

MAY 2008



MONTGOMERY COUNTY, MARYLAND

HIGHWAY MOBILITY REPORT



MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

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I. EXECUTIVE SUMMARY

Staff Recommendations

Staff recommends that the Planning Board support two actions regarding the 2008 Highway Mobility Report:

- Transmit the 2008 Highway Mobility Report (HMR) to the County Council, to provide background information for the consideration of recommended modifications to the State's Consolidated Transportation Program (CTP) priorities, and
- Adopt the FY 2009 Policy Area Mobility Review (PAMR) mitigation requirements, effective July 1, 2008.

Staff has tentatively scheduled the review of recommended modifications to the State's CTP for June 12, 2008.

Key Findings

- About one in seven intersections in Montgomery County has congestion levels that are worse than their current Growth Policy standards.
- About two-thirds of the County's policy areas have overall arterial and transit mobility characteristics that require new development to mitigate some or all of their vehicle trips according to current Growth Policy requirements.
- Congestion trend lines from 2004 through 2012 show that in general, the provision of transportation facilities and services is just keeping pace with development, so that the level of congestion is remaining at undesirable levels in many areas of the County.
- Currently, congestion is generally most severe in down-county areas. Areas requiring the greatest levels of developer participation under the FY 2009 Policy Area Mobility Review (PAMR), however, are in the northern half of the I-270 corridor from Rockville to Clarksburg, due to this area's:
 - More stringent arterial mobility standards,
 - Sizeable pipeline growth (about two-thirds of the County's total pipeline jobs and housing units), and
 - Relatively low proportion of master planned transportation system improvements ready for implementation in the next four years.
- For FY 2009, staff finds that four policy areas: Germantown East, Gaithersburg City, Montgomery Village/Airpark and North Potomac, require full mitigation and eleven policy areas require partial mitigation.

- The following corridors continue to experience the most significant levels of congestion and should be targeted for congestion-relief:
 - Rockville Pike/Frederick Rd (MD 355)
 - From the Bethesda CBD to West Cedar La
 - From Chestnut St/Walker Ave to Montgomery Village Ave (MD 124)
 - From Middlebrook Rd to Brink Rd
 - Georgia Ave (MD 97)
 - From the Silver Spring CBD to the Capital Beltway (I-495)
 - From Veirs Mill Rd (MD 586) to Randolph Rd
 - Connecticut Ave (MD 185) to Olney-Sandy Spring Rd (MD 108)
 - Norbeck Rd/First St (MD 28)
 - From Veirs Mill Rd (MD 586) to Georgia Ave (MD 97)
 - Columbia Pike (US 29)
 - Stewart La/Milestone Dr to Fairland Rd
 - Connecticut Ave (MD 185)
 - From Western Ave (D.C. Line) to the Capital Beltway (I-495)

- Continued investment in a wide range of State and County transportation infrastructure improvements, as well as development-related improvements, is needed to help reduce congestion in nearly all areas of the County:
 - Improvements at two of the “ten most congested intersections” listed in the 2006 Highway Mobility Report have reduced congestion levels by more than 15%,
 - Two of the intersections in this year’s “ten most congested intersections” list are candidates for improvements as part of the National Naval Medical Center BRAC mitigation program, and
 - Two of the intersections in this year’s “ten most congested intersections” list located along MD 28 are forecasted to experience traffic reduction upon completion of the Intercounty Connector.

Highlights

The Highway Mobility Report (HMR) was not assembled in 2007, as it was superseded by the Annual Growth Policy (AGP) reform work that was performed for the greater part of the year. As a result, there have been a few notable changes in the observed locations of both existing and future congestion when compared to those seen in the 2006 HMR.

This report contains updated Critical Lane Volume (CLV) data for a number of intersections that were identified as congested in the previous report. The updated CLV data for a number of these intersections was found to be consistent with the data presented in previous reports. This data helps to further validate the long-standing issues with congestion experienced at various locations. This report also contains an expanded set of GPS-based arterial travel time/speed samples for a number of major highways and arterials in the County. Expanded coverage in 2007 better enabled staff to identify a number of congested corridors, as well as the relationship between the traffic flow conditions and CLVs at various intersections along these corridors.

Despite the fact that a number of the locations discussed in this report have been chronically congested over the past four years, ongoing infrastructure improvements (i.e. intersection improvements, grade-separations, and road widenings) continue to help reduce congestion levels along various corridors in the County. In addition, there are a number of planned infrastructure improvements associated with the some of the congested locations identified in this report. The identification of solutions for these chronically congested corridors must be multimodal, including potential Bus Rapid Transit (BRT) treatments.

Staff found that 14% of the signalized intersections sampled for this report had CLVs that exceeded their Local Area Transportation Review (LATR) standard. It should be noted that the status of only two of these intersections were changed by the new Local Area Transportation Review (LATR) standards that were approved as part of the FY 2007-2009 Growth Policy. Of the intersections that were found to be congested this year, 41% of these intersections were also found to be congested in the both the 2005 and 2006 reports. These findings indicate a pattern of recurring congestion at these locations. Therefore, staff feels that these locations should be targeted for congestion relief via State and County capital improvements, as well as developer-funded improvements as warranted. A number of these intersections are located along some of the County's major north-south corridors, and have chronically experienced severe levels of congestions. In addition, some of these intersections are located in areas that have experienced significant levels of growth and development over the past few years.

The GPS-based travel time and speed data samples acquired during the spring of 2007 provide a broad spatial coverage of traffic conditions on most of the State highways located in the County. The samples were collected during the PM peak period (4-7 PM) and during the evening off-peak. Samples were not collected during the AM peak period as was done in prior years. The evening off-peak samples were collected in order to observe the more free-flowing travel times and speeds for analysis requirements related

to last year's Growth Policy reform initiative. Analysis of these samples helps to further document the long-standing issues with reduced mobility along various roadway sections. Sampled sections of Wisconsin Ave/Rockville Pike/Frederick Rd (MD 355), Georgia Ave (MD 97), Norbeck Rd (MD 28), Spencerville Rd/Sandy Spring Rd (MD 198) Columbia Pike/Colesville Rd (US 29), and Connecticut Ave (MD 185) yielded results that show long travel time durations, slow average speeds, and significant amounts of delay along lengths of these roadways. Additionally, a significant number of samples yielded a consistent pattern of congested conditions located along major roads, which traverse various policy area boundaries. These roadways essentially function as constricted gateways, carrying high traffic volumes to and from adjacent policy areas. The samples also yielded results that indicated significant delays at some major intersections (i.e. Georgia Ave/Norbeck Rd). These findings help to reinforce the need for additional capacity in the vicinity of the some policy area boundaries, as well as at some spot locations and/or major intersections.

The results of the travel demand model run conducted for this report conclude that under the anticipated transportation network for the year 2012, both vehicle-miles traveled (VMT) and vehicle-hours travel (VHT) are forecasted to increase by 11.8% and 15.9%, respectively by the horizon year (2012) relative to the year 2005 model run results. The model results further indicate that the larger increases in VMT and VHT will occur on the freeway facilities. However, the non-freeway facilities are forecasted to have a higher percentage of congested lane-miles. Despite these increases in VMT and VHT, the countywide average volume-to-capacity (V/C) ratio is anticipated to increase by only 3.9% to 0.79 during the PM peak period. These results provide some indication that the planned network capacity for the year 2012 is anticipated to generally keep pace with future traffic growth resulting from planned development throughout the County and surrounding areas. The infrastructure expected to be in place by 2012, however, will not result in acceptable levels of transportation, as indicated by the fact that most of the County's policy areas will still require private-sector mitigation under the FY 2009 Policy Area Mobility Review standards.

Changes to the Report

This report also includes an update on the Policy Area Mobility Review (PAMR) analysis results, which were developed as part of the 2007 Annual Growth Policy (AGP) reform. The PAMR analysis requires the use of a future-year travel demand model to assess the levels of relative mobility on arterial roadways compared to transit mobility, which taken together represents the measure of performance used in this analysis. The year 2012 model run contained in this report serves as a follow-up to the 2011 model run that was conducted for the PAMR analysis in 2007, that resulted in the finding of two policy areas (Germantown East, and Gaithersburg City) to be "adequate with full trip mitigation required" from a relative mobility standpoint. The PAMR analysis update contained in this report further investigates these findings.

II. BACKGROUND

Purpose

The purpose of this report is to provide an annual update on the status of congestion in Montgomery County. This report serves as a follow-up to the 2006 Highway Mobility Report (HMR). This report contains information on historical, current, and future traffic congestion trends and patterns, which is to be used by the Planning Board and County Council to comment on this year's State Consolidated Transportation Program (CTP) project priorities. In addition, this report includes an update on the Policy Area Mobility Review (PAMR) analysis results, which were developed as part of the 2007 Annual Growth Policy (AGP) reform.

Performance Measurements

This report describes the status of congestion on the County's major highway and arterials. For this reason, two key performance measurements were used to report on current congestion:

- (1) Critical Lane Volumes (CLVs), and
- (2) GPS-based Arterial Travel Times and Speeds

Observed Critical Lane Volumes (CLVs): The Department's Intersection Analysis Database contains the essential data needed to calculate and identify levels of congestion at signalized intersections throughout the County. This measure of congestion 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. Furthermore, 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 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: In the spring of 2007, 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, but in smaller, less extensive sets of samples. 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. More specifically, this data is used to represent the degree of mobility observed along various roadway sections, also referred to as "arterial mobility". Moreover, 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. However, to economize on the sampling requirements, the latter half of the data collection only sampled during the PM peak period. That decision was made with the expectation of using calculated travel times, associated with the posted speed limits along a roadway, to represent the values of uncongested travel time.

This report also describes the levels of future congestion anticipated on the County's transportation network for the year 2012. This particular measure of congestion relies on the results of the Department's TRAVEL/3 model. The two performance measurements yielded from this year's model run are:

- (1) Year 2012 Volume-to-Capacity (V/C) Ratios, and
- (2) Policy Area Mobility Review adequacy, based on Relative Transit Mobility and Relative Arterial Mobility forecasts as defined in the Growth Policy.

Year 2012 Forecasted V/C Ratios and Relative Mobility: For the purpose of this report, the Department's TRAVEL/3 model was utilized to generate a traffic forecast for the year 2012. This model run required the use of land use/development assumptions for the County, which reflects the existing base plus pipeline of approved development as of January 1, 2008. In addition, the model utilized regional land use estimates (outside of the County) for the year 2012, which are based on MWCOG's Round 7.1 cooperative land use forecast. The model also required the use of an anticipated transportation network for the year 2012, consisting of all projects that are considered to either: (a) fully-funded within the first four years of the current County Capital Improvement Program (CIP) and the State Consolidated Transportation Program (CTP), or (b) required by private sector development in the pipeline of approved development. The results of this model run were compared to the year 2005 model run results for analysis purposes.

The performance measurements used in this report to describe the current-day congestion levels in the County do not assign an adequacy determination to the freeway facilities. The majority of the County's freeway system continues to undergo long-range project planning at the Maryland Department of Transportation (MDOT). The Intercountry Connector (ICC), which recently began construction, is anticipated to be completed by the year 2012. The I-270 / US 15 Multi-Modal Study and the Capital Beltway (I-495) Western Mobility Study are the two major initiatives aimed at reducing congestion and improving mobility on the freeway network. In addition, the I-270 corridor was recently selected as a "pioneer site" under the U.S. Department of Transportation's (USDOT) current Integrated Corridor Management (ICM) Systems initiative, as it has been identified as one of the nation's busiest urban corridors. Under this five-year initiative, the Maryland Department of Transportation (MDOT), the Washington Metropolitan Area Transit Authority (WMATA), and the County Department of Public Works and Transportation (DPWT) will be developing strategies to help manage congestion for this corridor. More detailed information on this initiative can be found at:

<http://www.its.dot.gov/icms>

Data Sources and Reliability Issues

The data stored in the Department's intersection analysis database provides the framework for the discussion on Critical Lane Volumes (CLVs) at signalized intersections, as a measure of performance. A majority of the CLV data stored in the database was derived either from turning movement count data acquired from SHA, or data collected by consultants for traffic study purposes as required by the Department's LATR guidelines. SHA collects intersection turning movement counts in 13-hour (6:00 am - 7:00pm) intervals, while the Department requires consultants to submit 6-hour (6:30 am – 9:30 am, 4:00 pm – 7:00pm) turning movement counts for LATR purposes. It is also worth noting that the Department periodically receives and utilizes turning movement count data collected and provided by DPWT, which are conducted as part of the County's Transportation Demand Management (TDM) program. These counts tend to vary in duration from 4-hours (7:00 am – 9:00 am, 4:00 pm – 6:00 pm) to 6-hours (7:00 am – 9:00 am, 11:00 am – 1:00 pm, 4:00 pm – 6:00 pm).

The GPS-based travel time and speed survey data discussed in this report was collected during the spring of 2007, in support of the development of the Policy Area Mobility Review (PAMR) analysis. 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). In addition, a small set of roadways were sampled during the off-peak (7-9 pm) in order to obtain the uncongested travel times and speeds along those corridors for comparison purposes. 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.

In late 2006, the Department transitioned from the former TRAVEL/2 model to the new TRAVEL/3 model, which employs the Metropolitan Washington Council of Governments (MWCOG) modeling process. The TRAVEL/3 model was first used as an application in support of the MD 355/I-270 Corridor Study, which was conducted during the latter part of 2006. The TRAVEL/3 model was also applied in the establishment of the Policy Area Mobility Review test developed during 2007. The model is used to conduct both long and short-range travel forecasts. Similar to the TRAVEL/2, the model utilizes forecasted land use data as a key input to estimate future traffic to be generated on the County's transportation system

Future Data Sources

In early 2006, the Department began coordinating with the University of Maryland - Center for Advanced Transportation Technology Laboratory (UMD-CATT Lab) on the transfer of the Department's former DASH (Data Acquisition Software and Hardware) system traffic data for archiving and analysis purposes. The University's archiving efforts eventually evolved to become to the Regional Integrated Transportation

Information System (RITIS) program. The RITIS program aims to improve transportation efficiency, safety, and security through the integration of existing transit and transportation system management data for the Washington D.C. metropolitan area. As a stakeholder in the project consortium, the Department will have access to various types of transportation data to be used for planning purposes as the data becomes available. Staff will continue to coordinate with UMD as the program develops for future data acquisition purposes.

III. CURRENT CONGESTION

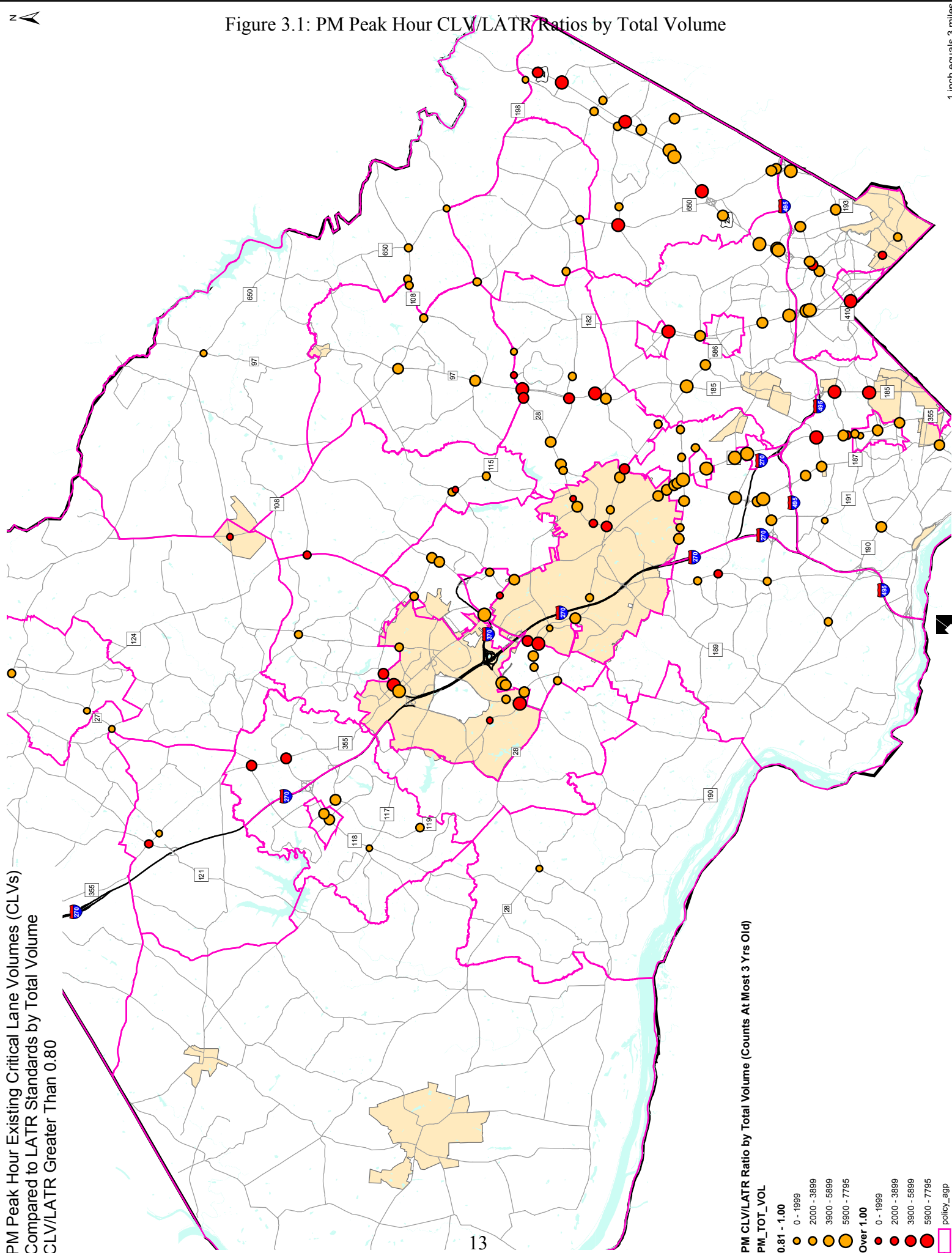
Critical Lane Volumes (CLVs) at Signalized Intersections

The Department's intersection database currently contains turning movement count samples for 564 of the 772 (existing and planned), signalized intersections in the County, with samples that date back to March 1, 2001. For the purpose of this report, counts dating as far back as three years were analyzed for purposes of discussing current-day congestion. The Department has deemed this an acceptable standard practice, as the percent change in CLVs seen at most intersections tends to be fairly minimal within a three-year period. In addition, the Department routinely utilizes CLV data dating back the same length of time to conduct intersection trend analyses for LATR purposes. Staff elected to remove data prior to January 1, 2005 from the sampling for this year's report. A total of 422 intersections were included in this report (see Appendix 5.1A for the complete list of samples in the database). Although this year's sample size is smaller than that used in the previous report, it should be noted that this sample set contains updated count data for a number of intersections that had CLVs which exceeded their respective LATR standard in the 2006 report. Staff acknowledges that some count samples, which are dated prior to 2005, may hold some degree of relevancy to the current-day traffic conditions. However, it is preferred that more up-to-date samples for these locations be obtained prior to re-reporting on them. It should be noted however that a small set of count data samples, which predate 2005, were used to perform a CLV trend analysis for some intersections.

The findings in this year's study indicate that approximately 14% of the 422 intersections sampled had CLVs that exceeded their LATR standard, or a CLV/LATR ratio of greater than 1.00. Staff estimates that most of the signalized intersections for which data is currently unavailable represent minor intersections operating within their congestion standards. Therefore, the intersections with congestion levels worse than their LATR standards probably represent about 10% of the total number of signalized intersections. In addition, staff found that 28% of the intersections sampled had a CLV/LATR ratio between 0.80 and 1.00, which is indicative of noticeable delay, but not severely congested conditions.

Figure 3.1 provides a graphic display of the PM peak hour CLV/LATR ratios for approximately 160 intersections in the County. Locations with a CLV/LATR ratio of greater than 1.00 are shown as a red dot and locations with a V/C ratio between 0.80 and 1.00 are shown as an orange dot. The size of the dot is proportional to the total number of vehicles traveling through the intersection. The distribution of the highest-volume (large dots) congested intersections tends to be along several heavily traveled State highways, notably Rockville Pike (MD 355), Georgia Avenue (MD 97), and Columbia Pike (US 29). See Figure 3.2 for the complete categorization of CLV/LATR ratios for all of the intersections sampled.

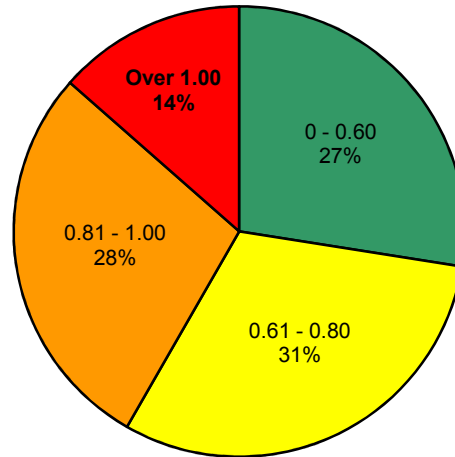
Figure 3.1: PM Peak Hour CLV/LATR Ratios by Total Volume



PM Peak Hour Existing Critical Lane Volumes (CLVs) Compared to LATR Standards by Total Volume CLV/LATR Greater Than 0.80

Figure 3.2: CLV/LATR Ratio Categorization

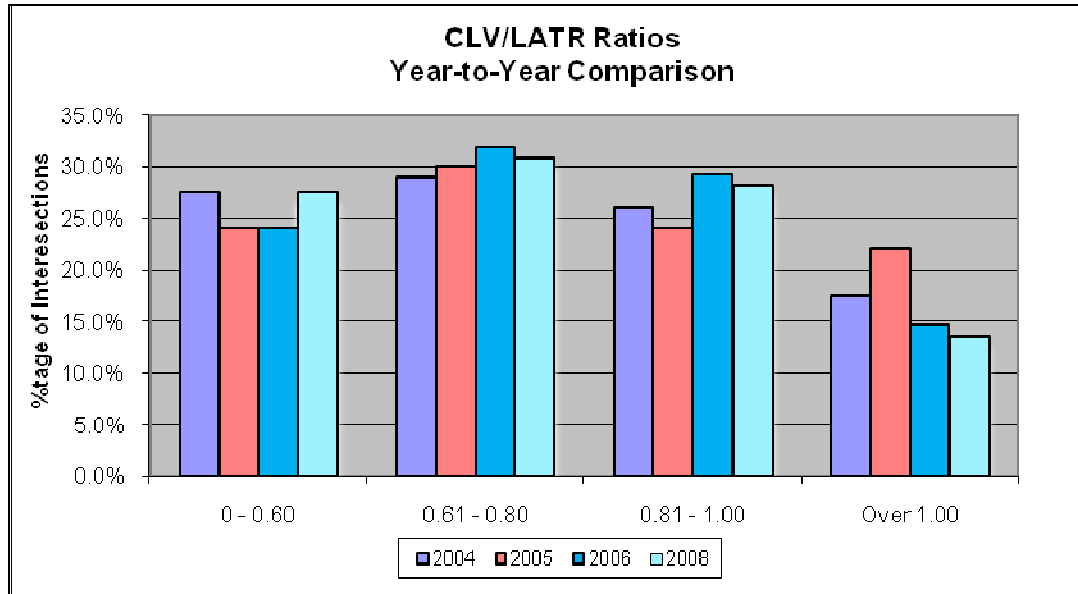
Higher of the AM and PM Peak Hour CLV/LATR Standard Ratio
(sample size = 422)



In general, this categorization mirrors the percentages that were presented in the 2006 HMR. Moreover, 42% of the intersections with a CLV/LATR ratio greater than 1.00 also had CLVs that exceeded their LATR standard in both the 2005 and 2006 reports. This finding indicates that a significant number of the County’s intersections are chronically congested, as majority of these intersections are located along the major State roads (i.e. MD 355), which carry the bulk of the County’s traffic. In 2006 and 2007, the County witnessed the completion of approximately 6,000 new dwelling units and 4 million square feet of new commercial space. In general, transportation system infrastructure improvements are keeping pace with the growth in new jobs and housing units. Two elements of the 2007-2009 Growth Policy: (1) the establishment of Policy Areas that are deemed “acceptable with partial mitigation”, and (2) the requirement to improve failing intersections to somewhat better than background levels, are designed to improve conditions rather than maintain the status quo.

Staff acknowledges that the variability in traffic conditions at some locations over the past three years has slightly influenced the reduction in the number of intersections with CLVs exceeding their standard. Figure 3.3 shows the year-to-year comparison of CLV/LATR ratios for all of the intersections sampled during each reporting year. It should also be noted that 20 of the 81 intersections in the database that have CLVs that exceed their LATR standard, were sampled prior to 2005. While a cursory examination of the proportion of over-capacity intersections in Figure 3.3 might suggest that conditions have improved from 2006 to 2008, staff concludes that the slight improvement is not significant, considering the variability in daily traffic flows. Therefore, staff proposes to acquire more recent count data as budgets permit for these locations prior to re-reporting on their status. Furthermore, the acquisition of the additional fiscal resources will enable staff to audit more intersections on an annual basis for reporting purposes.

Figure 3.3: Year-to-Year Comparison of CLV/LATR ratios



The 2007-2009 Growth Policy was adopted by the County Council on November 13, 2007. As a result, the Local Area Transportation Review (LATR) standards for 16 of the County’s 34 policy areas were modified. Table 3.1 shows the revised LATR congestion standards for all 34 policy areas of the County. Nine of the County’s policy areas are designated as either Central Business Districts (CBDs) or Metro Station Policy Areas (MSPAs). County policy aims to concentrate the higher levels of growth and development in these areas primarily because they have the transportation infrastructure to accommodate higher levels of congestion, as well as an abundance of transit alternatives.

Table 3.1: 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

Table 3.2 lists the 10 most congested intersections in the County. It should be noted that four of this year’s 10 most congested intersections appeared on the same list in the 2006 HMR. 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 3.4 for a detailed map of these locations.

Table 3.2: 10 Most Congested Intersections

RANKING			INTERSECTION NAME	COUNT DATE	CLV	LATR STANDARD	POLICY AREA
2008	2006	2005					
1	3	11	<i>Great Seneca Hwy at Muddy Branch Rd</i>	3/5/2008	2179	1450	Gaithersburg City
2	*	*	<i>Georgia Ave at Randolph Rd</i>	2/23/2006	2069	1800	Glenmont
3	8	10	Frederick Rd (MD 355) at King Farm Blvd	3/6/2008	2021	1800	Shady Grove
4	7	8	<i>Connecticut Ave at Jones Bridge Rd</i>	6/6/2007	2017	1600	Bethesda/Chevy Chase
5	2	3	<i>Rockville Pike at W Cedar La</i>	5/9/2006	1996	1600	Bethesda/Chevy Chase
6	*	9	Shady Grove Rd at Midcounty Hwy	3/5/2008	1894	1475	Derwood
7	*	46	Norbeck Rd at Bel Pre Rd	5/31/2006	1834	1475	Aspen Hill
8	14	28	<i>Connecticut Ave at East West Hwy</i>	3/29/2006	1831	1600	Bethesda/Chevy Chase
9	16	*	Norbeck Rd (MD 28) at Avery Rd	10/12/2005	1815	1500	Rockville City
10	*	20	Randolph Rd at New Hampshire Ave	3/14/2006	1794	1475	Fairland/White Oak

*Unranked either because data was unavailable or CLV did not exceed standard
 Entries in *italics* indicates special notes for this particular location

Notes for Table 3.2 (by rank)

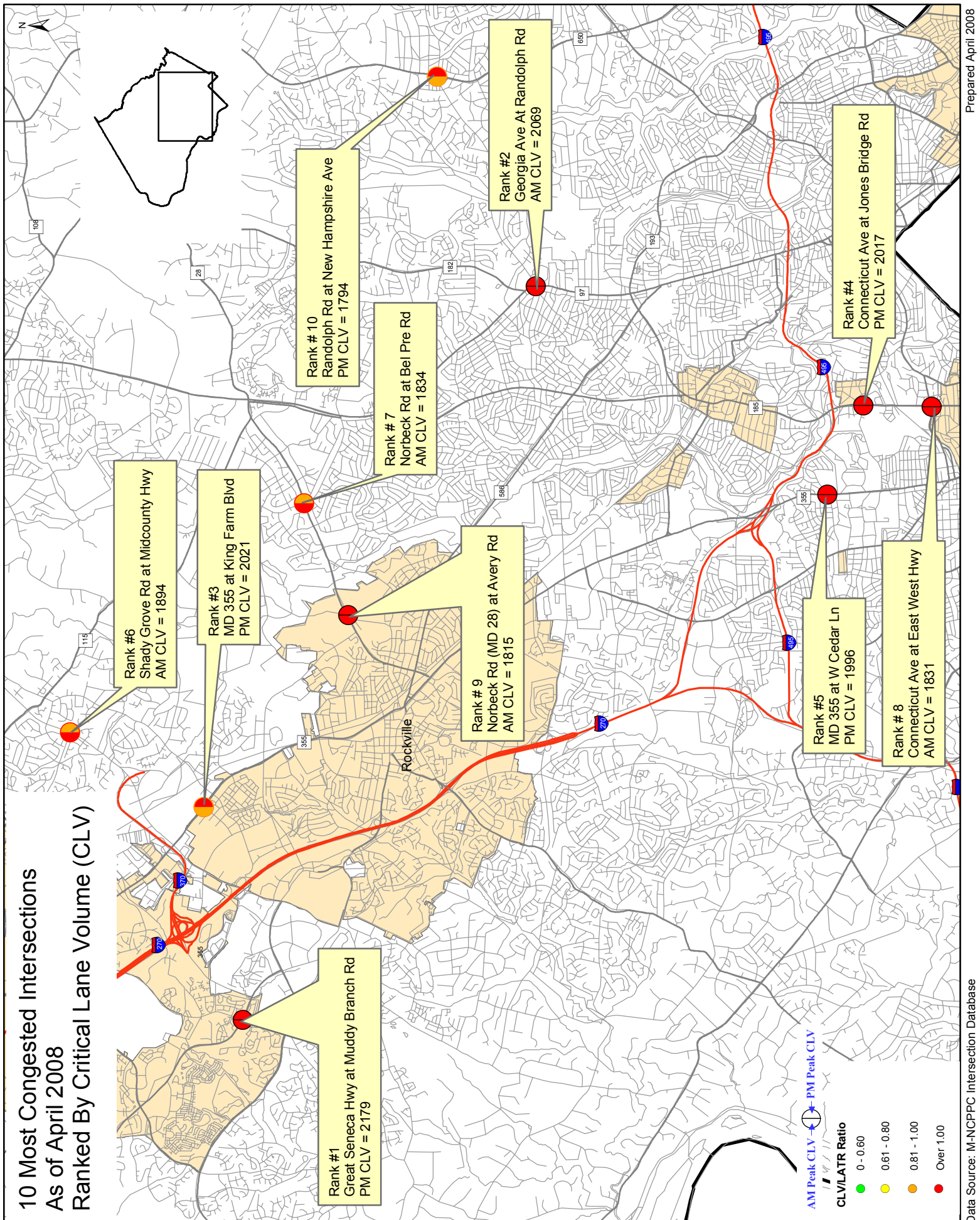
- Intersection #1: Capacity improvements completed on Great Seneca Hwy in ‘06
- Intersection #2: Grade-separated interchange has been funded for construction
- Intersection #4: Currently under study for BRAC project purposes
- Intersection #5: Grade-separated interchange recommended in master plan; currently under study for BRAC project purposes
- Intersection #8: Intersection capacity improvement completed in ’05

This year, five intersections debuted on the 10 most congested intersections list, while another intersection returned to the list after being excluded from the sampling that was reported in 2006.

- **Georgia Ave (MD 97) at Randolph Rd** moved into this year’s list at #2. Archived data for this intersection indicates that the CLV at this intersection steadily increased from 2003 to 2006. In 2003, this intersection had CLV of 1654, while in 2005 the intersection had a CLV of 1762. The CLV at this intersection increased 17.4% between 2005 and 2006; as a result of increased traffic volumes, in the both AM and PM peak directions, along Georgia Ave (MD 97) as well as Randolph Rd. The level of congestion at this intersection is also reflected in observed travel times as described in the next section of this report.

- **Shady Grove Rd at Midcounty Hwy** appears on this year's list at #7 after being excluded from the sampling in 2006. However, this intersection was ranked as the 9th most congested intersection in the County in the 2005 AGP Chapter on Highway Mobility. When comparing the count sample for this intersection to an archived count sample taken in 2001, a significant decrease in the through-volumes along Shady Grove Rd was observed. This is reflected in the CLV as it decreased 3% within a six-year period. This finding may be indicative of reduced mobility at this intersection during the AM and PM peak periods, and/or a change in commuting patterns (route choice).
- **Norbeck Rd (MD 28)/Bel Pre Rd** and **Norbeck Rd (MD 28)/Avery Rd** both appear on the list for the first time at #8 and #10, respectively. The Norbeck Rd (MD 28)/Avery Rd intersection has not previously been counted for regulatory or monitoring purposes, therefore no historical data is available for this location. However, it should be noted that Norbeck Rd serves as one of the County's major east-west corridors, and therefore the weekday peak period volumes on this roadway are relatively high. The Norbeck Rd (MD 28)/Bel Pre Rd intersection was not identified as a congested location in the 2006 HMR, however it was identified as such in the 2005 AGP Chapter on Highway Mobility.
- **Connecticut Ave (MD 185) at East-West Hwy (MD 410)** has a long history of experiencing severely congested conditions during the AM and PM peak periods. This intersection appears on the list at #9 after being ranked #14 and #28 respectively, in the two previous reports. This intersection must accommodate a significant amount of traffic from all approaches on a daily basis, as it consists of the intersection of two major State roads. Despite the fact that a minor capacity improvement was completed at this intersection prior to the most recent count sample being taken (2006), the CLV (1831) has not decreased from where it was in 2004 (previous count sample). This may be attributed to the observed increase in the northbound throughput volumes at this intersection between 2004 and 2006.
- **New Hampshire Ave (MD 650) at Randolph Rd** debuts on the list at #10 after being excluded from the sampling in 2006. This intersection was ranked #20 in the 2005 AGP Chapter on Highway Mobility with a CLV of 1882. When comparing the most recent count sample to the previous count sample (2002), staff observed slight decreases in the number of vehicles traveling the peak direction along New Hampshire Ave during the peak periods. However, it should be noted that this intersection is located along one of the County's major east-west corridors, as indicated by the relatively high daily peak period volumes reported for Randolph Rd. This intersection will be monitored for future reporting purposes.

Figure 3.4: Map of the 10 Most Congested Intersections



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 14 of the 49 intersections listed in these tables either have master plan recommended improvements, or ongoing/recently completed improvements associated with them, which may 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.

Table 3.3: Congested Intersections (11-30)

RANKING			INTERSECTION NAME	COUNT DATE	CLV	LATR STANDARD	POLICY AREA
2008	2006	2005					
11	22	38	<i>Veirs Mill Rd at Twinbrook Pkwy</i>	9/8/2005	1783	1550	North Bethesda
12	15	29	<i>Veirs Mill Rd at First St</i>	11/15/2005	1783	1500	Rockville City
13	*	17	Montgomery Village Ave at Russell Ave	3/6/2008	1755	1450	Gaithersburg City
14	*	*	Great Seneca Hwy at Lakeland Blvd	10/3/2007	1754	1450	Gaithersburg City
15	21	48	Old Georgetown Rd at Tuckerman La	5/26/2005	1746	1550	North Bethesda
16	28	27	<i>Norbeck Rd at Bauer Dr</i>	10/20/2005	1710	1475	Aspen Hill
17	29	*	Piney Branch Rd at Philadelphia Ave	4/20/2005	1704	1600	Silver Spring/Takoma Park
18	12	16	<i>Georgia Ave at Norbeck Rd</i>	6/1/2006	1703	1475	Aspen Hill
19	*	85	Darnestown Rd at Muddy Branch Rd	10/23/2007	1697	1475	North Potomac
20	*	*	Norbeck Rd at Muncaster Mill Rd	6/1/2006	1684	1475	Aspen Hill
21	31	47	University Blvd at Piney Branch Rd	5/3/2005	1676	1600	Silver Spring/Takoma Park
22	17	30	Colesville Rd at University Blvd (S)	9/13/2006	1672	1600	Kensington/Wheaton
23	*	88	Frederick Rd at Darnestown-Germantown Rd	3/5/2008	1670	1450	Germantown East
24	34	*	Colesville Rd at Franklin Ave	4/13/2005	1670	1600	Silver Spring/Takoma Park
25	*	*	East-West Hwy at 16th St	12/6/2006	1669	1600	Silver Spring/Takoma Park
26	*	*	Key West Ave at Broschart/Diamondback	10/3/2007	1666	1450	R&D Village
27	*	*	Montrose Rd at Tower Oaks Blvd	11/14/2006	1663	1550	North Bethesda
28	25	*	Key West Ave at Shady Grove Rd	9/25/2007	1640	1500	Rockville City
29	57	77	<i>Columbia Pike at Fairland Rd</i>	9/6/2007	1636	1475	Fairland/White Oak
30	47	58	Woodfield Rd at Fieldcrest/Hadley Farms	3/10/2005	1635	1425	Montgomery Village/Airpark

*Unranked either because 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: Intersection capacity improvement currently in project planning

Intersection #12: Intersection capacity improvement currently in design

Intersection #16: Intersection improvement recommended in master plan

Intersection #18: Intersection improvement currently in project planning

Intersection #29: Grade-separated interchange currently in project planning

Table 3.4: Congested Intersections (31-59)

RANKING			INTERSECTION NAME	COUNT DATE	CLV	LATR STANDARD	POLICY AREA
2008	2006	2005					
31	44	42	Georgia Ave at Columbia Blvd/Seminary La	5/10/2005	1631	1600	Silver Spring/Takoma Park
32	11	41	Colesville Rd at Sligo Crk Pkwy/St Andre	3/6/2008	1624	1600	Silver Spring/Takoma Park
33	27	43	<i>Connecticut Ave at Veirs Mill Rd</i>	<i>6/6/2007</i>	<i>1607</i>	<i>1600</i>	<i>Kensington/Wheaton</i>
34	60	83	<i>Columbia Pike at Greencastle Rd</i>	<i>11/15/2006</i>	<i>1607</i>	<i>1475</i>	<i>Fairland/White Oak</i>
35	52	*	First St at Baltimore Rd	1/13/2005	1602	1500	Rockville City
36	5	6	Columbia Pike at Southwood Ave	3/5/2008	1601	1600	Kensington/Wheaton
37	*	*	Layhill Rd at Ednor Rd/Norwood Rd	10/17/2006	1577	1450	Olney
38	*	*	Muddy Branch Rd at Diamondback Dr	10/9/2007	1563	1450	Gaithersburg City
39	*	*	Norbeck Rd at Norbeck Blvd	5/31/2006	1562	1475	Aspen Hill
40	58	78	Frederick Rd at Montgomery Village Ave	5/5/2005	1560	1450	Gaithersburg City
41	*	*	Parklawn Dr at Boiling Brook Pkwy	9/12/2006	1554	1550	North Bethesda
42	50	*	Georgia Ave at Connecticut Ave	5/31/2006	1539	1475	Aspen Hill
43	*	*	<i>Columbia Pike at Blackburn Rd</i>	<i>12/6/2006</i>	<i>1532</i>	<i>1475</i>	<i>Fairland/White Oak</i>
44	*	*	Briggs Chaney Rd at Old Columbia Pk	11/14/2006	1531	1475	Fairland/White Oak
45	*	*	<i>Georgia Ave at Bel Pre Rd</i>	<i>6/1/2006</i>	<i>1530</i>	<i>1475</i>	<i>Aspen Hill</i>
46	*	18	<i>Columbia Pike at Milestone/Stewart</i>	<i>8/30/2007</i>	<i>1520</i>	<i>1475</i>	<i>Fairland/White Oak</i>
47	61	*	Shady Grove Rd at Epsilon/Tupelo	4/6/2005	1518	1475	Derwood
48	62	*	Muncaster Mill Rd at Needwood Rd	4/12/2005	1510	1350	Rock Creek
49	63	66	Midcounty Hwy at Washington Grove La	3/22/2005	1508	1475	Derwood
50	*	74	Seven Locks Rd at Tuckerman La	11/9/2006	1499	1450	Potomac
51	6	7	<i>Frederick Rd at Ridge Rd</i>	<i>3/29/2007</i>	<i>1496</i>	<i>1425</i>	<i>Germantown East</i>
52	66	36	<i>Georgia Ave at Old Baltimore Rd</i>	<i>3/8/2007</i>	<i>1487</i>	<i>1450</i>	<i>Olney</i>
53	37	93	Frederick Rd at Clarksburg Rd	5/10/2006	1482	1425	Clarksburg
54	*	*	Shady Grove Rd at Corporate Dr	11/30/2005	1467	1450	R&D Village
55	23	39	<i>Georgia Ave at Emory La</i>	<i>6/1/2006</i>	<i>1461</i>	<i>1450</i>	<i>Olney</i>
56	68	*	<i>Georgia Ave at New Hampshire Ave</i>	<i>2/14/2006</i>	<i>1457</i>	<i>1350</i>	<i>Patuxent</i>
57	49	60	Mont. Village Ave at Chris/Lost Knife	5/9/2006	1454	1425	Montgomery Village/Airpark
58	*	*	Ridge Rd at Lewis Dr/Locust Dr	5/16/2006	1437	1400	Damascus
59	*	*	Laytonsville Rd at Brink/Sundown	11/2/2006	1433	1350	Goshen

* Unranked either because 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 #33: Intersection capacity improvement completed in '06
- Intersection #34: Grade-separated interchange recommended in master plan
- Intersection #43: Grade-separated interchange recommended in master plan
- Intersection #45: Intersection capacity improvement recommended in master plan
- Intersection #46: Grade-separated interchange recommended in master plan
- Intersection #51: Intersection capacity improvement completed in '06: grade-separated interchange recommended in master plan
- Intersection #52: Intersection capacity improvement recommended in master plan

Intersection #55: Intersection capacity improvement recommended in master plan
 Intersection #56: Intersection capacity improvement recommended in master plan

The availability of archived count data enabled staff to conduct a CLV trend analysis for a selected group of intersections. This analysis illustrates the impact of infrastructure improvements on CLVs. Table 3.5 lists locations where CLVs decreased by 15% or more over a 4-year period. In 2006, the Georgia Ave (MD 97)/Forest Glen Rd and Frederick Rd (MD 355)/Ridge Rd (MD 27) intersections were ranked among the 10 most congested intersections in the County. However, intersection capacity improvements have helped to reduce the CLVs at these locations by 26% and 47%, respectively. An analysis of this nature helps to further justify the need for, and effectiveness of, various infrastructure improvements.

Table 3.5: Decrease in CLV of 15% or More between 2003 and 2007

INTERSECTION NAME	CLV	COUNT DATE	ARC CLV	ARC COUNT DATE	PCT CHG	COMMENTS
Great Seneca Hwy (MD 119) at Middlebrook Rd	930	3/28/2006	1274	5/13/2003	-27.0%	Intersection was improved prior to '06 count
Georgia Ave (MD 97) at Forest Glen Rd	1553	6/6/2007	2106	8/28/2003	-26.3%	Intersection capacity improvement was completed in '04
Frederick Rd (MD 355) at Ridge Rd (MD 27)/Father Hurley Blvd	1496	3/29/2007	1981	9/8/2004	-24.5%	Intersection capacity improvement was completed prior to '07 count
Georgia Ave (MD 97) at Olney-Laytonsville/Sandy Spring Rd (MD 108)	1337	3/15/2007	1722	12/14/2005	-22.4%	Intersection capacity improvement was completed prior to '07 count
Montrose Rd at Tildenwood La	1308	3/7/2007	1643	3/9/2005	-20.4%	Montrose Pkwy construction zones/altered traffic pattern may have affected counts
Crabbs Branch Way at Redland Rd	1682	6/6/2007	2064	4/19/2006	-18.5%	Intersection capacity improvement was completed prior to '07 count
New Hampshire Ave (MD 650) at Lockwood Dr	1353	3/23/2006	1644	11/17/2004	-17.7%	Intersection capacity improvement completed in '06

Archived data was also used to identify locations where CLVs may have increased as a result of changes in travel patterns and/or increases in intersection traffic volumes. 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, which will be monitored to determine the margin of effectiveness for future reference. Table 3.6 lists locations where CLVs have increased by at least 15% between 2003 and 2007. The results of this analysis help to illustrate the potential impacts of the opening of a new facility (i.e. roadway or grade-separated interchange) on traffic volumes, and ultimately CLVs at intersections located in the immediate vicinity. This actuality can be seen in the increases in CLV at the Briggs Chaney Rd/Old Columbia Pike and Fernwood Rd/Rock

Spring Dr intersections (23.8% and 30.8%, respectively) as a result of the opening of a new interchange in the area.

Table 3.6: Increase in CLV of 15% or More between 2003 and 2007

INTERSECTION NAME	CLV	COUNT DATE	ARC CLV	ARC COUNT DATE	PCT CHG	COMMENTS
Clopper Rd (MD 117) at Germantown Rd (MD 118)	1361	9/13/2006	899	11/18/2003	51.4%	Traffic generated by new/ongoing developments in Germantown West
Fernwood Rd at Rock Spring Dr / Marriott Drwy	820	3/9/2006	627	6/3/2004	30.8%	Traffic redistributed via new interchange at I-270/Fernwood Rd
East-West Hwy (MD 410) at Blair Mill Rd / Newell St	838	12/14/2005	646	5/29/2003	29.7%	Traffic generated by new/ongoing development in SS CBD
Georgia Ave (MD 97) at Veirs Mill Rd (MD 586) / Prichard Rd	1424	6/7/2007	1115	6/14/2005	27.7%	Traffic generated by new/ongoing development in Wheaton
Darnestown Rd (MD 28) at Quince Orchard Rd (MD 124)	1485	5/12/2005	1190	3/16/2004	24.8%	Down-stream traffic impact resulting from new/ongoing developments in Germantown West
Briggs Chaney Rd at Old Columbia Pike	1531	11/14/2006	1237	2/5/2004	23.8%	Traffic redistributed via new interchange at Columbia Pike (US 29) at Briggs Chaney Rd
Colesville Rd (US 29) at Fenton St	1038	9/19/2006	848	5/24/2005	22.4%	Traffic generated by new/ongoing development in SS CBD
East-West Hwy (MD 410) at 16th St (MD 390)	1669	12/6/2006	1366	6/8/2004	22.2%	Traffic generated by new/ongoing development in SS CBD
Veirs Mill Rd (MD 586) at University Blvd W (MD 193)	1239	4/26/2005	1036	6/5/2003	19.6%	Traffic generated by new/ongoing development in Wheaton
Old Georgetown Rd (MD 187) at Rock Spring Dr	1275	5/26/2006	1099	6/2/2004	16.0%	Rockledge Dr interchange opened in '04

CLV data is useful for identifying levels of congestion at signalized intersections. However, this data does not necessarily 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 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 May and June of 2007 in support of last year's Growth Policy work. 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.

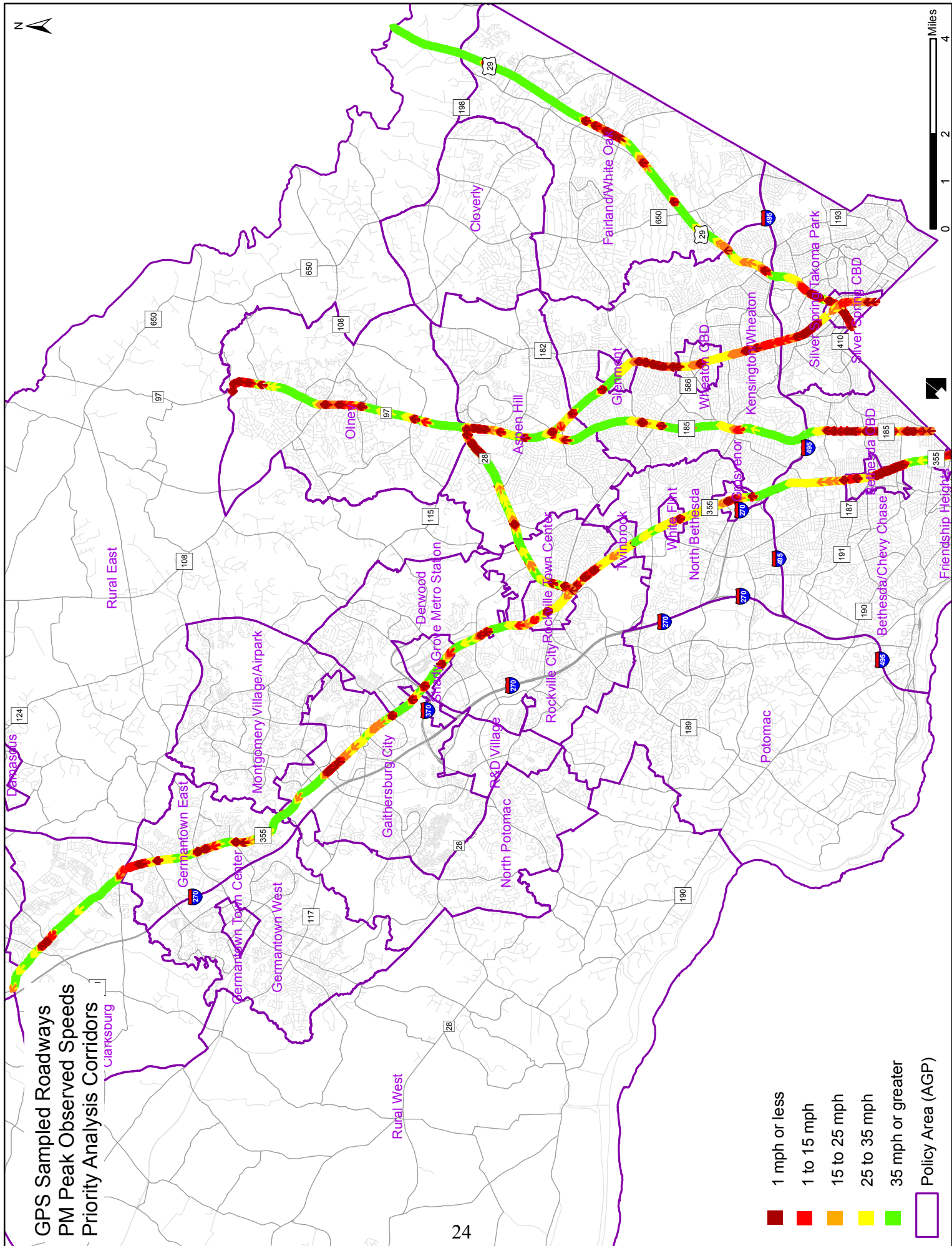
Arterial Travel Times and Speeds

Arterial Travel Times and Speeds of 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. This discussion first focuses on the results for the priority analysis corridors that exhibit well-defined patterns of congestion. A detailed discussion of the sampling approach and methodology used for the purposes of this report can be found in Appendix 5.2A. Additional summaries for the other key sampled roadways, in the form of travel time-distance profiles, can be found in Appendices 5.2B-5.2O.

The results for each corridor (beginning with Figure 3.6) are shown graphically in the form of a “travel time versus distance profile”. The colors of each point along each line indicate the speed range of the probe at that point. Thus each line of the profile depicts the variation in speed along the trajectory. 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 that are dark reddish brown in color. The PM peak survey results (in the peak direction) are shown in Figure 3.5 and discussed in the following paragraphs for the five corridors with notable levels of congestion and delay:

- (1) Wisconsin Ave/Frederick Rd (MD 355)
- (2) Georgia Ave (MD 97)
- (3) Norbeck Rd (MD 28)
- (4) Colesville Rd/Columbia Pike (MD 384/US 29)
- (5) Connecticut Ave (MD 185)

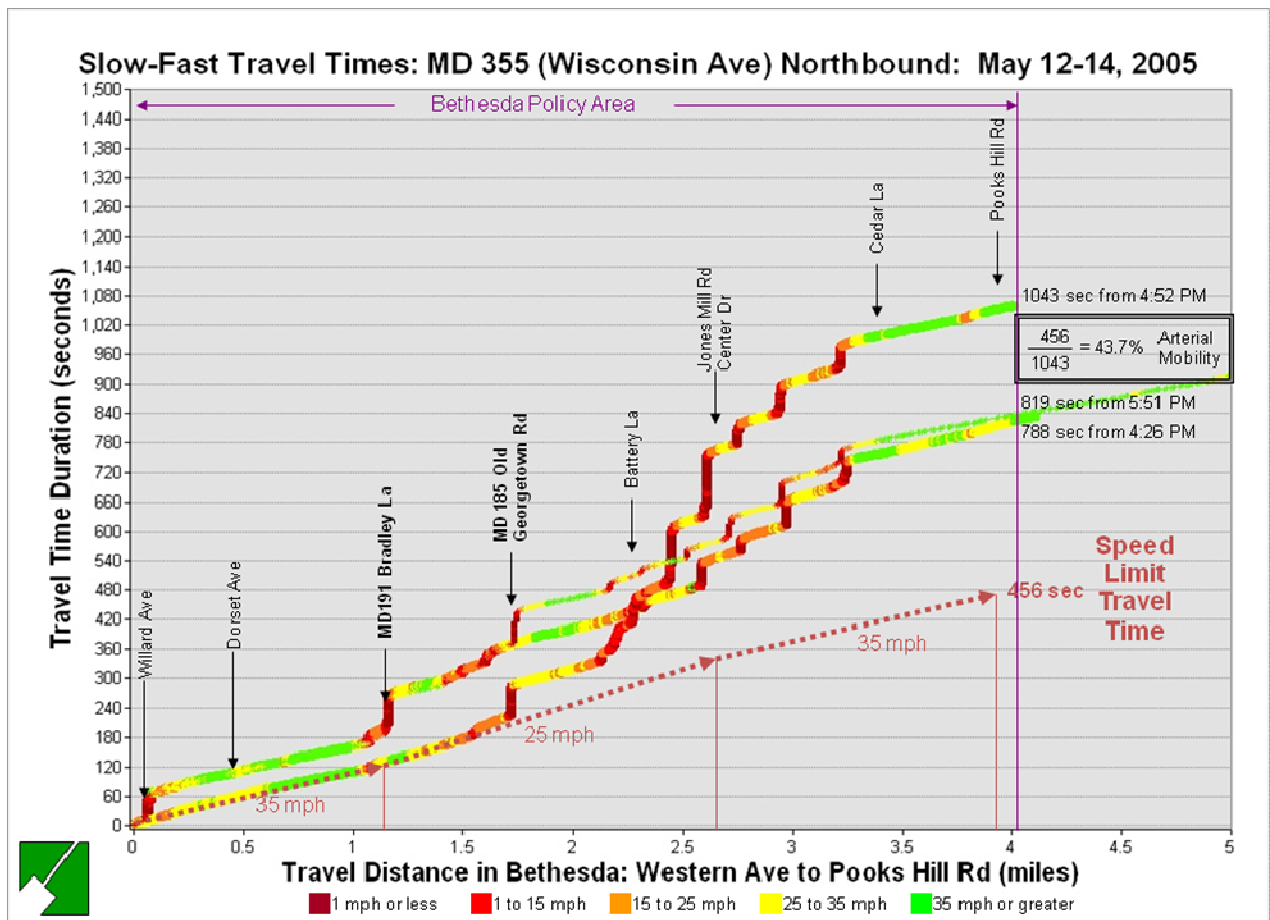
Figure 3.5: Spatial Coverage of Selected Priority Analysis Corridors



Wisconsin Ave (MD 355) from Western Ave (D.C. Line) to Pooks Hill Rd:

These results are based upon samples collected for MDOT/SHA for traffic signal timing in spring 2005. The results shown here are for 3 of 15 northbound samples taken during four days where each of the 15 samples began between 3 and 6 pm. The samples, shown in Figure 3.6, were collected for the section of MD 355 extending from Western Ave to Pooks Hill Rd (roughly 4.6 miles), just south of the Capital Beltway (I-495). The slowest travel time sample began at 4:52 pm and took 1,043 seconds (17.4 minutes) to reach Pooks Hill Rd. The fastest travel time sample during the PM peak began at 4:26 pm, and took 788 seconds (13.1 minutes). Intermediate crossing roadways are also shown in the figure. An extended queue of very slow traffic, which often indicates recurring delays, starts nearly at Cedar La, and extends back to south of Battery Lane in the Bethesda CBD, roughly a distance of one and a quarter miles. That queue lasted about 11.0 minutes, and had an average speed of about 6.8 mph. This resulted in a delay of about 8.0 minutes more than the 3.0 minutes of expected travel time at an average speed limit of about 30 mph along that distance.

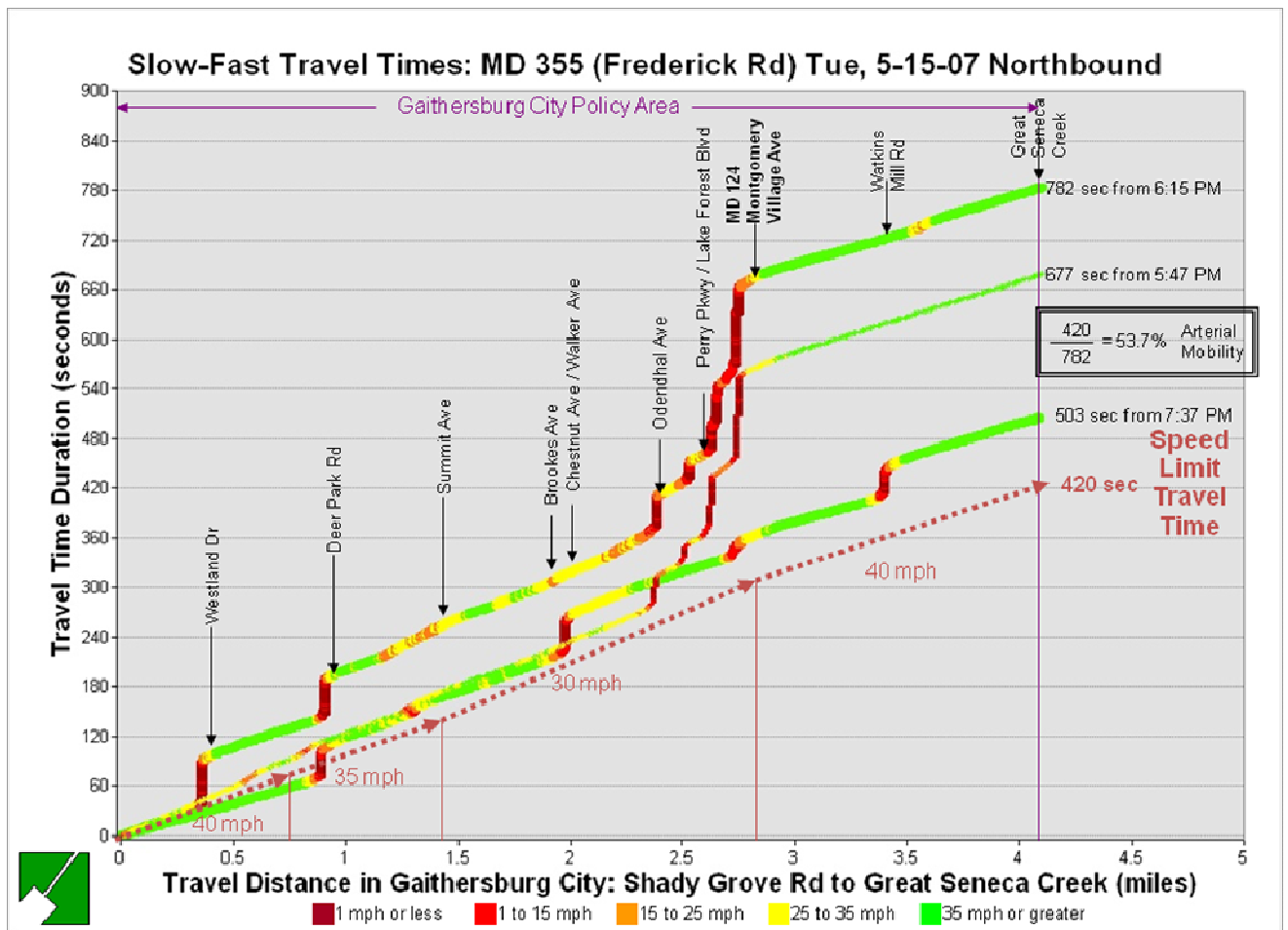
Figure 3.6: Travel Time-Distance Profile for Northbound Wisconsin Ave (MD 355)



Frederick Ave (MD 355) from Shady Grove Rd to Great Seneca Creek:

Seven northbound trajectory samples were collected for this section of Frederick Ave (MD 355), 4 during the PM peak period and 3 during the evening time period. The results for three of those samples are displayed in Figure 3.7, which shows that slowest run started about 6:15 pm. The second fastest run initiated at about 5:47 pm, while the fastest sample was conducted during the off-peak beginning at about 7:37 pm. The slowest run took about 13.0 minutes to travel a distance of roughly 4.1 miles at an average speed of 18.9 mph, compared to the posted speed limits ranging from 35 to 40 mph. The fastest sample took 503 seconds (about 8.4 minutes) at an average speed of about 28.6 mph. The two samples conducted during the peak period recorded significant queues and delays beginning at Montgomery Village Ave (MD 124) that extended south to about Odenhal Ave. The longer of those queues was about 0.67 miles long, and had a travel time duration of about 5.85 minutes. In addition, the traffic queue yielded an average speed of about 7.1 mph, and a delay of about 4.3 minutes more than the 1.3 minutes the probe would have taken to travel that distance at the speed limit of 30 mph.

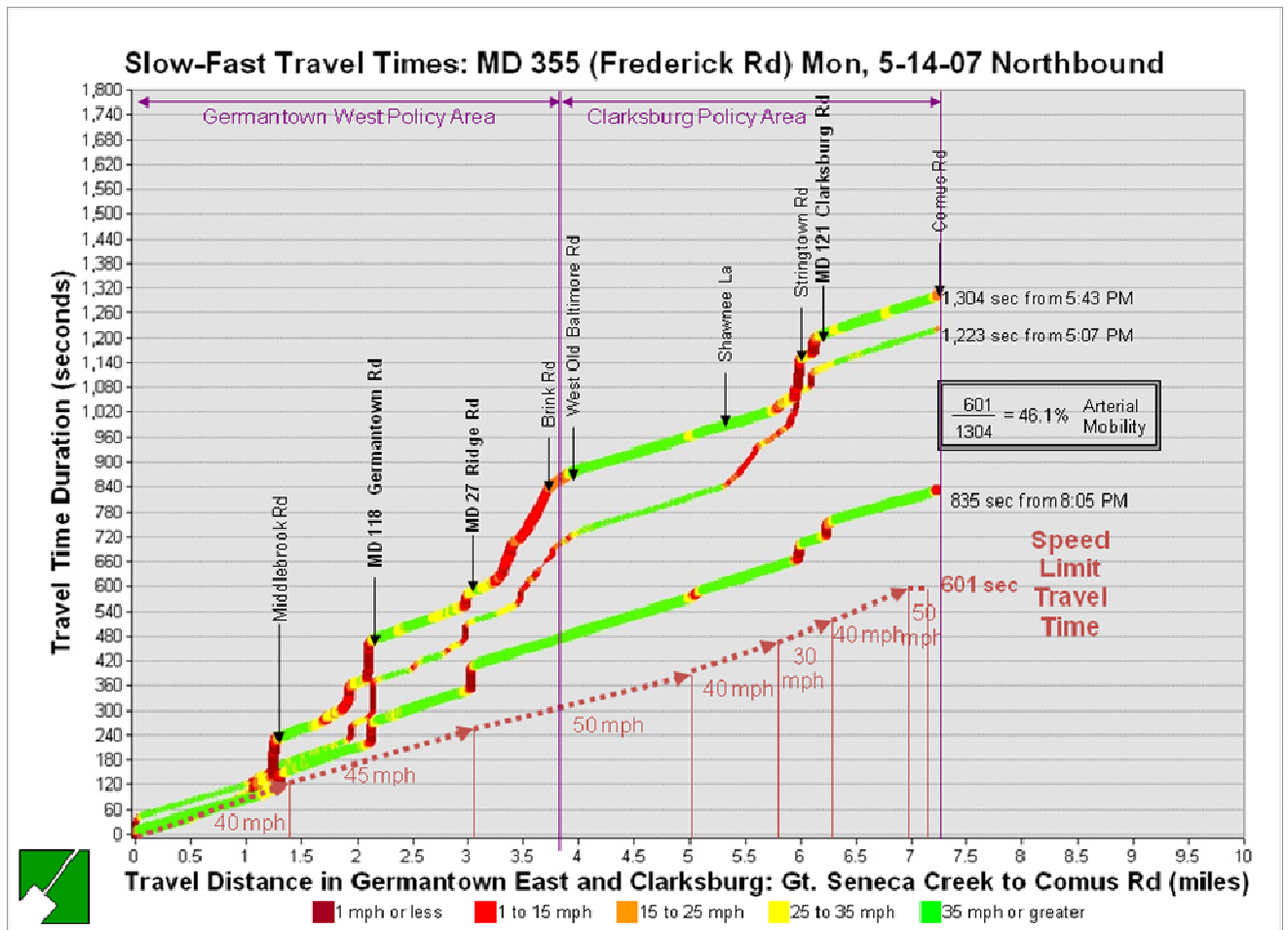
Figure 3.7: Travel Time-Distance Profile for Northbound Frederick Rd (MD 355)



Frederick Rd (MD 355) from Great Seneca Creek to Comus Rd:

Four full-length northbound trajectory samples were collected for this section of Frederick Rd (MD 355), 2 during the PM peak period and 2 during the off-peak period. This section totals a distance of about 7.1 miles. The two peak period samples initiated at 5:07 pm and 5:43 pm, respectively. The third sample was conducted during the off-peak beginning at 8:05 pm. The results of the sampling are displayed graphically in Figure 3.8. The slowest run began at 5:43 pm, and took 1,304 seconds (about 21.7 minutes) at an average speed of about 19.6 mph, compared to the posted speed limits ranging from 40 to 50 mph. The fastest run was conducted during the off-peak beginning at about 8:05 pm, and took 835 seconds (about 13.9 minutes) at an average speed of about 30.7 mph. The two samples conducted during the peak period recorded three separate notable traffic queues beginning at the: Clarksburg Rd (MD 121), West Old Baltimore / Brink Rd intersections, and the Germantown Rd (MD 118) intersections, which were consistent among the samples. The most severe traffic queue was reflected in the sample that initiated at 5:07 pm, during which it took the probe driver about 5 minutes to travel from Shawnee La to Clarksburg Rd (about .90 miles) at an average speed of 10.8 mph.

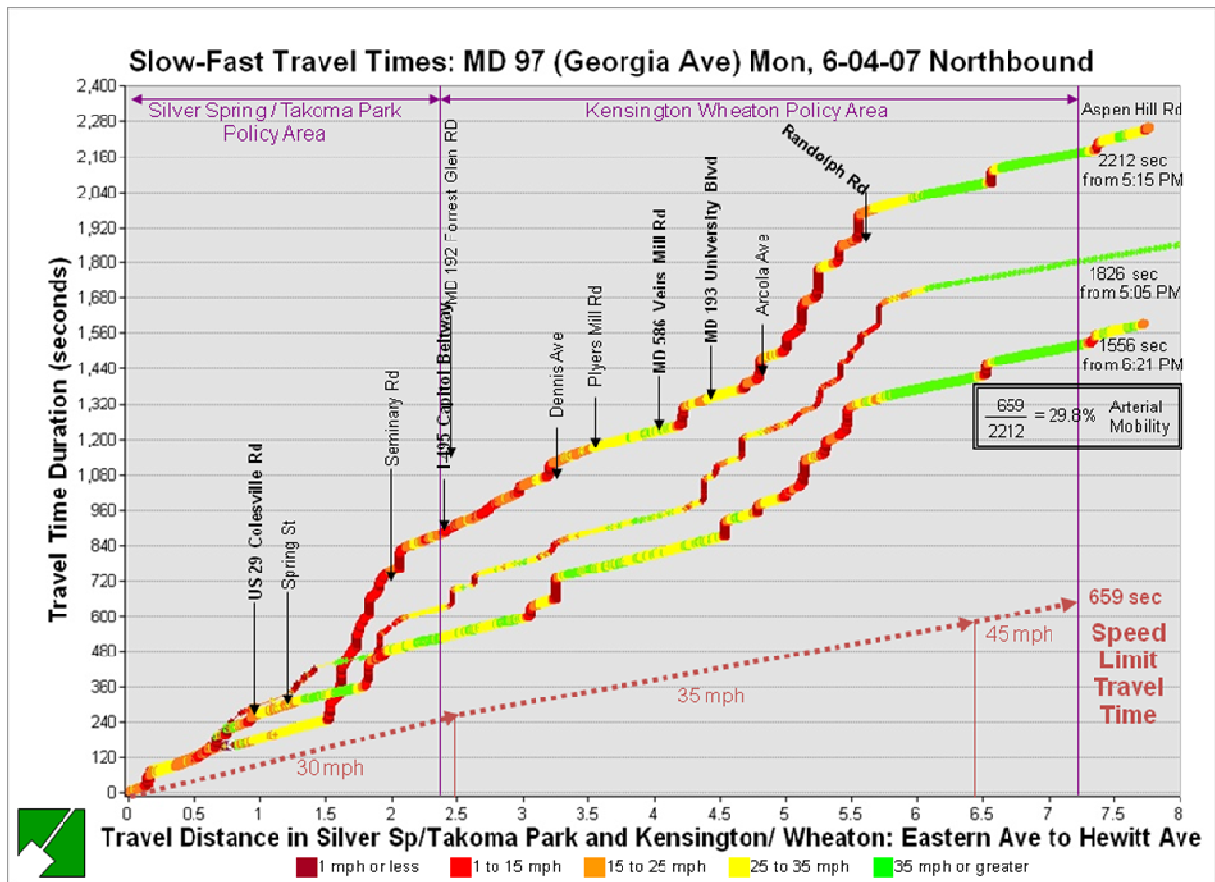
Figure 3.8: Travel Time-Distance Profile for Northbound Frederick Rd (MD 355)



Georgia Ave (MD 97) from Eastern Ave (D.C. Line) to Hewitt Ave:

Four northbound samples were collected for this section of Georgia Ave (MD 97) during the peak period. A graphic display of the observed congested conditions for three of the four samples is provided in Figure 3.9. The samples began at about 5:05 pm, 5:15 pm, and 6:21 pm, respectively. The slowest sample began at about 5:15 pm, and took 2,212 seconds (about 36.9 minutes) to travel a distance of about 7.2 miles, at an average speed of about 11.7 mph, compared to the posted speed limits ranging from 30 to 45 mph. The fastest run began about 6:21 pm and took 1,556 seconds (about 25.9 minutes), at an average speed of 16.7 mph. The first two samples recorded significant traffic queues beginning at Seminary Rd and extending as far south as Noyes Dr (just north of Spring St). During the slowest run, it took the probe vehicle roughly 8.3 minutes to travel this stretch of Georgia Ave (0.46 miles) at an average speed of 3.3 mph. In addition, all three samples recorded significant delays beginning at Randolph Rd, which extended as far south as University Blvd (roughly a distance of 1.2 miles). During the slowest run, it took the probe vehicle approximately 8.0 minutes to travel from Arcola Ave to Randolph Rd (roughly .69 miles), at an average speed of 5.2 mph, and a delay of about 6.8 minutes more than the approximate 1.2 minutes that it would have taken to travel that distance at the speed limit of 35 mph.

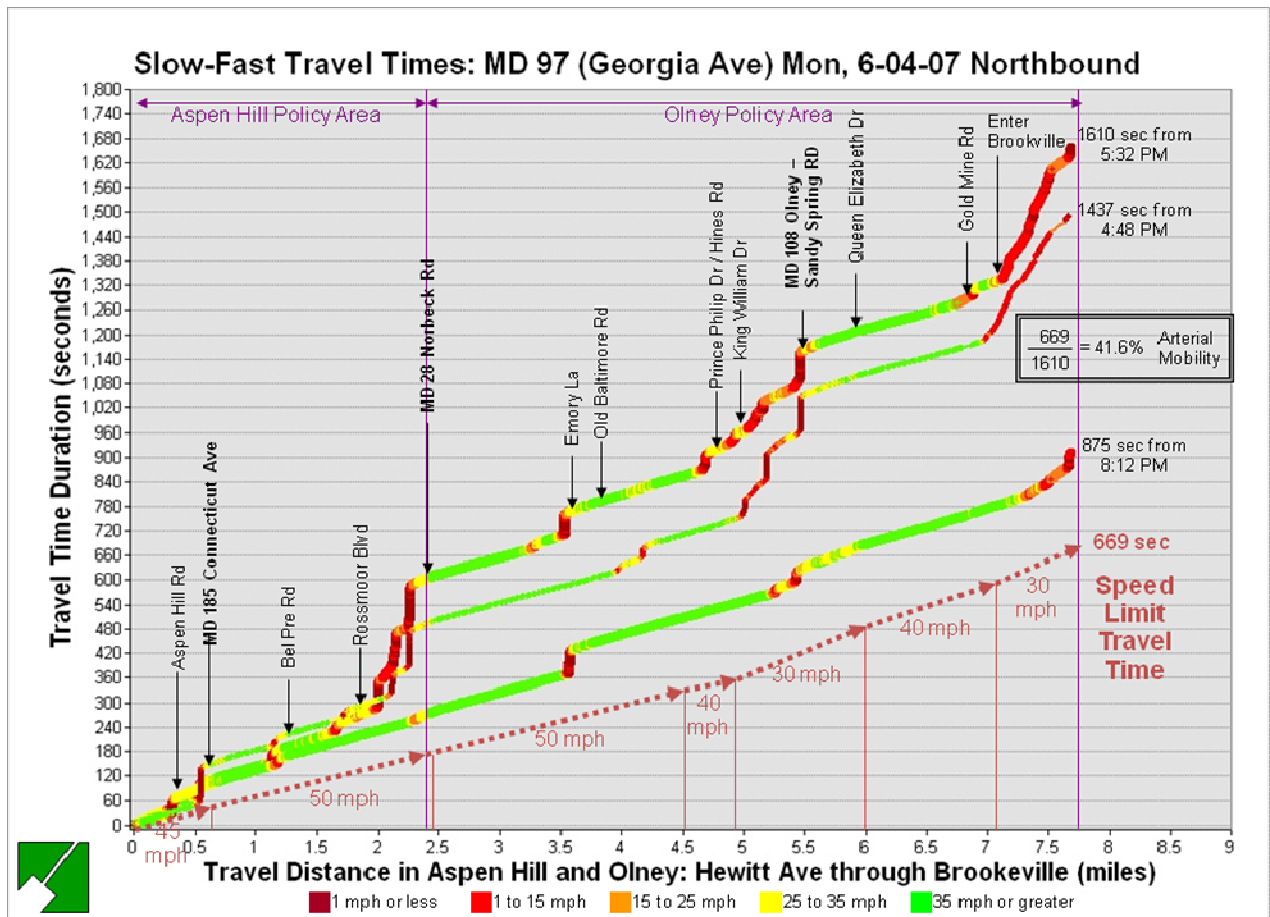
Figure 3.9: Travel Time-Distance Profile for Northbound Georgia Ave (MD 97)



Georgia Ave (MD 97) from Hewitt Ave through Brookeville:

Five northbound trajectory samples were collected in 2007 for this section of Georgia Ave (MD 97), three during the PM peak period and two during the evening time period. This section totals a distance of about 7.7 miles. The results of the three of the sampling trajectories are displayed graphically in Figure 3.10, which shows that the two peak samples began at about 4:48 pm and 5:32 pm respectively, while the off-peak sample began at about 8:12 pm. The slowest sample began at about 5:32 pm, which took 1,610 seconds (about 26.8 minutes) to travel the entire corridor at an average speed of about 17.2 mph, compared to the posted speed limits ranging from 30 to 50 mph. The fastest sample trajectory, which was recorded during the off-peak, took 875 seconds (about 14.6 minutes), at an average speed of about 31.6 mph. Both peak period samples, which were taken about 45 minutes apart, showed significant queues and delays that began at Norbeck Rd (MD 28) and extended back south of Rossmoor Blvd. In addition, both samples recorded traffic queues beginning at Olney-Sandy Spring Rd (MD 108), which extended as far south as Prince Phillip Dr/Hines Rd. Figure 3.10 also shows that significant queues and delays were recorded after Gold Mine Rd approaching the Town of Brookeville and extending through Brookville.

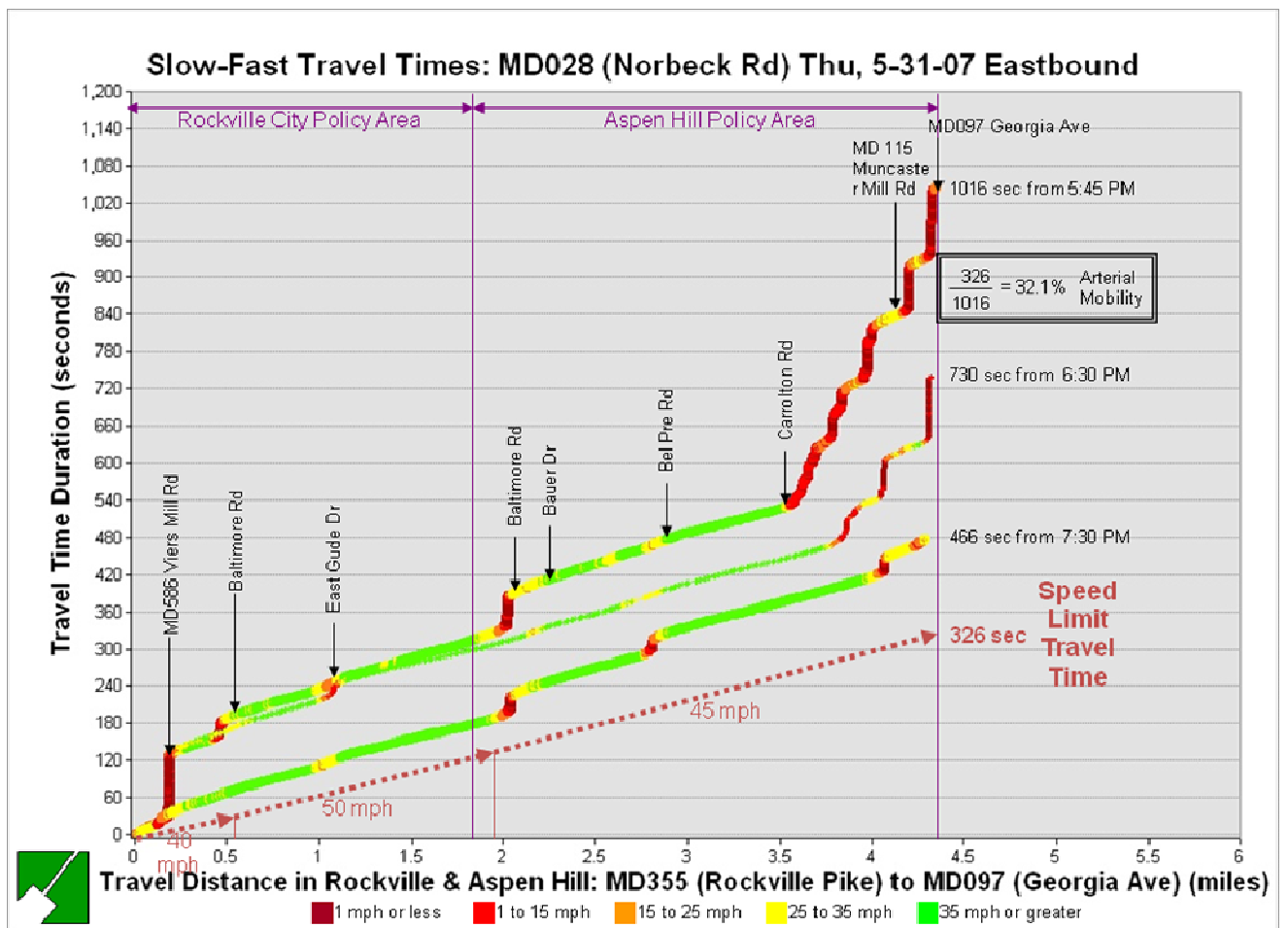
Figure 3.10: Travel Time-Distance Profile for Northbound Georgia Ave (MD 97)



Norbeck Rd (MD 28) from Rockville Pike (MD 355) to Georgia Ave (MD 97):

Three eastbound samples were collected for this section of Norbeck Rd (MD 28). A graphical display of the sampling results is provided in Figure 3.11. Two of the samples were collected during the peak period, which began at 5:45 pm and 6:30 pm, respectively. The third sample was collected during the off-peak beginning at 7:30 pm. The slowest of the three runs began at 5:45 pm and took 1,016 seconds (about 16.9 minutes) to travel the approximate 4.4-mile length of this roadway section, at an average speed of about 15.5 mph. The fastest run was conducted during the off-peak, which took 466 seconds (about 7.8 minutes) at an average speed of about 33.9 mph. Both of the runs conducted during the peak period recorded significant traffic queues, in which the slower one began at Georgia Ave extended as far west as Carrollton Rd (roughly a distance of about 0.81 miles). During the slowest run, it took the probe vehicle about 8.6 minutes to travel this congested segment at an average speed of about 5.7 mph, compared to the posted speed limit of 45 mph. That resulted in a delay of about 7.3 minutes more than the approximate 1.2 minutes of expected travel time it would have taken to travel that distance at the posted speed limit of 45 mph.

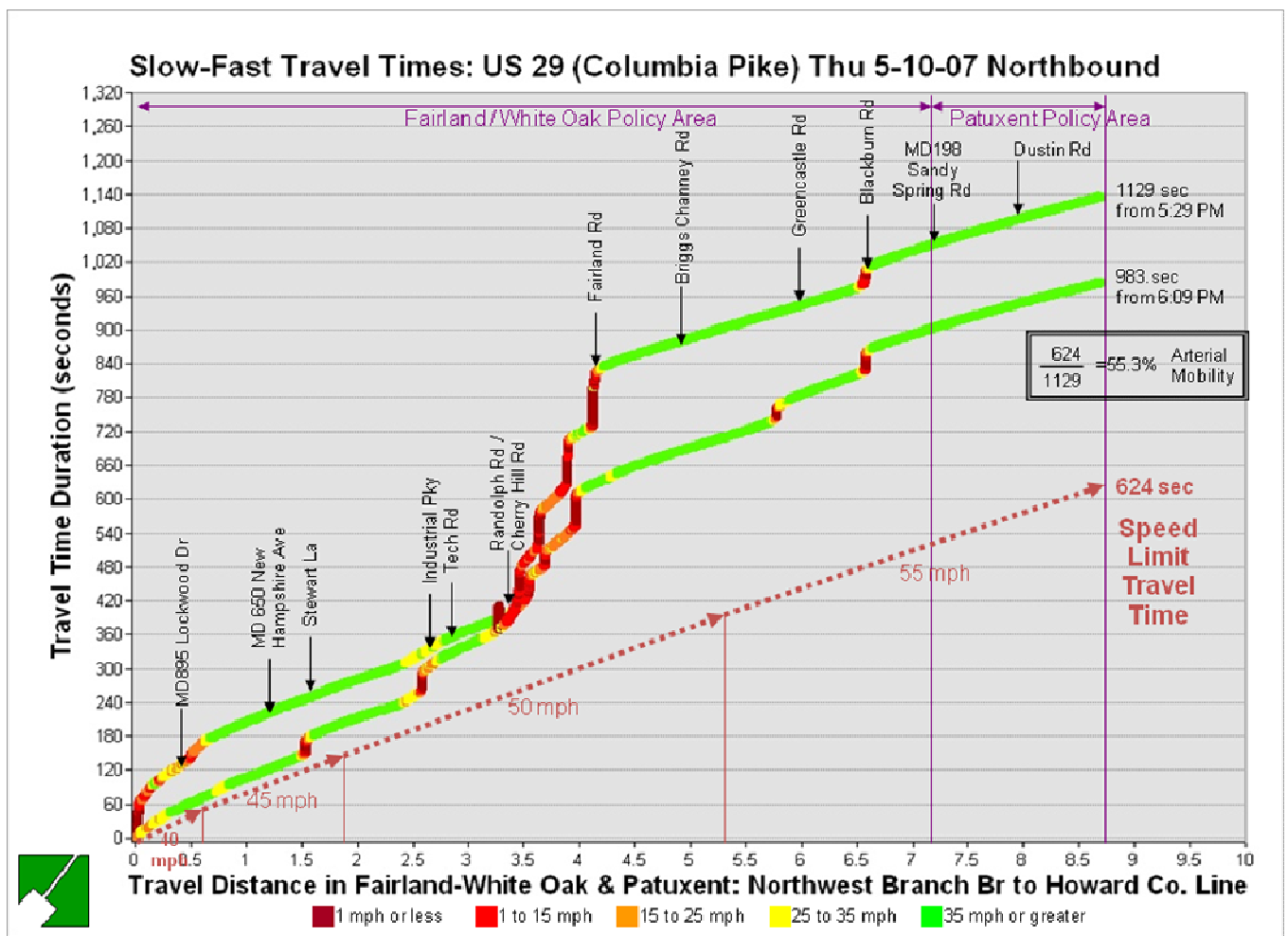
Figure 3.11: Travel Time-Distance Profile for Eastbound Norbeck Rd (MD 28)



Columbia Pike (US 29) from Northwest Branch to the Howard County Line:

Three northbound samples were conducted for this section of Columbia Pike (US 29) during the PM peak period. Results for two of the sampling trajectories are displayed graphically in Figure 3.12. The two samples shown started at about 5:29 pm and 6:09 pm, respectively. The slower of the two samples, which began at about 5:29 pm, took 1,129 seconds (about 18.8 minutes) to travel a distance of roughly 8.7 miles, at an average speed of about 27.8 mph, compared to the posted speed limits ranging from 40 to 55 mph. Both samples recorded significant queues and delays beginning at about Fairland Rd, which extended back south of Randolph Rd/Cherry Hill Rd, roughly a distance of about 1.05 miles. During the slower sample, it took the probe vehicle about 7.95 minutes to travel this congested segment at an average speed of about 7.9 mph. That resulted in a delay of about 6.7 minutes more than the approximate 1.25 minutes of expected travel time it would have taken to travel that distance at the posted speed limit of 50 mph.

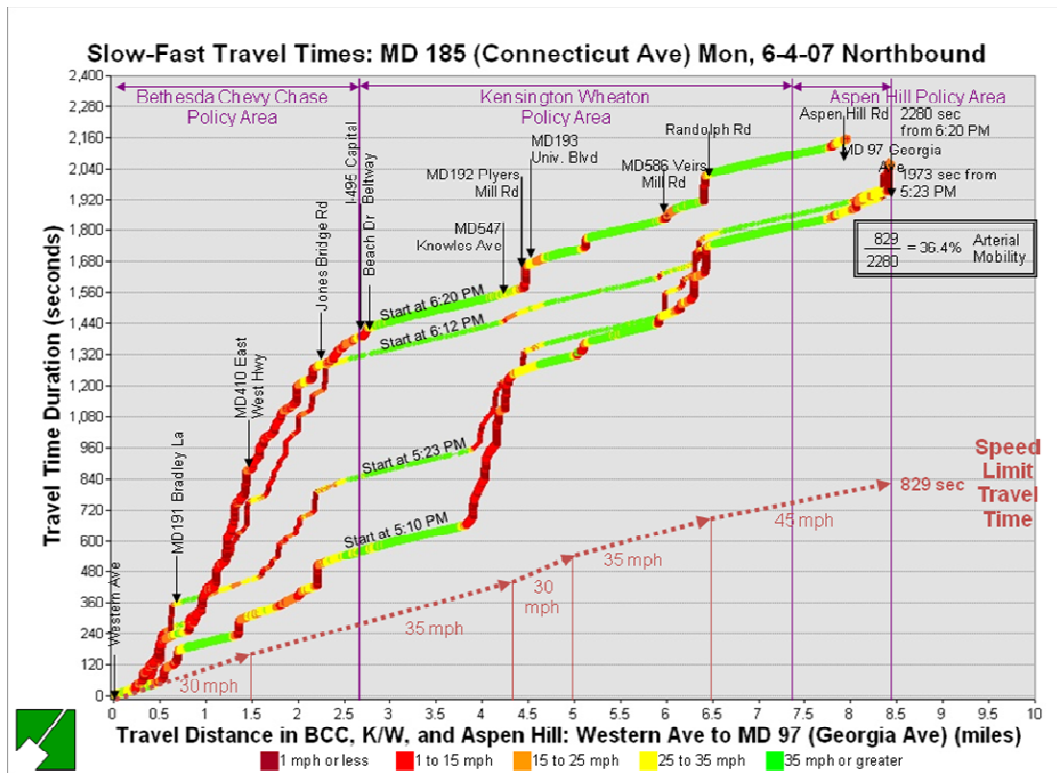
Figure 3.12: Travel Time-Distance Profile for Northbound Columbia Pike (US 29)



Connecticut Ave (MD 185) from Western Ave (D.C. Line) to Georgia Ave (MD 97):

Four samples were collected during the peak period for this 8.4-mile stretch of Connecticut Ave (MD 185). The samples began at about 5:10 pm, 5:23 pm, 6:12 pm, and 6:20 pm, respectively. The slowest of the four samples began at about 6:20 pm and took 2,280 seconds (about 38.0 minutes) to travel the corridor at an average speed of about 13.3 mph, compared to the posted speed limits ranging from 30 to 45 mph. The fastest of the four peak period samples that began at about 5:23 pm, took 1,973 seconds (about 32.9 minutes) at an average speed of about 15.3 mph. The last two samples observed significant traffic queues and delays, which began at the Capital Beltway and extended back almost as far as south as Bradley La (MD 191), roughly a distance of about 2.0 miles. During the slowest run, it took the probe vehicle about 19.6 minutes to travel this congested segment at an average speed of about 6.1 mph and a delay of about 16.0 minutes more than the expected 3.6 min expected travel time. The slower of the two earlier runs recorded a traffic queue of about 0.67 miles (average speed of 4.0 mph) beginning at University Blvd W (MD 193) and extending through Kensington to near Dresden St. Another significant queue, which began at Randolph Rd and extended back about 0.62 miles through Veirs Mill Rd, had a 5.2-minute duration and average speed of about 7.2 mph. Thus the location of the significant congestion tends to consistently vary by location and time within the peak period. With the earlier samples being more congested in Kensington and at Randolph Rd, while the later samples are more congested south of the Capital Beltway.

Figure 3.13: Travel Time-Distance Profile for Northbound Connecticut Ave (MD 185)



Current Arterial Mobility for Selected Policy Areas of the Annual Growth Policy:

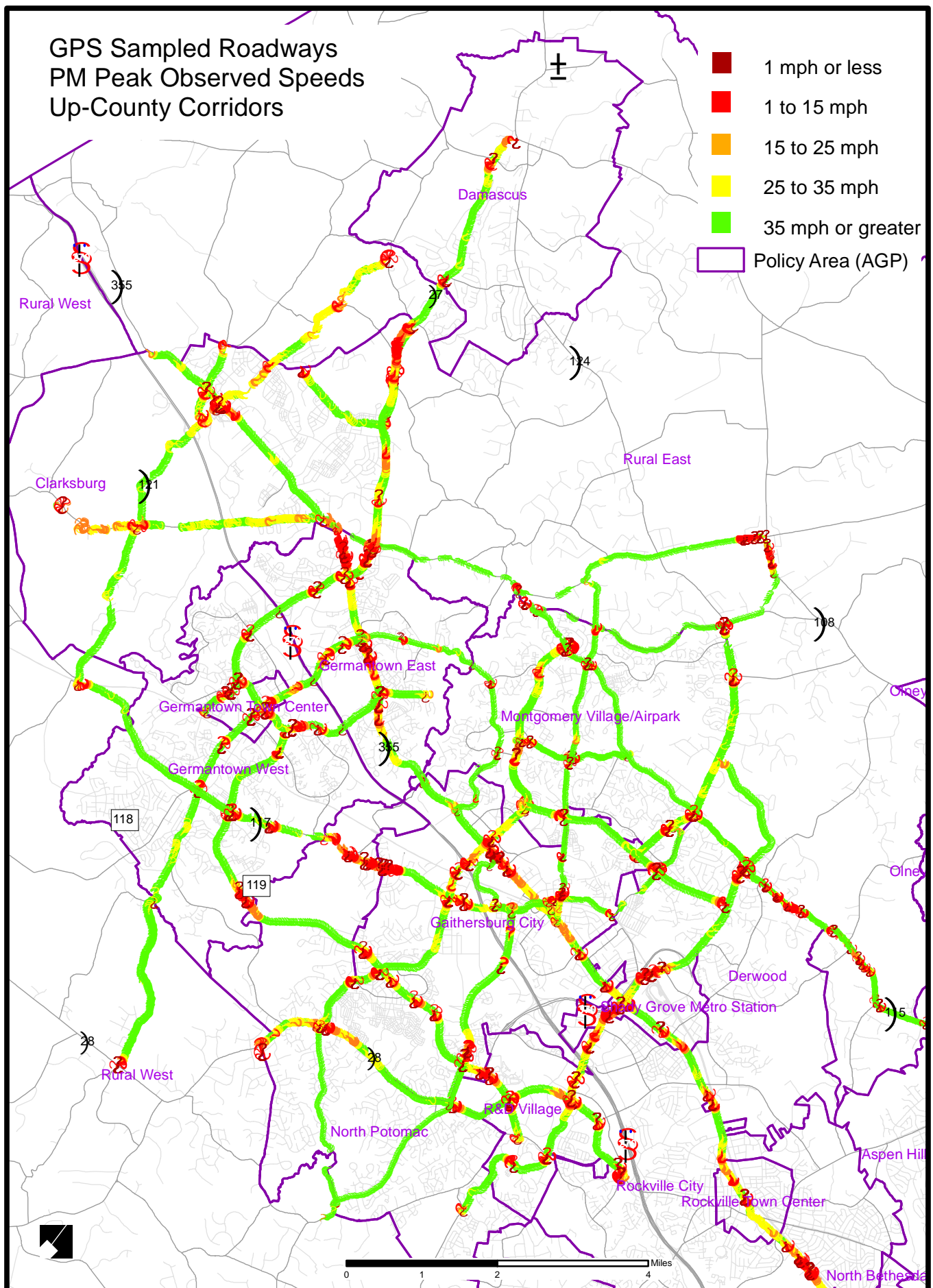
Each of the travel time versus distance profiles shown in the preceding section of this report contained some additional information. First, each of the roadway sections shown is located in one or more Policy Areas, as indicated by the Policy Area boundary labels in each of the figures. While most of the sampled sections are in one or two Policy Areas, the roadway section of Connecticut Ave (MD 185) shown in Figure 3.13 is located in three Policy Areas. Some other key corridors such as Great Seneca Highway (MD 119) are located in four Policy Areas. Secondly, each figure shows a value for the Speed Limit Travel Time, which is the theoretical amount of time the probe would take to travel that section if it traveled no slower or any faster than the speed limit, absent any stoppages at traffic signals. Thirdly, the calculations for a measure termed as “arterial mobility” is shown in each figure as being the percentage that the Speed Limit Travel Time is of the slowest of the observed travel times in the sampling.

Figure 3.14, shows the spatial coverage and spatial resolution of the 2007 samples associated with non-freeway roadways in the “Up-County” Policy Areas of: Clarksburg, Germantown East, Germantown West, Gaithersburg City, Montgomery Village/Airpark, and North Potomac. While the discussion of congested travel times and speeds in the preceding section focused on that observed along a selected set of roadways, in Figure 3.14 one can begin to discern area-wide patterns of congested traffic conditions associated with one or more Policy Areas based upon the location and general magnitudes of queue length and delay. For example, for arterial roadways that traverse the boundary between Gaithersburg City and Germantown West and East, such as Great Seneca Highway (MD 119), Clopper Road MD 117) and Frederick Rd (MD 355), each appear to have long queues that from a traffic flow standpoint are effectively near or are at that boundary. In essence, it appears that these arterial roadways collectively function as constricted gateways for the high traffic flow volumes that pass to and from adjacent Policy Areas. This observation is similar in concept to the gateway capacity constraints long associated in the AGP with setting of growth amounts within several down-county Metro Station Policy Areas, such as the Silver Spring CBD.

It is believed that further exploration of these ideas based upon additional information to be obtained from the already collected arterial travel time and speed data will better assist the Board, Council, and other interested parties in their understanding of how to set the particular Policy Area Mobility Review (PAMR) categories and/or amounts as part of the 2008 AGP work.

The next section of this report examines the general degree of consistency in findings between information about congestion based upon travel times and speed with that based upon the turning movements and traffic volumes as expressed in terms of CLVs.

Figure 3.14: Spatial Coverage of Sampled Roadways in the Up-County Policy Areas



Congested Corridors

By analyzing this year's CLV data samples against the GPS arterial travel time and speed survey results, staff has identified a group of congested corridors. A number of these locations have exhibited well-defined patterns of recurring congestion, some of which were identified in the 2006 Highway Mobility Report (HMR). However, it should be noted that some locations have recently become more congested, as indicated in some of the arterial travel time and speed data results. In most cases, a significant number of the intersections located along these corridors have CLVs that either exceed, or are close to exceeding their LATR standard. These intersections tend to be located along the major thoroughfares (e.g. State routes), which provide linkages to the various activity centers (including CBDs) of the County. In addition, these corridors tend to exhibit instances of spotty congestion and/or extremely elongated patterns of congestion, as indicated by lengthy travel times and reduced travel speeds and mobility. 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 routes and corridors are experiencing significant levels of congestion:

- **Rockville Pike (MD 355)** from the Bethesda CBD to West Cedar La, where the Cedar La / W Cedar La intersection has a CLV that exceeds its LATR standard. The Rockville Pike/West Cedar La intersection is the 5th most congested intersection in the County with a CLV of 1996. In addition, the GPS travel samples indicated that it takes up to 8.5 minutes to travel from Battery La to W Cedar La (roughly one mile), at an average speed of 7.1 mph (compared to the posted speed limits ranging from 25 to 35 mph). The West Cedar La intersection ranks among the 10 most congested intersections in the County for the fourth consecutive reporting year. The master-planned grade-separated interchange for this location was recommended by the County Executive and County Council, for addition to the State's Development & Evaluation (D&E) program in the fall of 2005. In addition, a number of the intersections located along this corridor are currently being analyzed under the Base Realignment and Closures (BRAC) Study.

- **Frederick Rd (MD 355)** from Chestnut St / Walker Ave to Montgomery Village Ave (MD 124) in Gaithersburg, and from Middlebrook Rd to Brink Rd in Germantown East where four intersections (Montgomery Village Ave (MD 124), Christopher St, Darnestown-Germantown Rd (MD 118), Ridge Rd (MD 27)/Father Hurley Blvd) all have CLVs that exceed their respective LATR standard. The GPS travel samples indicated that it takes up to 6 minutes to travel from Walker Ave to Montgomery Village Ave (roughly one mile), at a speed of an average speed of 8 mph (compared to the posted speed of 30 mph). In addition, the samples indicated that it takes up to 10 minutes to travel from Middlebrook Rd to Brink Rd (roughly 2.3 miles), at a speed of an average speed of 13.8 mph (compared to the posted speeds ranging from 45 to 50 mph). A grade-separated interchange for the Ridge Rd (MD 27)/Father Hurley Blvd

intersection has been recommended in the area master plan. This corridor may be a candidate for Bus Rapid Transit (BRT) treatments.

- **Frederick Rd (MD 355)** in the vicinity of the Clarksburg Town Center where the Clarksburg Rd (MD 121) currently has a CLV, which exceeds its LATR standard. In addition, the GPS travel samples indicated that it takes drivers up to 5 minutes to travel from Shawnee La to Clarksburg Rd (a distance of about .90 miles), at an average speed of 10.8 mph. This area should continue to be monitored with a high level of scrutiny, as there is a significant amount of new development has been approved for this area that has yet to be built. There is also a significant amount of planned transportation infrastructure for this area, both developer-funded (such as the extension of Snowden Farm Parkway to Ridge Road) and through public funding sources (such as the extension of Observation Drive). However, travel conditions will most likely worsen until those facilities are actually constructed. In addition, the Midcounty Corridor Study, which focuses on improving mobility for the corridor east of I-270, is currently in phase I facility planning.

- **Colesville Road / Columbia Pike (US 29)** from Stewart La/Milestone Dr to Fairland Rd where two intersections (Stewart La/Milestone Dr, Fairland Rd) have CLVs that exceed their respective LATR standards. In addition, the GPS travel samples indicated that it takes up to 10 minutes to travel from Industrial Pkwy to Fairland Rd (a distance of about 1.5 miles), at an average speed of about 9 mph (compared to the posted speed limit of 50 mph). Construction of the new grade-separated interchange at Briggs Chaney Rd was completed in late 2007. Four additional grade-separated interchanges (Blackburn Rd, Fairland Rd / Musgrove Rd, Greencastle Rd, Stewart La, 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. The development of planned interchanges along US 29 has reserved the opportunity for future Bus Rapid Transit (BRT) priority treatments.

- **Georgia Avenue (MD 97)** from the Silver Spring CBD to the Capital Beltway (I-495) and from Veirs Mill Rd (MD 586) to Randolph Rd, where two intersections (Columbia Blvd / Seminary La, Randolph Rd) have CLVs exceeding their LATR standard. The Randolph Rd intersection is ranked the 2nd most congested intersection in the County with a CLV of 2069. The GPS travel samples indicated that it takes up to 11 minutes to travel from Spring St to I-495 (roughly 1.1 miles), at an average speed of 6.0 mph (compared to the posted speed of 30 mph). In addition, the samples indicated that it takes up to 13 minutes to travel from Veirs Mill Rd to Randolph Rd (roughly 1.6 miles), at an average speed of 7.4 mph (compared to the posted speed of 35 mph). A new grade-separated interchange for the Randolph Rd intersection is currently funded for construction.

- **Georgia Avenue (MD 97)** from Connecticut Ave (MD 185) to Olney-Sandy Spring Rd (MD 108), where four intersections (Connecticut Ave, Bel Pre Rd, Norbeck Rd (MD 28), Old Baltimore Rd) each have CLVs that exceed their LATR standard. In addition, the GPS travel samples indicated that it takes up to about 17 minutes to travel from Connecticut Ave to Olney-Sandy Spring Rd (roughly 4.9 miles), at an average speed of 17.3 mph (compared to the posted speeds ranging from 30 to 50 mph). An intersection capacity improvement is currently in project planning for the Norbeck Rd intersection. In addition, 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 and Emory La intersections. The County Executive and County Council have indicated that the Georgia Avenue Busway is a priority for future study in the state's CTP.

- **Norbeck Rd/First St (MD 28)** from Veirs Mill Rd (MD 586) to Georgia Ave (MD 97), where 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. The Bel Pre Rd and Avery Rd intersections are ranked the 8th and 10th most congested intersections in the County with CLVs of 1834 and 1815, respectively. The GPS travel samples indicated that it takes up to 18 minutes to travel from MD 355 (in the City of Rockville) to Georgia Ave (roughly 4.9 miles), at an average speed of 16.3 mph (compared to the posted speeds ranging from 40 to 50 mph). An intersection capacity improvement is currently in project planning for the Georgia Ave intersection. In addition, intersection capacity improvement options for the Norbeck Rd/First St / Veirs Mill Rd intersection are currently in the design phase. This corridor is expected to see some reduction in its PM peak traffic volumes with the completion of the ICC, as indicated by the year 2012 PAMR analysis results.

- **Connecticut Ave (MD 185)** from Western Ave (DC Line) to the Capital Beltway (I-495) where two intersections (East-West Hwy (MD 410) and Jones Bridge Rd) have CLVs exceeding their LATR standard. The East-West Hwy intersection is ranked the 9th most congested intersection in the County with a CLV of 1831. In addition, the GPS travel samples indicated that it takes up to 20 minutes to travel from Bradley La (MD 191) to the Capital Beltway (a distance of 2 miles), at an average speed of 6.1 mph. The Jones Bridge Rd intersection is currently being analyzed under the Base Realignment and Closures (BRAC) Study.

IV. FUTURE CONGESTION

Year 2012 Forecasted Volume-to-Capacity (V/C) Ratios

For the purpose of this report, a year 2012 traffic forecast was conducted using the Department's new TRAVEL/3 model. The TRAVEL/3 model, which was adopted in late 2006, employs the Metropolitan Washington Council of Governments (MWCOG) modeling process and was first used as an application in support of the MD 355/I-270 Corridor Study, which was conducted during the latter part of 2006. This forecast updates last year's Policy Area Mobility Review (PAMR) growth policy analysis to reflect an estimate of year 2012 conditions.

Regarding land use, development assumptions inside Montgomery County were updated to reflect the existing base plus pipeline of approved development as of January 1, 2008. Land use outside the County is an estimate of development by the year 2012 based on MWCOG's Round 7.1 cooperative land use forecast.

Within Montgomery County, the current pipeline of approved but unbuilt development includes some 38,000 households and 127,000 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

For comparison purposes, these ten policy areas currently have about one-third of the County's jobs and households.

It should be noted that 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 transportation network, projects considered to be fully-funded within the first four years of the current County Capital Improvement Program and the State Consolidated Transportation Program, plus those conditioned to be built by the private sector as part of development pipeline approvals, were assumed inside Montgomery County. In this regard, a significant change relative to last year's PAMR analysis is the

inclusion of the “eastern segment” of the Intercounty Connector (ICC) between Georgia Avenue (MD 97) and US Route 1. Outside the 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 2012 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 have yet to be determined; 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 forecasts for the year 2005 and 2012 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 2012, the countywide total for households is assumed to be 389,237 (a 12.2% increase relative to 2005). The year 2012 countywide total for jobs is assumed to be 626,080 (a 25.2% increase). Based on the results, the average volume-to-capacity (V/C) ratio on the County’s transportation system is anticipated to increase by 3.9% by the year 2012. In addition, both the vehicle-miles traveled (VMT) and the vehicle-hours traveled (VHT) are anticipated to increase by 11.8% and 15.9%, respectively. Furthermore, the model predicts a 24.6% increase in the amount of congested lane-miles (V/C ratio of 1.00 or higher) during the PM peak period by the year 2012. The Intercounty Connector (ICC) and other future road and intersection improvements will account for an 8.1% increase in the roadway network’s total lane-miles. These figures indicate that, although more vehicles are predicted travel the County’s roadways for longer periods of time by the year 2012, 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 TRAVEL/3 Model Results

	2005 Network	2012 PAMR Network	% Chg
Households*	347,000	389,237	12.2%
Jobs*	500,000	626,080	25.2%
Total Lane-Miles	2,751	2,974	8.1%
Vehicle-Miles Traveled (in 000s)	5498.5	6146.5	11.8%
Vehicle-Hours Traveled (in 000s)	317.0	367.4	15.9%
Average Speed (mph)	17.4	16.7	-4.0%
Average V/C Ratio	0.76	0.79	3.9%

*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 (3.9%) versus that of the freeway facilities (2.6%). Conversely, the increases in VMT and VHT on the freeway facilities (22.7% and 20.3%, respectively) are forecasted to be higher than that of the non-freeway facilities (6.9% and 14.5%, 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 TRAVEL/3 Model Results – Non-freeway vs. Freeway Facilities

	Non-freeway facilities			Freeway facilities		
	2005 Network	2012 PAMR Network	% Chg	2005 Network	2012 PAMR Network	% Chg
Total Lane-Miles	2,362	2,495	5.6%	389	479	23.1%
Vehicle-Miles Traveled (in 000s)	3790.2	4050.1	6.9%	1708.3	2095.4	22.7%
Vehicle-Hours Traveled (in 000s)	238.7	273.3	14.5%	78.2	94.1	20.3%
Average Speed (mph)	15.9	14.8	-6.9%	21.9	22.3	1.8%
Average V/C Ratio	0.76	0.79	3.9%	0.76	0.78	2.6%

Figure 4.1 maps the PM peak period V/C ratios and volumes forecasted for the year 2012 on the County's transportation system. The model results indicate that 6.4% of the congested lane-miles will be located along the freeway facilities (i.e. I-495 and I-270), while the remaining 19.6% 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.

A number of road and intersection improvements are anticipated to be completed by the year 2012. In some cases, the forecast indicates that these facilities will see an increase in their three-hour PM peak hour 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 it, are anticipated to see an increase of at least 4000 vehicles during the three-hour PM peak period. On a related note, 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. Some of this may reflect an a potential change in travel patterns as a result of the widening, as indicated by a forecasted decrease in the PM peak volumes for Muncaster Mill Rd, which serves as the alternative connection to Woodfield Rd. Refer to Figure 4.2 for a map which shows the forecasted differences in PM peak volumes, when comparing the results of the year 2005 and 2012 scenarios.

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 volumes for these facilities. The addition of the ICC as the primary east-west route alternative is predicted to reduce PM peak volumes on a number of major roadways in the immediate vicinity 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 confirm that east-west mobility in the County will be enhanced with the addition of this facility.

Figure 4.1: Map of 2012 PM Peak Hour V/C Ratios and Volumes

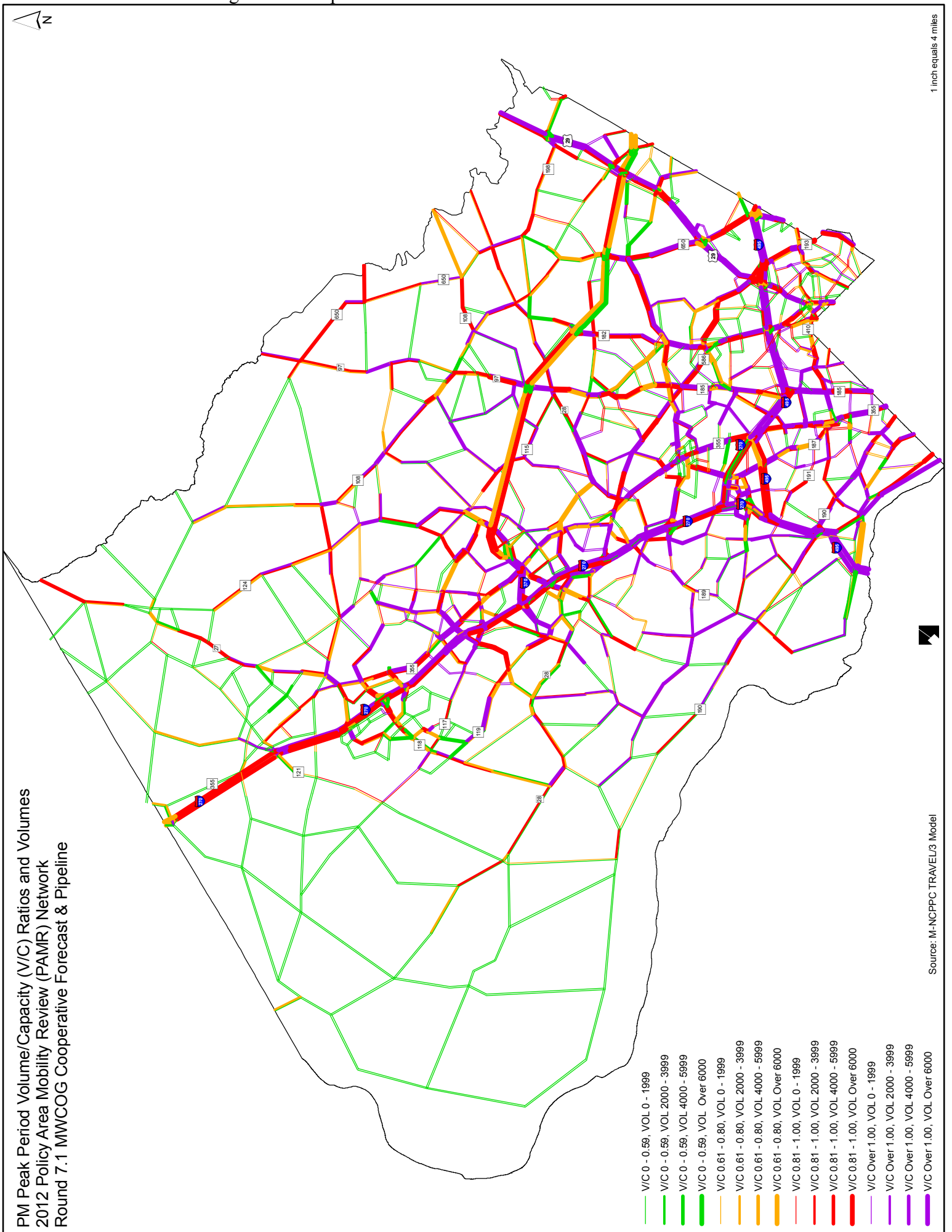
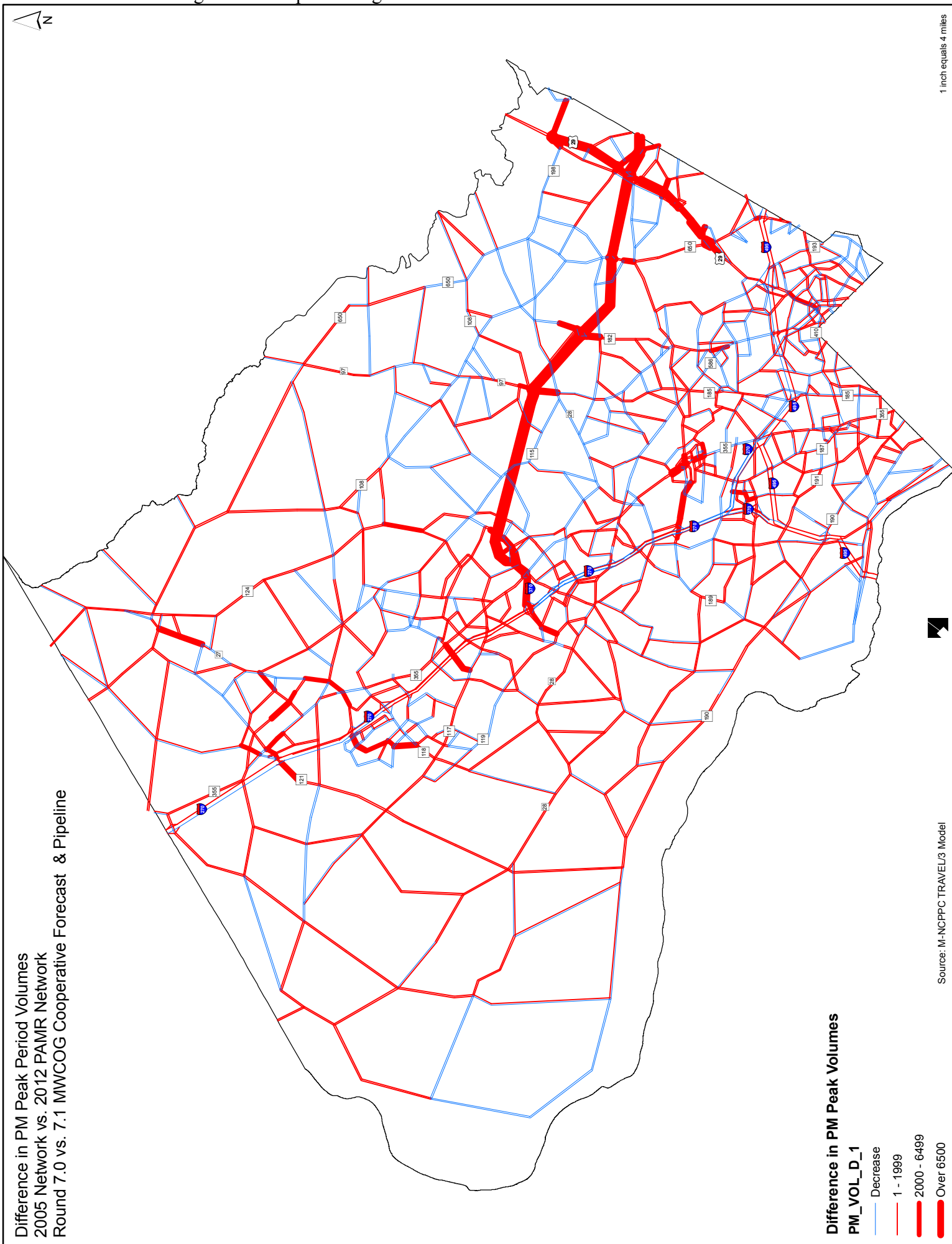


Figure 4.2: Map Showing Difference in PM Peak Volumes - 2005 vs. 2012



Year 2012 Policy Area Mobility Review (PAMR) Analysis Results

Using the TRAVEL/3 transportation model, planning staff has computed the year 2012 relationship between the set of transportation facilities currently funded in the four-year capital program and the geographic pattern of existing and approved jobs and housing units in the County. The framework for this analysis is described in more detail in the preceding discussion of year 2012 forecasted volume-to-capacity ratios. The transportation model tests this future land use pattern for its traffic impact, comparing the resulting traffic volumes and distribution to the arterial level of service standard for each policy area.

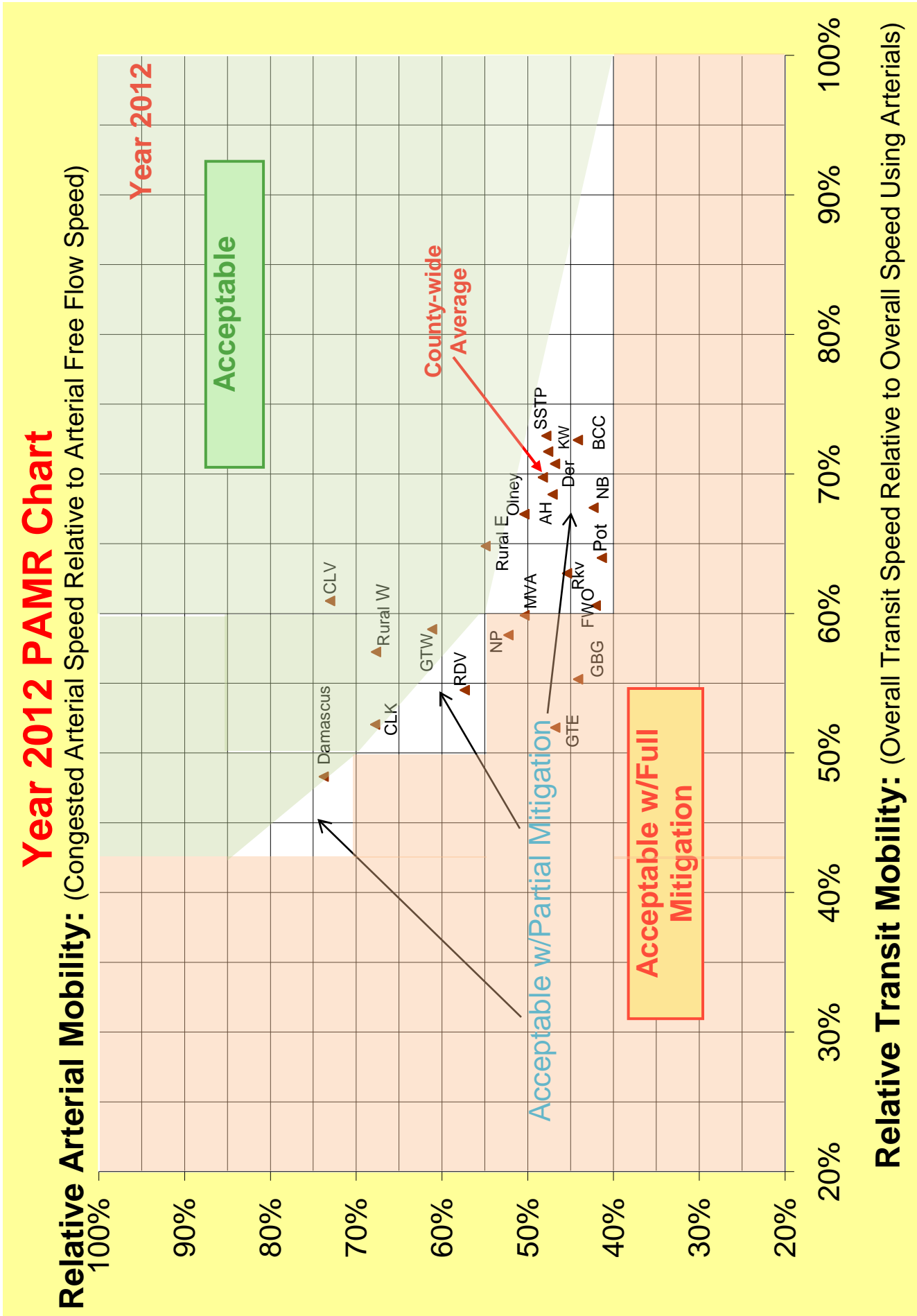
This analysis results in a finding of acceptable with full mitigation for a policy area if the level of service on local roads in the policy area is expected to exceed the arterial level of service standard.

The key year 2012 PAMR-related transportation model results used to perform the PAMR analysis are reported in Appendix 5.3B. The resultant year 2012 PAMR chart is displayed in Figure 4.3. As can be observed, four (4) policy areas fall into the acceptable with full mitigation area on the chart: (1) Germantown East; (2) Gaithersburg City; (3) North Potomac and: (4) Montgomery Village/Airpark. Concurrent with this finding, eleven (11) policy areas fall into the acceptable with partial mitigation area in the chart. These policy areas, along with the FY 2009 trip mitigation percentages required in these areas, are listed in Table 4.3.

Table 4.3: 2012 PAMR Results - Required Trip Mitigation by Policy Area

Policy Area	Trip Mitigation Required
Aspen Hill	20%
Bethesda/Chevy Chase	30%
Derwood/Shady Grove	20%
Fairland/White Oak	45%
Gaithersburg City	100%
Germantown East	100%
Kensington/Wheaton	15%
Montgomery Village/Airpark	100%
North Bethesda	40%
North Potomac	100%
Olney	10%
Potomac	45%
R&D Village	35%
Rockville	30%
Silver Spring/Takoma Park	10%

Figure 4.3: Year 2012 PAMR Analysis Results Chart



The 2012 PAMR results reflect updates to both demographic and transportation system assumptions. In this regard, there are two notable changes between 2011 and 2012:

- The assumed levels of development in Montgomery County are higher in 2012 than that assumed for the 2011 analysis. This is due in part to the fact that the full pipeline of development assumed in the year 2013 analysis was not correctly transferred, as intended, to the year 2011 analysis conducted last fall. The levels of required mitigation in the 2007-2009 Growth Policy were therefore slightly lower, particularly in the I-270 corridor, than they would have been if the pipeline had been correctly transferred from 2013 to 2011 conditions.
- The ICC will be fully open to traffic by 2012, whereas only the section west of Georgia Avenue (MD 97) was assumed open to traffic in 2011.

The combination of these changes has a slightly positive effect in the central portion of the County (notably Aspen Hill and Olney) and a negative effect in many other areas of the County (notably Montgomery Village/Airpark, North Potomac and R&D Village).

V. APPENDICES

Appendix 5.1A: All Available Critical Lane Volume Data 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	4/27/2005	779	830	1800	Friendship Heights
Arcola Ave at Kemp Mill Rd	5/11/2004	1020	1290	1600	Kensington/Wheaton
Arlington Rd at Bethesda Ave	10/4/2006	954	970	1800	Bethesda CBD
Arlington Rd at Edgemoor Ln	3/21/2007	597	823	1800	Bethesda CBD
Arlington Rd at Elm St	10/12/2006	712	892	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	1475	Aspen Hill
Bel Pre Rd at Homecrest Dr	6/1/2006	1252	842	1475	Aspen Hill
Bickerstaff/Diamondback/Story	9/7/2005	681	635	1450	Gaithersburg City
Bonifant Rd at Pebblestone Dr	3/10/2005	1325	1240	1450	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	12/8/2005	1211	1455	1600	Bethesda/Chevy Chase
Bradley Blvd at Goldsboro Rd	6/10/2003	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
Briggs Chaney Rd at Automobile/Castle	10/18/2005	889	1244	1475	Fairland/White Oak
Briggs Chaney Rd at Fairdale Rd	11/16/2006	847	791	1475	Fairland/White Oak
Briggs Chaney Rd at Old Columbia Pk	11/14/2006	1531	1209	1475	Fairland/White Oak
Broad-Calv-Cherryhill	9/6/2007	1498	1462	1475	Fairland/White Oak
Burtonsville Blv at Burtonsville Xing SC	6/2/2004	1628	1310	1350	Patuxent
Calverton Blvd at Galway Dr	9/6/2007	1336	977	1475	Fairland/White Oak
Capitol View Ave at Forest Glen/Seminary	2/12/2004	937	900	1600	Kensington/Wheaton
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	1475	Fairland/White Oak
Cherry Hill Rd at Prosperity Dr	9/5/2007	1019	1011	1475	Fairland/White Oak
Clopper Rd at Great Seneca Hwy	3/30/2004	1053	1169	1425	Germantown West
Clopper Rd at Hopkins Ln	11/19/2003	1039	751	1425	Germantown West
Clopper Rd at Kingsview Rd	2/5/2004	962	1037	1425	Germantown West
Clopper Rd at Kingsview Village Dr	9/13/2006	944	943	1425	Germantown West
Clopper Rd at Longdraft Rd	3/16/2004	914	1069	1450	North Potomac
Clopper Rd at Mateney Rd	3/30/2004	1041	1026	1425	Germantown West
Clopper Rd at Metropolitan Grove Rd	4/19/2005	819	1069	1450	Gaithersburg City
Clopper Rd at Quince Orchard Rd	3/4/2004	1350	1152	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	4/7/2005	1464	1453	1600	Silver Spring/Takoma Park
Colesville Rd at East West Hwy	6/2/2004	1022	1061	1800	Silver Spring CBD
Colesville Rd at Fenton St	9/19/2006	943	1038	1800	Silver Spring CBD
Colesville Rd at Franklin Ave	4/13/2005	1670	1502	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

Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

Colesville Rd at University Blvd (S)	9/13/2006	1672	1492	1600	Kensington/Wheaton
Columbia Pike at Blackburn Rd	12/6/2006	1484	1448	1350	Patuxent
Columbia Pike at Burnt Mills Ave	10/7/2004	1374	1246	1475	Fairland/White Oak
Columbia Pike at Fairland Rd	9/6/2007	1636	1604	1475	Fairland/White Oak
Columbia Pike at Greencastle Rd	11/15/2006	1607	1575	1475	Fairland/White Oak
Columbia Pike at Industrial Pkwy	9/5/2007	1061	1365	1475	Fairland/White Oak
Columbia Pike at Lockwood Dr	10/26/2004	1699	1374	1475	Fairland/White Oak
Columbia Pike at Milestone/Stewart	8/30/2007	986	1520	1475	Fairland/White Oak
Columbia Pike at Musgrove Rd	9/13/2007	1265	1279	1475	Fairland/White Oak
Columbia Pike at Prelude Dr	3/21/2006	1362	1406	1475	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	1475	Fairland/White Oak
Columbia Pike at Tech Rd	9/5/2007	1192	1411	1475	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	1475	Aspen Hill
Connecticut Ave at Bel Pre Rd	6/1/2006	1069	1227	1475	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
Connecticut Ave at Dunlop St	2/2/2006	1025	999	1600	Bethesda/Chevy Chase
Connecticut Ave at East West Hwy	3/29/2006	1831	1829	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	10/8/2002	1063	880	1475	Aspen Hill
Connecticut Ave at Jones Bridge Rd	6/6/2007	1731	2017	1600	Bethesda/Chevy Chase
Connecticut Ave at Knowles Ave	9/4/2002	1433	1274	1600	Kensington/Wheaton
Connecticut Ave at Manor Rd	4/27/2004	1324	1299	1600	Bethesda/Chevy Chase
Connecticut Ave at Perry	2/11/2004	1188	1018	1600	Kensington/Wheaton
Connecticut Ave at Randolph Rd	3/3/2004	1631	1550	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	10/18/2005	1335	974	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	989	892	1350	Poolesville
Darnestown Rd at Darnestown-Germantn Rd	10/5/2005	1291	1060	1350	Darnestown/Travilah
Darnestown Rd at Glen Mill Rd	9/27/2007	1124	1038	1500	Rockville City
Darnestown Rd at Muddy Branch Rd	10/23/2007	1697	1250	1450	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	1450	North Potomac
Darnestown Rd at Quince Orchard Rd	10/2/2007	1311	1123	1450	North Potomac
Darnestown Rd at Riffle Ford Rd	11/9/2004	1558	1769	1450	North Potomac
Darnestown Rd at Seneca Rd (MD 112)	2/9/2006	1152	1160	1350	Darnestown/Travilah
Darnestown Rd at Shady Grove Rd	9/11/2007	1098	794	1500	Rockville City
Darnestown Rd at Travilah Rd	9/27/2007	1002	1330	1450	North Potomac
Darnestown Rd at Tschiffely Square Rd	10/2/2007	1202	997	1450	North Potomac
Darnestown-Germantown Rd at Clopper Rd	9/13/2006	1044	1361	1425	Germantown West
Darnestown-Germantown Rd at Middlebrook	10/23/2007	1256	1423	1600	Germantown Town Center
Darnestown-Germantown Rd at Observation	3/29/2007	942	1065	1425	Germantown East

Source: M-NCPPC Intersection Database

Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

Darnestown-Germantown Rd at Wisteria Dr	10/18/2007	894	1356	1600	Germantown Town Center
Deer Park Dr at Railroad Ave	5/6/2003	1060	1034	1475	Derwood
Democracy Blvd at Falls Rd/S Glen Rd	12/9/2003	1390	1204	1450	Potomac
Democracy Blvd at Fernwood Rd	3/14/2006	1185	1348	1550	North Bethesda
Democracy Blvd at I-270	6/3/2004	1184	1371	1450	Potomac
Democracy Blvd at Rockledge Dr	4/21/2005	724	1013	1550	North Bethesda
Democracy Blvd at Seven Locks Rd	10/12/2005	1365	1278	1450	Potomac
Democracy Blvd at Westlake Terr	5/24/2005	835	869	1450	Potomac
E Gude Dr at Calhoun Dr	10/27/2005	1175	1084	1475	Derwood
E Gude Dr at Crabbs Branch/Cecil	10/27/2005	1395	1135	1475	Derwood
E Gude Dr at Southlawn Ln	9/28/2004	1545	1211	1500	Rockville City
E Randolph Rd at Fairland Rd/Octagon La	6/1/2006	1081	1357	1475	Fairland/White Oak
E Randolph Rd at Old Columbia Pike	9/13/2007	903	1080	1475	Fairland/White Oak
E Randolph Rd at Serpentine Way	9/13/2007	718	873	1475	Fairland/White Oak
E Randolph Rd at Tamarack Ln	10/29/2003	633	589	1475	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 Newell/Blair Mill	12/14/2005	745	838	1800	Silver Spring CBD
East-West Hwy at 16th St	12/6/2006	1625	1669	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	1047	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	851	1600	Silver Spring/Takoma Park
East-West Hwy at Waverly	3/21/2007	786	781	1800	Bethesda CBD
Edgemoor Ln at Woodmont Ave	1/31/2007	912	734	1800	Bethesda CBD
Ethan Allen Ave (MD 410) at Carroll Ave	12/21/2005	1251	774	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	1475	Fairland/White Oak
Falls Rd at Bells Mill Rd	5/29/2003	885	995	1450	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	1450	Potomac
Falls Rd at Wootton Pkwy	11/8/2006	1313	1203	1500	Rockville City
Father Hurley Blvd at Crystal Rock Dr	1/11/2007	984	956	1425	Germantown West
Father Hurley Blvd at Middlebrook Rd	5/17/2006	1102	1139	1425	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	4/13/2005	711	903	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	1450	R&D Village
Fields Rd at Washingtonian Blvd	9/14/2005	455	747	1450	R&D Village
First St at Baltimore Rd	1/13/2005	1193	1602	1500	Rockville City

Source: M-NCPPC Intersection Database

Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

Frederick Ave at Education Blvd	10/27/2004	1324	944	1450	Gaithersburg City
Frederick Ave at Plummer Dr	12/7/2005	999	959	1425	Germantown East
Frederick Ave at Travis	10/13/2004	1056	1212	1450	Gaithersburg City
Frederick Rd (MD 355) at King Farm Blvd	3/6/2008	1556	2021	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	1425	Germantown East
Frederick Rd at Chestnut St	9/30/2004	1260	1204	1450	Gaithersburg City
Frederick Rd at Christopher St	11/9/2004	1237	1566	1450	Gaithersburg City
Frederick Rd at Clarksburg Rd	5/10/2006	1362	1482	1425	Clarksburg
Frederick Rd at Darnestown-Germantown Rd	3/5/2008	1670	1479	1425	Germantown East
Frederick Rd at Deer Park Dr	3/10/2004	1381	1192	1475	Derwood
Frederick Rd at Gunners Branch Rd	10/19/2004	940	937	1425	Germantown East
Frederick Rd at Henderson Corner Rd	11/4/2004	1088	854	1425	Germantown East
Frederick Rd at Lakeforest/Perry	3/10/2004	995	974	1450	Gaithersburg City
Frederick Rd at Montgomery Village Ave	5/5/2005	1560	1427	1450	Gaithersburg City
Frederick Rd at Newcut Rd	5/23/2006	1000	1034	1425	Clarksburg
Frederick Rd at Odenhal Ave	11/10/2004	1049	1372	1450	Gaithersburg City
Frederick Rd at Old Hundred Rd (MD 109)	10/12/2004	708	613	1350	Goshen
Frederick Rd at Redland Rd	10/19/2004	1542	1418	1800	Shady Grove
Frederick Rd at Ridge Rd	3/29/2007	1036	1496	1425	Germantown East
Frederick Rd at Shady Grove Rd	3/10/2005	1649	1497	1800	Shady Grove
Frederick Rd at Shakespeare Blvd	4/15/2004	1269	1018	1425	Germantown East
Frederick Rd at Solid Waste Drwy	9/21/2004	1280	1102	1800	Shady Grove
Frederick Rd at Stringtown Rd	5/18/2006	1289	1239	1425	Clarksburg
Georgia Ave at 16th St	6/2/2005	1075	1270	1600	Silver Spring/Takoma Park
Georgia Ave at Arcola Ave	2/23/2006	1231	1471	1600	Kensington/Wheaton
Georgia Ave at Aspen Hill Rd	6/6/2006	1018	1130	1475	Aspen Hill
Georgia Ave at August Dr	11/19/2003	1221	1002	1600	Kensington/Wheaton
Georgia Ave at Bel Pre Rd	6/1/2006	1530	1530	1475	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	5/10/2005	1631	1542	1600	Silver Spring/Takoma Park
Georgia Ave at Connecticut Ave	5/31/2006	1377	1539	1475	Aspen Hill
Georgia Ave at Dennis Ave	6/7/2007	1447	1437	1600	Kensington/Wheaton
Georgia Ave at East-West/Burlington/13th	12/7/2006	1471	1190	1800	Silver Spring CBD
Georgia Ave at Emory Ln	6/1/2006	1227	1461	1450	Olney
Georgia Ave at Forest Glen Rd	6/6/2007	1553	1377	1600	Kensington/Wheaton
Georgia Ave at Glenallen Ave	1/9/2003	963	1232	1800	Glenmont
Georgia Ave at Gold Mine Rd	3/15/2007	855	814	1450	Olney
Georgia Ave at Hathaway Dr	12/8/2004	1142	940	1600	Kensington/Wheaton
Georgia Ave at Hewitt Ave	1/12/2005	807	876	1600	Kensington/Wheaton
Georgia Ave at Hines/Prince Phillip	3/6/2007	1221	1145	1450	Olney
Georgia Ave at I-495 ramps	11/20/2003	1142	1206	1600	Kensington/Wheaton
Georgia Ave at International	12/18/2003	931	1012	1475	Aspen Hill
Georgia Ave at King William Dr	12/9/2003	1192	1095	1450	Olney
Georgia Ave at Layhill Rd	9/15/2005	1200	1071	1800	Glenmont
Georgia Ave at MD 108	3/15/2007	1337	1251	1450	Olney
Georgia Ave at Morningwood/Spartan	1/8/2002	1069	1293	1450	Olney
Georgia Ave at New Hampshire Ave	2/14/2006	1457	1356	1350	Patuxent
Georgia Ave at Norbeck Rd	6/1/2006	1703	1567	1475	Aspen Hill
Georgia Ave at Old Baltimore Rd	3/8/2007	1487	1077	1450	Olney

Source: M-NCPPC Intersection Database

Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

Georgia Ave at Plyers Mill Rd	11/18/2003	1626	1248	1600	Kensington/Wheaton
Georgia Ave at Prince Phillip/Queen Eliz	3/8/2007	1158	1104	1450	Olney
Georgia Ave at Randolph Rd	2/23/2006	2069	1910	1800	Glenmont
Georgia Ave at Reedie Dr	11/28/2007	1032	1184	1800	Wheaton CBD
Georgia Ave at Rossmoor Ln	6/7/2006	1052	934	1475	Aspen Hill
Georgia Ave at Seminary	4/7/2005	1462	1374	1600	Silver Spring/Takoma Park
Georgia Ave at Shorefield Ln	2/23/2006	1066	1244	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
Georgia Ave at Urbana Ln	11/19/2003	783	778	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 at Dawson Farm Rd	2/14/2002	1244	1108	1425	Germantown West
Goshen Rd at Centerway Rd	9/19/2002	1214	1212	1425	Montgomery Village/Airpark
Goshen Rd at E Village Ave	3/25/2004	1025	891	1425	Montgomery Village/Airpark
Goshen Rd at Snouffer School/Wightman	1/4/2006	1041	1366	1425	Montgomery Village/Airpark
Goshen Rd at Warfield Rd	3/25/2004	1078	1105	1425	Montgomery Village/Airpark
Goshen Rd/N Summit at Odenhal Ave	5/9/2006	983	1225	1425	Montgomery Village/Airpark
Great Seneca Hwy at Clopper Mill/Richter	12/14/2004	1082	836	1425	Germantown West
Great Seneca Hwy at Darnestown Rd	9/27/2007	1028	1009	1450	R&D Village
Great Seneca Hwy at Dawson Farm Rd	10/25/2005	608	708	1425	Germantown West
Great Seneca Hwy at Key West Ave	10/3/2007	1227	1114	1450	R&D Village
Great Seneca Hwy at Lakeland Blvd	10/3/2007	1754	1498	1450	Gaithersburg City
Great Seneca Hwy at Mateney Rd (S)	3/30/2006	1094	1335	1425	Germantown West
Great Seneca Hwy at Middlebrook Rd	3/29/2007	980	1224	1425	Germantown West
Great Seneca Hwy at Muddy Branch Rd	3/5/2008	1654	2179	1450	Gaithersburg City
Great Seneca Hwy at Queenstown La	12/14/2004	887	764	1425	Germantown West
Great Seneca Hwy at Sam Eig Hwy	10/10/2007	1240	1348	1450	R&D Village
Great Seneca Hwy at Wisteria Dr	3/29/2006	637	868	1425	Germantown West
Gude Dr at Dover	6/17/2003	1148	1436	1475	Derwood
Hungerford Dr (MD 355) at Campus Dr	10/28/2004	1496	980	1500	Rockville City
Hungerford Dr (MD 355) at Manakee St	10/27/2004	1504	1027	1500	Rockville City
Hungerford Dr at Beall St	10/14/2004	839	965	1500	Rockville City
Hungerford Dr at College Pkwy	10/27/2004	1382	958	1500	Rockville City
Hungerford Dr at Middle Ln/Park Rd	10/21/2004	1352	1370	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
Hungerford Ln (MD 355) at Gude Dr	10/26/2004	1656	1447	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	1450	R&D Village
Key West Ave at Darnestown Rd	9/27/2007	1085	1058	1450	North Potomac
Key West Ave at Medical Ctr/Omega Dr	10/2/2007	1313	1359	1450	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 Ednor Rd/Norwood Rd	10/17/2006	1577	1230	1450	Olney
Layhill Rd at Glenallen Ave	9/15/2005	828	980	1600	Kensington/Wheaton
Layhill Rd at Middlevale	3/11/2005	1002	800	1600	Kensington/Wheaton

Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

Laytonsville Rd at Brink/Sundown	11/2/2006	1422	1433	1350	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
Main St Damascus at Woodfield Rd	5/11/2006	599	1113	1400	Damascus
Massachusetts Ave at Biltmore	3/3/2005	1201	856	1600	Bethesda/Chevy Chase
Massachusetts Ave at Cromwell	3/2/2005	675	530	1600	Bethesda/Chevy Chase
Massachusetts Ave at Little Falls Pkwy	4/18/2007	1204	980	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	1450	Olney
MD 108 at Norwood Rd	9/19/2006	1234	1245	1450	Olney
MD 108 at Spartan	3/8/2007	965	1094	1450	Olney
MD 118 at Aircraft Dr	1/11/2007	880	1080	1600	Germantown Town Center
MD 118 at Crystal Rock Dr	5/16/2006	869	1232	1600	Germantown Town Center
MD 124 at Airpark Rd	3/21/2007	912	832	1425	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	10/13/2004	1450	1590	1500	Rockville City
MD 355 at Elm/Waverly	3/27/2007	762	954	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	6/6/2007	1462	1248	1500	Rockville City
MD 355 at Middlebrook (N)	4/29/2004	992	1351	1425	Germantown East
MD 355 at Professional	10/20/2004	1232	1184	1450	Gaithersburg City
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	3/16/2004	784	1057	1450	Gaithersburg City
MD 355 at Willard/Wisconsin Circle	5/18/2005	998	863	1800	Friendship Heights
MD 355 at Woodmont Ave	2/8/2007	1022	1800	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	964	1371	1500	Rockville City
Midcounty Hwy at Goshen Rd	3/16/2004	1140	1255	1425	Montgomery Village/Airpark
Midcounty Hwy at Montgomery Village Ave	3/9/2004	1110	1553	1425	Montgomery Village/Airpark
Midcounty Hwy at Washington Grove Ln	3/22/2005	1508	1196	1475	Derwood
Midcounty Hwy at Woodfield/Saybrooke	3/16/2004	1150	838	1450	Gaithersburg City
Middlebrook Rd at Crystal Rock Dr	3/29/2007	889	890	1600	Germantown Town Center
Middlebrook Rd at Waring Station Dr	10/28/2004	959	1081	1425	Germantown West
Mont. Village Ave at Chris/Lost Knife	5/9/2006	1037	1454	1425	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	1425	Montgomery Village/Airpark
Montgomery Village Ave at Centerway Rd	9/18/2002	1012	1171	1425	Montgomery Village/Airpark
Montgomery Village Ave at Russell Ave	3/6/2008	962	1755	1450	Gaithersburg City
Montrose Rd at E Jefferson St	6/5/2007	1278	1495	1550	North Bethesda
Montrose Rd at Falls Rd	11/8/2006	678	942	1450	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

Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

Montrose Rd at Seven Locks Rd	11/8/2006	999	860	1450	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	1450	Potomac
Muddy Branch Rd at Diamondback Dr	10/9/2007	1563	1195	1450	Gaithersburg City
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	4/12/2005	1258	1246	1350	Rock Creek
Muncaster Mill Rd at Bowie Mill Rd	4/12/2005	1314	1263	1350	Rock Creek
Muncaster Mill Rd at Needwood Rd	4/12/2005	1397	1510	1350	Rock Creek
Muncaster Rd at MD 108	6/3/2004	1638	1277	1350	Patuxent
MVA at Lakeforest Mall	11/10/2004	876	999	1425	Montgomery Village/Airpark
New Hampshire Ave at Adelphi/Dilston	1/13/2004	1253	1450	1600	Silver Spring/Takoma Park
New Hampshire Ave at Bonifant/Good Hope	5/25/2004	1476	1227	1450	Cloverly
New Hampshire Ave at Briggs Chaney Rd	2/6/2007	882	892	1450	Cloverly
New Hampshire Ave at Cape May Rd	2/1/2005	1459	1207	1475	Fairland/White Oak
New Hampshire Ave at Chalmers	5/24/2006	1097	1042	1475	Fairland/White Oak
New Hampshire Ave at Columbia Pk Ramps	10/23/2001	1121	1452	1475	Fairland/White Oak
New Hampshire Ave at Ednor Rd	1/30/2007	1160	1213	1450	Cloverly
New Hampshire Ave at I-495/Elton Rd	3/29/2007	1117	1255	1475	Fairland/White Oak
New Hampshire Ave at Lockwood Dr	3/23/2006	1353	1108	1475	Fairland/White Oak
New Hampshire Ave at MD 108	11/30/2006	1226	1223	1350	Patuxent
New Hampshire Ave at Midland Dr	2/3/2005	991	1060	1475	Fairland/White Oak
New Hampshire Ave at Northwest/Michelson	5/31/2006	1045	927	1475	Fairland/White Oak
New Hampshire Ave at Norwood Rd	5/26/2004	1019	1121	1450	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	1475	Fairland/White Oak
New Hampshire Ave at Schindler/Mahan	5/24/2006	1083	861	1475	Fairland/White Oak
New Hampshire Ave at Spencerville Rd	1/30/2007	979	1053	1450	Cloverly
New Hampshire Ave at Wolf	3/2/2005	1144	1180	1475	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	10/12/2005	1815	1629	1500	Rockville City
Norbeck Rd at Baltimore	1/13/2005	937	1390	1475	Aspen Hill
Norbeck Rd at Bauer Dr	10/20/2005	1710	1405	1475	Aspen Hill
Norbeck Rd at Bel Pre Rd	5/31/2006	1834	1251	1475	Aspen Hill
Norbeck Rd at E Gude Dr	10/12/2005	1185	1365	1500	Rockville City
Norbeck Rd at Layhill Rd	6/8/2006	941	861	1450	Cloverly
Norbeck Rd at Muncaster Mill Rd	6/1/2006	1684	1551	1475	Aspen Hill
Norbeck Rd at Norbeck Blvd	5/31/2006	1436	1562	1475	Aspen Hill
Norbeck Rd at Norwood Rd	2/6/2007	1122	910	1450	Cloverly
Norbeck Rd at Owens Glen/Manor Care	10/9/2007	1229	950	1450	North Potomac
Norbeck Rd at Wintergate Dr	5/18/2006	1246	1338	1475	Aspen Hill
Norfolk Ave at St Elmo Ave	11/1/2006	530	629	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	1475	Fairland/White Oak
Old Columbia Pk at Spencerville Rd	11/15/2006	1062	1332	1350	Patuxent
Old Georgetown Rd at Auburn St	10/4/2006	895	1138	1800	Bethesda CBD

Source: M-NCPPC Intersection Database

Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

Old Georgetown Rd at Battery Ln	3/16/2006	1204	1320	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	1146	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/Pointdexter	3/10/2005	976	1181	1550	North Bethesda
Old Georgetown Rd at Executive Blvd	9/20/2006	0	0	1800	White Flint
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	5/26/2005	1746	1391	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	5/1/2003	1347	1452	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	1450	Olney
Olney-Laytonsville Rd at Olney Mill Rd	6/3/2004	1017	972	1450	Olney
Olney-Sandy Spg Rd at Old Baltimore Rd	3/1/2007	1366	1021	1450	Olney
Olney-Sandy Sprg Rd at Prince Philip D	3/6/2007	1031	1072	1450	Olney
Olney-Sandy Spring Rd at Doctor Bird Rd	10/18/2006	1025	1188	1450	Olney
Olney-Sandy Spring Rd at Olney Vil. Mart	1/12/2005	995	941	1450	Olney
Olney-Sandy Spring Rd at Sherwood HS	2/12/2002	1205	1163	1350	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	930	1477	1600	Silver Spring/Takoma Park
Philadelphia Ave (MD 410) at Maple Ave	5/19/2005	693	1102	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	4/20/2005	1244	1704	1600	Silver Spring/Takoma Park
Piney Branch Rd (MD 320) at Ray Dr/TPMS	12/18/2001	841	963	1600	Silver Spring/Takoma Park
Piney Branch Rd at Arliss St	9/20/2005	855	771	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	9/16/2003	706	774	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	807	1600	Silver Spring/Takoma Park
Piney Branch Rd at Sligo Ave/Hilltop	1/24/2006	1153	1085	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	1450	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	6/7/2005	1202	1339	1550	North Bethesda
Randolph Rd at Glenallen Ave	9/13/2005	1309	1026	1600	Kensington/Wheaton
Randolph Rd at Kemp Mill Rd	9/13/2005	1263	1270	1600	Kensington/Wheaton
Randolph Rd at Lauderdale	3/6/2001	1388	1663	1550	North Bethesda
Randolph Rd at Locksley	3/14/2006	1196	928	1475	Fairland/White Oak

Source: M-NCPPC Intersection Database

Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

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	3/14/2006	1491	1794	1475	Fairland/White Oak
Randolph Rd at Parklawn Dr (W)	6/1/2005	1324	1332	1550	North Bethesda
Randolph Rd at Tivoli	9/14/2005	1040	789	1600	Kensington/Wheaton
Randolph Rd at Veirs Mill Rd	9/29/2005	1314	1216	1600	Kensington/Wheaton
Redland Rd at Crabbs Branch Way	6/6/2007	1515	1682	1800	Shady Grove
Redland Rd at Somerville	6/6/2007	741	765	1800	Shady Grove
Ridge Rd at Bethesda Church Rd	10/19/2004	874	1183	1400	Damascus
Ridge Rd at Brink Rd	3/28/2007	1007	1073	1425	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	1425	Clarksburg
Ridge Rd at Lewis Dr/Locust Dr	5/16/2006	1437	1000	1400	Damascus
Ridge Rd at Main St (MD 108)	12/14/2005	893	1276	1400	Damascus
Ridge Rd at Observation Dr	3/29/2007	942	1065	1425	Germantown East
Ridge Road at Sweepstakes/Marlboro	9/7/2005	1101	1349	1400	Damascus
River Rd at Beech Tree/Nevis Rd	6/13/2007	1206	1195	1600	Bethesda/Chevy Chase
River Rd at Bradley Blvd	6/8/2006	1398	1293	1450	Potomac
River Rd at Brookside/Ridgefield	11/4/2003	1202	1071	1600	Bethesda/Chevy Chase
River Rd at Congressional/Norwood	6/7/2006	1220	1021	1450	Potomac
River Rd at Counselman	10/3/2002	1417	926	1450	Potomac
River Rd at Goldsboro Rd	10/20/2005	1141	1289	1600	Bethesda/Chevy Chase
River Rd at I-495 (E)	11/7/2002	1703	1503	1600	Bethesda/Chevy Chase
River Rd at Little Falls Pkwy	6/6/2007	1494	1573	1600	Bethesda/Chevy Chase
River Rd at Piney Meetinghouse Rd	11/14/2006	1384	1049	1450	Potomac
River Rd at Royal Dominion/Holton Arms	2/24/2004	1591	1358	1600	Bethesda/Chevy Chase
River Rd at Seven Locks Rd	6/7/2006	1356	1111	1450	Potomac
River Rd at Springfield-Kc	9/19/2006	1160	996	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	10/18/2005	1392	1484	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	Grosvenor
Rockville Pike (MD 355) at Pooks Hill Rd	6/8/2004	1621	1923	1600	Bethesda/Chevy Chase
Rockville Pike at Bou Ave	11/1/2005	1123	1288	1550	North Bethesda
Rockville Pike at Congressional Ln	6/3/2004	1108	1538	1500	Rockville City
Rockville Pike at E Jefferson/Veirs Mill	10/26/2004	1438	1305	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	6/8/2005	1013	1224	1550	North Bethesda
Rockville Pike at Fed Plz / Pike Ctr	11/2/2005	852	1064	1550	North Bethesda
Rockville Pike at Hubbard	11/2/2005	1167	1478	1550	North Bethesda
Rockville Pike at Jones Bridge/Center	12/22/2005	1306	1536	1600	Bethesda/Chevy Chase
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	5/9/2006	1809	1996	1600	Bethesda/Chevy Chase

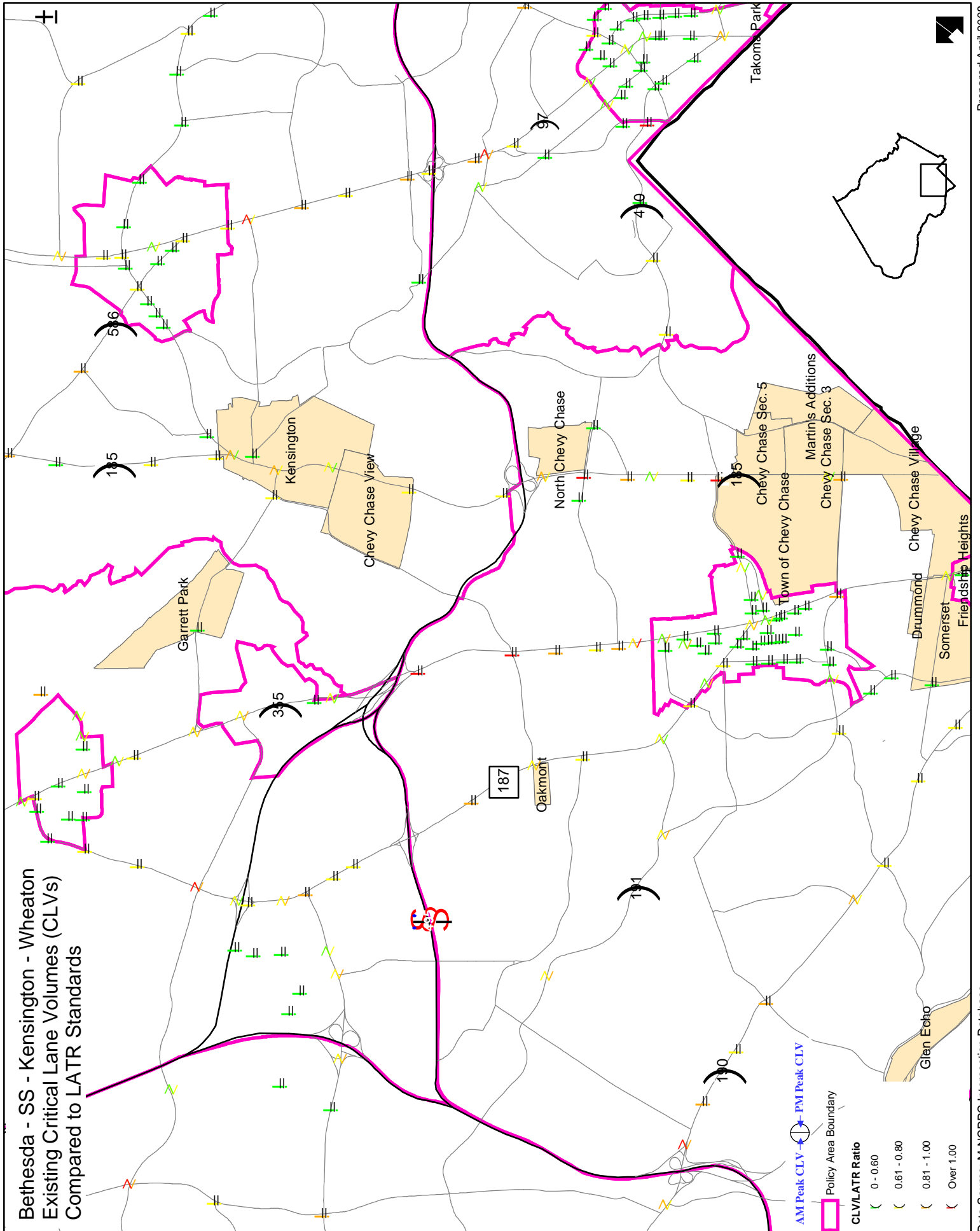
Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

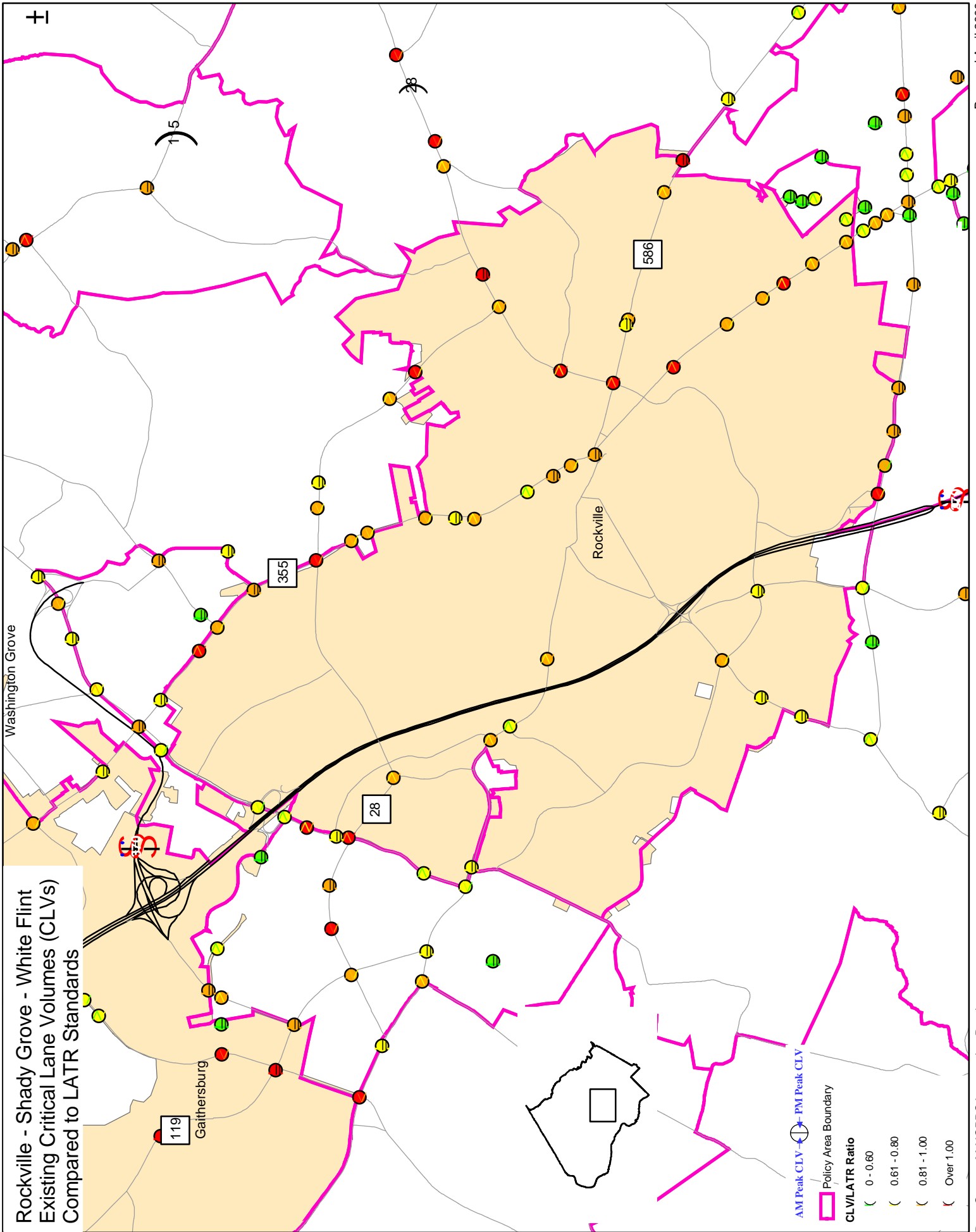
Rockville Pike at Wilson/NIH	6/10/2004	1395	1421	1600	Bethesda/Chevy Chase
Rockville Pike at Woodmont CC/Best Buy	6/8/2004	1229	1155	1500	Rockville City
Rockville Pk at Grosvenor/Beach	5/18/2004	1244	977	1800	Grosvenor
Rockville Pk at Security Ln	3/8/2005	922	994	1550	North Bethesda
Rockville Pk at Templeton Pl	6/8/2004	1272	1214	1500	Rockville City
Rockville-Pk/Twinbrook/Rollins	11/2/2005	1131	1450	1500	Rockville City
Sam Eig Hwy at Diamondback Dr	10/10/2007	933	1217	1450	R&D Village
Sam Eig Hwy at Fields Rd	10/11/2007	1456	1297	1450	R&D Village
Sandy Spring Rd at Mcknew	9/10/2003	1401	1260	1350	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	1450	Potomac
Seven Locks Rd at Gainsborough	3/13/2007	1350	1290	1450	Potomac
Seven Locks Rd at Tuckerman Ln	11/9/2006	1499	1487	1450	Potomac
Shady Grove Rd and Crabbs Branch Way	3/8/2005	1203	1115	1800	Shady Grove
Shady Grove Rd at Corporate Dr	11/30/2005	1097	1467	1450	R&D Village
Shady Grove Rd at Epsilon/Tupelo	4/6/2005	1518	1359	1475	Derwood
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 Oakmont	4/5/2005	1345	992	1800	Shady Grove
Shady Grove Rd at Research Blvd	9/25/2007	1074	1089	1450	R&D Village
Shady Grove Rd at Traville Gateway Dr	2/7/2008	431	585	1450	R&D Village
Snuffer School Rd at Centerway Rd	9/11/2002	1483	844	1425	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	1450	Potomac
Tuckerman Ln at Westlake Terr	5/17/2005	507	1021	1450	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	791	871	1600	Kensington/Wheaton
University Blv at Newport Mill/Lexington	10/18/2005	703	772	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	1250	1156	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	5/10/2005	1512	1328	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	5/10/2005	394	734	1800	Wheaton CBD
University Blvd at Midvale	6/4/2003	387	421	1800	Wheaton CBD

Source: M-NCPPC Intersection Database

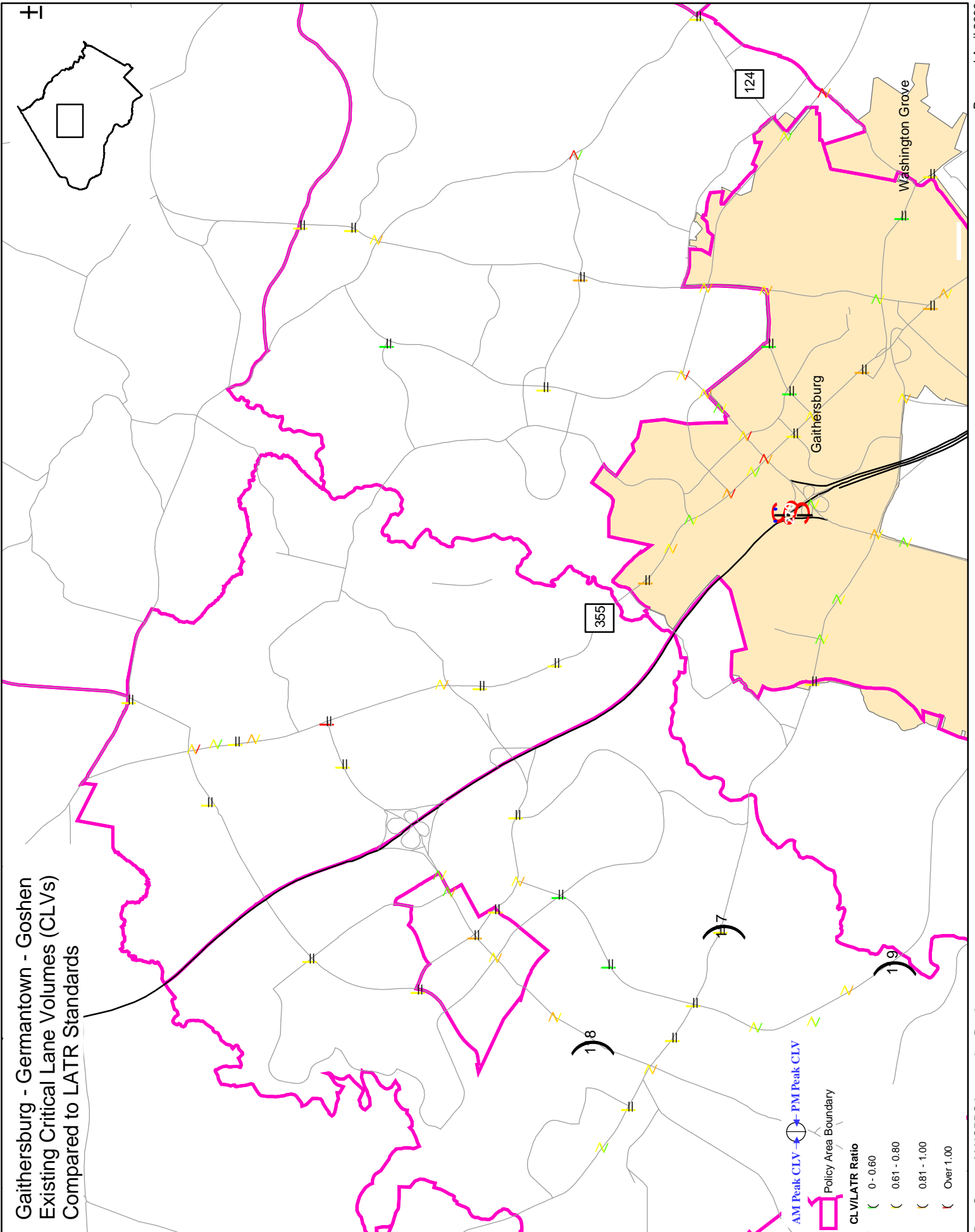
Appendix 5.1A: All Available Critical Lane Volume Data at Signalized Intersections

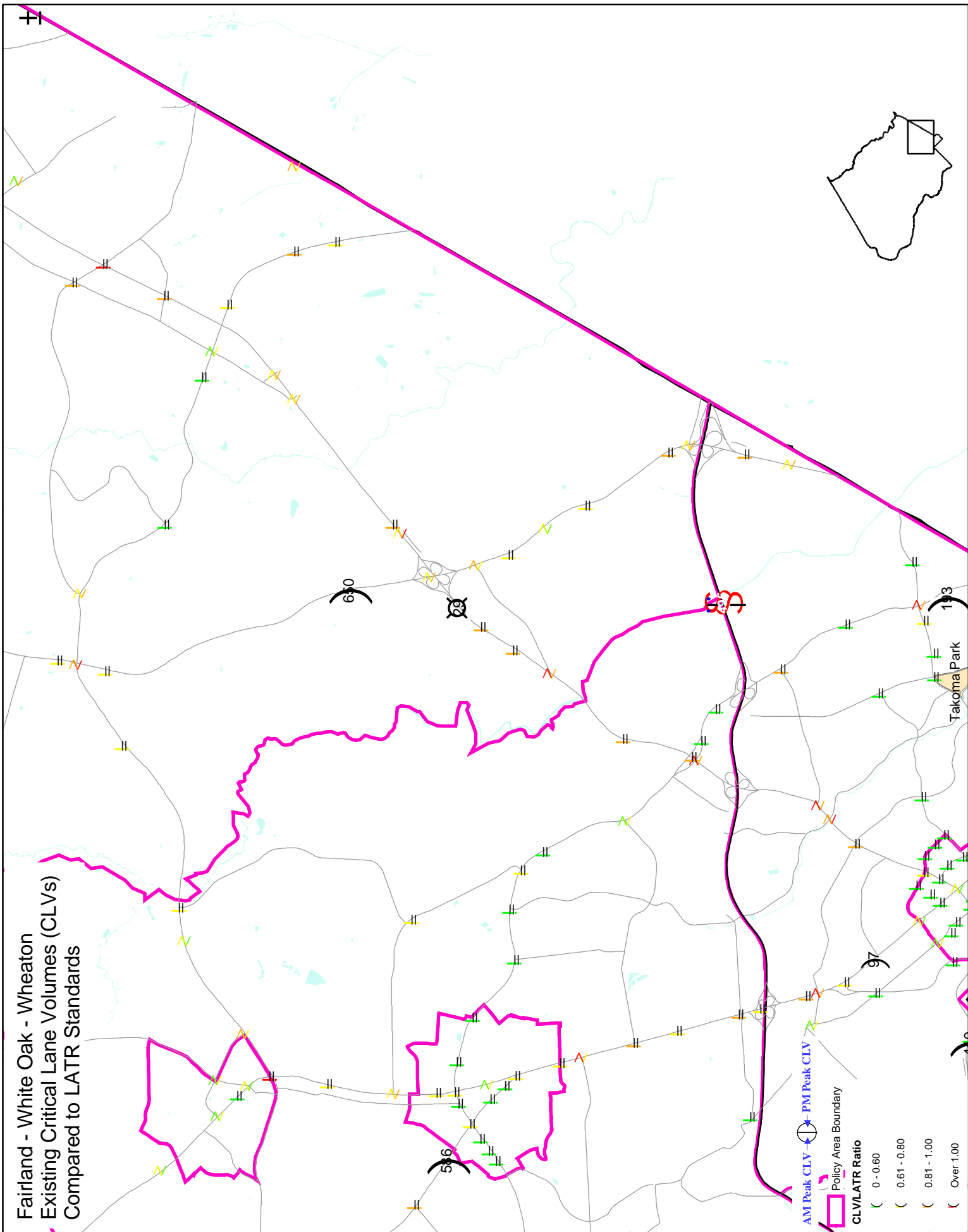
University Blvd at Piney Branch Rd	5/3/2005	1676	1582	1600	Silver Spring/Takoma Park
University Blvd at Sligo Creek Pkwy	12/13/2005	751	909	1600	Kensington/Wheaton
University Blvd at Veirs Mill Rd	4/26/2005	1202	1239	1800	Wheaton CBD
University Blvd at Williamsburg	12/13/2005	801	955	1600	Kensington/Wheaton
Veirs Mill Rd at Aspen Hill Rd	11/8/2005	1137	1102	1475	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	11/15/2005	1255	1765	1500	Rockville City
Veirs Mill Rd at Gaynor/Parkland	11/10/2005	1191	1237	1475	Aspen Hill
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 Reddie Dr	2/8/2006	836	959	1800	Wheaton CBD
Veirs Mill Rd at Robindale	11/9/2005	818	1054	1475	Aspen Hill
Veirs Mill Rd at Twinbrook Pkwy	9/8/2005	1783	1649	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	3/9/2004	1039	1227	1450	Gaithersburg City
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	1450	Potomac
Willard Ave at Friendship Blvd	4/27/2005	723	898	1800	Friendship Heights
Wisconsin Ave at Battery/Rosedale	2/8/2007	808	1745	1800	Bethesda CBD
Wisconsin Ave at Bethesda/Willow	11/9/2006	744	862	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 Elm St (S)	4/10/2007	645	737	1800	Bethesda CBD
Wisconsin Ave at Leland St	11/9/2006	824	912	1800	Bethesda CBD
Wisconsin Ave at Montgomery Ln	2/8/2007	1051	1191	1800	Bethesda CBD
Wisconsin Ave at Montgomery St/S Park Av	4/27/2005	767	753	1800	Friendship Heights
Woodfield Rd at Cypress Hill Dr	9/14/2005	895	1109	1425	Montgomery Village/Airpark
Woodfield Rd at Fieldcrest/Hadley Farms	3/10/2005	1390	1635	1425	Montgomery Village/Airpark
Woodfield Rd at Muncaster Mill Rd	9/17/2002	1038	1127	1425	Montgomery Village/Airpark
Woodfield Rd at Sweepstakes Rd	12/4/2003	1128	1076	1400	Damascus
Woodmont Ave at Battery Ln	11/1/2006	892	746	1800	Bethesda CBD
Woodmont Ave at Bethesda Ave	11/9/2006	578	732	1800	Bethesda CBD
Woodmont Ave at Cheltenham/Norfolk	5/11/2006	852	673	1800	Bethesda CBD
Woodmont Ave at Cordell Ave	2/6/2007	615	1700	1800	Bethesda CBD
Woodmont Ave at Elm St	11/9/2006	557	730	1800	Bethesda CBD
Woodmont Ave at Hampden Ln	3/28/2007	503	654	1800	Bethesda CBD
Woodmont Ave at Montgomery Ln	11/9/2006	419	434	1800	Bethesda CBD
Woodmont Ave at North Ln	2/8/2007	498	669	1800	Bethesda CBD
Woodmont Ave at St Elmo Ave	4/10/2007	628	599	1800	Bethesda CBD

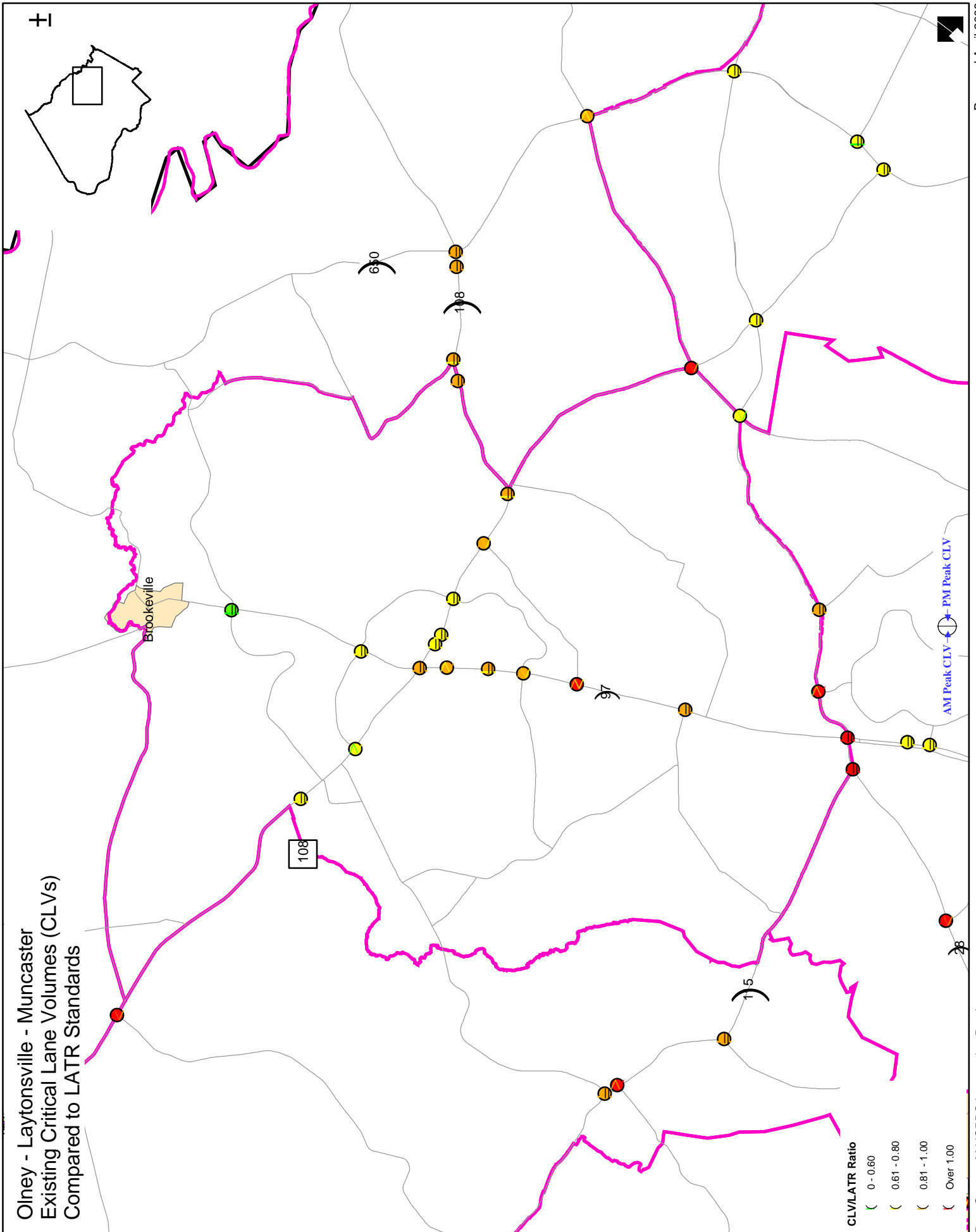


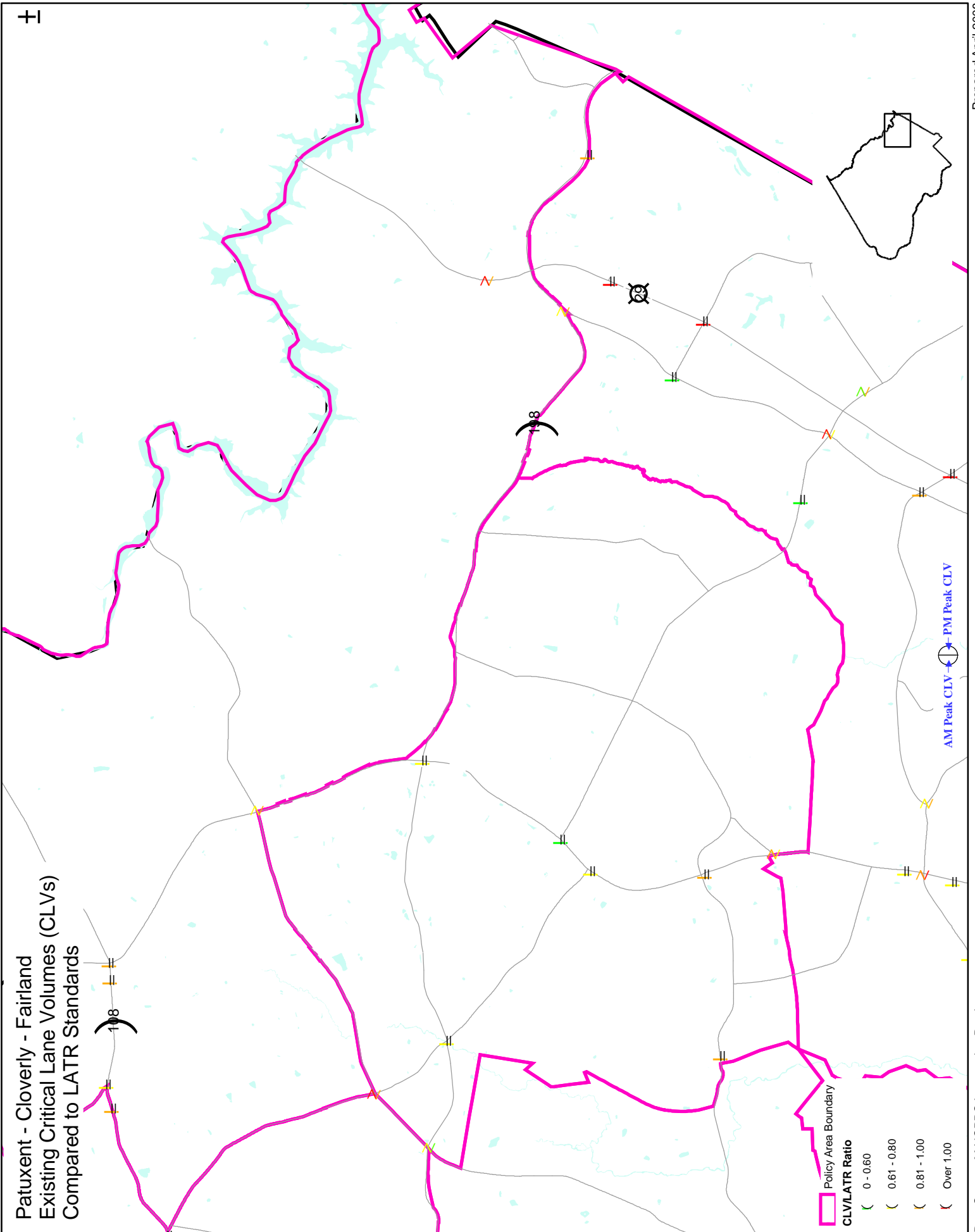


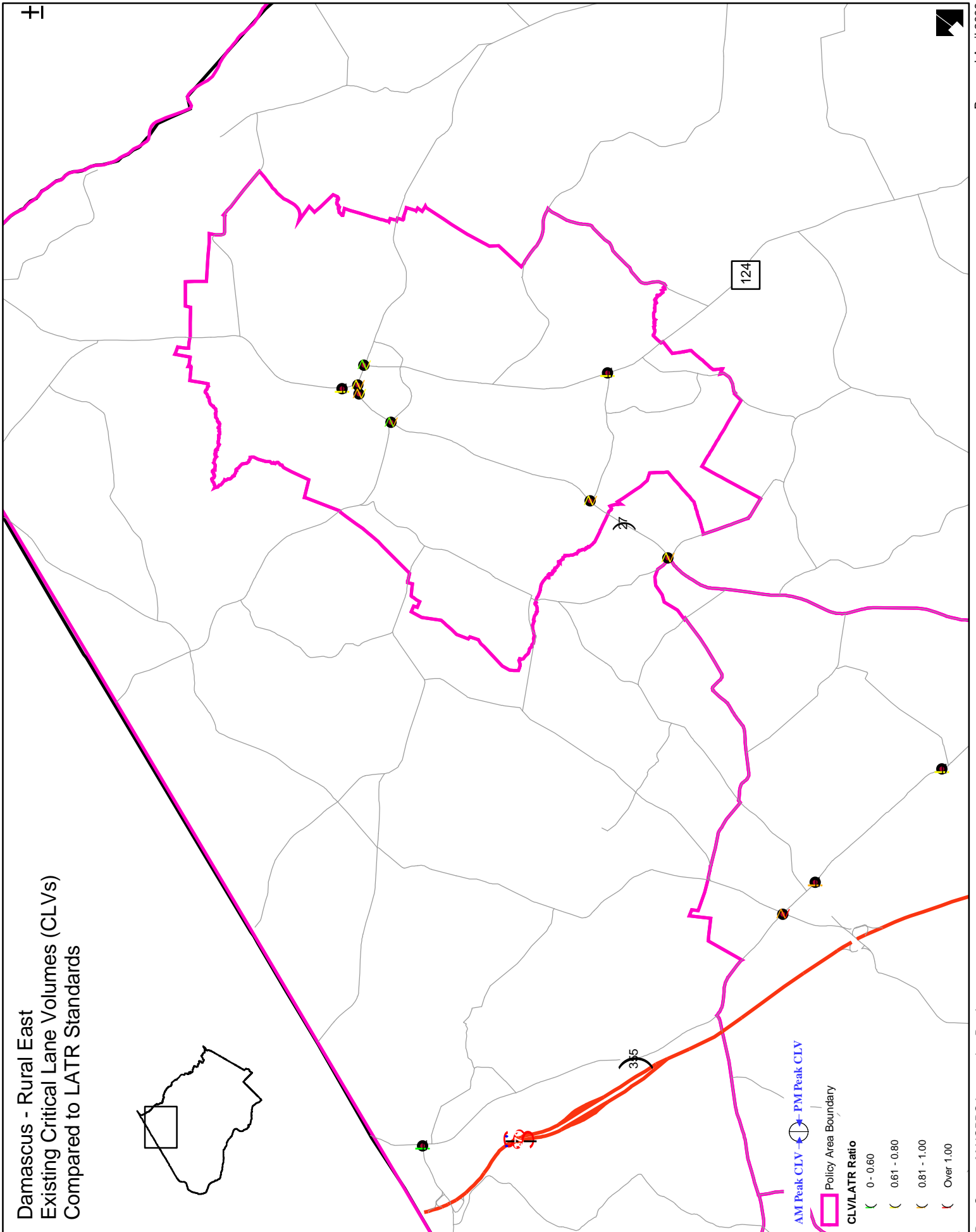
Appendix 5.1D: Map of CLVs for Gaithersburg – Germantown – Goshen











Appendix 5.2A: Arterial Travel 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 2007 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. In 2007 within the 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.

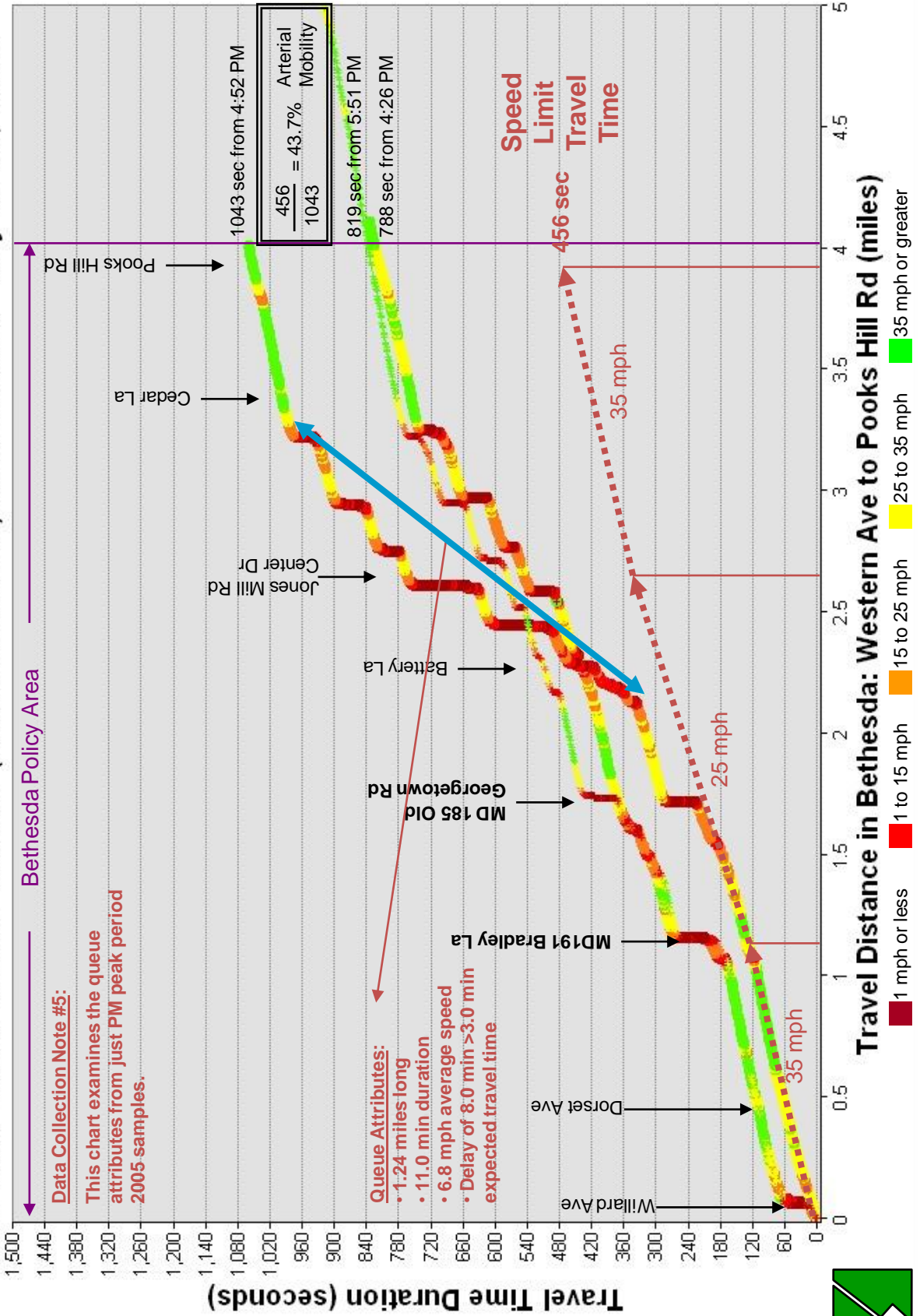
The arterial travel time and speed samples collected in 2007 represent a significant departure from the more ad hoc and limited sampling conducted in 2004, 2005, and 2006. Resources had been set-aside in the budget to carry out a more extensive and intensive sampling of travel times and speeds in support of the Annual Growth Policy (AGP) reform work that was conducted throughout most of 2007. In conjunction with the staff recommendations to the Board in early May 2007, a decision was made to perform a more extensive and intensive sampling of travel times and speeds, which was done in the last half of May and the first half of June 2007. However, it was also recognized at that time that: (1) the resources to analyze and summarize the resulting information from that data collection would not be available until FY07-08, (2) the timing of that analysis should not begin at best until after the Council had finished their review and actions, and (3) the time to carry out and summarize the resulting information would take at least until the preparation of the 2008 Highway Mobility Report commenced.

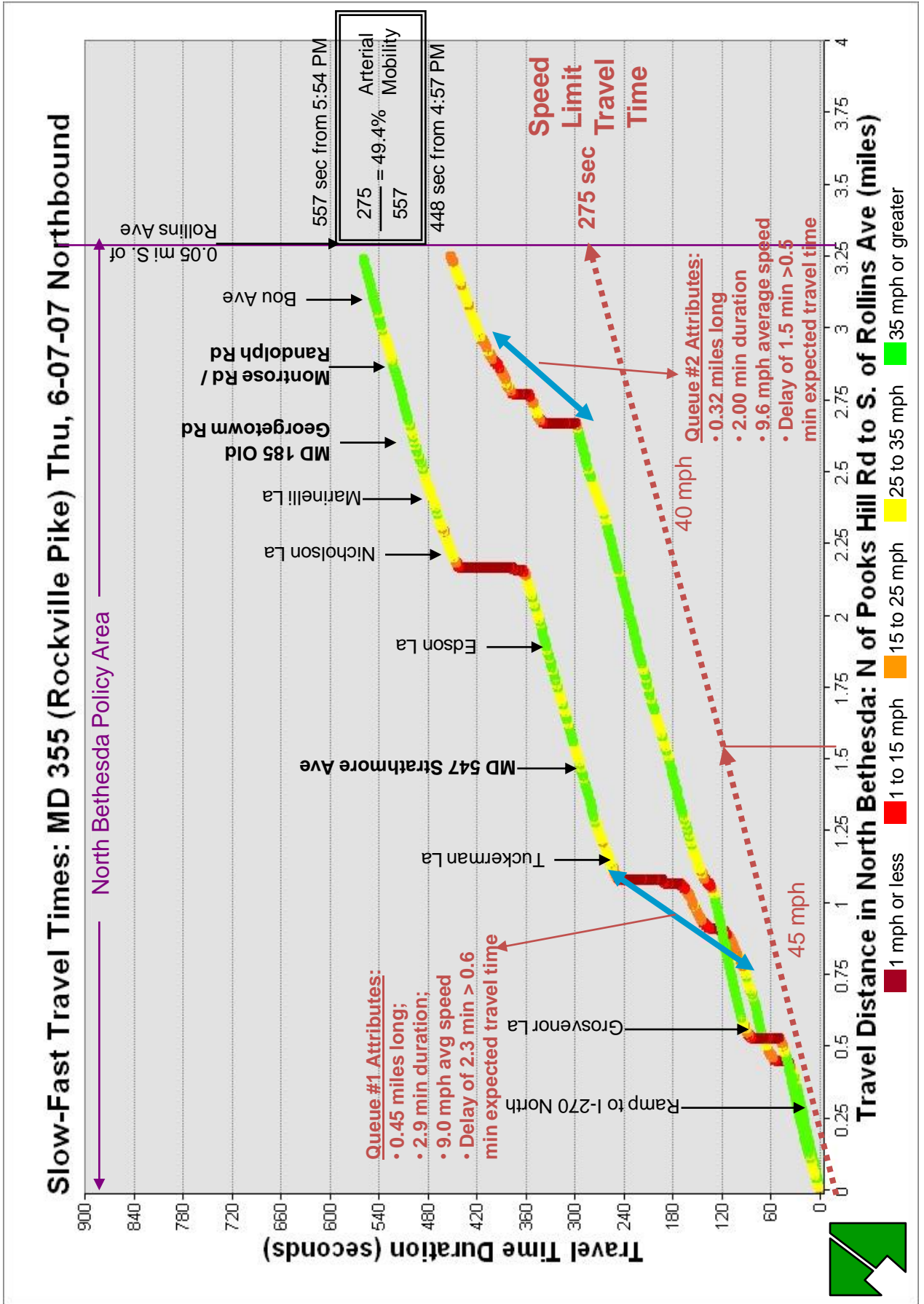
The decision to perform this sampling included the specification of a sampling approach that would be tailored to meet the needs and requirements for the expected outcome of the AGP reform options that were under consideration at that time. In particular, the sampling plan included: (a) the spatial coverage described above, (b) a spatial resolution that included most of the non-freeway roadways associated with the modeling network used in the Policy Area Mobility Review (PAMR) analysis, (c) temporal coverage initially of weekday (Monday through Thursday, non-holiday) PM peak period of 4 to 7 PM and an evening off-peak period of about 7:30 to 8:30 PM, and (d) a temporal resolution of about four samples in each direction in the peak period and two samples in the evening off-peak period.

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. The initial field supervision, training, and one probe driver were provided by Motion Maps, while the remaining probe drivers were provided by MCV and Associates. About midway through the sampling schedule, it was realized that in order to conserve resources for the purpose of sampling the full spatial extent of roadways that: (a) it would not be necessary to collect additional samples during the evening off-peak, and (b) the remaining field supervisor-driver role could be fulfilled by

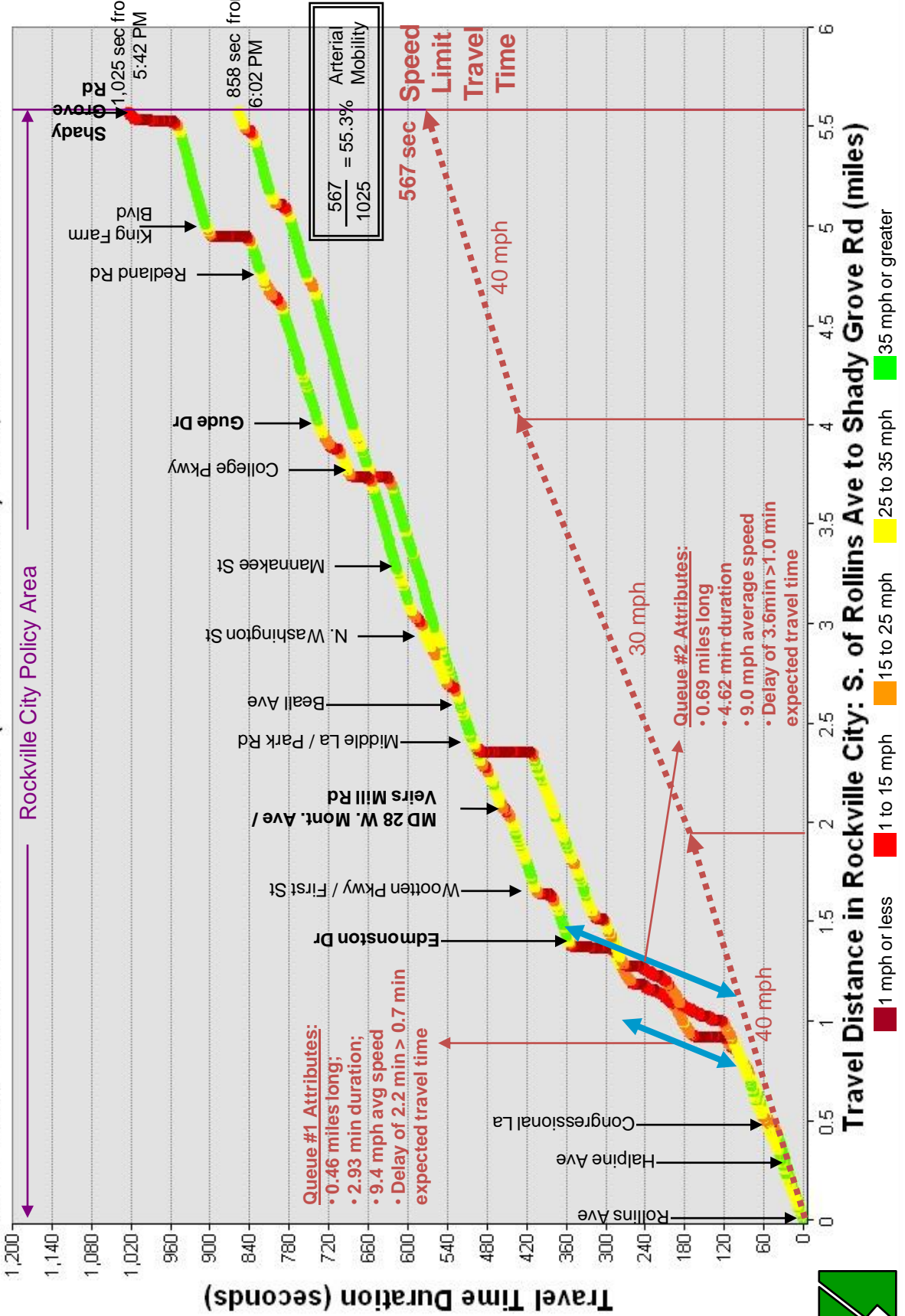
Planning staff. In the subsequent analysis and summary phases of the work, Motion Maps LLC provided training on the use of their specialized analysis software that enabled Planning staff to also work on the processing and analysis of the numerous dataset chains, ultimately converting them into trajectory samples of GPS travel time and speed. The following sections presents the summary of this information and displays derived from the arterial travel time and speed samples.

Slow-Fast Travel Times: MD 355 (Wisconsin Ave) Northbound: May 12-14, 2005

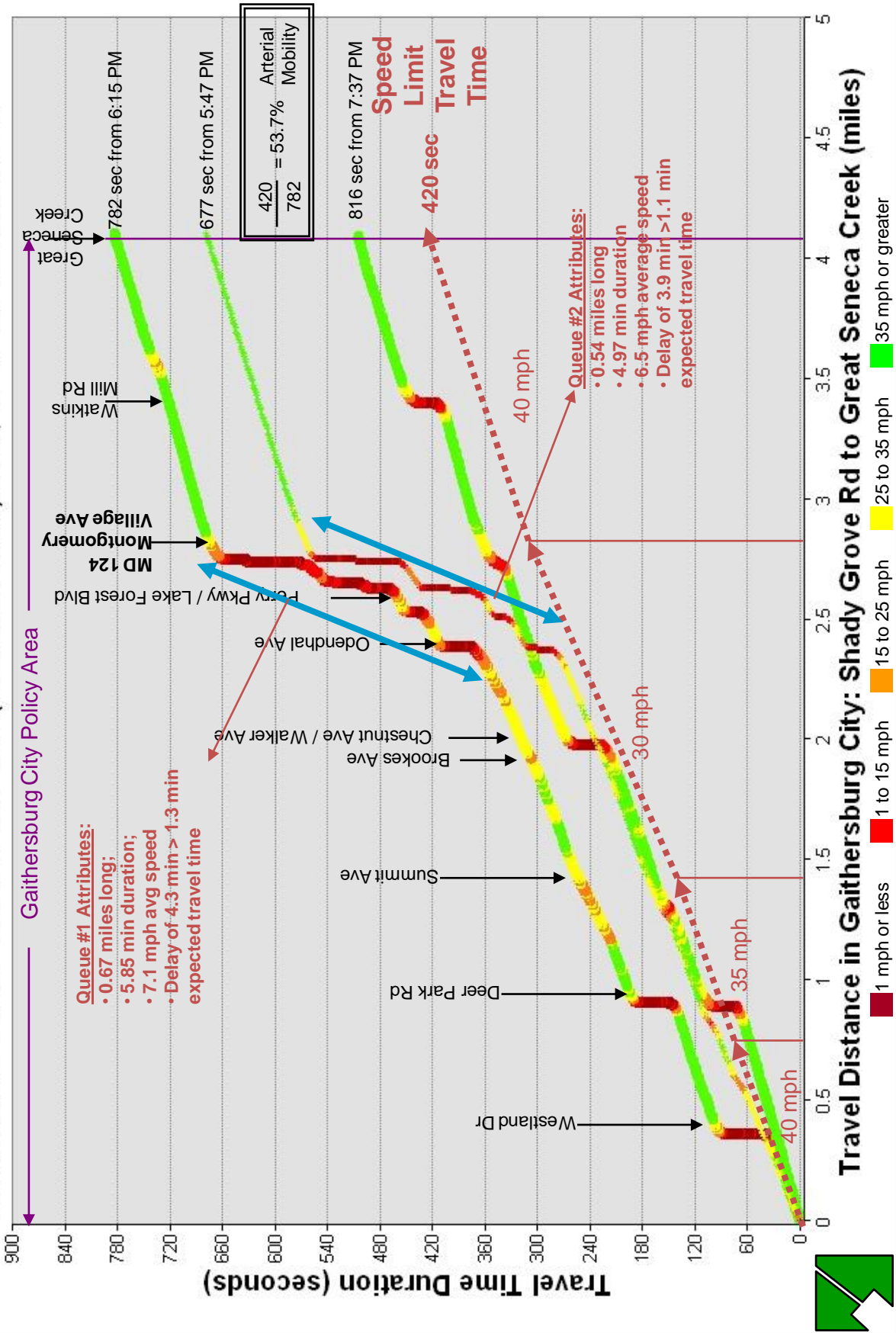




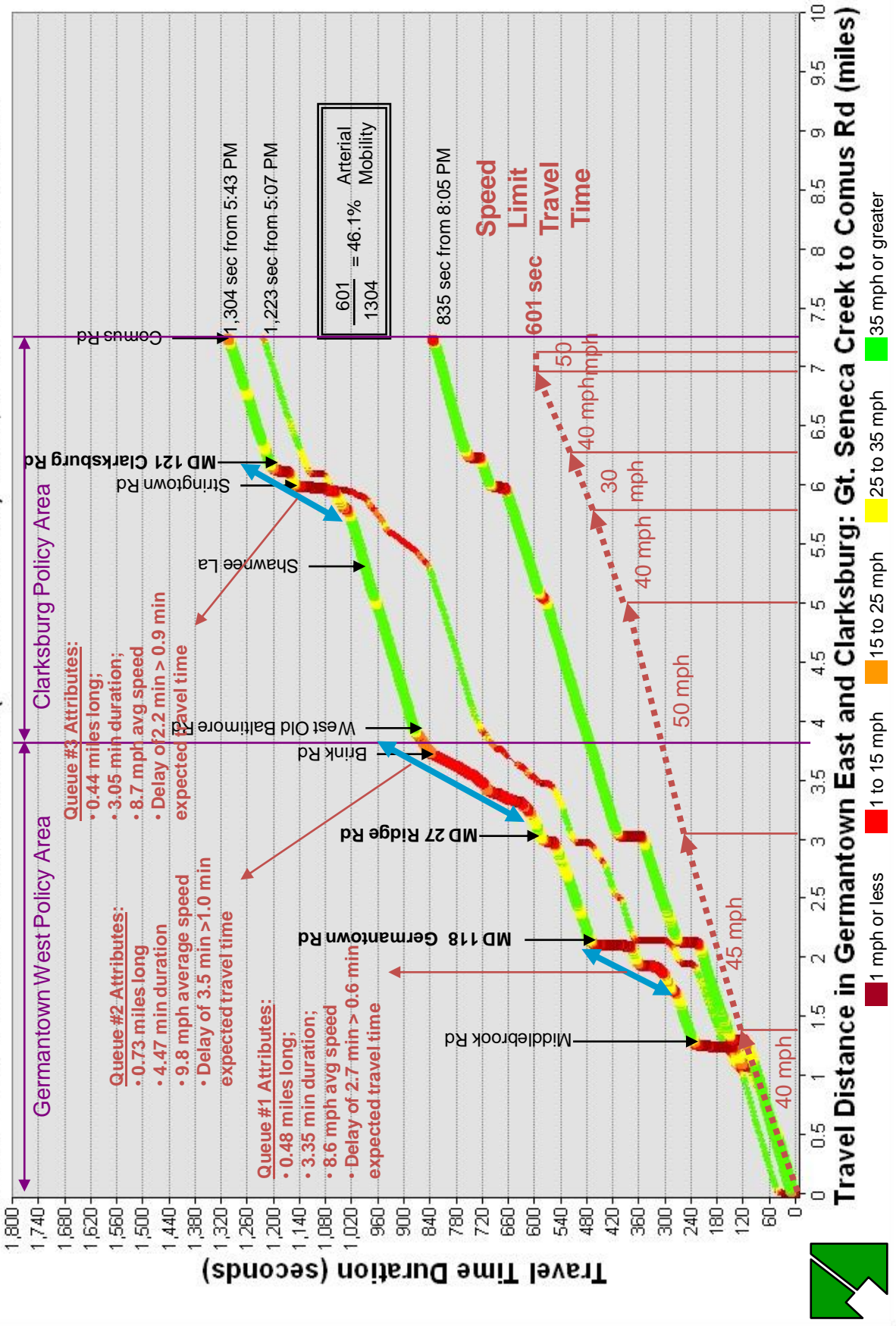
Slow-Fast Travel Times: MD 355 (Rockville Pike) Thu, 6-07-07 Northbound



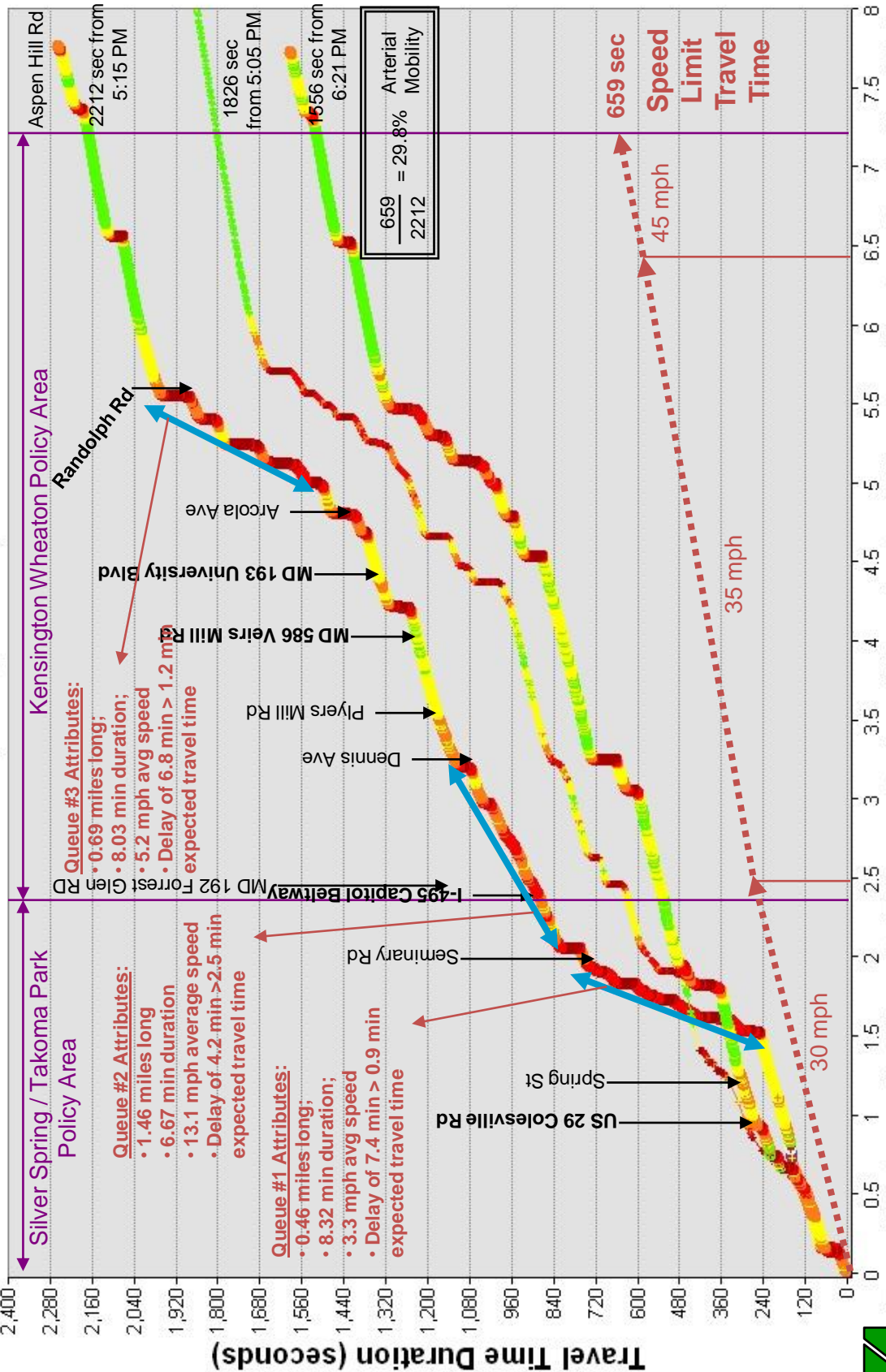
Slow-Fast Travel Times: MD 355 (Frederick Rd) Tue, 5-15-07 Northbound



Slow-Fast Travel Times: MD 355 (Frederick Rd) Mon, 5-14-07 Northbound



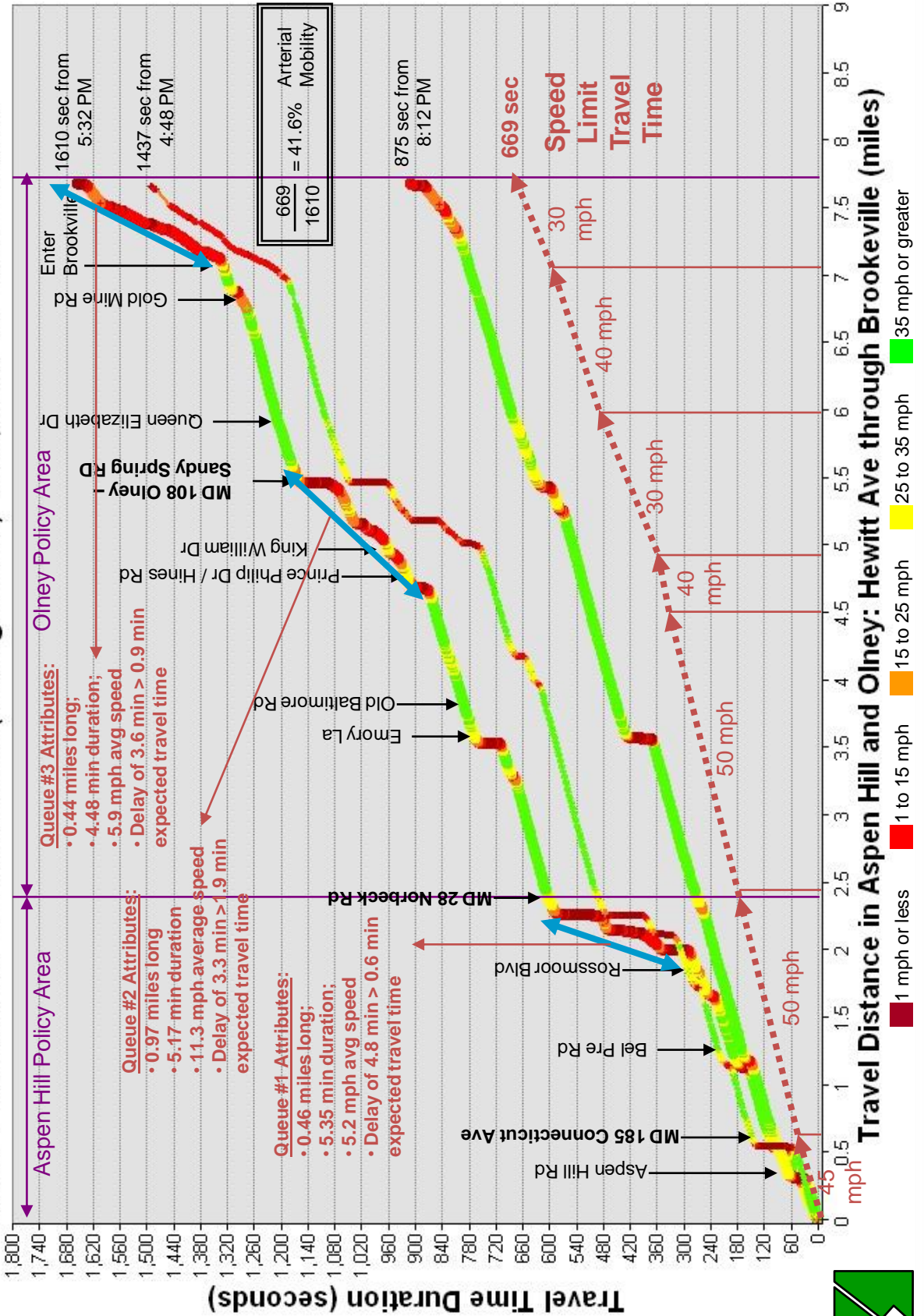
Slow-Fast Travel Times: MD 97 (Georgia Ave) Mon, 6-04-07 Northbound



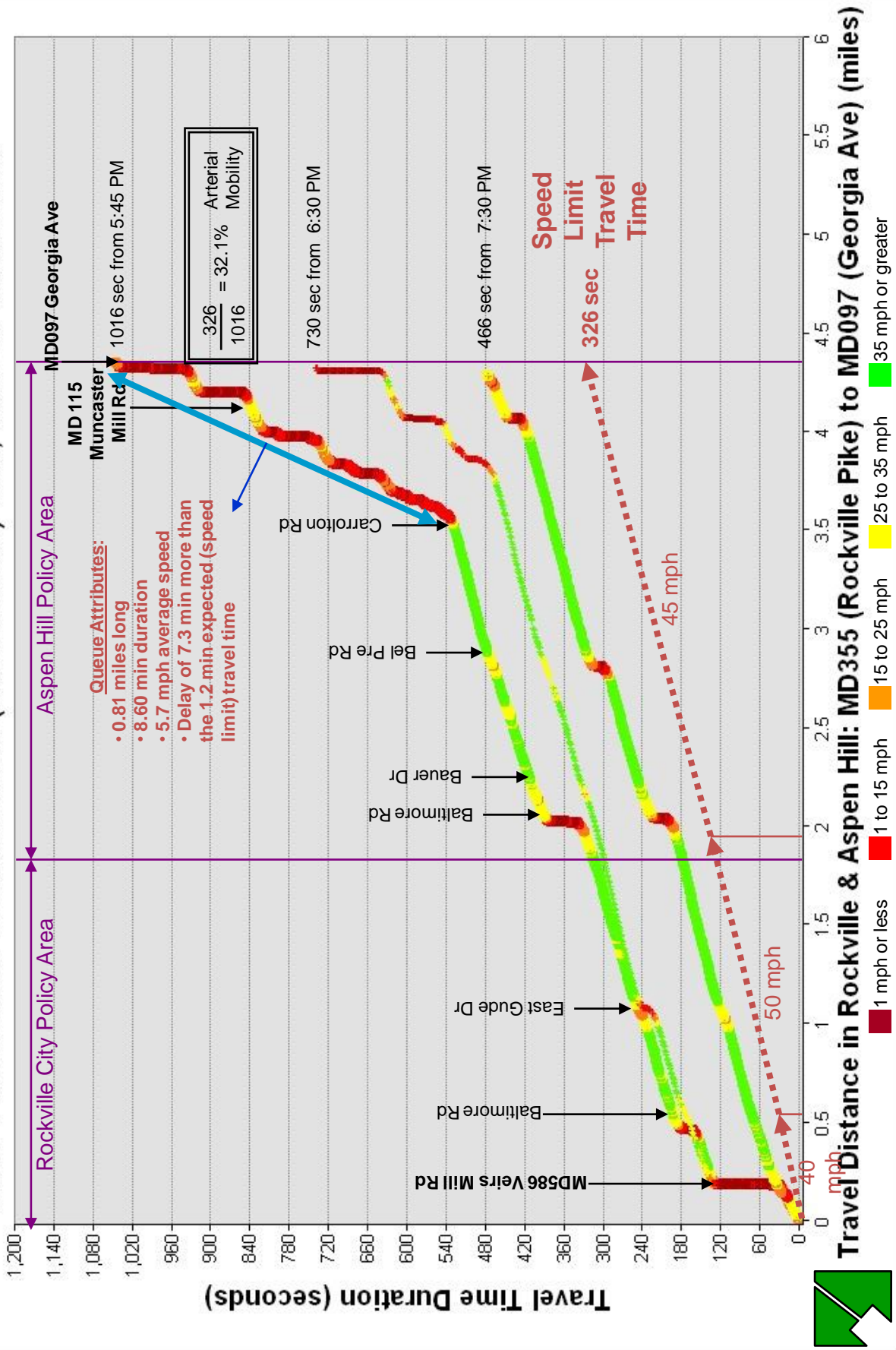
Travel Distance in Silver Sp/Takoma Park and Kensington/ Wheaton/ Eastern Ave to Hewitt Ave

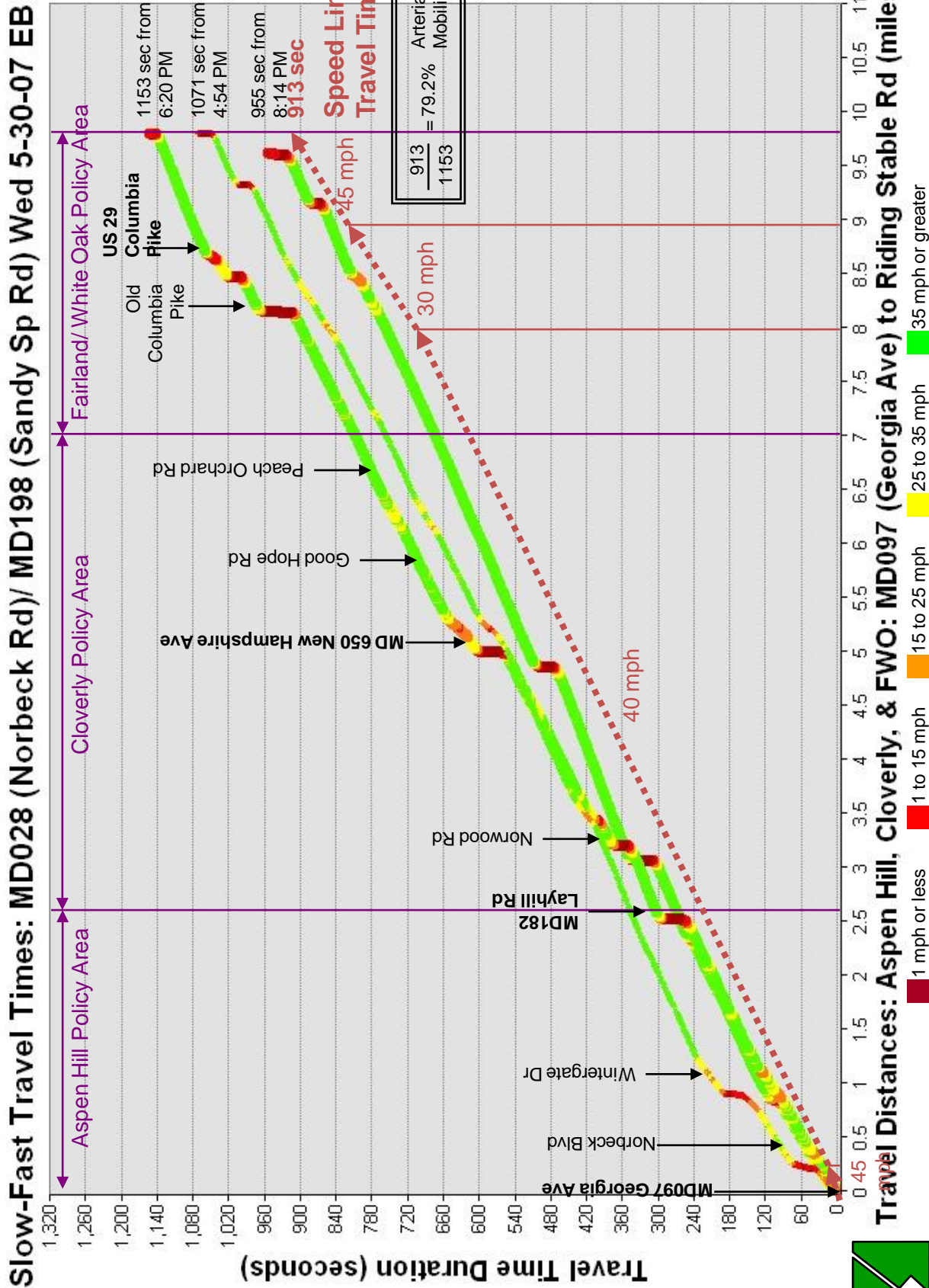
■ 1 mph or less
 ■ 1 to 15 mph
 ■ 15 to 25 mph
 ■ 25 to 35 mph
 ■ 35 mph or greater

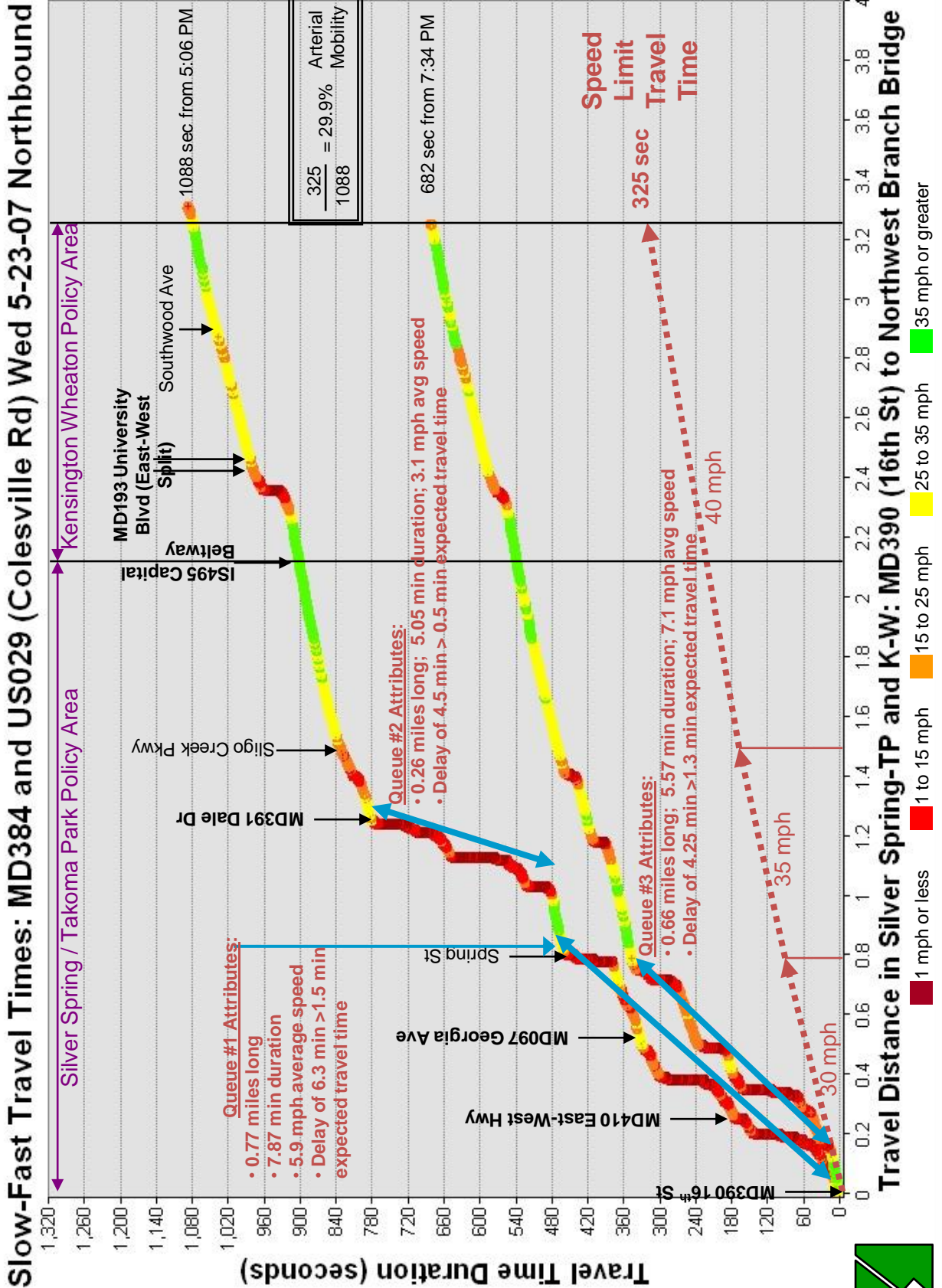
Slow-Fast Travel Times: MD 97 (Georgia Ave) Wed, 5-30-07 Northbound



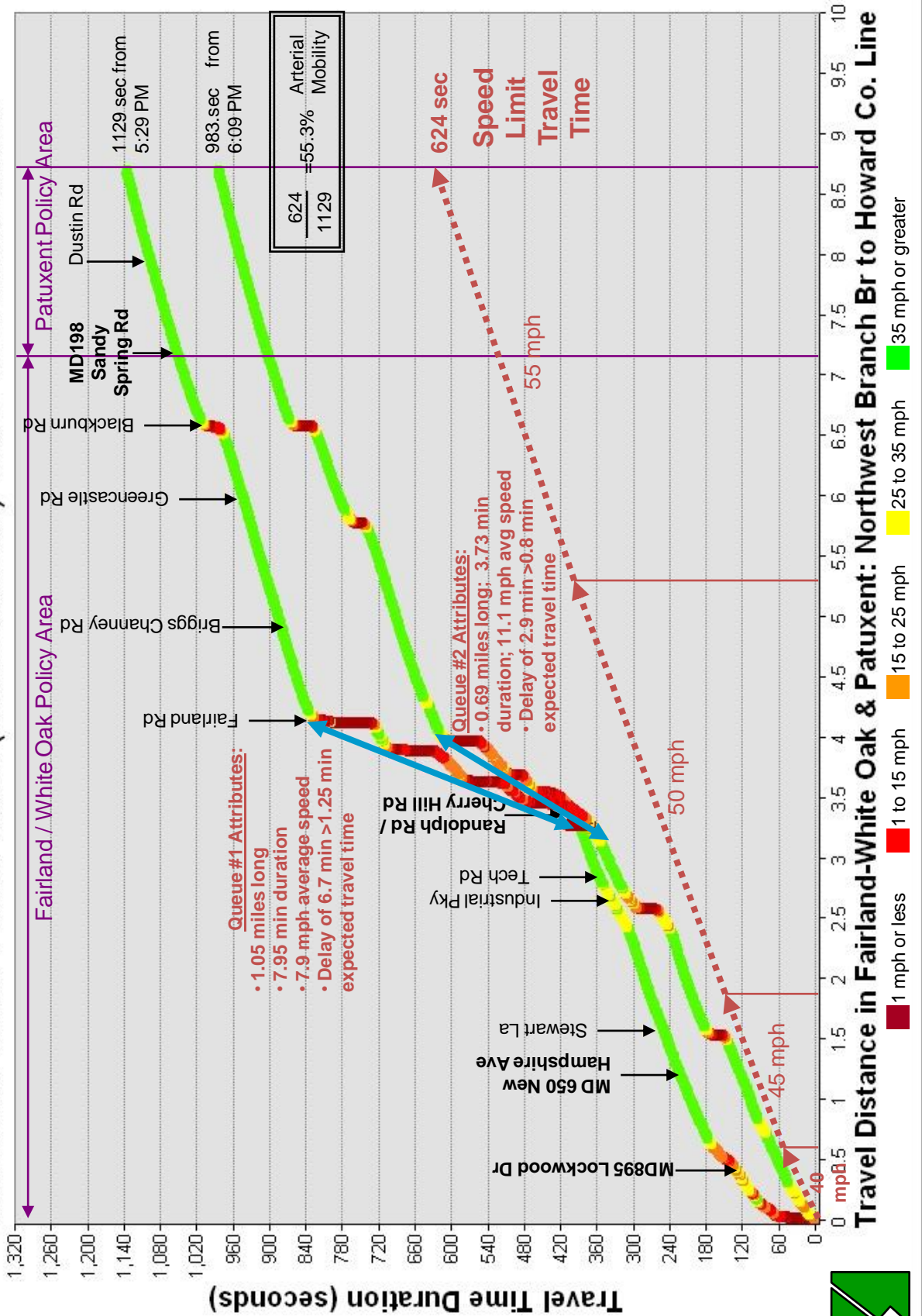
Slow-Fast Travel Times: MD028 (Norbeck Rd) Thu, 5-31-07 Eastbound



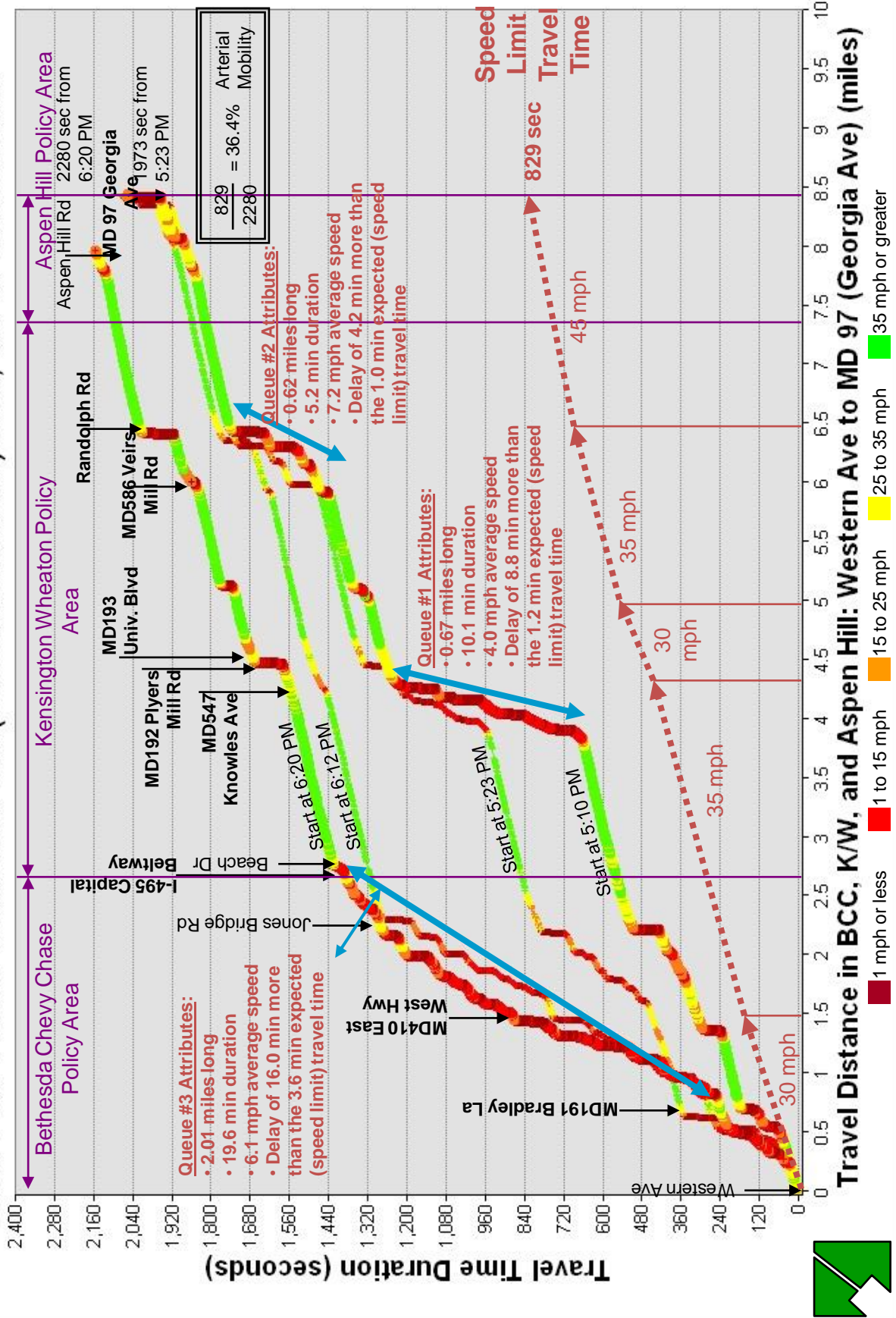




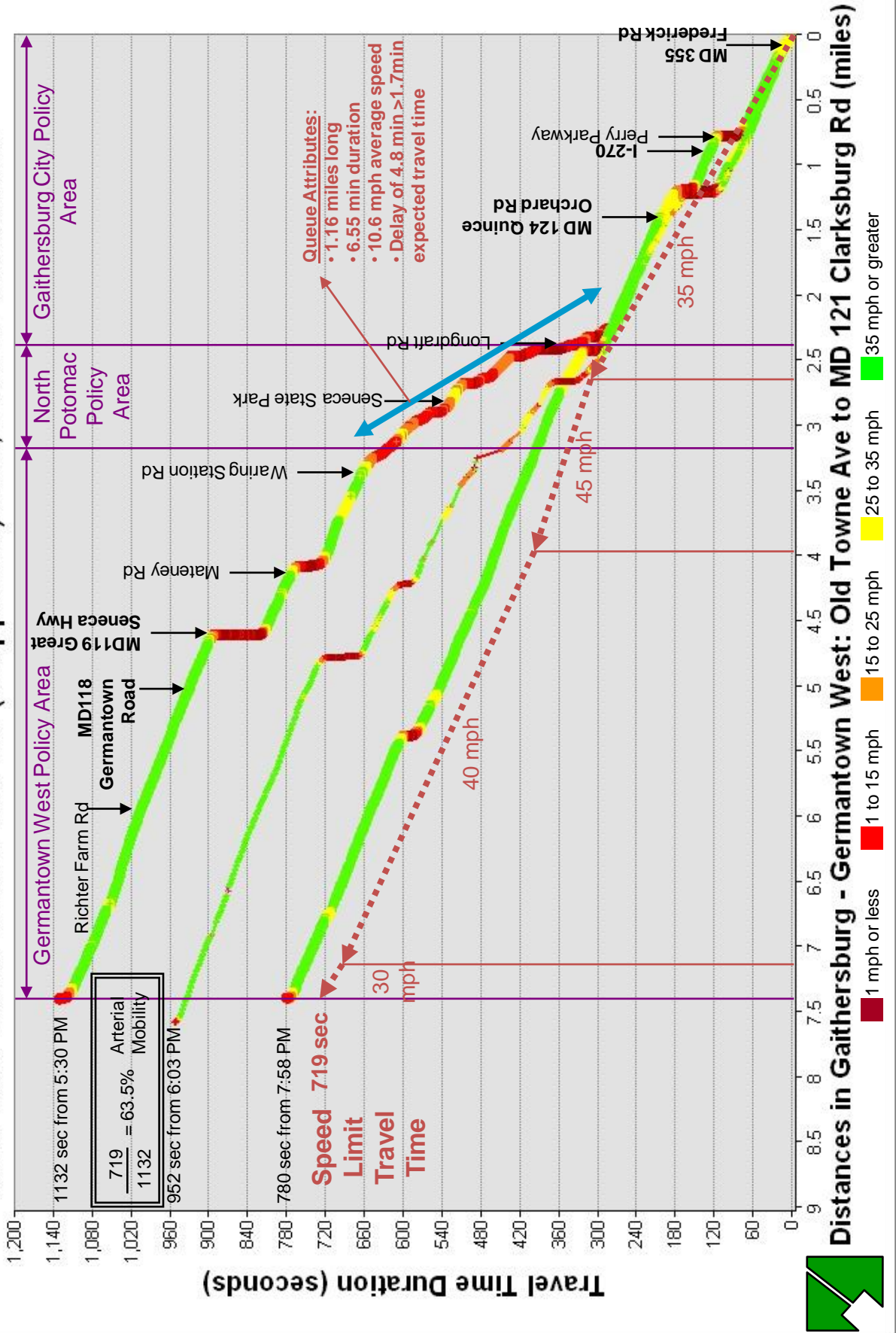
Slow-Fast Travel Times: US 29 (Columbia Pike) Thu 5-10-07 Northbound



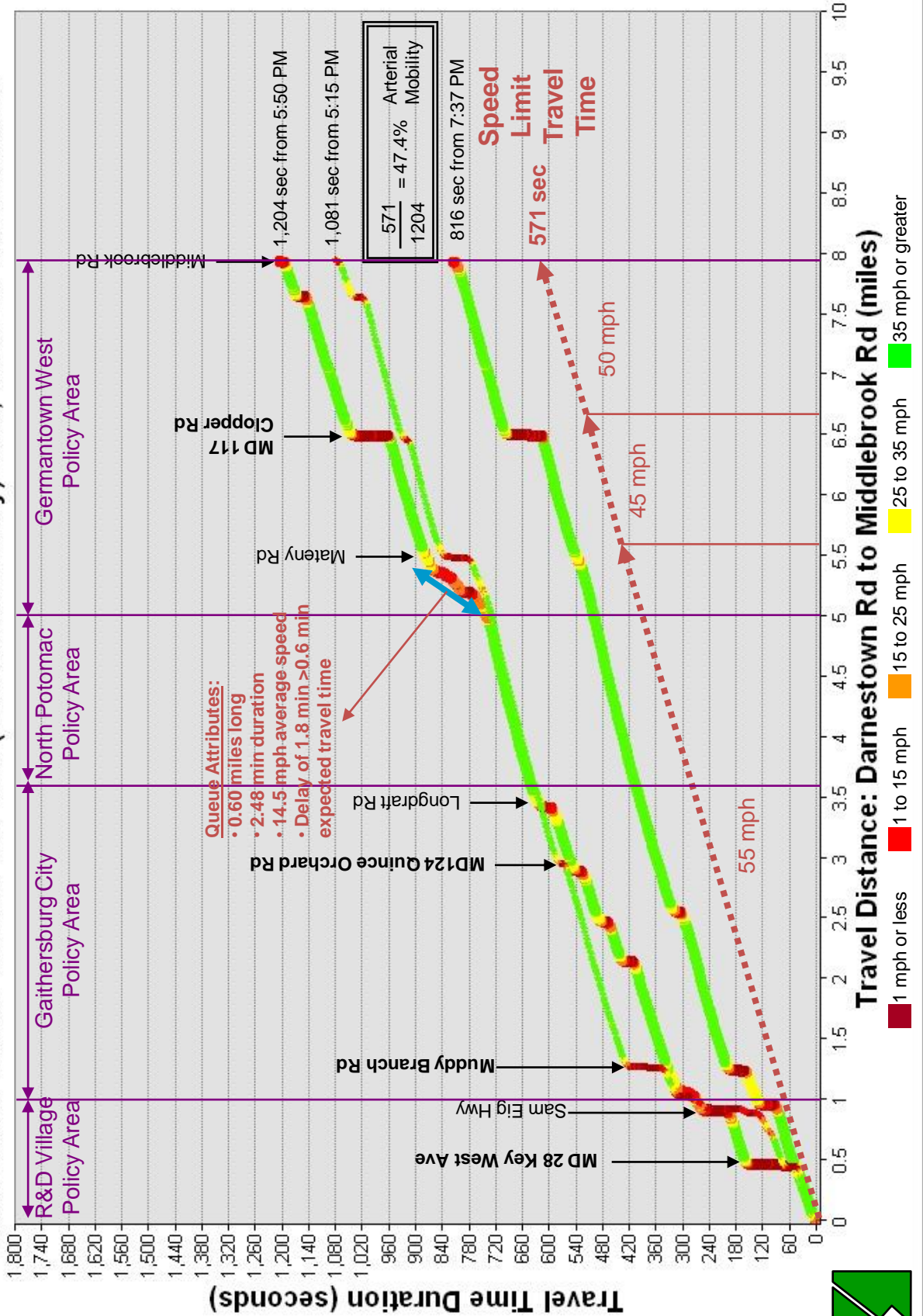
Slow-Fast Travel Times: MD 185 (Connecticut Ave) Mon, 6-4-07 Northbound



Slow-Fast Travel Times: MD 117 (Clopper Rd) Mon, 5-21-07 Westbound



Slow-Fast Travel Times: MD 119 (Gt. Seneca Hwy) Tue, 5-22-07 Northbound



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, 2008 Base.
 as of: February 29, 2008

Policy Area*	Approved Unit Type				Remaining Unit Type			
	Detached Single Family	Townhouse	Multifamily	Total	Detached Single Family	Townhouse	Multifamily	Total
Aspen Hill	90	54	46	190	58	48	46	152
Bethesda Central Business District	4	12	1,161	1,177	4	12	1,161	1,177
Bethesda/Chevy Chase	35	39	240	314	20	17	240	277
Clarksburg	4,946	2,249	2,031	9,226	3,737	942	1,890	6,569
Cloverly	87	0	0	87	62	0	0	62
Damascus	58	52	0	110	57	52	0	109
Derwood	142	256	196	594	142	256	196	594
Fairland/White Oak	101	386	0	487	75	302	0	377
Friendship Heights	0	200	733	933	0	200	733	933
Gaithersburg City	1,134	1,478	3,223	5,835	390	1,131	3,223	4,744
Germantown East	7	192	0	199	3	129	0	132
Germantown West	1,159	217	491	1,867	218	168	179	565
Germantown Town Center	0	0	604	604	0	0	172	172
Glenmont	0	0	0	0	0	0	0	0
Grosvenor	0	112	473	585	0	112	0	112
Kensington/Wheaton	518	446	45	1,009	511	446	45	1,002
Montgomery Village/Montgomery Airpark	22	32	0	54	21	3	0	24
North Bethesda	41	0	1,480	1,521	10	0	860	870
North Potomac	67	85	0	152	64	67	0	131
Olney	226	103	241	570	188	103	141	432
Potomac	208	165	547	920	116	42	467	625
Research & Development Village	4	0	168	172	4	0	52	56
Rockville City	49	59	4,259	4,367	49	28	3,516	3,593
Shady Grove	6	36	0	42	6	36	0	42
Silver Spring Central Business District	0	0	2,721	2,721	0	0	2,578	2,578
Silver Spring/Takoma Park	23	132	169	324	22	100	169	291
Twinbrook	0	0	0	0	0	0	0	0
Wheaton Central Business District	0	0	180	180	0	0	180	180
White Flint	0	0	1,973	1,973	0	0	1,973	1,973
Rural	1,282	75	0	1,357	1,081	55	0	1,136
Total	10,209	6,380	20,981	37,570	6,838	4,249	17,821	28,908

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*, 2007 Base, as of: January 3, 2008

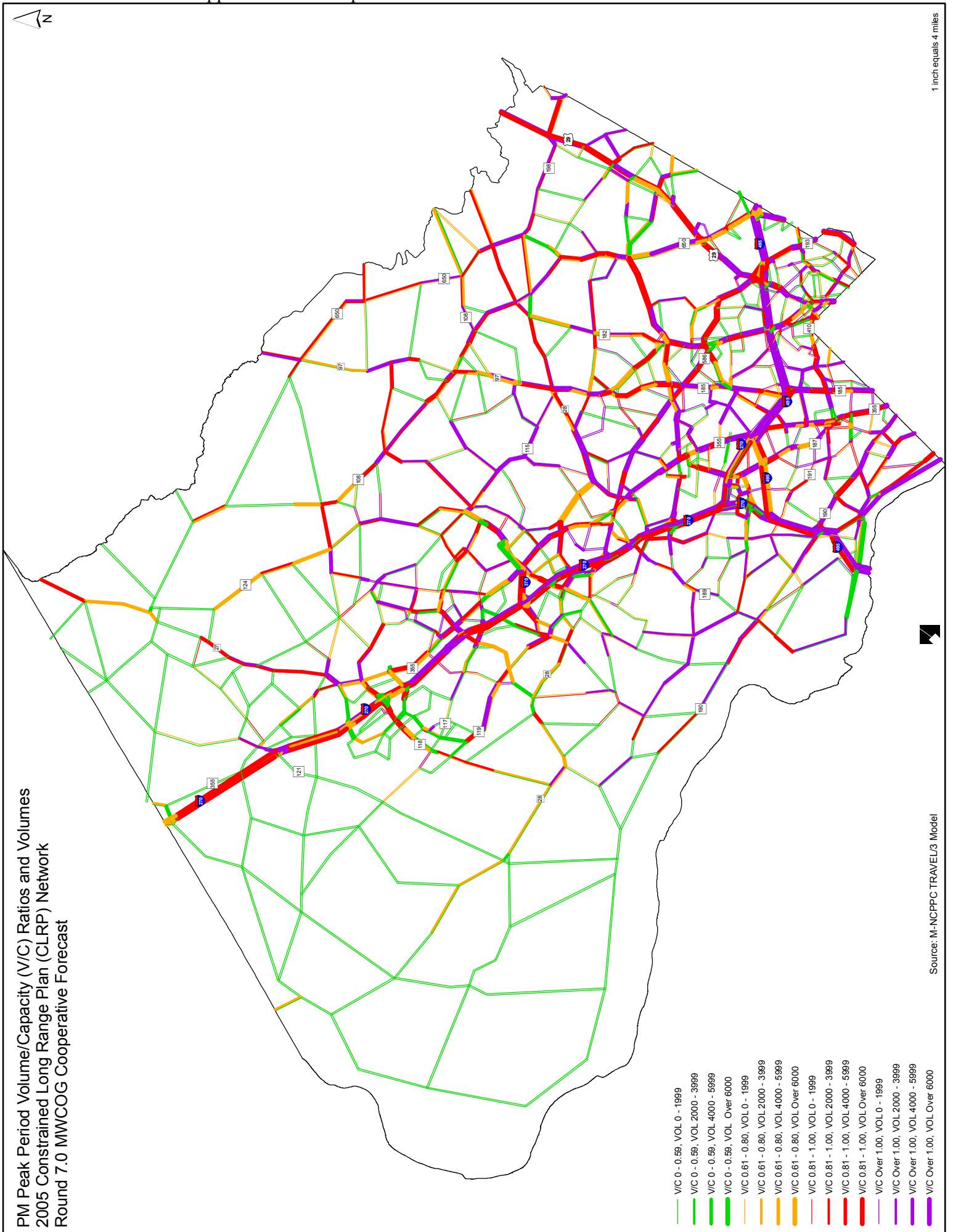
Policy Area	Square Feet		Estimated Job Capacity			Estimated Job Capacity by Development Type			
	Approved	Remaining	Approved	Remaining	Other	Office	Retail	Industrial	Other
Aspen Hill	62,986	62,986	80	80	0	0	75	0	5
Bethesda Central Business District	327,845	303,514	587	525	3	3	420	0	102
Bethesda/Chevy Chase	299,023	299,023	1,203	1,203	860	860	268	0	75
Clarksburg	2,902,000	2,365,139	11,210	9,063	8,405	8,405	648	0	10
Cloverly	103,000	103,000	10	10	0	0	0	0	10
Damascus	3,162	3,162	13	13	13	13	0	0	0
Derwood	427,775	409,925	1,572	1,522	1,389	1,389	10	123	0
Fairland/White Oak	4,975,839	2,879,884	17,342	9,581	9,041	9,041	146	128	266
Friendship Heights	760,055	760,055	3,058	3,058	2,670	2,670	347	0	41
Gaithersburg City*	4,784,620	3,871,526	16,801	13,911	11,840	11,840	1,647	222	202
Germentown East	3,059,378	1,949,829	10,826	7,975	7,643	7,643	316	0	16
Germentown West	1,701,740	1,468,640	6,642	5,846	5,714	5,714	48	0	84
Germentown Town Center	21,929	16,877	140	128	29	29	24	0	75
Glenmont	8,585	8,585	17	17	0	0	0	0	17
Grosvenor	0	0	0	0	0	0	0	0	0
Kensington/Wheaton	54,766	51,486	159	151	30	30	75	32	14
Montgomery Village/Montgomery Airpark	1,322,613	1,268,925	3,843	3,776	1,263	1,263	32	1,014	1,466
North Bethesda	1,752,554	1,752,554	6,017	6,017	4,544	4,544	850	-43	667
North Potomac	40,000	40,000	160	160	160	160	0	0	0
Olney	576,035	576,035	310	310	0	0	30	0	280
Potomac	1,350,000	1,350,000	3,673	3,673	1,880	1,880	1,613	0	181
Research & Development Village	4,086,667	2,147,647	12,827	6,915	346	346	0	5,060	1,509
Rockville City*	5,168,201	5,078,488	18,025	16,711	15,099	15,099	871	177	564
Shady Grove	0	0	75	75	0	0	0	0	75
Silver Spring Central Business District	1,827,973	986,324	3,767	2,420	1,563	1,563	338	210	309
Silver Spring/Takoma Park	232,171	203,445	334	334	213	213	49	21	51
Twinbrook	447,914	447,914	1,280	1,280	1,280	1,280	0	0	0
Wheaton Central Business District	4,000	4,000	10	10	0	0	10	0	0
White Flint	1,780,415	1,780,415	5,937	5,937	4,592	4,592	1,098	0	247
Rural	599,568	546,924	1,128	999	246	246	617	0	136
Total	38,680,814	30,736,302	127,047	101,699	78,823	78,823	9,530	6,944	6,402

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-foot-to-job multipliers for a given type of development, unless the developer has agreed to limit the number of jobs in a project.

Derivation of Year 2012 PAMR Results by Policy Area

Policy Area	Relative Arterial Mobility				Relative Transit Mobility				
	VMT	VHT (free-flow)	VHT (congested)	Free-Flow Speeds	Congested Speeds	Relative Arterial Mobility	Average Arterial Travel Time	Average Transit Travel Time	Relative Transit Mobility
Aspen Hill	161,213	4,817	10,223	33.5	15.8	47%	35.9	52.4	69%
Bethesda/Chevy Chase	376,903	14,428	32,661	26.1	11.5	44%	26.1	36.0	73%
Clarksburg	89,934	2,823	4,162	31.9	21.6	68%	38.2	73.3	52%
Cloverly	67,482	1,711	2,342	39.4	28.8	73%	38.2	62.8	61%
Damascus	69,936	1,679	2,275	41.7	30.7	74%	44.8	92.7	48%
Derwood	124,044	4,305	9,192	28.8	13.5	47%	33.5	47.3	71%
Fairland/White Oak	350,177	9,312	22,124	37.6	15.8	42%	35.3	58.3	61%
Gaithersburg City	222,111	8,005	18,137	27.7	12.2	44%	29.4	53.1	55%
Germentown East	94,819	3,189	6,812	29.7	13.9	47%	33.7	65.1	52%
Germentown West	125,987	4,296	7,022	29.3	17.9	61%	34.4	58.4	59%
Kensington/Wheaton	417,941	13,091	27,484	31.9	15.2	48%	32.0	44.7	72%
Montgomery Village/Airpark	105,663	3,539	7,022	29.9	15.0	50%	36.6	61.1	60%
North Bethesda	210,721	8,815	20,816	23.9	10.1	42%	25.7	38.0	68%
North Potomac	58,199	2,095	4,010	27.8	14.5	52%	35.5	60.7	58%
Olney	144,206	3,985	7,909	36.2	18.2	50%	41.7	62.2	67%
Potomac	189,873	5,613	13,564	33.8	14.0	41%	32.6	50.9	64%
R & D Village	59,491	2,385	4,157	24.9	14.3	57%	27.1	49.7	55%
Rockville City	263,083	10,857	23,895	24.2	11.0	45%	27.5	43.8	63%
Silver Spring/Takoma Park	229,564	9,063	18,939	25.3	12.1	48%	28.3	38.9	73%
Rural East	475,864	12,139	22,097	39.2	21.5	55%	43.0	66.3	65%
Rural West	212,900	5,703	8,425	37.3	25.3	68%	42.5	74.2	57%
Montgomery County Total	4,050,111	131,850	273,268	30.7	14.8	48%	33.5	48.0	70%

Relative Arterial Mobility measures total PM Peak Period vehicular travel on arterial roadways within each policy area
 Relative Transit Mobility measures AM Peak Period travel times for journey-to-work trips originating within each policy area
 VMT = Vehicle Miles of Travel
 VHT = Vehicle Hours of Travel



Appendix 5.4: CTP and CIP Project Status as of April 2008

Construction Projects (State & County)			AGENCY DETAILS	% comp/status
PROJECT NAME	LOCATION/LIMITS	AGENCY	DETAILS	
Stringtown Road Extended	MD 355 to I-270 ramps at MD 121	County	New 4-lane arterial road	99%
I-495 Ramps @ University Blvd*		State	WB off-ramp modified to allow access to SB MD 193	96%
MD 396	MD 614 to Onodaga Rd	State	Resurfacing, safety improvements	95%
I-495 Ramps @ Georgia Ave*		State	EB off-ramp widening to 2 lanes	87%
Montrose Pkwy West	E. of Tildenwood to MD 187	County	New 4-lane arterial road	79%
Fairland Rd*	US 29 to County Line	County	Widening from 2 to 3 lanes	59%
Travilah Rd - Phase 1*	MD 28 to Duffief Mill Rd	County	Reconstruction	47%
Greencastle Rd*	Greencastle Ridge Terr to Fairland Park	County	Widening from 2 to 4 lanes	38%
MD 650 @ Holton Lane*	to Merrimac Dr 800' e/w of MD 650	State	NB left turn lane construction, safety improvements	38%
Citadel Avenue Extended*	S. of Marinelli to Nicholson Ln	County	New 2-lane road	20%
MD 124 (Woodfield Rd) phase I*	S. of Airpark Rd to N. of Fieldcrest Rd	State	Widening from 4 to 6 lanes	5%
Intercounty Connector*	I-270 to I-95/US 1	State	New 6-lane multi-modal freeway facility	0%
MD 27 @ Sweepstakes Rd/Marlboro Dr*		State	NB right turn lane construction	0%
MD 355 @ Randolph Rd/Montrose Rd (Phase I)*	Old Georgetown Rd to Maple/Chapman Ave	State	New Interchange	0%
MD 650 @ MD 97*		State	EB left turn lane (to NB MD 97) construction	0%
MD 650 @ Oakview Dr*		County	Construction of EB & WB turning lanes	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 108 @ Fieldcrest Rd*		State	New bypass lane construction	PP
MD 115 at Bowie Mill Rd*		State	Extension of EB left turn lane	PP
MD 117 (Clopper Rd/Diamond Ave) [Phase II]	I-270 to Metropolitan Grove Rd	State	Intersection improvements, widening to 4/6 lanes	PP
MD 117 (Clopper Rd) [Phase III]	Metropolitan Grove Rd to Seneca Creek Park	State	Intersection improvements, widening to 4/6 lanes	PP
MD 124 (Woodfield Rd) [Phase I]	Fieldcrest Rd to S. of Airpark Rd	State	Widening to 6 lanes	PP
MD 124 (Woodfield Rd) [Phase II]	Mid County Hwy to Warfield Rd	State	Widening to 6 lanes	PP
MD 193 University Blvd @ MD 320*		State	EB right turn lane (to SB MD 320) construction	PP
MD 28/MD 355/MD 586/MD 911	Intersection Vicinity	State	Study to construct intersection improvements	PP
MD 28/MD 198 corridor study	MD 97 and PG County Line	State	Widening to 4 lanes	PP
MD 355/Montrose Rd/Randolph Rd/CSX RR		State	New interchange	PP
MD 586 (Veirs Mill Rd) @ Twinbrook Pkwy*		State	SB through lane, right turn lane construction, and WB right turn lane construction	PP
MD 650 @ Adelphi Rd*		State	EB lane construction	PP
MD 97 (Brookeville Bypass)	MD 97 to N. of Town of Brookeville	State	Reconstruction of MD 97 as a bypass road	PP
MD 97 @ MD 28*		State	SB 2nd left turn lane construction	PP
MD 97 @ Randolph Rd		State	New interchange	PP
US 29 @ Blackburn Rd		State	New interchange	PP
US 29 @ Fairland/Musgrove Rd		State	New interchange	PP
US 29 @ Greencastle La		State	New interchange	PP
US 29 @ Stewart La		State	New interchange	PP
US 29 @ Tech Rd/Industrial Pkwy		State	New interchange	PP

Sources: SHA DPW monthly status reports (CTP, CIP) - May 2006 to April 2008, FY 08-13 MD CTP and FY 09-14 County CIP catalogs

County DPWT Facility Planning			County	Property Acquisition
MD 355 @ Twinbrook Pkwy	Chapman Ave to Randolph Rd	County	NB right turn lane construction	Property Acquisition
Nebel Street Extended	Father Hurley Blvd to Crystal Rock Dr	County	Roadway extension to Randolph Rd	Property Acquisition
Century Blvd Extended*		County	Roadway extension to Crystal Rock Dr	Participation
Watkins Mill Rd Extended*	E. of I-270 to W. of I-270	County	Construction of (non developer-funded) roadway section	Participation
Burtonsville Access Rd	MD 198 to School Access Rd	County	New 2-lane road	Phase II FP (Design)
Chapman Ave Extended*	N. of MD 187 to Randolph Rd	County	Roadway extension to Randolph Rd	Phase II FP (Design)
Dale Dr @ Colesville Rd		County	Construct EB & WB approach lanes	Phase II FP (Design)
Father Hurley Blvd Extended	Wisteria Dr to MD 118	County	Roadway extension to MD 118	Phase II FP (Design)
Goshen Rd	Girard Street to Warfield Rd	County	Widening from 2 to 4/6 lanes	Phase II FP (Design)
Montrose Pkwy East*	MD 187 to MD 586	County	New 4-lane arterial road	Phase II FP (Design)
Randolph Rd	Gaynor Rd to Charles Rd	County	Safety improvements	Phase II FP (Design)
Redland Rd	Crabbs Branch Way to Needwood Rd	County	Intersection improvements	Phase II FP (Design)
S. Glen Rd @ Falls Rd		County	EB right turn lane construction	Phase II FP (Design)
Snuffer School Rd*	Goshen Rd to MD 124	County	Widening from 2 to 4 lanes	Phase II FP (Design)
Woodfield Rd Ext (A-12)	Main St to MD 27	County	New 2-lane arterial road	Phase II FP (Design)
Longdraft Rd	MD 124 to MD 117	County	Widening from 2 to 4 lanes	Phase I FP
Midcounty Corridor Study*	MidCounty Area	County	Transportation-related improvements	Phase I FP
Observation Dr	Water Discovery Ln to Stringtown Rd	County	Construction of (non developer-funded) roadway sections	Phase I FP
Thompson Road Connection*	Thompson Rd and Rainbow Dr	County	New 2-lane primary road	Phase I FP
Completed Projects (State & County)				
New Roads/Interchanges:				
Skylark Rd*	adjacent to Ovid Hazen Wells Park	County		
US 29 @ Briggs Chaney Rd*		State		
US 29 @ MD 198 N. to Dustin Rd		State		
Road Widening:				
Briggs Chaney Rd*	Automobile Blvd to E. of Ashton Manor Dr	County		
Grade-Separated Interchange Improvements:				
I-495 @ MD 355*	Interchange Ramps	State		
Intersection Improvements:				
Father Hurley Blvd @ Observation Dr*		County		
MD 124 (Midcounty Hwy) @ Goshen Rd*		State		
MD 27 @ Oak Dr*		County		
MD 28 @ Wintergate Dr*	WB left turn lane construction	State		
MD 410 (Montgomery Ave)*	Pearl St to Chelton Ave	State		
MD 410 @ MD 390 (16th St)		County		
MD 586 @ MD 185 & Randolph Rd		State		
MD 614 (Goldsboro Rd) @ Radnor Rd*		State		
MD 650/FDA*	Powder Mill Rd to N. of US 29	State		
MD 97 @ Bonifant St*		County		
MD 650 @ Oakview Dr*		County		
Observation Dr @ Shakespear Blvd*		County		
Old Baltimore Rd @ Covered Wagon Way*		County		
Warfield Rd @ Plum Creek Rd*		County		

Resurfacing/Rehabilitation:				
I-270*	MD 189 to Muddy Branch Rd	State		
MD 109*	MD 355 to Little Monocacy River	State		
MD 193*	Rock Creek Run	State		
MD 193*	MD 320 to Lebanon Street	State		
MD 97*	I-495 to MD 586	State		
US 29*	MD 193 to Burnt Mills Ave	State		
Safety/Spot Improvements:				
MD 115*	MD 28 to Muncaster Rd/Redland Rd	State		
MD 198 (Spencerville Rd)*	Kruhm Rd	State		
Muncaster Road*	Rock Creek Bridge Vicinity	County		
Old Columbia Pike*	Perrywood Dr	County		
KEY/NOTES:				
PP = Project Planning (State)				
TBA = Awaiting Start of Construction				
Property Acquisition = 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 May 2006				

Staff Acknowledgements

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