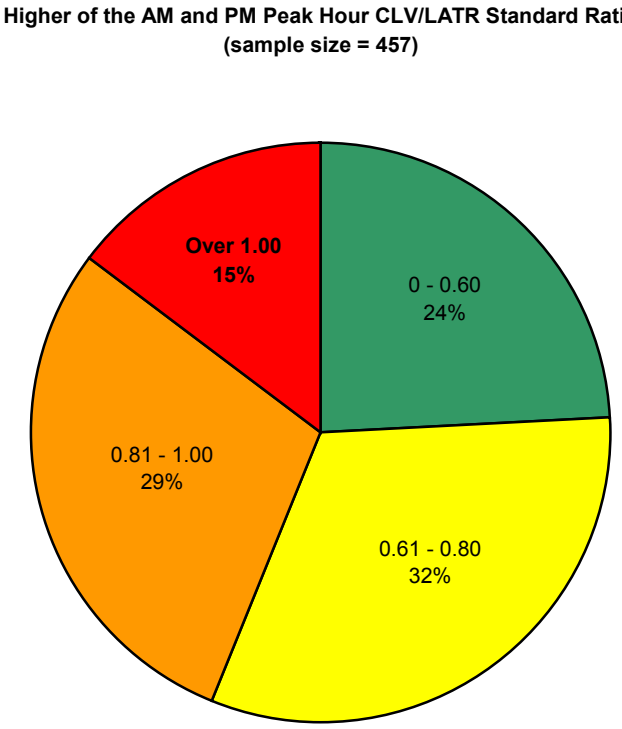
III. CURRENT CONGESTION

Critical Lane Volumes (CLVs) at Signalized Intersections

The Department's intersection database currently contains count samples for 506 of the 762 (both existing and planned) signalized intersections in the County, which date back to March 1, 2001. The total number of samples is up from the 435 samples that were in the database at the time of last year's report. The Priority Funding Areas (PFAs) continue to be well monitored as roughly 71% of the intersections located in these areas have been sampled in recent years. Staff feels that it is acceptable to utilize turning movement count data dating as far back as 3 years for reporting purposes, primarily because the percent change in CLV seen at most locations during this time frame tends to fall within what is considered the be the normal variability. In addition, the Department routinely utilizes CLV data dating back the same length of time to conduct intersection trend analyses for LATR purposes. That being said, staff elected to remove data from this year's sampling, which was dated prior to January 1, 2003. Therefore, only 457 of the 506 intersections were sampled for the purposes of this report (see Appendix 5.1A for the complete list of samples in the database). Staff acknowledges that some count samples, which are dated prior to 2003, may hold some degree relevancy to the current-day traffic conditions. However, it is preferred that more up-to-date samples for these locations are obtained prior to re-reporting on them. It should be noted however that a small set of count data samples, which predate 2003, were used to analyze CLV trends at some locations for this report. Prior to assembling this year's report, staff was able to acquire updated turning movement count data for 49 intersections located along some of the major State roads from SHA's database. These counts were all conducted between the dates of 1/1/2004 and 12/31/2005.

The findings in this year's study indicate that approximately 15% of the 457 intersections sampled had a CLV that exceeded their respective LATR standard, or a CLV/LATR ratio of greater than 1.00. In addition, staff found that 29% of the intersections sampled had a CLV/LATR ratio between 0.80 and 1.00. Figure 3.1 shows the full distribution of CLV/LATR ratios for all of the intersections sampled. It should be noted that 13 of the 47 intersections in the database, which have count samples predating 2003, had CLVs that exceeded their designated LATR standard. Therefore, staff plans to acquire more recent count data for these locations before re-reporting on their status.

Figure 3.1: CLV/LATR Ratio Distribution



It is worth noting that, last year's report indicated that 22% of the 435 intersections sampled had a CLV that exceeded its respective LATR standard. The 7% decrease (between 2005 and 2006) in the number of intersections with a CLV/LATR ratio of greater than 1.00 can be explained in several ways. Roadway and intersection infrastructure improvements (i.e. the new US 29 interchanges) performed by both the State and County, as well as improvements related to development; have helped to reduce CLVs at a number of problematic locations. These locations will be discussed in greater detail later in this report. Also, prior to assembling this report, staff conducted an audit of a small set of CLV data in the database, which either appeared to be questionable, or had values that were found to be incorrect. After performing a thorough quality assurance and control (QA/QC) exercise, it was found that some of this CLV data had been previously miscalculated, as a result of incorrect input parameters and/or erroneous raw count data. Therefore, staff proceeded to revise input parameters (i.e. geometrics, signal phasing, number of lanes, etc.) for the intersections in question, prior to re-calculating their CLVs. Another reason for this decrease has to do with the range of dates for which the most recent counts were sampled. By excluding all counts from the sample set that predate January 1, 2003, a number of questionable counts, as well as counts with CLVs that may no longer reflect current day conditions, were removed from the sample set. A number of the earlier counts in the database were collected before the Department had stringent QA/QC measures in place that would ensure the validity of the counts, as well as the CLV data.

A majority of the change in CLVs over the last 2-3 years is within the normal variability of 10%. However, it is important to note that when comparing this year's CLV/LATR ratios to

those reported in the 2005 report, notable differences are seen particularly in the upper two class ranges (0.81 – 1.00, and Over 1.00) (see figure 3.2). According to this year's data, the total number of intersections with a CLV/LATR of greater than 1.00 decreased by roughly 7% when compared to the data presented in last year's report. In contrast, the number of intersections with a CLV/LATR ratio between 0.81 and 1.00 increased by roughly 5.5% since last year. This would indicate that some of the locations that were extremely congested the previous year have seen their CLV/LATR ratios decrease to less than 1.00. As mentioned earlier, much of this contrast in year-to-year variation of CLV/LATR ratios can be attributed to the impact of infrastructure improvements, a more refined data sampling, and the re-calculation of CLVs at a few locations.

Figure 3.2: Year-to-Year Comparison of CLV/LATR ratios

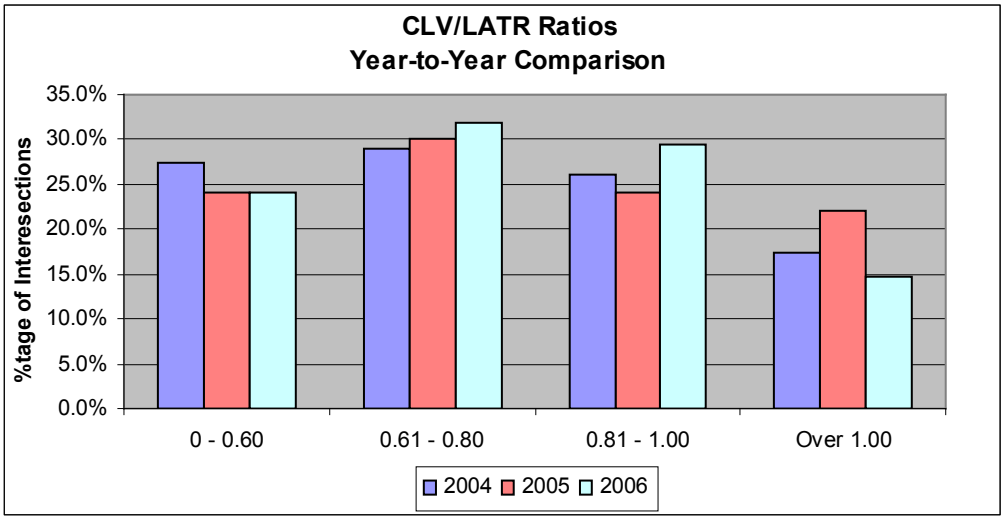


Table 3.1 shows the LATR congestion standards for all (34) policy areas of the County. Nine of the County's 34 policy areas are designated Central Business Districts (CBDs). County policy promotes high levels of growth and development in the CBDs, mainly because these areas have the transportation infrastructure to accommodate higher levels of congestion, hence a LATR standard of 1800.

Table 3.1: LATR Congestion Standards

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

Table 3.2 lists the 10 most congested intersections in the County, as of April 28, 2006. As seen in the previous two reports, the intersections are ranked by absolute CLV as opposed to the CLV/LATR standard ratio. Staff has concluded in previous years that absolute CLV tends to be a better determinant of the severity of congestion. That is, a CLV of 1500 typically indicates some degree of congestion, but may not be viewed as severe in some policy areas (e.g. CBDs) when compared to less stringent standards. See figure 3.3 for a detailed map of these locations.

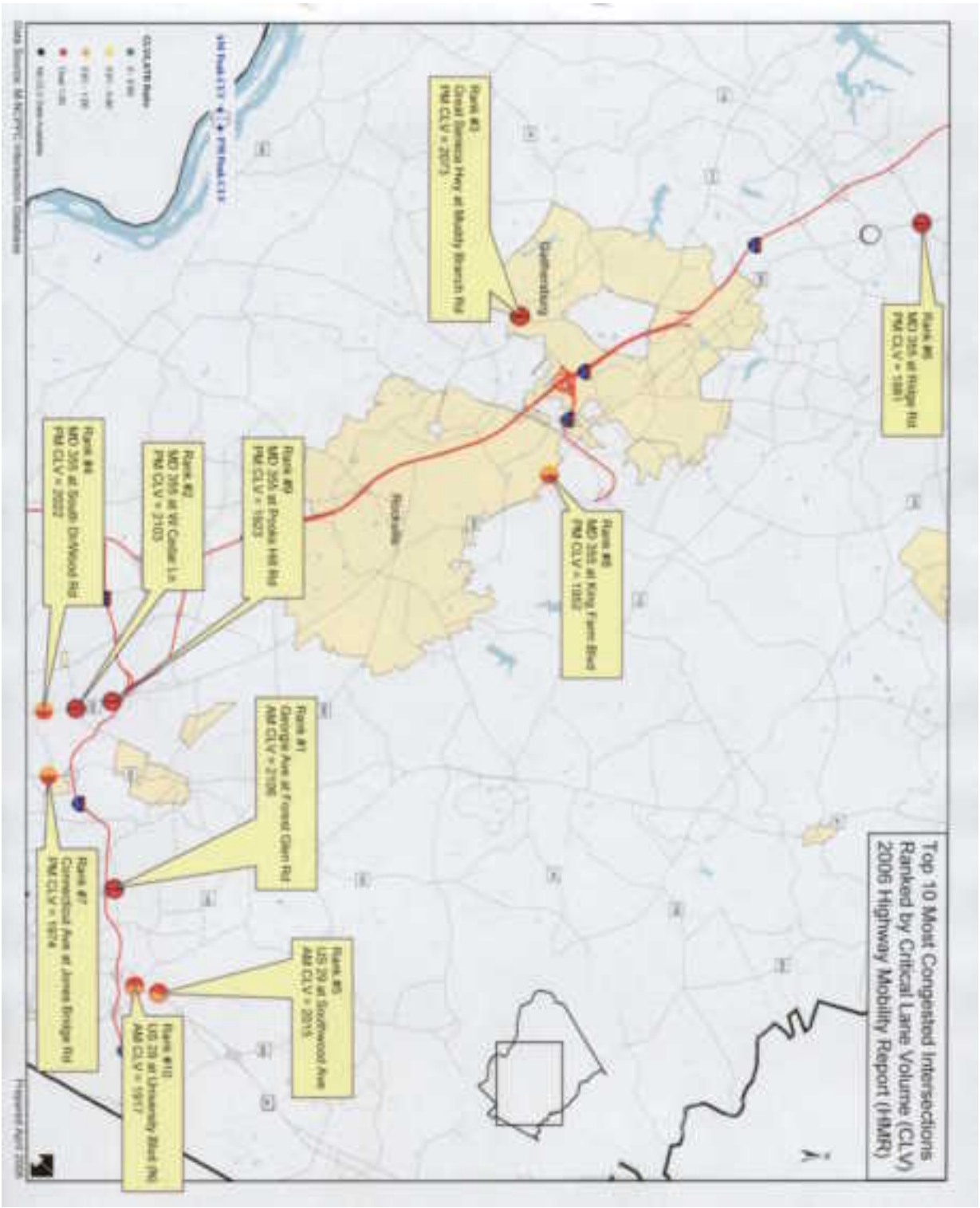
Table 3.2: Top 10 Most Congested Intersections in 2006
- Revised May 30, 2006 (after the staff draft was published) -

RANKING			INTERSECTION NAME	COUNT DATE	CLV	LATR STAN	POLICY AREA
2006	2005	2004					
1	*2*	*	*Georgia Ave at Forest Glen Rd*	*8/28/2003*	*2106*	*1600*	*Kensington/Wheaton*
2	*3*	*1*	*Rockville Pike at W Cedar Ln*	*4/5/2005*	*2103*	*1600*	*Bethesda/Chevy Chase*
3	*11*	*64*	*Great Seneca Hwy at Muddy Branch Rd*	*10/5/2005*	*2073*	*1450*	*Gaithersburg City*
4	5	*	Rockville Pike at South/Wood/NNMC	6/9/2004	2022	1600	Bethesda/Chevy Chase
5	6	11	Columbia Pike at Southwood Ave	10/28/2004	2015	1600	Kensington/Wheaton
6	*7*	*81*	*Frederick Rd at Ridge Rd*	*9/8/2004*	*1981*	*1450*	*Germantown East*
7	8	9	Connecticut Ave at Jones Bridge Rd	6/11/2003	1974	1600	Bethesda/Chevy Chase
8	10	*	Frederick Rd (MD 355) at King Farm Blvd	4/15/2004	1952	1800	Shady Grove
9	13	53	Rockville Pike (MD 355) at Pooks Hill Rd	6/8/2004	1923	1600	Bethesda/Chevy Chase
10	14	66	Colesville Rd at University Blvd (N)	10/28/2004	1917	1600	Kensington/Wheaton

***** Intersection was unranked either b/c data was unavailable
Entries in *italics* indicates special notes for this particular location

Notes for Table 3.2 (by rank)
Intersection #1: Signal phasing changed since the count was taken
Intersection #2: Grade-separated interchange recommended in MP
Intersection #3: Roadway improvement was nearing completion when count was taken
Intersection #6: Grade-separated interchange recommended in MP

Figure 3.3: Map of the Top 10 Most Congested Intersections
- Revised May 30, 2006 (after the staff draft was published) -



Great Seneca Hwy (MD 119) at Muddy Branch Rd has moved into the list of the 10 most congested intersections at #4 from a #11 ranking last year. As a result of increased volumes along both Great Seneca Hwy and Muddy Branch Rd, the CLV at this location increased 6.4% between 2004 and 2005 (most recent count). The increase in volumes along these roads can be partially attributed to some of the recently completed office and commercial development concentrated in the R&D village. In addition, the recently completed widening of Great Seneca Hwy has more than likely contributed to the increased volumes along this roadway. Further monitoring of this location will be necessary in order to determine the degree to which the widening will impact the CLV over time. The intersection of Rockville Pike (MD 355) and Pooks Hill Rd / Bellevue Dr has also moved into this year's list at #9 after being ranked #13 during the previous year. This location, which has a calculated CLV of 1923, is located just to the north of two intersections (MD 355 at Cedar Ln, MD 355 at South Dr / Wood Rd) that are ranked among the top 10 most congested for the second consecutive year. The consistent increase in volumes along MD 355 during both the AM and PM peaks, have helped to sustain this corridor as one of the most congested in the County. The third intersection to move into this year's list is Colesville Rd (US 29) at University Blvd (N). This intersection is appearing on the list at #10 after being ranked #14 last year. This intersection is located in the heavily congested Four Corners section of the Silver Spring. The severe levels of congestion observed at this intersection during the AM peak can be primarily attributed to the large volumes of traffic that access the Capital Beltway (westbound I-495) via southbound US 29 on a daily basis.

Tables 3.3 and 3.4 rank the remaining intersections that have CLVs, which exceed their respective LATR standard. It is important to note that 29 of the 70 intersections listed in these tables either have recommended improvements, or ongoing/recently completed improvements associated with them, which could impact or have impacted the CLVs at these locations. See appendix 5.3 in the back of the report for the complete list of planned, active, and recently completed State and County infrastructure improvements. Similar to the table (above), which ranks the top 10 most congested intersections, these tables display the ranking (by absolute CLV) for each intersection by year. By doing so, staff was able to highlight intersections that shifted significantly in the rankings as a result of both past and recent infrastructure improvements. In addition, staff was able to identify locations that shifted in the rankings (from a CLV standpoint) as a result of on-street work zones related to ongoing infrastructure improvements, which ultimately reduced mobility at these locations.

Table 3.3: Congested Intersections (11-30)
- Revised May 30, 2006 (after the staff draft was published) -

RANKING			INTERSECTION NAME	COUNT DATE	CLV	LATR STAN	POLICY AREA
2006	2005	2004					
11	*41*	*	*Colesville Rd at Sligo Creek Pkwy/St Andrews*	*12/8/2005*	*1917*	*1600*	*Silver Spring/Takoma Park*
12	*16*	*	*Georgia Ave at Norbeck Rd*	*9/11/2003*	*1896*	*1500*	*Aspen Hill*
13	*25*	*	*Columbia Pike at Stewart/NB Slip Ramp*	*1/29/2003*	*1849*	*1500*	*Fairland/White Oak*
14	*28*	*30*	*Connecticut Ave at East West Hwy*	*3/18/2004*	*1831*	*1600*	*Bethesda/Chevy Chase*
15	*29*	*32*	*Veirs Mill Rd at First St*	*3/18/2003*	*1818*	*1500*	*Rockville City*
16	*	*	Norbeck Rd (MD 28) at Avery Rd	10/12/2005	1815	1500	Rockville City
17	*30*	*55*	*Colesville Rd at University Blvd (S)*	*10/28/2004*	*1810*	*1600*	*Kensington/Wheaton*
18	31	139	MD 355 at Indianola Dr/Watkins Pond	10/6/2004	1789	1500	Rockville City
19	*34*	*89*	*Columbia Pike at Briggs Chaney Rd*	*2/4/2004*	*1770*	*1500*	*Fairland/White Oak*
20	*35*	*92*	*Darnestown Rd at Riffle Ford Rd*	*11/9/2004*	*1769*	*1475*	*North Potomac*
21	48	43	Old Georgetown Rd at Tuckerman Ln	5/26/2005	1746	1550	North Bethesda
22	*38*	*77*	*Veirs Mill Rd at Twinbrook Pkwy*	*6/9/2004*	*1743*	*1550*	*North Bethesda*
23	39	*	Georgia Ave at Emory Ln	9/9/2003	1741	1475	Olney
24	40	*	Hungerford Dr at N Washington St	7/8/2004	1736	1500	Rockville City
25	*	*	Key West Ave at Shady Grove Rd	9/27/2005	1733	1500	Rockville City
26	*	*	Georgia Ave at MD 108	12/14/2005	1722	1475	Olney
27	*43*	*8*	*Connecticut Ave at Veirs Mill Rd*	*3/3/2004*	*1717*	*1600*	*Kensington/Wheaton*
28	*27*	*21*	*Norbeck Rd at Bauer Dr*	*10/20/2005*	*1710*	*1500*	*Aspen Hill*
29	*	*	Piney Branch Rd at Philadelphia Ave	4/20/2005	1704	1600	Silver Spring/Takoma Park
30	45	35	Columbia Pike at Lockwood Dr	10/26/2004	1699	1500	Fairland/White Oak

* Intersection was unranked either b/c data was unavailable or CLV did not exceed standard
Entries in *italics* indicates special notes for this particular location

Notes for Table 3.3 (by rank)
Intersection #11: Work zone existed north of intersection when count this was taken
Intersection #12: Grade-separated interchange in project planning
Intersection #13: Grade-separated interchange under study
Intersection #14: Count taken prior to intersection improvement
Intersection #15: Grade-separated interchange/intersection improvements under study
Intersection #17: Work zone existed south of intersection when this count was taken
Intersection #19: Grade-separated interchange under construction
Intersection #20: Roadway has been improved since this count was taken
Intersection #22: Road improvements south of intersection have been completed since this count was taken
Intersection #27: Intersection improvements completed since this count was taken
Intersection #28: Intersection improvements recommended in MP

Table 3.4: Congested Intersections (31-70)
- Revised May 30, 2006 (after the staff draft was published) -

31	*47*	*37*	*University Blvd at Piney Branch Rd*	*5/3/2005*	*1676*	*1600*	*Silver Spring/Takoma Park*
32	49	145	Rockville Pike at Wilson/NIH	6/10/2004	1675	1600	Bethesda/Chevy Chase
33	50	51	Old Georgetown Rd at Beech St	10/5/2004	1675	1600	Bethesda/Chevy Chase
34	*	*	*Colesville Rd at Franklin Ave*	*4/13/2005*	*1670*	*1600*	*Silver Spring/Takoma Park*
35	*	*	*Georgia Ave at Arcola Ave*	*5/3/2005*	*1661*	*1600*	*Kensington/Wheaton*
36	*52*	*7*	*Hungerford Ln (MD 355) at Gude Dr*	*10/26/2004*	*1656*	*1500*	*Rockville City*
37	93	68	Frederick Rd at Clarksburg Rd	8/24/2005	1653	1450	Clarksburg
38	*	*	*New Hampshire Ave at Lockwood Dr*	*11/17/2004*	*1644*	*1500*	*Fairland/White Oak*
39	*	*	*Montrose Rd at Tildenwood Ln*	*3/9/2005*	*1643*	*1550*	*North Bethesda*
40	54	47	Old Georgetown Rd at W Cedar Ln	4/30/2003	1639	1600	Bethesda/Chevy Chase
41	59	56	Muncaster Rd at MD 108	6/3/2004	1638	1400	Patuxent
42	*	*	Layhill Rd at Belpre/Bonifant Rd	9/15/2005	1633	1500	Aspen Hill
43	55	17	Connecticut Ave at Randolph Rd	3/3/2004	1631	1600	Kensington/Wheaton
44	42	29	Georgia Ave at Columbia Blvd/Seminary Ln	5/10/2005	1631	1600	Silver Spring/Takoma Park
45	*56*	*	*Columbia Pk at Burtonsville Xing SC*	*6/2/2004*	*1628*	*1400*	*Patuxent*
46	57	52	Georgia Ave at Plyers Mill Rd	11/18/2003	1626	1600	Kensington/Wheaton
47	*58*	*80*	*Woodfield Rd at Fieldcrest/Hadley Farms*	*3/10/2005*	*1620*	*1450*	*Montgomery Village/Airpark*
48	*4*	*5*	*Montrose Rd at E Jefferson St*	*3/9/2005*	*1617*	*1550*	*North Bethesda*
49	*60*	*269*	*Mont. Village Ave at Chris/Lost Knife*	*11/4/2004*	*1613*	*1450*	*Montgomery Village/Airpark*
50	*	*	Georgia Ave at Connecticut Ave	2/19/2004	1611	1500	Aspen Hill
51	*63*	*60*	*Veirs Mill Rd at Aspen Hill Rd*	*3/22/2003*	*1608*	*1500*	*Aspen Hill*
52	*	*	First St at Baltimore Rd	1/13/2005	1602	1500	Rockville City
53	67	*	Cherry Hill Rd at Broadbirch/Calverton Blvd	5/18/2004	1589	1500	Fairland/White Oak
54	72	75	MD 355 at Edmondston Ln	3/20/2003	1556	1500	Rockville City
55	*	*	Olney-Laytons Rd at Queen Elizabeth Dr	12/15/2005	1555	1475	Olney
56	75	71	E Gude Dr at Southlawn Ln	9/28/2004	1545	1500	Rockville City
57	*77*	*38*	*Columbia Pike at Fairland Rd*	*11/20/2003*	*1541*	*1500*	*Fairland/White Oak*
58	78	*	Frederick Rd at Montgomery Village Ave	3/3/2004	1540	1450	Gaithersburg City
59	79	113	Rockville Pike at Congressional Ln	6/3/2004	1538	1500	Rockville City
60	*83*	*	*Columbia Pike at Greencastle Rd*	*2/5/2004*	*1524*	*1500*	*Fairland/White Oak*
61	*	*	Shady Grove Rd at Epsilon/Tupelo	4/6/2005	1518	1475	Derwood
62	*	*	Muncaster Mill Rd at Needwood Rd	4/12/2005	1510	1400	Rock Creek
63	66	61	Midcounty Hwy at Washington Grove Ln	3/22/2005	1508	1475	Derwood
64	*84*	*149*	*Great Seneca Hwy at Quince Orchard Rd*	*3/9/2004*	*1507*	*1450*	*Gaithersburg City*
65	86	*	Hungerford Dr (MD 355) at Manakee St	10/27/2004	1504	1500	Rockville City
66	36	31	Georgia Ave at Old Baltimore Rd	4/7/2005	1498	1475	Olney
67	91	247	New Hampshire Ave at Bonifant/Good Hope	5/25/2004	1476	1475	Cloverly
68	*	*	Georgia Ave at New Hampshire Ave	2/14/2006	1457	1400	Patuxent
69	92	*	Great Seneca Hwy at Kentlands Blvd	5/11/2005	1454	1450	Gaithersburg City
70	95	*	Sandy Spring Rd at McKnew Rd	9/10/2003	1401	1400	Patuxent

* Intersection was unranked either b/c data was unavailable or CLV did not exceed standard
Entries in *italics* indicates special notes for this particular location

Notes for Table 3.4 (by rank)
Intersection #31: Work zone existed north of intersection when this count was taken
Intersection #34: Work zone existed north of intersection when this count was taken
Intersection #35: Intersection improvements in project planning
Intersection #36: Grade separated interchange recommended in MP
Intersection #38: Intersection/roadway improvements completed since this count was taken
Intersection #39: Intersection improvement under construction
Intersection #45: Grade-separated interchange completed at US 29/MD198 after count was taken
Intersection #47: Roadway improvement under study
Intersection #48: Intersection improvement was nearing completion when count was taken
Intersection #49: Intersection improvements completed since this count was taken
Intersection #51: Intersection improvements completed since this count was taken
Intersection #57: Grade-separated interchange in project planning
Intersection #60: Grade-separated interchange in MP
Intersection #64: Intersection improvements completed since this count was taken

The availability of archived count data enabled staff to conduct a CLV trend analysis for a selected group of intersections. This analysis was done primarily to illustrate the impact of infrastructure improvements on CLVs. Table 3.5 lists locations where CLVs decreased as a result of infrastructure improvements by at most 15% over a 4-year period. State (SHA) improvements such as; the widening of Darnestown Rd (MD 28) and Great Seneca Hwy (MD 119), have helped to significantly reduce CLVs at a number of intersections located in the Gaithersburg and R & D Village areas of the County. Improvements related to development such as; the improvement of the intersection at Wayne Ave and Cedar St (in the Silver Spring CBD) helped to reduce the CLV at this location by roughly 40% between late 2003 and late 2005. Analyses of this nature helps to further justify the need for and effectiveness of various forms of infrastructure improvements.

Table 3.5: CLV % Change <= -15%

INTERSECTION	CLV	DATE	O CLV	O DATE	PCT CHG	JUSTIFICATION/REASONING
Darnestown Rd (MD 28) at Key West Ave	1111	9/21/2005	2225	5/8/2001	-100%	MD 28 widening was completed just prior to ’05 count
Wisconsin Ave (MD 355) at Jones Bridge/Center Dr	1536	12/22/2005	2299	4/24/2003	-49%	Result of '04 intersection improvements
Wayne Ave at Cedar St	776	4/12/2005	1094	6/5/2003	-40%	Development-related improvements made at Wayne/Fenton prior to '05 count
Rockville Pike (MD 355) at Marinelli Rd	998	3/8/2005	1394	6/12/2003	-39%	White Flint Metro parking garage was relocated just prior to ’05 count
Darnestown Rd (MD 28) at Muddy Branch Rd	1178	12/20/2005	1505	2/24/2004	-27%	MD 28 and MD 119 widenings were completed prior to ’05 count
Montrose Rd at Executive/E Jefferson St	1617	3/9/2005	2061	5/22/2003	-27%	Intersection improvement was nearing completion when ’05 count was taken
Great Seneca Hwy (MD 119) at Key West Ave (MD 28)	1230	9/27/2005	1556	2/11/2003	-26%	MD 119 widening, reconstruction was being completed when ’05 count was taken
Veirs Mill Rd (MD 586) at Randolph Rd	1314	9/29/2005	1613	10/31/2002	-22%	Intersection improvement was nearing completion when ’05 count was taken
Connecticut Ave (MD 185) at Veirs Mill Rd (MD 586)	1717	3/3/2004	1975	9/19/2001	-15%	MD185/MD586 improvement was nearing completion when ’04 count was taken

The availability of archived data also allowed staff to identify locations where CLVs have increased as the result of new development, or the expansion of existing development. Staff was also able to identify locations where CLVs have increased as result of on-street work zones related to ongoing construction, which typically decrease roadway capacity, and ultimately impact traffic flow. It is important to note that despite the increases in CLVs as a result of development, traffic mitigation measures have been implemented at a number of these locations. Moreover, the absence of these traffic mitigation measures would have resulted in much more drastic increases in CLVs at these locations. Table 3.6 lists locations where CLVs have increased by at least 15% between 2001 and 2005. The CLV at the intersection of Key West Ave (MD 28) and W Gude Dr increased roughly 49% between 2004 and 2005, as a result of the opening of Falls Grove Dr as the northbound leg of the intersection. Comparably, the CLV at Democracy Blvd and Rockledge Dr increased 35% between 2004 and 2005 as a result of the opening of the Rockledge Dr extension to I-270.

Table 3.6: CLV % Change >= 15%

INTERSECTION	CLV	DATE	O CLV	O DATE	PCT CHG	JUSTIFICATION/REASONING
Fenton St at Ellsworth Ave	503	4/19/2005	253	6/12/2003	49%	Eastbound Ellsworth Ave was reopened prior to '05 count
Key West Ave (MD 28) at W Gude Dr	1231	9/28/2005	616	12/8/2004	49%	Falls Grove Dr (new) opened prior to '05 count
Fenton St at Cameron St	644	11/16/2005	394	5/26/2005	38%	Fenton St garage exit re-opened prior to '05 count
Muncaster Mill Rd (MD 115) at Needwood Rd	1510	4/12/2005	955	1/17/2001	36%	MD 115 safety, geometric improvements were underway when ’05 count was taken
Democracy Blvd at Rockledge Dr	1013	4/21/2005	650	2/26/2004	35%	Rockledge Dr (new) was opened prior to '05 count
Fenton St at Thayer St	930	4/14/2005	636	5/20/2003	31%	CBD work zones along Fenton St removed prior to '05 count
Key West (MD 28) at Shady Grove Rd	1733	1/26/2005	1222	10/29/2002	30%	Traffic resulting from development in the R&D Village
Fenton St at Sligo Ave	1087	9/27/2005	770	5/20/2003	29%	CBD work zones along Fenton St removed prior to '05 count
Burlington Ave (MD 410) at Fenton St	1169	3/3/2005	861	6/9/2004	26%	CBD work zones along Fenton St removed prior to '05 count
Coleseville Rd at 2nd/Wayne Ave	1088	5/12/2005	849	6/10/2004	21%	Traffic resulting from ongoing development in Silver Spring CBD prior to '05 count
Old Georgetown Rd at Rock Spring Dr	1368	5/25/2005	1099	6/2/2004	19%	Rockledge Dr (new) was opened prior to '05 count
Old Georgetown Rd at Executive Blvd	1620	3/10/2005	1341	5/22/2003	17%	Traffic resulting from ongoing development at LCOR site seen in ’05 count
Rockville Pike (MD 355) at Tuckerman Lane (N)	1586	5/10/2005	1314	3/25/2003	17%	I-495/270 PM bail-out traffic; development impacts at Strathmore site seen in ’05 count
Darnestown Rd (MD 28) at Riffle Ford Rd/Seurat Dr	1769	11/9/2004	1493	4/24/2001	15%	MD 28 widening was underway when ’04 count was taken
Old Georgetown Rd (MD 187) at Democracy Blvd	1440	4/19/2005	1234	6/2/2004	14%	MD 187 safety, resurfacing improvements were underway when ’04 count was taken

Using this year’s available CLV data, staff has assembled a list of locations that exhibit definitive patterns of congestion. Based on this information, it is discernable that this year’s congested locations tend to mirror those seen in the 2005 Highway Mobility Report (HMR). These corridors tend to have a significant number of intersections, which have CLVs that either are exceeding or are close to exceeding their LATR standard. As seen in the previous two reports, these intersections tend to be located along the major thoroughfares (e.g. State routes), which provide linkages to the various activity centers (e.g. CBDs) of the County. In some instances, some congested intersections are located at the gateway points to the major job and activity centers. There are a number of projects that are either master-planned, or already in project planning, which should help to improve mobility in these areas. Based on this year’s analysis, the following areas and corridors are experiencing significant levels of congestion:

- **Rockville Pike (MD 355)** between the Capital Beltway (I-495) and the intersection of Jones Bridge Rd / Center Dr, where four signalized intersections (Pooks Hill Rd / Bellvue Dr, Cedar Ln / W Cedar Ln, Wilson Dr / NIH, South Dr / Wood Rd) all have CLVs exceeding the LATR standard. Three of these intersections (Cedar Ln / W Cedar Ln, South Dr / Wood Rd, Pooks Hill Rd / Bellvue Dr) rank among the 10 most congested intersections in the County with CLVs of 2103, 2022, and 1923 respectively. The intersection of Rockville Pike and Cedar Ln / W Cedar Ln is ranked among the 10 most congested intersections in the County for the third consecutive year. The master-planned grade-separated interchange for this location was recommended by the County Executive, for addition to the State's Development & Evaluation (D&E) program in the fall of 2005.

- **Rockville Pike / Hungerford Dr / Frederick Rd (MD 355)** between Shady Grove Rd and Twinbrook Pkwy / Rollins Ave, where five intersections (King Farm Blvd, Gude Dr, N Washington St, Edmonston Ln, Congressional Ln) all have CLVs that exceed their respective LATR standard. All, but one of these intersections (King Farm Blvd), are located in the **City of Rockville**. The City of Rockville has its own review procedures and is not subject to the County's LATR guidelines. However, the Department uses the LATR standard for travel monitoring purposes within the city limits. The master-planned grade-separated interchange for the MD 355/Gude Dr intersection was recommended by the County Executive, for addition to the State's Development & Evaluation (D&E) program in the fall of 2005. It should also be noted that Twinbrook Pkwy / Rollins Ave intersection improvement project is currently in the property acquisition phase.

- **Frederick Rd (MD 355)** from Montgomery Village Ave (MD 124) in the **City of Gaithersburg** to points north (Germantown, Clarksburg), where four intersections (Montgomery Village Ave, Christopher St, Ridge Rd (MD 27), Clarksburg Rd (MD 121)) all have CLVs, which exceed their respective LATR standards. The CLVs at these intersections have increased uniformly over the past few years as a result of ongoing development in Clarksburg and the surrounding vicinities. Therefore, this corridor should continue to be monitored with the highest level of scrutiny, as a significant amount of development in this area has been approved, but has yet to be built. There is a significant amount of additional transportation infrastructure planned for these areas, both developer-funded and through traditional funding sources, but travel conditions will likely worsen until those facilities are actually constructed. Staff should note that the Stringtown Rd extension project recently began construction, while the Midcounty Hwy (M-83) extension project from Montgomery Village Ave north to Ridge Rd is currently in phase I facility planning by DPWT.

- **Colesville Road / Columbia Pike (US 29)**, where 10 intersections from the Howard County line to Sligo Creek Pkwy have CLVs exceeding their respective LATR standards. Construction of the new grade-separated interchanges at Sandy Spring Rd (MD 198) and Randolph Rd / Cherry Hill Rd were completed in late 2005. Construction of the new grade-separated interchange at Briggs Chaney Rd is to be completed by mid-to-late 2007. Four additional grade-separated interchanges

(Blackburn Rd, Fairland Rd / Musgrove Rd, Greencastle Rd, Stewart Ln, Tech Rd) are either master planned or in project planning. However, in accordance with the Council Master Plan guidance, SHA is conducting a monitoring program in the vicinity of and downstream from the new interchanges before additional interchanges are funded for construction.

- **Georgia Avenue (MD 97)** between the Wheaton and Silver Spring CBDs, where four intersections (Columbia Blvd / Seminary Ln, Forest Glen Rd, Plyers Mill Rd) all have CLVs exceeding their LATR standard. The intersection at Arcola Ave also has a CLV that exceeds its LATR standard. Five intersections (Connecticut Ave (MD 185), Norbeck Rd (MD 28), Emory Ln, Old Baltimore Rd, Olney-Sandy Spring Rd (MD 108)) from the Glenmont area to the Olney Town Center also have CLVs that exceed their respective LATR standards. New grade-separated interchanges for the Randolph Rd and Norbeck Rd intersections are currently in project planning by SHA. Intersection improvements for Georgia Ave (MD 97) at Arcola Ave are also in project planning. The Forest Glen Road intersection, which ranks #2 on the list of the most congested intersections for the second consecutive year with a CLV of 2106, had its signal phasing plan updated following its most recent count and conditions have improved following the new phasing plan, but a new count with a current CLV is not yet available.

- **Norbeck Rd (MD 28)** from Georgia Ave (MD 97) to Veirs Mill Rd (MD 586), where 5 of the 10 signalized intersections (Georgia Ave, Bauer Dr, Avery Rd, Baltimore Rd, Veirs Mill Rd) have CLVs that exceed their LATR standard. A grade-separated interchange for the Georgia Ave intersection is currently in project planning by SHA. In addition, at-grade and grade-separated improvement options for the Norbeck Rd / First St / Veirs Mill Rd intersection are currently under study by SHA

- **Veirs Mill Rd (MD 586)** from Georgia Ave to Norbeck Rd / First St, where four intersections (Georgia Ave, Aspen Hill Rd, Twinbrook Pkwy, Norbeck Rd / First St) all have CLVs exceeding their respective LATR standards. The master-planned widening of Veirs Mill Rd from Randolph Rd to Twinbrook Pkwy was recommended by the County Executive, for addition to the State's Development & Evaluation (D&E) program in the fall of 2005.

- **Montrose Rd** where the intersections at Tildenwood Ln and E Jefferson St both have CLVs, which exceed their LATR standard. The intersection at E Jefferson St was recently improved with the additions of a second southbound right turn lane, and a second eastbound left turn lane. Therefore, staff will need to obtain new data for this intersection to determine the effectiveness the recent improvements. The County recently began construction of the new Montrose Pkwy West (from Tildenwood Ln to Old Georgetown Rd), which will serve as a bypass around the existing Montrose / Randolph Rd. This project also involves the widening of an existing segment of Montrose Rd between Tower Oaks Blvd and Tildenwood Ln. The Montrose Parkway East (from Old Georgetown Rd to Veirs Mill Rd (MD 586)) extension of this project is currently in phase II facility planning by DPWT. A grade-separated interchange for the

intersection at Rockville Pike (MD 355) and the CSX railroad crossing is currently in project planning by SHA.

- **River Road (MD 190)** from Seven Locks Rd to Winston Dr / Whittier Blvd, where four signalized intersections (Seven Locks Rd, I-495 E access ramp, Beech Tree Rd / Nevis Rd, Winston Dr / Whittier Blvd) all have CLVs exceeding the their LATR standard. The counts for these intersections all predate 2003. Therefore, staff would like to obtain more recent count data for these locations to determine the accuracy of the reported conditions, for future reporting purposes.

Although CLV data is useful for identifying levels of congestion at signalized intersections and along some of the more heavily signalized corridors, it does not always clearly describe the issue of congestion at the link or roadway segment level. In some cases, an intersection may have a CLV, which indicates that it is performing at an acceptable level relative to the LATR standard. However, if the approach volume at that intersection is being impeded or diminished by the lack of flow along the approaching link or 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, which were conducted for a selected group of well-traveled routes and corridors throughout the County. The information to be discussed in this section will help to identify congestion at the link level along some of the aforementioned congested corridors.

Arterial Travel Times and Speeds

This performance measure was introduced in the 2004 ADAC Report and was perceived as an indicator that could be easily understood by transportation system users. People are usually very aware of the travel times and speeds that they experience while traveling from place-to-place at different times of the day, during different days of the week. GPS-equipped probe vehicles are used to conduct structured samples of different roadways at specific times of the day to yield measures such as representative speeds and travel times, variations in speeds and travel times, and average speed and travel times over specific sampling periods. Because roadway users experience and internalize these measures of traffic congestion during their own travel, they can understand how well the results of sampling and characterization of congestion levels agree with their own experiences.

The Planning Board has expressed sentiments in previous reviews that the cumulative summary of collected GPS-based travel time and speed data provides a good enough representation of the overall traffic congestion patterns in the County to support continuing data collection efforts with slight variations in the study scope from year to year. For the previous two reports, the consultant had structured the travel time and speed samples to include many well-traveled routes and reported the results on a route-by-route basis, so that readers could easily check the range of the results against their own travel experiences. The summaries tend to emphasize the variations in congestion in terms of: (a) its duration over time, (b) extent along the route, and (c) its intensity at different places and times. The analysis is less concerned with average conditions and recognizes that congestion can have many causes. A significant amount of congestion does not recur from day-to-day; rather it can be

associated with incidents that occur somewhat randomly, as well as periodic events that take place from time-to-time. Such non-recurring, incident-based congestion is often observed in the speed and travel time samples.

In 2004, the Department analyzed the performance of the County's arterial network by reviewing travel times and speeds along selected routes, as surveyed by a series of GPS-equipped probe vehicles. With the assistance of the consultant (Motion Maps, LLC) and the subcontractor (MCV), a series of data samples were collected along the freeways, a series of major arterial corridors, and a few minor arterials throughout most of the County during weekday AM and PM peak periods. Those samples were structured to emphasize greater spatial coverage rather than having more samples over the peak period for a particular roadway, although some repeated sampling was done along certain routes. Additional secondary GPS-based travel time and speed data was obtained from the Metropolitan Washington Council of Governments (MWCOG), as they perform collection of travel time and speed data samples on a three-year cycle for a selected set of arterials in the region, including a significant amount in Montgomery County.

In 2005, the Department conducted a similar set of travel time and speed samples using the same consultant team. However, based upon feedback received following the 2004 report, the 2005 sampling focused on: (a) a selection of County and State arterials, (b) getting more frequent samples within each peak period, and (c) establishing an ability to track year-to-year changes in congestion patterns based on archived travel time and speed data. Fourteen route-corridors were sampled in 2005. Each of these route-corridors was sampled in 2004 as well, although some had a small set of samples at that time. In 2005, an increased number of secondary source GPS-based travel time and speed runs (in Montgomery County) were made available. In addition to the fourteen route-corridors associated with the primary data collection, the secondary data source samples included four additional corridors. The availability of the secondary data sources enabled the primary data collection to cover a few different corridors that might have otherwise been excluded due to resource limitations. Secondary data was available from two new sources: (1) the State Highway Administration (SHA), and (2) the Montgomery County Department of Public Works and Transportation (DPWT), as well as from the prior year source of the MWCOG. Specific documentation of the corridors sampled by the primary and secondary sources was provided in the 2005 report. For the primary and secondary routes sampled in 2005, there was an overall total of about 550 travel time and speed samples. For the typical route-corridor sampled, there were a total of about 28 travel time runs on average, or about 7 travel time runs per direction and time period.

Readers should recognize that there is a high degree of variability in the congestion along a route during the peak periods of congested or slow traffic – at any given time, some segments may be congested and others not; and at any given place, the congestion may peak at a time different than other places along a corridor. In other words, congestion particularly on arterials can be localized and intense. Yet at other locations along that arterial, the congestion may be most intense at a different time or for a different duration. For some arterials, the slowness can be very directional, but for other arterials, the slowness can be more evenly distributed bi-directionally. For that reason and the practicality of conducting the probe samples, each corridor is typically sampled in both directions during both the AM and the PM peak periods to

capture both the peak and off-peak directional flows according to the following general procedures:

- **Sample Frequency per Hour**: The more travel time and speed samples that are collected, the easier it is to capture such variability and the full range of congested conditions. Yet, more samples require more resources to collect the data, and given the general limitations of Department's resources, there is a limit to the number of observations that can be performed. The sampling approach attempts to obtain between two and four observations per hour per direction for the corridors. Between one and three probes are used to sample each corridor and direction by driving back and forth along the route. The field supervision tries to have a somewhat even time spacing between the probes when more than one probe is used.
- **Sampling Duration per Peak Period**: Three probes are typically used on longer more congested routes, while one probe tends to be used on shorter less congested routes. However, to get to the start or return from the end of a particular route, at times it is more feasible to use a route that is being sampled on a different day, referred to as a "deadheading sample". The duration of the sampling per peak period is generally about two and a half to three hours, but sometimes more or sometimes less. The field supervision generally tries to start the first sample and stop the last sample as a full sample of the corridor, but this is not always the most practical approach

The following discussion and illustrations presents the results of the travel time and speed samples for two specific corridors. As mentioned earlier, new primary data was collected for only two corridors: (1) Frederick Road (MD 355) between Montgomery Village Avenue (MD 124) and Comus Road, and (2) the combined corridor of First Street (MD 911) and Norbeck Road (MD 28) / MD 28-198 Connector between Rockville Pike (MD 355) and New Hampshire Avenue (MD 650). In addition, some secondary GPS-based travel time and speed data was available for 2006 for adjacent sections of these two corridors. The results of the travel time and speed data analysis are discussed below:

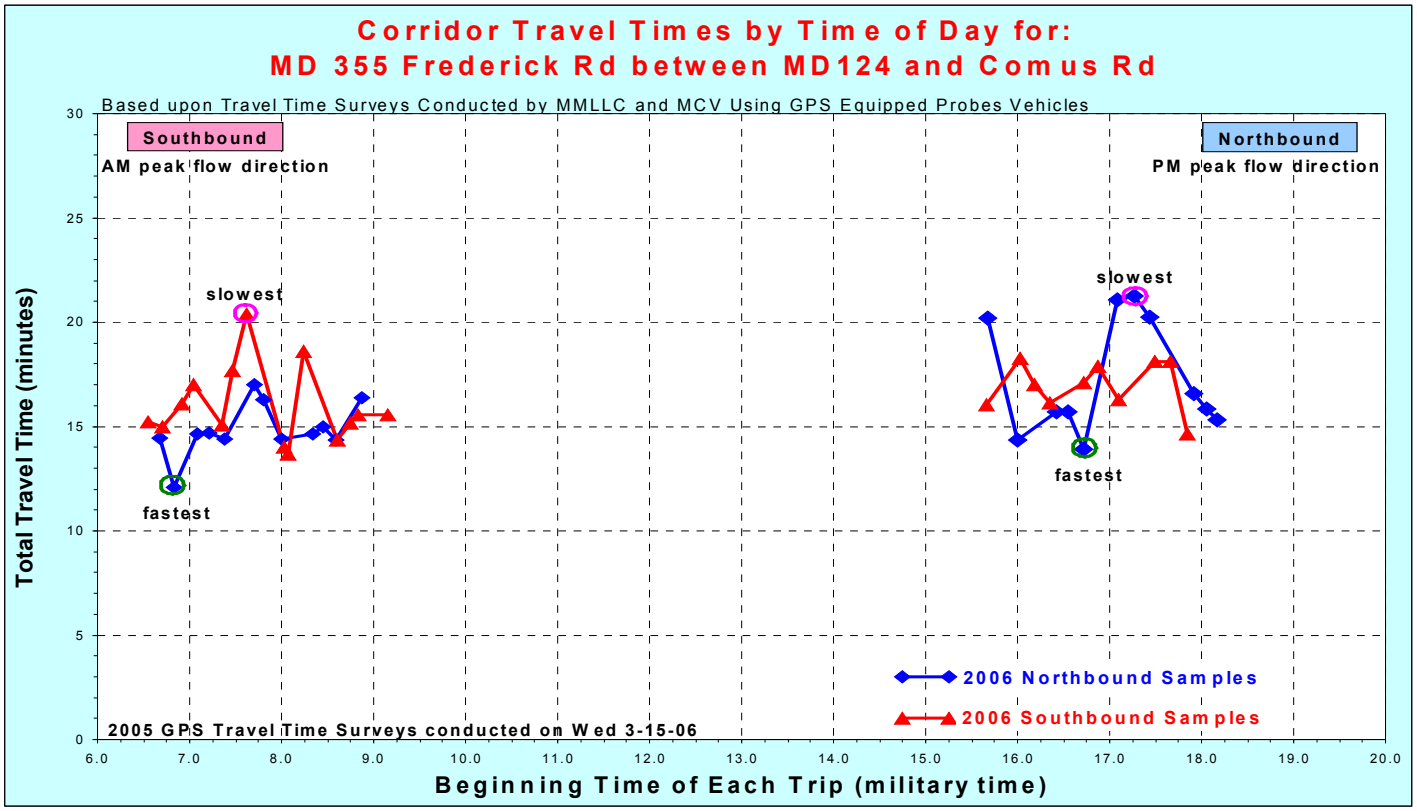
Frederick Road (MD 355) from Montgomery Village Avenue (MD 124) to Comus Road: In the 2005 report, the MD 355 corridor between Montgomery Village Avenue and Comus Road was presented as an example to illustrate the impact on congestion levels associated with growth and development. Figure 3.4 presents a summary of the travel time results by time-of-day graphically for the data collected in 2006. Comus Rd intersects MD 355 on the north side of the Clarksburg area. This approximately 8.4 mile roadway segment passes through the Gaithersburg, Germantown, and Clarksburg areas on the east side of the I-270 Corridor. This roadway segment serves an area of the County that has experienced and will continue to experience a significant pace of development, especially of recent in sections of Clarksburg.

In Figure 3.4, the horizontal axis gives the time of day (in military time) for the start of each travel time sample, the vertical axis gives the total travel time from the start to the end of the particular corridor. The results of each of the travel time samples are shown as the points in the Figure. Figure 3.4 shows that there were 47 completed directional travel time samples in 2006 for this corridor, with 12 during the AM peak-period northbound, 14 during the AM peak-period southbound, 11 during the PM peak-period northbound, and 10 during the PM

peak-period southbound. The figure shows that from this collection of data samples, the slowest southbound AM peak travel time was about 20.4 minutes for the sample that started about 7:37 AM, while the slowest northbound PM peak travel time was about 21.2 minutes for a sample that started at about 5:16 PM. No traffic related incidents were observed that would have affected these travel times.

The fastest northbound sample observed was about 12.1 minutes while the slowest northbound sample observed was about 21.2 minutes. When contrasting these two samples, there is a resulting travel-time-ratio of about 1.8 of the slowest northbound time to the fastest northbound time. The fastest southbound sample observed was about 13.7 minutes, and when contrasted to the slowest southbound sample of 20.4 minutes, the result is a travel-time-ratio of about 1.5 of the slowest southbound time to the fastest southbound time.

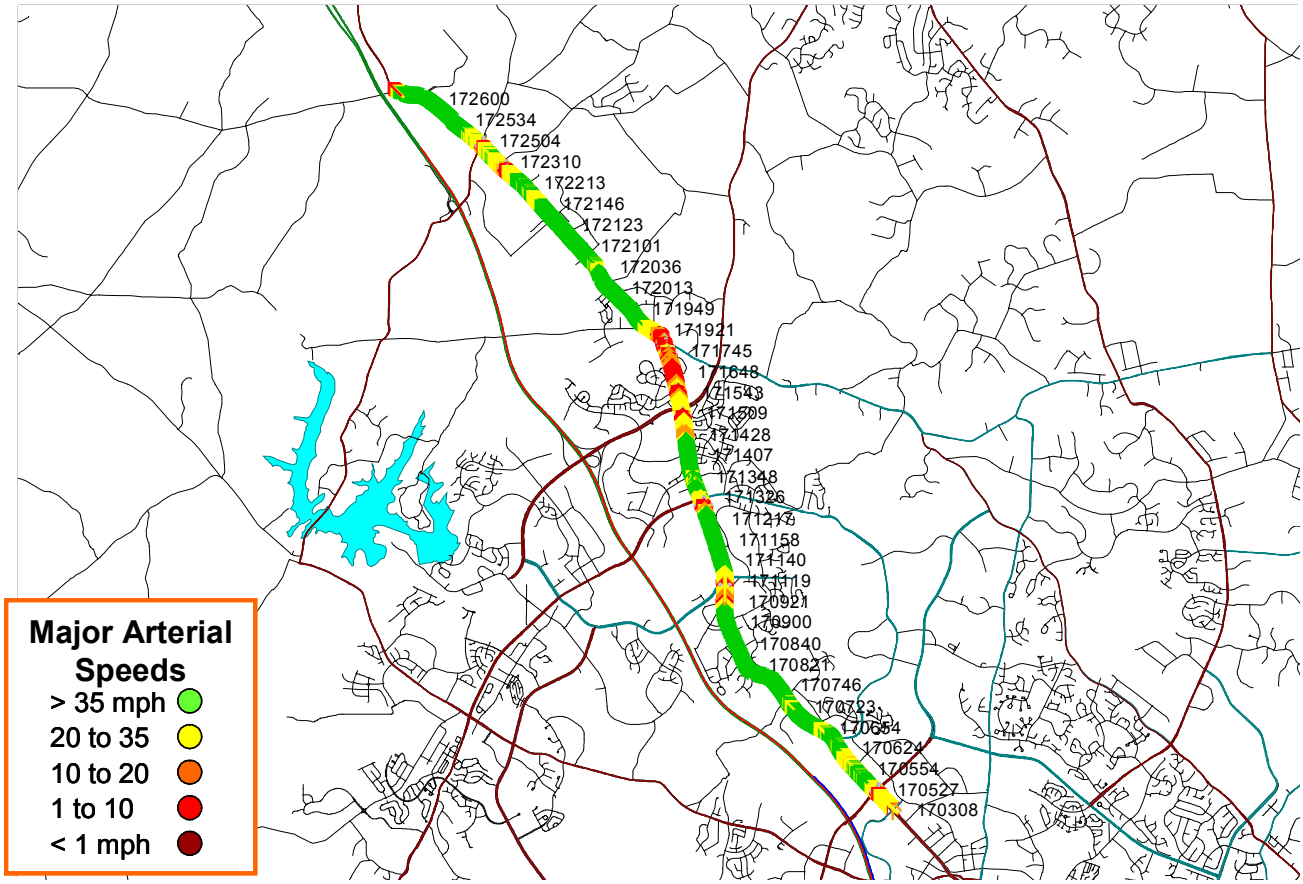
Figure 3.4: Frederick Rd (MD 355) Travel Time Samples - Results



It should be noted that for that slowest AM southbound trip, the slowest speeds and congestion were experienced at two main locations: (1) the north end of this corridor approaching Clarksburg Road (MD 121), and continuing south to Stringtown Road, and (2) the south end of the corridor from Watkins Mill Road through Montgomery Village Avenue. For other southbound samples earlier that morning, queues were observed stretching north from Clarksburg Road to as far north as Comus Road.

A similar review of the specific results of the northbound samples for the PM peak period as well as the AM peak period, presents a somewhat different set of congestion patterns. Some for which, certain potential short-term roadway improvements are seen as perhaps being appropriate from the perspective of reducing traffic congestion conditions and improving safety. Based on the 2005 data, it was noted in last year's report that for the slowest PM northbound sample, and the others before and after, the slow speeds and congestion were experienced starting at Ridge Road (MD 27) and generally continued as a rolling delay until the intersection with Clarksburg Road was cleared. The sample further indicated that it took roughly 15 min to travel this 3.2-mile long stretch of road, at an average speed of about 13 mph. In late 2005, a new traffic signal was installed at Stringtown Road and vertical curvature improvements were under construction during the 2006 sampling. The very long queues observed in 2005 were not observed in the 2006 samples, and the slowest PM peak northbound travel time in 2006 was about 3 minutes and 45 seconds faster than the slowest sample observed in 2005. However, significant northbound queues of very slow traffic were observed during several 2006 samples that started between about 5 and 6 PM. One of these, that for the longest queue and nearly the slowest travel time sample, is given in Figure 3.5 for the sample that started at about 5:05 PM at MD 124.

Figure 3.5: Northbound Frederick Rd (MD 355) PM Congestion



The longer queues observed in 2005 perhaps masked an interesting aspect of the queue shown in Figure 3.5 – as the congestion appears to be associated with traffic conditions found at the intersection of West Old Baltimore Road with Frederick Road. The congested conditions are compounded by the nearby intersection with Brink Road, as well as the lack of shoulders in the northbound direction along Frederick Road at West Old Baltimore Road. A detailed version of the same queue is presented in Figure 3.6, which shows 5 distinct stop or near-stoppages in the queue as the probe vehicle moved north. For the northbound samples in the AM peak period, 8 of the 12 samples observed delay at that location as shown in one example in Figure 3.7.

Given the lack of a northbound left-turn lane from Frederick Road onto West Old Baltimore Road, the heavy southbound flows in the AM peak period observed before 7 AM as shown in Figure 3.7, and no shoulder for a northbound vehicle to use to bypass a left turning vehicle, together these factors can result in a queue of several vehicles if just one vehicle wants to make that left turn. The heavier PM peak period flows can cause the queue to extend back south of Brink Road, which has its own queue of traffic merging onto MD 355. It is likely that some of this traffic is making the immediate left turn onto West Old Baltimore Road. The queue, which extends south along MD 355 a few hundred feet south of Brink Road, marks the end of the transition area where the two-northbound lanes on MD 355 to the south become one

Figure 3.6: Frederick Rd (MD 355) at W Old Baltimore Rd PM Congestion

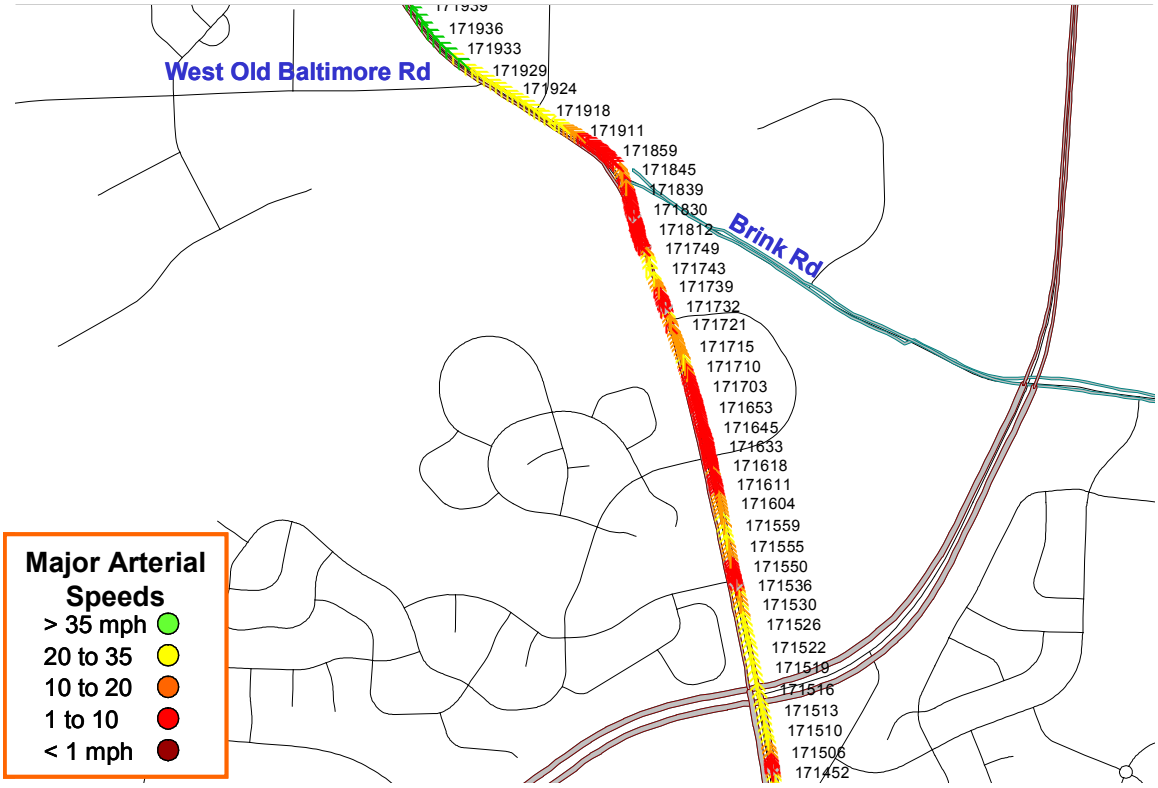
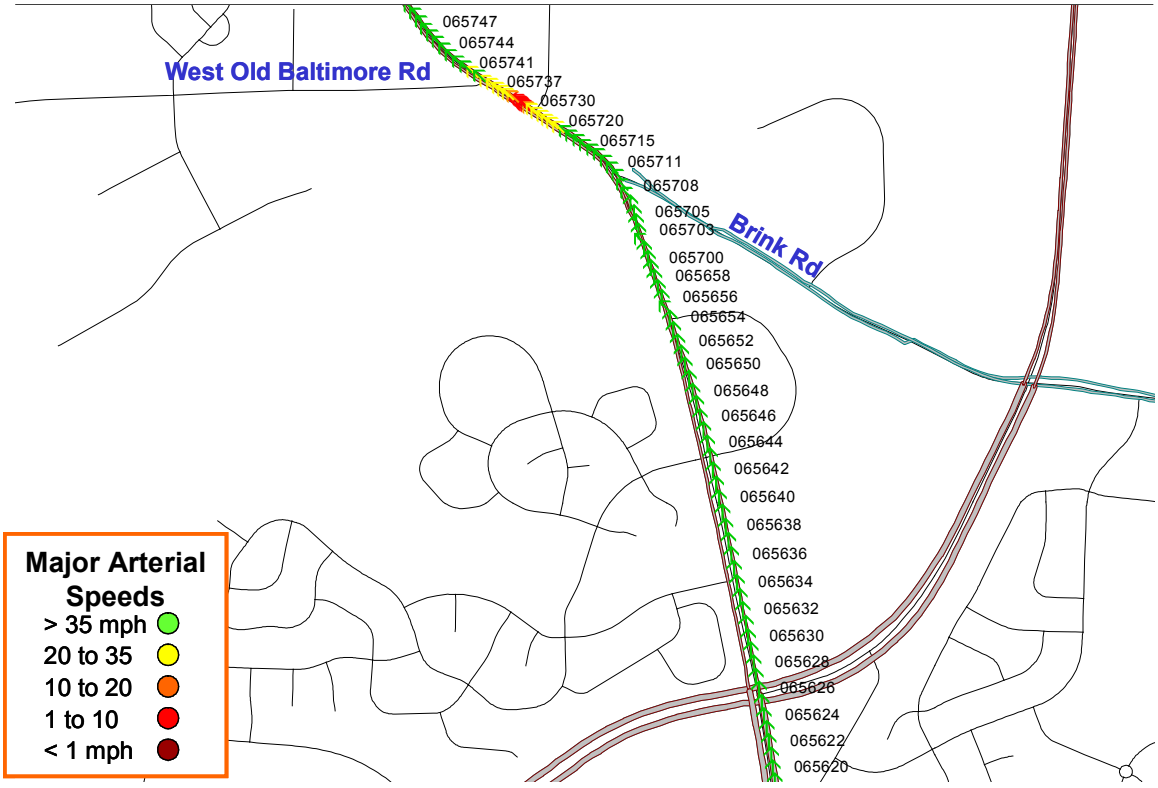


Figure 3.7: Frederick Rd (MD 355) at W Old Baltimore Rd AM Congestion



northbound lane. The transition down to one-northbound lane, when the traffic flow is heavy enough such as at that time of day, then further results in the queue extending to the south, as shown in the example in Figure 3.6. At the very least, consideration should be given to developing an appropriate intersection improvement to address the conditions at the West Old Baltimore intersection with MD 355 to be included in the State's Consolidated Transportation Program (CTP) or Spot Improvement Program.

In the 2005 report, discussion was presented that compared the sample from 2004 with those observed in 2005 for this roadway corridor. The next set of figures refines that analysis and examines the trends over the three-year period of 2004 through 2006. To make it easier for the reader to discern the trends, the year-to-year changes in the corridor travel times by time-of-day (for the start of each sample) are shown separately for the southbound and northbound directions in Figures 3.8 and 3.9, respectively. These two figures are similar to the previous Figure 3.4 displayed above.

In Figure 3.8 which shows the southbound samples for the morning peak period; (1) the 2005 and 2006 samples both show markedly slower travel times than the samples for 2004, and (2) while the 2006 versus the 2005 samples seem to show little, if any, discernable differences in the corridor travel time by time of day. Moreover, the reported travel times for the 2006 data samples are somewhat faster overall. For the southbound samples during the evening peak period, the 2006 data samples appear to be consistently slower, by about one to three minutes, than the comparable samples from 2004 and most of the samples for 2005. It is also interesting to note that for just the 2006 data, the evening samples are just as generally slow as the morning samples, with the exception of two of the fourteen observations in the morning peak period. Conversely, several of the southbound morning samples are faster than the fastest southbound samples in the evening. These differences may be the result of some of the traffic signal retiming and traffic flow optimization measures that have been implemented in this corridor, as an attempt to alleviate congestion in the interim.

In Figure 3.9 showing the northbound samples for the evening peak period, the 2006 data samples are considerably faster than the comparable samples from 2005, and are more consistent with and similar to those of 2004. This appears to be the case although several (four) of the samples were considerably slower than the limited number of samples in 2004. For the northbound samples in the morning peak period, the same general observation can be made – that the 2006 samples are consistently faster than the comparable samples from 2005 and are more in line and similar to those of 2004, although several (three) of them were slower than the limited number of samples in 2004. Again, these differences may be the result of some of the traffic signal retiming and traffic flow optimization measures that have been implemented in this corridor. These differences may also be the result of the intersection improvements that were underway at the MD 355 at Stringtown Rd intersection.

Figure 3.8: Southbound MD 355 Corridor Travel Time Trend Analysis

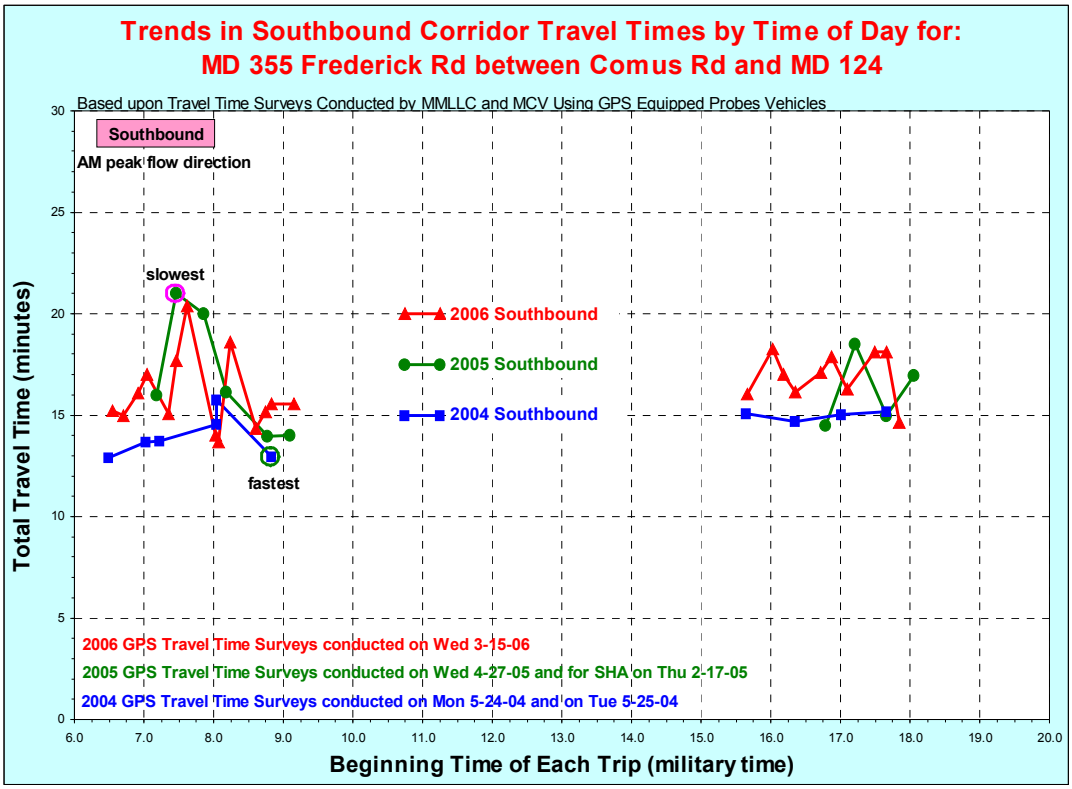
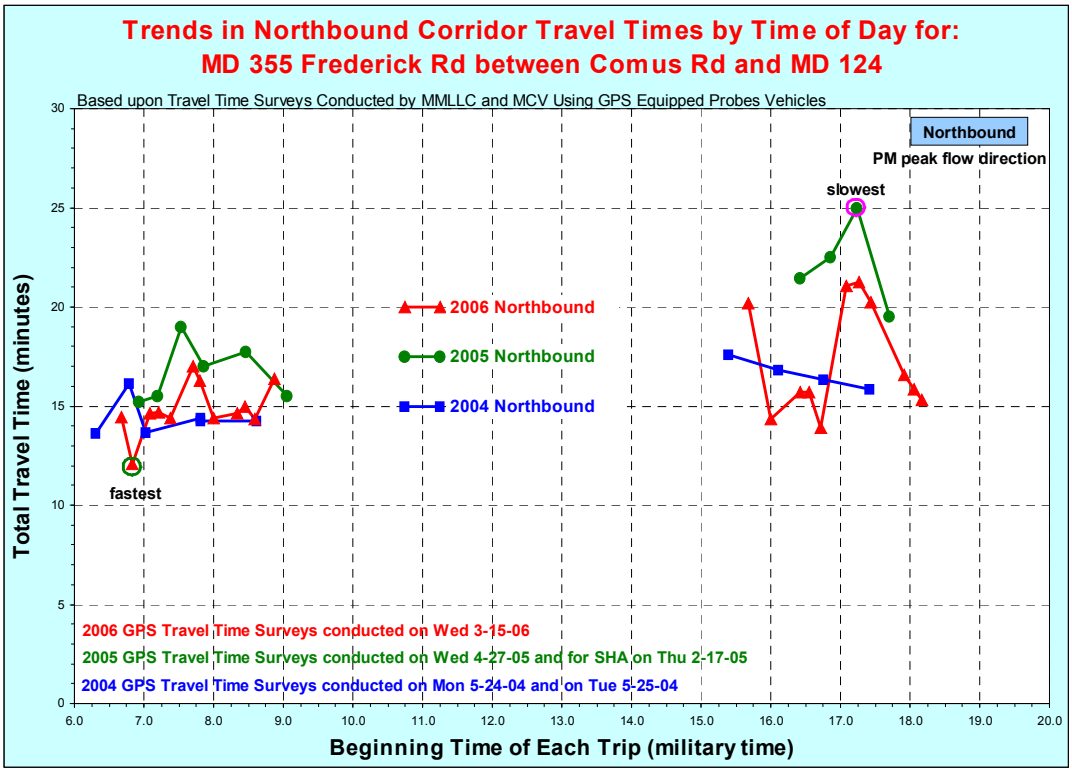


Figure 3.9: Northbound MD 355 Corridor Travel Time Trend Analysis



Norbeck Road (MD 28) / Spencerville Road (MD 198) – MD 28 / 198 Connector: In the 2005 report, the results of the data sampling for the MD 28 / MD 198 corridor showed the impacts associated with having a sparse transportation network resulting in: (a) limited route alternatives and excessive congestion, and (b) having travelers being severely inconvenienced when parts of the system break down due to incidents. Figure 3.10 summarizes the results for just the eastbound travel time data collected in 2005 and 2006. The results are displayed in a time-of-day graph for the combined routes of MD 28 and MD 198, which consists of several route segments traveling from west to east for: (a) First Street, (b) Norbeck Road, (c) MD28-198 Connector, and (d) Spencerville Road, between MD 355 in Rockville and Riding Stable Road (just before the Prince George's County Line). The combined length of the set of travel route segments is approximately 14.1 miles.

The graph showing the corridor travel times for the nine AM samples (for the 2005 data set) has somewhat of a "bell shaped" curve, even though the westbound flows are the peak flows in the AM. The data samples shown here have the benefit of including some very early morning pre-AM peak and late morning post-AM peak observations, which were obtained in support of another data collection project focusing on travel to and/or from the Baltimore area. These data samples indicated that the ambient, un-congested travel time was about 20 to 21 minutes for this 14.1-mile travel corridor, or an average speed of about 41 to 42 miles per hour. The observed peak travel time of about 40 minutes is about 2.0 times more than the ambient travel time. The well-defined peak for this data sample indicates the presence of excessive congestion. The duration of the peak-slower travel time of about 25 to 30 minutes lasted from about 7 to 9 AM.

Figure 3.10 also shows the evening corridor travel times observed in 2005 and 2006. In 2005, a series of significant incidents occurred during the day the sample was conducted, which resulted in very congested travel times of more than 50 minutes. In contrast, two samples conducted on different days in 2005 suggest that the peak eastbound travel times were considerably faster during conditions free of incidents. Two sets of samples were conducted in 2006: (a) directly for this report between Rockville Pike (MD 355) and New Hampshire Avenue MD (650), and (b) by the staff of MWCOG between New Hampshire Avenue (MD 650) into Prince George's County, as part of their annual Congestion Management Program activities. The MNCPPC samples were coordinated with the MWCOG samples to take place on the same day during the same general time period but for a lesser duration. There were 9 samples conducted for MNCPPC and 24 conducted by MWCOG. By selecting specific pairs of travel time samples, the combined travel times for the two data sets were combined, as if the probe vehicles continued driving onto the next segment. The combined 2006 eastbound PM data shows a peak-slowest travel time of over 37 minutes, and a fastest travel time of about 25 minutes. No significant incident conditions were observed during the time period in which this sample was conducted. Moreover, this combined data set is generally consistent with the two-non-incident samples from 2005.

Figure 3.10: Eastbound MD 28 / MD 198 Corridor Travel Time Trend Analysis

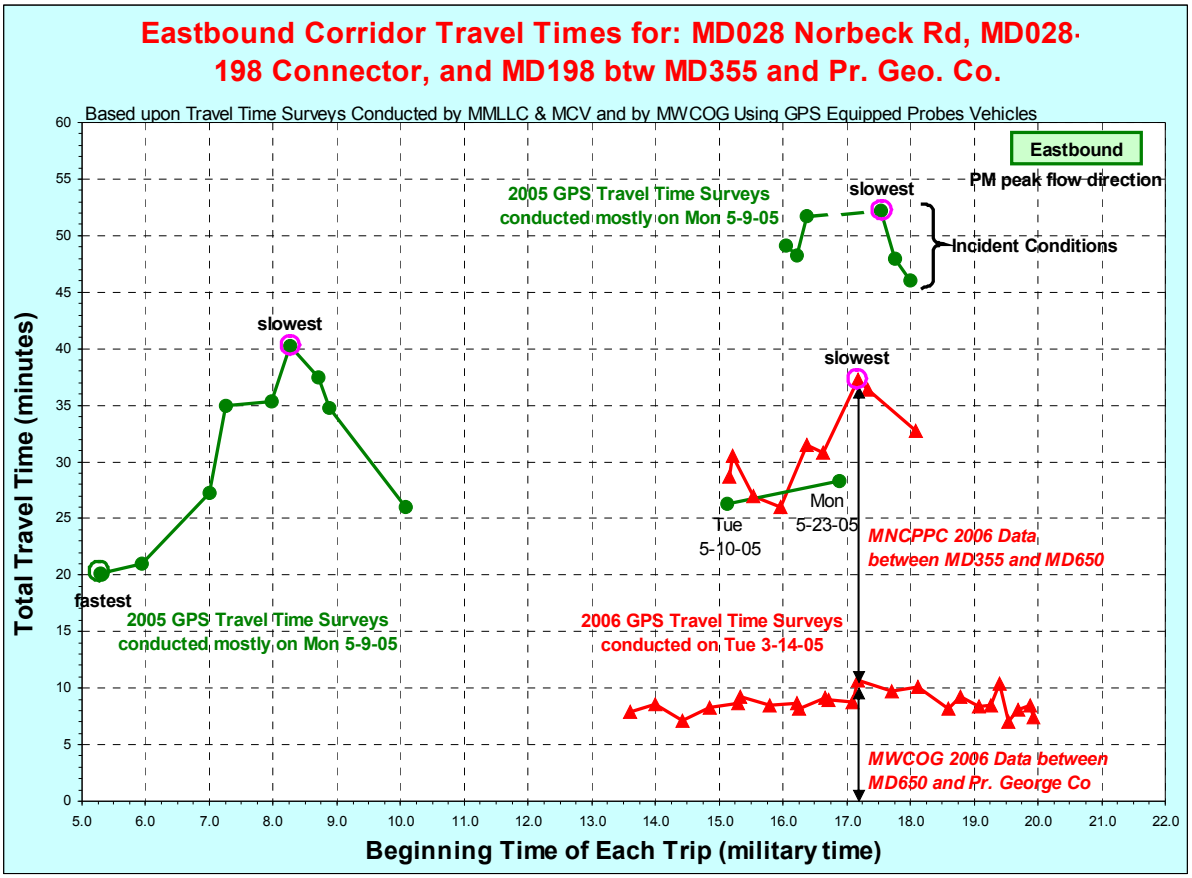
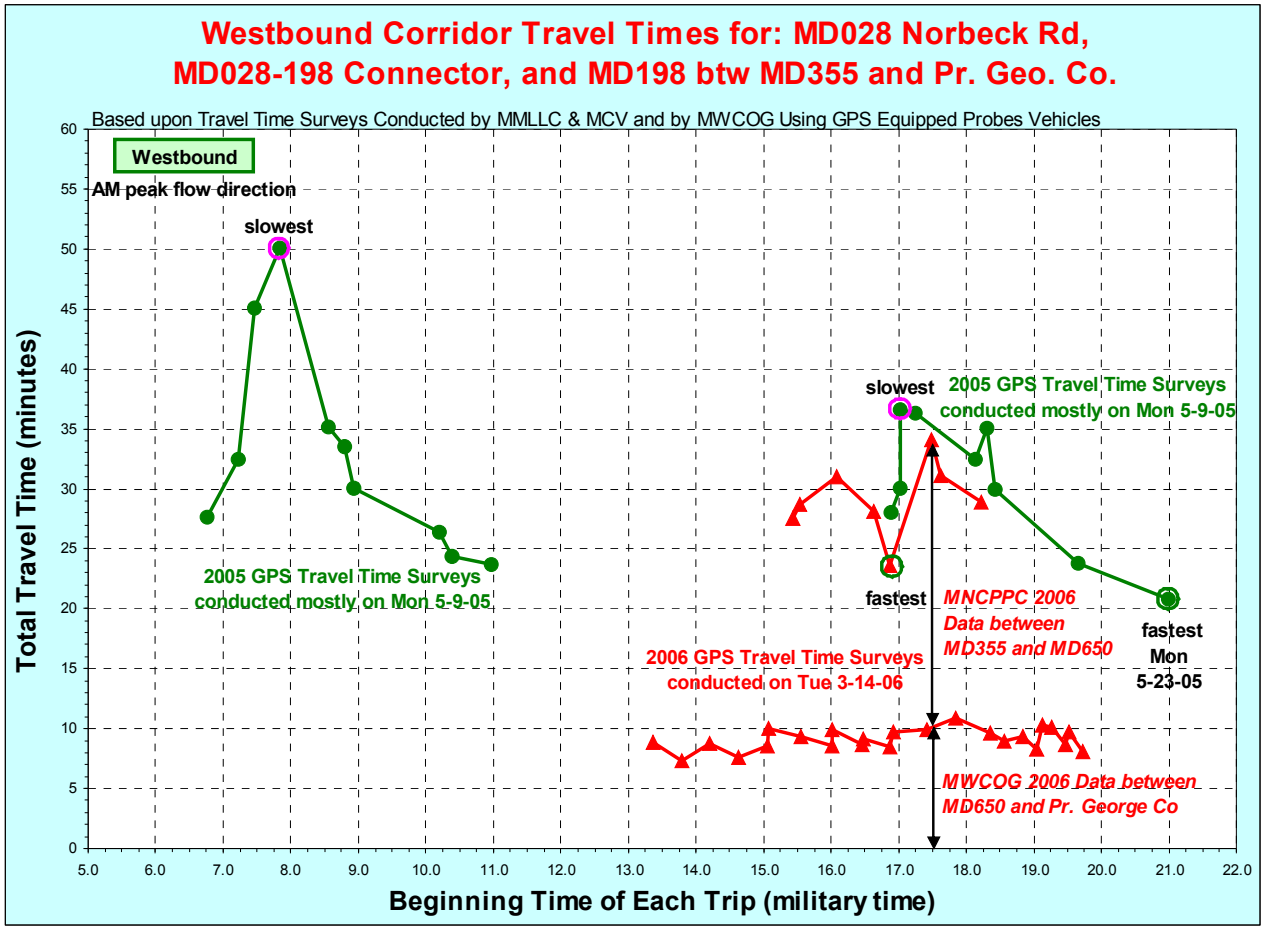


Figure 3.11 shows the results for just the westbound travel time data collected in 2005 and 2006, in a time-of-day graph for the combined routes of MD 28 / MD 198. The 2005 AM travel time data collection results revealed that the slowest westbound AM peak travel time was about 50 minutes. The ten AM westbound travel time samples show a very distinct, consistent, and peaked "bell shaped" curve for this peak flow direction travel and time period. The PM data showed that the ambient, un-congested travel time was 21 minutes for this 14.1-mile travel corridor, or an average speed of about 42 miles per hour. The observed peak travel time of about 50 minutes is about 2.5 times more than the un-congested westbound travel time in the late PM.

The 2006 westbound travel time data, also shown in Figure 3.11, for the PM time period is again the combination of: (a) primary data collected for MNCPPC between Rockville Pike (MD 355) and New Hampshire Avenue (MD 650), and (b) secondary data collected by staff of MWCOG between New Hampshire Avenue (MD 650) into Prince George's County. The samples were coordinated in the same fashion as the samples that were conducted for the eastbound travel runs. The combined 2006 westbound PM data shows a peak-slowest travel time of about 34 minutes and a fastest travel time of about 23 minutes. No significant incident conditions were observed during that this sampling period, although there was a stalled vehicle in the left approach lane to Muncaster Mill Road (MD 115) for about a half hour that was quickly moved into the left turning lane and towed away shortly afterwards.

Figure 3.11: Westbound MD 28 / MD 198 Corridor Travel Time Trend Analysis



The sample of combined westbound PM travel times consistently show about 10% faster travel times (roughly 3 minutes) when compared to similar data for 2005. In late 2005, the new grade-separate interchange at US 29 and Spencerville Rd / Sandy Spring Rd (MD 198) was completed, which resulted in the re-direction of the north and southbound through-traffic around the former intersection via an overpass. While this improvement should have resulted in improved conditions for traffic traveling along Spencerville Road (MD 198), it is not clear solely from this comparison of travel time and speed data trends that the observed differences are *different* in a statistical sense.