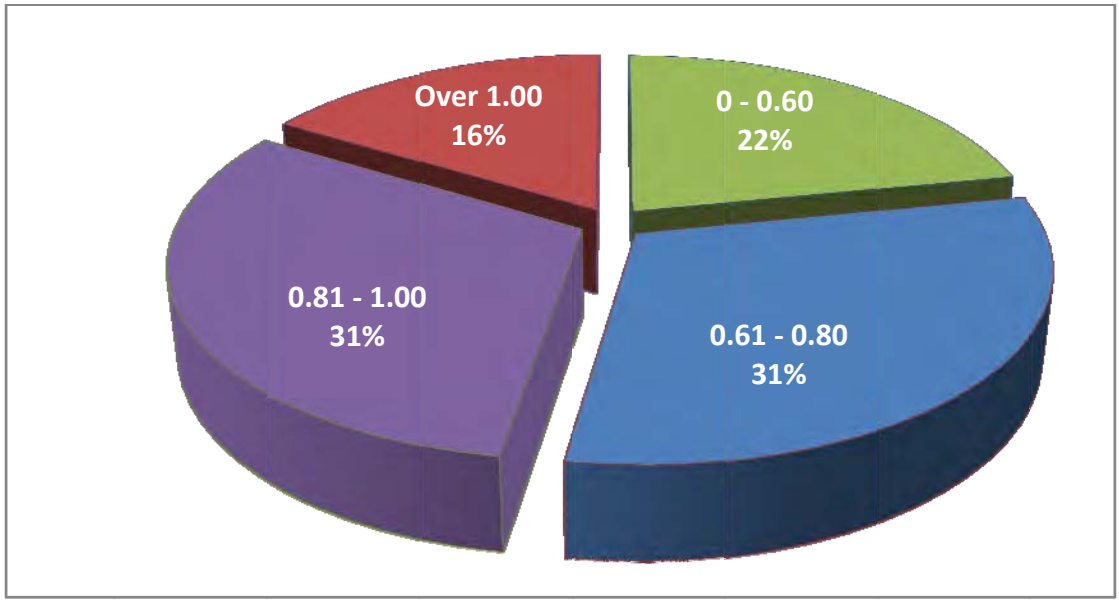
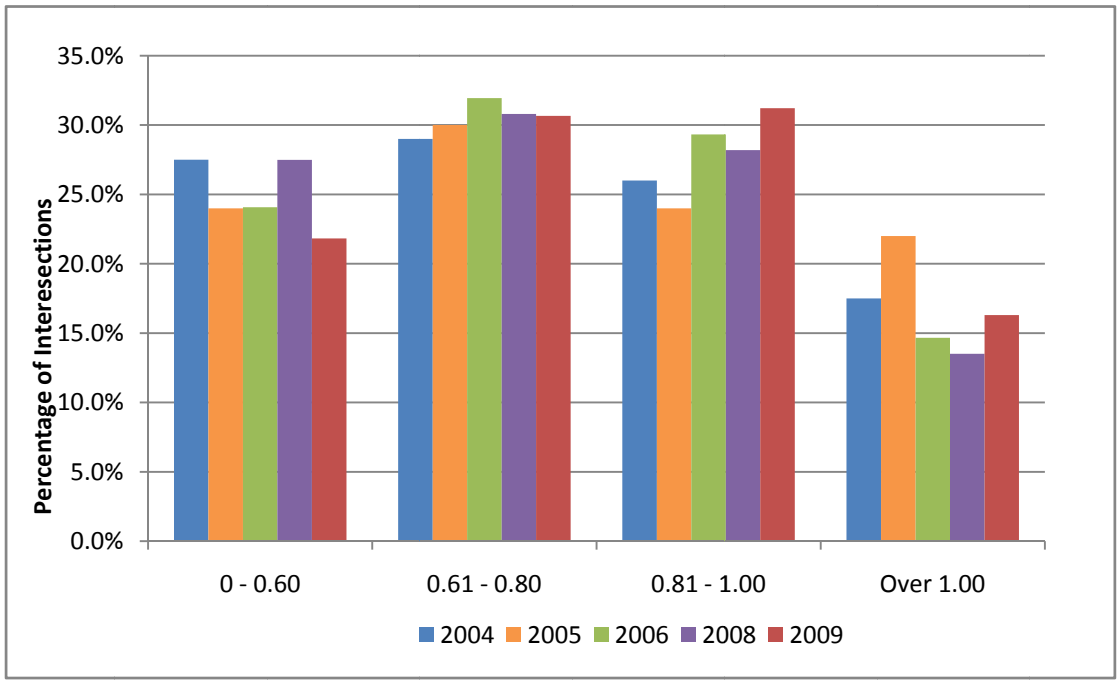


Figure 2.3 illustrates the current allocation of intersections by CLV/LATR ratio class in comparison with data from previous HMR sample sets. It is worth noting, as evidenced in Figure 2.3, that although more intersections exceed the LATR standard in the 2009 sample than the 2008 data set, analysis in 2005 yielded ratios similar to those in the current 2009 data sample.

Figure 2.3: Year to Year Comparison of CLV/LATR Ratios



Review of LATR Standards

Current LATR standards for CLV counts are listed in table 2.1. These standards reflect the approved figures in the 2007-2009 Growth Policy as adopted by the County Council on November 13, 2007. Rankings of CLV in the standard reflect the County's policy of concentrating growth in areas with existing transit and infrastructure such as the Central Business Districts of Silver Spring and Bethesda and limiting growth outside of urban areas.

Table: 2.1: LATR Congestion Standards

Congestion (CLV) Standard	Policy Area
1350	Rural Areas* (Poolesville, Goshen, Patuxent, Darnestown / Travilah)
1400	Damascus*
1425	Clarksburg*, Germantown East*, Germantown West*, Montgomery Village/Airpark*
1450	Cloverly*, Gaithersburg City, North Potomac*, Olney*, Potomac*, R&D Village*
1475	Aspen Hill*, Derwood, Fairland/White Oak*
1500	Rockville City
1550	North Bethesda
1600	Bethesda / Chevy Chase, Kensington / Wheaton, Silver Spring / Takoma Park, Germantown Town Center
1800	Bethesda CBD, Friendship Heights CBD, Glenmont, Grosvenor, Shady Grove, Silver Spring CBD, Twinbrook, Wheaton CBD, White Flint

* LATR standard tightened with the approval of the FY07-09 Growth Policy

10 Most Congested Intersections

Table 2.2 lists the 10 most congested intersections in the County in 2009. As with previous HMR reports, there has been shuffling in the ranking of intersections within the highest CLV counts in the County. Four intersections from the 2008 top ten list appear in this year's most congested ranking, two were in the top 20 in 2008 and the remaining four intersections in this year's list were ranked higher than 60 in both the 2008 and 2006 report. The intersections in the 2009 listing are also more concentrated along established congested corridors (discussed later in this document) than in previous years. The locations of these intersections can be seen in Figure 2.4 .

Table 2.2: Most Congested Intersections for 2009

Ranking			INTERSECTION NAME	COUNT DATE	CLV	LATR STD.	Policy Area
2009	2008	2006					
1	6	*	Shady Grove Rd at Midcounty Hwy	3/5/2008	1894	1475	Derwood
2	*5*	*2*	*Rockville Pike at W Cedar Ln*	*1/7/2008*	*1883*	*1600*	*Bethesda/Chevy Chase*
3	10	*	Randolph Rd at New Hampshire Ave	3/26/2009	1834	1500	Fairland/White Oak
4	*	*	Connecticut Ave at Plyers Mill Rd	4/28/2009	1825	1600	Kensington/Wheaton
5	*18*	*12*	*Georgia Ave at Norbeck Rd*	*1/22/2009*	*1816*	*1500*	*Aspen Hill*
6	*	*	MD 355 at Edmonston Dr	3/12/2008	1810	1500	Rockville City
7	*	*	Connecticut Ave at Randolph Rd	1/8/2008	1804	1600	Kensington/Wheaton
8	*11*	*22*	*Veirs Mill Rd at Twinbrook Pkwy*	*2/3/2009*	*1771*	*1550*	*North Bethesda*
9	*4*	*7*	*Connecticut Ave at Jones Bridge Rd*	*3/19/2009*	*1769*	*1600*	*Bethesda/Chevy Chase*
10	*	*	Rockville Pike at East-West/Old G'town	2/6/2007	1745	1800	Bethesda CBD

* Unranked either because data was unavailable or CLV did not exceed standard

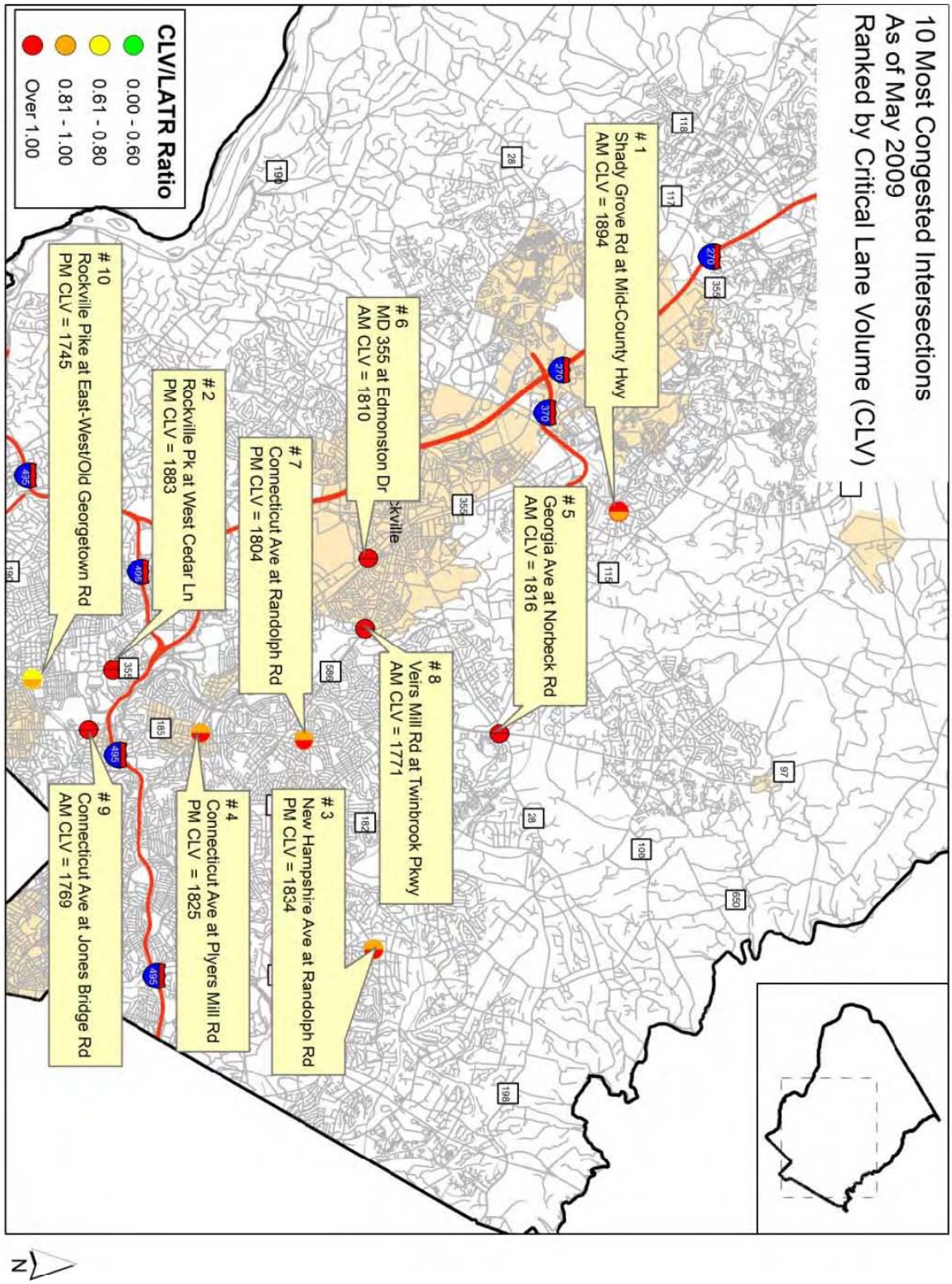
Comments (by rank) for Table 2.2 entries in italic font are listed below:

- Intersection #2: Grade separated interchange is recommended in the master plan; intersection is one of several to be improved as part of the BRAC process – construction is scheduled to begin in summer/fall 2010
- Intersection #5: Plans for a grade separated interchange at this location are part of the state Consolidated Transportation Plan. Engineering is underway although construction funds have been deferred.
- Intersection #8: Intersection improvements are in the design phase.
- Intersection #9: Slated for improvements as part of the BRAC process – construction is scheduled to begin in summer/fall 2010

The intersections are ranked by CLV and not CLV/LATR ratio because the CLV is a better determinant of congestion throughout the County. For example, an intersection with a CLV of 1500 is generally considered to be congested regardless of policy area, but would not have a high CLV/LATR ranking in a Central Business District where the LATR standard is 1800. Intersections new to the top ten list in 2009 are described in more detail below:

- Connecticut Avenue (MD 185) at Plyers Mill Road (#4) : This intersection is the first of two along MD 185 in the Kensington/Wheaton Policy Area, and is a new count in the database. Changes at this location are also associated with Kensington Sector Plan efforts.
- Rockville Pike (MD 355) at Edmonston Drive (#6) : This intersection is just south of Rockville Town Center and is likely a recipient of volume related to ongoing construction in the area. The most recent count here was in 2004 where the CLV was 1590. Edmonston Drive serves as a connection for those that cross between Veirs Mill Road to Wooton Parkway, and may serve as a work around for those wishing to avoid delays at First Street or Veirs Mill Road.
- Connecticut Avenue (MD 185) at Randolph Road (#7) :This is the second of the top ten intersections on MD 185 in the Kensington/Wheaton Policy Area. The most recent CLV for this location is 2004 when the figure was 1631, just above the LATR standard.
- Rockville Pike (MD 355) at East-West Highway (MD 410)/Old Georgetown Road (#10) : This intersection is within the Bethesda CBD and was last counted in 2007. This intersection was not on the top ten list in 2008 because its CLV did not exceed the LATR standard. The CLV at this location is high, however, and the intersection would have been ranked among the top twenty intersections in 2008 if rank was based on solely on the basis of the CLV figure.

Figure 2.4: Map of the 10 Most Congested Intersections



Tables 2.3 and 2.4 rank the next 55 intersections in the MNCPPC Traffic Count Database by CLV. A majority of these intersections have CLV values that are above their LATR standard. Although the standard is a key planning tool, many intersections appear to be congested despite having a CLV below the standard. Many of these intersections are part of master planned studies, or have ongoing construction to improve their performance. Notes pertaining to these construction projects are listed below the associated table.

Table 2.3: Intersections with CLV Ranked 11-30

Ranking							
2009	2008	2006	INTERSECTION NAME	COUNT DATE	CLV	LATR STD.	Policy Area
11	*	*	E Gude Dr at Crabbs Branch/Cecil	3/24/2009	1742	1475	Derwood
12	55	23	Georgia Ave at Emory Ln	10/23/2007	1738	1450	Olney
13	*	39	Hungerford Ln (MD 355) at Gude Dr	5/6/2009	1723	1500	Rockville City
14	*	*	Rockville Pike at Jones Bridge/Center	5/6/2009	1714	1600	Bethesda/Chevy Chase
15	47	61	Shady Grove Rd at Epsilon/Tupelo	2/11/2009	1704	1475	Derwood
16	40	58	Frederick Rd at Montgomery Village Ave	5/5/2009	1697	1450	Gaithersburg City
17	8	14	Connecticut Ave at East West Hwy	4/16/2009	1693	1600	Bethesda/Chevy Chase
18	*	58	E Gude Dr at Southlawn Ln	3/5/2009	1692	1500	Rockville City
19	*	*	Wisconsin Ave at Bradley Blvd	11/9/2006	1681	1800	Bethesda CBD
20	*	32	Piney Branch Rd at Philadelphia Ave	1/21/2009	1680	1600	Silver Spring/Takoma Park
21	*	12	Colesville Rd at University Blvd (S)	1/22/2009	1680	1600	Kensington/Wheaton
22	26	*	Key West Ave at Broschart/Diamondback	10/3/2007	1666	1475	R&D Village
23	27	*	Montrose Rd at Tower Oaks Blvd	11/14/2006	1663	1550	North Bethesda
24	*	*	Bradley Blvd at Wilson Ln	3/12/2009	1660	1600	Bethesda/Chevy Chase
25	*	*	River Rd at Falls Rd	3/31/2009	1657	1475	Potomac
26	2	*	Georgia Ave at Randolph Rd	3/31/2009	1657	1800	Glenmont
27	*	*	Frederick Rd at Shady Grove Rd	3/10/2005	1649	1800	Shady Grove
28	*	*	Colesville Rd at Dale Dr	2/26/2009	1645	1600	Silver Spring/Takoma Park
29	1	3	Great Seneca Hwy at Muddy Branch Rd	4/15/2009	1647	1450	Gaithersburg City
30	28	25	Key West Ave at Shady Grove Rd	9/25/2007	1640	1500	Rockville City

Comments (by rank) for Table 2.3 entries in italic font are listed below:
#17 Connecticut Ave. at East West Highway: Capacity improvements were made in 2006. 2009 CLV is down by approximately 150 from 2008.
#26 Georgia Avenue at Randolph Road: This was the second most congested intersection in the 2008 HMR. The 2009 CLV is down significantly from 2008. A new interchange at this location is in the engineering stage with the State Highway Administration.
#29 Great Seneca Highway at Muddy Branch Road: Operational improvements along Great Seneca Highway may have influenced the 2009 CLV.

Table 2.4: Intersections with CLV Ranked 31-65

Ranking							
2009	2008	2006	INTERSECTION NAME	COUNT DATE	CLV	LATR STD.	Policy Area
31	15	21	Old Georgetown Rd at Tuckerman Ln	1/22/2009	1640	1550	North Bethesda
32	29	57	Columbia Pike at Fairland Rd	9/6/2007	1636	1500	Fairland/White Oak
33	*	*	Montgomery Village Ave at Stedwick	10/4/2007	1633	1450	Montgomery Village/Airpark
34	*	*	Ridge Road at Skylark Rd	4/16/2009	1629	1350	Goshen
35	*	*	Georgia Ave at Forest Glen Rd	7/2/2008	1626	1600	Kensington/Wheaton
36	32	11	Colesville Rd at Sligo Crk Pkwy/St Andre	3/6/2008	1624	1600	Silver Spring/Takoma Park
37	31	44	Georgia Ave at Columbia Blvd/Seminary Ln	1/8/2009	1613	1600	Silver Spring/Takoma Park
38	20	*	Norbeck Rd at Muncaster Mill Rd	1/29/2009	1609	1500	Aspen Hill
39	33	27	Connecticut Ave at Veirs Mill Rd	6/6/2007	1607	1600	Kensington/Wheaton
40	34	60	Columbia Pike at Greencastle Rd	11/15/2006	1607	1500	Fairland/White Oak
41	12	15	Veirs Mill Rd at First St	3/5/2009	1605	1500	Rockville City
42	*	33	Columbia Pike at Lockwood Dr	4/2/2009	1603	1500	Fairland/White Oak
43	*	*	Randolph Rd at Parklawn Dr (W)	2/11/2009	1601	1550	North Bethesda
44	36	5	Columbia Pike at Southwood	3/5/2008	1601	1600	Kensington/Wheaton
45	35	52	First St at Baltimore Rd	1/22/2009	1601	1500	Rockville City
46	*	*	Democracy Blvd at Falls Rd/S Glen Rd	4/1/2009	1594	1475	Potomac
47	*	*	New Hampshire Ave at Oakview	1/24/2006	1591	1600	Silver Spring/Takoma Park
48	*	12	Colesville Rd at University Blvd (N)	9/13/2006	1589	1600	Kensington/Wheaton
49	*	*	Rockville Pike at Tuckerman Ln (N)	5/10/2005	1586	1800	Grosvenor
50	*	*	Muncaster Rd at MD 108	3/11/2009	1579	1400	Patuxent
51	*	*	River Rd at I-495 (E)	3/10/2009	1579	1600	Bethesda/Chevy Chase
52	37	*	Layhill Rd at Ednor Rd/Norwood Rd	10/17/2006	1577	1475	Olney
53	*	*	Connecticut Ave at Bradley Ln	3/17/2004	1577	1600	Bethesda/Chevy Chase
54	*	*	East West Hwy at Jones Mill/Beach	3/5/2009	1574	1600	Bethesda/Chevy Chase
55	24	34	Colesville Rd at Franklin Ave	2/3/2009	1571	1600	Silver Spring/Takoma Park
56	16	28	Norbeck Rd at Bauer Dr	1/21/2009	1571	1500	Aspen Hill
57	38	*	Muddy Branch Rd at Diamondback Dr	10/9/2007	1563	1450	Gaithersburg City
58	*	*	River Rd at Wilson Ln	4/23/2009	1563	1600	Bethesda/Chevy Chase
59	*	*	River Rd at Bradley Blvd	1/24/2008	1562	1475	Potomac
60	41	*	Parklawn Dr at Boiling Brook Pkwy	9/12/2006	1554	1550	North Bethesda
61	31	44	Georgia Ave at Seminary	6/11/2008	1544	1600	Silver Spring/Takoma Park
62	*	*	Frederick Rd at Redland Rd	10/19/2004	1542	1800	Shady Grove
63	42	50	Georgia Ave at Connecticut Ave	5/31/2006	1539	1500	Aspen Hill
65	3	3	Frederick Rd (MD 355) at King Farm Blvd	1/6/2008	1538	1800	Shady Grove

Comments (by rank) for Table 2.3 entries in italic font are listed below:
#32: Columbia Pike at Fairland Road: A new interchange at this location is in the engineering stage
34 Columbia Pike at Greencastle Road: Master plan recommended grade separated interchange is in the engineering stage but is on hold due to funding constraints
#41 Veirs Mill Road and First Street: Intersection capacity improvements are in the planning phase
#56 Norbeck Road and Bauer Drive: Intersection improvements are currently recommended in the master plan

Significant progress has already been made at a number of the county's congested intersections. Comparisons with previous CLV counts illustrate the impact of recent infrastructure improvements. Table 2.5 lists those intersections where the most recent CLV decreased when compared with previous counts. The largest of these decreases was observed at the intersection of Rockville Pike (MD 355) Pooks Hill Road. At this location, improvements by the State Highway Administration helped to decrease the CLV by more than 35 percent between 2004 and 2009. Other notable interchange improvements are noted in Table 2.5.

Table 2.5: Intersections with a Decrease in CLV greater than 15% Between 2006 and 2009

INTERSECTION NAME	CLV	COUNT DATE	Previous CLV	Previous Count Date	PCT CHG	COMMENTS
Rockville Pike (MD 355) at Pooks Hill Rd	1248	2/24/2009	1923	6/8/2004	-35.1%	SHA improvements associated with Beltway ramps
Frederick Rd (MD 355) at Indianola/Watkins Pond	1040	2/11/2009	1421	6/6/2007	-28.9%	Traffic patterns may be affected by ICC construction activity
Great Seneca Highway (MD 119) & Muddy Branch	1647	5/12/2009	2179	3/5/2008	-29.1%	
Montgomery Village Ave at Russell Ave	1218	4/22/2009	1755	3/6/2008	-30.6%	
Ridge Rd (MD 27) at Observation Dr	1065	3/29/2007	1433	1/6/2005	-25.7%	There was an intersection improvement after the 2005 count.
Norbeck (MD 28) at Bel Pre Rd	1464	1/8/2008	1834	5/31/2006	-20.2%	
Norbeck (MD 28) at Avery Rd	1511	1/8/2008	1815	10/12/2005	-16.8%	
Rockville Pike (MD 355) at Congressional Ln	1282	1/14/2009	1538	6/3/2004	-16.6%	Traffic patterns may be affected by Montrose Parkway and MD 355 interchange construction
Darnestown Rd (MD 28) at Darnestown-Germantown Rd (MD 118)	1077	3/31/2009	1291	10/5/2005	-16.6%	
Darnestown Rd (MD 28) at Muddy Branch Rd	1417	1/21/2009	1697	10/23/2007	-16.5%	Intersection improvements in 2006 may take a couple of years to see the results of the lowered traffic patterns.
New Hampshire Ave (MD 650) at Lockwood Dr	1151	6/3/2008	1353	3/23/2006	-14.9%	Intersection capacity improvement completed in '06.

Table 2.6 identifies those with the largest percent increases in CLV when compared with previous data. Intersections with CLV increases are located in several policy areas throughout the County. Some of these increases are not surprising given that the previous count is significantly older. All previous counts are at least two years old, and one is five years old. Changes in development and infrastructure projects near these intersections are likely the cause of most of the increase in CLV.

Table 2.6: Intersections with an Increase in the CLV of more than 15% Between 2006 and 2009

INTERSECTION NAME	CLV	COUNT DATE	Previous CLV	Previous Count Date	PCT CHG	COMMENTS
Redland Rd at Somerville	1092	2/25/2009	765	6/6/2007	42.8%	Traffic patterns may be affected by ICC construction activity
Rockville Pike (MD 355) at Security Ln	1295	8/14/2008	994	3/8/2005	30.3%	
E Gude at Crabbs Branch Rd	1742	3/24/2009	1395	10/27/2005	24.9%	
Hungerford Dr at Beall St	1197	9/16/2008	965	10/14/2004	24.0%	Changes due to Rockville Town Center
Piney Branch At Philadelphia Ave	1680	1/21/2009	1363	12/19/2007	23.3%	
Randolph Rd at Parklawn Dr (W)	1601	2/11/2009	1332	6/1/2005	20.2%	Traffic patterns may be affected by Montrose Parkway and MD 355 interchange construction
Georgia Ave (MD 97) at Emory Ln	1738	10/23/2007	1461	6/1/2006	19.0%	Impact at this intersection was to be addressed with restriping of the eastbound Emory Lane approach.

Intersection Volume Analysis

Even the most congested intersections in the County are uncongested during some times of the day or night. One congestion management tool is to encourage the distribution of traffic away from the busiest hour to adjacent hours (often described as "the shoulder of the peak"). This strategy, often described as "peak-spreading", increases efficiency in the utilization of a scarce resource, in this case roadway pavement, by spreading the demand over time. Travel demand management strategies such as flex-time at the workplace and congestion pricing (already in place in the Metrorail system and being implemented on the Intercounty Connector) help achieve this efficiency.

However, flex time strategies are only effective if there is available capacity outside of the peak hour to accommodate the temporal shift in demand. The analysis of travel demand within the three-hour AM and PM peak periods indicates that the peak hour is a bit longer than one hour, but that

- peak period capacity remains available during the shoulder hours, and
- the peak hour remains within the three-hour peak periods designated by County policy.

In addition to the CLV figures discussed in the previous sections, information about volume is also contained within the MNCPPC intersection database. Traffic volume data includes information not just about overall congestion, but also, when viewed in relation to time, the duration and temporal patterns of traffic at a given intersection.

The volume patterns of 2009 traffic counts at three intersections are depicted in Figure 2.5 below. The intersections represent distinct conditions in the County. Middlebrook Road and Observation Drive is in Germantown between I-270 and Frederick Road (MD 355), New Hampshire Avenue (MD 650) and Randolph Road is north of I-495 in White Oak, and Connecticut Avenue (MD 185) and East West Highway (MD 410) is inside I-495 in Bethesda-Chevy Chase.

The traffic volumes at Observation Drive and Middlebrook Road exhibit characteristics of intersections farther from employment centers, with an AM peak before 8:00 am. The other two intersections in the graph are closer to employment centers and illustrate weekday morning volumes with a peak period between 8:00 and 9:00 am.

The derivation of the percentage of peak period travel during the peak hour is demonstrated in Figure 2.5. Each intersection in Figure 2.5 exhibits similar but distinct evening rush characteristics. Generally, the volume curves for the afternoon peak period exhibit a flatter shape than the morning curves, and contain several peaks with similar volumes. Table 2.7 provides a comparison of traffic volumes at these three intersections.

Figures 2.6 and 2.7 illustrate the relationship between volume and peak hour in the morning and afternoon for signalized intersections included in 2009 counts. The peak hour ratio is the ratio of the highest one hour volume at a given intersection to the total volume during the three hour peak period. There does not seem to be a relationship between CLV and peak hour. That is, congested intersections (with a higher CLV value) do not have distinct temporal patterns of volume, nor do those that are less congested. What is evident from the peak hour graphs is that volume is more evenly distributed in the afternoon peak hours than it is in the morning.

A peak hour ratio of 0.33 would reflect an even distribution of demand across all three hours in the peak period; peak hour ratios lower than 0.33 are not possible. Conversely, a peak hour ratio of 0.50 would indicate that the busiest hour handles as much traffic as the other two hours combined; none of the intersections sampled have so uneven a temporal demand pattern.

In the morning peak period, between 37% and 41% of the peak period traffic occurs in the peak hour at most intersections. Demand is more evenly spread out during the evening peak period, with most intersections having between 35% and 39% of the peak period traffic during the peak hour.

Conventional wisdom suggests that those intersections that are most congested would have a lower peak hour ratio as demand in excess of peak hour capacity would “spill over” into adjacent hours. The fact that there is no observed relationship between the intersection CLV and the peak hour ratios indicates that motorist travel patterns are not significantly affected by delays at individual intersections, but rather are determined by broader travel needs that demonstrate some peak spreading likely due both to regional network constraints and to independent travel needs.

CLV and intersection volume data are useful for identifying levels of congestion and evaluating temporal patterns of traffic at signalized intersections. However, these data do not necessarily describe the issue of congestion at the link or roadway segment level. In some cases, an intersection may be performing at an acceptable level relative to the LATR standard. However, if the intersection approach volumes are being impeded or diminished because of reduced mobility along the approaching links, then the issue of congestion can be attributed to conditions along the link. The next section of this report discusses the results of GPS travel time and speed runs samples that were collected in February and March of 2009 in support of this document. This type of traffic monitoring data is needed in order to assess the location, extent, duration, intensity, and relative magnitudes of observable congested conditions along roadway links.

Figure 2.5: Diurnal Analysis of Traffic Volume at Three Signalized Intersections

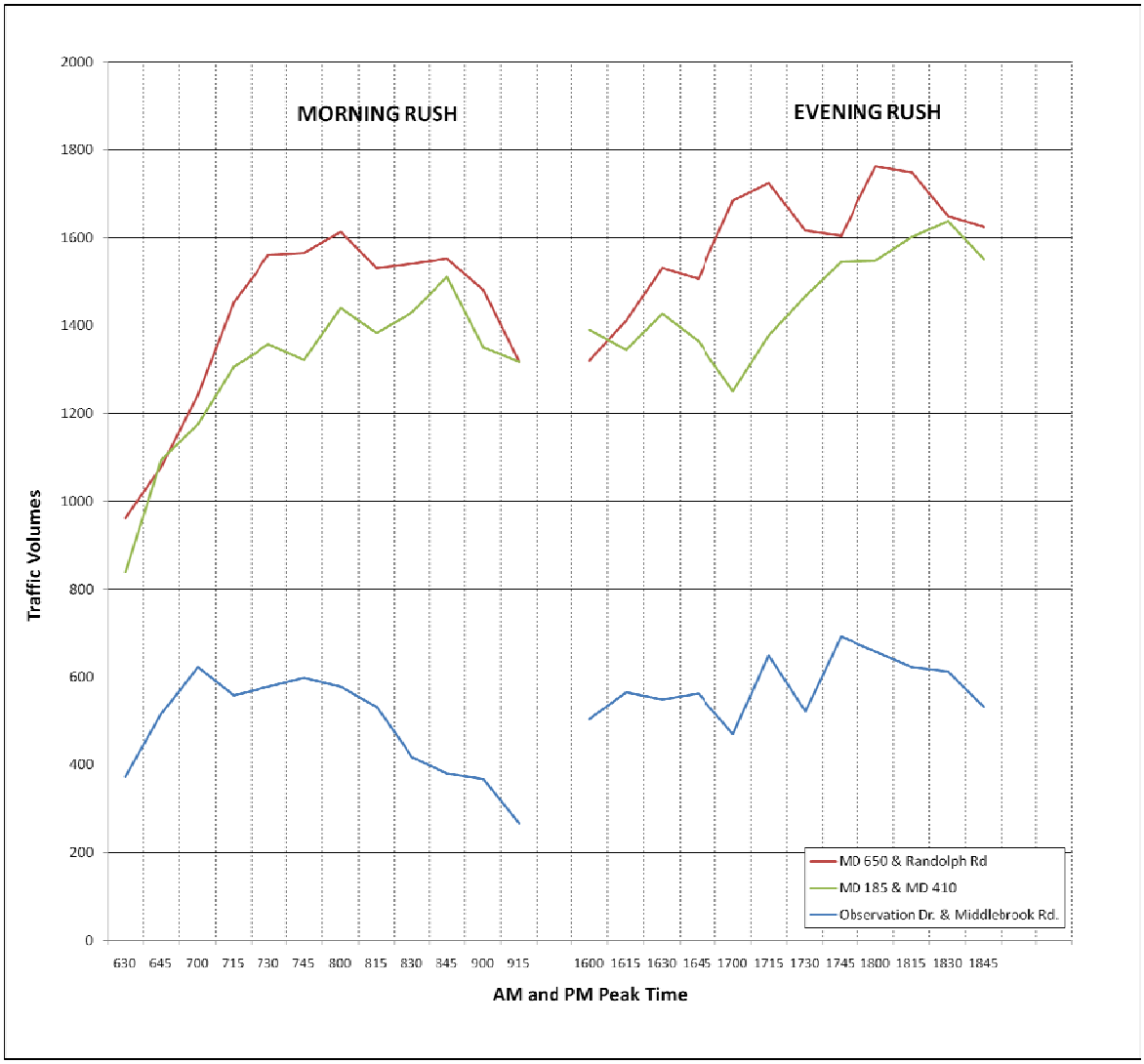


Table 2.7: PM Peak Volume Analysis

Intersection	Total PM Peak Volume	Busiest PM Hour (Four Successive 15 Minute Intervals)	Busiest PM Hour Volume	Busiest Hour Volume as % of Total PM Peak Volume
MD 650 & Randolph Rd.	19,200	5:45 – 6:30	6,800	35%
MD 185 & MD 410	17,500	5:30 – 6:15	6,200	36%
Observation Dr. & Middlebrook Rd.	6,900	5:15 – 6:00	2,573	37%

Figure 2.6: AM Peak Hour Ratios for Traffic Counts at Signalized Intersections in 2009

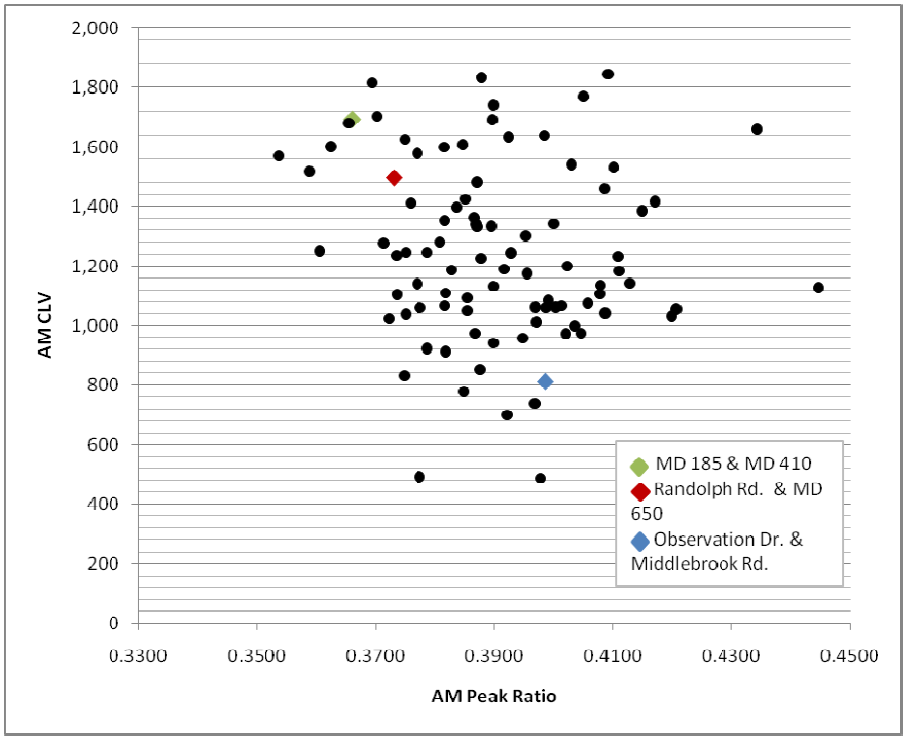
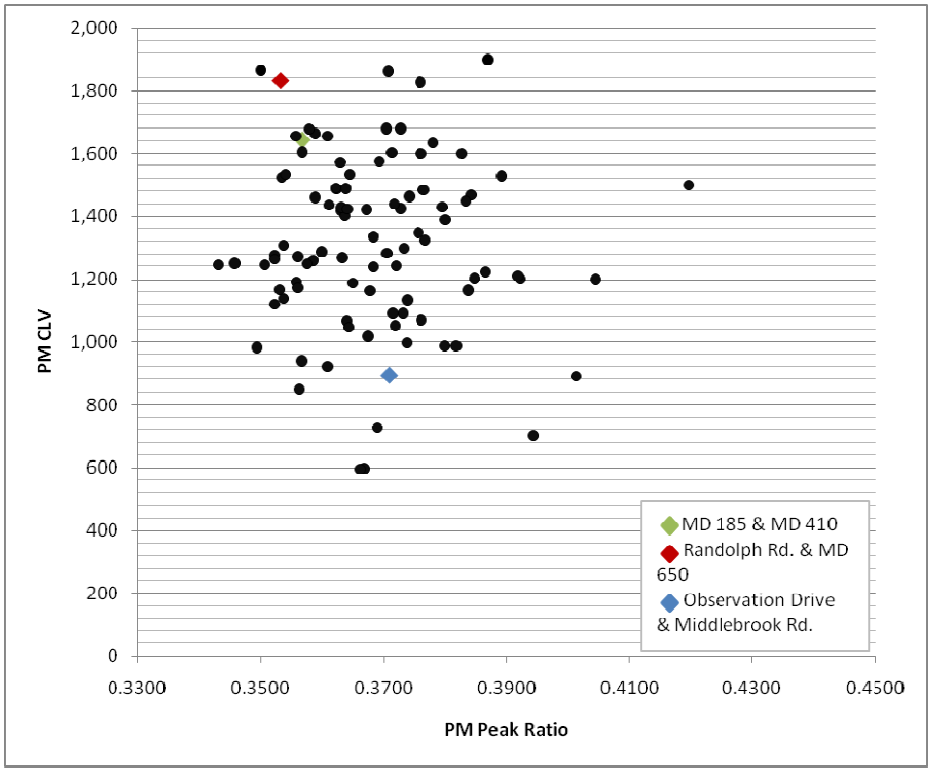


Figure 2.7: PM Peak Hour Ratios for Traffic Counts at Signalized Intersections in 2009



Arterial Travel Times and Speeds

Selected Priority Analysis Corridors

Staff initially summarized results for corridors that were determined to be the "priority analysis corridors". The priority analysis corridors were selected based on their: (1) degree of interest and visibility to the public and elected officials, (2) location and history of congested conditions, and/or (3) relevance to current or future planning studies. In addition to the five corridors included in the 2008 report, the 2009 analysis described in this document also includes Veirs Mill Road (MD route 586). The complete list of Priority Corridors included in the 2009 study is as follows:

1. Wisconsin Ave/Rockville Pike/Hungerford Dr/Frederick Rd (MD 355)
2. Georgia Ave (MD 97)
3. Veirs Mill Road (MD 586)
4. Norbeck Rd (MD 28)/ Spencerville Rd (MD 198)
5. Colesville Rd/Columbia Pike (MD 384/US 29)
6. Connecticut Ave (MD 185)

With two exceptions, travel along the full length of each corridor was collected in a distinct data set. The long corridors of MD 355 and MD 97 were parsed into segments (three and two respectively) to facilitate analysis for roadways with consistent conditions and allow graphic representations of congested areas in a manageable scale. The 2008 report includes analysis of 2007 travel time data which was collected in smaller segments by Policy Area. Although Policy Areas are useful boundaries for analysis, it was determined that longer segments are best for corridor analysis, so longer segments were used in 2009 field work.

Discussion of results from the 2009 measurements along these corridors is accompanied by graphics which illustrate comparative speed, historical analysis and geographic parameters of travel time along each corridor. A detailed discussion of the sampling approach and methodology used for the purposes of this report can be found in Appendix 4.3. Datasets for PM peak period weekday conditions along each corridor are depicted three ways in this report.

1. **Corridor Maps**: Corridor maps highlight key areas of congestion and depict the slowest movements (e.g. north-south or east-west) along each corridor. Corridors are grouped by area into two maps, one for the Priority Corridors, and another for the up-county or I-270 corridor.

2. **Travel Time Versus Distance Profiles**: These graphs show where along a corridor congested conditions were found as well as the intensity and extent of those congested conditions. The profiles compare various measurements along each corridor, typically in the direction of slowest movement (northbound for most segments). The colors of each point along each line, the trajectory of the probe vehicle, indicate the speed range of the probe at that point (green is faster while yellow, red and browns are incrementally slower). The slope of the line between any two points along the trajectory gives the average speed between those points. Thus stopped traffic is shown by vertical lines.

3. **Travel Time Versus Time of Day Graphs**: These graphs show the results of several independent samples and indicate when during the day the faster and slower travel times were observed. When feasible, historical data is compared with 2009 data samples to compare travel time on each corridor at each of the recorded starting times. As noted previously, 2007 samples were collected at the Policy

Area level. In order to make comparisons along the full length of the longer 2009 samples, several 2007 trajectories were combined obtain samples of equal length. Each of these graphs also provides a view of all recorded travel time samples in the peak direction for a given corridor, highlighting peak travel times.

Arterial Mobility

Although each corridor is unique, travel conditions between roadways can be compared using a calculated measure called "Arterial Mobility". Arterial Mobility is expressed as the ratio (expressed here as a percentage) of the slowest travel time along a given corridor to the speed limit travel time for that same corridor. Arterial Mobility data can also help to provide a means of comparison between samples on a given roadway from year to year. The County's Growth Policy assigns Level of Service (LOS) letter-grades to Arterial Mobility based on the urban street delay level of service in the 2000 Highway Capacity Manual published by the Transportation Research Board. Arterial LOS A (the best grade) conditions occur if the congested travel speed is at least 85 percent of the free flow travel speed. Arterial LOS F conditions occur when the congested speed is less than 25 percent of the free flow speed. At LOS F conditions, travel during congested times of day takes more than four times the amount of time than travel at free flow speeds.

LOS A represents the best system performance for the customer. However, the highest levels of throughput occur at LOS E, which means it is the most efficient use of the transportation resource. The County's current Growth Policy requires area wide conditions to be LOS D or better, although this area wide policy recognizes that individual roadway segments will operate worse than the standard.

Table 2.8 ranks sections of the six priority corridors by their respective mobility ranking.

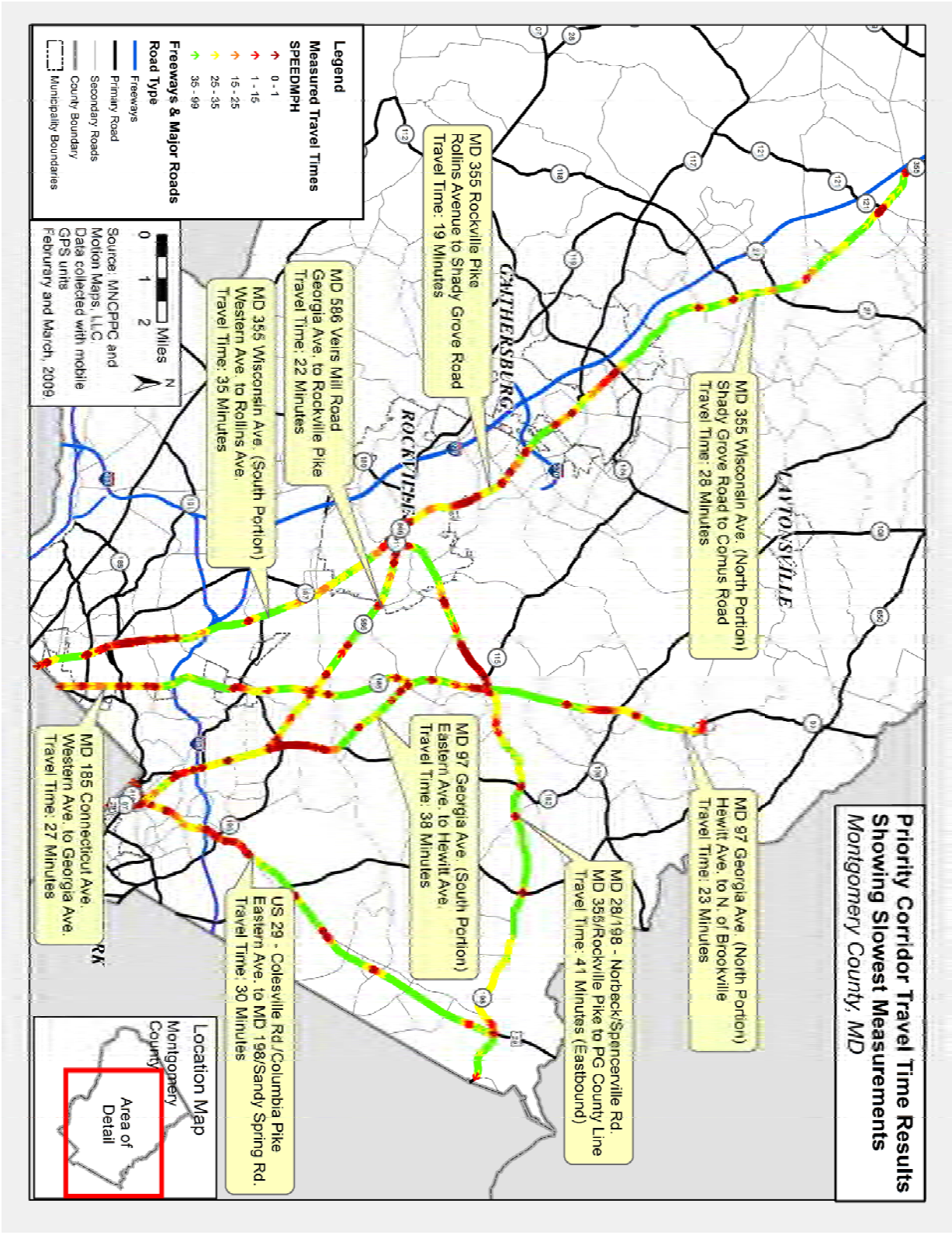
Among travel time samples for 2009, Frederick Road (the northernmost portion of MD 355) has the highest Arterial Mobility rating at 62 percent, a 15 percent increase from 2007 samples. The southern portion of Georgia Avenue (MD 97) had the lowest Arterial Mobility figure at 29 percent, just two percent lower than 2007 samples. Overall comparisons of the 2007 and 2009 samples reveals that change in Arterial Mobility was evenly mixed among the priority corridors; four corridors increased their arterial mobility, two corridors had little change (less than 3 percent) and three corridors had 2009 Arterial Mobility figures less than 2007.

The PM peak survey results (in the peak direction) are shown in Figure 2.8 and discussed in the following paragraphs for the six corridors measured in the 2009 study.

Table 2.8: Arterial Mobility Measures for Priority Corridors

Route	Direction	From	To	Travel Time (Min.) Slowest 2009 Travel Time	Travel Time @ Speed Limit	2009 Arterial Mobiltiy	2009 LOS	2007 Arterial Mobility	Percent Change
MD 355	NB	Shady Grove Road	Comus Rd.	27.68	17.28	**62.4%**	**C**	54.2%	15.3%
MD185	NB	Western Ave	MD 97	26.73	13.82	**51.7%**	**D**	36.4%	42.0%
MD 28/198	EB	Rockville Pike	PG County Line	41.30	20.92	**50.6%**	**D**	57.9%	-12.5%
MD355	NB	Rollins Ave.	Shady Grove Road	19.30	9.45	**49.0%**	**D**	55.3%	-11.5%
MD 97	NB	Hewitt Ave.	N. of Brookville	22.92	11.15	**48.7%**	**D**	41.6%	17.0%
MD 384/US 29	NB	Eastern Ave.	Sandy Spring Rd.	29.65	12.85	**43.3%**	**D**	35.1%	23.6%
MD586	NB	MD 97	MD 355	22.22	8.07	**36.3%**	**E**	36.3%	0.0%
MD355	NB	Western Ave	Rollins Ave	34.62	12.18	**35.2%**	**E**	45.3%	-22.3%
MD 97	NB	Eastern Ave.	Hewitt Ave.	37.68	10.98	**29.1%**	**E**	29.8%	-2.2%

Figure 2.8: Congestion in Peak Direction (Weekday PM Peak) for 2009 Priority Analysis Corridors



Wisconsin Avenue/Rockville Pike (MD 355) from Western Avenue to Rollins Avenue

Description: The southern portion of MD 355 to Rollins Avenue at the edge of the Rockville City Policy Area is 7.11 miles. Information about travel times along MD 355 through Rockville, and in policy areas north of Rockville follow this section. Approximately one half of this portion of MD 355 lies in the Bethesda/Chevy Chase Policy Area with the balance in the North Bethesda Policy Area. Speed limits range from 25 miles per hour to 45 miles per hour in this segment of Wisconsin Avenue, yielding a travel time at the speed limit of 731 seconds or 12.2 minutes.

2009 Observations: A total of 35 travel time measurements (18 northbound and 17 southbound) were made along this portion of Wisconsin Avenue on Tuesday February 24, 2009. Data was collected with runs beginning at 3:56 pm and continuing through to the last run which departed Western Avenue northbound at 7:41 pm. Travel times ranged from 18.5 minutes for the fastest measurement to 34.6 minutes for the slowest. The slowest recorded time left Western Avenue at about 5:55 pm and experienced delays throughout much of the Bethesda/Chevy Chase Policy Area, particularly north of Bradley Lane. Delays at Montrose Road were also common among northbound samples, with slower trips experiencing delays through to Rollins Avenue. Average speed for this slowest trip was just over 12 miles per hour. Travel time was nearly three times the speed limit travel time for the segment, while the Arterial Mobility was 35.2 percent, (12.2 minutes divided by 34.6 minutes). See the Travel Time versus Distance Comparison graphic for details of where along the corridor congestion was observed and how intense (slow) was the congestion for the representative set of three 2009 observed travel times shown there. A comparison to the slowest 2007 sample is also given in that graph.

Historical Comparison of Travel Times: Among the 2009 priority corridors, the southern section of Wisconsin Avenue/Rockville Pike through Bethesda and North Bethesda is the one that most closely matches 2007 observations. With peak travel time occurring near 5:30 pm, and higher travel times between 4:00 and 5:00 pm when compared to those in the 6:00 to 7:00 hours, the travel time by time of day graph (Figure 2.10) appears to be one shouldered rather than bell curved. The slowest 2009 sample was roughly seven minutes longer than the slowest 2007 sample, but both experienced similar patterns of delay. The increased number of samples in between the peak 5:30 to 6:30 pm hour in 2009 reduced the Arterial Mobility measure for this portion of MD 355 in 2009 to 45.6 percent in 2007 to 35.2 percent in 2009.

Figure 2.9: Travel Time-Distance Profile for Northbound Wisconsin Ave./Rockville Pike (MD 355)

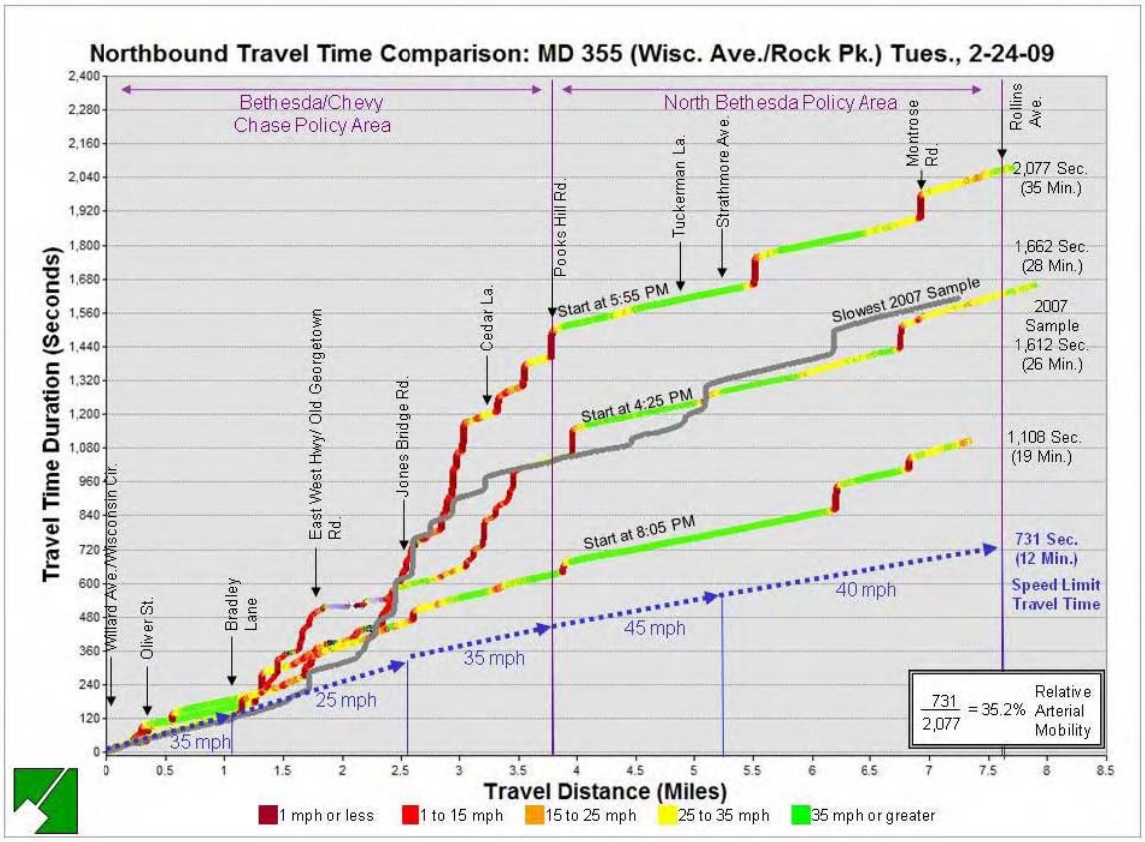
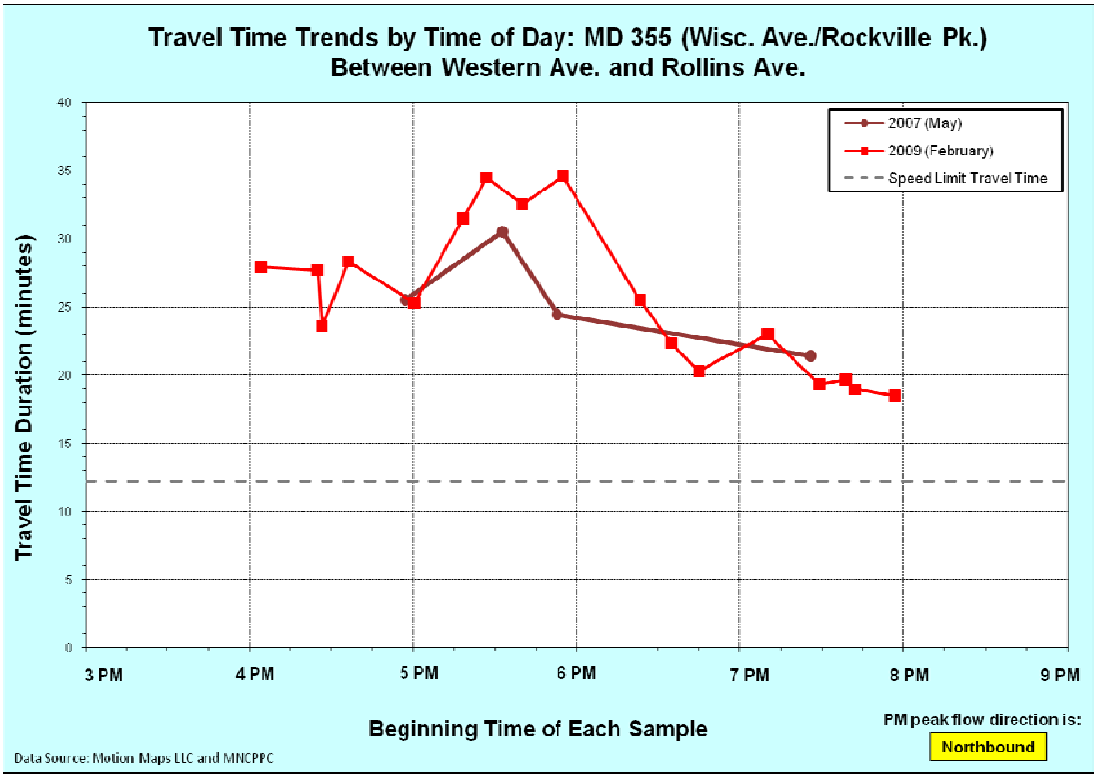


Figure 2.10: Travel Time - Time of Day Profile for Wisconsin Ave./Rockville Pike (MD 355)



Rockville Pike/Hungerford Drive (MD 355) from Rollins Avenue to Shady Grove Road

Description: This portion of MD 355 through Rockville is roughly 5.5 miles long. Speed limits begin at 40 miles per hour and drop to 30 miles per hour at Veirs Mill Road through to Gude Drive where the speed limit returns to 40 miles per hour. The travel time at the speed limit for this section of road in the Rockville City Policy Area is 567 seconds or about 9.5 minutes.

2009 Observations: Eight northbound and eight southbound travel time measurements were recorded along this corridor on Wednesday February 25, 2009. Samples began at 3:49 pm and continued through the eight o'clock hour with the last southbound sample leaving Shady Grove Road at 8:33 pm. Although peak travel during this time is in the northbound direction, northbound and southbound samples recorded very similar travel times throughout the sampling period. The fastest travel time was a northbound sample that began at 7:35 pm with a run time of 653 seconds or 10.9 minutes. The fastest southbound sample was at 7:14 pm and took 724 seconds or just over 12 minutes. The slowest travel time was in the northbound direction beginning at Rollins Avenue at 5:27 pm and lasting 1,158 seconds or 19.3 minutes, nearly twice the estimated speed limit travel time. The inverse, arterial mobility, was 49.0 percent (19.3 minutes divided by 9.5 minutes) . Travel time delays along this portion of MD 355 occurred primarily at Wootten Parkway, and again leading up to Gude Drive. The slowest sample experienced a large queue at Gude Drive, lasting six minutes and extending south from Gude Drive for approximately three quarters of a mile. The fastest travel time observed minor delays at signalized intersections and traveled at speed at the speed limit through much of the corridor.

Historical Comparison of Travel Times: Comparisons with 2007 samples for this portion of Rockville Pike indicate that conditions did not change dramatically over the past two years. The 2009 observations (as depicted in Figure xx) follow a similar curve when compared with the 2007 data. Although the peak travel time is more pronounced in 2009, travel times before 5:00 pm and after 6:00 pm were not slower than those in 2007. The slowest 2007 trip (depicted in figure xx) indicated that moderate delays were more evenly spaced though the sampling distance than those in 2009. Rather than large delays at Gude Drive, 2007 travel was slow before Edmonston Drive, Middle Lane and King Farm Road. Due to the increase in travel time for the slowest trip, Arterial Mobility for this corridor has declined from 55.3 percent in 2007 to 49 percent in 2009.

Figure 2.11: Travel Time-Distance Profile for Northbound Rockville Pike/Hungerford Dr. (MD 355)

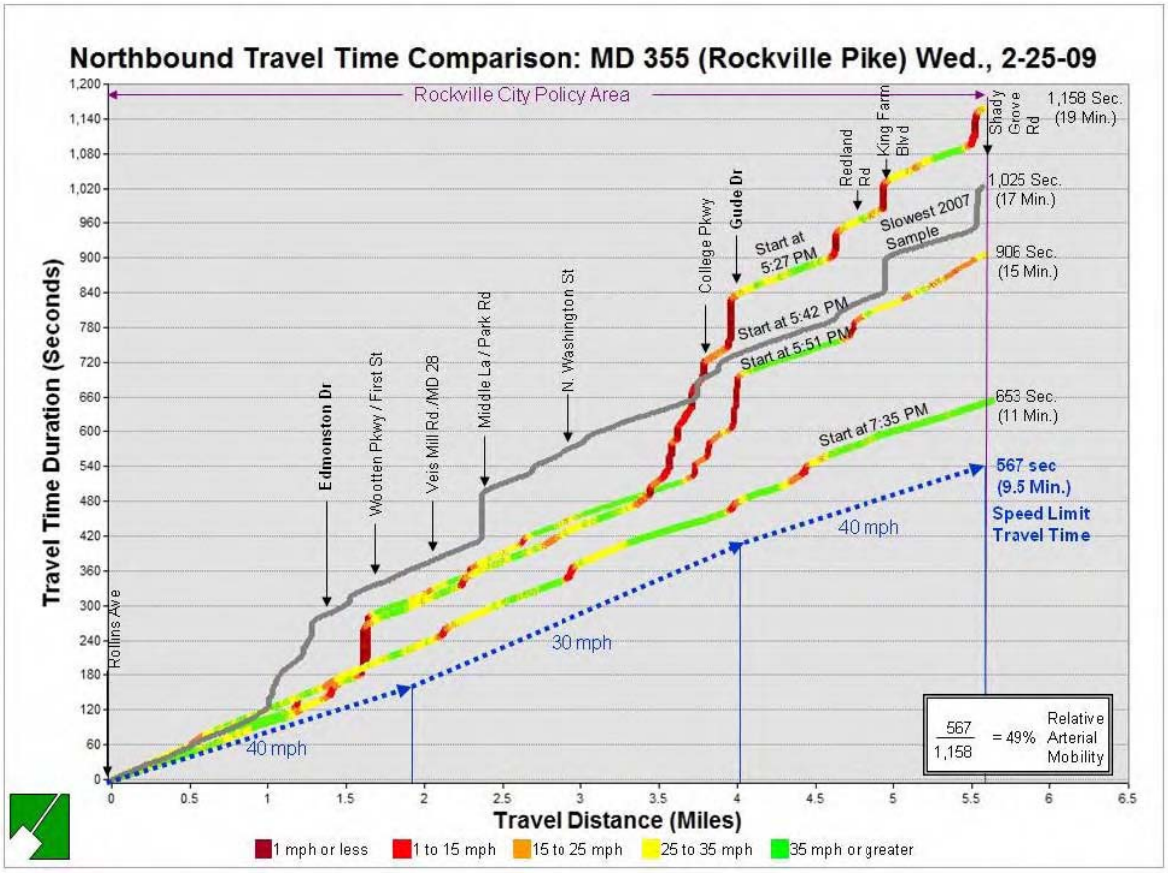
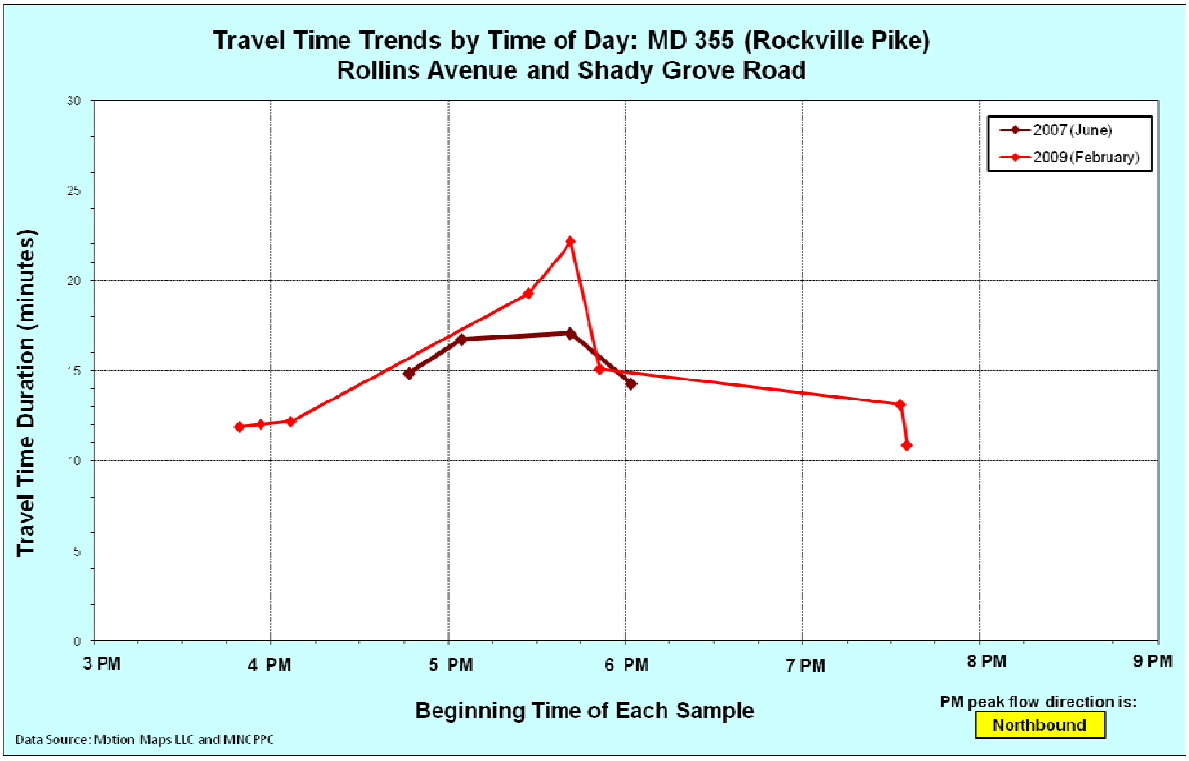


Figure 2.12: Travel Time - Time of Day Profile for Rockville Pike/Hungerford Dr. (MD 355)



Frederick Road (MD 355) from Shady Grove Road to Comus Road

Description: This is the northernmost portion of MD 355 (Frederick Road) that was sampled in 2009. The segment between Shady Grove Road and Comus Raod is 11.3 miles long and is within three Montgomery County Policy Areas, Gaithersburg City, Germantown West and Clarksburg. Each of these policy areas shares about one third of the length of the roadway. Speed limits vary along this portion of Frederick Road from 30 miles per hour up to 50 miles per hour. Calculated travel time at the speed limit is 17.3 minutes.

2009 Observations: Due to a major incident that incurred major delays along the route, travel time samples were recorded on two separate days (Wednesday February 25 and Wednesday March 11). The second set of these samples on March 11 experienced incident free conditions. During the second sample set, 12 northbound and 12 southbound travel time measurements were made. Samples began at 3:56 pm in the northbound direction and concluded with the last southbound trip leaving Comus Road at 6:54 pm. Travel times in the northbound direction (peak) ranged from 21 to 27 minutes, with the slowest trip measured from 6:13 pm at an average speed of 24 miles per hour. The most significant delays in the travel time measurements on March 11 were recorded between Summit Avenue and Montgomery Village Avenue in the Gaithersburg Policy Area. Travel times north of Montgomery Village Avenue moved at speed with minor congestion at Germantown Road and Clarksburg Road, although these delays were not observed in each sample. The incident observed on February 25 affected nearly all samples that day. The following Travel Time vs. Distance graph depicts one of the slowest of these travel times. Large delays are observed leaving Gaithersburg due to the major accident just south of Game Preserve Road for which the police closed all three northbound lanes for nearly four hours and detoured traffic around the incident site. The graphs on the following page show that the incident added about 15 to 20 minutes of delay and the queue extended south about two miles to south of Odenhall Avenue in Gaithersburg, while the downstream traffic in Germantown and Clarksburg was less congested than usual due to the constriction at the incident site.

Historical Comparison of Travel Times: Travel time samples in 2009 were greatly affected by the February 25 incident. The travel time vs. time of day graph on the following page depicts the impact that the delay had on travel samples. Compared with 2007 samples, 2009 measurements on March 11 were faster. Calculated Arterial Mobility for the segment increased from 54 percent in 2007 to 62 percent in 2009. The travel time measurements for this corridor segment depict a pattern that is expected for up-county roadways with an afternoon peak travel time after 6:00 pm, as the earlier rush further south filters up through the road network. Travel times by time of day exhibit a flatter curve than other roadways with a nearly consistent travel time from 5:00 pm through 6:30 pm, rather than a defined peak.

Figure 2.13: Travel Time-Distance Profile for Northbound Frederick Road (MD 355)

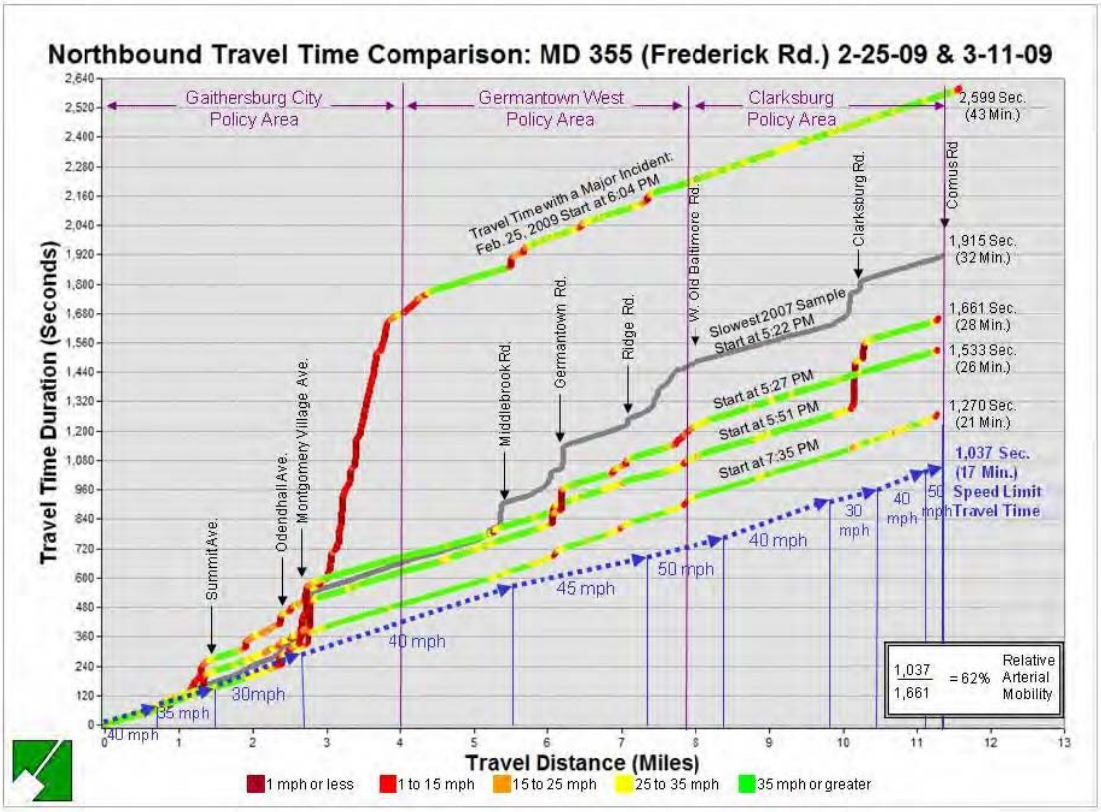
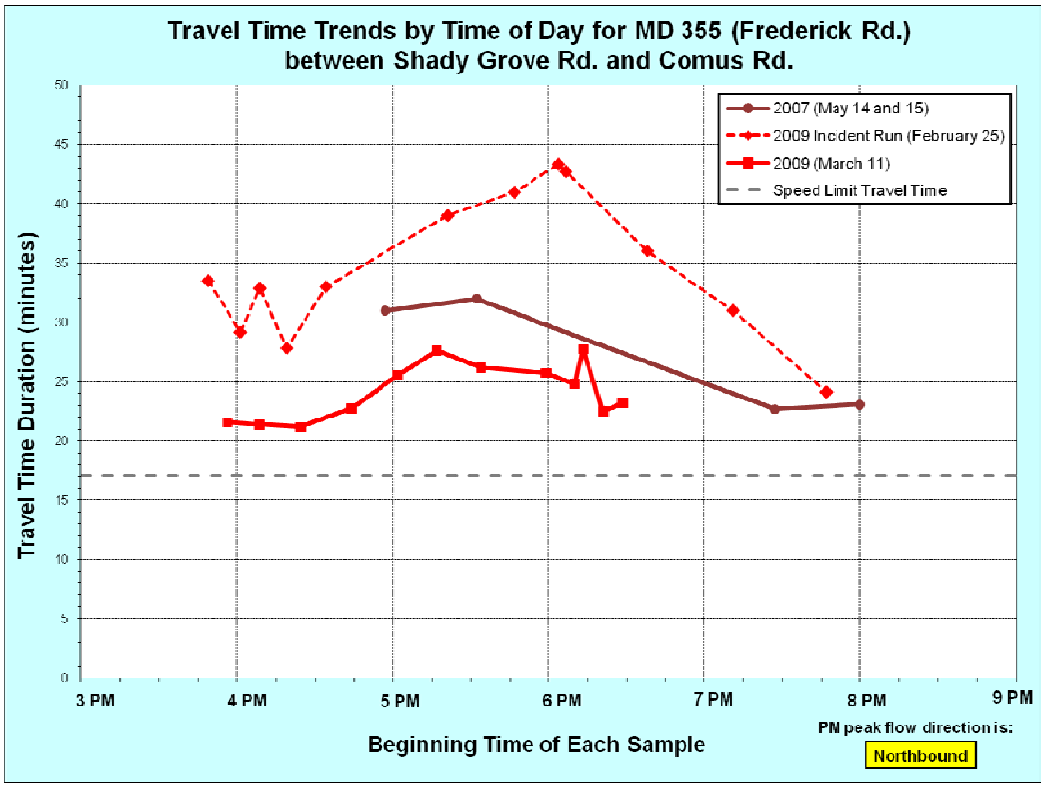


Figure 2.14: Travel Time - Time of Day Profile for Frederick Road (MD 355)



Georgia Avenue (MD 97) from Eastern Avenue to Hewitt Avenue

Description: Sampling along Georgia Avenue was parsed into two segments, one south of Hewitt Avenue in the Silver Spring/Takoma Park and Kensington/Wheaton Policy Areas, and another running from Hewitt Avenue north to Brookville. Analysis of the northern section can be found immediately after this section. The trip from Eastern Avenue to Hewitt Avenue is roughly 7.5 miles, with one third of its length in the Silver Spring/Takoma Park Policy Area and the balance of its length in the Kensington/ Wheaton Policy Area. Speed limits along this stretch of Georgia Avenue range from 30 miles per hour in Silver Spring to 45 miles per hour near Hewitt Avenue. Calculated travel time at the speed limit is 11.0 minutes.

2009 Observations: 23 northbound and 18 southbound travel time measurements were recorded on this stretch of Georgia Avenue on March 3, 2009. Data collection began with the first northbound run at 3:39 pm and concluded with the last northbound run at 8:15 pm. Recorded travel times ranged from 17.6 minutes to 37.7 minutes for northbound trips while southbound times ranged from 15.5 minutes to 25.9 minutes. The slowest northbound sample began at 5:24 pm and took more than three times the travel time according to posted speed limits. Arterial Mobility calculations for 2007 and 2009 are nearly the same at 29.8 percent and 29.1 percent respectively. The figure on the following page depicts travel time along the corridor. Notable delays can be observed in the Silver Spring business district as well as the central part of Kensington/Wheaton north of University Boulevard through Randolph Road. The fastest measured travel time incurred minor delays at the main signalized intersection throughout this segment corridor, but experienced none of the long delays observed in the five and six o'clock hours.

Historical Comparison of Travel Times: The slowest travel time for this section of Georgia Avenue nearly matches the timing for a similar run in 2007. The locations of the observed delays between the two years are different, however. The 2007 sample recorded more significant delays in the Silver Spring area leading up to the Capital Beltway. The Travel Time by Time of Day graph on the following page compares northbound 2007 measurements with the northbound 2009 samples. Although there were many more samples in 2009, the peak for both the 2007 and 2009 samples continues to be in the five to six o'clock hour. The 2009 samples appear to have a peak travel time at approximately 5:30, with a steady decline in travel time through the six o'clock hour. Although the 2007 sample at 5:53 pm appears to be much slower than a comparable 2009 sample, earlier and later runs in 2007 are just a few minutes apart from their counterparts in 2009.

Figure 2.15: Travel Time-Distance Profile for Northbound Georgia Avenue (MD 97) (Southern)

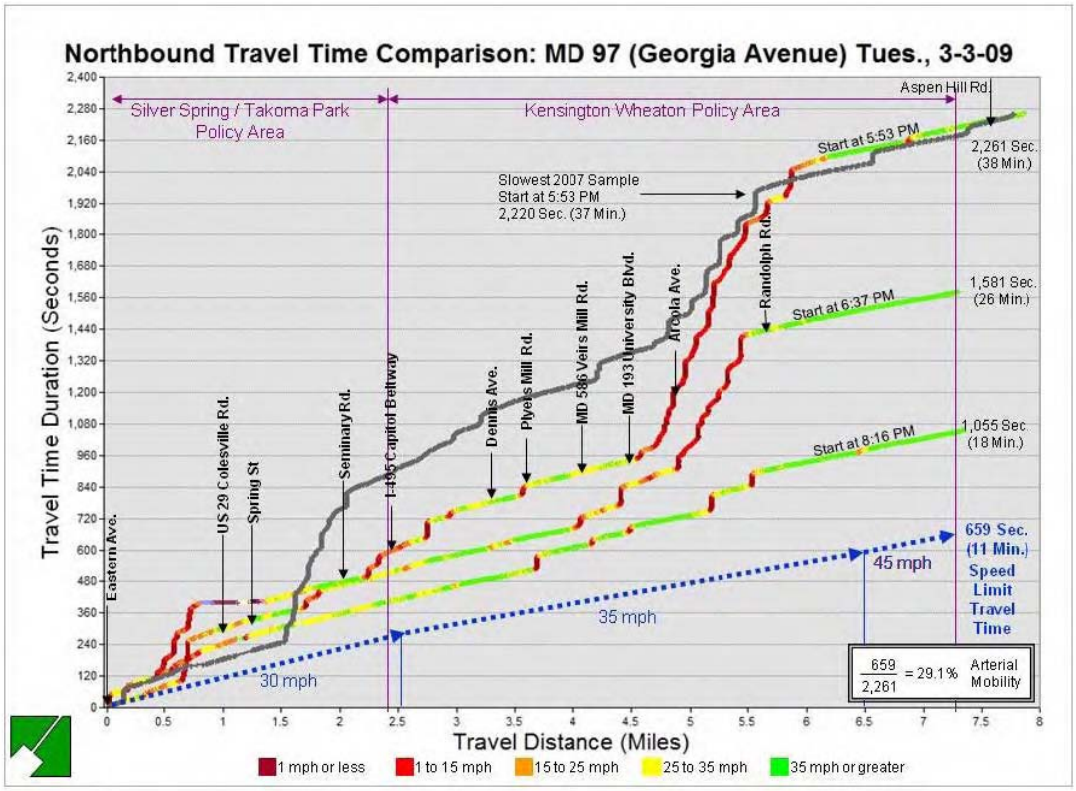
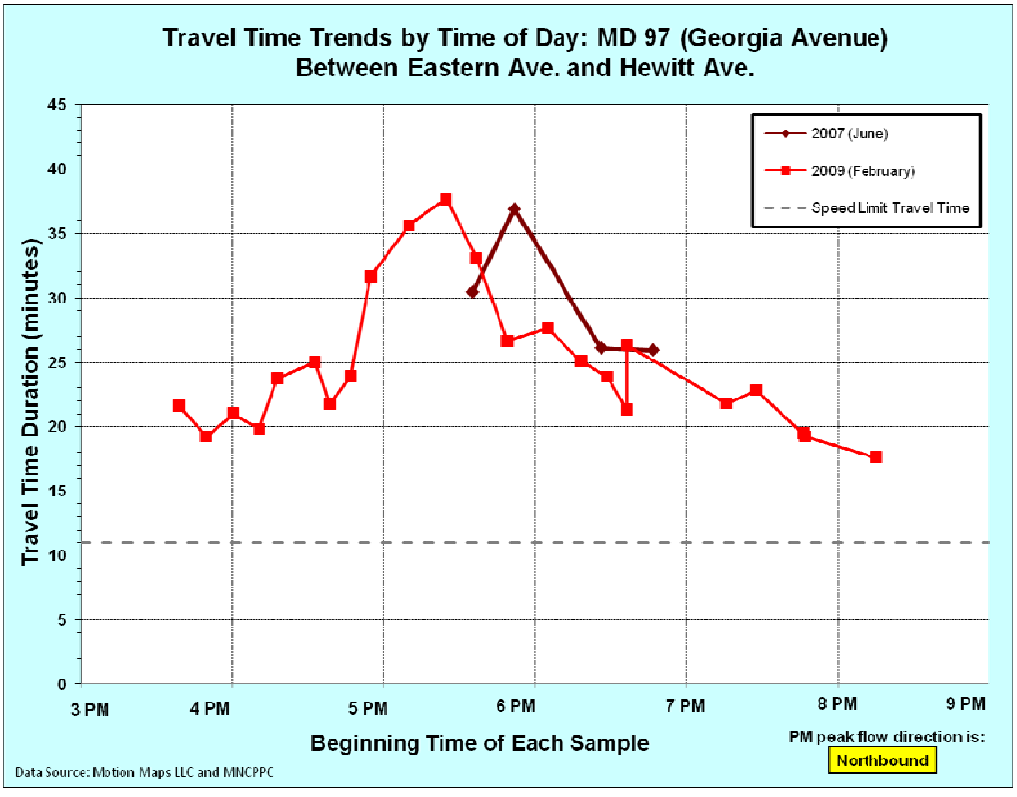


Figure 2.16: Travel Time - Time of Day Profile for Georgia Avenue (MD 97) (Southern)



Georgia Avenue (MD 97) from Hewitt Avenue to Brookville Road

Description: The northern section of Georgia Avenue in the Aspen Hill and Olney Policy Areas between Hewitt Avenue and Brookville Road is slightly longer than its southern counterpart at 7.66 miles. Roughly 2.5 miles north of Hewitt Avenue, Georgia Avenue crosses Norbeck Road, leaving the Aspen Hill Policy Area and entering the Olney Policy Area. Speed limits range from 30 to 50 miles between the two endpoints. Calculated travel time at the speed limit is 669 seconds or 11.2 minutes.

2009 Observations: A total of 39 travel time samples, 20 in the northbound direction and 19 in the southbound direction, were recorded on Wednesday March 4, 2009. Data collection occurred between 3:52 pm and 7:22 pm. Northbound travel times were slower than southbound travel times and ranged from 14.5 and 22.9 minutes. Southbound travel times ranged from 14.9 minutes to 18 minutes. The slowest northbound sample took 1,375 seconds or 23 minutes, roughly double the speed limit travel time. Figure 2.16 depicts a sample of northbound travel times for this section of Georgia Avenue. The slowest sample experienced a queue of about five minutes approaching Norbeck Road (MD 28) and then a series of delays between Prince Phillip Drive and Queen Elizabeth Drive. The fastest measured northbound sample took 867 seconds or approximately 14 minutes, and experienced minor delays at signalized intersections.

Historical Comparison of Travel Times: Northbound travel times along this section were consistently faster than the smaller number of 2007 samples. As is the case with most of the corridors in this study, samples that began in the five to six o'clock hour were the slowest. The same is true for the 2007 data as depicted in Figure 2.17. Both the 2009 and 2007 data depict a decline in travel time after 6:00 pm, and similar observations in the period between 6:00 and 7:00 pm. The slowest 2007 sample (from 5:32 pm) experienced delays similar to the slowest 2009 sample with additional delays upon entering Brookville. The travel times for the slowest 2007 and 2009 samples were very similar, with the exception of the last half mile approaching and passing through Brookville. The calculated Arterial Mobility for this segment of the corridor improved just slightly from about 42 percent in 2007 to about in 49 percent in 2009, reflecting the faster observed travel times.

Figure 2.17: Travel Time-Distance Profile for Northbound Georgia Avenue (MD 97) (Northern)

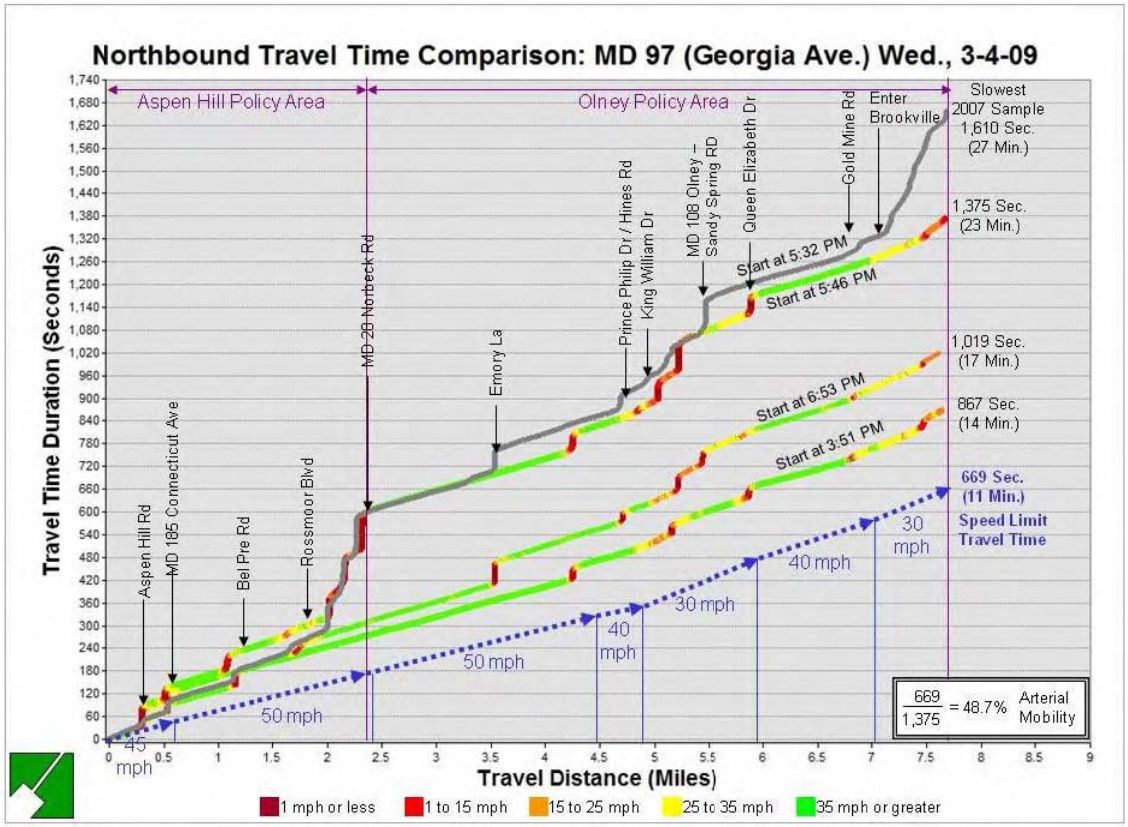
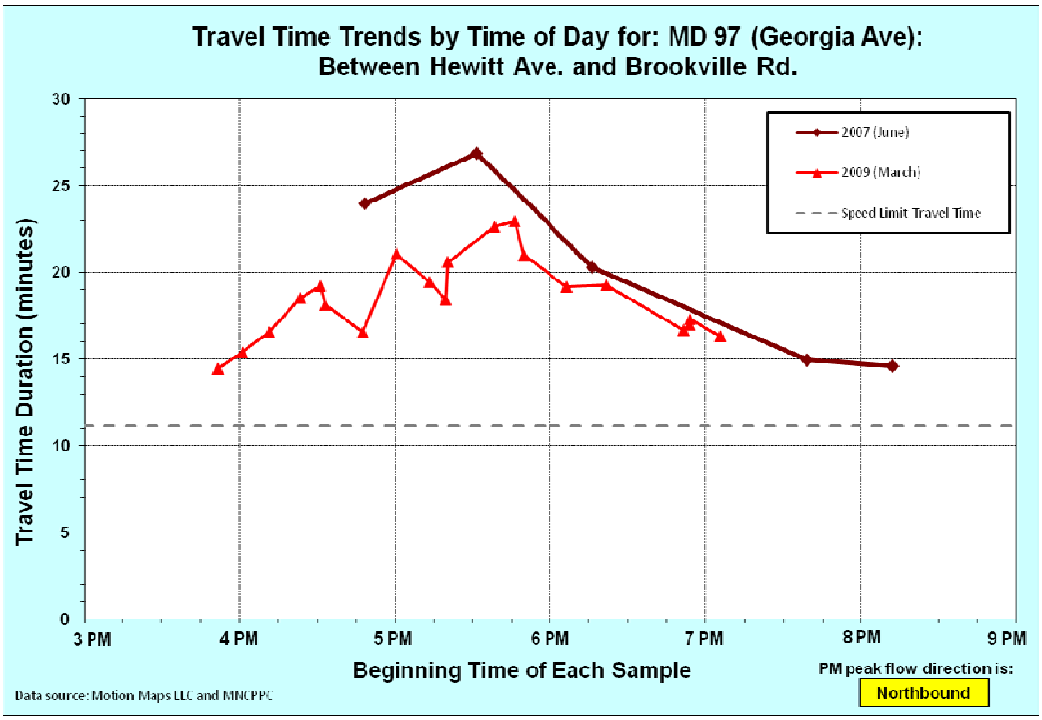


Figure 2.18: Travel Time - Time of Day Profile for Georgia Avenue (MD 97) (Northern)



Veirs Mill Road (MD 586) from Georgia Avenue (MD 97) to Norbeck Road (MD 28)

Description: Travel time samples were collected along the 5.78 mile length of Viers Mill Road from Georgia Avenue in the south to a northern terminus at Norbeck Road. The route travels through three of Montgomery County's Policy areas, Wheaton CBD, Kensington/Wheaton, Aspen Hill (from south to north), and terminates in the city of Rockville. Speed limits along Viers Mill Road range from 35 miles in Rockville to 40 and 45 miles south of Twinbrook Parkway. Travel time at the posted speed limits is 484 seconds or 8.1 minutes.

2009 Observations: Twelve northbound and twelve southbound samples were collected along this segment on February 23, 2009. Travel time measurements were conducted roughly between 4:00 pm and 7:45 pm with the first recorded trajectory beginning at 3:58 pm and the last at 7:46 pm. Northbound travel times were slower than the southbound times and ranged from about 13 to 22 minutes. Southbound travel times ranged from 13 minutes to 19 minutes. The slowest trip took 1,333 seconds or 22.2 minutes, nearly three times the speed limit travel time, with an average speed of 15.6 miles per hour. This trip was in the northbound direction and left the southern terminus of Georgia Avenue at 5:56 pm. As with most of the sampled roadways, delays occurred at signalized intersections along the route, most notably between Georgia Avenue (MD 97) and University Boulevard (MD 193), at Connecticut Avenue (MD 185), Aspen Hill Road, and Twinbrook Parkway. The largest delay was experienced by northbound trips in the five to six o'clock hour was in a queue that began near Claggett Drive and continued for approximately one mile to the First Street/MD 28/Norbeck Road intersection.

Historical Comparison of Travel Times: Samples from 2007, 2005 and 2004 provide points of comparison for travel time along this corridor. Unlike other corridors in this study, plotted travel times depicted in the graph on the following page, reveal a pattern without a sharp peak. With one observation from 2004 as an outlier, the previous year samples display a similar pattern. 2004, 2005 and 2009 samples show travel times within three minutes between 5:00 and 5:15 pm. Peaks in the 2004 data suggest that incidents along the route (or nearby routes) affected travel time. The peak time of travel in 2005 was just before 5:00 pm while the peak in 2009 was just before 6:00 pm. The 2007 and 2009 peak travel times were essentially identical at 22.2 minutes, yielding consistent Arterial Mobility figures of 36.3 percent.

Figure 2.19: Travel Time-Distance Profile for Northbound Veirs Mill Road (MD 586)

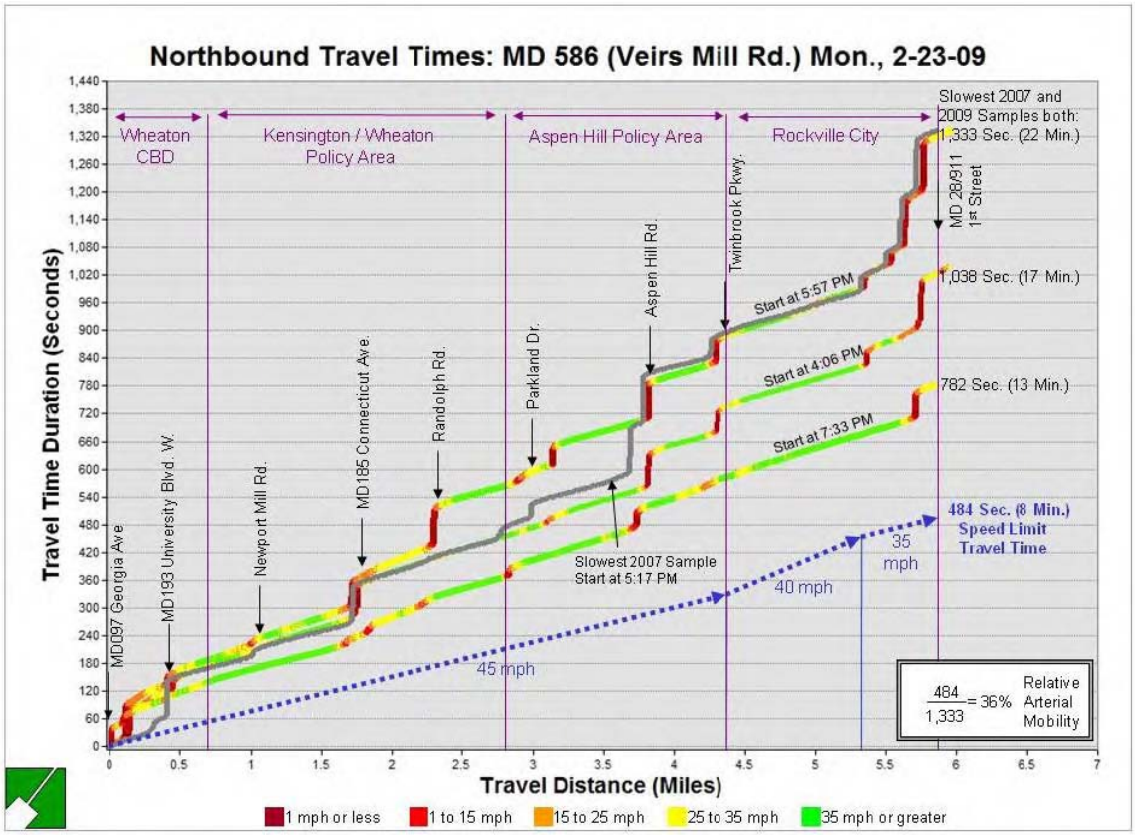
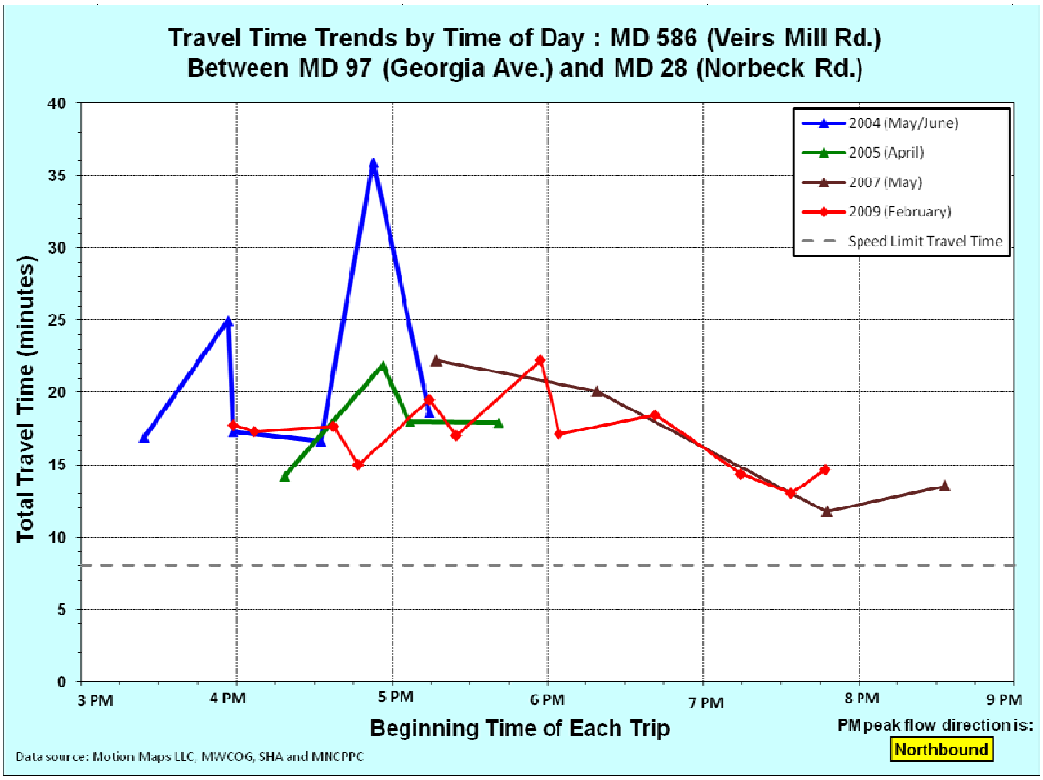


Figure 2.20: Travel Time - Time of Day Profile for Veirs Mill Road (MD 586)



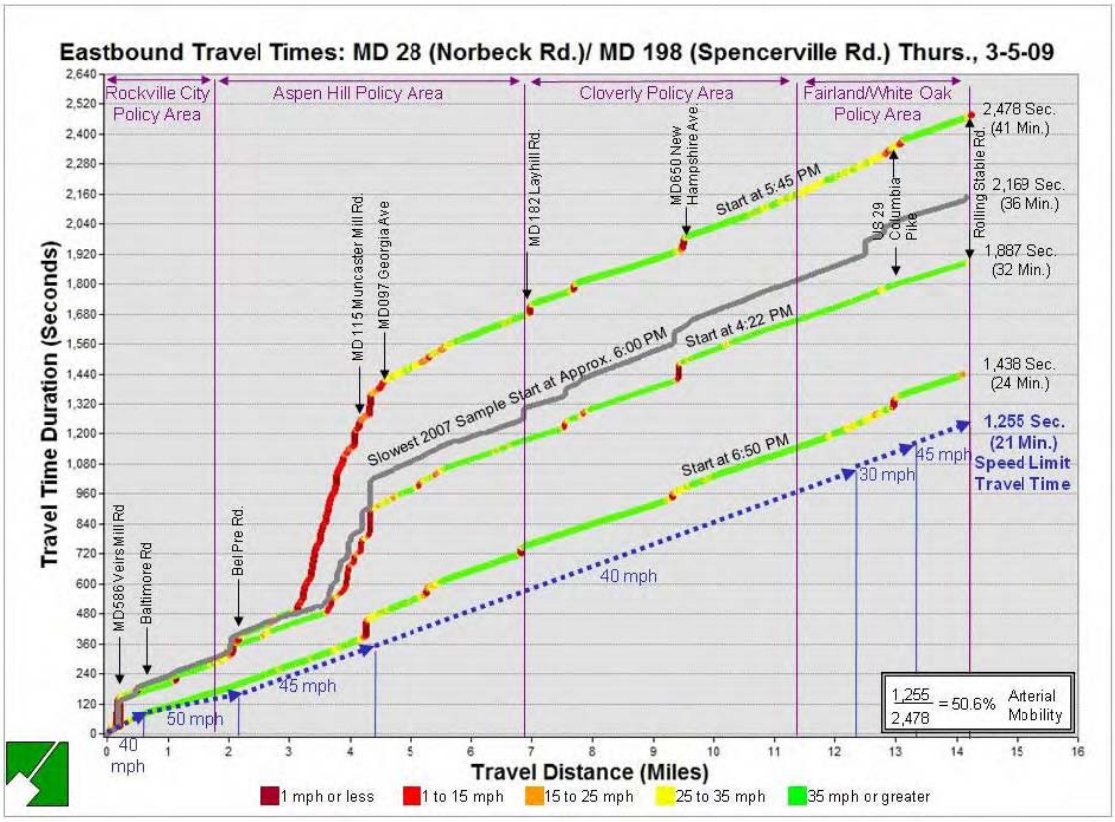
Norbeck Road (MD 28)/ Spencerville Road (MD 198) from Rockville Pike (MD 355) to Prince George's County Line

Description: This 14.3 mile stretch of roadway from Rockville Pike (MD 355) in the west to the Prince George's County line in the east is one of the longest of the priority corridors. It is the only corridor that runs in a west-east direction rather than north to south (with the possible exception of Veirs Mill Road which runs south-east to north-west). The combined Norbeck Road and Spencerville Road runs through four Policy Areas: Rockville City, Aspen Hill, Cloverly and Fairland. This corridor has posted speed limits which range from 30 miles per hour to 50 miles per hour, and a calculated speed limit travel time of 1,255 seconds or 20.9 minutes.

2009 Observations: Fourteen eastbound and thirteen westbound samples were collected for this route on Thursday March 5, 2009. Recorded samples began at in the eastbound direction at 3:35 pm and concluded with the last westbound trip leaving the Prince George's County line at 7:48 pm. Eastbound travel times were slower than their westbound counterparts and ranged from 24 minutes to 41.3 minutes. Westbound travel times ranged from 24.4 minutes to 35.7 minutes. The slowest trip of 41.3 minutes began at 5:45 pm and took roughly double the speed limit travel time of 20.9 minutes. Several eastbound samples experienced significant queues approaching Georgia Avenue. The longest of these queues was experienced by the slowest sample of the day and lasted approximately 16 minutes and extended roughly one mile in length. The approach to Georgia Avenue was by far the slowest section of the corridor aside from minor delays at signalized intersections between the two endpoints.

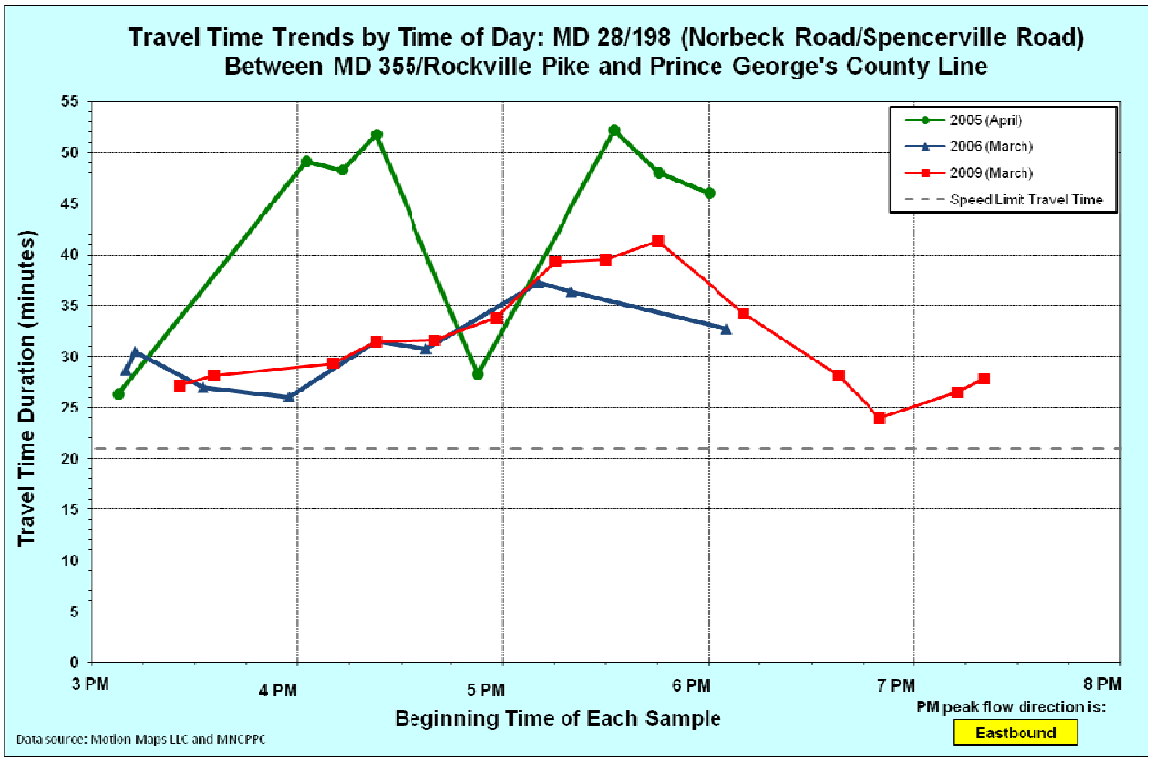
Historical Comparison of Travel Times: The slowest travel time among 2009 observations was five minutes slower than the combined 2007 samples (2007 data was split into MD 28 and MD 198 segments). This increase in travel time lowered the calculated Arterial Mobility for this corridor to about 51 percent from the figure of approximately 58 percent in 2007. Despite this decline, this corridor is one of the better performing corridors by the Arterial Mobility measure, and is just one of a few Priority Corridors (or associated segments) that have an Arterial Mobility above 50 percent. Historical samples from 2005 and 2006 indicate that peak hour eastbound travel in 2009 was comparable to previous travel time samples. Notes from the 2005 observations indicate that samples after 6:00 pm experienced slower than usual traffic due to an incident. The peak travel time for this roadway is consistent with other corridors. Peak travel time in 2009 was observed during a sample that departed at 5:45 pm. Subsequent travel observations after 6:00 pm were much faster. One sample, at 6:50 pm was just about three minutes slower than the speed limit travel time of 20.9 minutes.

Figure 2.21: Travel Time-Distance Profile for Eastbound Norbeck Rd. (MD 28)/Spencerville Rd. (MD198)



Note: 2007 Sample is a composite of two runs, one beginning at 5:45PM on MD28 and the second at 6:20PM on MD 198

Figure 2.22: Travel Time - Time of Day Profile for Eastbound Norbeck Rd. (MD 28)/ Spencerville Rd. (MD198)



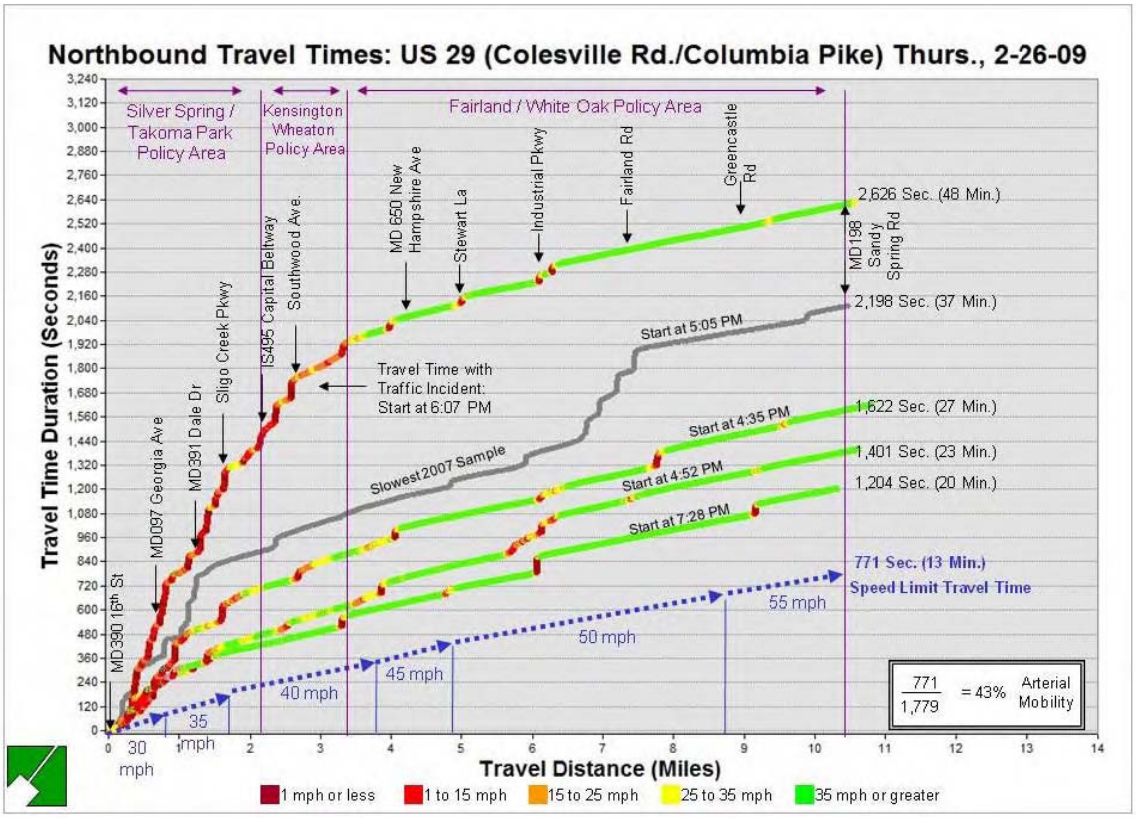
Colesville Road/Columbia Pike (MD 384/US 29) from Eastern Avenue to Sandy Spring Road (MD 198)

Description: This corridor extends 10.4 miles traversing nearly the full southeastern portion of Montgomery County from Eastern Avenue on the border with the District of Columbia to Sandy Spring Road, just short of the Howard County line. Travelling from south to north, the corridor begins in downtown Silver Spring in the Silver Spring/Takoma Park Policy Area and then passes through the Kensington/Wheaton Policy Area before reaching its northern terminus in the Fairland/White Oak Policy Area. Speed limits along this corridor range from 30 miles per hour in the urban portions of Silver Spring's central business district and increase to 55 miles per hour for the final two miles. Calculated travel time at the speed limit is 771 seconds or 12.9 minutes.

2009 Observations: There were 14 northbound and 11 southbound travel time measurements along this corridor in 2009. Data was collected on Thursday March 26 with time measurements beginning at increments from 3:34 pm through 8:05 pm. Northbound recorded travel times ranged from 20 minutes to 51 minutes although the tracking devices did not record trajectories for some samples. Travel along this corridor on the date of sampling was influenced by two incidents, one traffic related and the other due to police activity near Briggs Chaney Road. The first of these incidents occurred just before 5:00 pm at Lockwood Road and caused significant delays south into downtown Silver Spring through the six o'clock hour. Delays for this incident can be clearly seen in the long queue depicted for the 6:07 pm sample on the following Travel Time versus Distance graph. The second incident occurred late in the sampling and affected travel times between Randolph Road and Briggs Cheney Road for the sample that left Eastern Avenue at 8:05 pm. Roughly one third of the northbound samples were affected by these incidents, yielding lack of clarity with regard to an accurate slowest, incident free, travel time for the corridor. Samples before 5:00 pm and between 7:00 and 8:00 pm represent typical conditions and recorded notably slow travel speeds in the Silver Spring/Takoma Park Policy Area through Dale Drive, with another delay of roughly one half mile leading up to Industrial Parkway. Moderate delays at major signalized intersections were observed throughout the remainder of the samples for these time periods. The slowest representative sample (and that used in the 2009 Arterial Mobility calculation) began at 6:53 pm and took 1,779 seconds or nearly 30 minutes to reach MD 198.

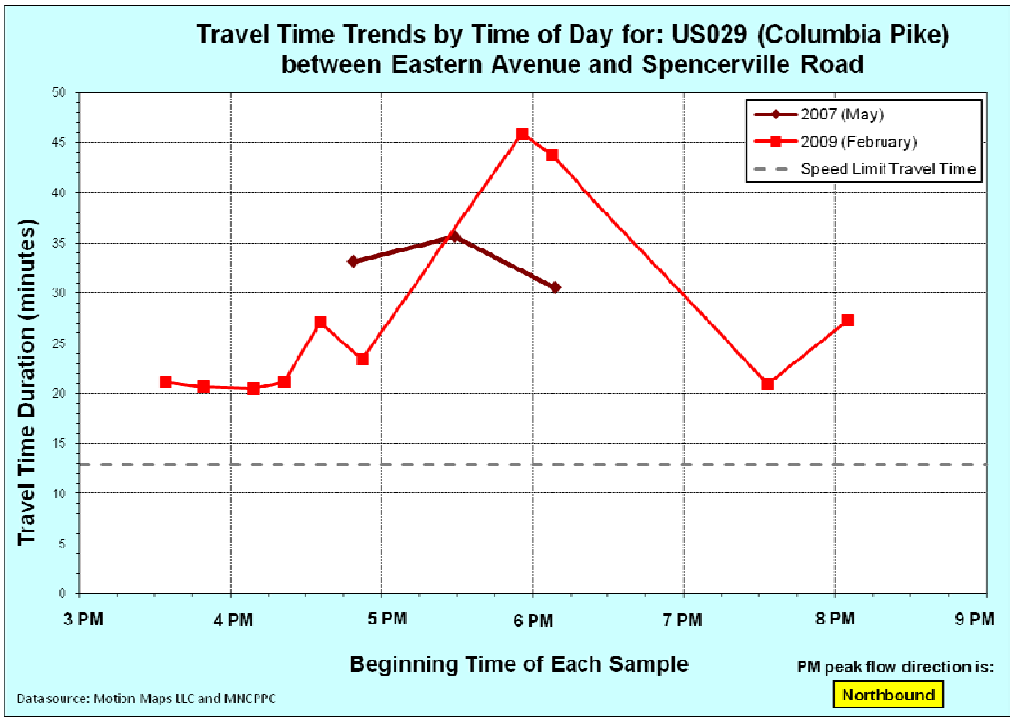
Historical Comparison of Travel Times: Travel time samples from 2007 provide an indication of what travel time might have been like between 5:00 pm and 6:00 pm if the incident at Lockwood Road had not occurred in 2009. The slowest 2007 sample recorded delays in Silver Spring south of Dale Drive as well as in Fairland/White Oak before Fairland Road. Travel time samples in 2009 before 5:00 pm and after 7:00 pm display very similar travel times of 20 to 25 minutes, an indication that the 2007 samples after 5:00 pm are indicative of the typical peak hour conditions.

Figure 2.23: Travel Time-Distance Profile for Northbound Colesville Rd./Columbia Pike (US 29)



Note: 2007 Sample is a composite of two runs, one beginning at 5:05PM at 16th Street and the second at 5:28 PM at the Fairland/While Oak Policy Area boundary.

Figure 2.24: Travel Time - Time of Day Profile for Northbound Colesville Rd./Columbia Pike (US 29)



Connecticut Avenue (MD 185) from Western Avenue to Georgia Avenue (MD 97)

Description: Travel time samples were collected along the full 8.4 mile length of Connecticut Avenue in Montgomery County, from Western Avenue in the south to its northern terminus at Georgia Avenue (MD 97). The route commences in the Bethesda Chevy Chase Policy Area and ends in the Aspen Hill Policy Area. The middle section of this route, and roughly half its length, lies in the Kensington/Wheaton Policy Area. Speed limit travel time for this segment is 829 seconds or 13.8 minutes, with posted speed limits ranging from 30 miles per hour in the Bethesda Chevy Chase Policy Area to 45 miles per hour north of Randolph Road in the Kensington-Wheaton and Aspen Hill Policy Areas.

2009 Observations: Eight northbound and seven southbound samples were collected along this corridor on February 23, 2009. Measurements began at roughly 4:00 pm and concluded with the last run leaving Western Avenue at approximately 7:30 pm. Southbound travel times were faster on the whole than northbound measurements. Southbound times ranged from 16.8 minutes to 20.3 minutes while northbound travel times ranged from 17.2 minutes to 26.7 minutes. The slowest trip of 26.7 minutes averaged 18.6 miles per hour and occurred on the northbound sample that left Western Avenue at about 5:20 pm. This time was about 13 minutes (roughly double) more than the calculated speed limit travel time. See Figure 2.25 for a depiction of the slowest north and southbound travel time samples. Measurable delays in travel times were fairly consistent among the samples and occurred at many of the signalized intersections with other main arterials on the route including East West Highway (MD 410), Knowles Road (MD 547), Veirs Mill Road (MD 586), Randolph Road and Georgia Avenue (MD 97).

Historical Comparison of Travel Times: The 2009 Connecticut Avenue travel time samples were uniformly faster than the most recent travel time samples in 2007 as depicted in this corridor's Travel Time by Time of Day Graph. Sample times were also faster than many of the 2004 measurements but were comparable to 2005 measurements. Decreased travel time measurements in 2009 samples when compared with 2007 samples is largely due to the absence of long, slow queues observed throughout the 2007 samples. In 2007 the most significant of these long queues occurred in the Bethesda Chevy Chase Policy Area from Western Ave to the Capital Beltway and in the Kensington Wheaton Policy Area in the vicinity of University Boulevard. Faster travel times in the 2009 samples yielded a significantly faster (i.e. improved) Arterial Mobility measurement of 51.7 percent in 2009 compared with 36.4 percent in 2007.

Figure 2.25: Travel Time-Distance Profile for Northbound Connecticut Avenue (MD 185)

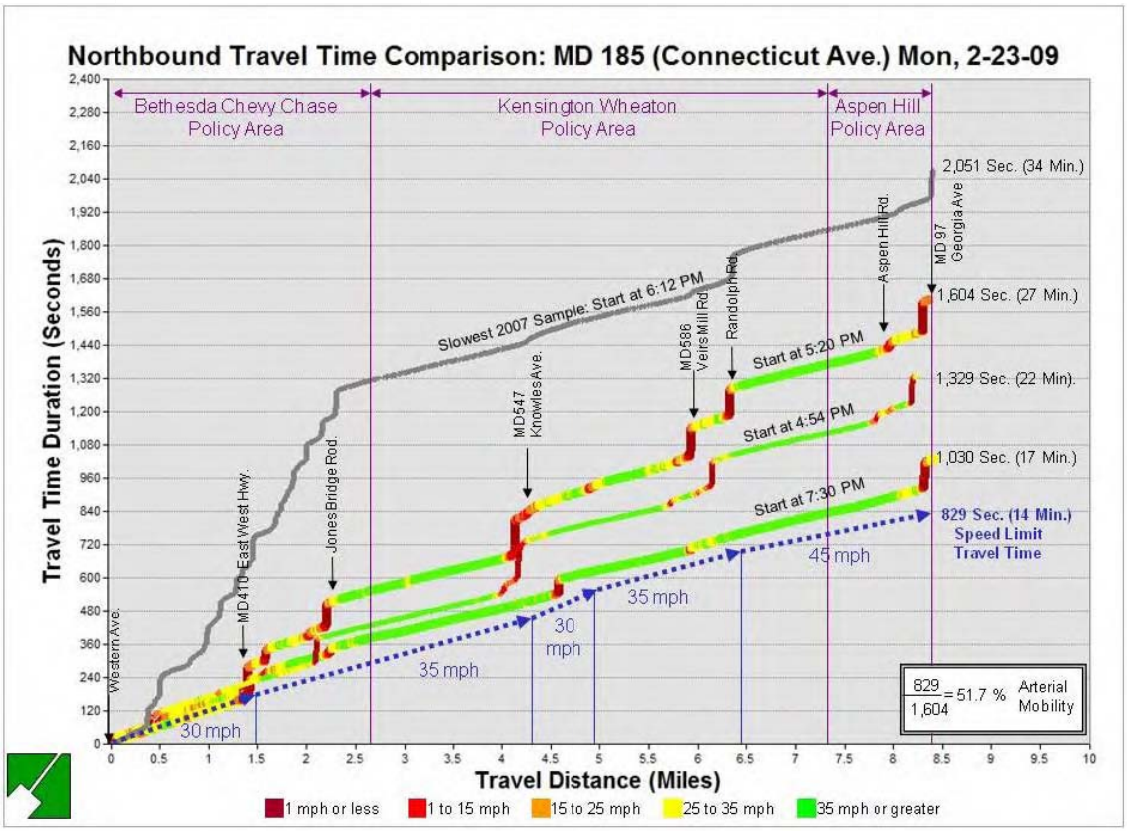
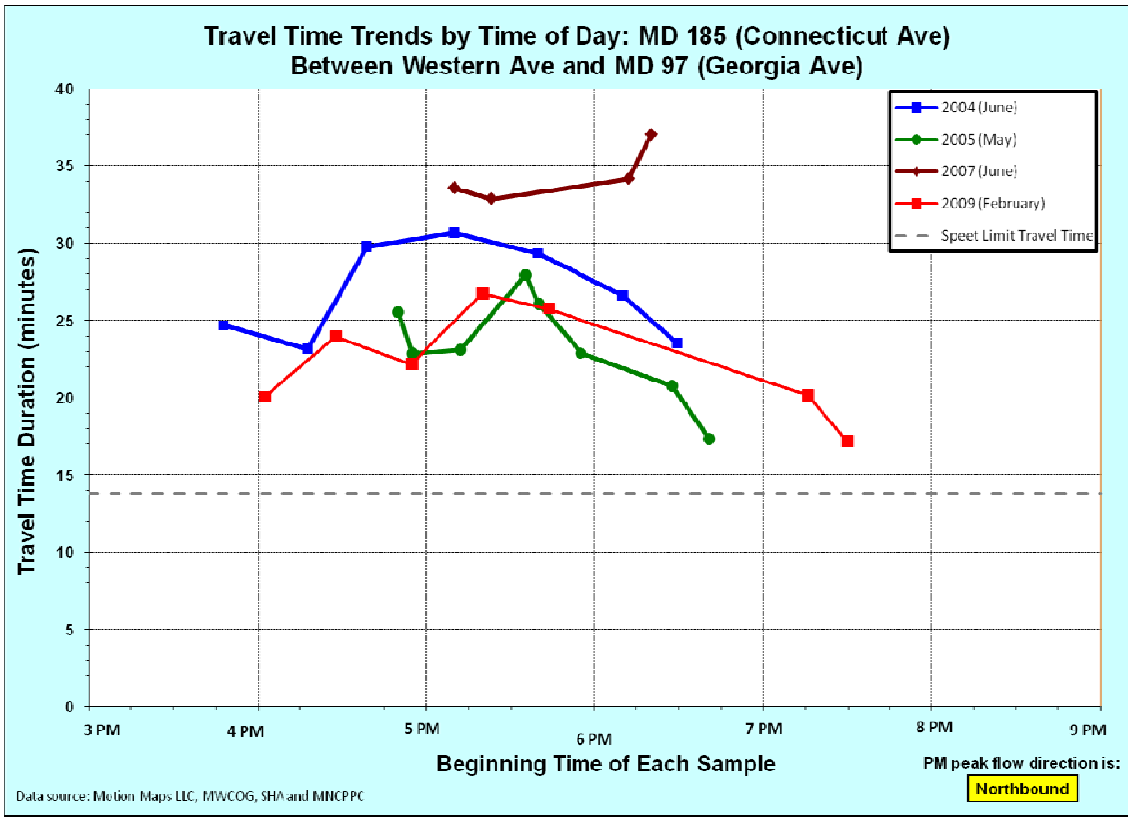


Figure 2.26: Travel Time - Time of Day Profile for Northbound Connecticut Avenue (MD 185)



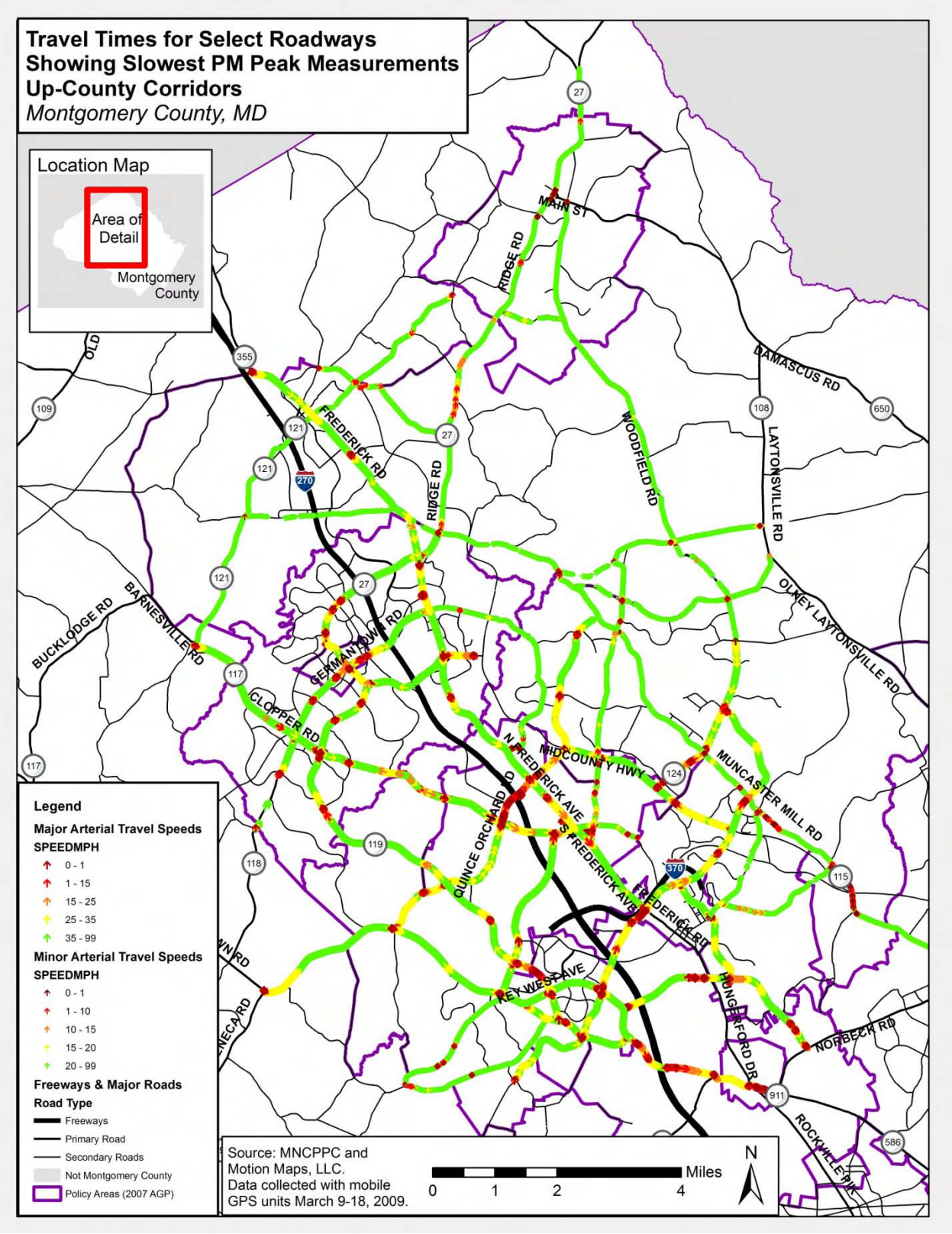
Mobility within Select Policy Areas of the AGP (I-270/North Areas)

Description: In addition to the six main priority corridors described in the previous section, a network of more than 30 additional road segments was sampled in the Up-County policy areas along and adjacent to the I-270 corridor. The MD 355 Priority Corridor samples are also show again on this graphic. Collectively these roadways form an extensive network of north-south and east-west travel routes between such policy areas from Rockville City to Clarksburg and Damascus. Travel time samples were collected throughout this area between March 9 and March 18, 2009.

2009 Observations: Unlike the priority corridors described earlier in this report, the travel time samples in the Up-County policy areas depict a broader spatial picture of transportation congestion patterns. When combined together as in Figure 2.24, two or more directions are depicted at major intersections. Such density of coverage allows for a more complete picture and assessment of localized and systemic congestion. In 2009, traffic delays were observed in a number of locations. In Rockville Town Center, traffic queues were observed along MD 28 (West Montgomery Ave) eastbound. A bit further north, notable delays in the pm peak hour were observed in R&D Village along MD 119 (Great Seneca Highway) and at the intersection of Shady Grove Road and MD 355 (Frederick Avenue). The longest delay among the 2009 data set occurred in the eastbound direction along Montgomery Village Avenue between MD 117 (Clopper Road) and MD 355 (Frederick Avenue). Significant delays also occurred in Germantown Town Center at the intersection of Father Hurley Boulevard and Middlebrook Road. Among the minor arterial roads in the 2009 sample, MD 27 (Ridge Road) and MD 115 (Muncaster Mill Road) also experienced delays along several portions of their recorded length.

Historical Comparisons: When compared with maps and data from the 2007 Highway Mobility Report, the 2009 data seems to be significantly less congested. This is largely due to advancement in the processing capability of the data, which provided the option of major arterial as well as minor arterial road classifications. Because minor arterial roads have lower speed limits, their travel speeds appeared congested when mapped using symbols that corresponds with higher speeds on the major arterial routes. However, discounting that technical distinction, observed delays in 2009 were generally fewer and less severe than those in 2007, most notably along MD 117 and MD 119 northbound entering the Germantown West Policy Area. With just two years of data samples, it is too early to determine if this is a trend or merely normal variation among data observations. These two data sets will form a solid base for comparisons in future Highway Mobility Reports.

Figure 2.27: Congestion in the Peak Direction (Weekday PM Peak) for Up-County Corridors



Congested Corridors

Synthesis of this year's intersection count data and travel time analysis yields a picture of the County's congested corridors. Congested corridors are identified by large numbers of high volume, often perennially congested intersections, coupled with reduced travel speeds, frequent delays and low mobility measurements. The list of 2009 congested corridors includes:

- MD 355 (Wisconsin Avenue/Rockville Pike/Hungerford Drive/Frederick Road) particularly from Western Avenue north to I-495 and from Rockville north through Gaithersburg,
- MD 185 (Connecticut Avenue), from Western Avenue to I-495 and in the vicinity of MD 586 (Veirs Mill Road)
- MD 97 (Georgia Avenue) from Eastern Avenue to MD 182 (Layhill Road), and MD 185 to MD 108 (Olney Laytonsville Road)
- US 29 (Colesville Road/Columbia Pike) particularly inside I-495 but also north to MD 198 (Sandy Spring/Spencerville Road)
- MD 28 (Norbeck Road) between Bel Pre Road and MD 182 (Layhill Road)
- MD 586 (Veirs Mill Road)

More than half of the top 60 CLV counts at intersections in this year's report are located along these corridors which are all state routes. Many of these intersections exceed, or are close to exceeding their LATR standard. Details of the conditions along several of these corridors and discussion of infrastructure improvements (both near term and in long term planning stages) are listed below. (Please note that all travel time comments refer to travel between 4:00 and 7:00 pm in the peak direction).

- **Wisconsin Avenue/Rockville Pike (MD 355)** from Bradley Lane to Pooks Hill Road. Three intersections in this corridor, W. Cedar Lane, MD 410 (East West Highway) and Jones Bridge Road are among the top 15 most congested intersections in 2009. Both the intersections at Cedar Lane and Jones Bridge Drive have CLV values that exceed their standard. The intersection with MD 410 is at its standard in 2007 (this intersection was not counted in 2009). Travel time during the peak pm hours was heavily delayed in this stretch of MD 355 beginning at Bradley Lane and continuing for the length of the corridor segment. At the height of the pm rush (6:00 pm), the delay for this segment lasted roughly two and ½ miles and added more than 15 minutes to travel above posted speed limits.

- **Rockville Pike (MD 355)** particularly from Edmonston Drive to Veirs Mill Road (just south of the Rockville Town Center). The intersection of MD 355 and Edmonston Drive is the sixth most congested in the County, with a CLV that exceeds the LATR standard by 20 percent. Proximate intersections with high volumes include Veirs Mill at First Street and First Street at Baltimore Road, both of which exceed their LATR standard. Travel time samples along this route experienced delays of nearly four mintues at the Wooten Parkway/First Street/MD 355 intersection in the peak period between 5:00 and 7:00 pm. Continued development in Rockville Town Center will alter traffic conditions here in the near term although development in the vicinity of the Rockville Metrorail station may increase transit ridership in the area.

- **Frederick Rd (MD 355)** from Shady Grove Road to Montgomery Village Avenue in Gaithersburg. The intersection with MD 355 and Montgomery Village Avenue is among the most congested in the county. The 2009 CLV for this intersection is more than 15 percent above the standard. Travel time analysis for this corridor in 2009 revealed continued congestion from south of

Summit Avenue through to Montgomery Village Avenue. Travel time through much of this section averaged below 15 miles per hour with delays at intersections totaling eight minutes. This corridor may be a candidate for Bus Rapid Transit (BRT) treatments.

- **Georgia Avenue (MD 97)** from University Boulevard to Norbeck Road (MD 28). Three intersections in this segment (Connecticut Ave, Bel Pre Rd, Norbeck Rd (MD 28)) each have CLVs that exceed their LATR standard. Major travel queues were observed on this segment between University Boulevard and Randolph Road and again in the half mile leading south of Norbeck Road. The delay from University Boulevard peaked at 16 minutes around 6:00 pm over roughly one mile of roadway. An intersection capacity improvement is currently in project planning for the Norbeck Rd intersection, and a grade-separated interchange has been recommended for this intersection in the master plan. Capacity improvements have also been recommended in the master plan for the Bel Pre Rd. The County Executive and County Council have indicated that the Georgia Avenue Busway is a priority for future study in the state's CTP.

- **Connecticut Ave (MD 185)** from Western Ave (DC Line) to the Capital Beltway (I-495). Two intersections in this corridor are among the top 20 most congested in the county. MD 185 at Jones Bridge Road has been among the top ten congested intersections in three successive Highway Mobility Reports. The 2009 count at this location showed that the intersection exceeded its LATR standard by 10 percent. The MD 185 intersection with East West Highway (MD 410) has also been one of the most congested in the county for some time and also exceeds it LATR standard. Traffic from Western Avenue to I-495 moves close to the speed limits of 30 and 35 miles per hour in this area except when in queues of roughly ¼ mile at each of the intersections described above, causing delays of nearly three minutes each. Improvements associated with the BRAC process at MD 185 and Jones Bridge Road are currently in the planning stages. Work is scheduled to be complete by 2011.

- **Colesville Road / Columbia Pike (US 29)** from Silver Spring CBD to Industrial Parkway. There are eight intersections along US 29 with CLV figures in the top 60 most congested in the county. Six of these intersections are within this most congested section of US 29; Dale Drive, Sligo Creek Parkway/St. Andrews, Southwood, University Boulevard (North and South) and Franklin Avenue. The intersections at Dale Drive, Sligo Creek Parkway and Southwood are all above their LATR standard. Travel time along this corridor is routinely stopped near these intersections, particularly in Silver Spring approaching Dale Drive. Travel speeds for this most southern portion of the corridor are routinely below 15 miles per hour, ½ the posted speed limit. Several intersections along US 29 are targeted for interchange improvements by the State Highway Administration, although construction funding has been withdrawn during the recent economic downturn.

- **Norbeck Rd/First St (MD 28)** from Veirs Mill Rd (MD 586) to Georgia Ave (MD 97). Conditions in this corridor have improved since 2008 when seven intersections (Veirs Mill Rd, Baltimore Rd (at First St), Avery Rd, Baltimore Rd, Bel Pre Rd, Muncaster Mill Rd, Georgia Ave) each have CLVs that exceed their LATR standard. Current data indicate that the intersections at Georgia Avenue, Muncaster Mill Road and Norbeck Boulevard are the only intersections above their LATR standard in 2009. Travel time results, however, indicate that drivers in the afternoon peak hours still experience significant delay between Bel Pre Road and Georgia Avenue where delays

can be nearly two miles and extend travel time above the speed limit by roughly 15 minutes. As noted above, the intersection with Georgia Avenue is scheduled for capacity improvements, and ultimately, a grade-separation.

- **Veirs Mill Road (MD 586)** from Georgia Avenue (MD 97) to First Street/Norbeck Road (MD 28). This is one of the most congested corridors in the County, largely because it crosses several east-west arteries and runs in between the heavily traveled MD 97 and MD 355 corridors. The intersections at Twinbrook Parkway (ranked eighth in this year's most congested list) and First Street both exceed their LATR standard. Travel time along this corridor is periodically marked by delays at major intersections including University Boulevard, MD 185, Randolph Road, Aspen Hill Road and First Street. As noted above, the intersection at First Street is part of a State Highway Administration intersection improvement study. The Veirs Mill Road corridor is currently under study as a candidate for Bus Rapid Transit.

III. TRANSPORTATION TRENDS

Vehicle Miles Traveled

National trend data collected by the Federal Highway Administration indicate that the nation is in the midst of a decline in national vehicle miles traveled (VMT) that began in 2005 (U.S. DOT *Traffic Volume Trends*, years 2006-2009). February 2009 VMT data indicate a decline of 1.9 billion vehicle miles, or 0.9 percent, when compared with February 2008. A slumping economy and fluctuating gas prices are likely causes of the national decline. This national decline in VMT is not uniform across the country, however. Depending on the time of year, and seasonal flows, quadrants of the country experience different changes in VMT. While the South Atlantic States (a group of eight states and the District of Columbia, which includes Maryland) saw a VMT decline of 2.2 percent from February 2008 to February 2009, the North Central states (12 states in the upper Midwest) saw an increase in VMT of 1.3 percent.

Both the state of Maryland and Montgomery County are affected by the recent downturn in the economy, and VMT analysis for these areas also show recent declines. Job losses, a common indicator of economic malaise, began to appear in Montgomery County in 2007. An estimated 4,800 jobs have been lost in the County since the end of 2006 (MNCPPC Research Team estimates, April 2009). Figure 3.1 provides a comparison of the decline in VMT at the national, state and county level. Although Maryland VMT has fluctuated somewhat over the past three years, Montgomery County VMT data reveal decreases in the past two years. Figure 3.2 depicts Montgomery County VMT totals since the year 2000 and illustrates the dramatic decrease in VMT since 2005.

Figure 3.1: Year to Year Percent Change in Vehicle Miles Traveled for the United States, Maryland and Montgomery County

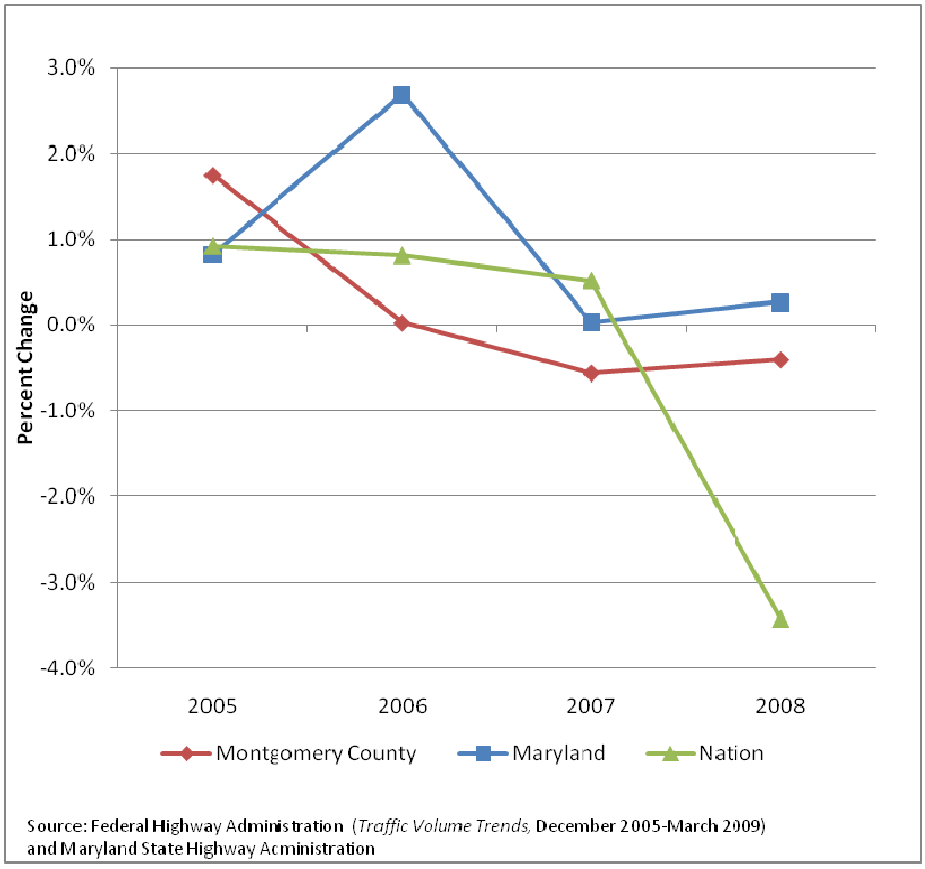
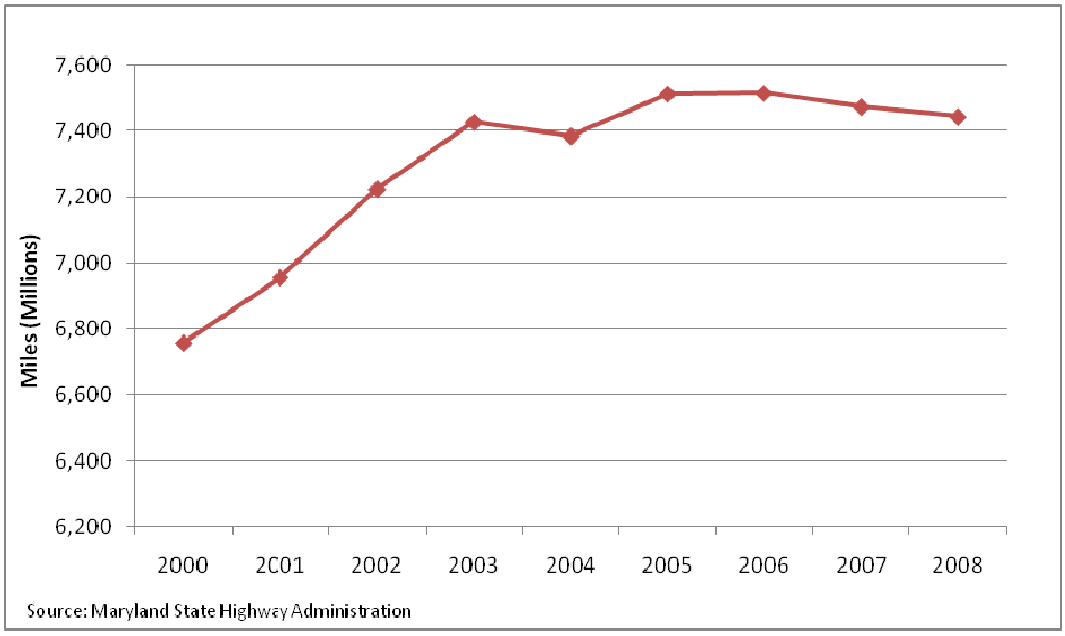


Figure 3.2: Total Vehicle Miles Traveled (VMT) on State Highways in Montgomery County, MD



Pedestrian Counts

Traffic counts conducted for the 2009 HMR by MCV, Inc. included pedestrian counts as well as vehicular counts where feasible. Pedestrian counts for 111 intersections have been loaded into the MNCPPC intersection count database and serve as a base for pedestrian analysis, particularly in relation to other transportation systems and trends. The highest 30 of these pedestrian counts are displayed in Table 3.1. Data displayed here is for the combined morning and afternoon peak travel times (6:30 – 9:30 am and 4:00 – 7:00 pm). Pedestrian counts conducted as part of this study in 2009 were recorded at intersections that were a high priority for the County from a vehicular standpoint (due to lack of previous data, interest in ongoing development nearby, etc.), with secondary regard to pedestrian connectivity or access. Therefore, pedestrian counts provided in Table 3.1 do not represent locations of the highest pedestrian volume county-wide or key pedestrian crossing locations. The pedestrian to vehicle ratio is also represented in the table, to provide context for the total traffic volume at a given intersection.

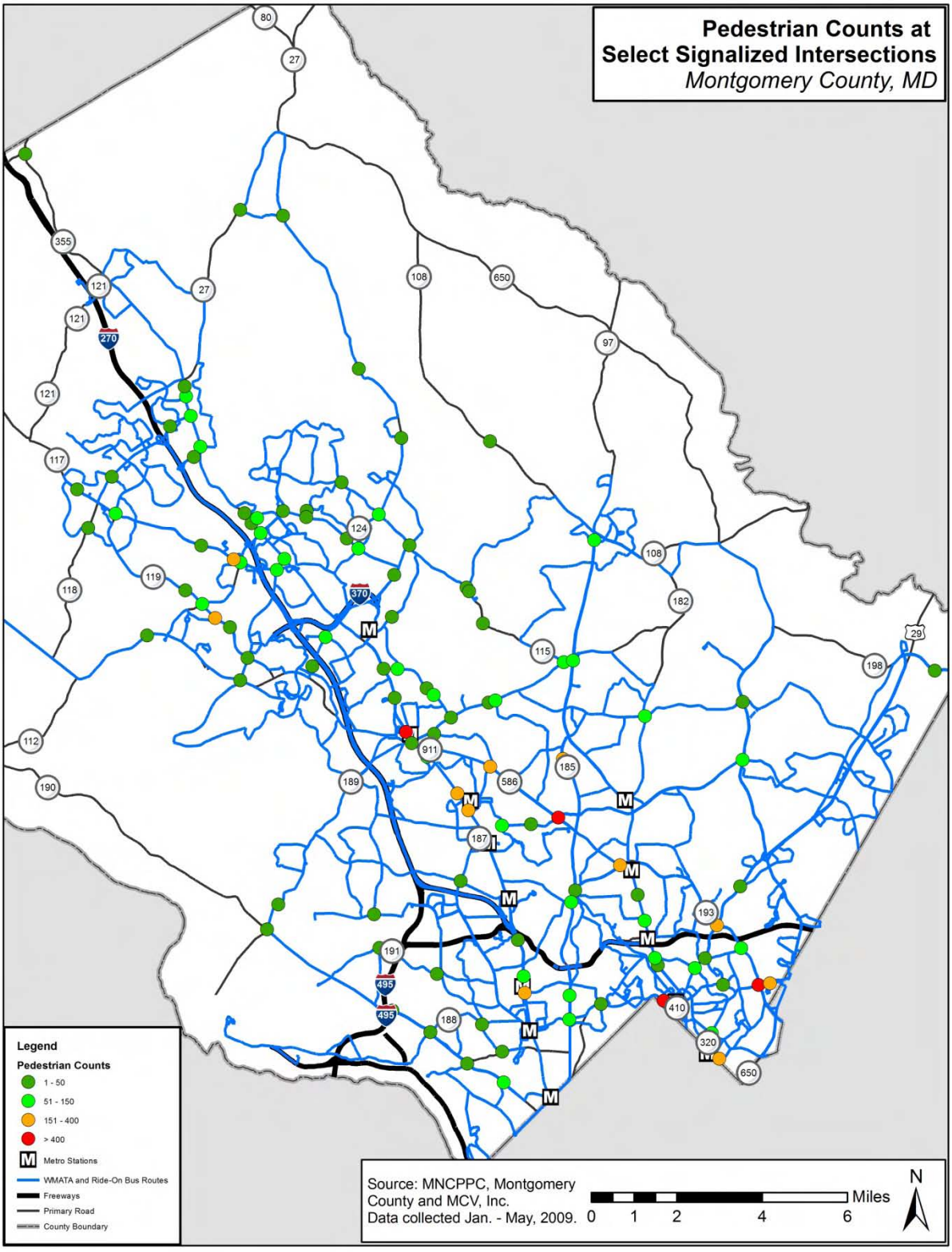
Of the 111 locations sampled for pedestrian data, 30 had counts over 100 during the peak hours on the date of sampling, while just four had counts over 500 and two had counts greater than 1,000 pedestrians. The busiest intersection, from a pedestrian count standpoint was at where 1,841 pedestrians were counted. Veirs Mill Road (MD 586) at Randolph Road and East West Highway (MD 410) and 16th Street (MD 390) also had high pedestrian volumes. The Colesville Road (US 29) and East West Highway (410) intersection also had the highest pedestrian to vehicle ratio of 0.098, followed by the intersection of Carroll Avenue (MD 195) and Laurel Avenue with 0.066. Few counts were done inside of central business districts were pedestrian volumes, and possibly ratios, would be higher.

The map in Figure 3.3 provides a picture of the locations of the 111 pedestrian counts, with grouping by total pedestrian volume. Although a distinct pattern of higher pedestrian volumes in down county areas is clearly displayed on the map, several intersections in Rockville and Gaithersburg have counts that are above 150 pedestrians, and in the top 20 percent of county-wide intersection counts.

Table 3.1: Total (AM + PM) Peak Period Observed Pedestrian Crossing Volumes

Pedestrian Volume Rank	Intersection Name	Peak Vehicle Volume	Peak Pedestrian Volume	Pedestrian to Vehicle Ratio
1	Colesville Rd (US 29) at East West Hwy (MD 410)	18,785	1,841	0.0980
2	Veirs Mill Rd (MD 586) at Randolph Rd	69,594	1,452	0.0209
3	East-West Hwy (MD 410) at 16th St (MD 390)	24,714	985	0.0399
4	Hungerford Dr (MD 355) at Middle Ln/Park Rd	24,650	671	0.0272
5	Georgia Ave (MD 97) at Randolph Rd	34,102	479	0.0140
6	Connecticut Ave (MD 185) at Jones Bridge Rd	37,415	348	0.0093
7	Piney Branch Rd (MD 320) at Carroll Ave	12,641	287	0.0227
8	Rockville Pk (MD 355) at Twinbrook Pkwy/Rollins Ave	24,303	263	0.0108
9	University Blvd (MD 193) at Veirs Mill Rd (MD 586)	24,850	250	0.0101
10	Carroll Ave (MD 195) at Laurel Ave	3,659	242	0.0661
11	Veirs Mill Rd (MD 586) at Twinbrook Pkwy	30,519	220	0.0072
12	Rockville Pike (MD 355) at Jones Bridge Rd/Center Dr	60,468	219	0.0036
13	Clopper Rd (MD 117) at Quince Orchard Rd (MD 124)	29,683	108	0.0036
14	Clopper Rd (MD 117) at Firstfield Rd	17,556	210	0.0120
15	Great Seneca Hwy (MD 119) at Kentlands Blvd	21,583	192	0.0089
16	Connecticut Ave (MD 185) at Independence St	19,260	185	0.0096
17	Connecticut Ave (MD 185) at East-West Hwy (MD 410)	33,026	149	0.0045
18	Frederick Rd (MD 355) at Chestnut St	16,974	149	0.0088
19	Georgia Ave (MD 97) at August Dr	25,019	140	0.0056
20	Russell Ave at Christopher St	8,245	136	0.0165
21	Layhill Rd (MD 182) at Bel Pre Rd/Bonifant Rd	20,744	131	0.0063
22	W Diamond Ave at Muddy Branch Rd/Chestnut St	13,735	130	0.0095
23	Clopper Rd (MD 117) at Great Seneca Hwy (MD 119)	16,103	127	0.0079
24	Georgia Ave (MD 97) at Morningwood/Spartan Rd	17,632	115	0.0065
25	Veirs Mill Rd (MD 586) at First St	85,553	114	0.0013
26	Colesville Rd (US 29) at Dale Dr	27,760	113	0.0041
27	Connecticut Ave (MD 185) at Plyers Mill Rd	29,319	111	0.0038
28	River Rd (MD 190) at Brookside/Ridgefield	17,742	108	0.0061
29	Connecticut Ave (MD 185) at Knowles Ave	25,020	103	0.0041
30	New Hampshire Ave (MD 650) at Randolph Rd	36,131	100	0.0028

Figure 3.3: 2009 Peak Hour Pedestrian Counts



Ride-On Bus Service

Montgomery County bus service, called Ride-On, is comprised of an extensive network of local, feeder, circulator and express routes that compliment the regional and line service provided by the Washington Metropolitan Area Transit Authority (WMATA). Figures 3.4 and 3.5 illustrate the breadth of these routes. These maps also depict fiscal year 2006 ridership (the most current data available) on these bus lines. Figure 3.4 depicts average daily (weekday) ridership while Figure 3.5 depicts ridership per revenue mile. In total, the Ride-On system operates roughly 80 routes. Ride-On service is a key factor in mobility within the County and registered more daily (average) boardings in fiscal year 2008 than the Montgomery County Metrorail stations. In fiscal year 2008, average daily ridership was approximately 95,000.

The County's heaviest ridership is on routes that serve areas in a line running north-west from Silver Spring along the I-270 corridor, stretching as far north as Germantown. Ridership is also heavy in the south eastern portion of the County near White Oak. In order, the three routes with the highest average daily ridership in fiscal year 2006 were Germantown to Rockville, Silver Spring to Langley Park, and Shady Grove/Montgomery College to National Naval Medical Center. The proximity of these routes to Metrorail stations underscores the importance of bus service beyond and between Metrorail stations as an important part of the transit network. Figure 3.5 depicts a somewhat different picture of ridership, with the additional consideration of cost. In this map it is clear that although ridership along the I-270 corridor is high, of these routes travel long distances and are not as productive on a rider per revenue mile basis. Therefore, these longer routes are not as cost effective as some other routes. Routes beyond the I-270 corridor such as the route to Olney, carry the least riders per revenue mile, while routes between Bethesda and Silver Spring are the most cost effective.

Frequency of Ride On bus service for 2008 is depicted in Figure 3.6. The majority of the County's routes provide peak hour service every 20 – 30 minutes. Busy routes from Germantown south along I-270, and routes serving the central business districts in and around I-495, offer service with headways of 15 minutes or less.

Linkages and patterns between pedestrians and buses are important as riders must walk to and from bus stops at either end of their trip. Intersections with heavy pedestrian activity reported in the previous section, particularly those along Veirs Mill Road, in Silver Spring and Rockville are likely connected to extensive bus service in those areas. Connections between bus and rail service in the county are also documented in the number of lines near metro stations in Figure 3.6. Metrorail ridership is discussed in the next section of the report.

Figure 3.4: Average Daily Ride On Ridership (2006)

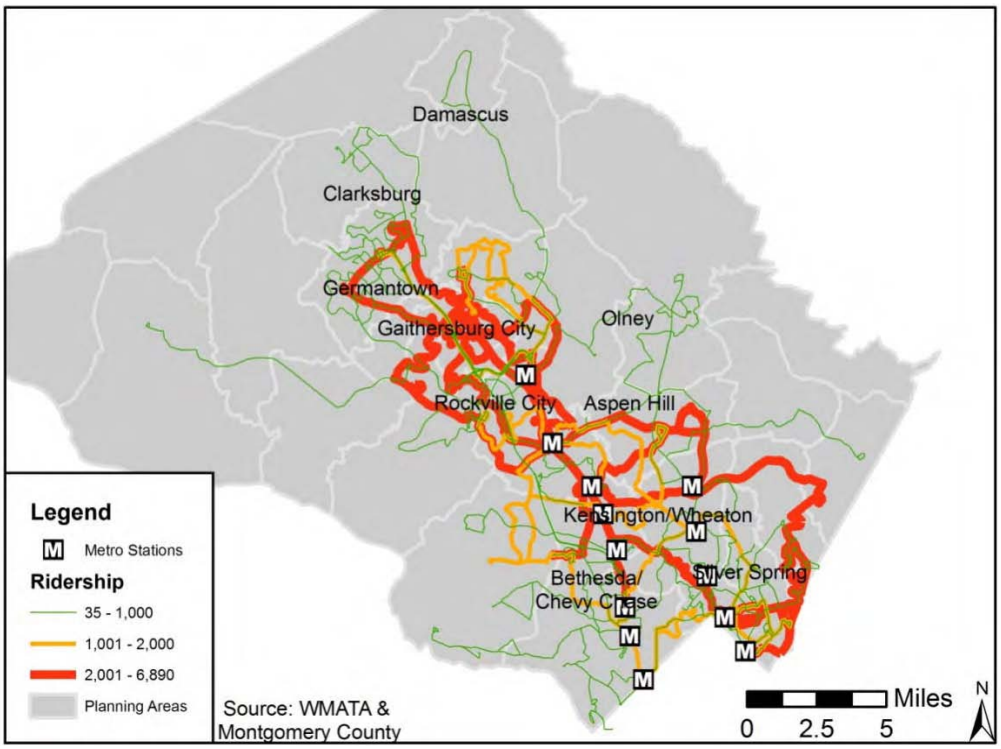


Figure 3.5: Ride On Ridership by Revenue Mile (2006)

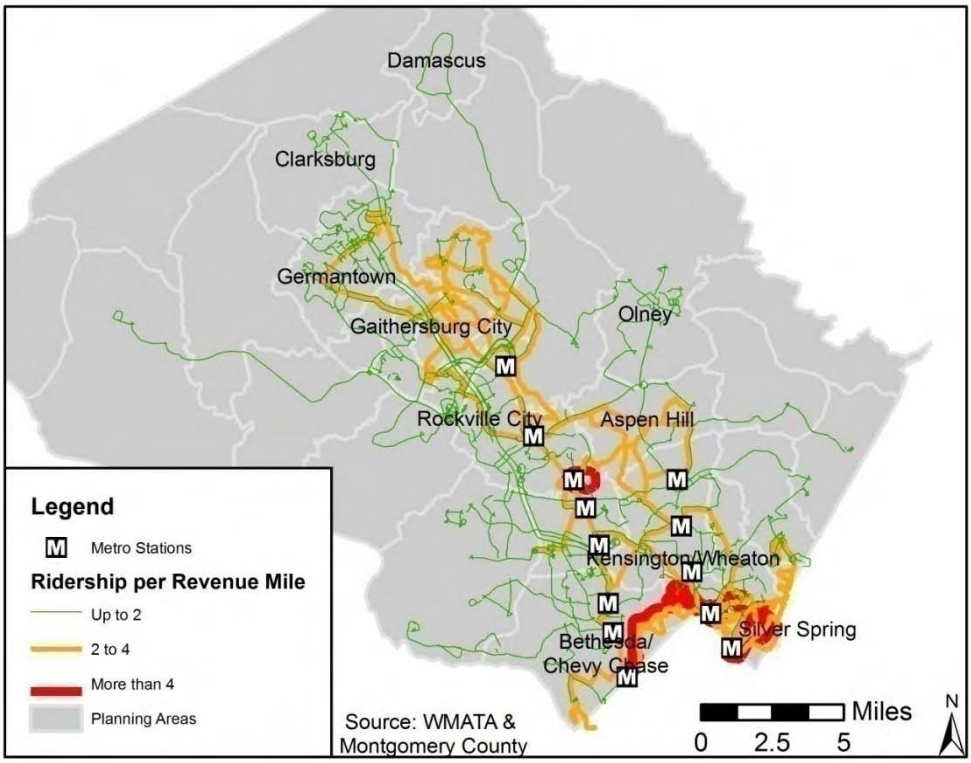
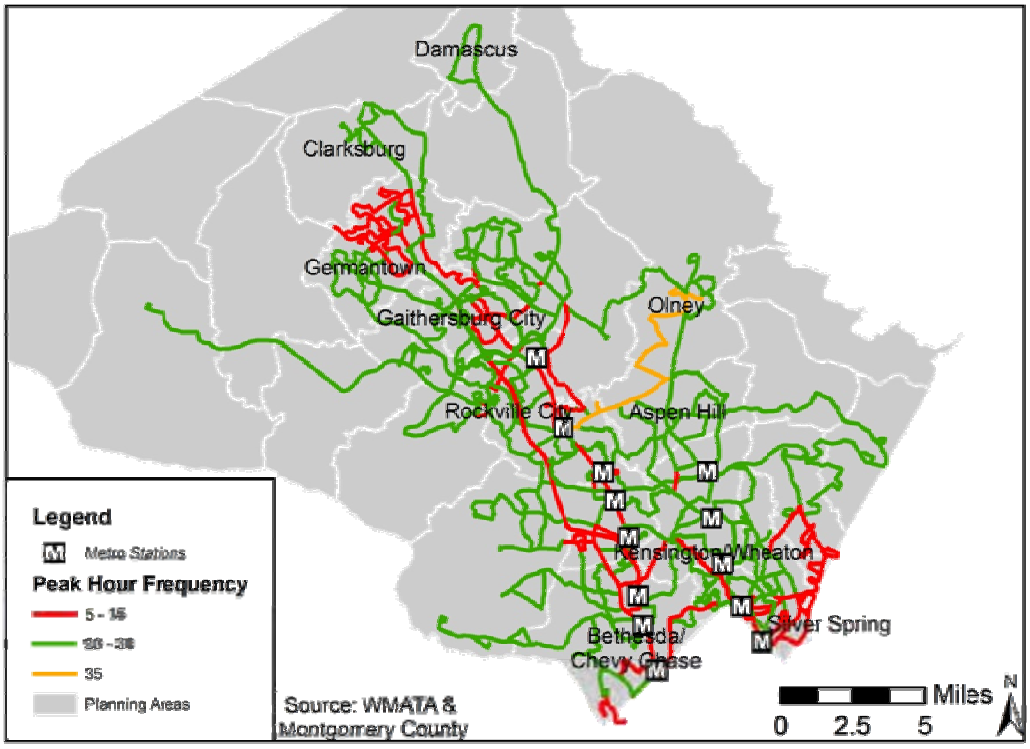


Figure 3.6: Peak Hour Ride On Bus Headways (2008)



Metrorail Analysis

Assessment of Metrorail ridership is another key component of mobility in Montgomery County. Similar to road and intersection analysis presented in the previous sections of this document, measures of volume and time of travel are also useful for Metrorail data. These two types of data are presented for each of Montgomery County's Red Line stations in terms of total ridership (entries and exits) in Figure 3.7 and ridership by time of day in Figure 3.8A (entries) and 3.8B (exits).

Unlike trends in vehicle miles traveled, ridership on Metrorail has increased, by approximately five percent, between February 2006 and February 2009. Figure 3.7 depicts the varying levels of ridership increases for average weekday ridership in Montgomery County. Two types of change are depicted in this figure. First, ridership at the four most heavily used stations; Silver Spring, Shady Grove, Bethesda and Friendship Heights, exhibit seasonal peaks (and troughs) with highest ridership in the summer months of June, July and August and significantly lower volume in the winter months. At the Shady Grove station, ridership increased from 28,933 in July 2006 to 30,952 in July 2009, a seven percent change. This peak travel period is important because it represents maximum stress on the capacity of the stations, and is ahead of the year to year increase in ridership of the entire system. A second change depicted in Figure 3.7 is the uneven increase in ridership at each station. For example, average daily ridership in Silver Spring was 27,285 in February 2006 and 27,708 in February 2009 while ridership at the Rockville station was 8,594 and 10,000 for the same time periods. This 16 percent increase in ridership in Rockville is roughly three times the percent change in total ridership for all Montgomery County stations.

The time of day patterns in Figures 3.8A and 3.8B depict the predominantly residential nature of the areas surrounding many Metrorail stations in Montgomery County. Metrorail stations located in communities with a balance of residential and employment/commercial uses have an equal pattern of entries and exits throughout the day. A good example of uneven ridership is the Medical Center station where the adjacent major employment sites of the National Institute of Health and Naval Medical Center draw large numbers of riders from elsewhere in the system who exit at the station in the morning and then head onto Metrorail in the afternoon to return home. Shady Grove is a station that exhibits ridership that is nearly the opposite of that at Medical Center. Roughly three quarters of entries to the Shady Grove Station occur during the morning peak hours, while approximately two thirds of the exits from the station occur in the afternoon peak hours. Entry and exit data are similar for the majority of the Red Line stations in the County with a few exceptions. The central business districts of Silver Spring, Bethesda and Friendship Heights exhibit more balanced ridership due to their large employment base.

Figure 3.7: Metrorail Ridership 2006 to 2009

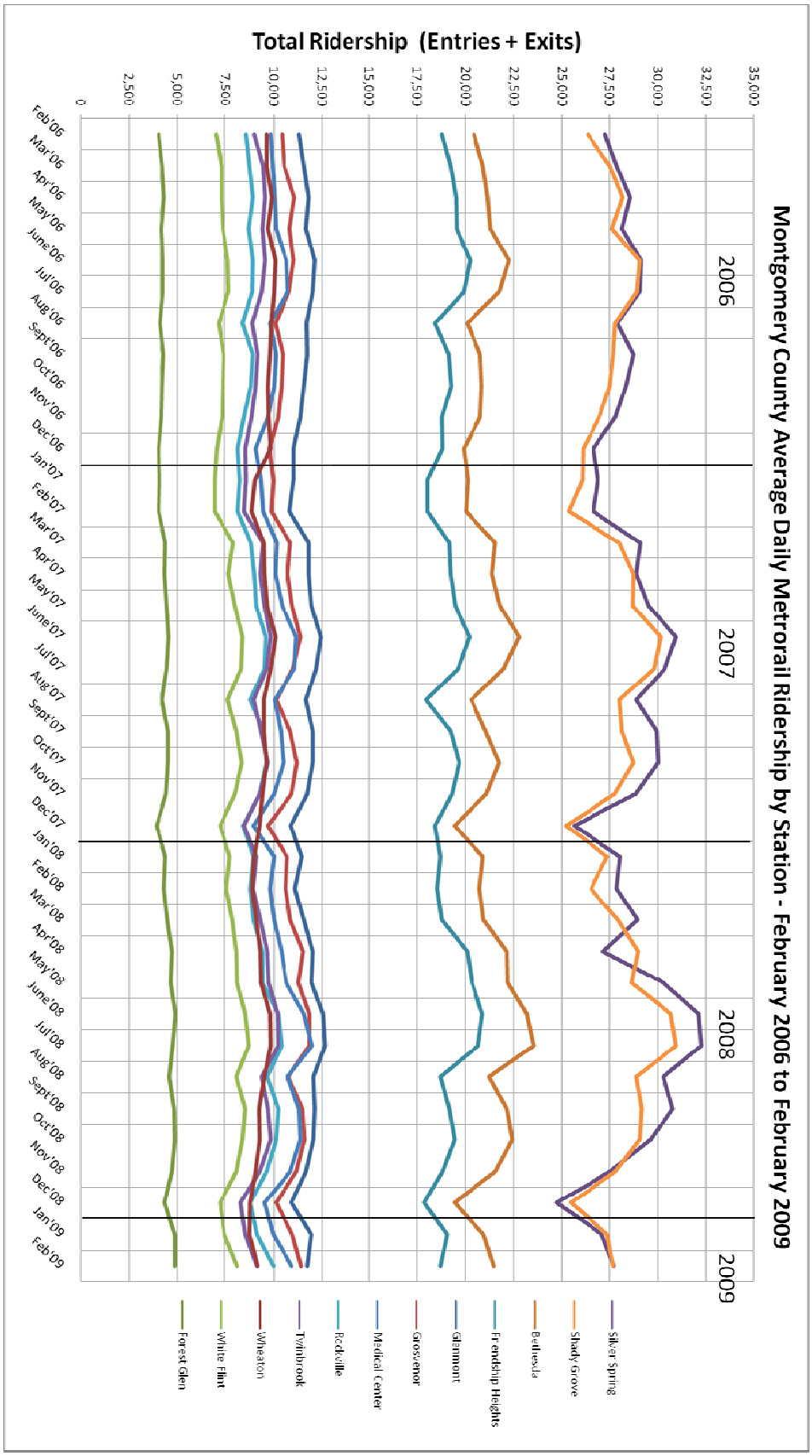


Figure 3.8A: Montgomery County Metrorail Entries (February 2008)

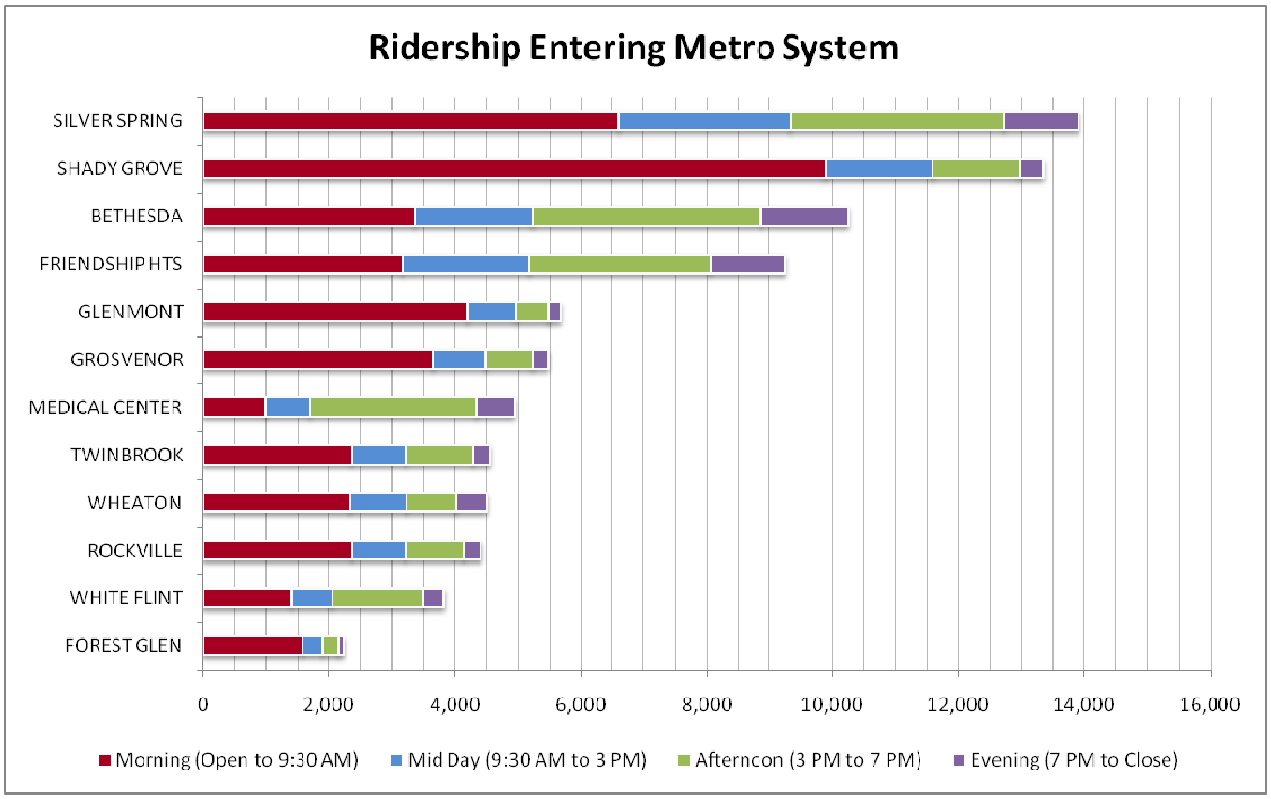
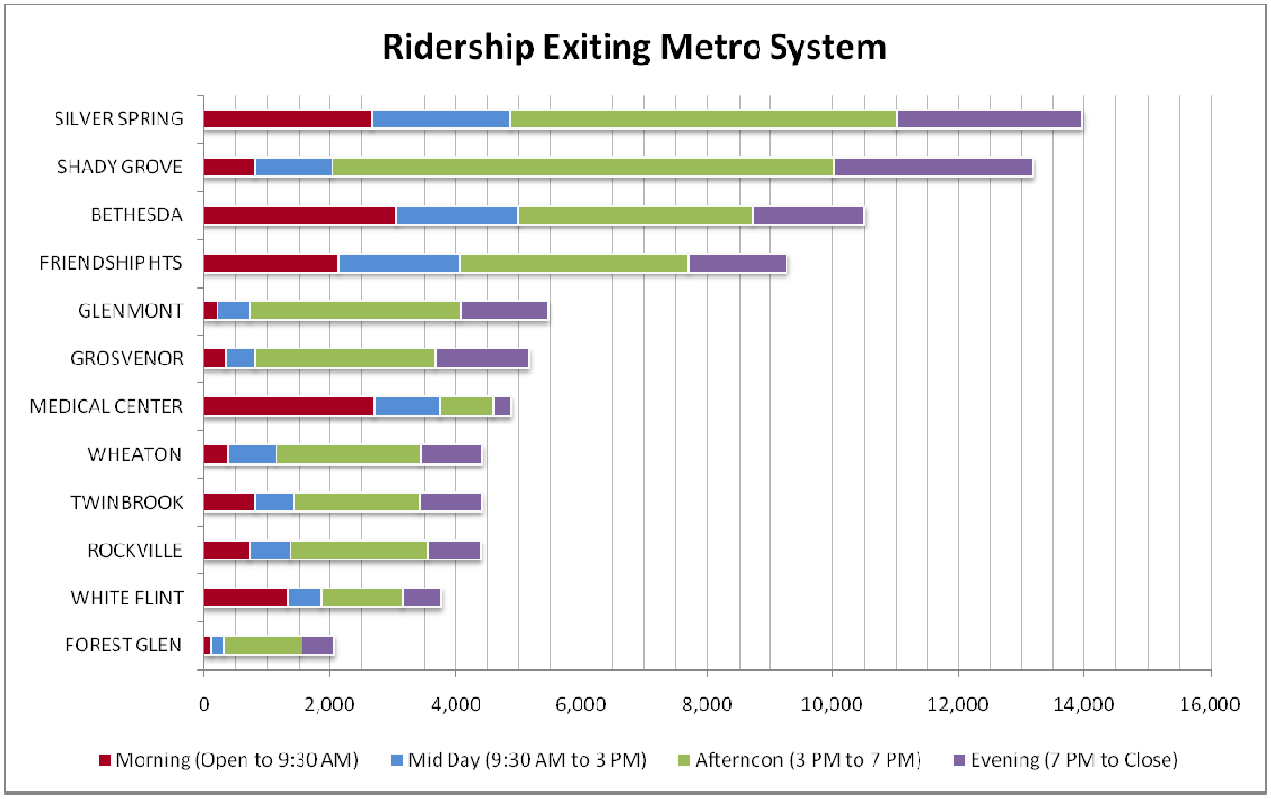


Figure 3.8B: Montgomery County Metrorail Exits (February 2008)



IV. FUTURE CONGESTION

Year 2013 Forecasted Volume-to-Capacity (V/C) Ratios

For the purpose of this report, the traffic forecast results derived from the year 2013 Policy Area Mobility Review (PAMR) analysis were used to report future traffic conditions. This analysis was performed using the Department's TRAVEL/3 model. This tool is an adaptation of the Metropolitan Washington Council of Governments (MWCOG) modeling process and has been applied in support of various growth policy and master planning studies undertaken by the Department.

Regarding land use for the 2013 PAMR analysis, development assumptions inside Montgomery County were updated to reflect the existing base plus pipeline of approved development as of January 1, 2009. Land use assumed outside the County is an estimate of development by the year 2013 based on MWCOG's Round 7.1 cooperative land use forecast.

Within Montgomery County, the current pipeline of approved but un-built development includes some 24,000 households and 123,000 jobs. Nearly two-thirds of this development is in the northern half of the I-270 corridor, from Rockville City north to Clarksburg, including the following ten policy areas:

- Clarksburg
- Germantown West, Town Center, and East
- North Potomac
- Gaithersburg City
- Montgomery Village/Airpark
- Derwood
- R&D Village
- Rockville City

These ten policy areas currently have roughly one-third of the County's jobs and households.

The 2013 PAMR land use scenario also reflects assumed Base Realignment and Closures (BRAC)-related employment totals at the Naval Medical Center in Bethesda as well as anticipated employment development at the Food and Drug Administration in White Oak associated with Federal consolidation plans at that location.

Regarding the 2013 PAMR transportation network, projects considered to be fully-funded within the first four years of the current County Capital Improvement Program (CIP) and the State Consolidated Transportation Program (CTP) , plus those projects conditioned to be built by the private sector as part of development pipeline approvals, were assumed inside Montgomery County. In this regard, no significant changes relative to last year's 2012 PAMR analysis were identified. However, the deferral of the Intercounty Connector (ICC) "Contract D" project in the CTP resulted in the exclusion of the planned collector-distributor roadways between the ICC and MD 198 in Prince George's County from the 2013 network. This is a key change relative to the 2012 PAMR network assumed last year. For the remainder of the network located outside Montgomery County, this analysis incorporates projects identified in the MWCOG Constrained Long-Range Plan (CLRP) network that are anticipated to be completed by the year 2010.

Project planning studies are currently underway for the both the I-270 / US 15 corridor, and the Capital Beltway (from the I-270 Spur to the American Legion Bridge). However, the proposed capacity improvements associated with these facilities were not included in the year 2013 model scenario. In addition, planning studies for both the Corridor Cities Transitway (CCT) and the Purple Line (Bi-County

Transitway) projects are underway. However, their anticipated completion dates are beyond the 2013 horizon; therefore these projects were excluded from the model run as well. The PM peak period results were analyzed and compared to that of the year 2005 model run results for discussion purposes, with the primary focus on the non-freeway facilities.

Table 4.1 shows a comparison of the model run results for the year 2005 and 2013 scenarios. It should be noted that the levels of development assumed in these two scenarios are markedly different. For 2005, countywide totals for households and jobs are 347,000 and 500,000, respectively. For 2013, the countywide total for households is assumed to be 383,459 (a 10.5% increase relative to 2005). The year 2013 countywide total for jobs is assumed to be 628,153 (a 25.6% increase). Based on the results, the average volume-to-capacity (V/C) ratio on the County's transportation system is anticipated to increase by 2.6% by the year 2013. In addition, both the vehicle-miles traveled (VMT) and the vehicle-hours traveled (VHT) are anticipated to increase by 11.6% and 16.1%, respectively. Furthermore, the model predicts a 25.1% increase in the amount of congested lane-miles (V/C ratio of 1.00 or higher) during the PM peak period by the year 2013. The Intercounty Connector (ICC) and other future road improvements will account for an 8.6% increase in the roadway network's total lane-miles. These figures indicate that, although more vehicles are predicted to travel the County's roadways for longer periods of time by the year 2013, planned capacity improvements are anticipated to sufficiently accommodate future traffic resulting from planned development throughout the County and surrounding areas, as reflected in the slight increase in the average V/C ratio countywide.

Table 4.1: Comparison of County-wide 2005 and 2013 TRAVEL/3 Model Results

	2005 Network	2013 PAMR Network	% Chg from 2005
Households*	347,000	383,459	10.5%
Jobs*	500,000	628,153	25.6%
Total Lane-Miles	2,751	2,988	8. 6%
Vehicle-Miles Traveled (in 000s)	5498.5	6133.6	11.6%
Vehicle-Hours Traveled (in 000s)	317.0	367.9	16.1%
Average Speed (mph)	17.4	16.8	-3.5%
Average V/C Ratio	0.76	0.78	2.6%

*Assumed for modeling purposes

Table 4.2 compares and summarizes the model results for both the freeway and non-freeway facilities. Based on the results, the forecasted increase in the average V/C ratio is higher for the non-freeway facilities (3.3%) versus that of the freeway facilities (1.3%). Conversely, the increases in VMT and VHT on the freeway facilities (22% and 19.8% respectively) are forecasted to be higher than that of the non-

freeway facilities (6.9% and 13.4% respectively). One of the main reasons for the smaller increase in the average V/C ratio on the freeway facilities, compared to that of the non-freeway facilities, is that the ICC accounts for a significant increase in total capacity (total lane-miles) for this particular facility type.

Table 4.2: Comparison of 2005 and 2013 TRAVEL/3 Model Results – Non-freeway vs. Freeway Facilities

	Non-freeway facilities			Freeway facilities		
	2005 Network	2013 PAMR Network	% Chg	2005 Network	2013 PAMR Network	% Chg
Total Lane-Miles	2,362	2,508	6.2%	389	479	23.1%
Vehicle-Miles Traveled (in 000s)	3790.2	4050.0	6.9%	1708.3	2083.6	22.0%
Vehicle-Hours Traveled (in 000s)	238.7	270.6	13.4%	78.2	93.7	19.8%
Average Speed (mph)	15.9	14.9	-5.7%	21.9	22.3	1.8%
Average V/C Ratio	0.76	0.79	3.3%	0.76	0.77	1.3%

Figure 4.1 maps the PM peak period V/C ratios and volumes forecasted for the year 2013 on the County's transportation system. The model results indicate that 26.1% of the congested lane-miles will be located along the freeway facilities (i.e. I-495 and I-270), while the remaining 73.9% will be located along the major non-freeway facilities such as; Columbia Pike (US 29), Georgia Ave (MD 97), and Connecticut Ave (MD 185). These results help to reinforce the future need for additional capacity on some of the County's major facilities that will be needed to accommodate the anticipated increases in traffic.

Figure 4.2 provides a map depicting the forecasted PM peak period traffic volume differences between 2005 and 2013. A number of road and intersection improvements are anticipated to be completed by the year 2013. In some cases, the forecast indicates that these facilities will see an increase in their three-hour PM peak period volumes as a result of added capacity. More specifically, the model results indicate that sections of Woodfield Rd (MD 124), which has a planned widening associated with this roadway, are anticipated to see an increase of at least 4000 vehicles during the three-hour PM peak period. Similarly, Airpark Rd, between Muncaster Mill Rd (MD 115) and Woodfield Rd, is forecasted to see an increase of at least 3000 vehicles during the PM peak period.

In contrast to these findings, the opening of some new facilities is anticipated to have a beneficial effect on roadways located in the immediate vicinity, as the model results indicate a decrease in the PM peak period volumes for these facilities. The addition of the ICC as the primary east-west route alternative, is predicted to reduce PM peak period volumes on a number of major roadways in the immediate vicinity of the ICC such as; Norbeck Rd (MD 28), Spencerville Rd (MD 198), Muncaster Mill Rd (MD 115), and sections of Olney-Laytonsville Rd (MD 108). These findings demonstrate that east-west mobility in the County will be enhanced with the addition of this facility.

Figure 4.1: Map of 2013 PM Peak Hour V/C Ratios and Volumes

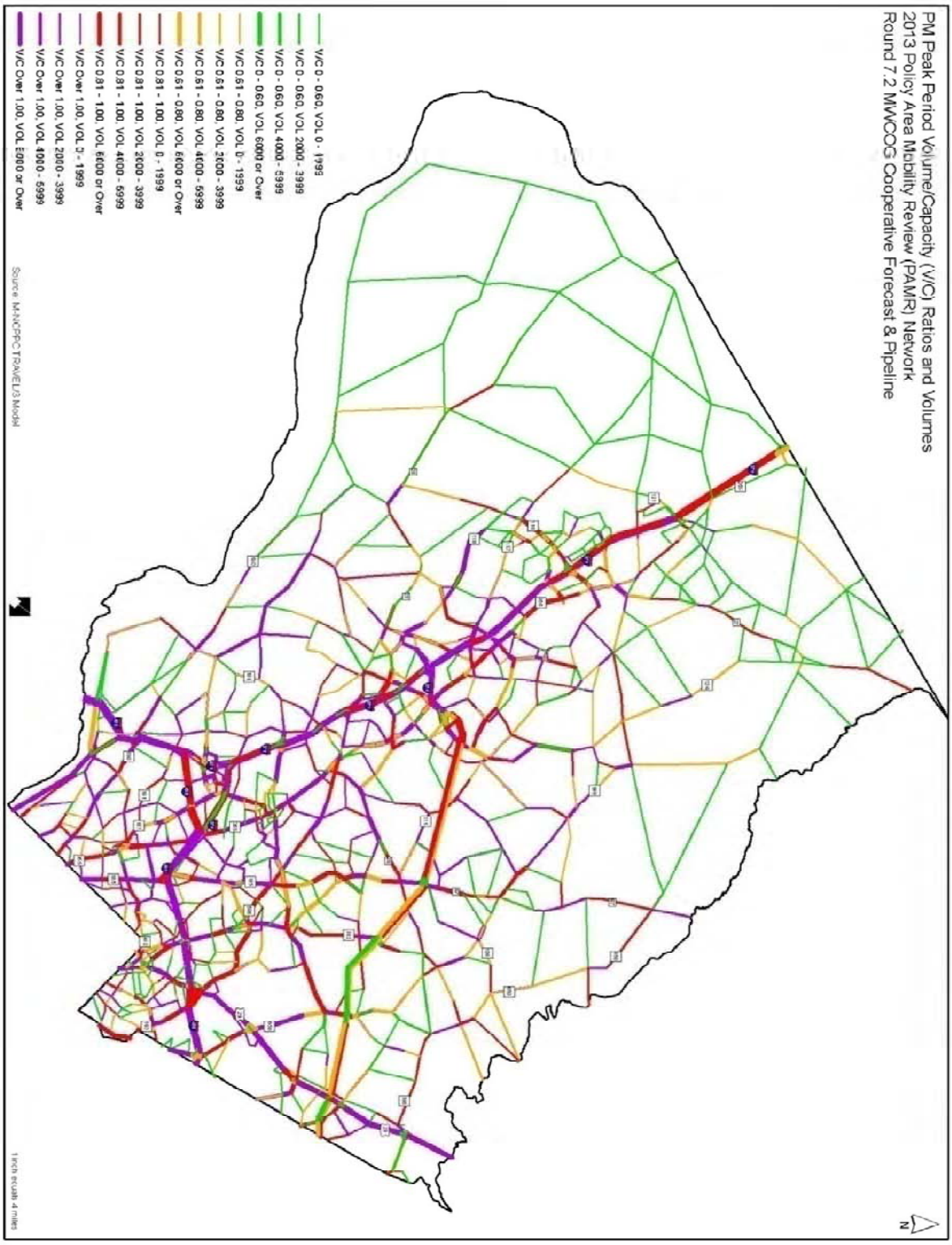
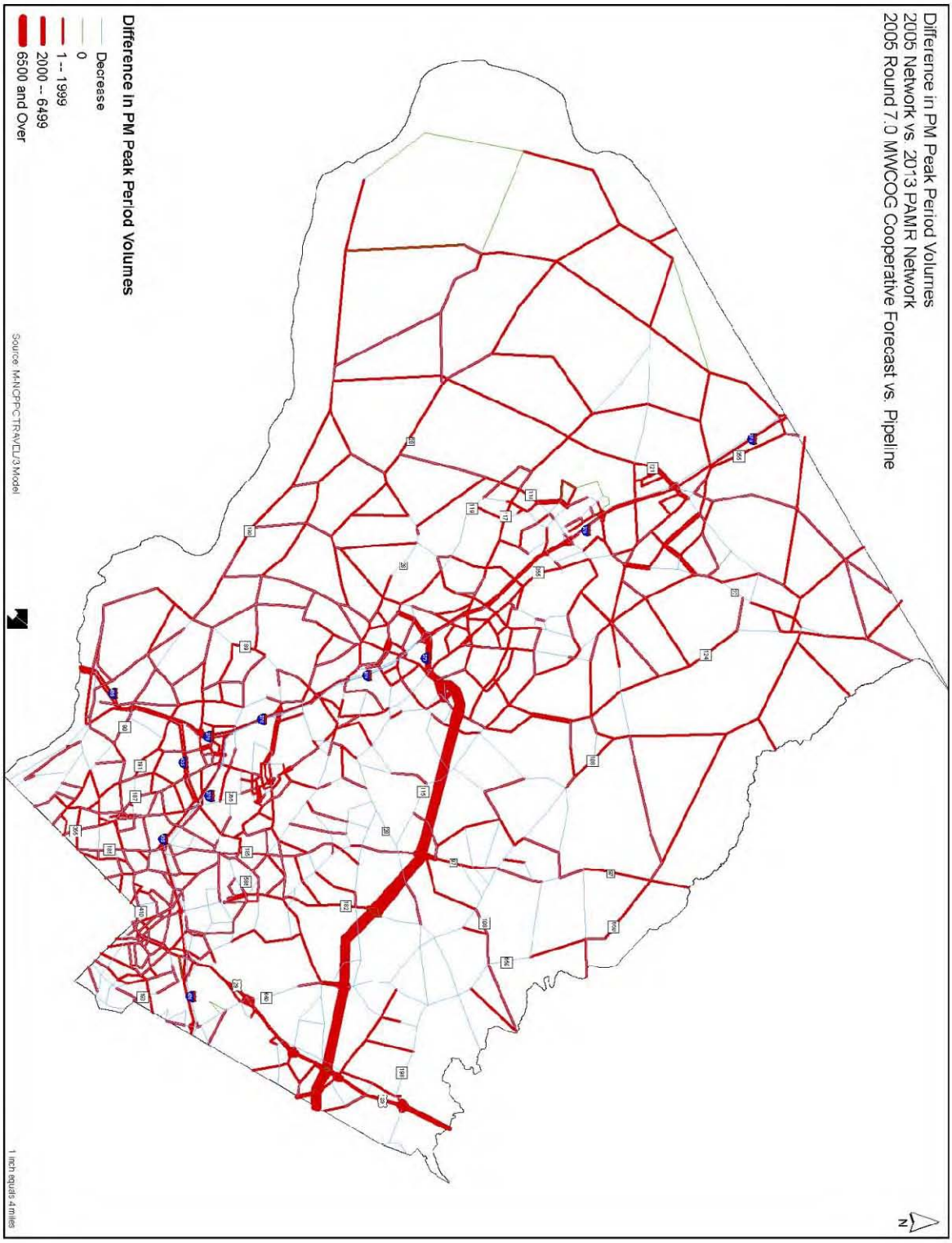


Figure 4.2: Map Showing Difference in PM Peak Volumes – 2005 vs. 2013



2009 Highway Mobility Report

Appendix A: List of Most Recent Critical Lane Volumes at Signalized Intersections

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
16th St at 2nd Ave/Elkhart	6/8/2004	906	749	1600	Silver Spring/Takoma Park
16th St at Spring St	4/19/2005	700	943	1600	Silver Spring/Takoma Park
2nd Ave at Apple Ave/Cameron St	12/13/2005	626	648	1800	Silver Spring CBD
355-Somerset Ter	3/21/2007	952	799	1800	Friendship Heights
Aircraft Dr at Century Blvd	4/30/2009	490	541	1450	Germantown Town Center
Arcola Ave at Amherst Ave	6/1/2005	839	1104	1600	Kensington/Wheaton
Arcola Ave at Kemp Mill Rd	5/11/2004	1020	1290	1600	Kensington/Wheaton
Arlington Rd at Bethesda Ave	6/11/2008	881	1102	1800	Bethesda CBD
Arlington Rd at Edgemoor Ln	3/21/2007	597	823	1800	Bethesda CBD
Arlington Rd at Elm St	9/9/2008	652	810	1800	Bethesda CBD
Arlington Rd at Little Falls Pkwy	10/31/2003	420	552	1600	Bethesda/Chevy Chase
Arlington Rd at Montgomery Ln	3/28/2007	405	656	1800	Bethesda CBD
Bel Pre Rd at Beaverwood Dr	5/30/2006	876	936	1500	Aspen Hill
Bel Pre Rd at Homecrest Dr	6/1/2006	1252	842	1500	Aspen Hill
Bickerstaff/Diamondback/Story	9/7/2005	681	635	1450	Gaithersburg City
Bonifant Rd at Pebblestone Dr	3/5/2009	833	702	1475	Cloverly
Bou Ave at Chapman Ave	11/1/2005	535	721	1550	North Bethesda
Bradley Blvd at Arlington Rd	10/4/2006	932	1092	1800	Bethesda CBD
Bradley Blvd at Fairfax	10/12/2006	671	1098	1800	Bethesda CBD
Bradley Blvd at Fernwood Rd	3/4/2009	1129	1440	1600	Bethesda/Chevy Chase
Bradley Blvd at Goldsboro Rd	3/11/2009	1052	1091	1600	Bethesda/Chevy Chase
Bradley Blvd at Hill/Leland	10/12/2006	628	860	1800	Bethesda CBD
Bradley Blvd at Huntington Pkwy	6/11/2003	980	1321	1600	Bethesda/Chevy Chase
Bradley Blvd at Wilson Ln	3/12/2009	1660	1603	1600	Bethesda/Chevy Chase
Briggs Chaney Rd at Automobile/Castle	10/18/2005	889	1244	1500	Fairland/White Oak
Briggs Chaney Rd at Fairdale Rd	9/17/2008	863	790	1500	Fairland/White Oak
Briggs Chaney Rd at Old Columbia Pk	11/14/2006	1531	1209	1500	Fairland/White Oak
Broad-Calv-Cherryhill	9/6/2007	1498	1462	1500	Fairland/White Oak
Burtonsville Blv at Burtonsville Xing SC	4/14/2009	494	596	1400	Patuxent
Calverton Blvd at Galway Dr	9/6/2007	1336	977	1500	Fairland/White Oak
Capitol View Ave at Forest Glen/Seminary	2/12/2004	937	900	1600	Kensington/Wheaton
Carroll Ave (MD 195) at Flower Ave	10/10/2006	860	1046	1600	Silver Spring/Takoma Park
Carroll Ave (MD 195) at Laurel Ave	4/16/2009	406	528	1600	Silver Spring/Takoma Park
Carroll Ave (MD 195) at Tulip Ave	8/5/2004	512	553	1600	Silver Spring/Takoma Park
Cedar St at Pershing Ln	6/4/2003	304	422	1800	Silver Spring CBD
Cherry Hill Rd at Plum Orch/Clover Patch	8/30/2007	1074	967	1500	Fairland/White Oak
Cherry Hill Rd at Prosperity Dr	9/5/2007	1019	1011	1500	Fairland/White Oak
Clarksburg Rd at Gateway Center Dr	5/7/2009	699	723	1425	Clarksburg

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Clopper Rd at Firstfield Rd	4/29/2009	1258	1302	1450	Gaithersburg City
Clopper Rd at Great Seneca Hwy	3/11/2009	1111	1223	1450	Germantown West
Clopper Rd at Hopkins Ln	3/12/2009	1068	988	1450	Germantown West
Clopper Rd at Kingsview Rd	2/5/2004	962	1037	1450	Germantown West
Clopper Rd at Kingsview Village Dr	9/13/2006	944	943	1450	Germantown West
Clopper Rd at Longdraft Rd	3/17/2009	925	1070	1475	North Potomac
Clopper Rd at Mateney Rd	3/30/2004	1041	1026	1450	Germantown West
Clopper Rd at Metropolitan Grove Rd	4/19/2005	819	1069	1450	Gaithersburg City
Clopper Rd at Quince Orchard Rd	3/10/2009	1355	1463	1450	Gaithersburg City
Clopper Rd at Watkins Mill/Pheasant	3/11/2004	726	1017	1450	Gaithersburg City
Colesville Rd at 2nd/Wayne	9/25/2007	964	835	1800	Silver Spring CBD
Colesville Rd at Dale Dr	2/26/2009	1604	1645	1600	Silver Spring/Takoma Park
Colesville Rd at East West Hwy	4/30/2009	991	1385	1800	Silver Spring CBD
Colesville Rd at Fenton St	9/19/2006	943	1038	1800	Silver Spring CBD
Colesville Rd at Franklin Ave	2/3/2009	1413	1571	1600	Silver Spring/Takoma Park
Colesville Rd at Georgia Ave	9/26/2006	1378	1049	1800	Silver Spring CBD
Colesville Rd at Sligo Crk Pkwy/St Andre	3/6/2008	1508	1624	1600	Silver Spring/Takoma Park
Colesville Rd at Spring St	9/20/2006	1123	1248	1800	Silver Spring CBD
Colesville Rd at University Blvd (N)	9/13/2006	1589	1434	1600	Kensington/Wheaton
Colesville Rd at University Blvd (S)	1/22/2009	1680	1535	1600	Kensington/Wheaton
Columbia Pike at Blackburn Rd	12/6/2006	1532	1501	1400	Patuxent
Columbia Pike at Burnt Mills Ave	10/7/2004	1374	1246	1500	Fairland/White Oak
Columbia Pike at Fairland Rd	9/6/2007	1636	1604	1500	Fairland/White Oak
Columbia Pike at Greencastle Rd	11/15/2006	1607	1575	1500	Fairland/White Oak
Columbia Pike at Industrial Pkwy	9/5/2007	1061	1365	1500	Fairland/White Oak
Columbia Pike at Lockwood Dr	4/2/2009	1603	1487	1500	Fairland/White Oak
Columbia Pike at Milestone/Stewart	8/30/2007	830	1500	1500	Fairland/White Oak
Columbia Pike at Musgrove Rd	9/13/2007	1265	1279	1500	Fairland/White Oak
Columbia Pike at Prelude Dr	3/21/2006	1362	1406	1500	Fairland/White Oak
Columbia Pike at Southwood	3/5/2008	1601	1521	1600	Kensington/Wheaton
Columbia Pike at Stewart/NB Slip Ramp	1/29/2003	1318	1371	1500	Fairland/White Oak
Columbia Pike at Tech Rd	9/5/2007	1192	1411	1500	Fairland/White Oak
Connecticut Ave at Adams	5/31/2007	926	885	1600	Kensington/Wheaton
Connecticut Ave at Aspen Hill Rd	6/1/2006	1446	1417	1500	Aspen Hill
Connecticut Ave at Bel Pre Rd	6/1/2006	1069	1227	1500	Aspen Hill
Connecticut Ave at Bradley Ln	3/17/2004	1516	1577	1600	Bethesda/Chevy Chase
Connecticut Ave at Chevy Chase Lake Dr	4/28/2004	950	1080	1600	Bethesda/Chevy Chase
Connecticut Ave at Denfield	2/12/2004	1273	1173	1600	Kensington/Wheaton

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INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Connecticut Ave at Dunlop St	2/2/2006	1025	999	1600	Bethesda/Chevy Chase
Connecticut Ave at East West Hwy	4/16/2009	1693	1644	1600	Bethesda/Chevy Chase
Connecticut Ave at I-495 (N)	3/9/2004	1283	1245	1600	Kensington/Wheaton
Connecticut Ave at I-495 (S)	3/10/2004	1515	1100	1600	Bethesda/Chevy Chase
Connecticut Ave at Independence	3/5/2009	1063	1120	1500	Aspen Hill
Connecticut Ave at Jones Bridge Rd	5/13/2009	1769	1618	1600	Bethesda/Chevy Chase
Connecticut Ave at Knowles Ave	2/26/2009	1364	1263	1600	Kensington/Wheaton
Connecticut Ave at Manor Rd	3/18/2009	1095	1245	1600	Bethesda/Chevy Chase
Connecticut Ave at Perry	2/11/2004	1188	1018	1600	Kensington/Wheaton
Connecticut Ave at Plyers Mill Rd	4/28/2009	1304	1825	1600	Kensington/Wheaton
Connecticut Ave at Randolph Rd	1/8/2008	1470	1804	1600	Kensington/Wheaton
Connecticut Ave at Raymond/Rosemary	1/30/2007	1201	806	1600	Bethesda/Chevy Chase
Connecticut Ave at Saul Rd	2/5/2004	1002	990	1600	Kensington/Wheaton
Connecticut Ave at University Blvd	3/11/2009	1186	1026	1600	Kensington/Wheaton
Connecticut Ave at Veirs Mill Rd	6/6/2007	1607	1535	1600	Kensington/Wheaton
Connecticut Ave at Washington St	5/26/2005	1034	819	1600	Kensington/Wheaton
Connecticut Ave at Weller Rd	12/7/2004	1286	1175	1600	Kensington/Wheaton
Crabbs Branch Way at Indianola Dr	4/25/2006	1277	1168	1800	Shady Grove
Dale Dr at Wayne Ave	4/21/2005	809	965	1600	Silver Spring/Takoma Park
Darnestown Rd at Beallsville Rd	10/5/2005	992	902	1400	Poolesville
Darnestown Rd at Darnestown-Germantn Rd	3/31/2009	1077	979	1400	Darnestown/Travilah
Darnestown Rd at Glen Mill Rd	9/27/2007	1124	1038	1500	Rockville City
Darnestown Rd at Muddy Branch Rd	1/21/2009	1417	1347	1475	North Potomac
Darnestown Rd at Potomac Valley Drwy	10/9/2007	862	722	1450	Gaithersburg City
Darnestown Rd at Quince Orchard HS	10/6/2005	744	832	1475	North Potomac
Darnestown Rd at Quince Orchard Rd	10/2/2007	1311	1123	1475	North Potomac
Darnestown Rd at Riffle Ford Rd	3/12/2009	1061	1898	1475	North Potomac
Darnestown Rd at Seneca Rd (MD 112)	2/9/2006	1152	1160	1400	Darnestown/Travilah
Darnestown Rd at Shady Grove Rd	9/11/2007	1098	794	1500	Rockville City
Darnestown Rd at Travilah Rd	2/4/2009	1108	1067	1475	North Potomac
Darnestown Rd at Tschiffely Square Rd	10/2/2007	1202	997	1475	North Potomac
Darnestown-Germantown Rd at Clopper Rd	9/13/2006	1044	1361	1450	Germantown West
Darnestown-Germantown Rd at Middlebrook	10/23/2007	1169	1427	1450	Germantown Town Center
Darnestown-Germantown Rd at Observation	3/29/2007	942	1065	1450	Germantown East
Darnestown-Germantown Rd at Richter Farm	5/6/2009	1245	1330	1450	Germantown West

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Darnestown-Germantown Rd at Wisteria Dr	10/18/2007	964	1594	1450	Germantown Town Center
Deer Park Dr at Railroad Ave	5/6/2003	1060	1034	1475	Derwood
Democracy Blvd at Falls Rd/S Glen Rd	4/1/2009	1594	1167	1475	Potomac
Democracy Blvd at Fernwood Rd	3/14/2006	1185	1348	1550	North Bethesda
Democracy Blvd at I-270	6/3/2004	1184	1371	1475	Potomac
Democracy Blvd at Rockledge Dr	4/21/2005	724	1013	1550	North Bethesda
Democracy Blvd at Seven Locks Rd	4/21/2009	1043	1429	1475	Potomac
Democracy Blvd at Westlake Terr	5/24/2005	835	869	1475	Potomac
E Gude Dr at Calhoun Dr	10/27/2005	1175	1084	1475	Derwood
E Gude Dr at Crabbs Branch/Cecil	3/24/2009	1742	1211	1475	Derwood
E Gude Dr at Southlawn Ln	3/5/2009	1692	1450	1500	Rockville City
E Randolph Rd at Fairland Rd/Octagon La	6/1/2006	1081	1357	1500	Fairland/White Oak
E Randolph Rd at Old Columbia Pike	9/13/2007	903	1080	1500	Fairland/White Oak
E Randolph Rd at Serpentine Way	9/13/2007	718	873	1500	Fairland/White Oak
E Randolph Rd at Tamarack Ln	10/29/2003	633	589	1500	Fairland/White Oak
E Wayne Ave at Flower Ave	5/18/2005	861	954	1600	Silver Spring/Takoma Park
East Diamond Ave at Summit Ave	4/24/2003	840	1051	1450	Gaithersburg City
East West Hwy at Jones Mill/Beach	3/5/2009	1087	1574	1600	Bethesda/Chevy Chase
East West Hwy at Newell/Blair Mill	12/14/2005	745	838	1800	Silver Spring CBD
East-West Hwy at 16th St	2/12/2009	1303	1299	1600	Silver Spring/Takoma Park
East-West Hwy at Blair Park Plz/NOAA	12/6/2006	489	541	1800	Silver Spring CBD
East-West Hwy at Chelton	4/19/2006	1147	690	1800	Bethesda CBD
East-West Hwy at Grubb Rd	2/6/2007	1203	1081	1600	Silver Spring/Takoma Park
East-West Hwy at Meadowbrook Ln	2/13/2002	1091	1268	1600	Silver Spring/Takoma Park
East-West Hwy at Montgomery Ave	4/19/2006	1082	678	1800	Bethesda CBD
East-West Hwy at Pearl St	4/19/2006	882	734	1800	Bethesda CBD
East-West Hwy at Sundale/Washington	9/15/2005	922	846	1600	Silver Spring/Takoma Park
East-West Hwy at Waverly	4/30/2008	548	503	1800	Bethesda CBD
Edgemoor Ln at Woodmont Ave	1/31/2007	912	734	1800	Bethesda CBD
Ethan Allen Ave (MD 410) at Carroll Ave	2/27/2007	403	574	1600	Silver Spring/Takoma Park
Executive Blvd at Marinelli Rd	3/10/2005	376	569	1800	White Flint
Executive Blvd at Nicholson Ln	3/10/2005	755	751	1800	White Flint
Fairland Rd at Old Columbia Pike	9/6/2007	1336	1386	1500	Fairland/White Oak
Falls Rd at Bells Mill Rd	5/29/2003	885	995	1475	Potomac
Falls Rd at Dunster/Falls Chapel	3/15/2007	1115	957	1500	Rockville City
Falls Rd at Kersey	10/18/2001	1068	1009	1500	Rockville City
Falls Rd at Tuckerman Ln/Falls Chapel	3/7/2007	978	1006	1475	Potomac
Falls Rd at Wootton Pkwy	11/8/2006	1313	1203	1500	Rockville City

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Father Hurley Blvd at Crystal Rock Dr	1/11/2007	984	956	1450	Germantown West
Father Hurley Blvd at Middlebrook Rd	5/17/2006	1102	1139	1450	Germantown West
Fenton St at Bonifant St	9/19/2006	684	849	1800	Silver Spring CBD
Fenton St at Burlington Ave	3/3/2005	1169	1046	1800	Silver Spring CBD
Fenton St at Cameron St	11/16/2005	473	644	1800	Silver Spring CBD
Fenton St at Ellsworth Ln	9/13/2006	419	678	1800	Silver Spring CBD
Fenton St at Silver Spring Ave	1/10/2008	562	899	1800	Silver Spring CBD
Fenton St at Sligo Ave	1/26/2005	988	1087	1800	Silver Spring CBD
Fenton St at Thayer Ave	9/13/2006	719	878	1800	Silver Spring CBD
Fenton St at Wayne Ave	9/14/2006	1090	1060	1800	Silver Spring CBD
Fernwood Rd at Rock Spring Dr/Marriott	3/9/2006	646	820	1550	North Bethesda
Fernwood Rd at Rockledge Dr/Westlake Ter	3/9/2006	857	838	1550	North Bethesda
Fields Rd at Rio Blvd	9/13/2005	439	1029	1475	R&D Village
Fields Rd at Washingtonian Blvd	9/14/2005	455	747	1475	R&D Village
First St at Baltimore Rd	1/22/2009	1061	1601	1500	Rockville City
Frederick Ave at Education Blvd	10/27/2004	1324	944	1450	Gaithersburg City
Frederick Ave at Plummer Dr	12/7/2005	999	959	1450	Germantown East
Frederick Ave at Travis	10/13/2004	1056	1212	1450	Gaithersburg City
Frederick Rd (MD 355) at King Farm Blvd	1/6/2008	1158	1538	1800	Shady Grove
Frederick Rd (MD 355) at Lockheed / IBM	11/16/2004	991	876	1450	Gaithersburg City
Frederick Rd (MD 355) at Milestone CtrS	10/14/2004	1054	955	1450	Germantown East
Frederick Rd at Chestnut St	3/25/2009	1144	1191	1450	Gaithersburg City
Frederick Rd at Christopher St	2/26/2009	1057	1417	1450	Gaithersburg City
Frederick Rd at Clarksburg Rd	7/26/2007	890	1329	1450	Clarksburg
Frederick Rd at Darnestown-Germantown Rd	4/16/2009	1247	1490	1450	Germantown East
Frederick Rd at Deer Park Dr	3/10/2004	1381	1192	1475	Derwood
Frederick Rd at Gunners Branch Rd	10/23/2007	975	862	1450	Germantown East
Frederick Rd at Henderson Corner Rd	3/17/2009	1106	938	1450	Germantown East
Frederick Rd at Lakeforest/Perry	3/10/2004	995	974	1450	Gaithersburg City
Frederick Rd at Montgomery Village Ave	5/5/2009	1697	1553	1450	Gaithersburg City
Frederick Rd at Odenhal Ave	3/31/2009	1013	1272	1450	Gaithersburg City
Frederick Rd at Old Hundred Rd (MD 109)	3/18/2009	1068	988	1400	Goshen
Frederick Rd at Redland Rd	10/19/2004	1542	1418	1800	Shady Grove
Frederick Rd at Shady Grove Rd	3/10/2005	1649	1497	1800	Shady Grove
Frederick Rd at Shakepeare Blvd	2/19/2009	1190	1138	1450	Germantown East
Frederick Rd at Solid Waste Drwy	9/21/2004	1280	1102	1800	Shady Grove
Georgia Ave at 16th St	3/4/2009	974	1269	1600	Silver Spring/Takoma Park

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Georgia Ave at Arcola Ave	1/22/2008	1103	1538	1600	Kensington/Wheaton
Georgia Ave at Aspen Hill Rd	6/6/2006	1018	1130	1500	Aspen Hill
Georgia Ave at August Dr	4/16/2009	1235	1214	1600	Kensington/Wheaton
Georgia Ave at Bel Pre Rd	6/1/2006	1530	1530	1500	Aspen Hill
Georgia Ave at Blueridge	11/28/2007	1114	1206	1800	Wheaton CBD
Georgia Ave at Bonifant St	9/26/2007	864	876	1800	Silver Spring CBD
Georgia Ave at Cameron St	11/16/2005	1081	866	1800	Silver Spring CBD
Georgia Ave at Columbia Blvd/Seminary Ln	1/8/2009	1408	1613	1600	Silver Spring/Takoma Park
Georgia Ave at Connecticut Ave	5/31/2006	1377	1539	1500	Aspen Hill
Georgia Ave at Dennis Ave	11/15/2007	1067	1293	1600	Kensington/Wheaton
Georgia Ave at East-West/Burlington/13th	12/7/2006	1471	1190	1800	Silver Spring CBD
Georgia Ave at Emory Ln	10/23/2007	1314	1738	1450	Olney
Georgia Ave at Forest Glen Rd	7/2/2008	1318	1626	1600	Kensington/Wheaton
Georgia Ave at Glenallen Ave	2/26/2008	867	1120	1800	Glenmont
Georgia Ave at Gold Mine Rd	3/15/2007	855	814	1475	Olney
Georgia Ave at Hathaway Dr	2/26/2008	1097	858	1600	Kensington/Wheaton
Georgia Ave at Hewitt Ave	1/12/2005	807	931	1600	Kensington/Wheaton
Georgia Ave at Hines/Prince Phillip	3/6/2007	1221	1145	1475	Olney
Georgia Ave at I-495 ramps	11/14/2007	1318	1042	1600	Kensington/Wheaton
Georgia Ave at International	12/18/2003	931	1012	1500	Aspen Hill
Georgia Ave at King William Dr	12/9/2003	1192	1095	1475	Olney
Georgia Ave at Layhill Rd	2/26/2008	1145	1138	1800	Glenmont
Georgia Ave at MD 108	5/21/2008	1147	1114	1475	Olney
Georgia Ave at Morningwood/Spartan	3/4/2009	1142	1308	1475	Olney
Georgia Ave at New Hampshire Ave	10/21/2008	1441	1176	1400	Patuxent
Georgia Ave at Norbeck Rd	1/22/2009	1816	1665	1500	Aspen Hill
Georgia Ave at Old Baltimore Rd	10/24/2007	1147	1125	1475	Olney
Georgia Ave at Plyers Mill Rd	3/26/2009	1425	1250	1600	Kensington/Wheaton
Georgia Ave at Prince Phillip/Queen Eliz	7/24/2008	1016	1116	1475	Olney
Georgia Ave at Randolph Rd	3/31/2009	1281	1657	1800	Glenmont
Georgia Ave at Reedie Dr	11/28/2007	1032	1184	1800	Wheaton CBD
Georgia Ave at Rossmoor Ln	8/21/2007	1176	1176	1500	Aspen Hill
Georgia Ave at Seminary	6/11/2008	1544	1034	1600	Silver Spring/Takoma Park
Georgia Ave at Shorefield Ln	2/26/2008	1104	1017	1600	Kensington/Wheaton
Georgia Ave at Sligo Ave	9/20/2007	719	975	1800	Silver Spring CBD
Georgia Ave at Spring St	11/17/2005	1176	1080	1800	Silver Spring CBD
Georgia Ave at Thayer St	9/26/2007	771	858	1800	Silver Spring CBD
Georgia Ave at University Blvd	11/28/2007	1269	1171	1800	Wheaton CBD

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Georgia Ave at Urbana Ln	2/26/2008	674	681	1800	Glenmont
Georgia Ave at Veirs Mill Rd	6/7/2007	1410	1424	1800	Wheaton CBD
Georgia Ave at Wayne Ave	9/25/2007	1028	1171	1800	Silver Spring CBD
Georgia Ave at Windham Ln	6/6/2007	1211	1247	1800	Wheaton CBD
Germantown Rd (MD 118) at Goldenrod Rd	4/30/2009	678	1049	1450	Germantown East
Germantown Rd at Dawson Farm Rd	4/22/2009	1100	1295	1450	Germantown West
Goshen Rd at Centerway Rd	9/19/2002	1214	1212	1450	Montgomery Village/Airpark
Goshen Rd at E Village Ave	3/25/2004	1025	891	1450	Montgomery Village/Airpark
Goshen Rd at Emory Grove Rd	4/15/2009	873	1061	1450	Montgomery Village/Airpark
Goshen Rd at Snouffer School/Wightman	1/4/2006	1041	1366	1450	Montgomery Village/Airpark
Goshen Rd at Warfield Rd	3/25/2004	1078	1105	1450	Montgomery Village/Airpark
Goshen Rd/N Summit at Odenhal Ave	5/9/2006	983	1225	1450	Montgomery Village/Airpark
Great Seneca Hwy at Clopper Mill/Richter	12/14/2004	1082	836	1450	Germantown West
Great Seneca Hwy at Darnestown Rd	9/27/2007	1028	1009	1475	R&D Village
Great Seneca Hwy at Dawson Farm Rd	10/25/2005	610	736	1450	Germantown West
Great Seneca Hwy at Kentlands Blvd	4/23/2009	1498	1252	1450	Gaithersburg City
Great Seneca Hwy at Key West Ave	10/3/2007	1227	1114	1475	R&D Village
Great Seneca Hwy at Lakeland Blvd	1/14/2009	1425	1211	1450	Gaithersburg City
Great Seneca Hwy at Longdraft Rd	4/28/2009	1295	1477	1475	North Potomac
Great Seneca Hwy at Mateney Rd (S)	3/30/2006	1094	1368	1450	Germantown West
Great Seneca Hwy at Middlebrook Rd	3/29/2007	980	1224	1450	Germantown West
Great Seneca Hwy at Muddy Branch Rd	5/12/2009	1512	1647	1450	Gaithersburg City
Great Seneca Hwy at Queenstown La	12/14/2004	887	764	1450	Germantown West
Great Seneca Hwy at Quince Orchard Rd	4/23/2009	1440	1423	1450	Gaithersburg City
Great Seneca Hwy at Sam Eig Hwy	10/10/2007	1240	1348	1475	R&D Village
Great Seneca Hwy at Wisteria Dr	3/29/2006	637	877	1450	Germantown West
Gude Dr at Dover	3/24/2009	1245	1323	1475	Derwood
Hungerford Dr (MD 355) at Campus Dr	10/28/2004	1496	980	1500	Rockville City
Hungerford Dr (MD 355) at Manakee St	2/25/2009	1533	1052	1500	Rockville City
Hungerford Dr at Beall St	9/16/2008	1197	982	1500	Rockville City
Hungerford Dr at College Pkwy	10/27/2004	1382	958	1500	Rockville City
Hungerford Dr at Middle Ln/Park Rd	3/12/2009	1201	1199	1500	Rockville City
Hungerford Dr at Monroe Pl/Church St	10/21/2004	1217	1055	1500	Rockville City
Hungerford Dr at N Washington St	7/8/2004	1094	1290	1500	Rockville City

Appendix A: List of Most Recent Critical Lane Volumes at Signalized Intersections

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Hungerford Ln (MD 355) at Gude Dr	5/6/2009	1723	1569	1500	Rockville City
Jones Bridge Rd at Manor Rd	11/19/2002	679	676	1600	Bethesda/Chevy Chase
Jones Bridge Rd at Platt Ridge Dr	11/19/2002	773	963	1600	Bethesda/Chevy Chase
Key West Ave at Broschart/Diamondback	10/3/2007	1666	1261	1475	R&D Village
Key West Ave at Darnestown Rd	9/27/2007	1085	1058	1475	North Potomac
Key West Ave at Medical Ctr/Omega Dr	10/2/2007	1313	1359	1475	R&D Village
Key West Ave at Shady Grove Rd	9/25/2007	1391	1640	1500	Rockville City
Key West Ave at W Gude Dr	9/18/2007	942	1304	1500	Rockville City
Knowles Ave at Summit Ave	10/2/2007	1167	1005	1600	Kensington/Wheaton
Layhill Rd at Belpre/Bonifant	4/21/2009	1240	1268	1500	Aspen Hill
Layhill Rd at Ednor Rd/Norwood Rd	10/17/2006	1577	1230	1475	Olney
Layhill Rd at Glenallen Ave	2/26/2008	874	898	1600	Kensington/Wheaton
Layhill Rd at Middlevale	2/21/2008	999	793	1600	Kensington/Wheaton
Laytonsville Rd at Brink/Sundown	11/2/2006	1422	1433	1400	Goshen
Little Falls Pkwy at Dorset Ave	4/12/2007	690	692	1600	Bethesda/Chevy Chase
Little Falls Pkwy at Hillandale	4/18/2007	695	654	1600	Bethesda/Chevy Chase
Massachusetts Ave at Biltmore	3/3/2005	1203	895	1600	Bethesda/Chevy Chase
Massachusetts Ave at Cromwell	3/2/2005	712	564	1600	Bethesda/Chevy Chase
Massachusetts Ave at Little Falls Pkwy	4/18/2007	1147	994	1600	Bethesda/Chevy Chase
Massachusetts Ave at Westbard Ave	3/4/2004	940	878	1600	Bethesda/Chevy Chase
MD 108 at Brooke/Meeting House Rd	10/19/2006	1188	1192	1475	Olney
MD 108 at Norwood Rd	9/19/2006	1234	1245	1475	Olney
MD 108 at Spartan	3/8/2007	965	1094	1475	Olney
MD 108 at Woodfield Rd (MD 124)	5/11/2006	599	1113	1450	Damascus
MD 118 at Aircraft Dr	1/11/2007	880	1080	1450	Germantown Town Center
MD 118 at Crystal Rock Dr	5/16/2006	869	1232	1450	Germantown Town Center
MD 124 at Airpark Rd	2/19/2009	827	726	1450	Montgomery Village/Airpark
MD 124 at Girard	5/12/2004	573	521	1450	Gaithersburg City
MD 124 at I-270 SB Ramp	9/13/2001	808	975	1450	Gaithersburg City
MD 124 at Twinlakes	5/21/2003	765	1363	1450	Gaithersburg City
MD 355 at Cordell	5/17/2005	702	740	1800	Bethesda CBD
MD 355 at Edmondston Dr	3/12/2008	1810	1651	1500	Rockville City
MD 355 at Elm/Waverly	6/10/2008	752	888	1800	Bethesda CBD
MD 355 at Frederick Ave	10/26/2004	1035	1063	1500	Rockville City
MD 355 at Halpine	11/1/2005	1103	1277	1500	Rockville City
MD 355 at Indianola/Watkins Pond	2/11/2009	1040	996	1500	Rockville City
MD 355 at Middlebrook (N)	4/1/2009	1040	1334	1450	Germantown East
MD 355 at Professional	10/20/2004	1232	1184	1450	Gaithersburg City

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
MD 355 at S_Westland	4/7/2005	1006	1147	1475	Derwood
MD 355 at Summit Ave	3/9/2004	1194	1246	1450	Gaithersburg City
MD 355 at Tuckerman (S)	4/27/2005	943	894	1800	Grosvenor
MD 355 at Watkins Mill Rd	4/2/2009	960	1189	1450	Gaithersburg City
MD 355 at Willard/Wisconsin Circle	3/21/2007	890	834	1800	Friendship Heights
MD 355 at Woodmont Ave	10/2/2008	1218	987	1600	Bethesda/Chevy Chase
Md.28-Hurley	9/22/2004	830	998	1500	Rockville City
Md.28-Research	11/1/2005	941	1307	1500	Rockville City
Md28-I270-Nelson	11/3/2005	1184	1361	1500	Rockville City
Midcounty Hwy at Goshen Rd	4/2/2009	1176	1425	1450	Montgomery Village/Airpark
Midcounty Hwy at Montgomery Village Ave	3/26/2009	915	1148	1450	Montgomery Village/Airpark
Midcounty Hwy at Washington Grove Ln	2/19/2009	1333	1017	1475	Derwood
Midcounty Hwy at Woodfield/Saybrooke	4/14/2009	976	1090	1450	Gaithersburg City
Middlebrook Rd at Century Blvd	5/5/2009	679	961	1450	Germantown Town Center
Middlebrook Rd at Crystal Rock Dr	3/29/2007	889	890	1450	Germantown Town Center
Middlebrook Rd at Observation Dr	3/25/2009	812	894	1450	Germantown East
Middlebrook Rd at Waring Station Dr	10/28/2004	959	1081	1450	Germantown West
Mont. Village Ave at Chris/Lost Knife	5/9/2006	1037	1454	1450	Montgomery Village/Airpark
Montgomery Ave at Waverly St	3/28/2007	697	1089	1800	Bethesda CBD
Montgomery Ln at East Ln	1/31/2007	446	649	1800	Bethesda CBD
Montgomery Ln at Pearl St	4/19/2006	755	1177	1800	Bethesda CBD
Montgomery Village Ave at Apple Ridge Rd	1/16/2002	752	784	1450	Montgomery Village/Airpark
Montgomery Village Ave at Centerway Rd	9/18/2002	1012	1171	1450	Montgomery Village/Airpark
Montgomery Village Ave at Russell Ave	4/22/2009	816	1218	1450	Gaithersburg City
Montgomery Village Ave at Stedwick	10/4/2007	1633	1170	1450	Montgomery Village/Airpark
Montrose Rd at E Jefferson St	6/5/2007	1278	1495	1550	North Bethesda
Montrose Rd at Falls Rd	11/8/2006	678	942	1475	Potomac
Montrose Rd at Farm Haven Dr	3/20/2007	1493	1409	1550	North Bethesda
Montrose Rd at Hitching Post/Monroe	3/20/2007	1354	945	1550	North Bethesda
Montrose Rd at Old Old Georgetown Rd	3/9/2005	713	926	1550	North Bethesda
Montrose Rd at Seven Locks Rd	11/8/2006	999	860	1500	North Potomac
Montrose Rd at Tildenwood Ln	3/7/2007	1307	1308	1550	North Bethesda
Montrose Rd at Tower Oaks Blvd	11/14/2006	1663	1232	1550	North Bethesda
Montrose Rd at Whites Ford Rd	3/15/2007	813	593	1475	Potomac
Muddy Branch Rd at Diamondback Dr	10/9/2007	1563	1195	1450	Gaithersburg City

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Muddy Branch Rd at East Dr	10/10/2007	863	887	1450	Gaithersburg City
Muddy Branch Rd at Festival Shop Ctr Ent	10/10/2007	830	966	1450	Gaithersburg City
Muddy Branch Rd at West Side Dr	10/10/2007	945	817	1450	Gaithersburg City
Muncaster Mill Rd at Avery Rd	4/1/2009	1087	1120	1400	Rock Creek
Muncaster Mill Rd at Bowie Mill Rd	5/7/2009	1328	1203	1400	Rock Creek
Muncaster Mill Rd at Needwood Rd	2/12/2009	1341	1090	1400	Rock Creek
Muncaster Rd at MD 108	3/11/2009	1579	1164	1400	Patuxent
MVA at Lakeforest Mall	11/10/2004	876	999	1450	Montgomery Village/Airpark
New Hampshire Ave at Adelphi/Dilston	9/10/2008	1250	1373	1600	Silver Spring/Takoma Park
New Hampshire Ave at Bonifant/Good Hope	1/29/2009	1237	1046	1475	Cloverly
New Hampshire Ave at Briggs Chaney Rd	4/3/2008	784	828	1475	Cloverly
New Hampshire Ave at Cape May Rd	2/1/2005	1459	1207	1500	Fairland/White Oak
New Hampshire Ave at Chalmers	5/24/2006	1097	1042	1500	Fairland/White Oak
New Hampshire Ave at Columbia Pk Ramps	10/23/2001	1121	1452	1500	Fairland/White Oak
New Hampshire Ave at Ednor Rd	1/30/2007	1160	1213	1475	Cloverly
New Hampshire Ave at I-495/Elton Rd	3/29/2007	1117	1255	1500	Fairland/White Oak
New Hampshire Ave at Jackson	9/16/2008	1400	1494	1500	Fairland/White Oak
New Hampshire Ave at Lockwood Dr	6/3/2008	1151	1027	1500	Fairland/White Oak
New Hampshire Ave at MD 108	11/30/2006	1226	1223	1400	Patuxent
New Hampshire Ave at Midland Dr	2/3/2005	991	1060	1500	Fairland/White Oak
New Hampshire Ave at Northwest/Michelson	5/31/2006	1045	927	1500	Fairland/White Oak
New Hampshire Ave at Norwood Rd	1/29/2008	1032	1102	1475	Cloverly
New Hampshire Ave at Oakview	1/24/2006	1591	1492	1600	Silver Spring/Takoma Park
New Hampshire Ave at Powder Mill Rd	3/28/2007	1331	1379	1500	Fairland/White Oak
New Hampshire Ave at Schindler/Mahan	5/24/2006	1083	861	1500	Fairland/White Oak
New Hampshire Ave at Spencerville Rd	4/3/2008	979	1053	1475	Cloverly
New Hampshire Ave at Wolf	4/2/2008	807	1315	1500	Fairland/White Oak
Nicholson Ln at Huff Ct	5/11/2006	618	854	1800	White Flint
Nicholson Ln at Nebel St	9/12/2006	808	1051	1550	North Bethesda
Nicholson Ln at White Flint	5/11/2006	604	1155	1800	White Flint
Nicholson Ln at Woodglen	5/18/2005	554	735	1800	White Flint
Norbeck Rd (MD 28) at Avery Rd	1/8/2008	1511	1422	1500	Rockville City
Norbeck Rd at Baltimore	4/14/2009	1267	1381	1500	Aspen Hill
Norbeck Rd at Bauer Dr	1/21/2009	1571	1524	1500	Aspen Hill
Norbeck Rd at Bel Pre Rd	1/8/2008	1464	1246	1500	Aspen Hill
Norbeck Rd at E Gude Dr	3/25/2009	1278	1245	1500	Rockville City

Appendix A: List of Most Recent Critical Lane Volumes at Signalized Intersections

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Norbeck Rd at Layhill Rd	6/8/2006	941	861	1475	Cloverly
Norbeck Rd at Muncaster Mill Rd	1/29/2009	1609	1238	1500	Aspen Hill
Norbeck Rd at Norbeck Blvd	10/16/2008	1369	1518	1500	Aspen Hill
Norbeck Rd at Norwood Rd	2/6/2007	1122	910	1475	Cloverly
Norbeck Rd at Owens Glen/Manor Care	10/9/2007	1229	950	1475	North Potomac
Norbeck Rd at Wintergate Dr	10/16/2008	1161	1200	1500	Aspen Hill
Norfolk Ave at St Elmo Ave	1/31/2008	567	782	1800	Bethesda CBD
Odendhal Ave at Lost Knife Rd	5/9/2006	425	874	1450	Gaithersburg City
Odenhal at Russell Ave	5/9/2006	412	744	1450	Gaithersburg City
Old Columbia Pk at Greencastle Rd	11/14/2006	757	623	1500	Fairland/White Oak
Old Columbia Pk at Spencerville Rd	12/3/2008	1009	1212	1400	Patuxent
Old Georgetown Rd at Auburn St	10/4/2006	895	1138	1800	Bethesda CBD
Old Georgetown Rd at Battery Ln	10/2/2008	1010	1191	1800	Bethesda CBD
Old Georgetown Rd at Beech St	5/5/2007	1373	1304	1600	Bethesda/Chevy Chase
Old Georgetown Rd at Cheshire Ln	3/1/2006	1073	1153	1550	North Bethesda
Old Georgetown Rd at Commerce	1/31/2007	558	773	1800	Bethesda CBD
Old Georgetown Rd at Democracy Blvd	5/25/2006	1352	1308	1550	North Bethesda
Old Georgetown Rd at Edson/Poindexter	3/10/2005	976	1181	1550	North Bethesda
Old Georgetown Rd at Executive Blvd	5/13/2008	1455	1335	1800	White Flint
Old Georgetown Rd at Fairmont Ave	1/31/2008	1424	1189	1800	Bethesda CBD
Old Georgetown Rd at Huntington Pkwy	2/10/2005	1289	953	1600	Bethesda/Chevy Chase
Old Georgetown Rd at I-270 (N) Ramp	9/20/2006	1165	933	1550	North Bethesda
Old Georgetown Rd at Lone Oak	3/9/2006	1148	1002	1550	North Bethesda
Old Georgetown Rd at Nicholson/Tilden	3/10/2005	1191	1222	1800	White Flint
Old Georgetown Rd at Rock Spring Dr	5/26/2006	1133	1275	1550	North Bethesda
Old Georgetown Rd at South/Greentree	3/30/2006	1137	1251	1600	Bethesda/Chevy Chase
Old Georgetown Rd at Tuckerman Ln	1/22/2009	1640	1484	1550	North Bethesda
Old Georgetown Rd at W Cedar Ln	5/5/2007	1249	1510	1600	Bethesda/Chevy Chase
Old Georgetown Rd at Wilson/Arlington	1/31/2008	1125	1141	1800	Bethesda CBD
Old Georgetown Rd at Woodmont Ave	4/10/2007	929	901	1800	Bethesda CBD
Old G'town Rd (MD 187) at Mid Pike Plz	3/9/2005	633	625	1800	White Flint
Old.Georgetown Rd at I-270 (S)	5/25/2005	1214	1163	1550	North Bethesda
Olney-Laytons Rd at Queen Elizabeth Dr	3/14/2007	828	980	1475	Olney
Olney-Laytonsville Rd at Olney Mill Rd	6/3/2004	1017	972	1475	Olney
Olney-Sandy Spg Rd at Old Baltimore Rd	3/1/2007	1366	1021	1475	Olney
Olney-Sandy Sprg Rd at Prince Philip D	3/6/2007	1031	1072	1475	Olney
Olney-Sandy Spring Rd at Doctor Bird Rd	10/18/2006	1025	1188	1475	Olney
Olney-Sandy Spring Rd at Olney Vil. Mart	1/12/2005	995	975	1475	Olney

Source: M-NCPPC Intersection Database

Appendix A: List of Most Recent Critical Lane Volumes at Signalized Intersections

INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Olney-Sandy Spring Rd at Sherwood HS	2/12/2002	1205	1163	1400	Patuxent
Parklawn Dr at Boiling Brook Pkwy	9/12/2006	1304	1554	1550	North Bethesda
Parklawn Dr at Braxfield	3/1/2001	784	603	1550	North Bethesda
Parklawn Dr at Twinbrook Pkwy	6/2/2005	1050	1184	1800	Twinbrook
Parklawn Dr at Wilkens (N)	6/2/2005	299	414	1800	Twinbrook
Philadelphia Ave (MD 410) at Carroll Ave	4/12/2005	900	1488	1600	Silver Spring/Takoma Park
Philadelphia Ave (MD 410) at Maple Ave	12/19/2007	611	1010	1600	Silver Spring/Takoma Park
Philadelphia Ave (MD 410) at Takoma Ave	1/26/2005	679	755	1600	Silver Spring/Takoma Park
Piney Branch Rd at Philadelphia Ave	1/21/2009	1228	1680	1600	Silver Spring/Takoma Park
Piney Branch Rd (MD 320) at Ray Dr/TPMS	12/19/2007	927	550	1600	Silver Spring/Takoma Park
Piney Branch Rd at Arliss St	9/20/2005	866	818	1600	Silver Spring/Takoma Park
Piney Branch Rd at Barron St	6/24/2003	1048	1044	1600	Silver Spring/Takoma Park
Piney Branch Rd at Carroll Ave	2/17/2009	740	849	1600	Silver Spring/Takoma Park
Piney Branch Rd at Dale Dr/Devon Rd	1/24/2006	1186	849	1600	Silver Spring/Takoma Park
Piney Branch Rd at Flower Ave	9/15/2005	855	812	1600	Silver Spring/Takoma Park
Piney Branch Rd at Sligo Ave/Hilltop	1/8/2008	1262	1147	1600	Silver Spring/Takoma Park
Pleasant/Shady-Grove/I370	3/5/2003	1277	1017	1800	Shady Grove
Plyers Mill Rd at Metropolitan Ave	9/21/2005	687	866	1600	Kensington/Wheaton
Quince Orchard Rd at Bank/North	2/5/2003	758	1056	1450	Gaithersburg City
Quince Orchard Rd at Longdraft Rd	9/20/2007	669	1017	1475	North Potomac
Quince Orchard Rd at Sioux	10/8/2007	866	1092	1450	Gaithersburg City
Randolph Rd at Colie Dr	5/6/2004	919	949	1600	Kensington/Wheaton
Randolph Rd at Gaynor/Rockinghorse	2/4/2009	1063	1499	1550	North Bethesda
Randolph Rd at Glenallen Ave	2/26/2008	1421	1239	1600	Kensington/Wheaton
Randolph Rd at Glenmont Cir	2/26/2008	939	915	1800	Glenmont
Randolph Rd at Kemp Mill Rd	9/13/2005	1263	1270	1600	Kensington/Wheaton
Randolph Rd at Lauderdale	1/6/2008	1069	1227	1550	North Bethesda
Randolph Rd at Locksley	3/12/2008	1130	913	1500	Fairland/White Oak
Randolph Rd at Maple Ave	3/9/2005	861	1008	1550	North Bethesda
Randolph Rd at Nebel St	3/9/2005	757	1060	1550	North Bethesda
Randolph Rd at New Hampshire Ave	3/26/2009	1497	1834	1500	Fairland/White Oak
Randolph Rd at Parklawn Dr (W)	2/11/2009	1601	1165	1550	North Bethesda
Randolph Rd at Tivoli	9/14/2005	1040	789	1600	Kensington/Wheaton
Randolph Rd at Veirs Mill Rd	3/18/2009	1484	1423	1600	Kensington/Wheaton
Redland Rd at Crabbs Branch Way	2/25/2009	1302	1133	1800	Shady Grove
Redland Rd at Needwood Rd	3/12/2009	1366	983	1475	Derwood
Redland Rd at Somerville	2/25/2009	735	1092	1800	Shady Grove
Ridge Rd at Bethesda Church Rd	10/19/2004	874	1183	1450	Damascus

Source: M-NCPPC Intersection Database

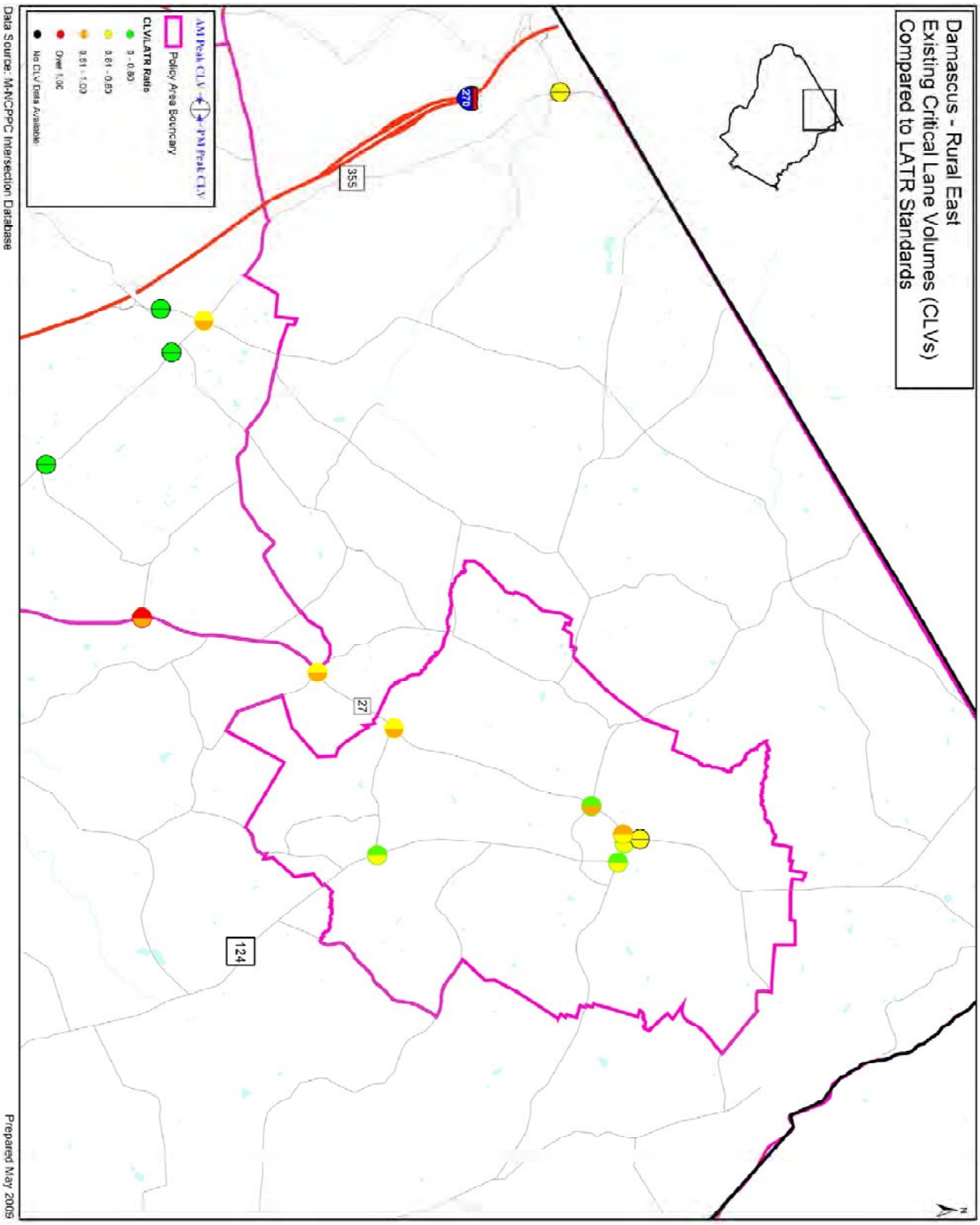
INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Ridge Rd at Brink Rd	3/28/2007	1007	1073	1450	Germantown East
Ridge Rd at High Corner St/Shop Ctr	5/23/2007	958	1021	1450	Damascus
Ridge Rd at Kings Valley Rd	6/6/2007	1039	1221	1450	Clarksburg
Ridge Rd at Lewis Dr/Locust Dr	5/16/2006	1437	1000	1450	Damascus
Ridge Rd at Main St (MD 108)	4/22/2009	836	953	1450	Damascus
Ridge Rd at Observation Dr	3/29/2007	942	1065	1450	Germantown East
Ridge Road at Skylark Rd	4/16/2009	1629	1314	1350	Goshen
Ridge Road at Sweepstakes/Marlboro	4/28/2009	1094	1317	1450	Damascus
River Rd at Beech Tree/Nevis Rd	6/13/2007	1206	1195	1600	Bethesda/Chevy Chase
River Rd at Bradley Blvd	1/24/2008	1562	1140	1475	Potomac
River Rd at Brookside/Ridgefield	3/26/2009	1184	1133	1600	Bethesda/Chevy Chase
River Rd at Congressional/Norwood	6/7/2006	1220	1021	1475	Potomac
River Rd at Counselman	10/3/2002	1417	926	1475	Potomac
River Rd at Falls Rd	3/31/2009	1399	1657	1475	Potomac
River Rd at Goldsboro Rd	4/15/2009	1135	1203	1600	Bethesda/Chevy Chase
River Rd at I-495 (E)	3/10/2009	1579	957	1600	Bethesda/Chevy Chase
River Rd at Little Falls Pkwy	6/6/2007	1494	1501	1600	Bethesda/Chevy Chase
River Rd at Piney Meetinghouse Rd	11/14/2006	1384	1049	1475	Potomac
River Rd at Royal Dominion/Holton Arms	2/24/2004	1523	1325	1600	Bethesda/Chevy Chase
River Rd at Seven Locks Rd	6/7/2006	1356	1111	1475	Potomac
River Rd at Springfield-Kc	9/19/2006	1169	1026	1600	Bethesda/Chevy Chase
River Rd at Whittier/Winston	6/7/2007	1370	1285	1600	Bethesda/Chevy Chase
River Rd at Willard Ln/Greenway	6/8/2004	1003	1191	1600	Bethesda/Chevy Chase
River Rd at Wilson Ln	4/23/2009	1524	1563	1600	Bethesda/Chevy Chase
Rock Spring Dr at Rockledge Dr	3/14/2006	772	819	1550	North Bethesda
Rockledge Blvd at I-270 Off Ramp	3/15/2006	796	651	1550	North Bethesda
Rockledge Blvd at Rockledge/Rock Forest	3/15/2006	772	790	1550	North Bethesda
Rockville Pike (MD 355) at Mid Pike Plz	3/8/2005	992	1335	1800	White Flint
Rockville Pike (MD 355) at Pooks Hill Rd	2/24/2009	1188	1248	1600	Bethesda/Chevy Chase
Rockville Pike at Bou Ave	11/1/2005	1123	1288	1550	North Bethesda
Rockville Pike at Congressional Ln	1/14/2009	1001	1282	1500	Rockville City
Rockville Pike at E Jefferson/Veirs Mill	5/5/2009	1362	1359	1500	Rockville City
Rockville Pike at East-West/Old G'town	2/6/2007	1454	1745	1800	Bethesda CBD
Rockville Pike at Edson/White Flint Mall	3/6/2008	1029	1164	1550	North Bethesda
Rockville Pike at Fed Plz / Pike Ctr	11/2/2005	852	1064	1550	North Bethesda
Rockville Pike at First St/Wootton Pkwy	4/14/2009	1265	1398	1500	Rockville City
Rockville Pike at Hubbard	11/2/2005	1167	1478	1550	North Bethesda
Rockville Pike at Jones Bridge/Center	5/6/2009	1550	1714	1600	Bethesda/Chevy Chase

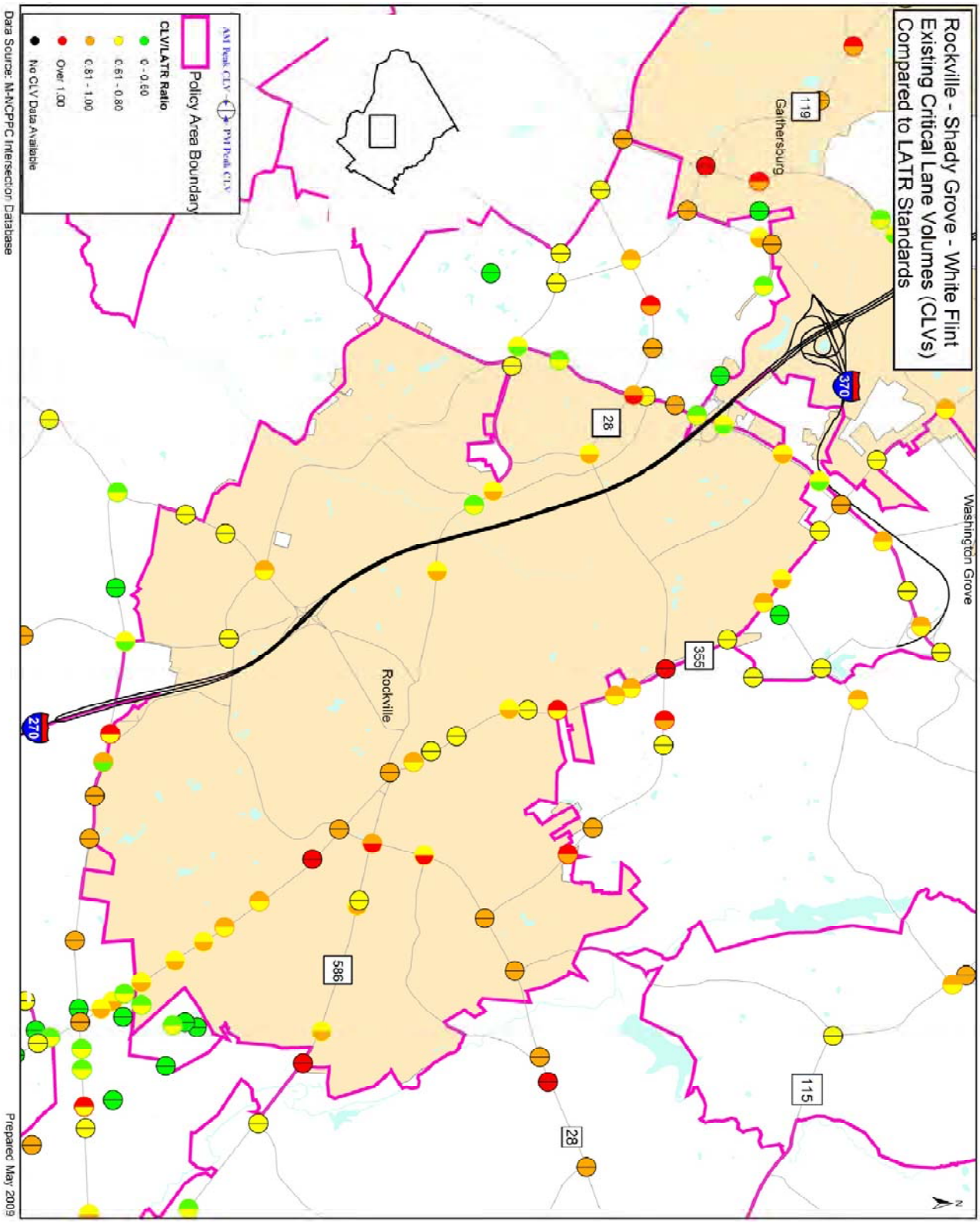
INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Rockville Pike at Marinelli Rd	3/8/2005	1067	998	1800	White Flint
Rockville Pike at Montrose/Randolph	3/8/2005	1501	1452	1550	North Bethesda
Rockville Pike at Nicholson Ln	5/10/2006	1236	1478	1800	White Flint
Rockville Pike at Old Georgetown Rd	9/20/2006	1152	1211	1800	White Flint
Rockville Pike at South/Wood/NNMC	3/12/2008	1198	1134	1600	Bethesda/Chevy Chase
Rockville Pike at Strathmore Ave	4/5/2005	1235	1493	1550	North Bethesda
Rockville Pike at Tuckerman Ln (N)	5/10/2005	1249	1586	1800	Grosvenor
Rockville Pike at W Cedar Ln	1/7/2008	1639	1883	1600	Bethesda/Chevy Chase
Rockville Pike at Wilson/NIH	5/7/2009	891	1122	1600	Bethesda/Chevy Chase
Rockville Pike at Woodmont CC/Best Buy	6/8/2004	1229	1155	1500	Rockville City
Rockville Pk at Grosvenor/Beach	5/18/2004	1244	977	1800	Grosvenor
Rockville Pk at Security Ln	8/14/2008	1295	1037	1550	North Bethesda
Rockville Pk at Templeton Pl	6/8/2004	1272	1214	1500	Rockville City
Rockville-Pk/Twinbrook/Rollins	2/24/2009	1043	1277	1500	Rockville City
Russell Ave at Christopher St	5/6/2009	382	750	1450	Gaithersburg City
Sam Eig Hwy at Diamondback Dr	10/10/2007	933	1217	1475	R&D Village
Sam Eig Hwy at Fields Rd	10/11/2007	1456	1297	1475	R&D Village
Sandy Spring Rd at Mcknew	2/11/2009	1462	1489	1400	Patuxent
Second St at Fenwick Ln	5/19/2005	271	447	1800	Silver Spring CBD
Seminary Rd at 2nd Ave/Linden Ln	3/25/2004	741	1054	1600	Silver Spring/Takoma Park
Seven Locks Rd and Wootton Pkwy	11/14/2006	1144	1116	1500	Rockville City
Seven Locks Rd at Bells Mill Rd	10/12/2005	1122	911	1475	Potomac
Seven Locks Rd at Bradley Blvd	3/17/2009	1192	1460	1475	Potomac
Seven Locks Rd at Gainsborough	3/13/2007	1350	1290	1475	Potomac
Seven Locks Rd at Tuckerman Ln	11/9/2006	1499	1487	1475	Potomac
Shady Grove Rd and Crabbs Branch Way	3/8/2005	1203	1115	1800	Shady Grove
Shady Grove Rd at Corporate Dr	2/19/2009	1388	1430	1475	R&D Village
Shady Grove Rd at Epsilon/Tupelo	2/11/2009	1704	1403	1475	Derwood
Shady Grove Rd at Gaither Rd	4/16/2009	1033	1468	1500	Rockville City
Shady Grove Rd at I-270 Ramp NB/Redland	12/20/2005	945	687	1500	Rockville City
Shady Grove Rd at I-270 Ramp SB/Fields	12/8/2005	864	925	1500	Rockville City
Shady Grove Rd at Medical Center Dr	9/26/2007	867	1092	1500	Rockville City
Shady Grove Rd at Metro (N)	4/5/2005	1276	1298	1800	Shady Grove
Shady Grove Rd at Metro (S)	4/5/2005	1467	1375	1800	Shady Grove
Shady Grove Rd at Midcounty Hwy	3/5/2008	1894	1309	1475	Derwood
Shady Grove Rd at Muncaster Mill/Airpark	4/29/2009	1208	1402	1475	Derwood
Shady Grove Rd at Oakmont	4/5/2005	1345	992	1800	Shady Grove
Shady Grove Rd at Research Blvd	9/25/2007	1074	1089	1475	R&D Village

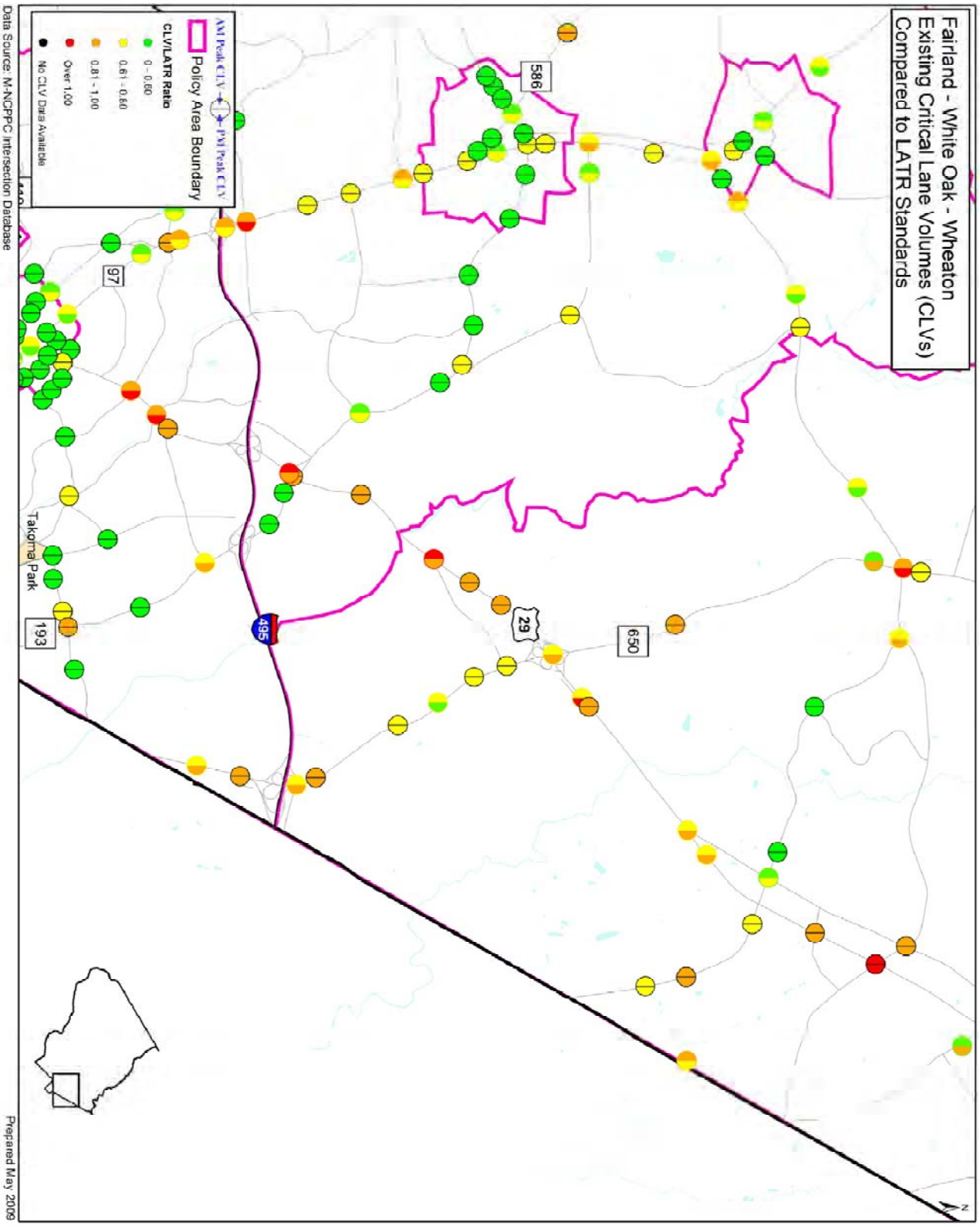
INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Shady Grove Rd at Traville Gateway Dr	2/7/2008	431	585	1475	R&D Village
Sligo Creek Pkwy at Wayne Ave	4/1/2009	1138	1200	1600	Silver Spring/Takoma Park
Snouffer School Rd at Centerway Rd	2/26/2009	1342	921	1450	Montgomery Village/Airpark
Spring St at 2nd Ave	12/5/2006	777	1270	1800	Silver Spring CBD
Spring St at Cameron St	9/20/2006	638	1074	1800	Silver Spring CBD
Spring St at Cedar/Ellsworth	9/13/2006	278	454	1800	Silver Spring CBD
Strathmore Ave at Kenilworth Ave	11/16/2006	823	854	1550	North Bethesda
Tuckerman Ln at Gainsborough Rd	4/27/2004	996	964	1475	Potomac
Tuckerman Ln at Westlake Terr	5/17/2005	507	1021	1475	Potomac
Twinbrook Pkwy at Ardennes Ave	9/11/2003	959	762	1800	Twinbrook
Twinbrook Pkwy at Chapman Ave	11/2/2005	785	1101	1500	Rockville City
Twinbrook Pkwy at Fishers Ln	6/9/2004	701	1048	1800	Twinbrook
University at Caddington/Gable	11/17/2005	803	876	1600	Kensington/Wheaton
University Blv at Newport Mill/Lexington	10/18/2005	715	774	1600	Kensington/Wheaton
University Blvd (MD 193) at Reedie Dr	11/15/2005	531	584	1800	Wheaton CBD
University Blvd at Amherst Ave	11/28/2007	846	1060	1800	Wheaton CBD
University Blvd at Arcola Ave	11/22/2005	1037	1155	1600	Kensington/Wheaton
University Blvd at Buckingham/Wayne	12/13/2005	697	790	1600	Silver Spring/Takoma Park
University Blvd at Carroll Ave	10/20/2005	1256	1159	1600	Silver Spring/Takoma Park
University Blvd at Dennis Ave	12/8/2005	841	978	1600	Kensington/Wheaton
University Blvd at East Ave	4/26/2005	583	707	1800	Wheaton CBD
University Blvd at Franklin Ave	1/7/2009	1234	1426	1600	Silver Spring/Takoma Park
University Blvd at Grandview Ave	11/28/2007	799	1000	1800	Wheaton CBD
University Blvd at Inwood	11/23/2004	589	761	1600	Kensington/Wheaton
University Blvd at Lexington	10/5/2005	777	902	1600	Kensington/Wheaton
University Blvd at Metro/Valley View Ave	9/16/2008	377	669	1800	Wheaton CBD
University Blvd at Midvale	6/4/2003	387	421	1800	Wheaton CBD
University Blvd at Piney Branch Rd	1/22/2009	1520	1429	1600	Silver Spring/Takoma Park
University Blvd at Sligo Creek Pkwy	12/13/2005	751	914	1600	Kensington/Wheaton
University Blvd at Veirs Mill Rd	2/23/2009	975	1259	1800	Wheaton CBD
University Blvd at Williamsburg	12/13/2005	801	1028	1600	Kensington/Wheaton
Veirs Mill Rd at Aspen Hill Rd	11/8/2005	1137	1102	1500	Aspen Hill
Veirs Mill Rd at Atlantic Ave	5/17/2005	1042	1424	1500	Rockville City
Veirs Mill Rd at Edmonston Dr (E)	9/15/2005	1042	1311	1500	Rockville City
Veirs Mill Rd at Edmonston Dr (W)	11/9/2005	1110	1095	1500	Rockville City
Veirs Mill Rd at Ferrara Ave	10/27/2005	886	944	1600	Kensington/Wheaton
Veirs Mill Rd at First St	3/5/2009	1252	1605	1500	Rockville City
Veirs Mill Rd at Gaynor/Parkland	11/10/2005	1191	1237	1500	Aspen Hill

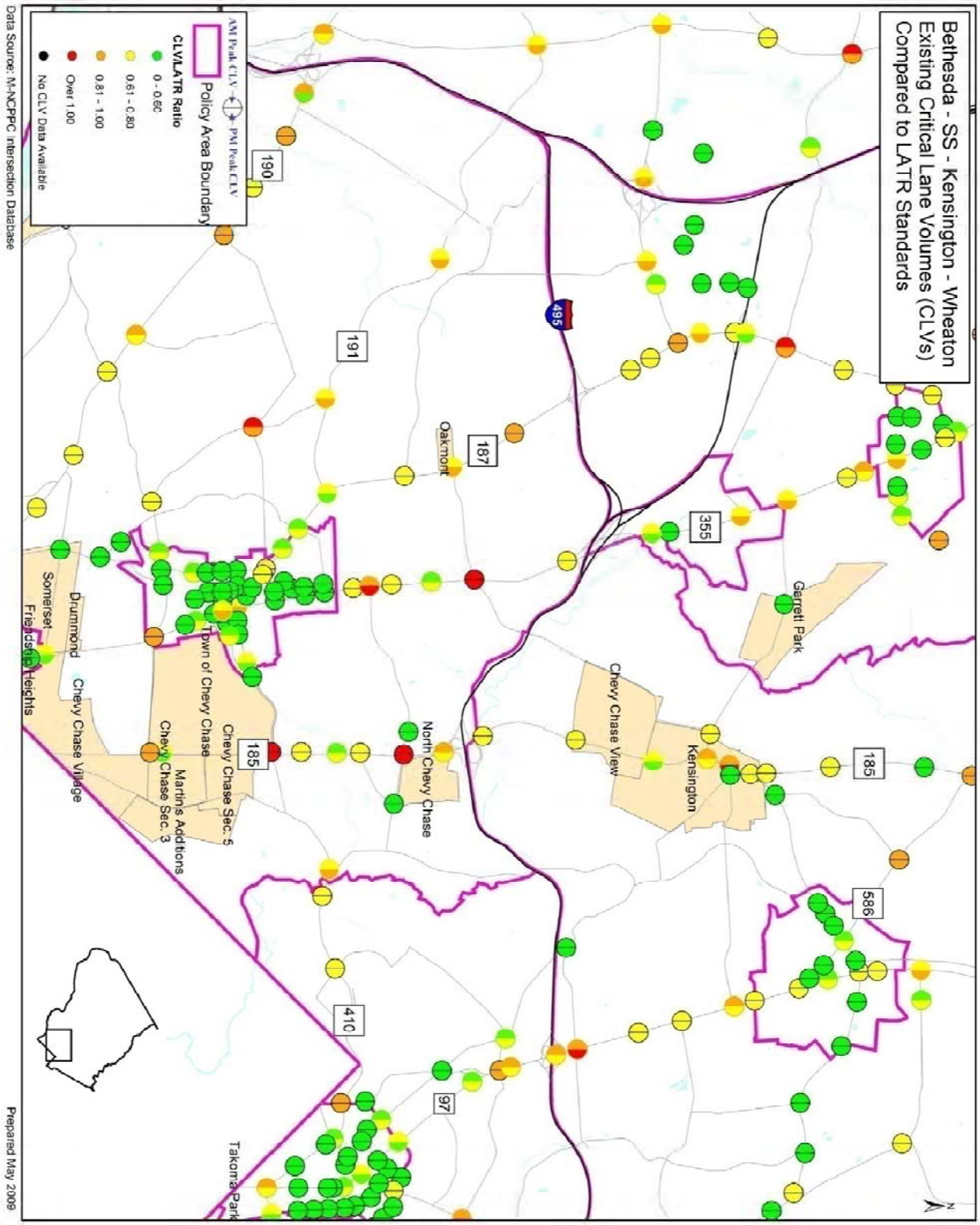
INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Veirs Mill Rd at Gridley	9/27/2005	1077	1189	1600	Kensington/Wheaton
Veirs Mill Rd at Newport	4/12/2005	1482	1339	1600	Kensington/Wheaton
Veirs Mill Rd at Reedie Dr	2/8/2006	836	959	1800	Wheaton CBD
Veirs Mill Rd at Robindale	11/9/2005	818	1055	1500	Aspen Hill
Veirs Mill Rd at Twinbrook Pkwy	2/3/2009	1771	1634	1550	North Bethesda
Veirs Mill Rd at Westfield Wheaton Drwy	6/13/2007	566	869	1800	Wheaton CBD
W Diamond Ave at Muddy Branch/Chestnut	4/14/2009	1040	1434	1450	Gaithersburg City
W Diamond Ave at Perry Pkwy	4/1/2008	1196	1410	1450	Gaithersburg City
Watkins Mill Rd at Stedwick	10/4/2007	707	972	1450	Montgomery Village/Airpark
Wayne Ave at Cedar St	4/12/2005	657	776	1800	Silver Spring CBD
Wayne Ave at Ramsey	12/6/2006	354	845	1800	Silver Spring CBD
Westlake Terr at Westlake Dr	3/7/2006	818	687	1475	Potomac
Willard Ave at Friendship Blvd	4/27/2005	723	898	1800	Friendship Heights
Wisconsin Ave at Battery/Rosedale	10/1/2008	887	888	1800	Bethesda CBD
Wisconsin Ave at Bethesda/Willow	6/11/2008	769	977	1800	Bethesda CBD
Wisconsin Ave at Bradley Blvd	11/9/2006	1503	1681	1800	Bethesda CBD
Wisconsin Ave at Cheltenham	3/28/2007	910	807	1800	Bethesda CBD
Wisconsin Ave at Dorset Ave	3/21/2007	1072	884	1600	Bethesda/Chevy Chase
Wisconsin Ave at Leland St	1/7/2009	942	982	1800	Bethesda CBD
Wisconsin Ave at Montgomery Ln	9/9/2008	1283	1468	1800	Bethesda CBD
Wisconsin Ave at Montgomery St/S Park Av	3/21/2007	743	667	1800	Friendship Heights
Woodfield Rd at Brink Rd	4/16/2009	1323	1462	1400	Goshen
Woodfield Rd at Cypress Hill Dr	9/14/2005	895	1111	1450	Montgomery Village/Airpark
Woodfield Rd at Fieldcrest/Hadley Farms	2/10/2009	1247	1529	1450	Montgomery Village/Airpark
Woodfield Rd at Lindbergh Dr	3/10/2009	490	595	1450	Montgomery Village/Airpark
Woodfield Rd at Muncaster Mill Rd	3/31/2009	1026	1241	1450	Montgomery Village/Airpark
Woodfield Rd at Sweepstakes Rd	4/2/2009	701	890	1450	Damascus
Woodmont Ave at Battery Ln	10/1/2008	1029	708	1800	Bethesda CBD
Woodmont Ave at Bethesda Ave	6/11/2008	582	877	1800	Bethesda CBD
Woodmont Ave at Cheltenham/Norfolk	1/31/2008	863	682	1800	Bethesda CBD
Woodmont Ave at Cordell Ave	10/8/2008	684	579	1800	Bethesda CBD
Woodmont Ave at Elm St	6/11/2008	483	670	1800	Bethesda CBD
Woodmont Ave at Hampden Ln	6/10/2008	537	753	1800	Bethesda CBD
Woodmont Ave at Montgomery Ln	11/9/2006	419	434	1800	Bethesda CBD

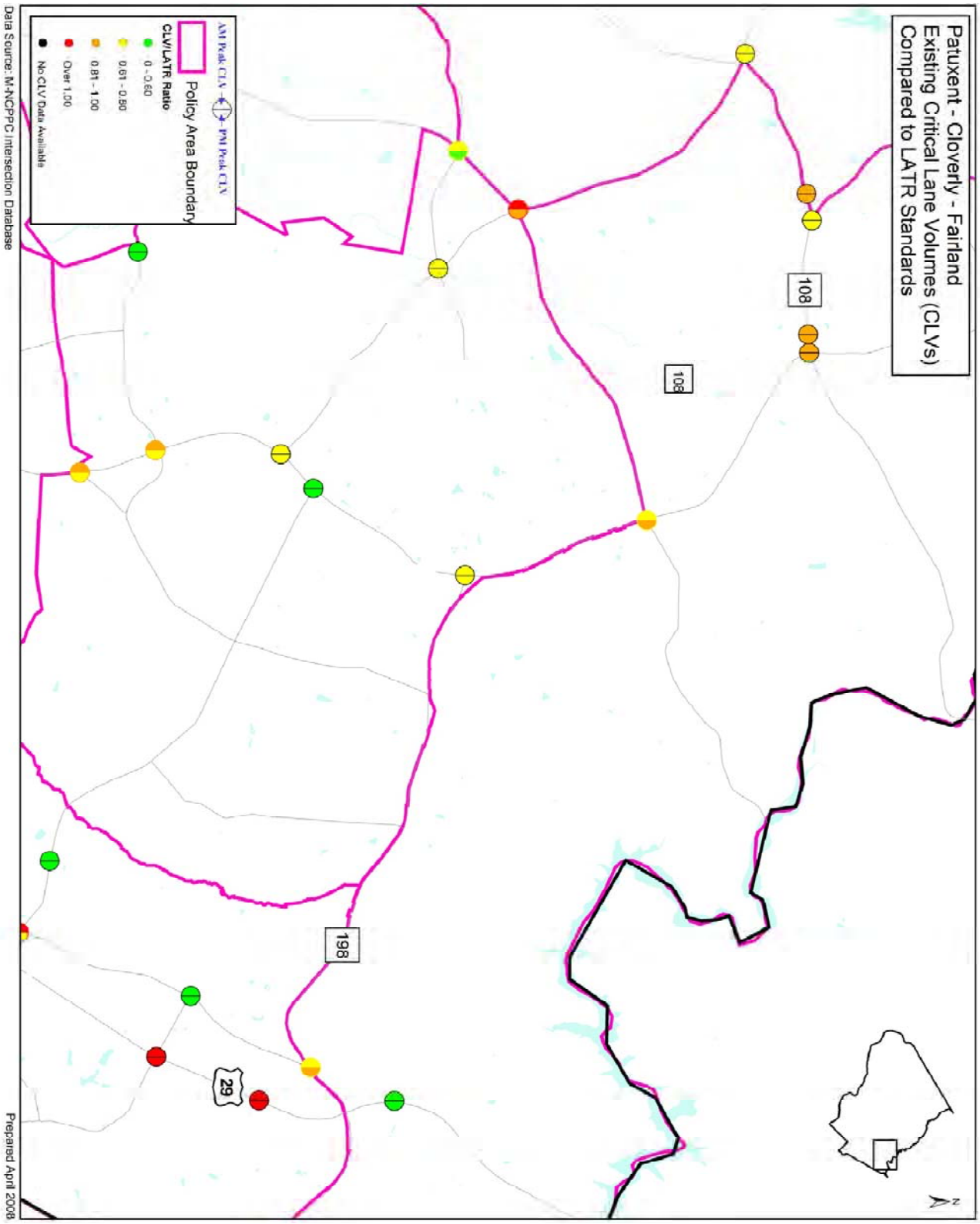
INTERSECTION NAME	Count Date	AM CLV	PM CLV	LATR Standard	Policy Area
Woodmont Ave at North Ln	2/8/2007	498	669	1800	Bethesda CBD
Woodmont Ave at St Elmo Ave	1/31/2008	613	589	1800	Bethesda CBD

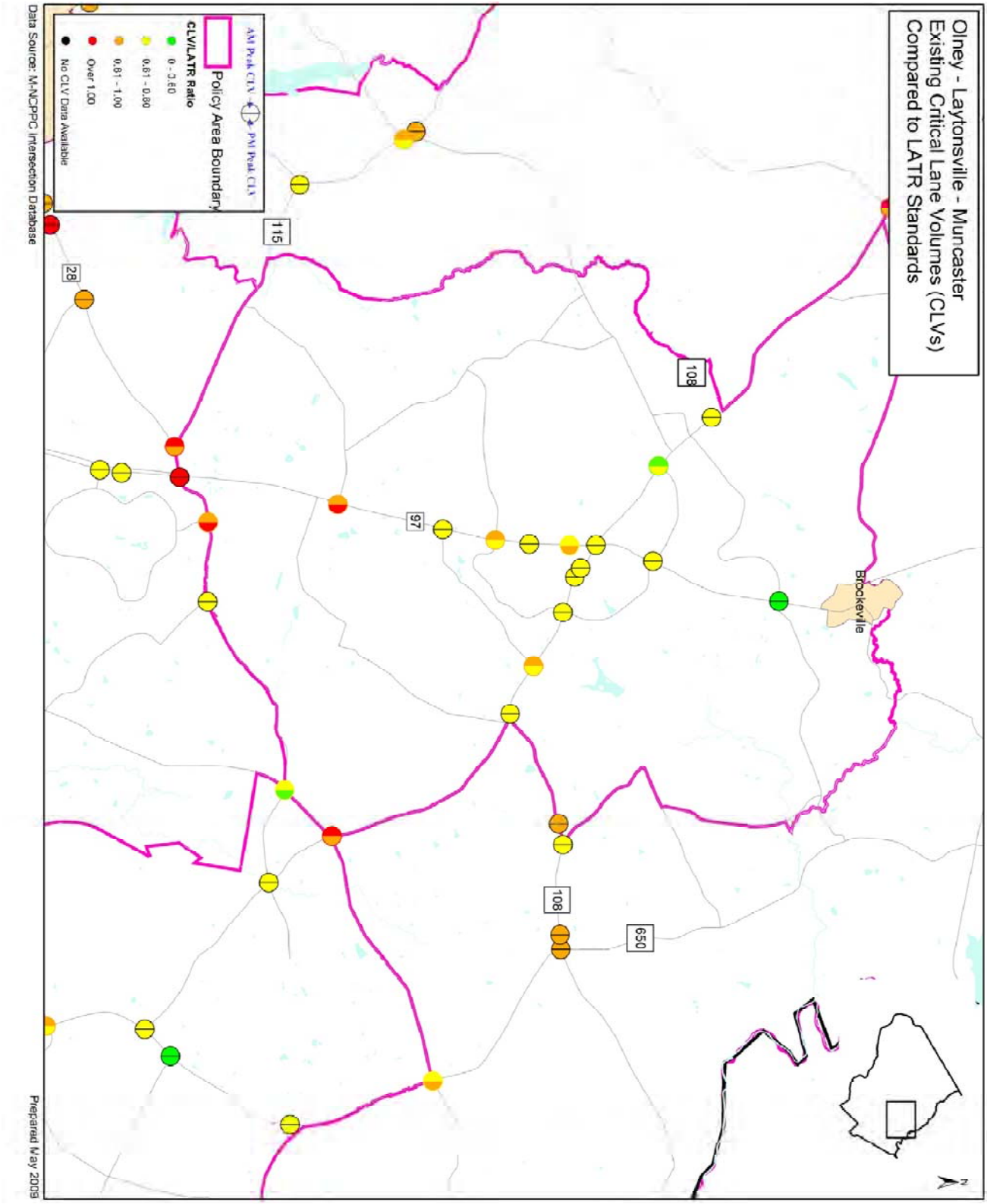

Damascus - Rural East
Existing Critical Lane Volumes (CLVs)
Compared to LATR Standards
AM Peak CLV
PM Peak CLV
Policy Area Boundary
CLV/LATR Ratio
0 - 0.80
0.81 - 0.89
0.91 - 1.00
Over 1.00
No CLV Data Available
270
355
27
124
Data Source: MNCPPC Intersection Database
Prepared May 2009

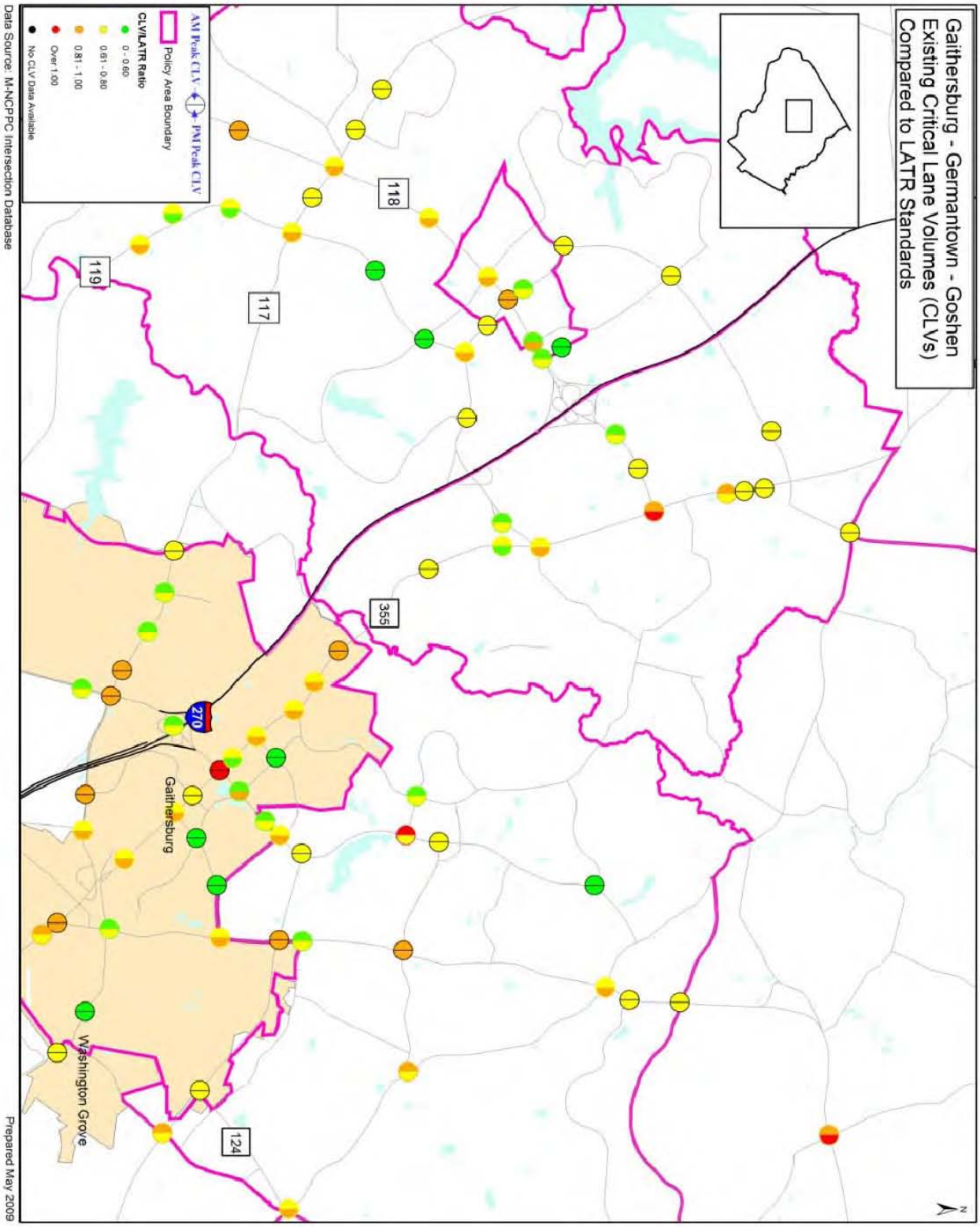

Rockville - Shady Grove - White Flint
Existing Critical Lane Volumes (CLVs)
Compared to LATR Standards
AM Peak CLV
PM Peak CLV
Policy Area Boundary
CLV/LATR Ratio
0 - 0.60
0.61 - 0.80
0.81 - 1.00
Over 1.00
No CLV Data Available
Data Source: M-NCPPC Intersection Database
Prepared: May 2009
Gaithersburg
Rockville
Washington Grove
119
28
370
355
270
586
115


Fairland - White Oak - Wheaton
Existing Critical Lane Volumes (CLVs)
Compared to LATR Standards
AM Peak CLV
PM Peak CLV
Policy Area Boundary
CLV/LATR Ratio
0 - 0.60
0.61 - 0.80
0.81 - 1.00
Over 1.00
No CLV Data Available
Takoma Park
586
97
193
495
29
650
Data Source: M-NCPPC Intersection Database
Prepared May 2009


Bethesda - SS - Kensington - Wheaton
Existing Critical Lane Volumes (CLVs)
Compared to LATR Standards
AM Peak CLV
PM Peak CLV
Policy Area Boundary
CLV/LATR Ratio
0 - 0.60
0.61 - 0.80
0.81 - 1.00
Over 1.00
No CLV Data Available
Data Source: M-NCPPC intersection Database
Prepared May 2009
190
191
495
187
355
185
586
410
97
Oakmont
Garrett Park
Chevy Chase View
Kensington
North Chevy Chase
Chevy Chase Sec. 5
Martins Additions
Chevy Chase Sec. 3
Town of Chevy Chase
Chevy Chase Village
Drummond
Somerset
Friendship Heights
Takoma Park


Patuxent - Cloverly - Fairland
Existing Critical Lane Volumes (CLVs)
Compared to LATR Standards
AM Peak CLV
PM Peak CLV
Policy Area Boundary
CLV/LATR Ratio
0 - 0.60
0.61 - 0.80
0.81 - 1.00
Over 1.00
No CLV Data Available
Data Source: M-NCPPC Intersection Database
Prepared April 2008
108
108
198
29


Olney - Laytonsville - Muncaster
Existing Critical Lane Volumes (CLVs)
Compared to LATR Standards
Policy Area Boundary
CLV/LATR Ratio
0 - 0.60
0.61 - 0.80
0.81 - 1.00
Over 1.00
No CLV Data Available
AM Peak CLV
PM Peak CLV
Brookeville
115
28
108
97
108
650
Data Source: M-NCPPC Intersection Database
Prepared May 2009


Gaithersburg - Germantown - Goshen
Existing Critical Lane Volumes (CLVs)
Compared to LATR Standards
AM Peak CLV
PM Peak CLV
Policy Area Boundary
CLV/LATR Ratio
0 - 0.60
0.61 - 0.80
0.81 - 1.00
Over 1.00
No CLV Data Available
118
119
117
355
270
124
Gaithersburg
Washington Grove
Data Source: M-NCPPC Intersection Database
Prepared May 2009

Arterial Travel Time and Speed Sampling Overview

In support of the first congestion report (formerly the ADAC Report), which was assembled in 2004, the Department began collecting and analyzing travel time and speed samples obtained using probe vehicles equipped with Global Positioning System (GPS)-based tracking devices. These tracking devices differ from traditional GPS-based navigation systems in that they record the second-by-second position of the probe vehicle, calculated in the vehicle by the device by triangulating on the signal's broadcast from each satellite in a cluster of satellites. The probe vehicle drivers are instructed to travel a prescribed sequence of roadways and to travel at the speed of the flow of traffic around them, which results in a "chain" of sample data being recorded on the device. At the end of the sampling period, the recorded data is downloaded from the device. Subsequently, that data chain can be analyzed to derive information on travel time duration, spot and average speed, the specific start, end, and duration of significant traffic queues, and travel delays relative to a free-flow or speed-limit speed.

To derive such information each chain first needs to be disaggregated into a set of "trajectories", which are directional samples each of which began at a unique time-of-day and had a unique travel time duration. These trajectory samples of traffic congestion fundamentally differ from traffic turning-movement counts (used to derive CLVs), which count and record the movement of all vehicles entering and exiting a specific intersection during a fixed time period (i.e. each successive 15-minute interval during a three-hour peak period). In a 15-minute time period, a probe vehicle on an arterial roadway may travel 5 to 10 miles passing through and "sampling" traffic congestion conditions for the through movements of many intersections located along that arterial. A different probe, either on the same day or a different day, is used similarly to sample traffic conditions on other arterials that cross the initial one. Thus over time, samples of congested conditions at each of the approaches to an intersection can be observed.

For most of the sample chains, the drivers are instructed to: (1) travel from one end of a roadway to the other end, (2) turn around, (3) travel back in the opposite direction to the start, (4) turn about again, and (5) then continue traveling back and forth several times. In some cases, more than one roadway would be sampled before the driver completed the directional run and returned to the point of origin. In many cases, one driver could thus collect three or four directional samples within a three-hour peak period. In other cases two or more drivers can be assigned to one route if the route is expected to be particularly long and/or slow, in terms of travel time duration. Depending upon the specific analytical application, a "temporal resolution" that samples between two and four observations in the peak period is usually a sufficient determinant of the range of congested conditions – of fastest to slowest. The more frequent the temporal resolution, the more certain would the analyst be that the true slowest and fastest conditions have been observed – however, such more frequent temporal resolution requires the availability of additional resources. The term "temporal coverage" refers to the overall time period covered by the sampling. (i.e., weekday AM peak period, mid-day peak period, and PM peak period).

Another dimension of the sampling is that of the "spatial coverage", which refers to the geographic extent of the sampling. In 2009 sampling coverage included the urban and developing parts of the

County, thereby excluding the rural parts of the County. The term "spatial resolution" refers to how closely spaced the samples were on different parts of the overall highway network. Within the In 2009 spatial coverage area, samples were conducted on: (a) major and minor State Highways, (b) major and minor County arterials, (c) selected municipal roadways, and (d) selected M-NCPPC (park) arterial roadways. No samples were explicitly collected on Interstate Freeways or National Park Service Parkways.

The arterial travel time and speed samples collected in 2009 expand upon the comprehensive sampling that was done in 2007, which was a significant departure from the more ad hoc and limited sampling conducted in 2004, 2005, and 2006.

The particulars of the sampling plan were developed by Motion Maps LLC, one of the consultants assisting Planning staff on this work program item. This included identifying which roadways would be sampled in conjunction with other roadways on particular days so as to try to efficiently use the time to actually be sampling and to minimize "dead-head" travel to and from the location of the survey crew meeting sites and of the turn-around distances along the chain. In the subsequent analysis and summary phases of the work, Motion Maps LLC provided training on the use of their specialized analysis software that enabled Planning staff to also work on the processing and analysis of the numerous dataset chains, ultimately converting them into trajectory samples of GPS travel time and speed.

A Note about Data Reliability

The GPS-based travel time and speed survey data discussed in this report was collected in late February and early March of 2009. Roughly 85% of the County's major highways and arterials (excluding those located in the rural policy areas) were sampled during the PM peak period (4-7pm). The majority of the major routes and corridors surveyed were driven multiple times in each direction during the peak period. In most cases, the reliability of the times and speeds recorded was greatly enhanced via the consistency of the results seen in the samples along various corridors. In a few cases, a limited number of samples or non-recurring congestion created by traffic incidents may have reduced the degree of reliability for some of the results. For a few select corridors, largely those that are partially within Central Business Districts, some GPS errors appeared in 2009 data. Mapping analysis of GPS probes in these locations indicated that the position of the probe wandered when the vehicle was stopped. Although this type of error did not influence travel time, distance of the segment appeared elongated as these small wandering points accumulated over one or two miles of congested roadway. Samples that were observed to have this error were therefore not included in the travel time by distance analysis but were included in Arterial Mobility and travel time by time of day analysis.

Pipeline of Approved Residential Development

by Unit Type and Policy Area

Montgomery County and Policy Areas

Source: M-NCPPC, Research & Technology Center, *Pipeline of Approved Development, 2009 Base.*

as of: February 09, 2009

Policy Area*	Approved Unit Type				Remaining Unit Type			
	Detached Single Family	*Townhouse*	*Multifamily*	***Total***	*Detached Single Family*	*Townhouse*	*Multifamily*	*Total*
Aspen Hill	83	54	46	**183**	53	48	46	**147**
Bethesda Central Business District	8	12	1,277	**1,297**	8	12	1,277	**1,297**
Bethesda/Chevy Chase	34	39	-	**73**	27	17	-	**44**
Clarksburg	4,105	2,898	2,454	**9,457**	2,793	1,490	2,295	**6,578**
Cloverly	70	-	-	**70**	58	-	-	**58**
Damascus	64	52	-	**116**	63	52	-	**115**
Derwood	49	164	196	**409**	49	164	196	**409**
Fairland/White Oak	94	386	-	**480**	75	258	-	**333**
Friendship Heights	-	200	733	**933**	-	200	733	**933**
Gaithersburg City	341	1,220	4,609	**6,170**	289	972	4,694	**5,955**
Germantown East	7	147	-	**154**	3	119	-	**122**
Germantown West	452	210	300	**962**	213	168	179	**560**
Germantown Town Center	-	-	604	**604**	-	-	162	**162**
Glenmont	-	-	-	**-**	-	-	-	**-**
Grosvenor	-	112	-	**112**	-	112	-	**112**
Kensington/Wheaton	517	446	45	**1,008**	511	400	24	**935**
Montgomery Village/Montgomery Airpark	22	-	-	**22**	21	-	-	**21**
North Bethesda	10	-	1,250	**1,260**	10	-	860	**870**
North Potomac	66	85	-	**151**	53	61	-	**114**
Olney	179	103	141	**423**	141	103	141	**385**
Potomac	207	165	547	**919**	111	38	467	**616**
Research & Development Village	4	-	168	**172**	4	-	52	**56**
Rockville City	42	47	3,516	**3,605**	42	17	3,516	**3,575**
Shady Grove	6	36	-	**42**	6	36	-	**42**
Silver Spring Central Business District	-	-	2,918	**2,918**	-	-	2,918	**2,918**
Silver Spring/Takoma Park	24	121	169	**314**	22	90	169	**281**
Twinbrook	-	-	-	**-**	-	-	-	**-**
Wheaton Central Business District	-	-	180	**180**	-	-	180	**180**
White Flint	1	-	1,973	**1,974**	1	-	1,973	**1,974**
Rural	1,311	109	-	**1,420**	1,125	103	-	**1,228**
Total	**7,696**	**6,606**	**21,126**	**35,428**	**5,678**	**4,460**	**19,882**	**30,020**

Note: The *Pipeline of Approved Residential Development* is the number of housing units that have been approved but not yet built in Montgomery County at a given point in time.

Pipeline of Approved Commercial Development

Summary by Policy Area

Montgomery County, Maryland

Source: M-NCPPC, Research & Technology Center, *Pipeline of Approved Development* , 2009 Base.
as of: February 2009

Policy Area	Square Feet		Estimated Job Capacity		Estimated Job Capacity by Development Type			
	Approved	*Remaining*	*Approved*	*Remaining*	*Office*	*Retail*	*Industrial*	*Other*
Aspen Hill	62,986	62,986	80	80	75	0	5	0
Bethesda Central Business District	500,004	500,004	958	957	351	411	0	195
Bethesda/Chevy Chase	299,023	299,023	1,006	1,006	721	285	0	0
Clarksburg	3,729,220	3,192,359	11,963	9,815	8,795	1,020	0	0
Cloverly	223,148	106,172	17	16	6	0	0	11
Damascus	3,162	3,162	13	13	13	0	0	0
Derwood	424,643	406,793	1,565	1,564	1,389	31	144	0
Fairland/White Oak	3,484,613	2,824,247	9,672	7,591	7,124	199	128	140
Friendship Heights	760,055	760,055	3,033	3,033	2,670	197	0	166
Gaithersburg City	4,532,096	3,827,007	15,488	15,488	12,030	2,973	226	259
Germantown East	3,105,288	1,945,543	10,679	9,019	8,682	274	0	63
Germantown West	1,878,570	1,702,053	7,301	7,226	6,926	285	0	15
Germantown Town Center	150,269	145,217	15	15	8	7	0	0
Glenmont	8,585	8,585	17	17	0	0	0	17
Grosvenor	0	0	0	0	0	0	0	0
Kensington/Wheaton	38,904	33,974	77	22	14	0	8	0
Montgomery Village/Montgomery Airpark	1,304,211	1,294,711	3,213	3,213	1,638	0	1,575	0
North Bethesda	3,473,068	2,164,153	13,740	7,913	6,344	947	73	549
North Potomac	40,000	40,000	160	160	160	0	0	0
Olney	579,755	579,755	208	207	10	20	0	177
Potomac	1,350,000	1,350,000	3,375	3,375	1,664	1,514	0	197
Research & Development Villlage	4,237,629	2,531,815	12,457	7,584	1,600	0	3,507	2,477
Rockville City	5,628,148	5,166,720	20,197	18,556	16,320	694	272	1,271
Shady Grove	6,400	6,400	16	16	0	16	0	0
Silver Spring Central Business District	1,644,784	804,826	5,450	5,218	3,285	1,629	0	304
Silver Spring/Takoma Park	203,445	183,300	284	283	261	21	1	0
Twinbrook	447,914	447,914	1,280	1,280	0	0	0	1,280
Wheaton Central Business District	4,000	4,000	10	10	0	10	0	0
White Flint	1,684,937	1,603,199	5,895	5,691	4,592	1,098	0	1
Rural	657,568	617,924	1,313	1,312	216	954	1	141
Total	**40,462,425**	**32,611,897**	**129,464**	**110,680**	**84,894**	**12,585**	**5,940**	**7,263**

Note: The *Pipeline of Approved Commercial Development* is the total square footage and estimated job-generating capacity of office, retail, industrial and other commercial development projects that have been approved but not yet built in the County. Approved square footage is converted to job estimates using standard square-feet-to-job multipliers for a given type of development, unless the developer has agreed to limit the number of jobs in a project.

Construction Projects (State & County)				
PROJECT NAME	**LOCATION/LIMITS**	**AGENCY**	**DETAILS**	**% comp/status**
Citadel Avenue Extended*	S. of Marinelli to Nicholson Ln	County	New 2-Lane Road	70%
Redland Rd*	Crabs Branch Way to Needwood Rd	County	Intersection Improvements	42%
Inter-County Connector (Contract A)*	I-370 to MD 97	State	New 6-lane multi-modal freeway facility	41%
(Phase I)	Old Georgetown Road to Maple/Chapman Ave	State	New Interchange	39%
MD 124 (Woodfield Rd) [Phase I]	S. of Airpark Rd. to Rosewood Manor Lane	State	Widen Road to 6 Lanes	37%
Inter-County Connector (Contract C)*	West of US 29 to East of I-95	State	New 6-lane multi-modal freeway facility	30%
Inter-County Connector (Contract B)*	East of MD 97 to West of US 29	State	New 6-lane multi-modal freeway facility	6%
MD 109, Old Hundred Road *	Little Bennett Creek	State	Replace deck on bridge	0%
MD 650 @ Adelphi Rd*	Intersection Vicinity	State	Widen MD-650 (WB), Add lane Adelphi in median	0%
Md 355 @ MD 118*	Intersection Vicinity	State	SB MD left turn bay extension, full signal upgrade	0%
Queen Elizabeth @ Prince Philip Dr*	Intersection Vicinity	State	Full Signal Upgrade	0%
MD 650 @ MD 97	Intersection Vicinity	State	EB left turn lane (to NB MD 97) construction	0%
SHA Development & Evaluation (D&E)				
I-270 @ Watkins Mill Rd extended	Future interchange @ Watkins Mill extended	State	New interchange	PP
I-270/US 15 multi-modal study	Shady Grove Rd to N Biggs Rd	State	Multi-modal improvements	PP
I-495 Capital Beltway	American Legion Bridge (County Line) to I-270	State	Lane feasibility study	PP
MD 28/MD 355/MD 586/MD 911	Intersection Vicinity	State	Study to construct intersection improvements	PP
MD 108 @ Fieldcrest Rd		State	New bypass lane construction	PP
MD 115 at Bowie Mill Rd		State	Extension of EB left turn lane	PP
US 29 @ Blackburn Rd *		State	New interchange	PP: Not Funded
I-270 and US 15*	MD 121 (Clarksburg Rd.)	State	Interchange Improvement and realignment	Design
MD 586 (Veirs Mill Rd) @ Twinbrook Pkwy *		State	right turn lane construction	Design
MD 28/MD198 corridor study *	MD 97 and PG County Line	State	Widening to 4 lanes	ROW
MD 97 @ Randolph Rd *		State	New interchange	Engineering
MD 124 (Woodfield Rd) [Phase II] *	Mid County Hwy. to Warfield	State	Widening to 6 lanes	Engineering
US 29 @ Fairland/Musgrove Rd *		State	New interchange	Engineering
US 29 @ Greencastle Rd *	Briggs Chaney Interchange to MD 198 intchg.	State	New interchange	Engineering: On Hold
US 29 @ Stewart La *		State	New interchange	Engineering: On Hold
US 29 @ Tech Rd/Industrial Pkwy *		State	New interchange	Engineering: On Hold
MD 97 @ MD 28 Norbeck Rd *		State	SB 2nd left turn lane construction	Engineering: On Hold
MD 97 (Brookeville Bypass) *	MD 97 to N. of Town of Brookeville	State	Construct 2 lane highway bypass at Brookville	On Hold
MD 117 (Clopper Rd/Diamond Ave) [Phase II] *	I-270 to Metropolitan Grove Rd	State	Intersection improvements, widening to 4/6 lanes	On Hold
MD 117 (Clopper Rd) [Phase III] *	Metropolitan Grove Rd to Seneca Creek Park	State	Intersection improvements, widening to 4/6 lanes	On Hold
MD 124 (Woodfield Rd) [Phase I] *	Fieldcrest to S of Airpark	State	Widening to 6 lanes	On Hold
MD 355/Montrose Rd/Randolph Rd/CSX RR *		State	New interchange	On Hold

County DPWT Facility Planning				
Nebel Street Extended	Chapman Ave to Randolph Rd	County	Roadway Extension to Randolph Rd	Property Acquisition
Midcounty Corridor Study	Mid County Study Area	County	Transportation-Related Improvements	Facility Planning I
Seminary Rd Intersection *	Seminary Rd/Pl/Second Ave/Linden Ln/Brookeville	County	Intersection/Roadway Improvements	Facility Planning II
Goshen Rd	Girard St to Warfield Rd	County	Widening from 2 to 4/6 lanes	Facility Planning II
Observation Dr *	Water Discovery Ln to Stringtown Rd	County	sections	Facility Planning II
Randolph Rd *	Gaynor Rd to Charles Rd	County	Safety Improvements	In Design
Thompson Rd *	Thompson Rd and Rainbow Dr	County	New 2-lane primary road	In Design
Father Hurley Blvd Extended	Wisteria Dr to MD 118	County	Roadway Extension to MD 118	In Design
Dale Dr at Colesville Rd	Intersection Vicinity	County	Construct EB and WB approach lanes	In Design
Woodfield Rd Extended	Main St to MD 27	County	New 2-lane arterial	In Design
Chapman Ave Extended	N. of MD 187to Randolph Rd	County	Roadway Extension to Randolph Rd	In Design
Montrose Parkway East	MD 187 to MD 586	County	New 4-lane arterial road	In Design
Century Blvd	Father Hurley Blvd to Crystal Rock Dr	County	Roadway extension to Crystal Rock Dr	Participation
Watkins Mill Rd Extended	e. of I-270 to W. of I-270	County	section	Participation
Completed Projects (State & County)				
New Roads/Interchanges:				
Montrose Parkway West	E. of Tildenwood to MD 187	County		
Stringtown Road Extended	MD 355 to I-270 ramps at MD 121	County		
Road Widenings:				
Greencastle Rd	Greencastle Ridge Terr to Fairland Park	County		
Fairland Rd	MD 28 to Dufief Mill Rd	County		
Grade-Separated Interchange Improvements:				
I-495 Ramps @ University Blvd		State		
Intersection Improvements:				
Rockville Pike (MD 355) @ Twinbrook Pkwy		County		
MD 650 @ Oakview Dr		County		
S Glen at Falls Rd		County		
Resurfacing/Rehabiliation:				
Clara Barton Parkway Bridge WB*	Replace Bridge Deck on Ramp Bridge 15103	State		
MD 650 @ Holton Lane*	to Merrimac Dr 800' e/w of MD 650	State		
MD 396	MD 614 to Onondaga Rd	State		
Travilah Rd - Phase 1	MD 28 to Dufief Mill Rd	County		

KEY/NOTES:

PP = Project Planning
TBA = Awaiting Start of Construction
Property Aquisition = Property/Right-of-Way Acquisition Phase
Participation = Partial developer funded/participation project
Phase I FP = Plans < 35% Complete (County)
Phase II FP = Plans 35% Complete (County)
Design = Plans 35 to 100% Complete (County)

* Denotes newly added project or change in status since April 2008