

appendix



mobility assessment report

October 2011



montgomery county planning department
M-NCPPC ■ MontgomeryPlanning.org



Abstract

This appendix contains data that accompanies the 2011 Mobility Assessment Report, measuring roadway and intersection congestion, along with pedestrian, bicycle, bus, and Metrorail travel within the County.

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Mobility Assessment Report

Appendix

Appendix 1 Data Sources and Methodolgy	1
Data Sources	2
INRIX	4
Methodology	6
Critical Lane Volume	6
CLV and Local Area Transportation Review	6
Appendix 2 Future Congestion	13
Year 2017 Forecasted Mobility	14
Appendix 3 Scheduled Road Construction Projects	19
Maps	
Map 1 I-95 Corridor Coalition INRIX Data Coverage	3
Map 2 PM Peak Period CLV/LATR Comparison	8
Map 3 Existing CLV and LATR Cross Analysis	11
Map 4 Difference in PM Peak Period Ratios and Volumes	17
Map 5 Difference in PM Peak Period Volumes, 2010 and 2017	18
Illustrations	
Illustration 1 How INRIX Works	5
Illustration 2 CLV/LATR Ratios 2004-2011	9
Tables	
Table 1 LATR Congestion Standards	7
Table 2 Fifty Most Congested Intersections based on CLV/LATR Comparison	10
Table 3 Existing CLV and LATR Percent Difference	12
Table 4 Countywide Travel/3 Model Results, 2010 and 2017	15
Table 5 Countywide Travel/3 Model Results, Non-Freeway and Freeway Facilities , 2010 and 2017	16
Table 6 Scheduled Road Construction Projects	20

Appendix 1 Data Sources and Methodology

Data Sources

INRIX

Methodolgy

Critical Lane Volume (CLV)

CLV and Local Area Transportation Review (LATR)

Data Sources

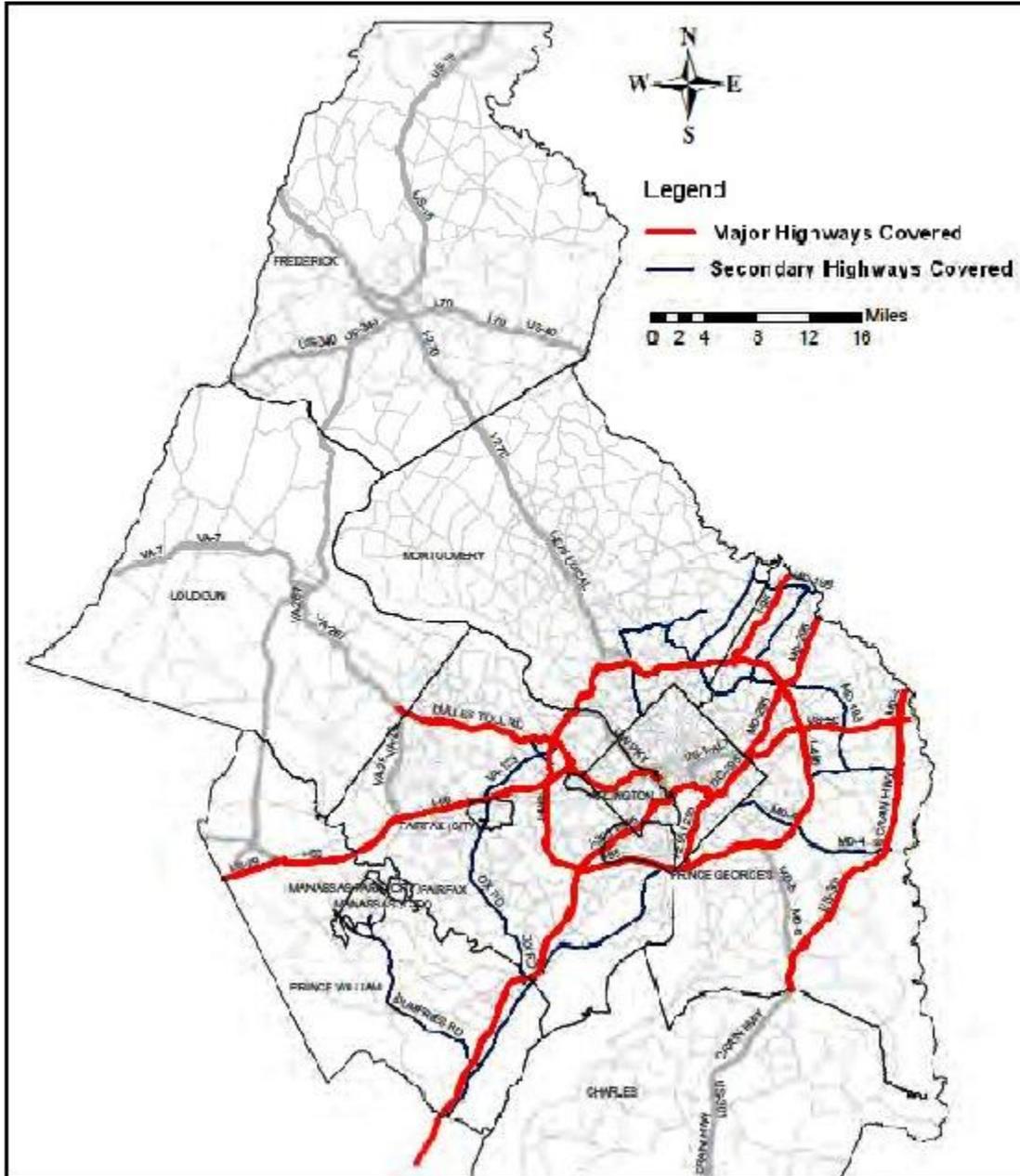
The Planning Department's Intersection Traffic Count Database is maintained by the Travel Forecasting and Monitoring Group in the Functional Planning and Policy Division. It contains counts for 618 of the 772 (planned and existing) signalized intersections in Montgomery County.

Traffic counts are provided from a variety of sources. One important source is the traffic studies that must be provided as part of development applications. Other counts are provided by the State Highway Administration's on-going count program for state roadways. Finally, some counts are provided by consultants in response to requests made by Planning Department staff to support special studies, master plans, and this Mobility Assessment Report.

The oldest count in the database is from March 1, 2001. For the purposes of this report, and in keeping with precedent set in previous mobility reports, only intersection counts collected during the past three years are included. Three hundred and seventeen intersection counts were analyzed for the 2011 *Mobility Assessment Report*, including 46 special counts requested specifically for this report. Those special counts include intersection traffic counts for the East County Science Center area, and high priority analysis corridors.

The database includes archived GPS-Travel Time data from Motion Maps, LLC dating back to 2006, 2010 INRIX data, and an additional month of INRIX data that focuses in on the East County Science Center Master Plan Area. Based on future work program efforts, Planning Staff can process and analyze additional corridors as we advance our analysis methods (see Map 1 I-95 Corridor Coalition INRIX Data Coverage).

Map 1 I-95 Corridor Coalition INRIX Data Coverage



INRIX

INRIX (www.inrix.com/) is an international transportation consulting firm that has been retained by the I-95 Corridor Coalition (www.i95coalition.org) to “acquire travel times and speeds using probe technology for both freeways and arterials...to present a comprehensive picture of traffic flow.”

The coalition data is primarily intended for monitoring and managing traffic flow in the I-95 Corridor from Maine to Florida, but the data gathered may also be used to build local transportation data bases. The Planning Department has access to this data through the Metropolitan Washington Council of Governments (MWCOCG). This new information supplements the datasets derived from *Motion Maps, LLC* used in previous reports. The contract allows for more corridors to be sampled and made available for future reports and analysis. Further samples would allow comparison of trends along all major routes throughout the County.

The INRIX data comes from MWCOCG through the I-95 Corridor Coalition contract and available free of charge to Coalition members. Unfortunately, the data is available for a limited number of roads, though other roads such as I-270, MD 185, MD 97, and MD 200 will most likely be included in future contracts.

The INRIX data used for 2010 covers secondary roads—US 29, MD 355, Randolph Rd, and MD 193—in Montgomery County (see Map 1). INRIX will shortly provide travel time data from the winter months of 2010-2011, which has yet to be analyzed, and which will cover more secondary routes.

The majority of the most congested intersections are located in **the priority corridors**. There were also critical lane volumes at other intersections located on roadways outside of the priority corridors that exceed LATR standards along such roadways as Piney Branch Road, Shady Grove Road, Randolph Road, and New Hampshire Avenue. The locations outside of the priority corridors would require more data collection to establish observed trends in future years.

How INRIX Works

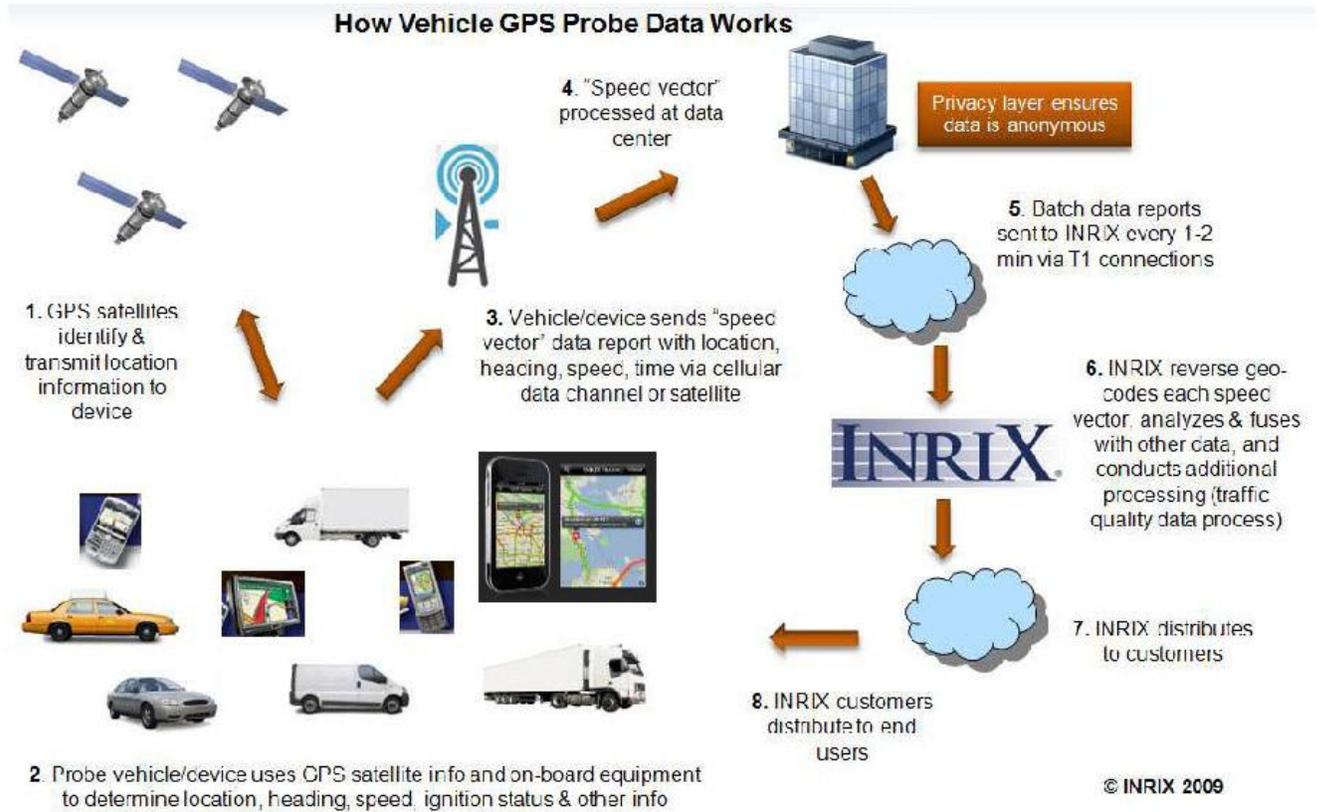
INRIX processes and distributes traffic speed and travel time data collected from GPS-outfitted commercial vehicle fleets (vehicle probe data) as well as other sources (see Illustration 1). Vehicle probe data are derived from GPS satellite signals that transmit location information to on-board devices located on commercial vehicles. These data are transmitted to INRIX, where the information is processed and sent to customers who can use the data to compute reference speed and reported speed (see Illustration 1 How INRIX Works).

Reference speed is the uncongested free flow speed, basically, the speed limit on each road segment. Reported speed is the actual travel speed for every hour each day of the week. There are 168 reported speed values for each road segment in a week. Comparing these two factors in a specified time period, congestion is indicated if the reported speed is less than the reference speed. This 2011 Mobility Assessment Report is an analysis of congestion during morning and evening peak travel periods (6:00 to 10:00 a.m. and 3:00 to 7:00 p.m.) on peak travel days (Tuesday through Thursday).

INRIX Data and the Travel Time Index

The variables provided were route, direction, time, date, reference speed, and average speed. That data is fed through a Travel Time Index (TTI), a metric used by many transportation analysts and planners that describes how much longer it takes to travel from one point to another in congested conditions.

GPS Probe Data



TTI is the ratio of reported speed over reference speed. If the ratio of a particular road segment is valued at 1.0 at a specified time, then the TTI is indicating that reported speed is equal to the reference speed. If the same roadway at a different time, such as the peak period, has a TTI of 1.5, then the extra time allowed to travel that roadway segment is 50 percent more than the time in uncongested conditions.

This is known as a Travel Time Tax, the percentage of extra time allocated above free-flow to get from point A to point B in a roadway segment. For this report, TTI has been analyzed for all routes together and for routes separately in each direction during morning and evening peak periods and peak days.

Methodology

Assessments of vehicular mobility are represented here in the form of historical, current, and future traffic congestion trends. Current congestion measures included in this study are:

- Critical Lane Volume (CLV) for signalized intersections
- arterial travel time for priority corridors.

Future congestion data is reported using volume to capacity ratios (V/C) as derived from the Department's regional transportation model, TRAVEL/3. These current and future transportation indicators are intended for use by the Planning Board and County Council to inform their comments on this year's State Consolidated Transportation Program (CTP) project priorities. This report supersedes and expands upon the Highway Mobility Report that was completed in May of 2009. In addition, this report introduces new ways of ranking intersection performance and reporting travel time data.

Critical Lane Volume

Critical Lane Volume (CLV) is the sum of traffic volumes that cross at a single point in an intersection. The resulting count is used to determine an intersection's level of service. The CLV is calculated mathematically using the following variables for a particular intersection:

- lane use factors of throughput and conflicting movements
- geometric lane configuration
- traffic signal phasing.

CLV is essentially a measure of conflicting movements. This calculation uses the lane use and configuration for each of an intersection's approach legs to determine the north/south and east/west peak flow of traffic, referred to as the "critical movements." The intersection's signal phasing then specifies if approaching traffic on a specific leg moves independently from traffic in the opposite direction. This information is used to determine whether or not a potential turning movement (i.e. left turn) conflict exists.

CLV and Local Area Transportation Standards (LATR)

Intersection congestion can also be measured by comparing the intersection's CLV to its Policy Area LATR standard.

The current LATR standards reflect the approved CLV thresholds in the 2009-2011 Growth Policy as adopted by County Council on November 10, 2009 (see Table 1 LATR Congestion Standards). These standards reflect the County's policy of concentrating growth in areas with existing infrastructure such as the Central Business Districts, and Metro Station Policy Areas.

Table 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, Gaithersburg City
1450	North Potomac, R&D Village, Olney, Cloverly, Potomac
1475	Derwood, Aspen Hill, 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, and White Flint

The 2010 CLV/LATR ratios indicate relatively little or no change compared to the CLV/LATR ratio from the 2009 report. Relative to 2009, the 2010 CLV/LATR ratio exhibited a one percent increase of intersections exceeding the CLV/LATR standard. It's important to note, however, that fewer intersections were measured in 2010 than in 2009 and as a result, the number of 2010 intersections found to exceed LATR standards is actually five intersections less than in 2009.

Rockville, Gaithersburg, Bethesda/Chevy Chase, Silver Spring, and the northern portion of Fairland/White Oak areas are where intersections are functioning above capacity, that is, they are more congested (see Map 2 PM Peak Period CLV/LATR Comparison).

Map 2 PM Peak Period CLV/LATR Comparison

Red dots indicate intersections where CLV exceeds the LATR standard. Green dots indicate where CLV is at or below standard. The dot size varies based on the total traffic volumes at the intersections.

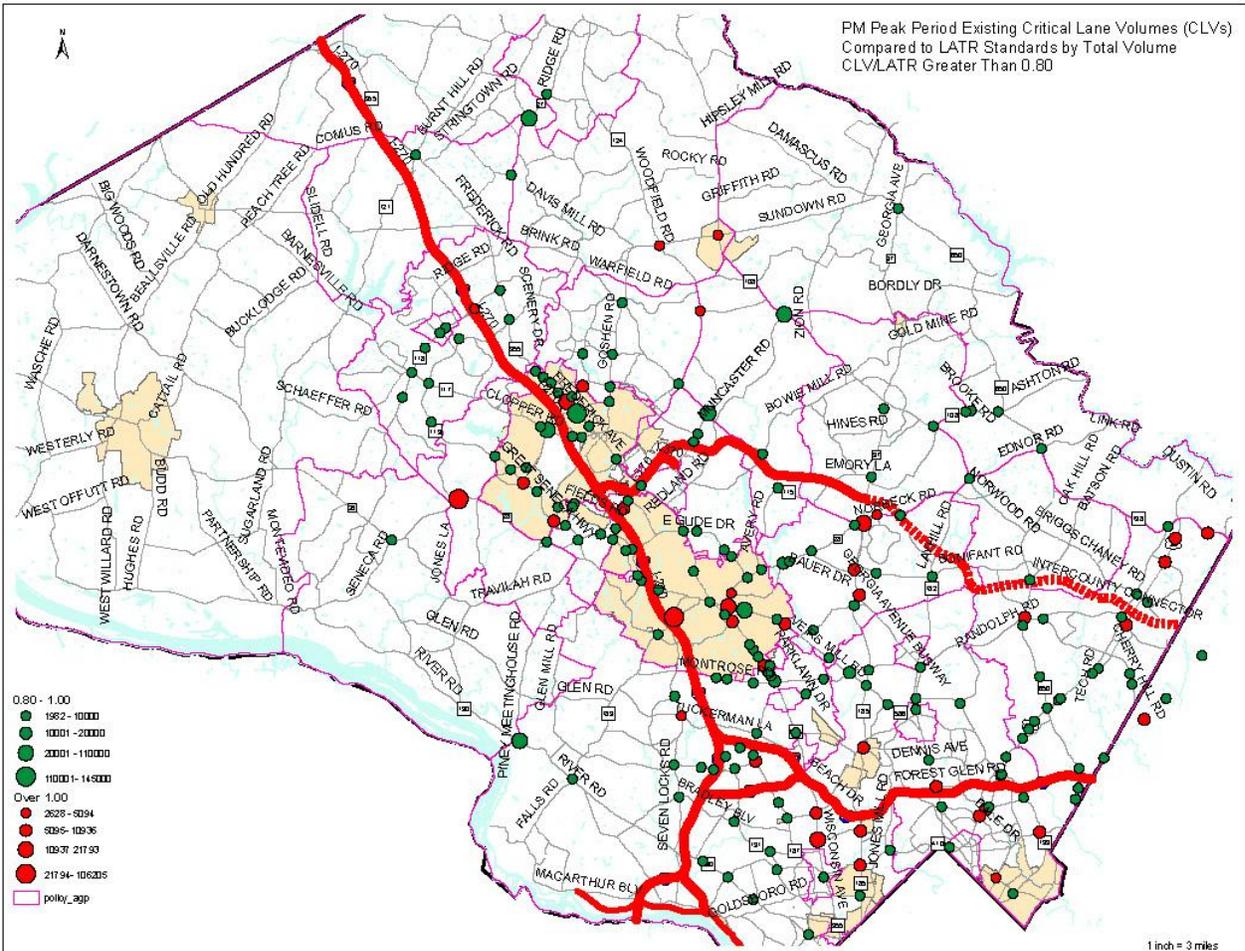
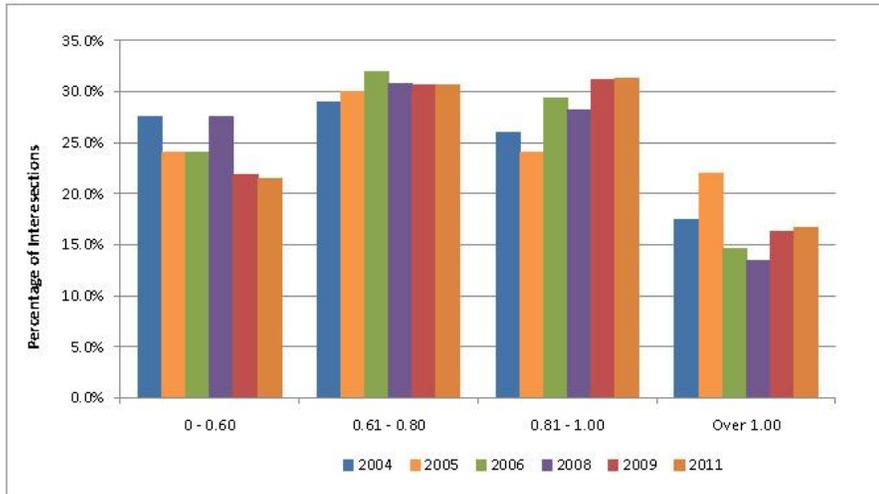


Illustration 2 CLV/LATR Ratios 2004-2011

For these intersections, sorted by CLV/LATR ratio class, it is important to note that the sample data set for 2011 is considerably smaller than the sample sets from previous years by at least 50 to 100 intersections. Decreased development in the County is the primary cause for fewer submitted traffic counts, resulting in a lower number in recent counts in the sample set.



Analysis of Intersections Using CLV and LATR

Table 2 illustrates two types of intersections. First, those that might not have been highly ranked in the original ranking system and as a result of the new method are ranked higher (highlighted in green). The second type are intersections that were ranked higher in the original ranking system but now rank lower based on the new method (highlighted in orange).

Table 2 Fifty Most Congested Intersections based on CLV/LATR Comparison

The top 50 intersections are ranked based on the percent by which the observed CLV differs from the LATR policy area standard, a measure that helps planners prioritize intersections by policy area.

Rank	Name	Count Date	CLV	LATR Standard	CLV Difference	% Exceeding LATR Standard	Policy Area
1	Darnestown Rd at Riffle Ford Rd	3/12/2009	1898	1450	448	23.60%	North Potomac
2	Great Seneca Hwy at Muddy Branch Rd	1/4/2011	1800	1450	350	19.44%	Gaithersburg City
3	Old Georgetown Rd at Democracy Blvd	6/9/2009	1923	1550	373	19.40%	North Bethesda
4	Shady Grove Rd at Choke Cherry Ln	5/19/2010	1853	1500	353	19.05%	Rockville City
5	Georgia Ave at Norbeck Rd	1/22/2009	1816	1475	341	18.78%	Aspen Hill
6	MD 355 at Edmondston Dr	3/12/2008	1810	1500	310	17.13%	Rockville City
7	Ridge Road at Skylark Rd	4/16/2009	1629	1350	279	17.13%	Goshen
8	E Gude Dr at Crabbs Branch/Cecil	3/24/2009	1742	1475	267	15.33%	Derwood
9	Randolph Rd at New Hampshire Ave	1/13/2011	1729	1475	254	14.69%	Fairland/White Oak
10	Shady Grove Rd at Epsilon/Tupelo	2/11/2009	1704	1475	229	13.44%	Derwood
11	Montgomery Village Ave at Stedwick	10/4/2007	1633	1425	208	12.74%	Montgomery Village/Airpark
12	Rockville Pike at W Cedar Ln	11/7/2010	1826	1600	226	12.38%	Bethesda/Chewy Chase
13	Columbia Pike at Blackburn Rd	12/6/2006	1532	1350	182	11.88%	Potomac
14	E Gude Dr at Southlawn Ln	3/5/2009	1692	1500	192	11.35%	Rockville City
15	Shady Grove Rd at Midcounty Hwy	11/18/2010	1644	1475	169	10.28%	Derwood
16	Veirs Mill Rd at Twinbrook Pkwy	6/3/2010	1721	1550	171	9.94%	North Bethesda
17	Connecticut Ave at Jones Bridge Rd	5/13/2009	1769	1600	169	9.55%	Bethesda/Chewy Chase
18	Falls Rd at Maryland Ave/Pot. Valley	9/16/2008	1658	1500	158	9.53%	Rockville City
19	Sandy Spring Rd at Mcknew	2/11/2009	1489	1350	139	9.34%	Potomac
20	Rockville-Pk/Twinbrook/Rollins	5/25/2010	1654	1500	154	9.31%	Rockville City
21	Democracy Blvd at Falls Rd/S Glen Rd	4/1/2009	1594	1450	144	9.09%	Potomac
22	Columbia Pike at Fairland Rd	3/2/2011	1612	1475	137	8.50%	Fairland/White Oak
23	Aspen Hill Rd at Arctic Ave	11/6/2008	1609	1475	134	8.33%	Aspen Hill
24	Norbeck Rd at Muncester Mill Rd	1/29/2009	1609	1475	134	8.33%	Aspen Hill
25	Columbia Pike at Greencastle Rd	11/15/2006	1607	1475	132	8.21%	Fairland/White Oak
26	Layhill Rd at Edmor Rd/Norwood Rd	4/27/2010	1579	1450	129	8.17%	Olney
27	Columbia Pike at Lockwood Dr	4/2/2009	1603	1475	128	7.99%	Fairland/White Oak
28	Woodfield Rd at Brink Rd	4/16/2009	1462	1350	112	7.66%	Goshen
29	Muddy Branch Rd at Diamondback Dr	10/9/2007	1563	1450	113	7.23%	Gaithersburg City
30	Woodfield Rd at Fieldcrest/Hedley Farms	2/10/2009	1529	1425	104	6.80%	Montgomery Village/Airpark
31	Montrose Rd at Tower Oaks Blvd	11/14/2006	1663	1550	113	6.79%	North Bethesda
32	Rockville Pike at Jones Bridge/Center	5/6/2009	1714	1600	114	6.65%	Bethesda/Chewy Chase
33	Veirs Mill Rd at First St	3/5/2009	1605	1500	105	6.54%	Rockville City
34	Georgia Ave at New Hampshire Ave	10/21/2008	1441	1350	91	6.32%	Potomac
35	First St at Baltimore Rd	1/22/2009	1601	1500	101	6.31%	Rockville City
36	University Blvd at Piney Branch Rd	1/22/2009	1703	1600	103	6.05%	Silver Spring/Takoma Park
37	Laytonsville Rd at Brink/Sundown	11/2/2006	1433	1350	83	5.79%	Goshen
38	Connecticut Ave at East West Hwy	4/16/2009	1693	1600	93	5.49%	Bethesda/Chewy Chase
39	Old Georgetown Rd at Tuckerman Ln	1/22/2009	1640	1550	90	5.49%	North Bethesda
40	Frederick Rd at Montgomery Village Ave	1/4/2011	1533	1450	83	5.41%	Gaithersburg City
41	River Rd at Piney Meetinghouse Rd	5/20/2009	1528	1450	78	5.10%	Potomac
42	Connecticut Ave at Payers Mill Rd	11/30/2010	1683	1600	83	4.93%	Kensington/Wheaton
43	Piney Branch Rd at Philadelphia Ave	1/21/2009	1680	1600	80	4.76%	Silver Spring/Takoma Park
44	Colesville Rd at University Blvd (S)	1/22/2009	1680	1600	80	4.76%	Kensington/Wheaton
45	Great Seneca Hwy at Lakeland Blvd	1/5/2011	1520	1450	70	4.61%	Gaithersburg City
46	Great Seneca Hwy at Sam Elg Hwy	2/3/2009	1513	1450	65	4.29%	R&D Village
47	Georgia Ave at Connecticut Ave	5/31/2006	1539	1475	64	4.16%	Aspen Hill
48	Briggs Chaney Rd at Old Columbia Pk	11/14/2006	1531	1475	56	3.66%	Fairland/White Oak
49	Bradley Blvd at Wilson Ln	3/12/2009	1660	1600	60	3.61%	Bethesda/Chewy Chase
50	Shady Grove Rd at Muncester Mill/Airpark	2/4/2010	1530	1475	55	3.59%	Derwood

For example, congestion at Rockville Pike and Jones Bridge Road is highly ranked at 12 based on observed CLV. A comparison of the observed CLV of 1714 to the LATR standard of 1600, shows that the observed CLV is 6.65 percent above standard; ranking it at 32, a significant drop in the ranking order when compared to the observed CLV method.

Comparing CLV to LATR can potentially be the new way of ranking and prioritizing intersection improvements. It would allow planners to better prioritize improvements based on planning policy considerations rather than by a relative ranking of CLV observations. The results of this method are reported in the 2011 *Mobility Assessment Report* and the method will be considered for future traffic analyses (see Map 3 Existing CLV/LATR Cross Analysis and Table 3 Existing CLV and LATR Percent Difference).

Map 3 Existing CLV/LATR Cross Analysis

Map 3 illustrates the amount by which an intersection exceeds its LATR standard. Using this measure, Darnestown Road at Riffle Ford Road, Great Seneca Highway at Sam Eigh Highway, Old Georgetown Road at Democracy Boulevard, Shady Grove Road at Choke Cherry Road, Ridge Road at Skylark Road, MD 355 at Edmonston Drive, and Georgia Avenue at Norbeck Road all exceed the applicable policy area standard.

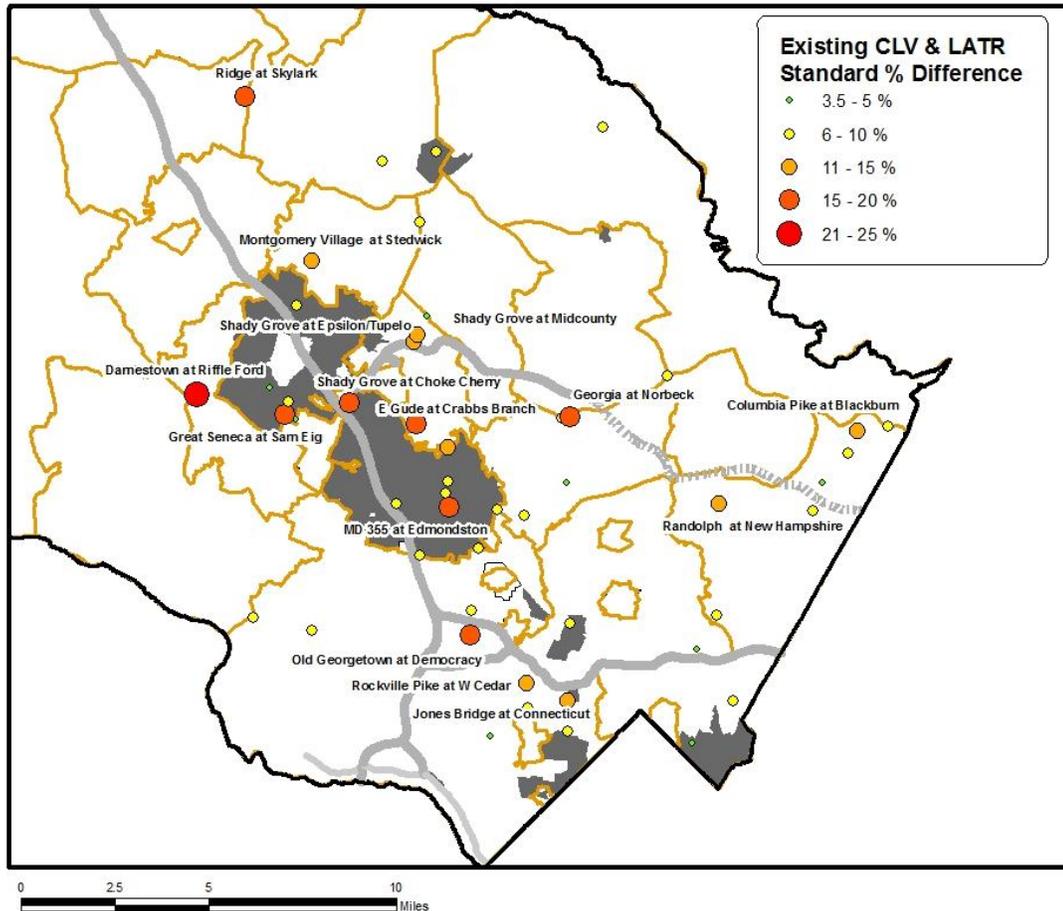


Table 3 Existing CLV and LATR Percent Difference

Applied LATR Ranking	Original Ranking			Intersection Name	Count Date	CLV	LATR Standard	Policy Area
	2011	2009	2008					
3	1*	*		Old Georgetown Rd at Democracy Blvd	6/9/2009	1923	1550	North Bethesda
1	2			Darnestown Rd at Riffle Ford Rd	3/12/2009	1898	1450	North Potomac
4	3*	*		Shady Grove Rd at Choke Cherry Ln	5/19/2010	1853	1500	Rockville City
12	4	2	5	Rockville Pike at W Cedar Ln	11/7/2010	1826	1600	Bethesda/Chevy Chase
5	5	5	18	Georgia Ave at Norbeck Rd	1/22/2009	1816	1475	Aspen Hill
6	6	6*		MD 355 at Edmondston Dr	3/12/2008	1810	1500	Rockville City
2	7	29	1	Great Seneca Hwy at Muddy Branch Rd	1/4/2011	1800	1450	Gaithersburg City
17	8	9	4	Connecticut Ave at Jones Bridge Rd	5/13/2009	1769	1600	Bethesda/Chevy Chase
8	9	11*		E Gude Dr at Crabbs Branch/Cecil	3/24/2009	1742	1475	Derwood
9	10	3	10	Randolph Rd at New Hampshire Ave	1/13/2011	1729	1475	Fairland/White Oak
16	11	8	11	Veirs Mill Rd at Twinbrook Pkwy	6/3/2010	1721	1550	North Bethesda
32	12	14*	*	Rockville Pike at Jones Bridge/Center	5/6/2009	1714	1600	Bethesda/Chevy Chase
10	13	15	47	Shady Grove Rd at Epsilon/Tupelo	2/11/2009	1704	1475	Derwood
36	14*	*		University Blvd at Piney Branch Rd	1/22/2009	1703	1600	Silver Spring/Takoma Park
38	15	17	8	Connecticut Ave at East West Hwy	4/16/2009	1693	1600	Bethesda/Chevy Chase
14	16	18*	*	E Gude Dr at Southlawn Ln	3/5/2009	1692	1500	Rockville City
42	17	4*	*	Connecticut Ave at Plyers Mill Rd	11/30/2010	1683	1600	Kensington/Wheaton
43	18	20*	*	Piney Branch Rd at Philadelphia Ave	1/21/2009	1680	1600	Silver Spring/Takoma Park
44	19	21*	*	Colesville Rd at University Blvd [S]	1/22/2009	1680	1600	Kensington/Wheaton
31	20	23	27	Montrose Rd at Tower Oaks Blvd	11/14/2006	1663	1550	North Bethesda
49	21	24*	*	Bradley Blvd at Wilson Ln	3/12/2009	1660	1600	Bethesda/Chevy Chase
18	22*	*	*	Falls Rd at Maryland Ave/Pot. Valley	9/16/2008	1658	1500	Rockville City
50+	23	26	2	Georgia Ave at Randolph Rd	3/31/2009	1657	1600	Glenmont
20	24*	*	*	Rockville-Pk/Twinbrook/Rollins	5/25/2010	1654	1500	Rockville City
50+	25	28*	*	Colesville Rd at Dale Dr	2/26/2009	1645	1600	Silver Spring/Takoma Park
15	26	1	6	Shady Grove Rd at Midcounty Hwy	11/18/2010	1644	1475	Derwood
39	27	31	15	Old Georgetown Rd at Tuckerman Ln	1/22/2009	1640	1550	North Bethesda
50+	28	39	33	Connecticut Ave at Veirs Mill Rd	5/25/2010	1637	1600	Kensington/Wheaton
11	29	33*	*	Montgomery Village Ave at Stedwick	10/4/2007	1633	1425	Montgomery Village/Airpark
7	30	34*	*	Ridge Road at Skylark Rd	4/16/2009	1629	1350	Goshen
50+	31	35*	*	Georgia Ave at Forest Glen Rd	7/2/2008	1626	1600	Kensington/Wheaton
50+	32	36	32	Colesville Rd at Silgo Crk Pkwy/St Andre	3/6/2008	1624	1600	Silver Spring/Takoma Park
50+	33	37	31	Georgia Ave at Columbia Blvd/Seminary Ln	1/8/2009	1613	1600	Silver Spring/Takoma Park
22	34	32	29	Columbia Pike at Fairland Rd	3/2/2011	1612	1475	Fairland/White Oak
23	35*	*	*	Aspen Hill Rd at Arctic Ave	11/6/2008	1609	1475	Aspen Hill
24	36	38	20	Norbeck Rd at Muncaster Mill Rd	1/29/2009	1609	1475	Aspen Hill
25	37	40	34	Columbia Pike at Greencastle Rd	11/15/2006	1607	1475	Fairland/White Oak
33	38	41	12	Veirs Mill Rd at First St	3/5/2009	1605	1500	Rockville City
27	39	42*	*	Columbia Pike at Lockwood Dr	4/2/2009	1603	1475	Fairland/White Oak
50+	40	43*	*	Randolph Rd at Parklawn Dr [W]	2/11/2009	1601	1550	North Bethesda
50+	41	44	36	Columbia Pike at Southwood	3/5/2008	1601	1600	Kensington/Wheaton
35	42	45	52	First St at Baltimore Rd	1/22/2009	1601	1500	Rockville City
21	43	46*	*	Democracy Blvd at Falls Rd/S Glen Rd	4/1/2009	1594	1450	Potomac
50+	44	46*	*	Darnestown-Germantown Rd at Wisteria Dr	10/18/2007	1594	1600	Germantown Town Center
50+	45	47*	*	New Hampshire Ave at Oakview	1/24/2006	1591	1600	Silver Spring/Takoma Park
44	46	48*	*	Colesville Rd at University Blvd [N]	9/13/2006	1589	1600	Kensington/Wheaton
50+	47	7*	*	Connecticut Ave at Randolph Rd	11/9/2010	1580	1600	Kensington/Wheaton
26	48	52	37	Layhill Rd at Ednor Rd/Norwood Rd	4/27/2010	1579	1450	Olney
50+	49	51*	*	River Rd at I-495 [E]	3/10/2009	1579	1600	Bethesda/Chevy Chase
50+	50	54*	*	East West Hwy at Jones Mill/Beach	3/5/2009	1574	1600	Bethesda/Chevy Chase

Appendix 2
Future Congestion

Year 2017 Forecasted Mobility

For the purpose of this report, the traffic forecast results derived from the year 2017 Policy Area Mobility Review (PAMR) analysis were used to report future traffic conditions. This analysis was performed using the Department's TRAVEL/3 model. This tool is an adaptation of the Metropolitan Washington Council of Governments (MWCOG) modeling process and has been applied in support of various subdivision staging policy and master planning studies undertaken by the Department.

Regarding the demographic assumptions the 2017 PAMR analysis, development assumptions inside Montgomery County were updated to reflect the existing base plus pipeline of approved but un-built development as of January 1, 2011. Land use assumed outside the County is an estimate of development by the year 2017 based on MWCOG's Round 8.0 cooperative land use forecast.

Within Montgomery County, the current pipeline of approved but un-built development includes some 21,000 households and 85,000 jobs. More than one-half 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, Germantown Town Center, and Germantown East
- North Potomac
- Gaithersburg City
- Montgomery Village/Airpark
- Derwood
- R&D Village
- Rockville City

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

It should be noted that the 2017 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 2017 PAMR transportation network, projects considered to be fully-funded within the current six-year County Capital Improvement Program (CIP) and the State Consolidated Transportation Program (CTP), plus those projects to be built by the private sector as a condition of development pipeline approvals, were assumed inside Montgomery County. In this regard, no significant changes relative to last year's 2016 PAMR analysis were identified. For the remainder of the network located outside Montgomery County, this analysis incorporates projects identified in the MWCOG Constrained Long-Range Plan (CLRP) network that are anticipated to be completed by the year 2015.

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 2017 model scenario. In addition, planning studies for both the Corridor Cities Transitway (CCT) and the Purple Line projects are underway. However, their anticipated completion dates are beyond the 2017 horizon and they were excluded from the model run as well. The PM peak period results were analyzed and compared to 2010 model run results for discussion purposes, with the primary focus on the non-freeway facilities (i.e., local roadways).

Table 4 compares the model run results for 2010 and 2017 scenarios. It should be noted that the levels of development assumed in these two scenarios are significantly different. For 2010, countywide totals for households and jobs are 362,000 and 510,000, respectively. For 2017, the countywide total for households is assumed to be 389,500 (an increase of 7.6 percent relative to 2010). The year 2017 countywide total for jobs is assumed to be 603,310 (an increase of 18.3 percent relative to 2010). Relative to 2010 conditions, the average volume-to-capacity (V/C) ratio on the County's transportation system is anticipated to increase by 8.9 percent by the year 2017. In addition, both the vehicle-miles traveled (VMT) and the vehicle-hours traveled (VHT) are anticipated to increase by 10.7 percent and 11.6 percent, respectively. The Intercounty Connector (ICC) and other future road improvements will account for a 3.8 percent increase in the roadway network's total lane-miles. These figures indicate that more vehicles are predicted travel the County's roadways and are forecasted to travel in more congested conditions by the year 2017. However, planned capacity improvements (most notably the ICC) are anticipated to maintain current average levels of mobility in the County as reflected in the slight decrease in average travel speeds.

Table 4 Countywide TRAVEL/3 Model Results, 2010 and 2017

	2010 Network	2017 PAMR Network	% Change from 2010
Households	362,000	389,500	7.6
Jobs	510,000	603,310	18.3
Total Lane-Miles	2,842	2,949	3.8
PM Vehicle-Miles Traveled (in 000s)	5,676	6,281	10.7
PM Vehicle-Hours Traveled (in 000s)	335.4	374.3	11.6
PM Average Speed (mph)	16.9	16.8	-0.8
PM Average V/C Ratio (4-7 p.m.)	0.76	0.83	8.8

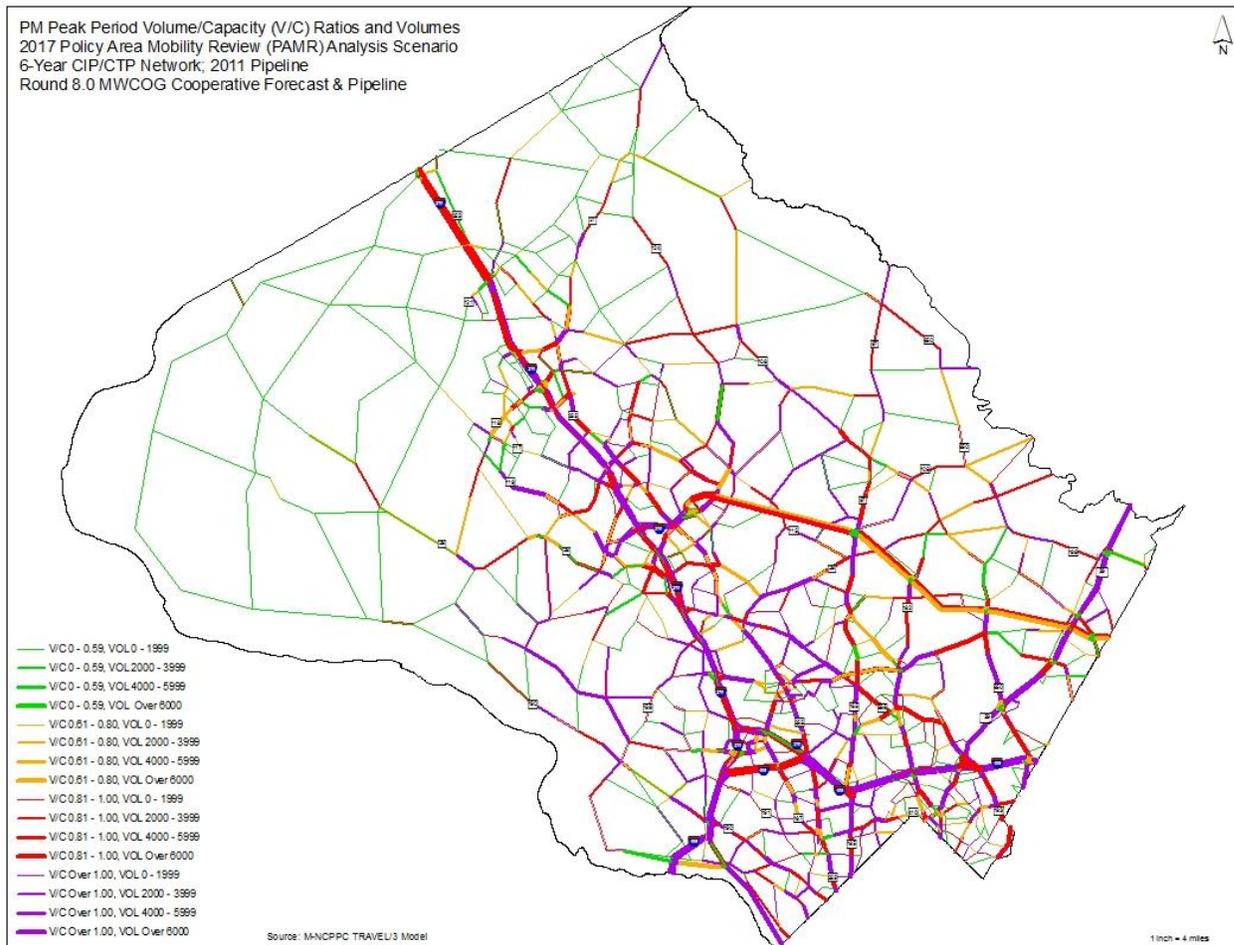
Table 5 compares and summarizes the 2010 and 2017 modeled results for both non-freeway and freeway facilities in the County. Based on the results, the forecasted increase in the average V/C ratio is higher for the freeway facilities (10.2 percent) versus that of the non-freeway facilities (8.7 percent). Similarly, the percent increases in VMT and VHT on the freeway facilities (22.3 percent and 16 percent, respectively) are forecasted to be higher than that of the non-freeway facilities (5.4 percent and 10.7 percent, respectively). One of the main reasons for the significant increase in total lane-miles for freeway facilities is the construction of the full length of the ICC between I-370 and US Route 1. This facility is anticipated to carry a significant amount of the additional traffic traveling on the County's roadways by 2017. As evidence by the V/C ratio result, congestion conditions on non-freeway and freeway facilities are anticipated to be roughly comparable between 2010 and 2017.

Table 5 Countywide TRAVEL/3 Model Results, Non-freeway and Freeway Facilities, 2010 and 2017

	Non-freeway Facilities			Freeway/Ramp Facilities		
	2010 Network	2017 PAMR Network	% Change from 2010	2010 Network	2017 PAMR Network	% Change from 2010
Total Lane-Miles	2,433	2,444	0.5	409	505	23.5
PM Vehicle-Miles Traveled (in 000s)	3,913.7	4,127	5.4	1,762.1	2,154.5	22.3
PM Vehicle-Hours Traveled (in 000s)	250.6	275.9	10.7	84.8	98.4	16.0
PM Average Speed (mph)	15.6	14.9	-4.2	20.8	21.9	5.4
PM Average V/C Ratio (4-7 pm)	0.76	0.82	8.7	0.77	0.85	10.2

Map 4 shows the PM peak period V/C ratios and volumes forecasted for the year 2017 on the County’s transportation system. The model results indicate that roughly 25 percent of the congested lane-miles (i.e., roadways with V/C ratios greater than 0.8) will be located along the freeway facilities (i.e. I-495 and I-270), while the remaining 75 percent will be located along the major non-freeway facilities such as Columbia Pike (US 29), Georgia Avenue (MD 97), and Connecticut Avenue (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.

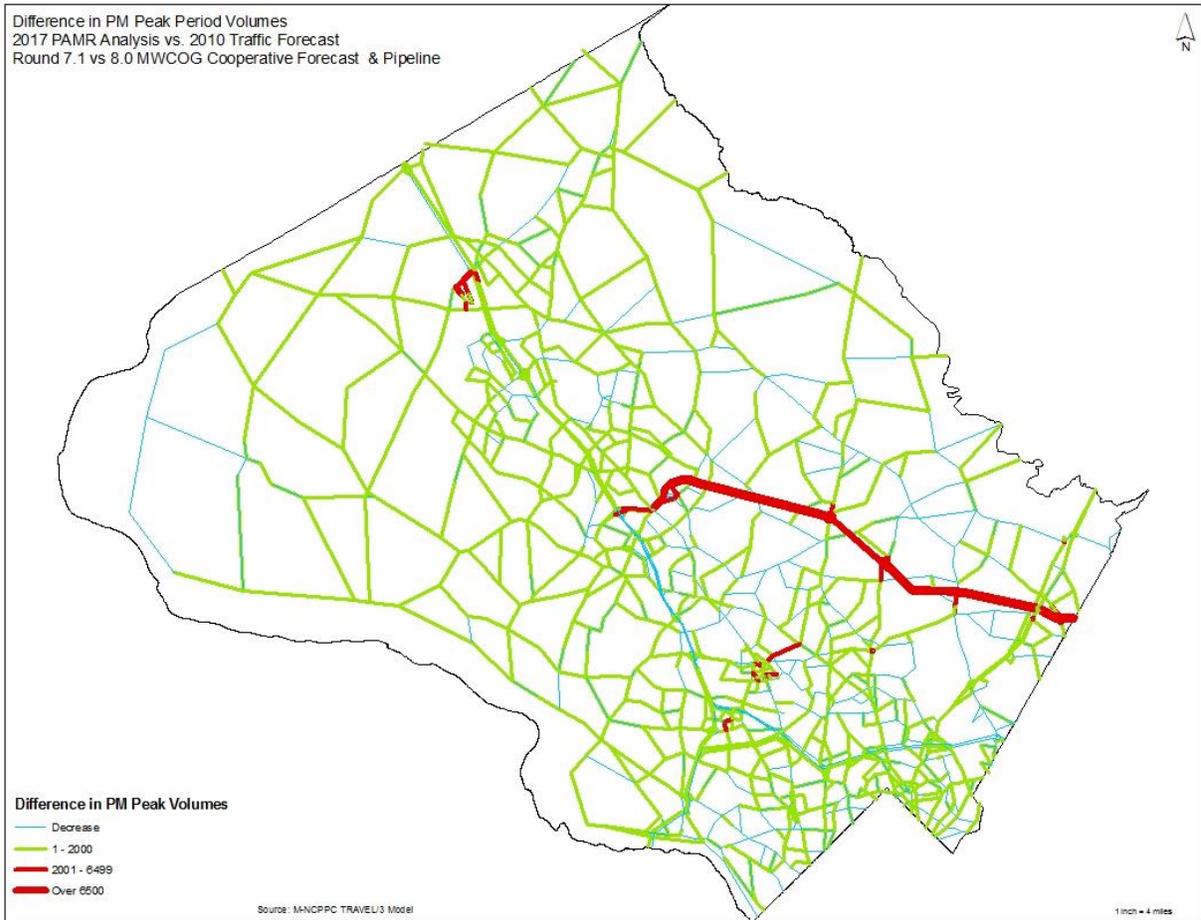
Map 4 Difference in PM Peak Period Ratios and Volumes



Map 5 depicts the forecasted PM peak period traffic volume differences between 2010 and 2017. Not surprisingly, traffic volumes are generally forecasted to increase throughout the County. In contrast to this general pattern, the opening of some new facilities is anticipated to have a beneficial effect on roadways located in the immediate vicinity of these projects.

A notable example is the addition of the ICC as a primary east-west route travel alternative. Some local roadways located in its immediate vicinity are anticipated to experience reductions in PM peak period travel volumes during the analysis period, including Norbeck Road (MD 28), Spencerville Road (MD 198), Muncaster Mill Road (MD 115), and sections of Olney-Laytonsville Road (MD 108). Similarly, modest reductions in travel volumes along the Beltway as well as along I-270 between the ICC and Montrose Road are also projected. These findings provide some indication that east-west mobility in the County will be enhanced, at least for the short-term, with the addition of the ICC.

Map 5 2017 PM Peak Period V/C Ratios and Volumes



Appendix 3
Scheduled Road Construction Projects

Construction Projects (State & County)

PROJECT NAME	LOCATION/LIMITS	AGENCY	DETAILS	% Completion
MD 650 at MD 97*	EB MD 650 and NB MD 97	State	Exclusive Left Turn Lane	86%
ICC - Contract C*	W. of US 29 to I-95	State	6-lane divided Tollway	75%
Woodfield Rd Extended*	Main St to MD 27	County	New 2-lane arterial	70%
ICC - Contract B*	MD 97 to W. of US 29	State	6-lane divided Tollway	70%
Father Hurley Blvd Extended*	Wisteria Dr to MD 118	County	Roadway extension to MD 118	69%
Watkins Mill Rd Extended*	e. of I-270 to W. of I-270	County	Sections	61%
Cedar Ln Bridge*	Over Rock Creek	County	Bridge Rehabilitation	5%
Nebel St Extended*	Chapman Ave to Randolph Rd	County	Roadway extension to Randolph	0%
E. Gude Dr WB Bridge over CSX and Metro*	600' e. of MD 355	County	Structural rehabilitation	0%
BRAC Bicycle and Pedestrian Facilities*	Surrounding NNMC	County	Bikeway network construction	0%
ICC - Contract D/E*	I-95 & Va Manor Rd	State	6-lane divided Tollway	0%
BRAC Bike Path: West Cedar Ln	MD 187 to MD 355	County	Shared Use Bike Path	0%
BRAC Bike Path: Jones Bridge Rd	MD 187 to MD 355	County	Shared Use Bike Path	0%
BRAC Bike Path: Battery Ln	MD 355 to MD 187	County	Shared Use Bike Path	0%
BRAC Bike Path: MD 355	West Cedar Ln to Jones Bridge Rd	County	Shared Use Bike Path	0%

SHA Development & Evaluation (D&E)

MD 390/16th St*	Second Ave/Eikhart Ave	State	Safety, Adding exclusive left turn lane	Design
MD 182 Norwood Rd*	Norwood Rd	State	Add left turn lane EB MD 182, excl WB right on MD 182	Design
MD 97 at Norbeck*	Interchange Vicinity	State	Interchange Project	Design
Randolph Rd/CSX Project*	Intersection Vicinity	State	Interchange Construction	Design
MD 124 Phase II*	Mid County Hwy to Snouffer School	State	6 lanes	Design
MD 355/Montrose/Randolph/CSX RR Phase I & II		State	New Interchange	Design
BRAC - MD 355 at Cedar Ln *	Intersection Vicinity	State	Intersection Improvements	Design
BRAC - MD 355 at Jones Bridge Rd*	Intersection Vicinity	State	Intersection Improvements	Design
BRAC - MD 187 at Cedar Ln *	Intersection Vicinity	State	Intersection Improvements	Design
BRAC - MD 185 at Jones Bridge Rd*	Intersection Vicinity	State	Intersection Improvements	Design
I-270 Watkins Mill Rd Extended*	Proposed Interchange	State	New Interchange	Engineering
MD 586 at Twinbrook Pkwy *		State	Right turn lane construction	On Hold
US 29 at Greencastle Rd	Briggs Chaney to MD 198	State	Interchange Construction	On Hold
US 29 at Musgrove Rd*		State	Interchange Construction	On Hold
US 29 at Stewart Ln*		State	Interchange Construction	On Hold
US 29 at Tech Rd*		State	Interchange Construction	On Hold
MD 28/MD 198 Corridor Study*	MD 97 to PG County Line	State	Widening to 4 lanes	On Hold
MD 97 at Norbeck Rd		State	SB 2nd left turn lane construction	On Hold
MD 117 Phase III & II	Seneca Park to Metropolitan Grove	State	4-6 lanes widening	On Hold
MD 124 Phase III*	N. of Fieldcrest to Warfield Rd	State	6 lanes	On Hold
I-270/US15 multi-modal study	Shady Grove Rd to N Biggs Rd	State	Multi-modal Improvements	PP
MD 97 (Brookeville Bypass)*	S. to N. of Brookeville	State	2-lane roadway	PP
MD 97 Accessibility Study	16th St to Forest Glen	State	Improve Safety and Accessibility	PP
MD 97 at Randolph Rd*		State	New Interchange	ROW

County DPWT Facility Planning

BRAC MD 355 Crossing Study *	NNMC (MD 355)	County	Planning Study to improve Ped Crossings	Facility Planning I
E. Gude Dr Widening*	Crabbs Branch to Southlawn	County	Comprehensive facility planning study	Facility Planning I
Midcounty Corridor Study	Mid County Hwy to Mont Vill Ave	County	Comprehensive facility planning study	Facility Planning I
Bradley Blvd Bikeway*	Wilson Ln to Goldsboro Rd	County	Comprehensive facility planning study	Facility Planning I
Oak Dr/27 Sidewalk*	Bethesda Church Rd to Ridge Rd	County	Comprehensive facility planning study	Facility Planning I
Observation Dr Extended*	Waters Discovery Ln to Observation I	County	Providing for the missing segments	Facility Planning II
Seminary Rd Intersection	"Mixing Bowl"	County	Addressing Recommendations from FP I	Facility Planning II
Montrose Parkway East	MD 187 to MD MD 586	County	New 4-lane arterial	In Design
Goshen Rd South*	Girard St to Warfield Rd	County	Widening from 2 to 4/6 lanes	In Design
Snouffer School Rd*	Centerway Rd to Woodfield Rd	County	5,850 linear ft of widening	In Design
Piney Meetinghouse Rd Bridge	Over Watts Branch	County	Prelim-Engineering for the rehabilitation of bridge	In Design
Whites Ferry Bridges	over Broad Run Tributary	County	Prelim-Engineering for the rehabilitation of bridge	In Design
Gold Mine Bridge	over Hawlings River	County	Prelim-Engineering for the rehabilitation of bridge	In Design
Thompson Rd	Thompson Rd to Rainbow Dr	County	New 2-lane primary road	On Hold
Randolph Rd	Gaynor Rd to Charles Rd	County	Safety Improvements	On Hold
Century Blvd	Father Hurley to Crystal Rock	County	Roadway extension to Crystal Rock Dr	Participation

Clarksburg Connector* Chapman Ave Extended*	Clarksburg Sq Rd to MD 355 Old Georgetown Rd to Maple Ave	County County	Roadway extension Provide local circulation trips in White Flint	Participation Property Acquisition
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Completed Projects (State & County)

New Roads/Interchanges:

Inter-County Connector (Contract A)*	I-370 to MD 97	State
Citadel Ave Extended*	S. of Marinelli to Nicholson Ln	County
Montrose Parkway West*	200' e. of Tildenwood Dr to MD 187	County

Road Widening:

MD 650 at Adelphi Rd*		State
MD 27 at Sweepstakes*	Provide Right Lane on Sweepstakes	State
MD 124 Phase I	Airpark Rd to Field Crest Rd	State

Grade-Separated Interchange Improvements:

Intersection Improvements:

Redland Rd*	Crabbs Branch Way to Needwood Rd	County
MD 586 at MD 28*		State

Resurfacing/Rehabilitation:

MD 586*	Andrew St to MD 193	State
MD 189*	1000' North of Winterset Dr to 300' n.	State
Clarksburg Road Bridge*	Over Bennett Creek	County
MD 109 Bridge Deck	Little Bennett Creek	State

Safety/Spot Improvements:

I-495*	From Seminary Rd to US 29	State
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Studies

I-495 Capital Beltway	Potomac River to I-270	State
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KEY/NOTES:

PP = Project Planning (State)

TBA = Awaiting Start of Construction

Property Aq = Property Acquisition Phase

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 February, 2009.

Mobility Assessment Report

Appendix

October 2011

Montgomery County Planning Department
M-NCPPC
MontgomeryPlanning.org



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