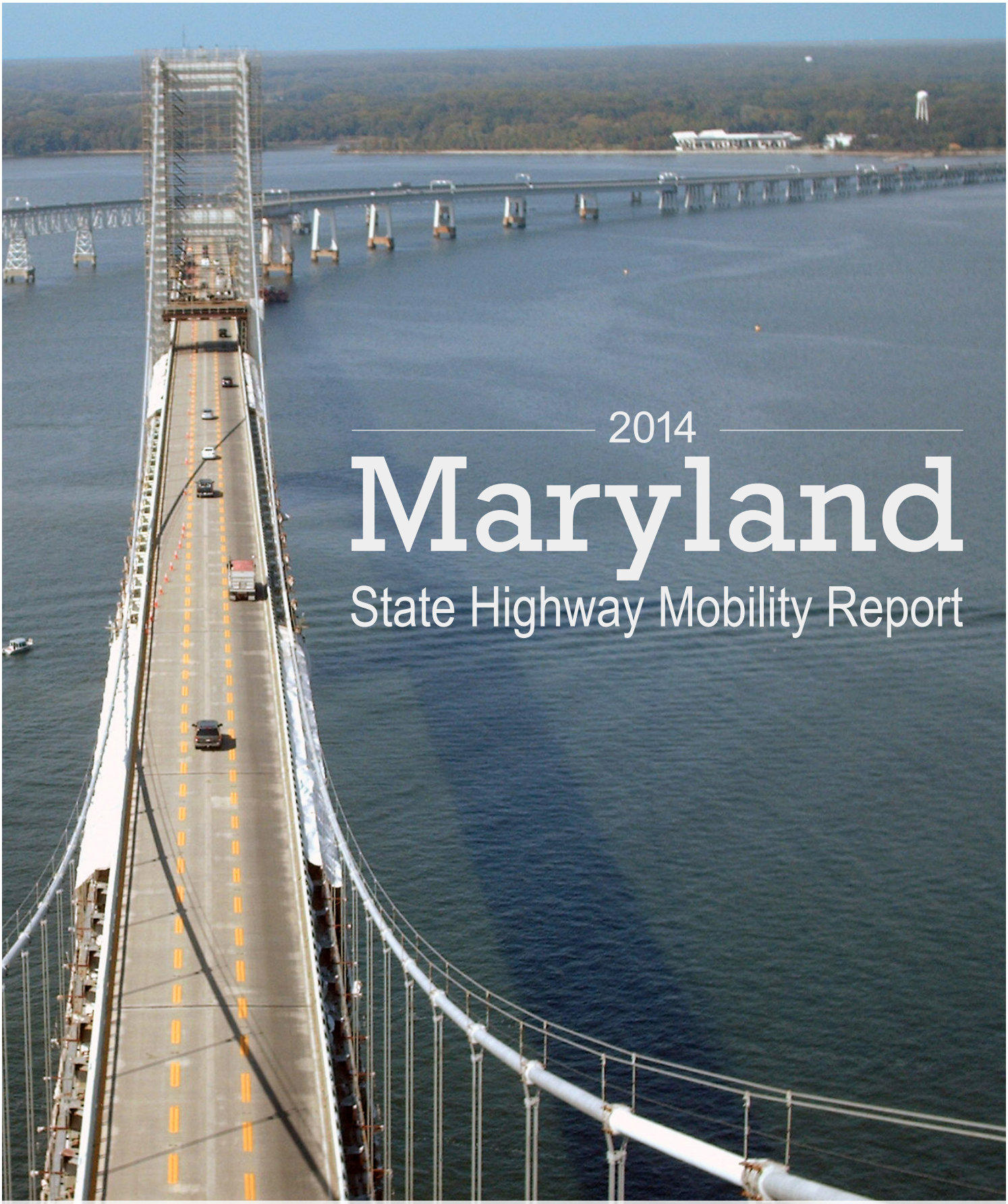

2014

Maryland

State Highway Mobility Report

SHA State Highway Administration
Maryland Department of Transportation

Maryland Department of Transportation

2014 Maryland State Highway Mobility Report

Third Edition

AUTHORS Subrat Mahapatra, Matthew Wolniak, Eric Beckett, Kaveh Farokhi Sadabadi, Thomas Jacobs

CONTENT CONTRIBUTORS Sepideh Eshragh, Reuben Juster, Abhay Nigam, Tom Costello, Ben Myrick, Sarah Gary, Theresa Pyzik Cox, Clyde Munz

REVIEW PANEL Douglas Simmons, Dave Coyne, Gregory Slater, Richard Woo, Mike Zezeski, Cedric Ward, Bruce Grey, Glenn McLaughlin, Morteza Tadayon, David Buck, Dennis Simpson

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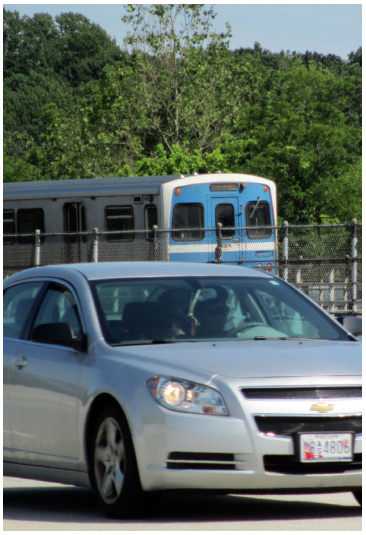

Executive Summary

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Mobility is a key performance area (KPA) at the Maryland State Highway Administration (SHA) and the Maryland Transportation Authority (MDTA). The goal is to "Support Maryland's Economy and Communities with Reliable Movement of People and Goods". In order to accomplish this, many different programs have been established to improve not only vehicular transportation but also multi-modal options to ensure the safety and accessibility of all users. SHA's and MDTA's mobility related efforts in calendar year 2013 is highlighted in the 2014 Maryland State Highway Mobility Report. This report identifies successes, challenges, and strategies being utilized to improve the transportation services SHA and MDTA delivers to Marylanders and the traveling public.

Investment in Maryland's' transportation system has been restricted in the last decade by limited funds and increasing needs both from a maintenance and capacity standpoint. This was further exacerbated by a growth in traffic volumes during the 1990s through the late 2000s. Maryland Governor Martin O'Malley and the General Assembly recognized these problems and passed the Transportation Infrastructure Investment Act of 2013 to provide significant funding to upgrade and invest in aging transportation facilities throughout the State. This will assist in preserving and improving the state highway system, while supporting Maryland's economic competitiveness, environmental stewardship, and quality of life. With a focus on policies, programs and projects that systematically address both recurring (every day congestion) and non-recurring (congestion due to weather, crashes, vehicle breakdowns, etc.). SHA continues a performance based approach to provide its users with a high quality, reliable highway system.

The 2014 Maryland Annual Mobility Report describes the calendar year 2013 performance as it related to mobility trends in Maryland and how SHA is focusing to address these challenges. This includes elements such as Transportation Systems Management and Operations (TSM&O), multi-modalism, and the capital projects SHA has accomplished in the past year.

The following is a summary of congestion and reliability trends on the Maryland highway network in 2013:

- The annual vehicle miles travelled (VMT) was 56.5 billion. This is a 0.2% increase over 2012 and is approximately 0.5% lower than the all-time high of 56.8 billion in 2007. Approximately 71% of the VMT occurred on state highways including toll facilities. 2013 VMT in the Baltimore - Washington region was 44.4 billion, whereas as 12.1 billion VMT occurred on the Eastern Shore, Southern and Western Maryland.
- In the last five years, changes in VMT has varied by locality. Baltimore City has seen a 6% drop in VMT while Counties such as Howard and St. Mary's experienced a 4% increase.
- The Maryland freeway/expressway system was analyzed using private sector vehicle probe speed data which shows that 8% of the system experienced heavy to severe congested conditions in the AM peak hour. Congestion levels in the PM peak hour were worse, with 12% of the system experiencing heavy to severe congested conditions.
- In 2013, on freeways/expressways, 16% of the AM peak hour VMT and 22% of the PM peak hour VMT was in congested conditions compared to 23% and 33% (AM and PM peak hour respectively) in 2012. On weekdays, almost 100% of the peak hour congestion occurred in the Baltimore - Washington region.
- Travelers on Maryland freeways/expressways experienced a total annual delay of 21.2 million hours and consumed 8.5 million gallons of extra fuel due to congestion. This translates into $1.68 billion dollars of annual user costs due to congestion.

The most congested freeway/expressway segments for the AM and PM peak hours are as follows:

2013 MOST CONGESTED FREEWAYS/EXPRESSWAY SEGMENTS (AVERAGE WEEKDAY)

AM Peak (8-9 AM)	PM Peak (5-6 PM)
I-495 Outer Loop - I-95 to MD 97	I-495 Inner Loop - Virginia State Line to I-270
I-695 Outer Loop - US 1 to MD 41	I-695 Inner Loop - MD 139 to Providence Road
I-695 Outer Loop - MD 26 to Edmondson Avenue	I-270 Northbound - MD 28 to Middlebrook Road
US 50 Westbound - MD 410 to Washington, DC Line	MD 100 Westbound - MD 713 to Coca-Cola Drive
I-270 Southbound - Shady Grove Road to Montrose Road	*MD 295 (Baltimore - Washington Parkway) Northbound - Powder Mill Road to MD 32

* - Maintained by National Park Service

Reliability performance measures illustrate the variability in traffic congestion so that highway users can add the extra “buffer” time to their trip to reach their destination on time. The Planning Time Index used to measure reliability, identified that 9% of the freeways/expressways operate in highly to extremely unreliable conditions in the AM peak hour and 13% in the PM peak hour.

The following roadway segments experienced the greatest variation in travel time in AM and PM peak hours.

2013 MOST UNRELIABLE FREEWAYS/EXPRESSWAY SEGMENTS (AVERAGE WEEKDAY)

AM Peak (8-9 AM)	PM Peak (5-6 PM)
I-495 Outer Loop - I-95 to US 29	I-495 Inner Loop - MD 187 to MD 185
I-695 Outer Loop - I-95 to MD 41	I-695 Inner Loop - MD 139 to MD 146
I-270 Southbound - Shady Grove Road to MD 189	I-495 Inner Loop - Clara Barton Parkway to I-270
I-695 Outer Loop - MD 140 to US 40	US 50/301 Eastbound - MD 450 to MD 70
US 50 Westbound - MD 410 to MD 459	I-270 Southbound/I-495 Inner Loop - I-270 Split to I-495

The worst bottlenecks on freeways/expressways are identified based on vehicle probe speed data. Bottlenecks are defined based on the number of occurrences of speed reductions due to capacity or incident issues, average length of queue that occurs and duration of event. The top bottleneck locations are:

2013 BOTTLENECKS

- I-495 Inner Loop at I-270
- I-695 Inner Loop at MD 147
- I-95 Northbound at MD 100
- I-695 Outer Loop at Edmondson Avenue**
- US 29 Northbound at MD 175
- I-270 Southbound at I-270 Spur
- I-495 Inner Loop at Greenbelt Metro
- MD 295 Northbound at MD 197*
- I-270 Northbound at MD 80
- I-270 Northbound at MD 124

* Maintained by the National Park Service, ** Under Construction

An analysis was performed based on available traffic count data for the SHA arterial system. It showed the following results:

- Based on intersection analysis from the last three years traffic count data, 88 intersections were operating at a failing level of service (LOS F)
- 21% of the multi-lane facilities accounting for 6% of the roadway mileage operate at LOS “F”
- 2% of the two lane roadways accounting for 1% of the mileage are operating at LOS “F”

The SHA uses a combination of policies, programs and strategies to improve mobility of the highway system. Programs have been established to provide incident management and travel information services, expand pedestrian and bicycle facilities, provide ADA accommodations, increase access to transit and address freight issues. The emphasis of these strategies also focuses on alleviating congestion hotspots through low cost improvement projects. This includes using the latest advances in Intelligent Transportation Systems (ITS) technology; retiming signals to reduce delay; making more efficient use of the existing system through avenues such as HOV lanes, reversible lanes and utilizing variable lane use control signals; and providing geometric improvements at critical segments or intersections. This is accomplished through high quality data driven processes in which SHA develops and implements programs and projects to provide improved mobility in a systemic and responsible manner.

The SHA and the Maryland Transportation Authority (MDTA) with the assistance of metropolitan planning organizations (MPOs), County and local agencies, completed numerous projects to improve mobility within the State of Maryland. Highlights of 2013 include:

- SHA's Coordinated Highways Action Response Team (CHART) program saved $1.16 billion in annual user costs in 2013 through incident management and traveler information services. This included responding to and clearing more than 17,000 incidents and assisting almost 27,000 stranded motorists from Maryland roadways.
- SHA operates the Maryland 511 traveler information service. This service, with its "Know Before You Go" theme, provides reliable travel information via the web or phone on state-maintained roadways. The 511 system continued to assist highway users in better trip planning by providing route specific real time information on travel times. A customized application is being developed for the commercial vehicle industry.
- SHA partnered with State Farm® Insurance to provide 46 full-time patrols and 10 part-time patrols. In addition, extra patrols are provided on the Eastern Shore during summer months.
- SHA collaborated with other regional agencies to increase camera video feed interoperability and currently has access to 600 camera sites to alert emergency personnel and provide real time traffic information. Travel time information is provided on over 100 dynamic message signs throughout Maryland.
- The retiming of traffic signals in Maryland in 2013 provided for an estimated reduction of 900,000 hours of delay resulting in an annual user cost savings of $29.4 million dollars. The traffic signal systems were retimed throughout the State accounting for improved operations at 222 signalized intersections which included 29 signal systems. This reduced delay on those corridors by an average of 8%.
- Two interchange projects were completed in calendar year 2013 including the reconstruction of the I-695/ Wilkens Avenue interchange and the construction of a new interchange at MD 32/Linden Church Road. These major projects are projected to result in an annual user cost savings of $3.3 million.
- SHA completed four minor congestion relief projects through its Congested Intersection Program. Improvements were made at MD 30/MD 91, MD 27/Sweepstakes Road, MD 108/Bowie Mill Road and US 40/MD 63 intersections. These projects result in a $2.4 million annual cost savings.

- Several major projects were under construction in calendar year 2013 to improve traffic operations including I-70 from west of MD 85 to east of MD 144 in Frederick County, the I-95/Contee Road interchange in Prince George's County, the I-695/MD 144 interchange in Baltimore County and the continued widening of MD 404 in Caroline County.
- The MDTA completed construction of the I-95/I-895 interchange for general purpose motorists. The section of I-95 from I-895 to MD 43 will become the first express toll lane facility in Maryland where motorists will have the choice to utilize the general purpose lanes or the express lanes for a fee. The first portion of the lanes opened in December 2014.
- The final section of the Intercounty Connector (ICC)/MD 200 from I-95 to US 1 opened November 2014. Traffic usage on the existing section from I-270 to I-95 is increasing with average usage of 31,000 to 35,000 vehicles per day. This roadway provides a vital east-west connection between the I-270 and I-95 corridors and improves access to the Baltimore - Washington Thurgood Marshall International Airport.
- The US 40/MD 715 interchange was opened to traffic in 2013 and construction completed in 2014. This project along with intersection improvements along MD 175 near Ft Meade in Anne Arundel County and providing additional capacity along MD 185, MD 355 and MD 187 in Montgomery County related to the Walter Reed National Military Medical Center are on-going. These were part of a large coordination effort between local and federal partners in relationship to the Base Realignment and Closure (BRAC) to provide transportation improvements in the area.
- SHA's Complete Street policy focuses on a multi-modal approach to projects. This facilitates walking and bicycling as low-cost, environmentally friendly, and healthy transportation alternatives. Two major sidewalk projects were completed in Montgomery and Worcester Counties along with upgrading existing accessible pedestrian signals at over 50 signals. In addition, there were 67 directional lane miles of bicycle facility improvements.
- At SHA and MDTA Park & Ride lots over 7,500 motorists park on a given day saving over 106 million vehicle miles travelled annually. This translates to a $5.9 million annual user cost savings.
- HOV operations especially along I-270 provide multi-occupant and transit travel time savings as much as 16 minutes in the PM peak hour. Person throughput along the corridor is substantially increased with a HOV accommodating as much as 1,000 additional persons versus a non-HOV lane: HOV lane operations on I-270 resulted in $4.5 million user cost savings in 2013.
- SHA recognizes the importance of safe and efficient movement of commercial vehicle freight. This includes from a safety standpoint by providing 61 additional overnight parking spaces which are being constructed at the I-95 southbound Welcome Center.

What is in the Maryland State Highway Mobility Report?

The 2014 Maryland State Mobility Report is broadly written around the central theme of:

- What is Happening? (Trends and Needs Identification - Chapter I)
- What is SHA doing? (Mitigation Strategies/Solutions - Chapter II)
- What is the outcome for end users? (Chapter II)

  - Chapter I discusses the Mobility Trends in Maryland that includes traffic volume trends, congestion, reliability and truck traffic trends for the year 2013. This chapter includes the congestion and reliability maps for peak hours and identifies the Top 30 peak hour and 24 hour bottlenecks on the Maryland freeway/ expressway system.
  - Chapter II discusses the Capital Projects, Programs and Policies that were implemented in 2013 along with the user benefits associated with them. Programs and policies include the CHART activities and various multimodal strategies implemented by the SHA.
  - The Appendices A - C include fact sheets that highlight the performance of major freeway/expressway, arterial corridors and capital projects completed in 2013.

What's new in the 2014 Report:

- Travel Time Index and Reliability metrics for the arterial corridor fact sheets.
- Transit route ridership information has been included for the arterial corridors.
- User benefits for High Occupancy Vehcile (HOV) operations and Park and Ride operations have been monetized for reporting purposes. HOV operational performance evaluation now includes advanced continuous monitoring through Bluetooth technology.
- The 2014 Report has been reorganized (compared to past reports).

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Mobility

Trends in Maryland

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A. Traffic Volume Trends

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Traffic Volume Trends

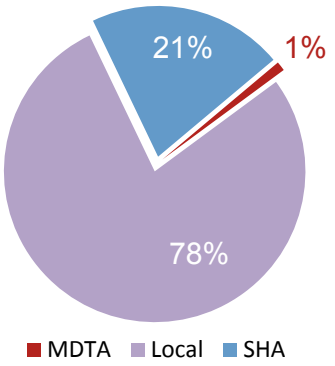
Although across the country travel growth has remained constant due to factors such as the slowly rebounding economy and younger adults either receiving their licenses later or driving less, there are still areas that experience immense amounts of congestion. This includes major population and activity centers such as the Baltimore - Washington region. This occurs as a result of too many users including automobiles, buses and trucks trying to share a common roadway segment at the same time. Due to the limited availability of funding for new projects in past years, infrastructure improvements in roads and public transportation have not been able to keep up with the growth in demand. This is further exacerbated by the non-recurring nature of the congestion due to crashes, vehicle breakdowns, special events and weather events. The impacts of a congested system are detrimental in several ways including increased costs to the individual user, environmental impacts and the overall quality of life.

The following facts highlight trip patterns in Maryland:

- Maryland is second in the nation in terms of commuters who travel over 60 minutes one way to reach their place of employment based on the American Community Survey. The Washington D.C. region is second in the nation with commuting times on average of 34.5 minutes each way.
- The 2012 data from the 2013 Urban Mobility Report lists the Washington, DC region with the fourth highest travel delay in the country amounting to approximately 1.8 billion hours of travel delay. The average D.C. region auto commuter experienced 67 hours of annual delay which is the highest in the country.
- The Baltimore region is better than the Washington region related to delay experienced by motorists. The Baltimore area ranks as the seventeenth highest delay in the country at approximately 70 million hours. On average the Baltimore area auto commuter experienced an annual delay of 41 hours.
- Maryland's population in 2013 was approximately 5.9 million, about 150,000 people greater than in 2010 according to the US Census Bureau. By 2040, population is projected to increase to over 6.8 million people. In addition, job growth in Maryland is expected to keep pace with an estimated 800,000 additional jobs between 2010 and 2040.

The majority of roadways in Maryland are locally owned either by counties, cities, local municipalities or private entities. These roadways carry mostly lower volumes of traffic. The higher volume roadways are mainly owned and operated by SHA and MDTA. SHA owns and maintains the numbered, non-toll routes in Maryland's 23 counties - a total of 14,800 lane-miles* and 2,576 bridges that represent the backbone of Maryland's transportation system. This infrastructure forms the majority of the National Highway System (NHS) in Maryland that connects local and county roads to major commercial and residential centers and other modes of transportation such as mass transit, the port, airports and railroads. Although SHA roadways account for only 21% of the state's roadways they carry 65% of the state's traffic. The MDTA owns and operates all toll roads in the state. This includes I-95 in Baltimore City to the Delaware State Line, I-895 including spurs to I-97 and MD 2, MD 695 from east of MD 10 to MD 151, the Hatem Bridge (US 40), the Bay Bridge (US 50/301), the Nice Bridge (US 301) and MD 200 (Intercounty Connector).

MARYLAND HIGHWAY LANE MILEAGE



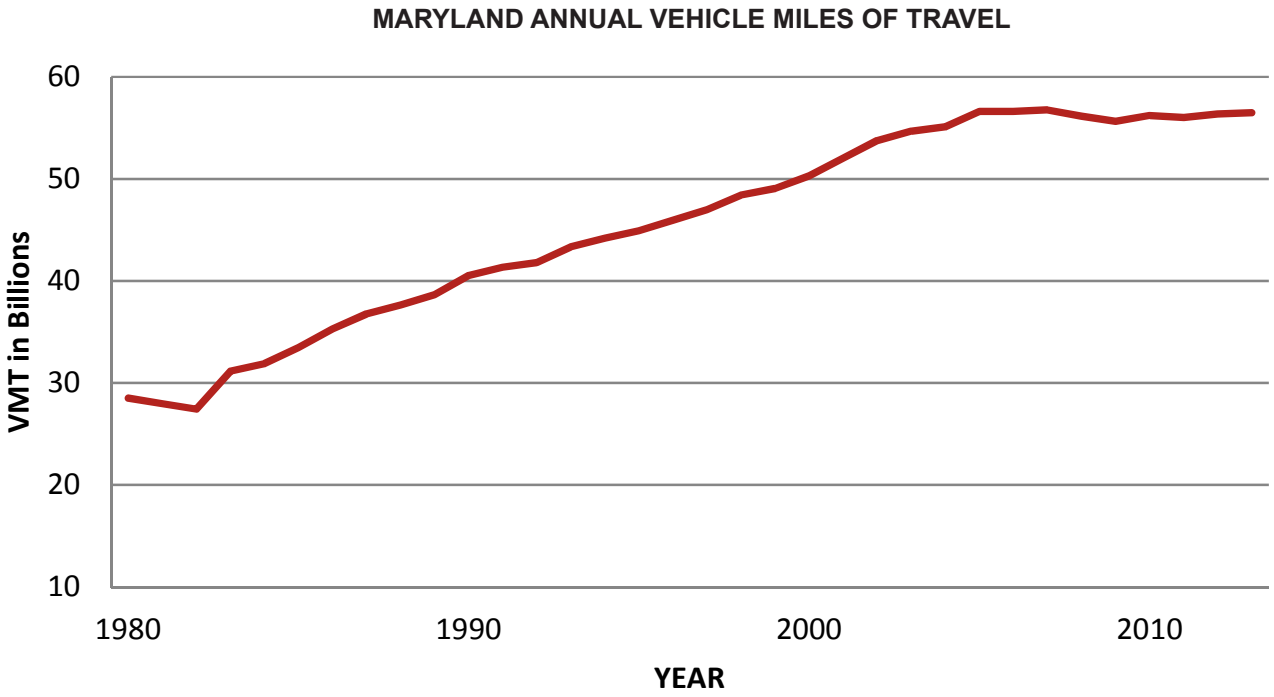
Traffic volume growth throughout Maryland varies according to region and roadway. While travel on several roadways on the Eastern Shore or Western Maryland have remained relatively constant for years, other roadways have seen a large growth in volume. The I-270 "Technology Corridor" in Montgomery County is one of those roadways. In less than 30 years, traffic volumes along I-270 have increased by 100,000 vehicles per day since the implementation of the collector-distributor roadway system. Other roadways such as MD 5 in Prince George's County and I-70 in Frederick County have experienced a growth in traffic of approximately 140% in less than 30 years.

The mobility of people utilizing Maryland's roadway system is reflected in the number of Vehicle Miles Traveled (VMT) and the traffic volumes along the various roadways. VMT on Maryland's roadways during past decades has steadily increased as a result of population growth and economic activity in the region.

VMT is a standard performance measure of travel at various levels of geography; local, regional, state and national. VMT is defined as the number of vehicles times the distance they traverse along the network. VMT has been measured for decades in each state throughout the nation and thereby gives a comparison in growth from one year and one decade to the next. Many areas in Maryland have seen growth in VMT that has outpaced population growth and SHA's ability to expand the roadway network especially in the Baltimore - Washington region. This has caused an increase in congestion on the roadway network. In order to keep pace with the VMT and congestion, various multi-modal and traveler incentive programs are utilized to help manage the demand for transportation services.

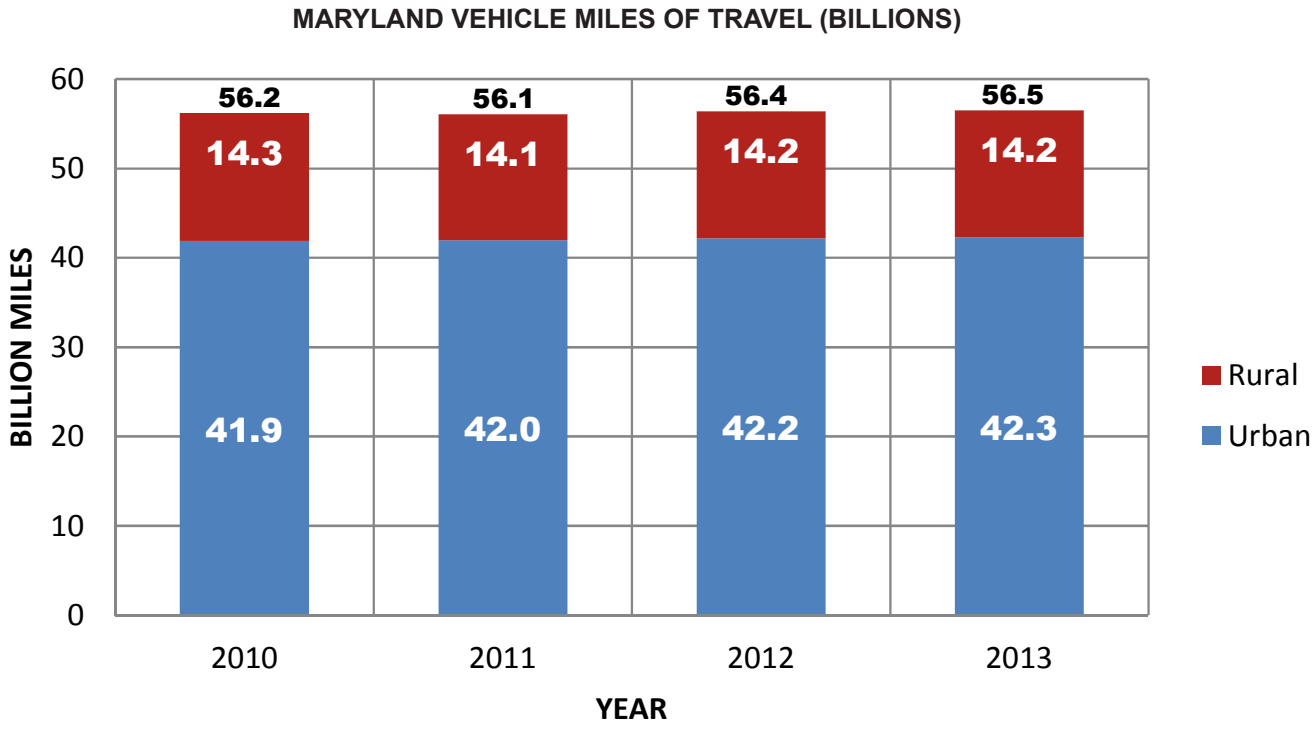
* Lane mileage from previous reports reflected ramps, spurs and service roads.

Economic and social conditions such as the increase of women in the work force in the 1970s and 1980s directly influence the number of vehicle miles traveled. Other items such as people moving to suburbs and further out areas increase the VMT while increases in gasoline prices reduce the VMT. In the last few years trends have seen a relatively flattening out of VMT due to the recession both nationally and in Maryland as compared to the rapid growth between 1980 and the mid 2000's as shown in the following graph.



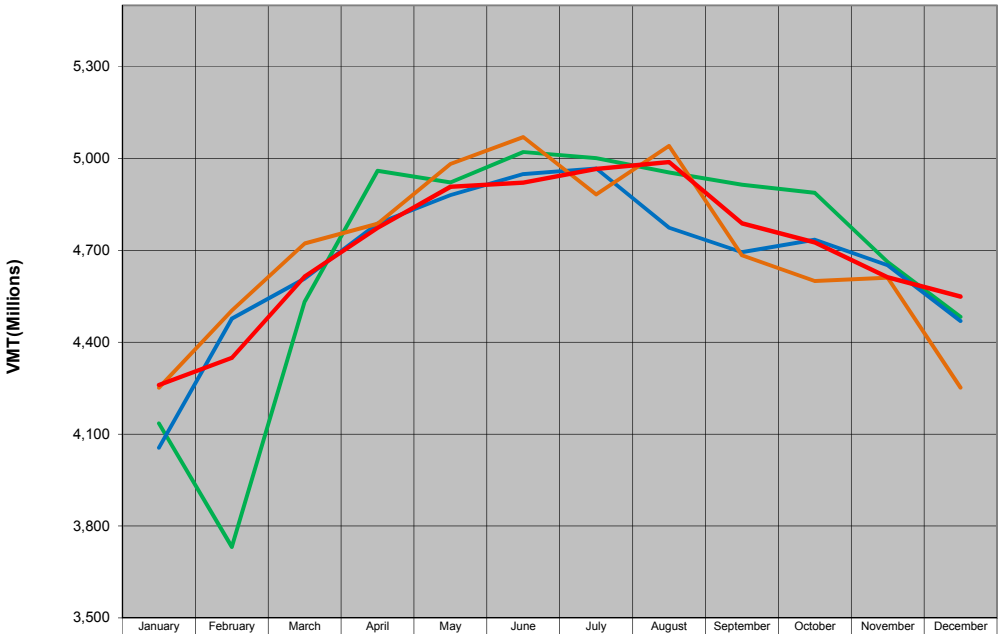
VMT is estimated to be 56.5 billion vehicle miles for 2013. VMT in 2013 is about 0.2% more than 2012 and 0.3 billion vehicle miles off the all-time high of 56.8 billion vehicle miles in 2007. The highest volume roadway sections are I-270 north of the I-270/I-495 split and I-495 west of I-270 which carry more than 240,000 vehicles per day. Sections of the Capital Beltway (I-495) both in Montgomery and Prince George's County and Baltimore Beltway (I-695) between the I-83s' in Baltimore County have volumes of over 220,000 vehicles per day.

The 2013 VMT on the state and toll maintained roadways was 40.4 billion, approximately the same as 2012. Similarly, along other roadways in Maryland, the VMT increased slightly to 16.1 billion vehicle miles in comparison to 16 billion vehicle miles in 2012. The urban areas are experiencing growth while rural areas have remained relatively constant as shown in the following chart.



The charts below show the monthly distribution and the disaggregation of VMT by ownership and roadway type.

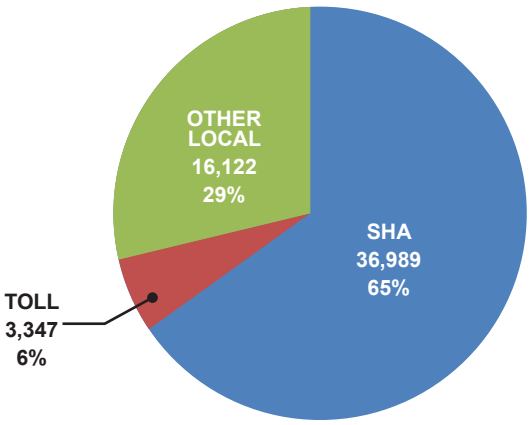
MONTHLY DISTRIBUTION OF ANNUAL VEHICLE MILES OF TRAVEL



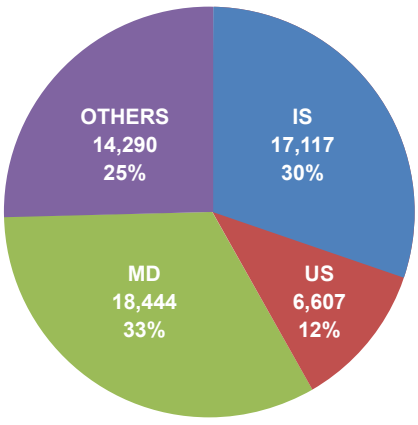
	January	February	March	April	May	June	July	August	September	October	November	December
2010 VMT (Millions)	4135	3731	4533	4960	4922	5021	5001	4954	4915	4888	4662	4483
2011 VMT (Millions)	4056	4477	4608	4788	4880	4949	4968	4775	4694	4735	4652	4469
2012 VMT (Millions)	4252	4504	4723	4787	4982	5070	4883	5042	4684	4600	4611	4252
2013 VMT (Millions)	4260	4349	4615	4774	4908	4921	4966	4989	4789	4726	4612	4549

NOTE: This chart displays estimated monthly Vehicle Miles of Travel compared with the previous year based on data collected at approximately 67 continuous count stations throughout the State.

2013 VMT BY OWNERSHIP ('000)



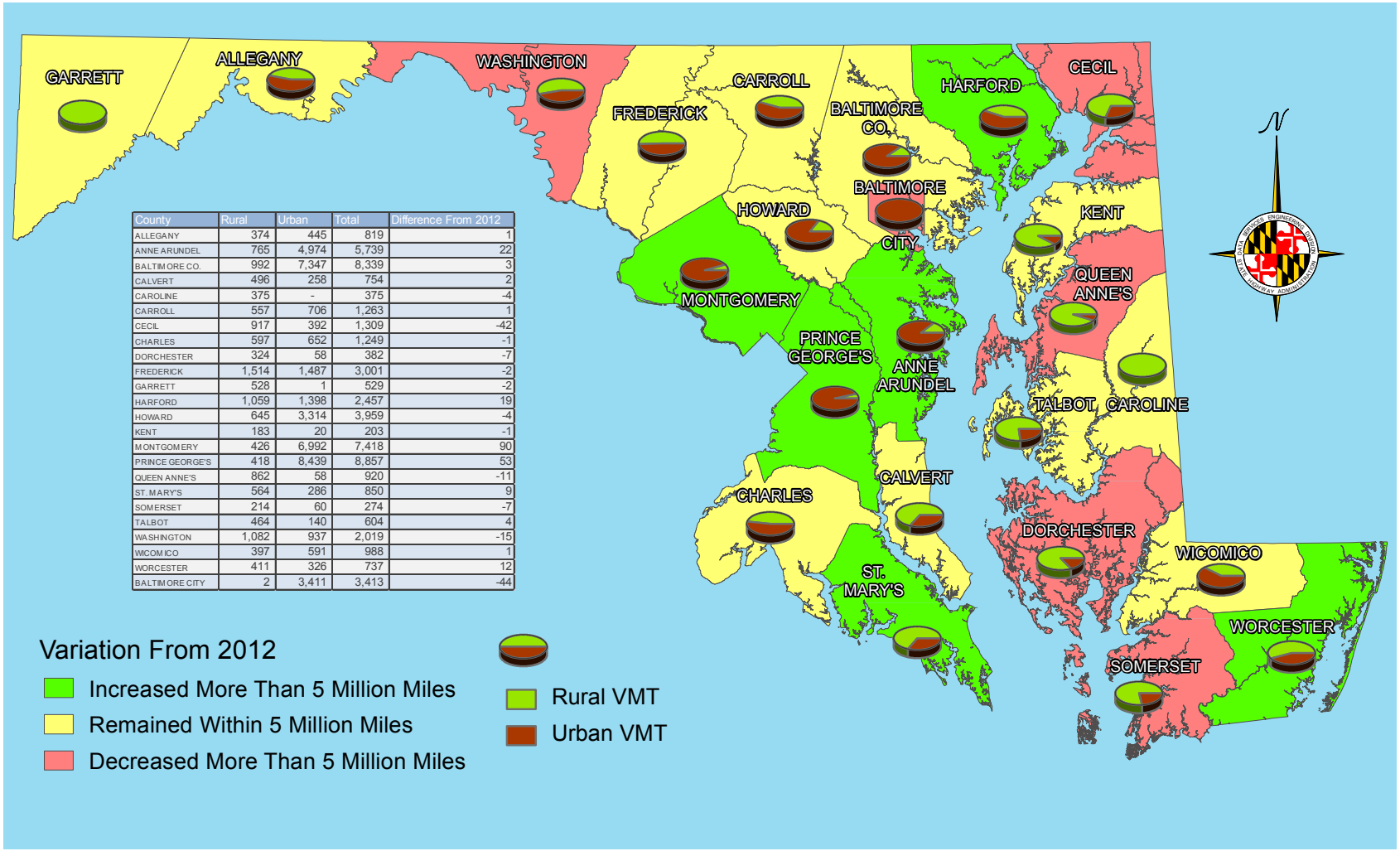
2013 VMT BY ROADWAY TYPE ('000)



On a countywide basis the change in VMT from county to county varies with some counties increasing, some decreasing and other remaining virtually the same. As shown in the following figure Montgomery County experienced the largest increase while Baltimore City had the greatest decrease in VMT.

2014 **Maryland** State Highway Mobility Report

VEHICLE MILES OF TRAVEL - 2013 DATA



County	Rural	Urban	Total	Difference From 2012
ALLEGANY	374	445	819	1
ANNE ARUNDEL	765	4,974	5,739	22
BALTIMORE CO.	992	7,347	8,339	3
CALVERT	496	258	754	2
CAROLINE	375	-	375	-4
CARROLL	557	706	1,263	1
CECIL	917	392	1,309	-42
CHARLES	597	652	1,249	-1
DORCHESTER	324	58	382	-7
FREDERICK	1,514	1,487	3,001	-2
GARRETT	528	1	529	-2
HARFORD	1,059	1,398	2,457	19
HOWARD	645	3,314	3,959	-4
KENT	183	20	203	-1
MONTGOMERY	426	6,992	7,418	90
PRINCE GEORGE'S	418	8,439	8,857	53
QUEEN ANNE'S	862	58	920	-11
ST. MARY'S	564	286	850	9
SOMERSET	214	60	274	-7
TALBOT	464	140	604	4
WASHINGTON	1,082	937	2,019	-15
WICOMICO	397	591	988	1
WORCESTER	411	326	737	12
BALTIMORE CITY	2	3,411	3,413	-44

The state was split up into five regions for purposes of analysis throughout this report. The regions and the Counties within those regions are as follows:

BALTIMORE METROPOLITAN REGION

- Anne Arundel County
- Baltimore City
- Baltimore County
- Carroll County
- Harford County
- Howard County

WASHINGTON METROPOLITAN REGION (MARYLAND COUNTIES)

- Frederick County
- Montgomery County
- Prince George's County

SOUTHERN MARYLAND

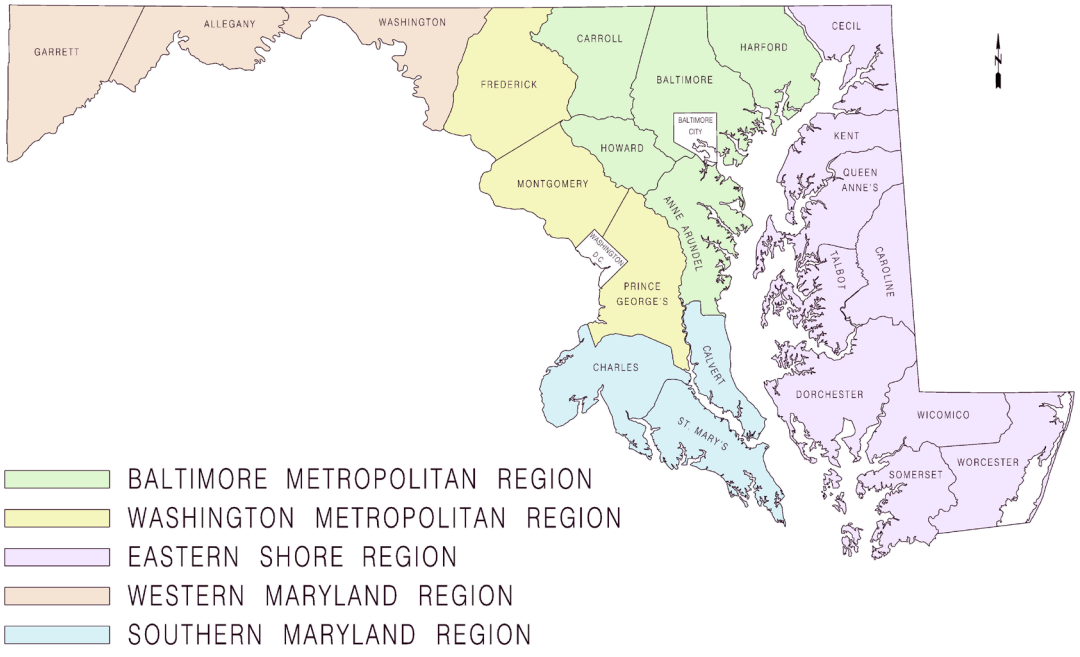
- Calvert County
- Charles County
- St. Mary's County

EASTERN SHORE

- Caroline County
- Cecil County
- Dorchester County
- Kent County
- Queen Anne's County
- Somerset County
- Talbot County
- Wicomico County
- Worcester County

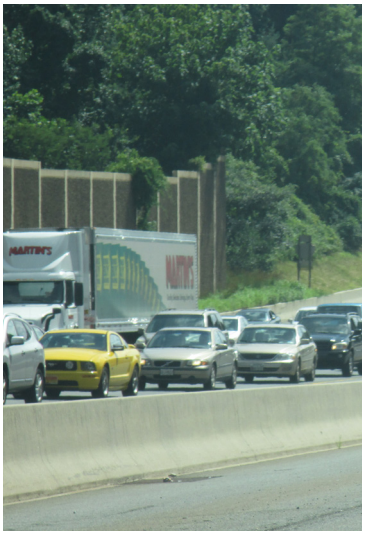
WESTERN MARYLAND

- Allegany County
- Garrett County
- Washington County



The VMT was determined for the five regions. As shown by the following chart the Washington region continues to experience the highest growth while most of the other regions are fairly flat:

VMT	2013	2012	2011	2010
Baltimore Region	25.2	25.2	25.0	25.1
Washington Region	19.2	19.1	19.1	19.0
Southern Region	2.9	2.8	2.8	2.9
Eastern Shore Region	5.8	5.9	5.8	5.8
Western Region	3.4	3.4	3.4	3.4
Total	**56.5**	**56.4**	**56.1**	**56.2**



B. Congestion Trends

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Congestion Trends

There are two types of congestion that impact mobility: recurring and non-recurring congestion. Recurring congestion is related to segments of roadway that are over capacity due to the volume of traffic. This can occur along segments of the freeway, areas where motorists merge or diverge from the roadway or in weave sections where traffic is both trying to ingress or egress from the freeway. Variations that influence these breakdowns include truck volumes, geometrics and lane and shoulder width. Non-recurring congestion relates to events such as crashes and weather that cause highways to experience slowing or stop and go conditions. Long term recurring congestion related issues are typically addressed by major capacity expansion projects or minor congestion relief projects depending upon the level of congestion that is occurring. Non-recurring congestion is addressed through various measures described in Chapter 2 (CHART Transportation System Management and Operations).

Congestion measurements have evolved dramatically over past few years as vehicle probe speed and traffic count data is now available from a variety of public and private sources. This data, together with analyses methodologies that have been developed and tested over time, provides a detailed “picture” of mobility for travelers using the highway system in Maryland. The public data is developed from a statewide program that collects traffic volume data on all of its roadways in a continual cycle. The private data comes from INRIX , a company that provides both real-time and historic traffic speed data collected from an estimated 100 million probe vehicles nationwide including commercial vehicle fleets. The University of Maryland Center for Advanced Transportation Technology (UMD CATT) uses the INRIX speed data, together with detailed traffic volume data from the SHA – Office of Planning and Preliminary Engineering to generate measures of congestion and reliability across the entire freeway system. These congestion and reliability measures have also been closely coordinated with the Washington and Baltimore Metropolitan Planning Organizations (MPOs) to ensure regional consistency in measure definitions and reporting.

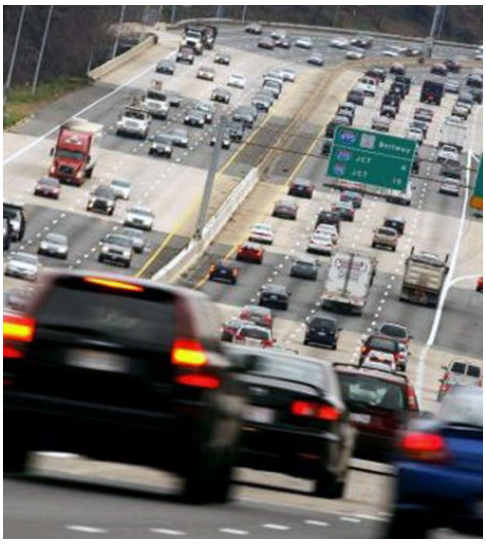
There are various measures of congestion including level of service and volume to capacity ratio. In the past few years, two other measures have become popular as they are easily computed from speed data and are relatively easy to communicate to a range of audiences: the Travel Time Index and the Planning Time Index. In analysis for Maryland's freeways/expressways the Travel Time Index (TTI) compares the 50th percentile travel time of a trip on a section of roadway during the peak hour (when congestion is the worst) to the travel time of a trip during off peak (free-flow or uncongested) conditions. The index depicts how much longer, on average, travel times are during congestion compared to light traffic. The higher the TTI number for a given hour of the day, the longer the travel times. For example, a TTI of 2.0 indicates that a trip that takes 15 minutes in light traffic will take two times longer, or 30 minutes in congested conditions.

For the purposes of the statewide and regional congestion maps presented in this report, the TTI is depicted as follows:

- Uncongested (TTI <1.15)
- Moderate Congestion (1.15 <TTI <1.3)
- Heavy Congestion (1.3 <TTI <2.0)
- Severe Congestion (TTI >2.0)

The detailed analysis of the various mobility measures was performed to provide a comprehensive picture of the statewide Maryland freeway/expressway network. The analysis was conducted statewide, with a focus on the five major geographic regions. The congestion and reliability measures are further analyzed for the combined Baltimore - Washington region, where the majority of weekday congestion occurs.

The vehicle probe speed data analysis for 2013 involves some 1,698 directional miles of freeways/expressways that account for approximately 95% of all these type roadways in Maryland. This includes directional miles of freeways/expressways in the combined Baltimore - Washington region with the remaining directional miles on the Eastern Shore, Southern Maryland and Western Maryland.



CONGESTION MEASURES ON THE MARYLAND STATE FREEWAY/ EXPRESSWAY NETWORK

1. Statewide Peak Hour Congestion (Percent System Congested & Percent VMT in Congested Conditions)

The freeway/expressway system in Maryland was analyzed to compute the TTI on each section of roadway. The analysis was performed for the AM and PM peak hours with the highest levels of congestion occurring from 8-9 AM in the morning peak and from 5-6 PM in the afternoon peak hour. The TTI for those hours are shown in Figure 1 and 2 for the freeway/expressway system.

In the morning peak hour (8-9 AM), heavy to severe congestion (TTI > 1.3) is experienced by motorists on a total of 130 road miles (8% of the statewide freeway/expressway network). Sixteen (16) % of the morning peak hour VMT occurs in congested conditions.

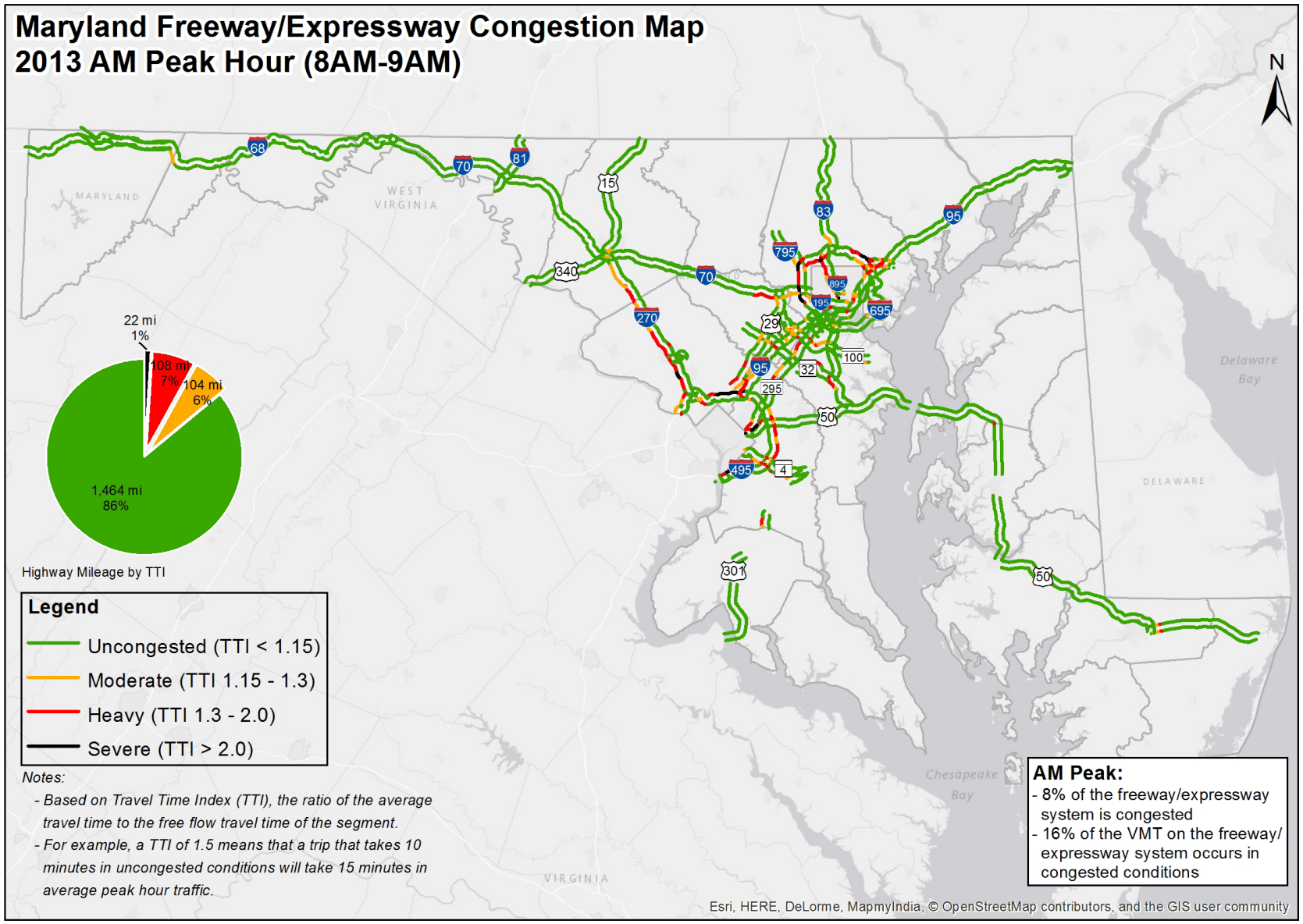
Motorists experience heavy to severe congestion (TTI >1.3) on 209 road miles (12% of the statewide freeway/expressway network) during the afternoon peak hour (5-6 PM). The vehicle miles traveled under congested conditions in the afternoon peak hour is 22% of the afternoon peak hour VMT.

The following table shows the comparison of these metrics for the last three years including an improvement in high to severe congestion in the AM and PM peak hours from 2012 to 2013.

Some of the higher levels on congestion in 2012 could be attributed to system preservation and construction activities on the freeway system. Congestion in 2013 appears to be comparable to 2011 conditions.

STATEWIDE FREEWAY/EXPRESSWAY NETWORK
(AVERAGE WEEKDAY AM & PM PEAK HOUR CONGESTION SUMMARY)

Heavy to Severe Congestion	2013		2012		2011	
	AM	PM	AM	PM	AM	PM
Roadway Miles	130	209	219	345	128	218
Percent of Roadway Miles	8	12	13	20	8	13
Percent of VMT	16	22	23	33	16	26


Maryland Freeway/Expressway Congestion Map
2013 AM Peak Hour (8AM-9AM)
N
MARYLAND
WEST VIRGINIA
VIRGINIA
DELAWARE
Delaware Bay
Chesapeake Bay
68
70
81
15
340
270
83
95
795
895
195
695
29
100
32
295
50
495
4
301
22 mi
1%
108 mi
7%
104 mi
6%
1,464 mi
86%
Highway Mileage by TTI
Legend
Uncongested (TTI < 1.15)
Moderate (TTI 1.15 - 1.3)
Heavy (TTI 1.3 - 2.0)
Severe (TTI > 2.0)
Notes:
- Based on Travel Time Index (TTI), the ratio of the average travel time to the free flow travel time of the segment.
- For example, a TTI of 1.5 means that a trip that takes 10 minutes in uncongested conditions will take 15 minutes in average peak hour traffic.
AM Peak:
- 8% of the freeway/expressway system is congested
- 16% of the VMT on the freeway/ expressway system occurs in congested conditions
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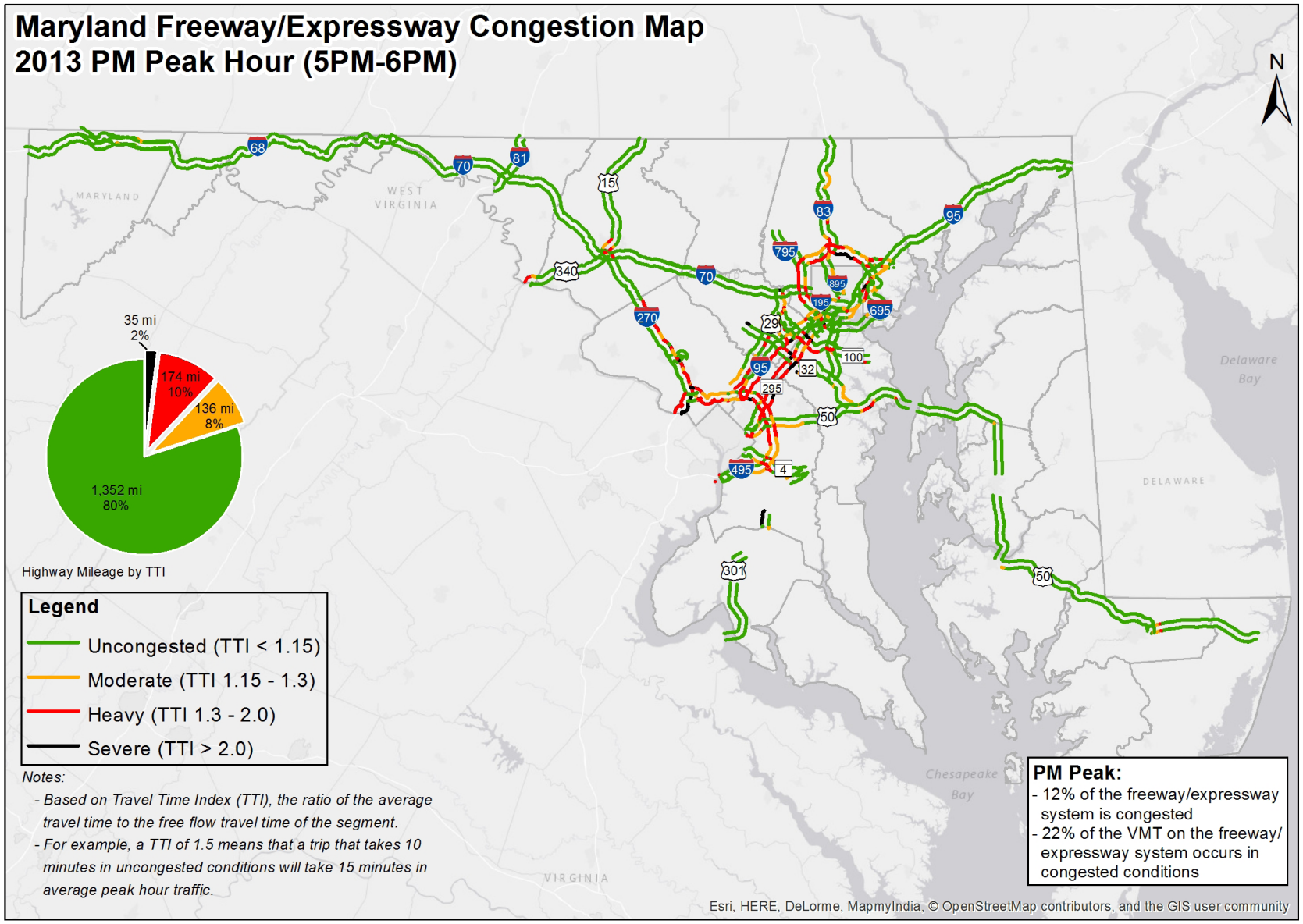
Maryland Freeway/Expressway Congestion Map
2013 PM Peak Hour (5PM-6PM)
N
MARYLAND
WEST VIRGINIA
VIRGINIA
DELAWARE
Delaware Bay
Chesapeake Bay
35 mi
2%
174 mi
10%
136 mi
8%
1,352 mi
80%
Highway Mileage by TTI
Legend
Uncongested (TTI < 1.15)
Moderate (TTI 1.15 - 1.3)
Heavy (TTI 1.3 - 2.0)
Severe (TTI > 2.0)
Notes:
- Based on Travel Time Index (TTI), the ratio of the average travel time to the free flow travel time of the segment.
- For example, a TTI of 1.5 means that a trip that takes 10 minutes in uncongested conditions will take 15 minutes in average peak hour traffic.
PM Peak:
- 12% of the freeway/expressway system is congested
- 22% of the VMT on the freeway/ expressway system occurs in congested conditions
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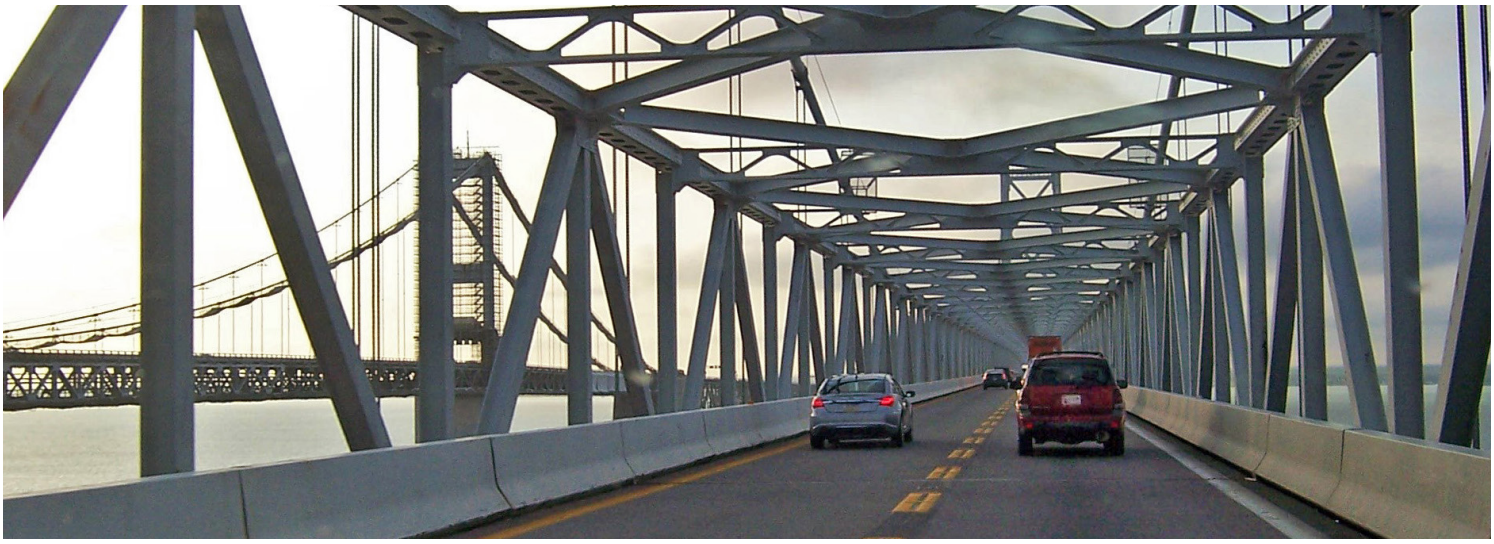


Baltimore - Washington Metropolitan Region Peak Hour Congestion

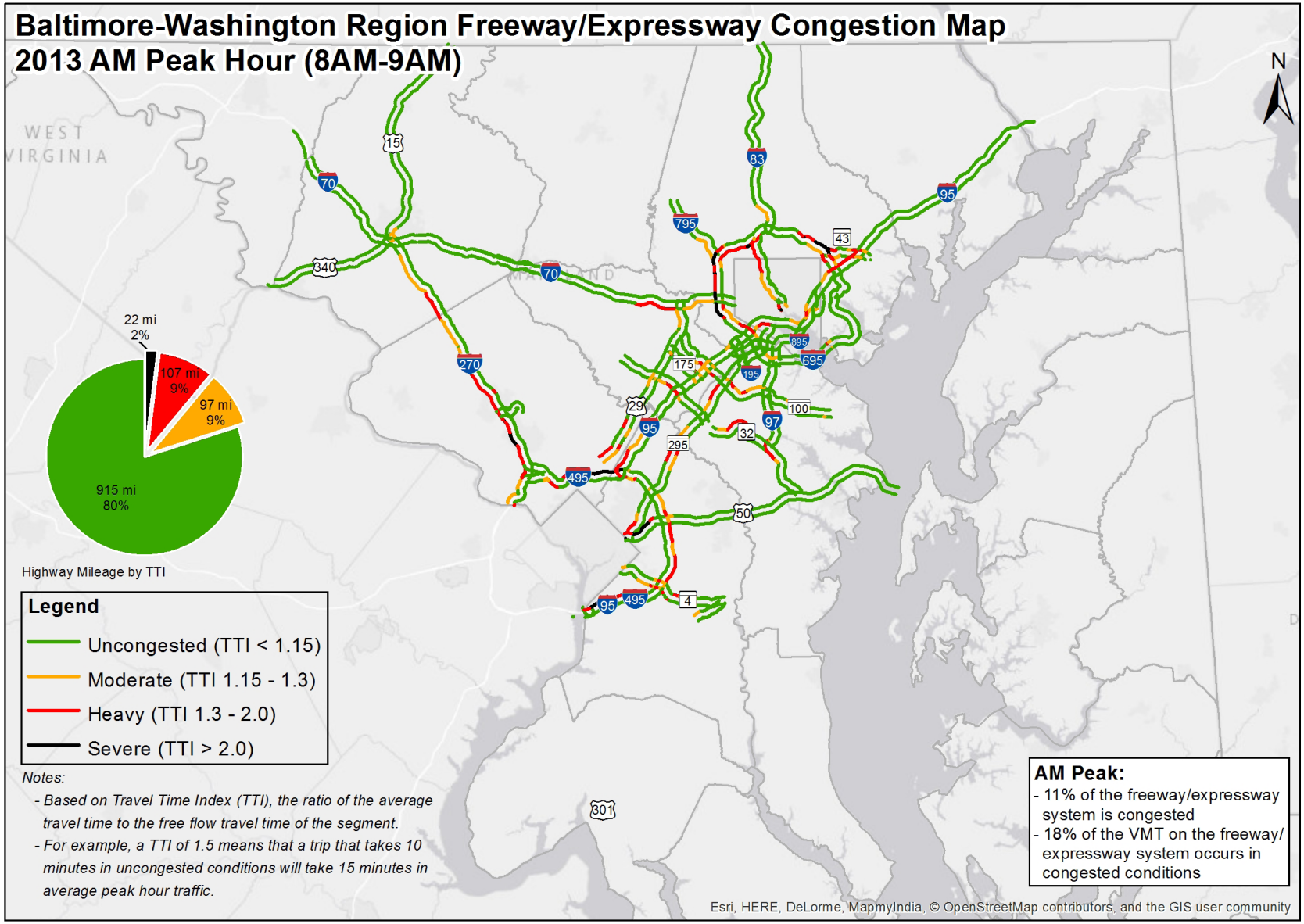
The Baltimore - Washington Region has the highest traffic volumes in the state and accounts for majority of commuting and through travel. Therefore these roadways experience the majority of congestion and impacts on mobility in Maryland. The Travel Time Index Maps are provided for the peak hours (8-9 AM and 5-6 PM) in figures 3 and 4.

Motorists in the Baltimore - Washington Metropolitan region experience heavy to severe congestion (TTI >1.3) on 11% of the freeways/expressways. This accounts for a total of 129 road miles that operate under these conditions. The vehicle miles traveled under these conditions in the morning peak hour is 18% of the total morning peak hour VMT.

The Baltimore - Washington Metropolitan region in the afternoon peak hour, has a total of 208 (18%) road miles that motorists experience heavy to severe congestion (TTI >1.3). This amounts to 26% of the total VMT that occurs in the afternoon peak hour that motorists experience this level of congestion.

Eastern Shore, Southern & Western Maryland Congestion

The Eastern Shore, Southern Maryland and Western Maryland experience pockets of congestion throughout the year. This ranges from the Hagerstown area, (the hub of two major interstate routes), to Salisbury, (the “Crossroads of Delmarva”) to the fast growing areas of Waldorf, La Plata, Prince Frederick, and Lexington Park where motorists encounter increased travel times and congestion. The Eastern Shore, Southern Maryland and Western Maryland have locations that are affected by congestion issues as shown in Figures 1-2 during the AM and PM peak hours. Some of the congestion in these regions are related to weekend travel and affected by seasonality.


Baltimore-Washington Region Freeway/Expressway Congestion Map
2013 AM Peak Hour (8AM-9AM)
N
WEST VIRGINIA
22 mi
2%
107 mi
9%
97 mi
9%
915 mi
80%
Highway Mileage by TTI
Legend
Uncongested (TTI < 1.15)
Moderate (TTI 1.15 - 1.3)
Heavy (TTI 1.3 - 2.0)
Severe (TTI > 2.0)
Notes:
- Based on Travel Time Index (TTI), the ratio of the average travel time to the free flow travel time of the segment.
- For example, a TTI of 1.5 means that a trip that takes 10 minutes in uncongested conditions will take 15 minutes in average peak hour traffic.
AM Peak:
- 11% of the freeway/expressway system is congested
- 18% of the VMT on the freeway/expressway system occurs in congested conditions
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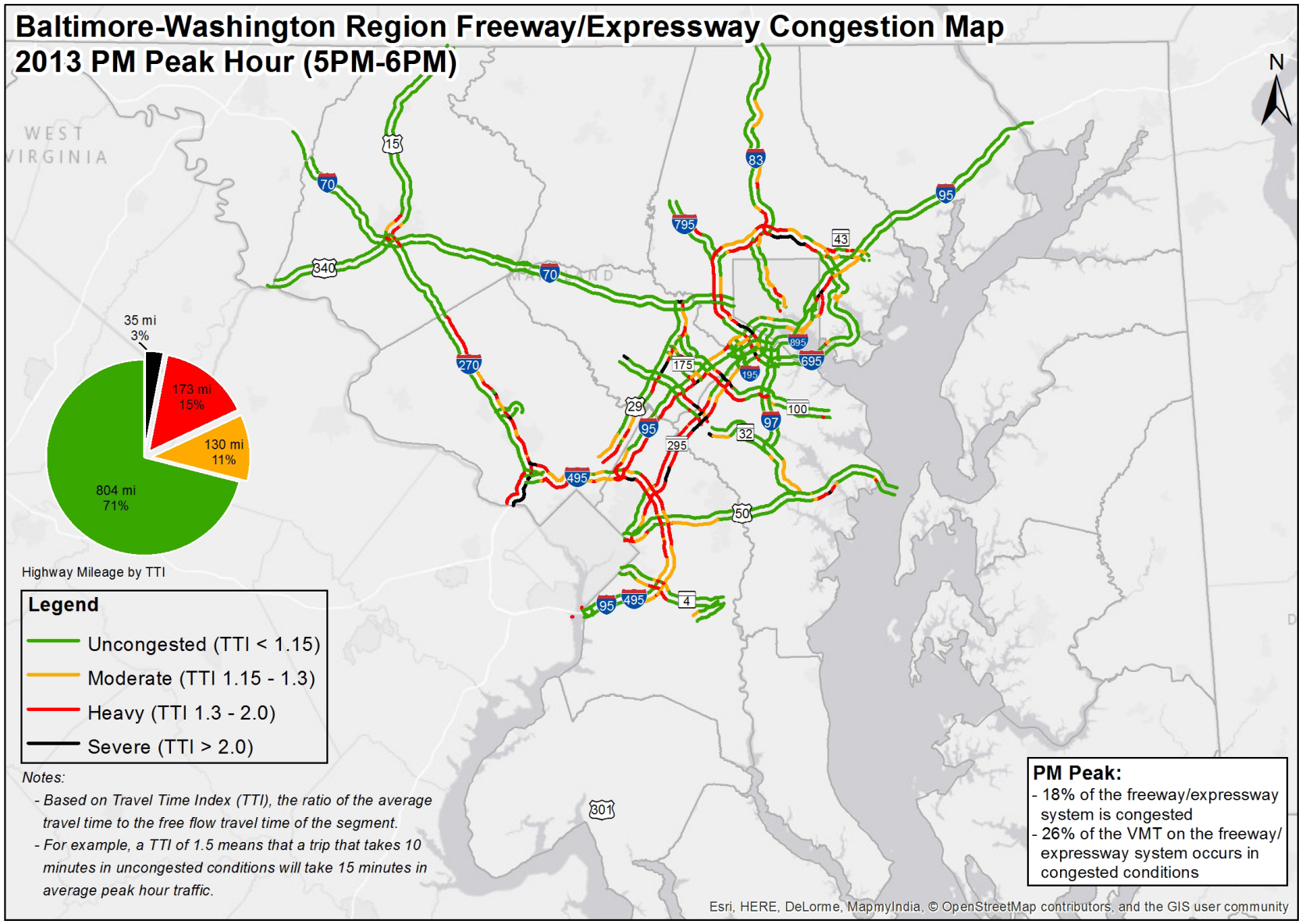
Baltimore-Washington Region Freeway/Expressway Congestion Map
2013 PM Peak Hour (5PM-6PM)
N
WEST VIRGINIA
35 mi
3%
173 mi
15%
130 mi
11%
804 mi
71%
Highway Mileage by TTI
Legend
Uncongested (TTI < 1.15)
Moderate (TTI 1.15 - 1.3)
Heavy (TTI 1.3 - 2.0)
Severe (TTI > 2.0)
Notes:
- Based on Travel Time Index (TTI), the ratio of the average travel time to the free flow travel time of the segment.
- For example, a TTI of 1.5 means that a trip that takes 10 minutes in uncongested conditions will take 15 minutes in average peak hour traffic.
PM Peak:
- 18% of the freeway/expressway system is congested
- 26% of the VMT on the freeway/ expressway system occurs in congested conditions
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2. Statewide Cost of Congestion

The total statewide and regionwide estimated cost of congestion due to auto delay, truck delay and wasted fuel and emissions on the freeway/expressway network in 2013 was estimated to be $1.676 billion. The total statewide costs can be broken down as follows:

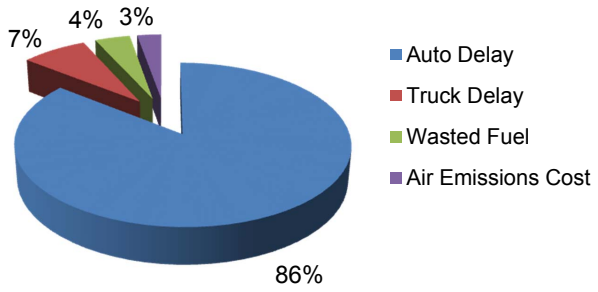
- Auto Delay Cost: $1,435.6 Million
- Truck Delay Cost: $126.0 Million
- Wasted Fuel Cost: $67.7 Million
- Air Emissions Cost: $46.4 Million

The majority of these costs ($1.63 billion) occur in the Baltimore Washington region. The cost associated with congestion for the Eastern Shore, Southern and Western Maryland regions is estimated to be $36 million. The congestion costs state and region wide are shown in the following chart.

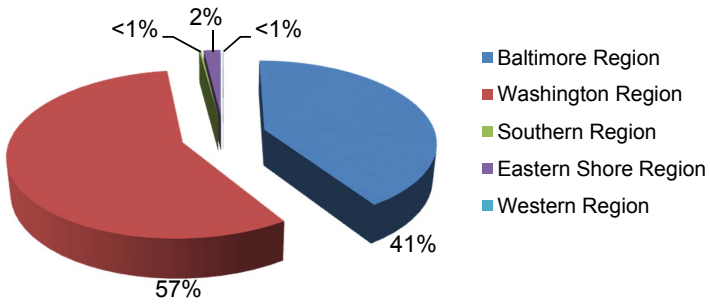
TOTAL COST OF CONGESTION (MILLIONS)	
Region	**2013**
Statewide	1,676
Baltimore Region	681
Washington Region	949
Eastern Shore Region	31
Southern Region	1
Western Region	4

The percent breakdown of the congestion costs by source and by different regions is depicted in the following graphs.

PERCENT OF STATEWIDE CONGESTION COST BY SOURCE
(TOTAL CONGESTION COST = $1.676 B)



PERCENT OF STATEWIDE CONGESTION COST BY REGION
(TOTAL CONGESTION COST = $1.676 B)



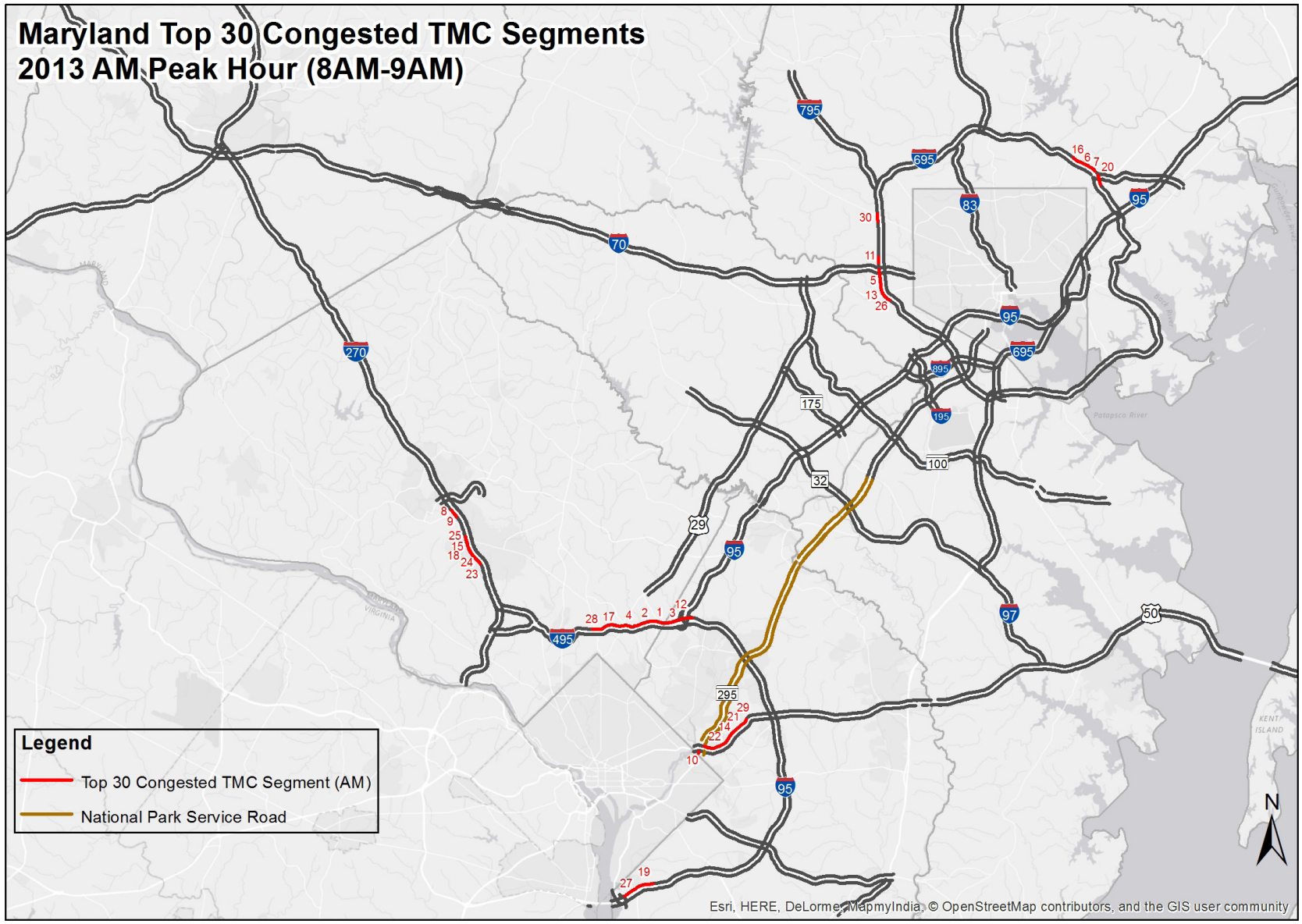
Top 30 Congested Segments

An analysis of all freeway/expressway segments statewide was conducted to determine the roadway segments that experience the highest levels of congestion in the AM peak hour (8-9 AM) and PM peak hour (5-6 PM). Based on the TTI the following tables and figures 5 and 6 depict the Top 30 locations for congestion in the State.

2013 TOP 30 CONGESTED SEGMENTS AM PEAK

2013 Rank	Road	Location	Direction	2013 TTI	2012 Rank	Rank Change 2012 to 2013
1	I-495	@ MD 650	OUTER LOOP	4.14	3	-2
2	I-495	MD 650 TO MD 193*	OUTER LOOP	3.83	4	-2
3	I-495	Prince George's CO/L TO MD 650	OUTER LOOP	3.56	2	1
4	I-495	MD 193 TO US 29*	OUTER LOOP	3.15	12	-8
5	I-695	@ IS 70	OUTER LOOP	3.12	13	-8
6	I-695	MD 147 TO MD 41	OUTER LOOP	2.98	8	-2
7	I-695	MD 43 TO MD 147	OUTER LOOP	2.69	7	0
8	I-270	SHADY GROVE RD TO MD 28 CD LANES	SOUTHBOUND	2.66	5	3
9	I-270	SHADY GROVE RD TO MD 28	SOUTHBOUND	2.66	6	3
10	MD 295	US 50 TO WASHINGTON DC/L[1]	SOUTHBOUND	2.63	173	-163
11	I-695	MD 26 TO MD 122	OUTER LOOP	2.58	59	-48
12	I-495	I-95 TO MONTGOMERY CO/L	OUTER LOOP	2.52	1	11
13	I-695	IS 70 TO US 40	OUTER LOOP	2.51	38	-25
14	US-50	MD 202 TO MD 459	WESTBOUND	2.49	34	-20
15	I-270	@ MD 189	SOUTHBOUND	2.44	22	-7
16	I-695	@ MD 41	OUTER LOOP	2.42	15	1
17	I-495	US 29 TO MD 97	OUTER LOOP	2.42	35	-18
18	I-270	MD 28 TO MD 189	SOUTHBOUND	2.39	23	-5
19	I-95	MD 414 TO MD 210	INNER LOOP	2.29	315	-296
20	I-695	US 1 TO MD 43	OUTER LOOP	2.27	10	10
21	US-50	@ MD 202	WESTBOUND	2.26	33	-12
22	US-50	MD 459 TO MD 201	WESTBOUND	2.24	54	-32
23	I-270	MD 189 TO MONTROSE RD CD LANES	SOUTHBOUND	2.23	25	-2
24	I-270	MD 189 TO MONTROSE RD	SOUTHBOUND	2.23	24	0
25	I-270	@ MD 28 to N of MD 189	SOUTHBOUND	2.18	31	-6
26	I-695	US 40 TO EDMONDSON AVE*	OUTER LOOP	2.17	81	-55
27	I-95	MD 210 TO IS 295	INNER LOOP	2.13	256	-229
28	I-495	@ MD 97	OUTER LOOP	2.13	52	-24
29	US-50	MD 410 TO MD 202	WESTBOUND	2.12	28	1
30	I-695	@ MD 26	OUTER LOOP	2.04	16	14

[1]Maintained by the National Park Service *Under Construction


Maryland Top 30 Congested TMC Segments
2013 AM Peak Hour (8AM-9AM)
Legend
Top 30 Congested TMC Segment (AM)
National Park Service Road
N
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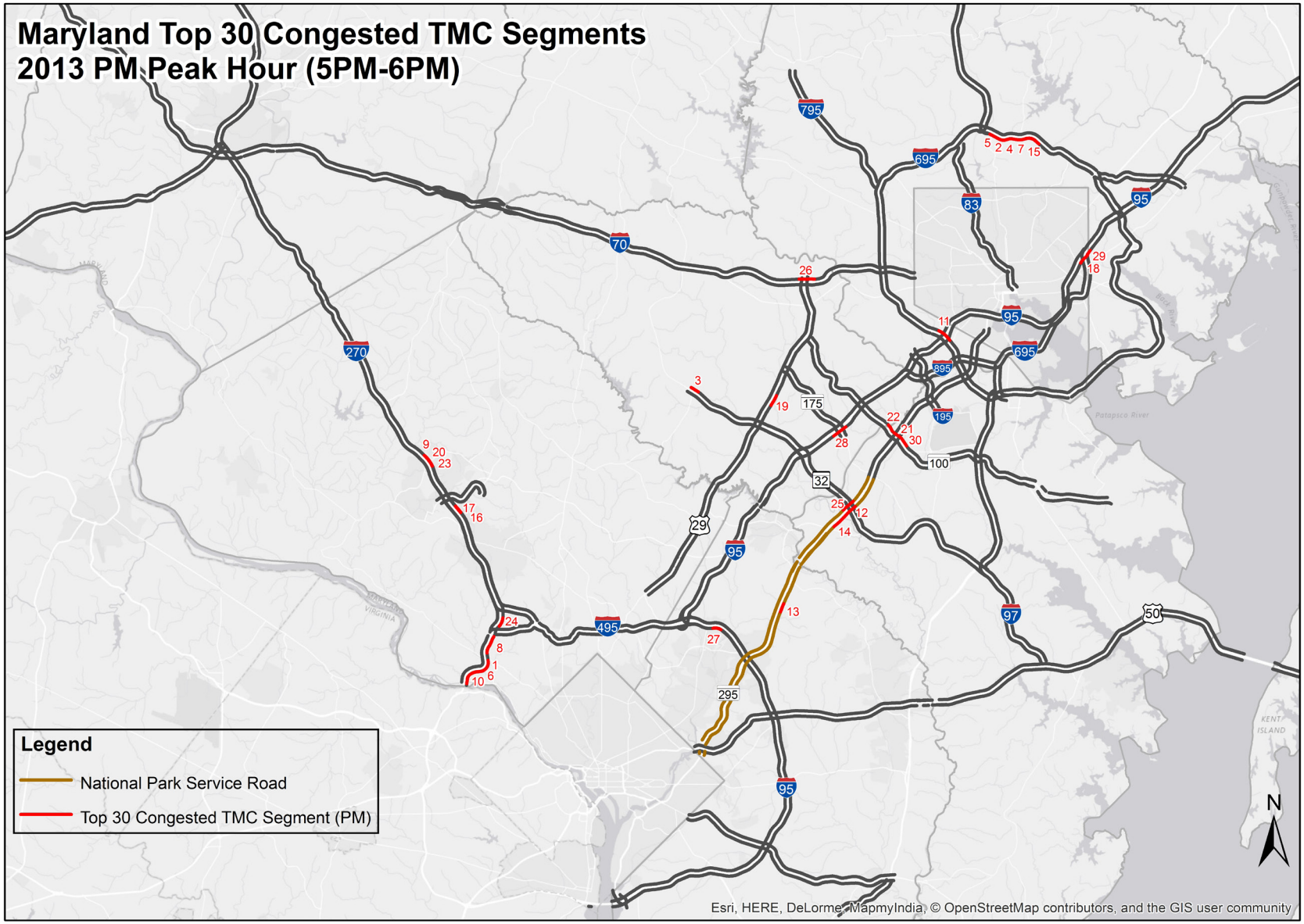
2013 TOP 30 CONGESTED SEGMENTS PM PEAK

2013 Rank	Road	Location	Direction	2013 TTI	2012 Rank	Rank Change 2012 to 2013
1	I-495	CABIN JOHN PKWY TO MD 190	INNER LOOP	3.81	8	-7
2	I-695	MD 139 TO MD 45	INNER LOOP	3.68	11	-9
3	MD-32	GREAT STAR DR TO MD 108	WESTBOUND	3.35	2	1
4	I-695	MD 45 TO MD 146	INNER LOOP	3.28	27	-23
5	I-695	@ MD 139	INNER LOOP	3.18	29	-24
6	I-495	CLARA BARTON PKWY TO CABIN JOHN PKWY	INNER LOOP	3.06	28	-22
7	I-695	@ MD 146	INNER LOOP	3.00	35	-28
8	I-495	@ MD 190 TO IS 270Y (WEST) & @ IS 270Y (WEST)	INNER LOOP	2.99	12	-4
9	I-270	MD 124 TO MIDDLEBROOK RD	NORTHBOUND	2.95	13	-4
10	I-495	@ CLARA BARTON PKWY	INNER LOOP	2.84	32	-22
11	I-695	@ IS 95	INNER LOOP	2.71	163	-152
12	MD-295	@ MD 32[1]	NORTHBOUND	2.66	76	-64
13	MD-295	POWDER MILL RD TO MD 197[1]	NORTHBOUND	2.65	17	-4
14	MD-295	MD 198 TO MD 32[1]	NORTHBOUND	2.62	67	-53
15	I-695	MD 146 TO PROVIDENCE RD	INNER LOOP	2.59	68	-53
16	I-270	@ SHADY GROVE RD	NORTHBOUND	2.52	44	-28
17	I-270	@ SHADY GROVE RD CD LANES	NORTHBOUND	2.52	43	-26
18	I-895	MORAVIA RD TO BALTIMORE CO/L[2]*	NORTHBOUND	2.47	51	-33
19	US-29	MD 32 TO BROKEN LAND PKWY	NORTHBOUND	2.46	46	-27
20	I-270	@ MD 124	NORTHBOUND	2.44	39	-19
21	MD-100	@ MD 295	WESTBOUND	2.42	177	-156
22	MD-100	@ COCA COLA DRIVE	WESTBOUND	2.37	73	-51
23	I-270	MD 117 TO MD 124	NORTHBOUND	2.37	38	-15
24	I-270 Spur	@ DEMOCRACY BLVD	NORTHBOUND	2.31	33	-9
25	MD-295	MD 32 TO MD 198[1]	SOUTHBOUND	2.27	62	-37
26	I-70	US 29 TO MARRIOTTSVILLE RD	WESTBOUND	2.27	84	-58
27	I-95	US 1 TO GREENBELT METRO*	INNER LOOP	2.26	110	-83
28	I-95	MD 32 TO MD 175	NORTHBOUND	2.25	100	-72
29	I-95	IS 895 TO BALTIMORE CITY LINE (NORTH)[2]*	NORTHBOUND	2.22	59	-30
30	MD-100	MD 713 TO MD 295	WESTBOUND	2.21	232	-202

[1]Maintained by the National Park Service [2]Owned & Operated by the Maryland Transportation Authority *Under Construction


Maryland Top 30 Congested TMC Segments
2013 PM Peak Hour (5PM-6PM)
Legend
National Park Service Road
Top 30 Congested TMC Segment (PM)
N
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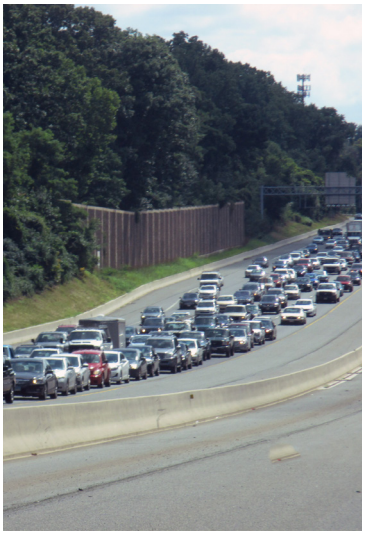

C. Reliability Trends

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Reliability Trends

Roadway users normally accept some level of congestion. It is when there is a substantial increase in the variability or unreliability of the system that motorists' frustration and anxiety increases greatly. A high degree of variability of travel times between two locations increases the potential for not arriving at a destination on time. A late arrival to a destination has a cost associated with it that varies by trip purpose and nature. For example, the penalty for not allowing enough" buffer time" to catch a flight, or make an appointment, or have a truck delivery on time have very high costs associated with it. Improving reliability leads to less uncertainty; which in turn decreases motorist frustration, allowing trips to be better planned and meet expectations of the motorists using the system.

The variation in reliability is greatly impacted by incidents that cause non-recurring congestion. In addition, reliability is critical for transit operations. Variations in travel time are difficult for transit operators to provide reliable schedules. This in turn can lead to a decrease in rider confidence and the potential to reduce ridership on the impacted routes.

The Planning Time Index (PTI) measures trip reliability. The PTI represents the total time a traveler should allow to make sure they arrive at their destination on-time while taking into account potential impacts due to traffic incidents or weather. As evaluated in Maryland, this represents the 95th percentile travel time for a section of roadway. A PTI of 1.5 means the total trip time under light traffic conditions should be increased by 50% to make sure of an on time arrival. So if a trip takes 10 minutes under uncongested traffic conditions where the PTI is 1.5 the total trip time should be increased to 15 minutes to ensure arriving on time. The lower the PTI number, the more reliable the trip while the higher the number, the less reliable the trip. For the purposes of the statewide and Baltimore - Washington region reliability maps presented in this report, the PTI is categorized for freeways/expressways as follows:

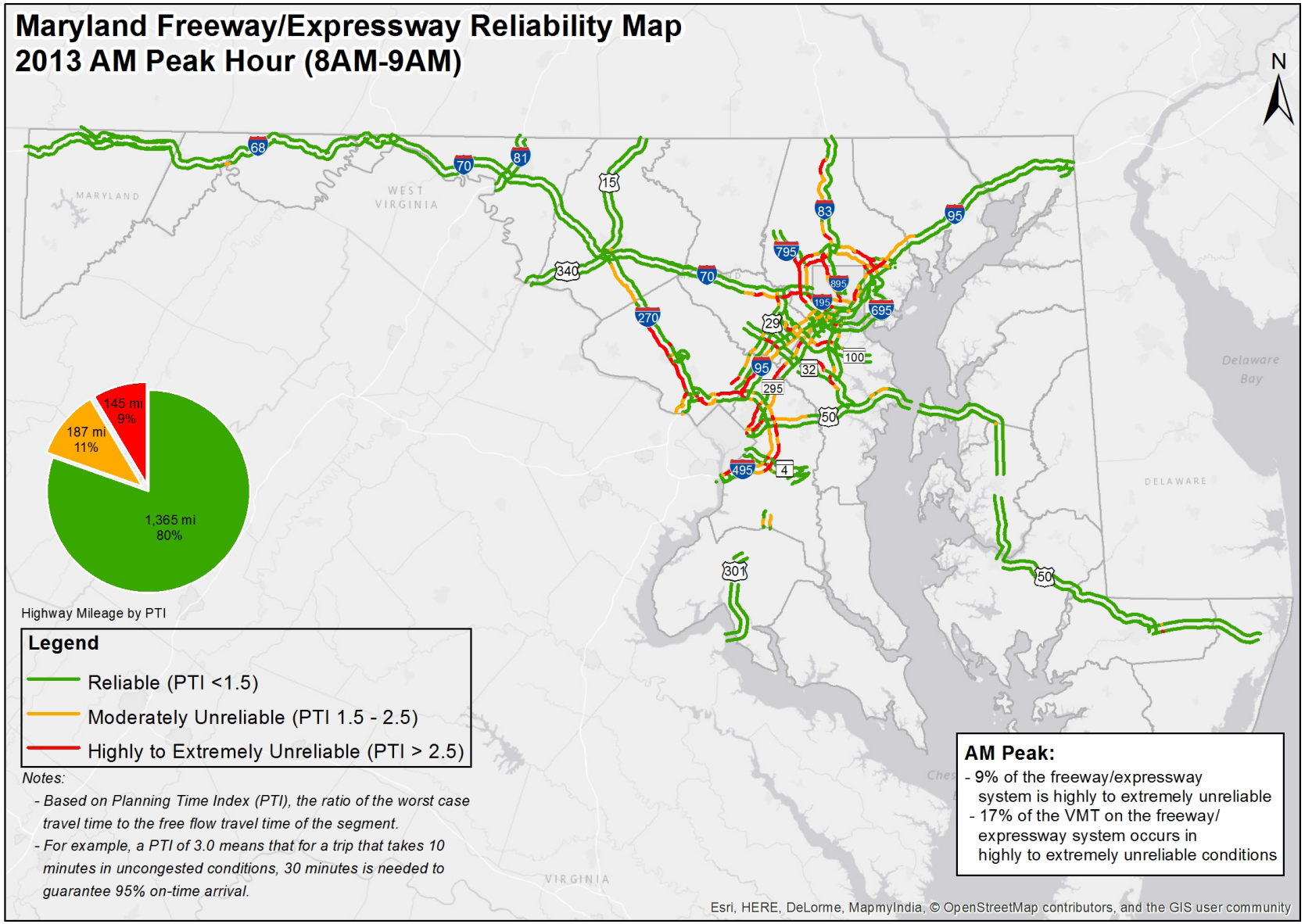
- Reliable (PTI ≤1.5)
- Moderately Unreliable (1.5 <PTI <2.5)
- Highly to Extremely Unreliable (PTI >2.5)

1. Statewide Freeway/Expressway Peak Hour Reliability

Reliability which was measured by the PTI was developed on a statewide basis for the peak hours (8-9 AM and 5-6 PM) of the network. The results are shown in figures 7 and 8.

Motorists experience highly to extremely unreliable conditions (PTI >2.5) on a total of 145 road miles (9% of the statewide freeway/expressway network) in the AM peak hour. The vehicle miles traveled under these unreliable conditions is estimated to be 17% of the morning peak hour, VMT.

In the afternoon peak hour, 213 road miles (13% of the statewide freeway/expressway network) operate under highly to extremely unreliable conditions (PTI >2.5). The vehicle miles traveled under these unreliable conditions is estimated to be 22% of the afternoon peak hour, VMT.


Maryland Freeway/Expressway Reliability Map
2013 AM Peak Hour (8AM-9AM)
N
MARYLAND
WEST VIRGINIA
VIRGINIA
DELAWARE
Delaware Bay
68
70
81
15
340
270
83
95
795
895
195
695
29
100
32
295
50
4
495
301
145 mi 9%
187 mi 11%
1,365 mi 80%
Highway Mileage by PTI
Legend
Reliable (PTI <1.5)
Moderately Unreliable (PTI 1.5 - 2.5)
Highly to Extremely Unreliable (PTI > 2.5)
Notes:
- Based on Planning Time Index (PTI), the ratio of the worst case travel time to the free flow travel time of the segment.
- For example, a PTI of 3.0 means that for a trip that takes 10 minutes in uncongested conditions, 30 minutes is needed to guarantee 95% on-time arrival.
AM Peak:
- 9% of the freeway/expressway system is highly to extremely unreliable
- 17% of the VMT on the freeway/ expressway system occurs in highly to extremely unreliable conditions
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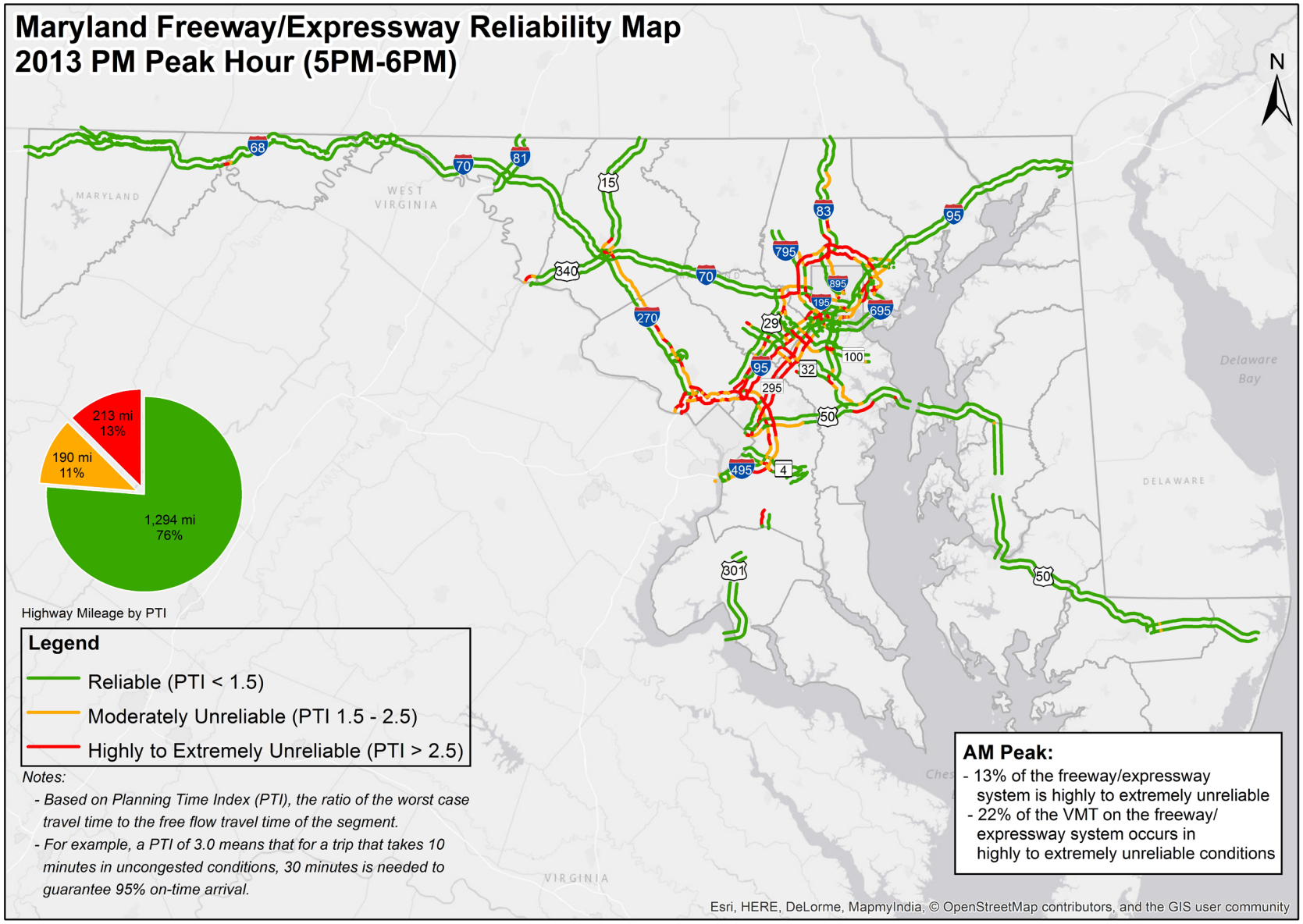
Maryland Freeway/Expressway Reliability Map
2013 PM Peak Hour (5PM-6PM)
N
MARYLAND
WEST VIRGINIA
VIRGINIA
DELAWARE
Delaware Bay
213 mi 13%
190 mi 11%
1,294 mi 76%
Highway Mileage by PTI
Legend
Reliable (PTI < 1.5)
Moderately Unreliable (PTI 1.5 - 2.5)
Highly to Extremely Unreliable (PTI > 2.5)
Notes:
- Based on Planning Time Index (PTI), the ratio of the worst case travel time to the free flow travel time of the segment.
- For example, a PTI of 3.0 means that for a trip that takes 10 minutes in uncongested conditions, 30 minutes is needed to guarantee 95% on-time arrival.
AM Peak:
- 13% of the freeway/expressway system is highly to extremely unreliable
- 22% of the VMT on the freeway/ expressway system occurs in highly to extremely unreliable conditions
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A comparison was performed on the statewide peak hour reliability over the past three years. The reliability on the freeway/expressway system has decreased slightly over the 2011 trends. The 2012 reliability showed a much lower percentage of roadways that was experiencing highly to extremely unreliable conditions.

RELIABILITY TRENDS ON MARYLAND FREEWAYS/EXPRESSWAYS

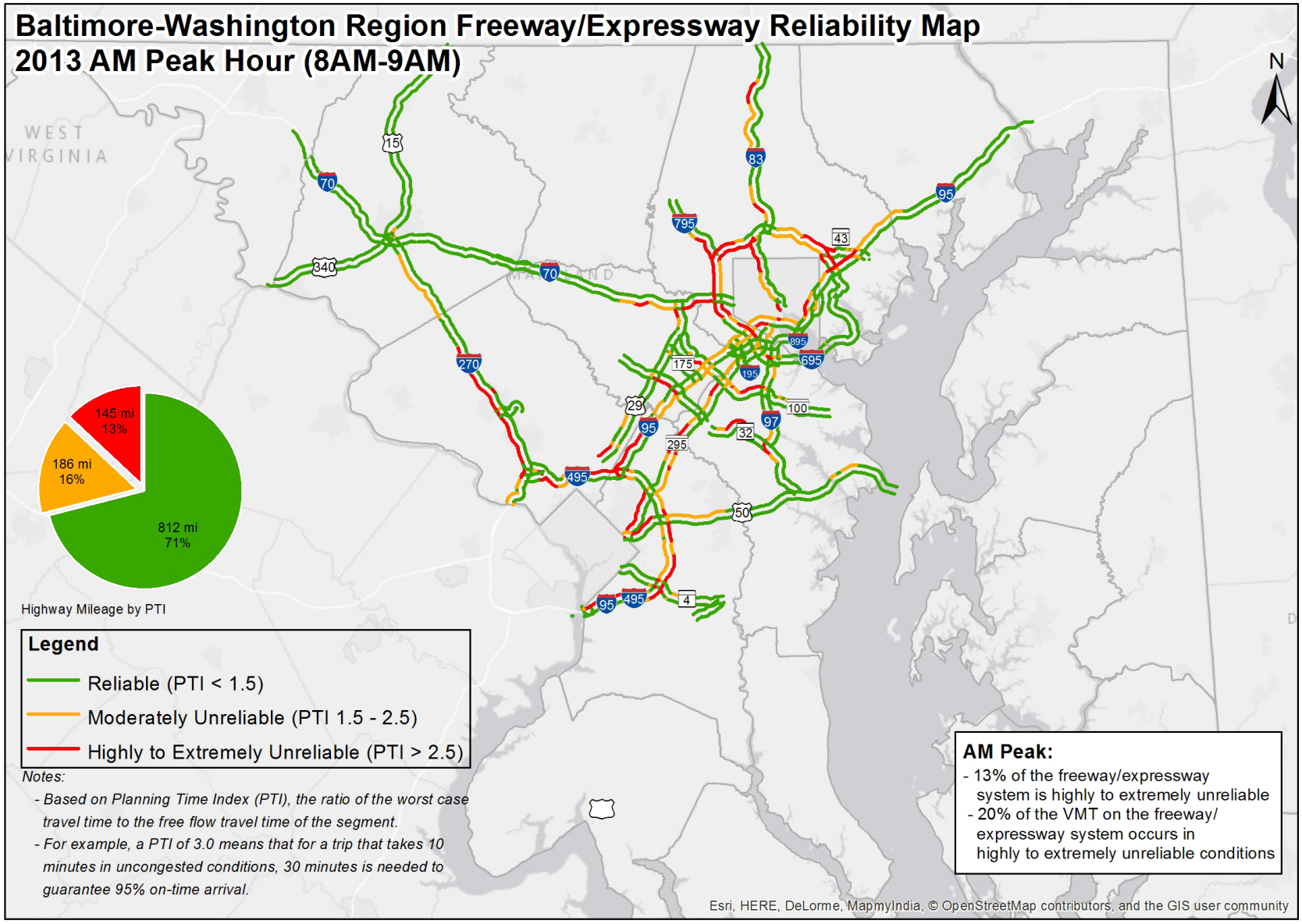
Highly to Extremely Unreliable Conditions	2013		2012		2011	
	AM	PM	AM	PM	AM	PM
Number of Roadway Miles	145	213	26	71	140	188
Percent of Roadway Miles	9	13	2	4	8	11

2. Baltimore - Washington Region Peak Hour Reliability

The AM (8-9) and PM (5-6) peak hours were used to calculate the PTI on the freeways/expressways in the Baltimore - Washington region. The reliability maps for the region are shown in figures 9 and 10.

There was a total of 145 road miles (13% of network) where motorists experience highly to extremely unreliable (PTI >2.5) conditions in the morning peak hour. Twenty (20)% of the morning peak hour VMT occurs in highly to extremely unreliable conditions.

During the PM peak hour, motorists experience highly to extremely unreliable conditions (PTI > 2.5) on 211 road miles within the Baltimore - Washington region. This represents 18% of the network. Twenty-six (26)% of the afternoon peak hour VMT in the Baltimore-Washington region occurs in highly or extremely unreliable conditions.


Baltimore-Washington Region Freeway/Expressway Reliability Map
2013 AM Peak Hour (8AM-9AM)
N
WEST VIRGINIA
145 mi
13%
186 mi
16%
812 mi
71%
Highway Mileage by PTI
Legend
Reliable (PTI < 1.5)
Moderately Unreliable (PTI 1.5 - 2.5)
Highly to Extremely Unreliable (PTI > 2.5)
Notes:
- Based on Planning Time Index (PTI), the ratio of the worst case travel time to the free flow travel time of the segment.
- For example, a PTI of 3.0 means that for a trip that takes 10 minutes in uncongested conditions, 30 minutes is needed to guarantee 95% on-time arrival.
AM Peak:
- 13% of the freeway/expressway system is highly to extremely unreliable
- 20% of the VMT on the freeway/ expressway system occurs in highly to extremely unreliable conditions
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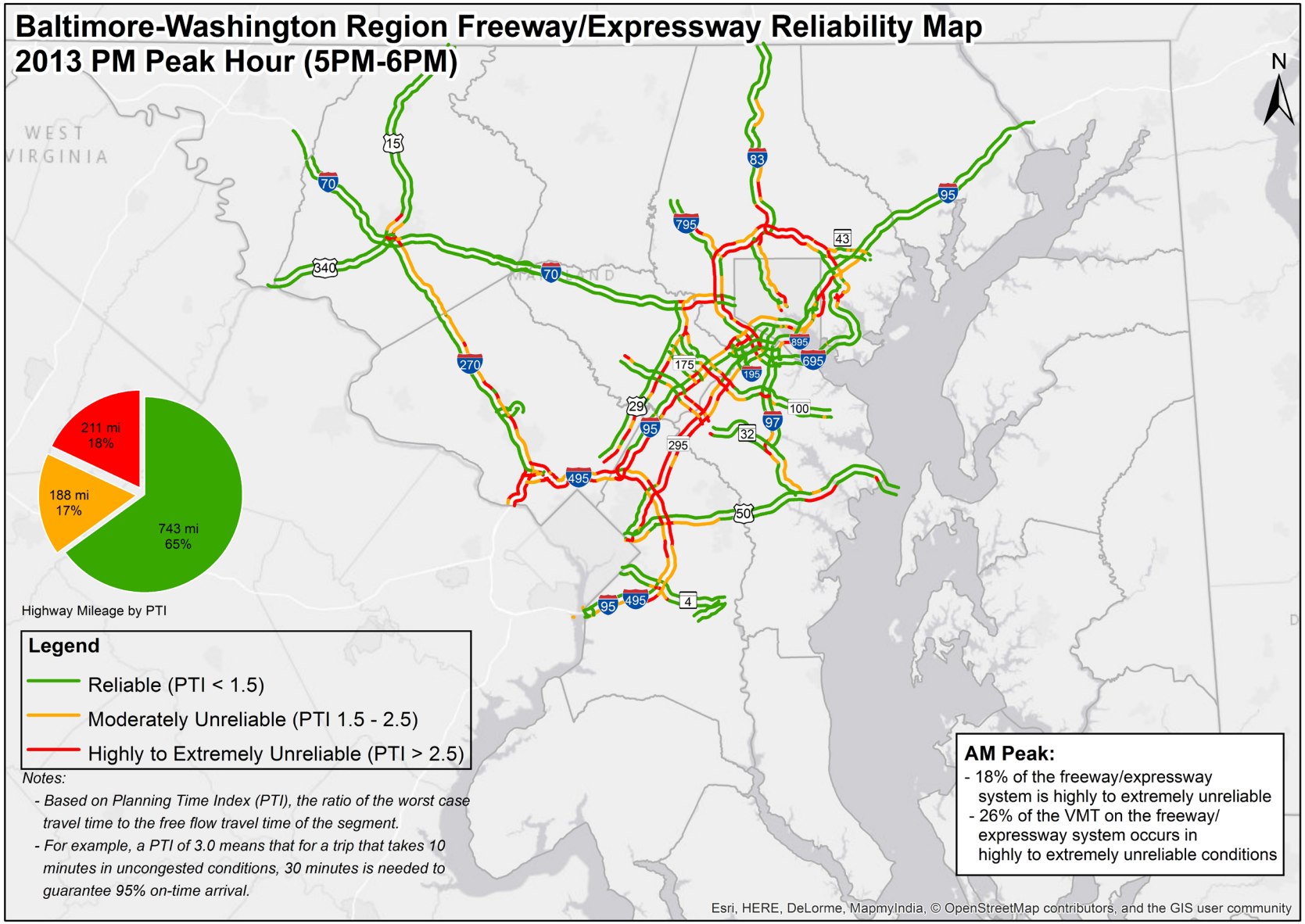
Baltimore-Washington Region Freeway/Expressway Reliability Map
2013 PM Peak Hour (5PM-6PM)
N
WEST VIRGINIA
211 mi
18%
188 mi
17%
743 mi
65%
Highway Mileage by PTI
Legend
Reliable (PTI < 1.5)
Moderately Unreliable (PTI 1.5 - 2.5)
Highly to Extremely Unreliable (PTI > 2.5)
Notes:
- Based on Planning Time Index (PTI), the ratio of the worst case travel time to the free flow travel time of the segment.
- For example, a PTI of 3.0 means that for a trip that takes 10 minutes in uncongested conditions, 30 minutes is needed to guarantee 95% on-time arrival.
AM Peak:
- 18% of the freeway/expressway system is highly to extremely unreliable
- 26% of the VMT on the freeway/ expressway system occurs in highly to extremely unreliable conditions
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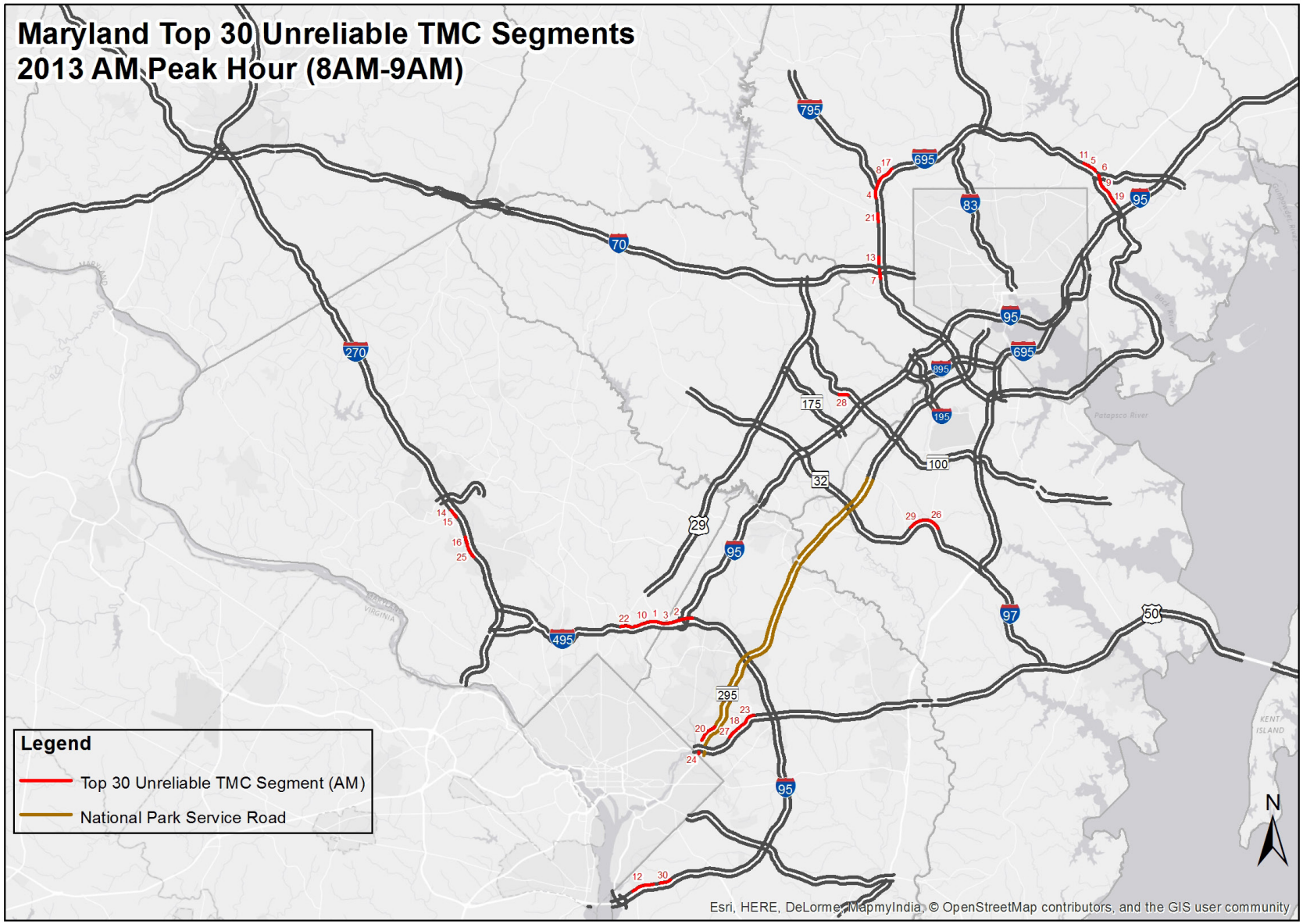
Top 30 Unreliable Segments

The top 30 most unreliable freeway/expressway segments based on the PTI for the AM peak hour (8-9 AM) and PM peak hour (5-6 PM) are listed in the following tables and shown in Figures 11 - 12:

2013 TOP 30 UNRELIABLE SEGMENTS AM PEAK

2013 Rank	Road	Location	Direction	2013 PTI	2012 Rank	Rank Change 2012 to 2013
1	I-495	@ MD 650	OUTER LOOP	8.29	2	-1
2	I-495	I-95 TO MONTOGMERY CO/L	OUTER LOOP	8.18	1	1
3	I-495	PRINCE GEORGES CO/L TO MD 650	OUTER LOOP	7.86	3	0
4	I-695	IS 795 TO MD 26	OUTER LOOP	7.71	14	-10
5	I-695	MD 43 TO MD 147	OUTER LOOP	7.47	6	-1
6	I-695	US 1 TO MD 43	OUTER LOOP	7.45	10	-4
7	I-695	IS 70 TO US 40	OUTER LOOP	7.33	9	-2
8	I-695	MD 140 TO IS 795	OUTER LOOP	7.17	35	-27
9	I-695	@ US 1	OUTER LOOP	7.15	32	-23
10	I-495	MD 650 TO MD 193*	OUTER LOOP	7.13	4	6
11	I-695	MD 147 TO MD 41	OUTER LOOP	7.00	5	6
12	I-95	MD 414 TO MD 210	INNER LOOP	6.86	285	-273
13	I-695	MD 26 TO MD 122	OUTER LOOP	6.45	55	-42
14	I-270	SHADY GROVE RD TO MD 28	SOUTHBOUND	6.18	7	7
15	I-270	SHADY GROVE RD TO MD 28 CD LANES	SOUTHBOUND	6.18	8	7
16	I-270	@ MD 28	SOUTHBOUND	6.11	27	-11
17	I-695	@ MD 140	OUTER LOOP	6.06	104	-87
18	US-50	MD 410 TO MD 202	WESTBOUND	6.01	30	-12
19	I-695	IS 95 TO US 1	OUTER LOOP	5.84	119	-100
20	MD-295	MD 202 TO US 50[1]	SOUTHBOUND	5.83	94	-74
21	I-695	@ MD 26	OUTER LOOP	5.51	34	-13
22	I-495	MD 193 TO US 29*	OUTER LOOP	5.45	15	7
23	US-50	@ MD 410	WESTBOUND	5.26	45	-22
24	MD-295	US 50 TO WASHINGTON DC/L[1]	SOUTHBOUND	5.09	164	-140
25	I-270	MD 28 TO MD 189	SOUTHBOUND	5.06	21	4
26	MD-32	SAPPINGTON STATION RD TO MD 170	WESTBOUND	5.04	260	-234
27	US-50	MD 202 TO MD 459	WESTBOUND	5.03	33	-6
28	MD-100	SNOWDEN RIVER PKWY TO MD 103	EASTBOUND	4.98	96	-68
29	MD-32	MD 170 TO MD 175	WESTBOUND	4.76	182	-153
30	I-95	@ MD 414	INNER LOOP	4.75	1604	-1574

[1]Maintained by the National Park Service *Under Construction


Maryland Top 30 Unreliable TMC Segments
2013 AM Peak Hour (8AM-9AM)
Legend
Top 30 Unreliable TMC Segment (AM)
National Park Service Road
N
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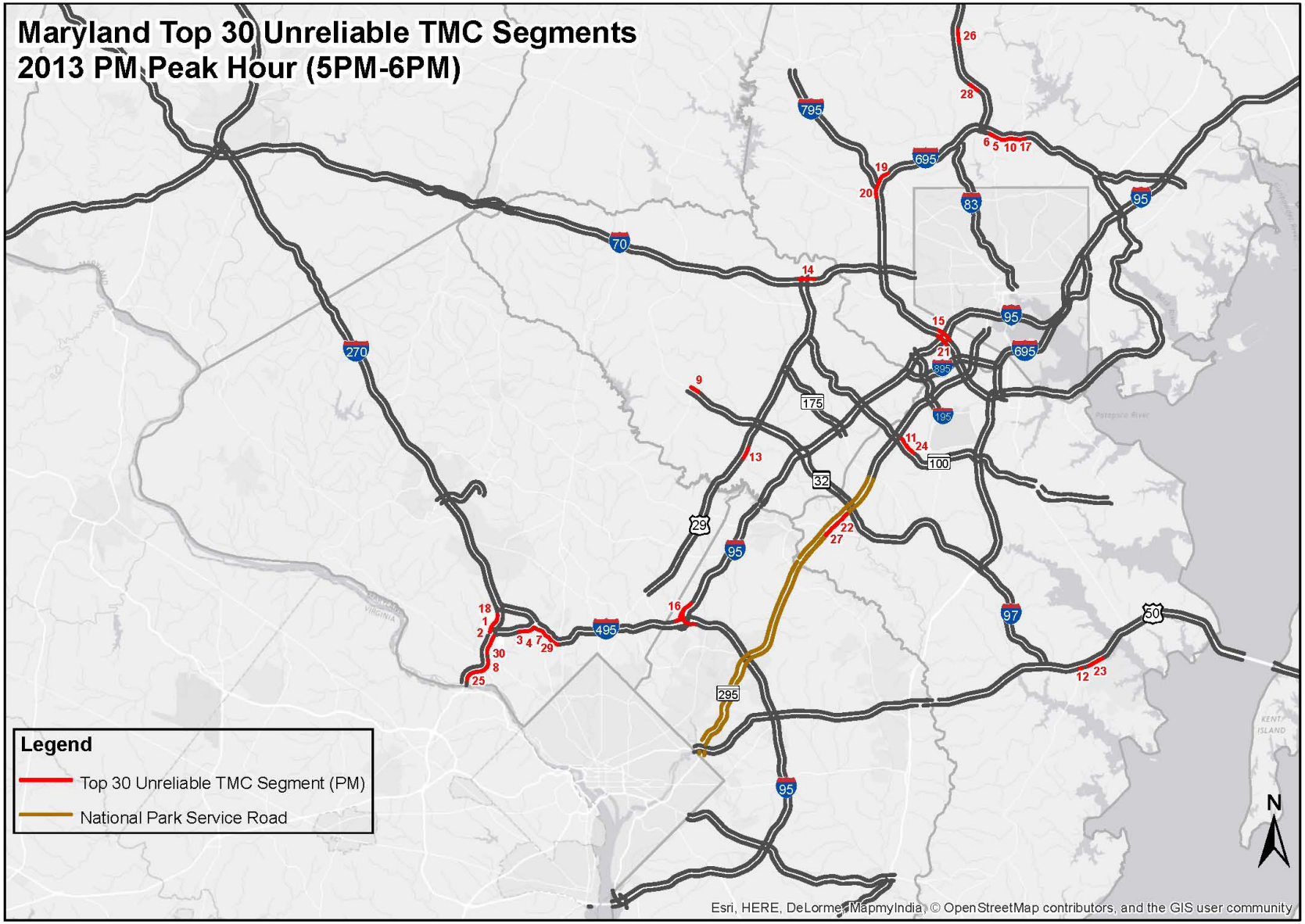
2013 TOP 30 UNRELIABLE SEGMENTS PM PEAK

2013 Rank	Road	Location	Direction	2013 PTI	2012 Rank	Rank Change 2012 to 2013
1	I-270 Spur	@ DEMOCRACY BLVD	SOUTHBOUND	9.30	1	0
2	I-270 Spur	@ IS 495	SOUTHBOUND	8.86	2	0
3	I-495	@ MD 187	INNER LOOP	8.01	4	-1
4	I-495	MD 187 TO MD 355	INNER LOOP	7.94	3	1
5	I-695	MD 139 TO MD 45	INNER LOOP	7.89	18	-13
6	I-695	@ MD 139	INNER LOOP	7.67	31	-25
7	I-495	MD 355 TO MD 185	INNER LOOP	7.40	5	2
8	I-495	CABIN JOHN PKWY TO MD 190	INNER LOOP	6.96	12	-4
9	MD-32	GREAT STAR DR TO MD 108	WESTBOUND	6.71	9	0
10	I-695	MD 45 TO MD 146	INNER LOOP	6.39	35	-25
11	MD-100	MD 713 TO MD 295	WESTBOUND	6.18	259	-248
12	US-50	@ MD 450	EASTBOUND	6.18	25	-13
13	US-29	MD 216 TO JOHNS HOPKINS RD	NORTHBOUND	5.95	196	-183
14	I-70	@ US 29	WESTBOUND	5.89	101	-87
15	I-695	@ IS 95	INNER LOOP	5.79	185	-170
16	I-95	MD 212 TO IS 495	SOUTHBOUND	5.64	140	-124
17	I-695	@ MD 146	INNER LOOP	5.63	56	-39
18	I-270 Spur	IS 270 TO DEMOCRACY BLVD	SOUTHBOUND	5.53	11	7
19	I-695	MD 140 TO IS 795	OUTER LOOP	5.48	211	-192
20	I-695	IS 795 TO MD 26	OUTER LOOP	5.48	165	-145
21	I-695	@ IS 95	OUTER LOOP	5.39	246	-225
22	MD-295	MD 198 TO MD 32[1]	NORTHBOUND	5.39	40	-18
23	US-50	@ MD 70	EASTBOUND	5.29	15	8
24	MD-100	MD 170 TO MD 713	WESTBOUND	5.28	433	-409
25	I-495	CLARA BARTON PKWY TO CABIN JOHN PKWY	INNER LOOP	5.17	41	-16
26	I-83	WARREN RD TO SHAWAN RD	NORTHBOUND	5.11	70	-44
27	MD-295	@ MD 198[1]	NORTHBOUND	5.02	106	-79
28	I-83	PADONIA RD TO TIMONIUM RD	SOUTHBOUND	5.00	258	-230
29	I-495	@ MD 185	INNER LOOP	4.98	20	9
30	I-495	@ IS 270Y Split	INNER LOOP	4.98	24	6

[1]Maintained by the National Park Service *Under Construction


Maryland Top 30 Unreliable TMC Segments
2013 PM Peak Hour (5PM-6PM)
Legend
Top 30 Unreliable TMC Segment (PM)
National Park Service Road
N
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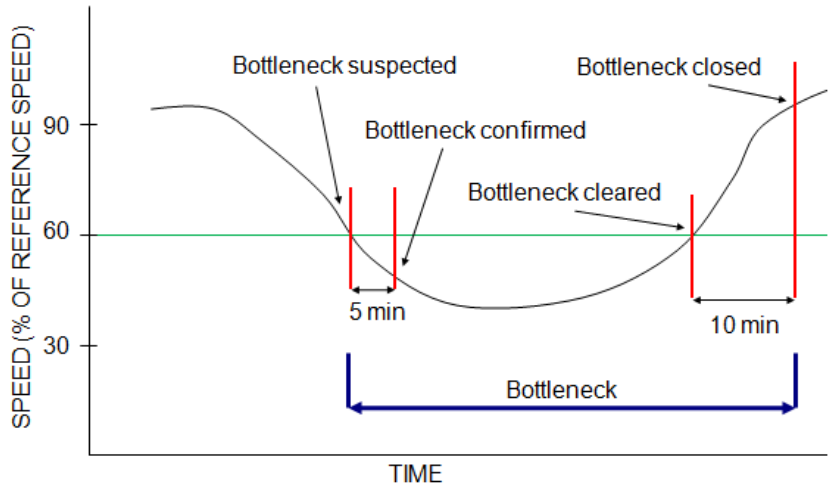
Top 30 Bottleneck Locations

The top 30 bottleneck locations were identified for Maryland in 2013. The ranking is based on speed observations used to calculate their occurrence. The ranking of the segments is performed by comparing the duration, intensity and frequency with which the bottlenecks occur during an entire average weekday.

A bottleneck, as defined by the Vehicle Probe Project (VPP) Suite, occurs when, "the speeds observed for a roadway segment drop below 60% of the free flow speed for a period greater than 5 minutes. Adjacent roadway segments meeting this condition are joined together to form a bottleneck queue. The duration of the bottleneck is calculated till the time speeds are greater than 60% for more than 10 minutes." This definition uses minute-to-minute speeds available across the state highway system to determine congestion patterns. This is graphically shown below:



The analysis is based on INRIX probe data for interstates and major roadways within Maryland available through the Vehicle Probe Project. The ranking is based on impact factors (computed as the number of times a bottleneck occurs on a particular segment, times its duration and the average queue length). The following page identifies the Top 30 Bottlenecks. These are shown in Figure 13.

2013 TOP 30 BOTTLENECK LOCATIONS

2013 Rank	Location	Road	Direction	Q1	Q2	Q3	Q4	Average Duration (Minutes)	Average MAX Length	Impact Factor	2012 Rank	Rank Change 2012 to 2013
1	I-495 IL @ I-270 Spur	I-495	INNER LOOP	172	266	214	208	185.5	13.83	1993724	18	-17
2	I-695 IL @ MD-147/Harford Rd/Exit 31	I-695	INNER LOOP	95	105	97	116	165.25	10.58	712794	5	-3
3	I-95 N @ MD-100/Exit 43	I-95	NORTHBOUND	96	195	162	127	122.5	10.53	699231	6	-3
4	I-695 OL @ Edmondson Ave/Exit 14*	I-695	OUTER LOOP	170	208	197	135	128	8.43	696761	8	-4
5	US-29 N @ MD-175	US-29	NORTHBOUND	169	135	126	159	139.5	8.84	617074	N/A	N/A
6	I-270 Spur S @ I-270	I-270	SOUTHBOUND	182	251	210	241	100.75	7.35	589191	3	+3
7	I-95 OL @ Greenbelt Metro Dr/Exit 24	I-495	OUTER LOOP	88	125	105	90	133	10.8	515630	28	-21
8	MD-295 N @ MD-197/Exit 11[1]	MD-295	NORTHBOUND	91	115	122	116	166.5	7.38	502221	4	+4
9	I-270 N @ MD-80/Exit 26	I-270	NORTHBOUND	64	90	127	76	100.75	9.75	303944	2	+7
10	I-270 Local N @ MD 124	I-270	NORTHBOUND	162	156	128	159	126.25	4.28	254174	1037	-1027
11	MD-295 S @ MD-193[1]	MD-295	SOUTHBOUND	112	101	92	85	95.75	7.58	252559	12	-1
12	I-695 IL @ Security Blvd/Exit 17	I-695	INNER LOOP	104	169	197	144	102.75	4.44	252163	N/A	N/A
13	I-95 N @ MD-43/Exit 67[2,*]	I-95	NORTHBOUND	44	97	113	82	109.5	7.77	244868	10	+3
14	I-270 N @ I-70/US-40	I-270	NORTHBOUND	85	106	81	128	83.25	8.07	227055	7	+7
15	I-270 S @ MD-109/Exit 22	I-270	SOUTHBOUND	126	178	156	118	84.25	4.62	206370	15	0
16	I-695 OL @ MD-144/Exit 13*	I-695	OUTER LOOP	66	46	55	40	142.5	8.96	201943	14	+2
17	I-495 OL @ MD-185/Connecticut Ave/Exit 33	I-495	OUTER LOOP	68	79	60	63	127.25	6.2	192474	23	-6
18	I-695 IL @ I-83/MD-25/Exit 23	I-695	INNER LOOP	94	117	111	104	82.25	5.22	173842	27	-9
19	I-695 IL @ MD-26/Exit 18	I-695	INNER LOOP	33	54	60	55	131.5	6.79	171284	22	-3
20	I-95 S @ I-495/Exit 27-25	I-95	SOUTHBOUND	113	179	163	155	85.25	3.59	169575	25	-5
21	MD-295 S @ Powder Mill Rd[1]	MD-295	SOUTHBOUND	61	135	166	114	82.75	4.72	169333	85	-64
22	I-695 IL @ MD-41/Perring Pkwy/Exit 30	I-695	INNER LOOP	87	98	88	68	84	6.35	166460	19	+3
23	MD-295 N @ MD 32[1]	MD-295	NORTHBOUND	41	74	75	46	92.25	7.53	151493	36	-13
24	I-495 OL @ MD-97/Georgia Ave/Exit 31	I-495	OUTER LOOP	78	118	99	114	102	3.47	141485	26	-2
25	I-270 N @ Middlebrook Rd/Exit 13	I-270	NORTHBOUND	98	91	0	83	104	5.99	141129	11	+14
26	MD-295 S @ DC Line[1]	MD-295	SOUTHBOUND	91	95	103	78	114.5	4.1	141111	31	-5
27	I-95 IL @ MD-214/Exit 15	I-495	INNER LOOP	65	84	157	111	71.5	6.02	139754	59	-32
28	US-50 W @ Bay Bridge	US-50	WESTBOUND	22	121	199	41	50.75	5.59	136461	32	-4
29	MD-295 S @ MD-198[1]	MD-295	SOUTHBOUND	79	123	147	113	88	3.28	131422	35	-6
30	I-95 OL @ US-50/Exit 19	I-495	OUTER LOOP	0	101	114	113	89.33	4.6	129385	N/A	N/A

Q1: Jan-Mar Q2: Apr-June Q3: July-Sept Q4: Oct-Dec

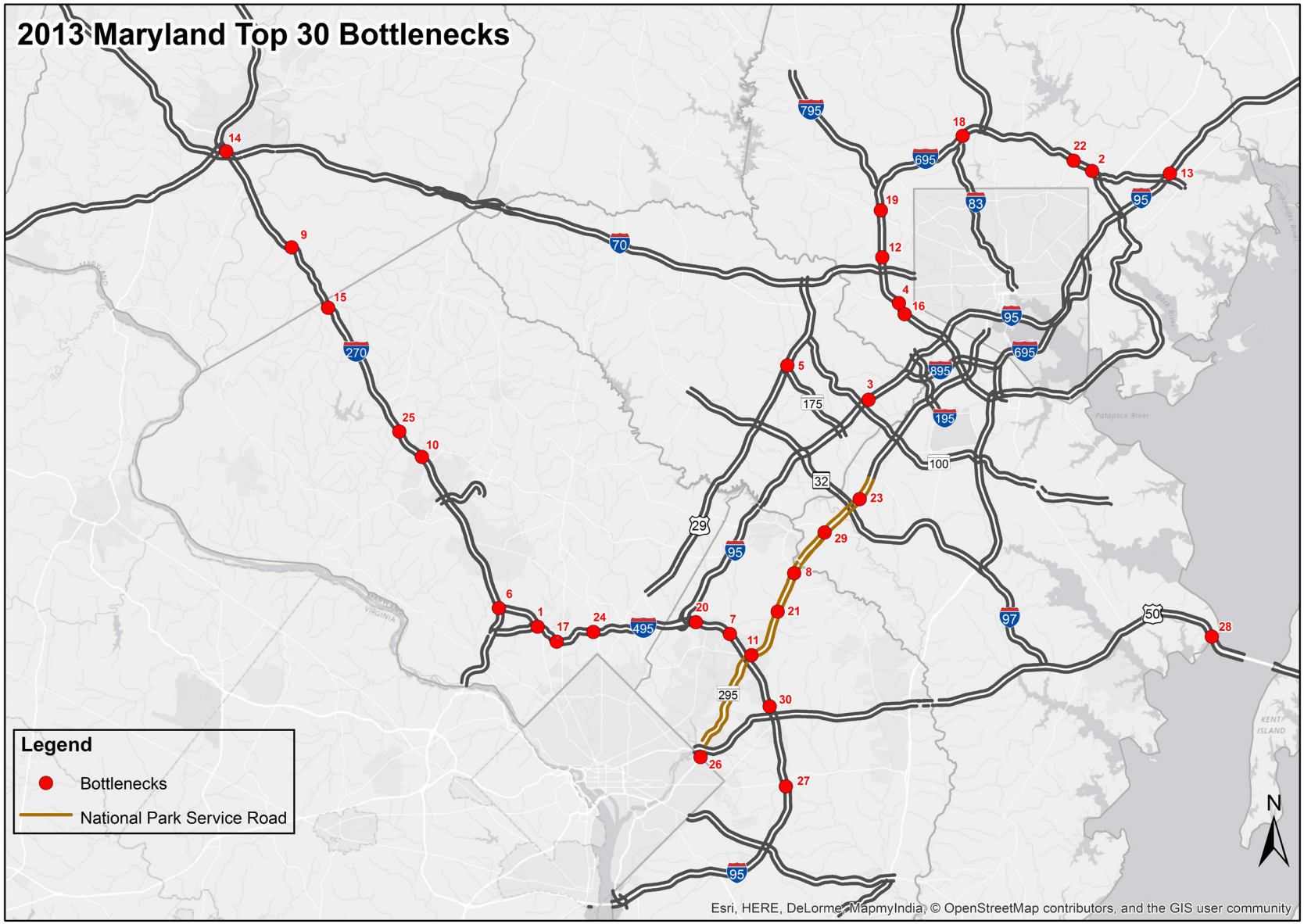
Occurrences: # of times speed dropped below 60% of the free flow speeds

Impact factor = Sum of Occurrence per quarter x Avg. Duration per Quarter x Queue Length per Quarter

1: Owned by National Park Service

2: Owned and Operated by Maryland Transportation Authority

*Under Construction


2013 Maryland Top 30 Bottlenecks
Legend
Bottlenecks
National Park Service Road
N
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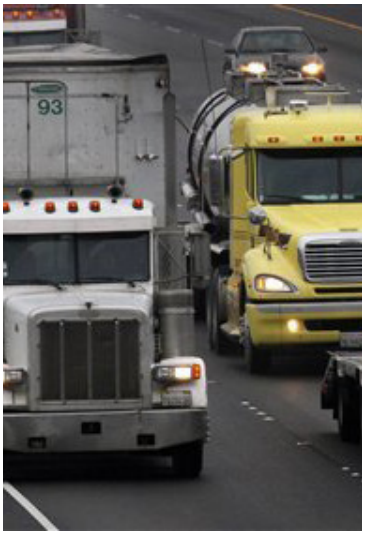

D. Truck Trends

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Truck Trends

Maryland's economy is enhanced by a safe, efficient, and reliable freight network. The highways, port infrastructure, airport, and rails must be in good working condition and relatively congestion free. Unpredictable congestion and delay reduces the reliability of delivery times, which leads to costlier freight movement. The trend toward leaner supply chains and changes in online retail require efficient roadway networks, warehouses, and intermodal facilities to ensure timely and cost-effective delivery. Planners and policymakers are paying special attention to population growth and related freight demand, increases in warehouse and distribution facilities in heavily trafficked corridors, and growth in intermodal traffic, which is expected to increase with the completion of the Panama Canal expansion project in 2015. Distribution giant Amazon.com announced in 2013 that it is building a one million square foot distribution center in Southeast Baltimore.

Freight movement in Maryland is estimated to be over $365 billion accounting for over 510 million tons of goods. Approximately 60% of the freight tonnage moves by highway. In order to support the economic viability SHA processes over 139,000 oversize/overweight truck load permits. In addition to the movement of goods in or around Maryland, our position as a "through" state especially related to the key corridors of I-95 and I-81 will continue to require that freight congestion be minimized. For example, on sections of I-95 there are over 25,000 trucks per day utilizing the roadway. The movement of freight is impacted by the same reliability and congestion that motorists on the network face.

The American Transportation Research Institute (ATRI) evaluated congestion costs for trucking on the interstate system which showed Maryland was rated 7th highest among all states in congestion costs. The Washington DC metropolitan area experienced the 5th highest congestion costs for highway freight movement.

The Federal Highway Administration (FHWA) Office of Management and Operations and ATRI monitor interstate highways as part of the Freight Performance Initiative. A major monitoring area is the identification of bottlenecks on the nations interstate system. The 2013 Freight Performance Measures Analysis of Freight Significant Highway Locations report identifies a congestion index based on the peak and off peak speeds below the free flow speeds over 24 hour periods and the freight demand at the junction of two interstate roadways nationwide. Four of the top 100 locations were in Maryland including in order:

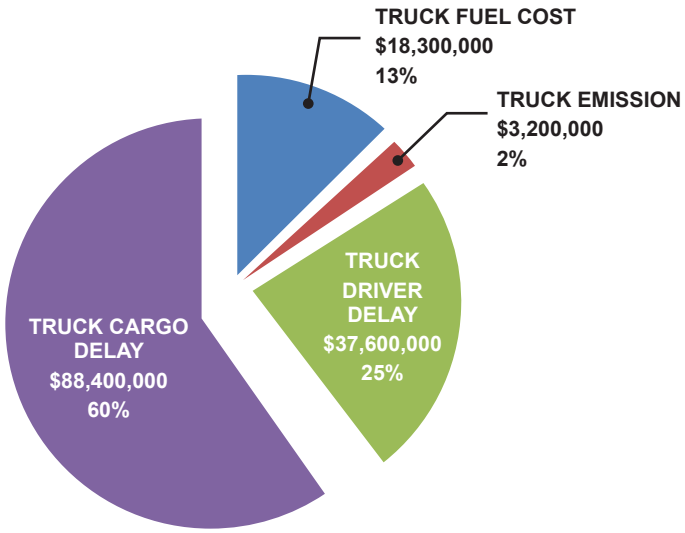
- I-95 @ I-495
- I-495 @ I-270
- I-95 @ I-395
- I-95 @ I-695 (South)

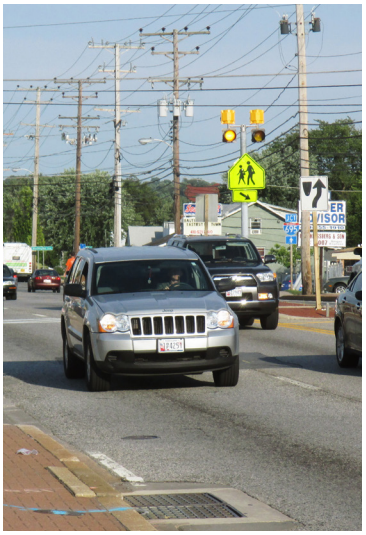
This congestion has an influence on the cost of the products we buy, impacts to the environment and safety. Cost ranging from delays of freight arriving on time to additional fuel costs are more significant to truckers than to motorists. Truckers experience a greater level of congestion at certain locations throughout the State. Based on the analysis of bottleneck locations the following sections represent the most congested areas of freight traffic:

- I-495 Inner Loop @ I-270
- I-695 Inner Loop @ MD 147
- I-95 Northbound @ MD 100
- I-695 Outer Loop @ Edmondson
- US 29 Northbound @ MD 175
- I-270 Southbound Spur @ I-270
- I-95 Outer Loop @ Greenbelt Metro
- I-270 Northbound @ MD 80
- I-270 Northbound @ North of MD 124

These bottlenecks result in driver delay costs, cargo delay costs, diesel costs and increased emissions. This amounts to an estimated $147.5 million in 2013. The following graph illustrated the costs.

2013 FREIGHT CONGESTION COSTS ON MARYLAND'S FREEWAYS/EXPRESSWAYS





E. Regionally Significant Corridors

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Controlled Access Facilities

Controlled access facilities consisting of various expressways and freeways, were individually evaluated for congestion, reliability and mobility measures including travel time index, planning time index, daily variability, speed and the location of the top bottlenecks along these roadways. The facilities evaluated include:

- I-70 (Pennsylvania Border to US 40 (Frederick))
- I-70 (US 40 (Frederick) to I-695)
- I-81
- I-83
- I-95 (Capital Beltway to I-695 North)
- I-95 (I-695 North to Delaware State Line)
- I-97
- I-495 Capital Beltway
- I-695 Baltimore Beltway
- I-795
- I-895
- US-50 (D.C Line to William Preston Lane Bridge (Bay Bridge))
- MD 32
- MD 100
- MD 295

Please refer to the Appendix for more in-depth information about the mobility performance of the above regionally significant corridors.

ARTERIALS

In addition to controlled access facilities, various arterial corridors were identified based on traffic volumes and regional significance. These corridors were reviewed to categorize the various operational characteristics of these facilities. This included condition data such as the number of lanes, interchanges and signalized intersections and traffic data. Traffic analysis was performed to identify the most congested intersections and the accompanying levels of service for the roadway segments along these corridors. The following corridors were analyzed:

- US 1 - MD 410 to MD 198
- US 29 - MD 97 to MD 650
- US 301 - Billingsley Road to MD 5
- Maryland 3 - I-97 to US 50/301
- Maryland 4 - Washington DC Line to I-95
- Maryland 2/4 - Prince Frederick
- Maryland 5 - I-95 to Washington D.C. Line
- Maryland 5 - US 301 to I-95
- Maryland 24 - US 40 to US 1
- Maryland 26 - Baltimore City Line to MD 32
- Maryland 28 - MD 124 to MD 97
- Maryland 43 - I-695 to US 40
- Maryland 45 - Baltimore City Line to Shawan Road
- Maryland 65 - MD 68 to 4th Street
- Maryland 85 - Executive Way to MD 355
- Maryland 97 - Washington DC Line to MD 108
- Maryland 124 - MD 28 to MD 108
- Maryland 140 - Baltimore City Line to MD 97
- Maryland 170 - Norcross Lane to MD 100
- Maryland 175 - MD 32 to US 29
- Maryland 185 - Washington DC Line to MD 97
- Maryland 210 - I-95 to MD 228
- Maryland 228 - MD 210 to US 301
- Maryland 235 - Airport Rd to MD 246
- Maryland 355 - Washington DC Line to MD 27

The appendix contains additional information related to various characteristics and performance measures of the above major arterials.

INTERSECTIONS

Traffic data has been collected at numerous intersections throughout the state in the past three years. The following signalized intersections have been defined to operate at the worse conditions or level of service 'F' based on the last three years counted locations:

ANNE ARUNDEL

- MD 2 @ Tarragon Lane
- MD 3 @ Crawford Blvd
- MD 3 @ MD 424
- MD 175 at MD 713

BALTIMORE

- US 1 @ Rossville Blvd
- MD 26 @ I-695 SB Ramps
- MD 43 @ Honeygo Blvd

CALVERT

- MD 2 @ MD 524/Cox Road

CHARLES

- MD 5 @ Billingsley Road
- MD 228 @ MD 229
- US 301 @ MD 228/MD 5 Bus

HARFORD

- US 1 @ MD 24
- MD 24 @ Singer Road
- MD 24 @ W. Ring Factory Road
- MD 24 @ I-95 NB Ramps

HOWARD

- MD 175 @ Tamar Drive
- US 40 @ MD 144A/Pebble Beach Drive

MONTGOMERY

- MD 28 @ Bauer Drive
- MD 28 @ MD 97
- MD 28 @ MD 115
- MD 28 @ MD 586/MD 911
- US 29 @ Dale Drive
- US 29 @ Fairland Drive
- US 29 @ Greencastle Road
- US 29 @ Musgrove Road
- US 29 @ Southwood Ave
- US 29 @ Stewart Lane
- US 29 @ Tech Road
- MD 97 @ MD 192/Forest Glen Rd
- MD 97 @ MD 390 (NB/L)
- MD 97 @ Old Baltimore Road
- MD 97 @ Seminary Road
- MD 97 @ Plyers Mill Road
- MD 97 @ Randolph Road
- MD 97 @ Seminary Place
- MD 108 @ Muncaster Road
- MD 117 @ Waring Station Road
- MD 119 @ Lakelands Drive
- MD 119 @ Muddy Branch Road
- MD 185 @ MD 410
- MD 185 @ Jones Bridge Road
- MD 185 @ MD 191
- MD 185 @ MD 192
- MD 187 @ Tuckerman Lane
- MD 190 @ Greenway Drive
- MD 355 @ Cedar Lane

- MD 355 @ Grosvenor Lane
- MD 355 @ MD 911/Wootton Parkway
- MD 355 @ Nicholson Lane
- MD 355 @ North Wood Road/Bethesda Naval Hospital Entrance
- MD 355 @ Shady Grove Road
- MD 355 @ Tuckerman Lane (North Intersection)
- MD 355 @ Twinbrook Pkwy
- MD 547 @ Summit Avenue
- MD 586 @ Randolph Road
- MD 650 @ Adelphi Road
- MD 650 @ Randolph Road

PRINCE GEORGE'S

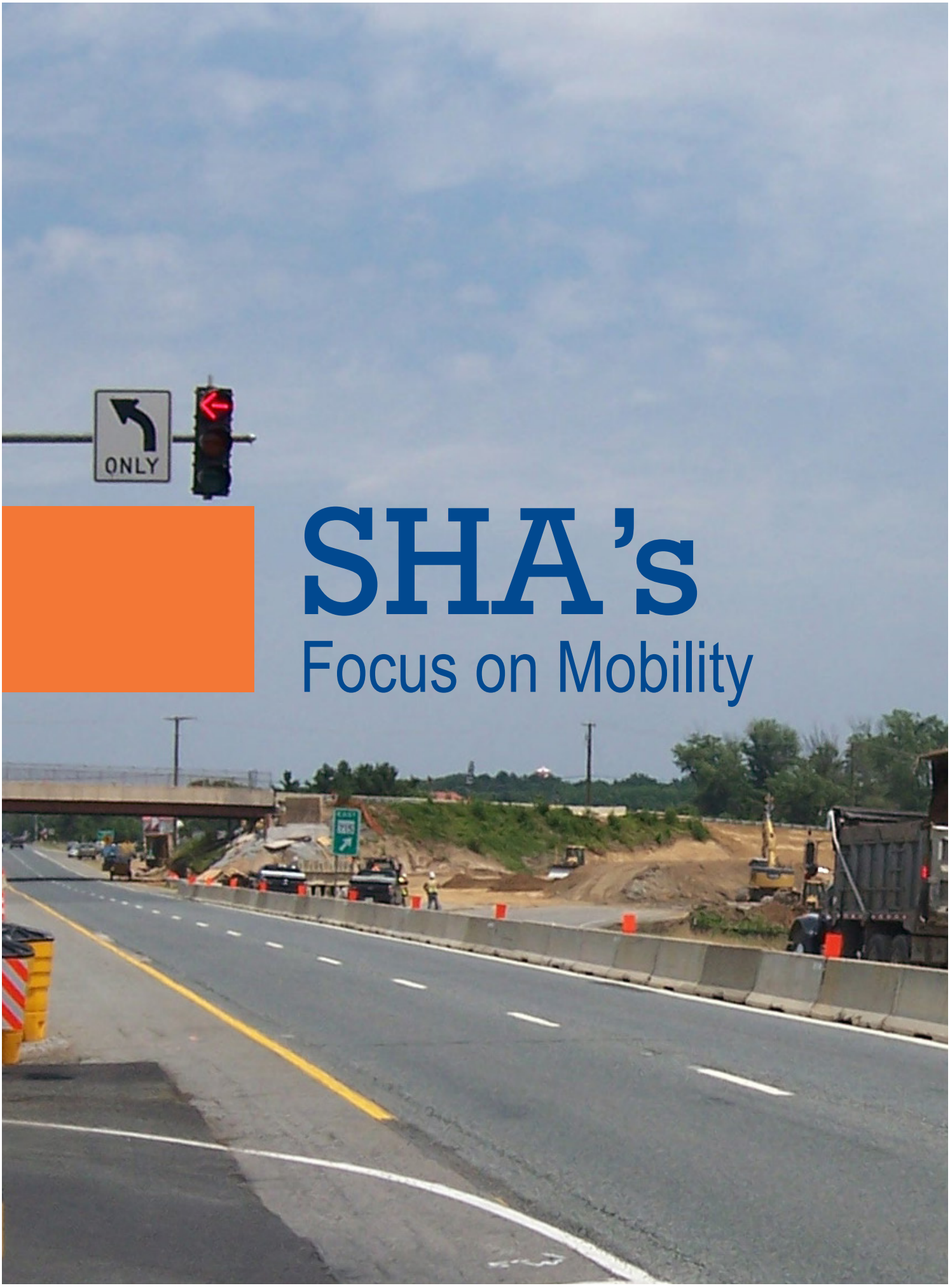
- US 1 @ Cherry Hill Road
- US 1 @ Edgewood Road/I-95 SB Ramp
- US 1 @ MD 410
- MD 4 @ Dower House Rd
- MD 4 @ MD 337
- MD 5 @ Brandywine Road
- MD 5 @ MD 373
- MD 5 @ Surratts Road
- MD 193 @ MD 212
- MD 197 @ MD 198
- MD 202 @ Brightseat Road
- MD 210 @ Livingston Road/Kerby Hill Road
- MD 210 @ Wilson Bridge Drive
- MD 212 @ Adelphi Road
- MD 214 @ IS 95 SB Ramps
- MD 228 @ Bealle Hill Road
- US 301 @ MD 197
- US 301 @ Clymer Drive
- MD 410 @ MD 212
- MD 410 @ MD 500
- MD 414 @ Livingston Road
- MD 414 @ Virginia Lane/I-95 SB Ramp
- MD 450 @ MD 704
- MD 450 @ MD 759C
- MD 458 @ Swann Road
- MD 637 @ Suitland Parkway

SAINT MARY'S

- MD 235 @ MD 237
- MD 235 @ Town Creek Drive
- MD 235 @ Shady Mile Drive
- MD 235 @ Wildewood Blvd

WORCESTER

- US 50 @ MD 528



SHA's

Focus on Mobility

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A. Capital Projects

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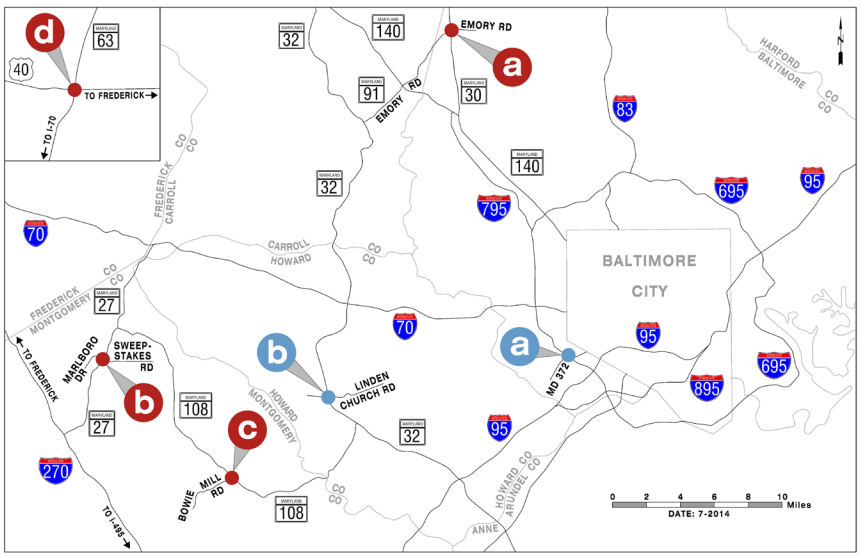
Capital Projects

In order to address congestion and reliability issues, SHA utilizes a variety of strategies. This includes capital projects and programs that implement bottleneck solutions in a systemic and responsible manner. SHA has been advancing the concepts of planning for operations and continues a performance based approach to identify and implement congestion mitigation solutions. The following describes SHA project and program efforts to address mobility issues.

As with the case of all other transportation agencies in the nation, the potential for major capacity enhancement projects in Maryland is limited due to cost, right-of-way and environmental constraints. The recent economic climate has limited the potential of implementing major mobility projects and the major emphasis in recent years has been on system preservation. However, with the passage of the Transportation Infrastructure and Investment Act of 2013, SHA is now evaluating major multi-modal capacity enhancement projects. However, these projects take years to complete design and construction. At the same time, SHA continues to focus on alleviating congestion hotspots through a low cost congested intersection improvement program. Another mobility improvement is by implementing signal system optimization projects. Signal optimization projects are one of the most cost effective methods of improving traffic flow. These studies are performed along arterials where signal timing adjustments are made to minimize delay, reduce wasted fuel costs and maximize vehicular throughput.

There are many locations throughout the State of Maryland that experience recurring congestion. This ranges from spot intersections to major sections of interstate highways. In order to address this congestion, Maryland SHA continues to provide capacity and operational enhancements through various projects. In 2013 six projects were completed, that consisted of two major projects and four minor congestion relief projects.

The location of the major and minor projects completed in 2013 is shown on the following map:



MAJOR PROJECTS

a. I-695/Wilkens Avenue

b. MD 32/Linden Church Road

MINOR PROJECTS

a. MD 30/MD 91

b. MD 27/Sweepstakes Road Marlboro Drive

c. MD 108/Bowie Mill Road

d. US 40/MD 63

THESE PROJECTS PROVIDE THE FOLLOWING ANNUAL USER BENEFITS:

- **Major Projects: $3.3 Million**
- **Minor Projects: $2.4 Million**

1. MAJOR PROJECTS

The Maryland Transportation Infrastructure Act of 2013 has allowed the commencement of various major construction projects throughout the State either in the design of plans or the actual construction. These projects provide for congestion relief, improve traffic operations, safety and allow for a basis for future improvements. However, major projects can take many years to complete. A number of these projects were commenced such as the I-695/Maryland 144 interchange and the I-70/South Street interchange and are under construction. Despite the previous limited funding in calendar year 2013, two projects were completed in Maryland including:

I-695 @ Maryland 372 (Wilkens Avenue) (Baltimore County)

This interchange is located on the southwest side of the Baltimore Beltway. I-695 was previously widened to four lanes and the southbound bridge reconstructed. This project involved reconstructing and widening the northbound bridge over Wilkens Avenue. The widening allowed for a painted collector distributor roadway to be created through the two ramp diverges. The basic ramp configuration for the interchange did not change. No improvements occurred along Wilkens Avenue. This project is part of the Baltimore Beltway widening.

Maryland 32 @ Linden Church Road (Howard County)

Maryland 32 from Maryland 108 to I-70 is a very congested two lane roadway carrying approximately 25,000 vehicles per day. The roadway is intersected by several moderate volume cross streets including Linden Church Road. In order to improve traffic flow along the mainline of MD 32 and provide better access for the neighboring developments, an interchange was constructed. This diamond interchange includes a roundabout at the ramp termini for traffic to and from the north.

Major Project Benefits

These two projects provide benefits to the motorists that utilize these facilities. The benefits are related to the reduction in delay incurred by motorists and commercial vehicles and the reduction in fuel consumption. Traffic analysis was performed for the before and after conditions. The analysis indicates that these two projects provide approximately in $3.3 million in annual user benefits.

MAJOR CONGESTION RELIEF PROJECTS ANNUAL BENEFITS

Location	Reduction in Delay		Reduction in Fuel Consumption		Annual Cost Savings (Million $)
	Hours (Thousands)	$ Savings (Thousands)	Gallons (Thousands)	$ Savings (Thousands)	
I-695 @ MD 372	5	172	7	24	0.20
MD 32 @ Linden Church Road	91	3,068	19	69	3.14
Total	**96**	**3,240**	**26**	**93**	**3.34**

2. MINOR CONGESTION RELIEF PROJECTS

Minor congestion relief projects are mainly small intersection improvements, which are part of the SHA Congested Intersection Program (CIP) or required from developers to mitigate their traffic impacts. The CIP addresses congestion issues at failing/near failing signalized intersections on state roadways using relatively low cost geometric or traffic control device improvements. Intersections that routinely suffer from daily recurring congestion increase overall travel times, delays and have the potential for a higher number of crashes. These intersections are often characterized by frequent signal phase failures, turn bay spillovers, long queues blocking upstream intersections, and/or blocked turn bays. Turn bay extensions can assist in reducing the occurrence of spillovers and blockages, while providing additional turn lanes or through lanes can reduce queues and increase intersection throughput. Projects funded in this category have cost constraints and are typically spot intersection type improvements for existing conditions (rather than corridor-wide improvements for future demand). SHA maintains a streamlined process to develop and implement projects across the state which along with congestion relief also provides safety and environmental benefits. In calendar year 2013, four CIP Projects were completed.

MD 30 @ MD 91 (Baltimore County)

This intersection is located in northwest Baltimore County south of Hampstead, approximately one - half mile from the Carroll County Line. MD 30 is a two lane roadway that has an average daily traffic volume of approximately 19,000 vehicles per day north of MD 91. Travel along the roadway is very directional especially in the AM peak hour with over 1,100 motorists traversing southbound compared to 200 proceeding northbound. This caused long queues to form on MD 30 southbound in the AM peak period. In order to alleviate the queuing, a second through lane was constructed on MD 30 southbound and an exclusive left turn lane was provided along MD 91.

MD 27 @ Sweepstakes Road/Marlboro Drive (Montgomery County)

MD 27 is a high volume two lane roadway that carries approximately 20,000 vehicles per day. MD 27 intersects with two Montgomery County roadways, Sweepstakes Road and Marlboro Drive south of Damascus. Traffic operations at this signalized intersection is constrained especially in the PM peak period due to the high volume of MD 27 northbound through traffic. Northbound MD 27 originally had a left turn lane and a through/right turn lane. To assist in improving the congestion at this intersection, a separate northbound right turn lane was constructed. The right turn movement exceeds 150 vehicles per hour in the PM peak hour. This project assists in reducing the queues and improving overall intersection operation.

MD 108 @ Bowie Mill Road (Montgomery County)

The MD 108/Bowie Mill Road intersection is located in the Olney area of Montgomery County. Maryland 108 operates in an east-west direction with Bowie Mill Road T-ing into the intersection on the south leg. The major movements are the westbound left turn and the northbound right turn with volumes in the peak hour exceeding 400 vehicles. With approximately 30,000 vehicles a day along MD 108 this caused difficulty for motorists from Bowie Mill Rd accessing MD 108 and for the left turn from MD 108 westbound to Bowie Mill Road. In order to improve operations, a traffic signal was constructed at this intersection including a short left turn lane on Bowie Mill Road northbound. This allowed the traffic signal to operate with the MD 108 westbound left turn movement at the same time as the Bowie Mill Road northbound right turn movement. This maximizes the efficiency of the signal operation.

US 40 @ MD 63 (Washington County)

The US 40 at MD 63 intersection is located west of Hagerstown in Washington County. The intersection is signalized and operates such that MD 63 northbound and southbound movements operate in a split phase where first northbound traffic progresses then southbound traffic flows. This causes inefficient signal operations but was needed due to the northbound left turn volume being almost 200 vehicles in the peak hour this was the most efficient manner to operate the signal to reduce delays. This improvement project consisted of providing northbound and southbound left turn lanes on MD 63 and eliminating the split phasing for the operation of the traffic signal.

Minor Congestion Relief Project Benefits

Analysis was performed on the four projects associated with the Congested Intersection Program to determine the benefits these projects provided. This included the annual reduction in the number of hours of delay, the savings in the amount of gallons of gasoline and the overall benefit provided by the project. The summation of the four projects is depicted in the following table:

MINOR CONGESTION RELIEF PROJECTS ANNUAL BENEFITS

Location	Reduction in Delay		Reduction in Fuel Consumption		Annual Cost Savings (Millions $)
	Hours (Thousands)	$ Savings (Thousands)	Gallons (Thousands)	$ Savings (Thousands)	
MD 30 @ MD 91	25	878	5	19	0.90
MD 27 @ Sweepstakes Road/ Marlboro Drive	2	68	1	4	0.07
MD 108 @ Bowie Mill Road	14	479	2	6	0.48
US 40 @ MD 63	28	967	6	20	0.99
Total	**69**	**2,392**	**15**	**49**	**2.44**

Intersection improvements to the State Highway System is supplemented by the need for developers to mitigate their traffic impacts. The Access Management Division is responsible for determining the mitigation measures required by developers to offset the additional traffic these developments will generate. The improvements can range from acceleration and deceleration lanes into their property to a major intersection enhancement. In 2013, several different improvements were constructed through the developer review process administered by the Access Management Division. Some of the locations include:

- US 50 at MD 16 (Dorchester County)
- I-95 at MD 222 (Cecil County)
- MD 118 at MD 355 (Montgomery County)
- MD 7 at Ashford Drive (Harford County)
- MD 713 at Bass Pro Drive (Anne Arundel County)
- US 11 at Glenside Avenue (Washington County)
- MD 30 at Brodbeck Road (Carroll County)

These projects benefit the traffic generated from these developments as well as motorists that utilize these roadways as everyday commuters and residents. These projects provided improvements in traffic operations thereby providing savings in user travel times and fuel costs.

3. Freight Projects

There are various areas of concern related to the movement of goods along the Maryland Highway system. Safety is one of those areas. This includes truck drivers being too tired and not having sufficient places to rest at their appropriate break times. MDOT and SHA have initiated a program to monitor overnight truck parking especially when it occurs along highways and not at appropriate rest areas. Trucks often park along the shoulders of the Maryland Truck Route system, increasing the potential for crashes between parked trucks and moving vehicles. A survey of the major routes in the Maryland Truck Route system where truck parking has been previously identified was performed. Peak overnight truck parking identified more than 600 trucks parked on the mainline and ramps either directly on or near these roadways. I-95 and I-70 were the leading routes for truck parking with on average over 145 trucks parked on a given night. The I-95/I-495 truck weigh station and the I-95 northbound Welcome Center in Howard County had over 60 trucks parked overnight, which were the highest recorded locations.

In order to address truck parking, a project was developed to expand the truck parking capacity at the I-95 southbound Welcome Center in Laurel. Truck parking is both a safety and infrastructure preservation issue, similar to the issue of overweight trucks, which can cause increased risk and damage on the system. The SHA Motor Carrier Division's Virtual Weigh Station program uses technology to protect the reliability of the pavement and keep trucks moving smoothly.

4. Pedestrians and Bicyclists

SHA has invested substantially in improving access and mobility to pedestrians and bicyclists through a series of projects. This includes sidewalk improvement projects along:

- MD 320 - Potomac Avenue to Sligo Creek Parkway (Montgomery County)
- MD 374 - Ann Drive to MD 818 (Worcester County)

In addition, accessible pedestrian signals have been provided at 60% of the intersections in Maryland, an increase of 4% of the total signals statewide.

One of the major emphasis of SHA is to improve pedestrian safety. One of the elements of this program is conducting pedestrian road safety audits. These audits identify safety issues pedestrians may confront and address those concerns. Among the locations where audits were completed in 2013 include Ocean City, Langley Park, Wheaton and MD 140 in Baltimore County.

The ability to provide facilities for bicyclists are another important part of the Complete Streets philosophy of SHA. This involves providing on-street bike lanes or off street facilities to encourage bicycle use and for safety.

The following bicycle improvements and procedures were implemented:

- Development of the Bicycle Policy and Design Guidelines
- Increased the directional miles of bicycle facilities along SHA roadways by 119 in the fiscal year

B. Programs and Policies

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1. CHART Transportation System Management & Operations

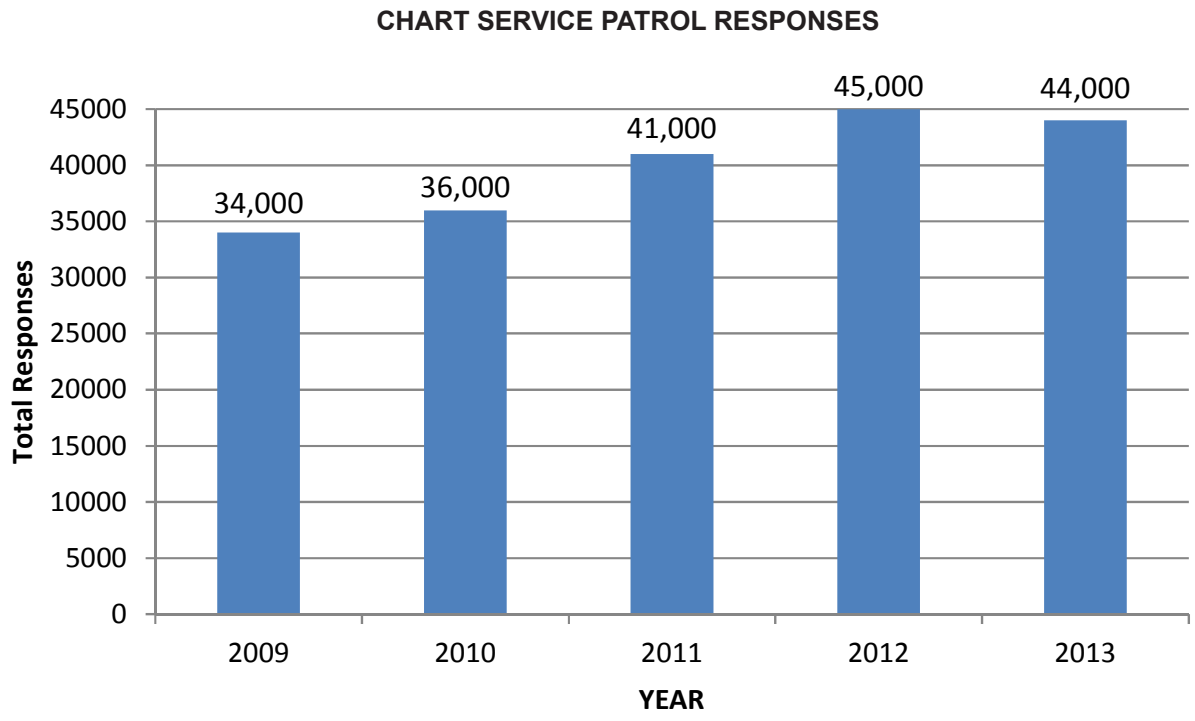
A major source of congestion along roadways is non-recurring congestion. Non-recurring congestion includes crashes, vehicle breakdowns, work zones, special events, and weather events. Non-recurring congestion is estimated to account for about 50% of all delays on Maryland roadways. The importance of avoiding crashes and providing emergency response in a timely manner is critical both for safety and mobility. From a safety standpoint, minimizing incident clearance times reduces the potential for secondary incidents caused by the original collision. Other benefits of reducing incident clearance times include lower user and agency costs in terms of travel delay and fuel consumption are reduced. Proper incident management also benefits the environment by reducing the amount of greenhouse gases emitted. The Coordinated Highways Action Response Team (CHART) Program, a joint effort between the Maryland Department of Transportation (MDOT) and Maryland State Highway Administration (SHA), in partnership with the Maryland State Police (MSP), and the Maryland Transportation Authority (MDTA), improves real-time operations for Maryland's highway system through communication, system integration, incident response and management, service patrols, and advanced traffic management systems. CHART's mission is to "Improve mobility and safety for the users of Maryland's highways through the application of intelligent transportation systems (ITS) technology and interagency teamwork." CHART is involved in the following areas:

- Emergency & Weather Operations
- Emergency Preparedness
- Incident Management
- Traffic & Roadway Monitoring
- Traffic Management
- Traveler Information

a. CHART Incident Management

In order to improve traffic operations during events that cause non-recurring congestion, CHART provides a variety of services. One of the major emphases for CHART is incident management. One goal of CHART related to incident management is to improve response times and clear incidents quickly. One way this is accomplished is proactively providing service patrols along major roadways. SHA and MDTA operate emergency traffic patrols to assist drivers when their vehicles become disabled. SHA has partnered with State Farm Insurance to expand CHART's emergency traffic patrol coverage. These daily patrols supplement CHART's current coverage and optimize incident response in identified high-volume/high-incident locations. There are currently 46 full-time and ten part-time Emergency Traffic Patrols (ETP's) in the Baltimore, Washington and Frederick regions that offer various types of motorist assistance on the freeways. In addition, from Maythrough September, extra patrols are assigned in response to the increased traffic volume traveling to and from Maryland's Eastern Shore. At its Statewide Operations Center (SOC) near BWI Airport and three regional operations centers, traffic is monitored through closed-circuit television (CCTV) cameras, speed sensors, and weather stations. When an incident occurs, the necessary information is relayed to emergency service personnel tasked with responding to an incident. With the use of various ITS technologies, travel time information is available to motorists along the major roadways. As a result of all of these incident management and traveler information system initiatives, CHART has saved billions of dollars since its inception for the roadway user in terms of lost time, fuel, and emissions.

The CHART Program responded to and cleared more than 17,000 incidents and assisted almost 27,000 stranded motorists in 2013. The total number of CHART responses on a yearly basis is illustrated in the following graph.



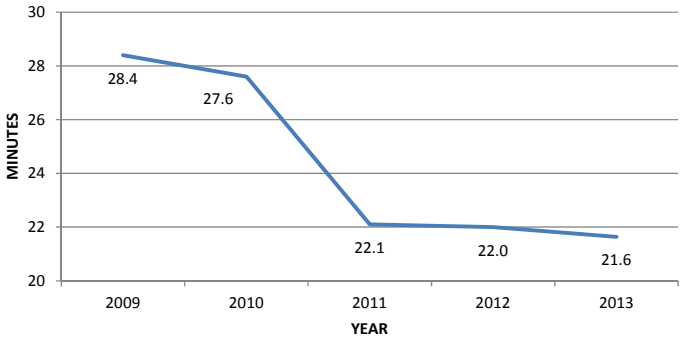
A timely response and efficient management have been shown to reduce the potential of secondary incidents. The faster the incident clearance the greater the benefits in reducing delay, improving mobility, and providing safer conditions. Once the traffic and roadway monitoring system has identified a problem, an immediate response is initiated to clear the incident and re-open lanes as quickly as possible, while protecting the safety of those involved in the incident, the emergency personnel responding, and other travelers in the vicinity. CHART operates a nationally recognized incident management program which depends heavily on the cooperation of the SHA, MSP, MDTA and numerous other agencies.

Some tools used for incident management include:

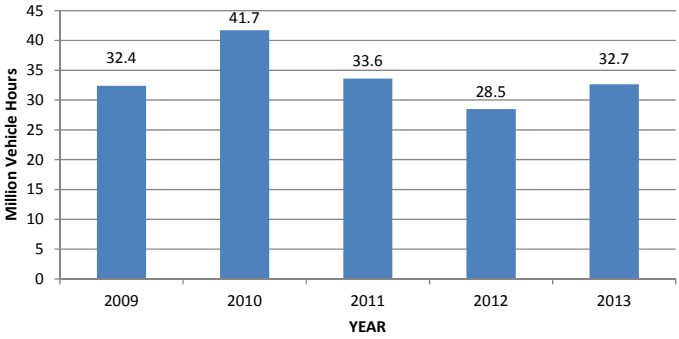
- Emergency Traffic Patrols (ETP's), which are used to provide emergency motorist assistance and to clear disabled vehicles from the travel lanes.
- Emergency Response Units (ERU's), which establish overall traffic control at crash locations.
- Freeway Incident Traffic Management (FITM) trailers, which are pre-stocked with traffic control tools including detour signs, cones, and trailblazer signs and are used to quickly set up pre-planned detour routes when incidents require full roadway closure.
- A "Clear the Road" policy, which provides direction for the rapid removal of vehicles from the travel lanes rather than waiting for a private tow service or time-consuming off-loading of disabled vehicles which are blocking traffic.
- An Information Exchange Network (IEN) Clearinghouse, provided by an I-95 Corridor Coalition workstation at the SOC, which shares regional incident and traveler information to member agencies along the corridor.

CHARTs' goal is to provide quick response time to reduce the duration of incidents and, therefore, reduce the amount of delay that motorists experience. This, in turn, provides user cost savings to the motorists. In 2013, CHART's average response time was less than 10 minutes, and the average incident took 22 minutes to clear. This saved almost 33 million vehicle hours in delay to motorists. The following graphs show the trends of average incident duration and reduction in delay for the last five years.

AVERAGE INCIDENT DURATION

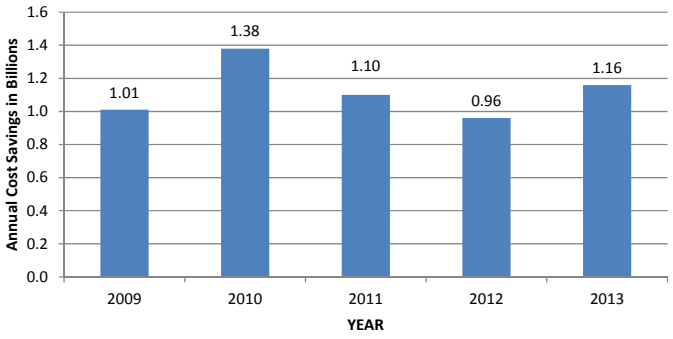


REDUCTION IN DELAY



The combination of a quick response time plus reducing delays means a savings in annual user costs. The following graph depicts the savings to motorists due to the CHART system in 2013, which is almost $1.16 billion on annual basis.

ANNUAL USER COST SAVINGS



b. ITS/511

ITS devices deployed throughout the state assist motorists to warn them of traffic operations and incidents. These ITS devices include:

- 600+ CCTV Cameras which include video feeds from other agencies
- 200+ Speed Detectors
- 85+ Dynamic Message Signs (DMS)

- 50+ Roadway Weather Information Systems
- 35+ Traveler Advisory Radios

CHART is involved in the following areas:

- Emergency Preparedness - Redundant Power and Communication, Decentralized Communications, and Department of Transportation Emergency Operations (DOTOPs)
- Emergency Weather Operations - Automatic Vehicle Location Fleet Management System and Resource Tracking System
- Incident Management - Emergency Traffic Patrols, CHART Operations Center, and Emergency Response Units
- Traffic Management - Special Event and Work Zone Management
- Traffic and Roadway Monitoring - Cell phone #77, CCTV, and Public/Private Partnerships
- Traveler Information - Maryland 511 Traveler Information System - High-quality, Timely, and Comprehensive Travel Information to Motorists, CCTV Camera Video Sharing with First Responders, and Internet (www.traffic.md.gov)

Each year possible improvements to the CHART system are analyzed and implemented as funding is available. The expansion of the CHART system will further assist travelers by providing better traffic operations statewide. In 2013, CHART deployed and integrated two Dynamic Message Signs (DMS) into the network. Through real-time analysis of INRIX traffic probe data, CHART posts travel time information on more than 100 DMS which includes signs owned by MDTA. The Maryland 511 Travel Information System continues to provide useful, high-quality, timely, and comprehensive travel information. In May 2013, work began on an enhancement to provide customized information to support the commercial vehicle industry.

c. Signal Operations

Traffic signal optimization projects provide for improved safety and increased person throughput on arterial corridors. This is accomplished by the retiming of signals to be more responsive to traffic flows, thereby reducing delay to motorists and decreasing automobile emissions. In studies from around the country, the benefit cost ratio of improving signal timings can range up to 40:1 by providing reduction in travel time delays, number of stops and fuel consumed.

The major emphasis of the signal system optimization program projects in 2013 was to increase the rate of traffic signal timing modifications that were installed in the controllers at the intersections after the analysis was completed. In 2013, the signal timings were put into 90% of the controllers. This represented a 25% to 35% increase over previous years.

The SHA has 249 signal systems across the State comprised of 1,524 signals. The process of upgrading signal timing includes gathering new traffic volume data, performing traffic modeling, developing adjustments to the timing patterns and conducting travel time analysis to evaluate the before and after results of the adjustments. A total of 313 signals were reviewed and 222 signals were retimed and changes to the timings implemented. This represents 29 signal systems. Some of the signal systems that were retimed include the following:

- US 1 Hyattsville
- MD 3 Crofton
- MD 8 Stevensville
- MD 24 Bel Air
- MD 27 Mt Airy
- MD 235 Lexington Park

The MD 3 and MD 235 projects provided the highest benefits associated with any of the 29 signal system upgrades. Travel times were reduced by up to 3 minutes in those corridors during the peak periods. Overall, the signal retiming and optimization modifications provided an estimated reduction of over 900,000 hours of delay for motorists. The fuel, delay and emissions savings resulted in approximately $29.4 million total annual user cost savings.

d. Transit Signal Prioritization

A balanced system of automobile, transit, bicycle and pedestrian usage will provide benefits to all users of the corridor. From a transit standpoint, one way to improve on-time performance is through the use of signal prioritization and queue jump/bypass lanes at signalized intersections. This approach allows buses the ability to continue to operate at a constant pace and reduces the variation in travel times for buses over the entire route. This provides for more consistent on-time performance and reduces the variation in arrival times at stops along the route. One on-going initiative is being led by the Washington Metropolitan Transportation Authority (WMATA). WMATA is evaluating locations in the US 1 corridor for signal prioritization. Equipment testing is anticipated to take place soon. Montgomery County has completed planning efforts to implement transit signal priority capabilities along major transit corridors in the County. A joint state/county policy and criteria for location identification has been developed, and corridors have been screened to determine the most beneficial locations for potential implementation. Future deployment remains unfunded at this time.

2. Multi-Modal

a. Park and Ride

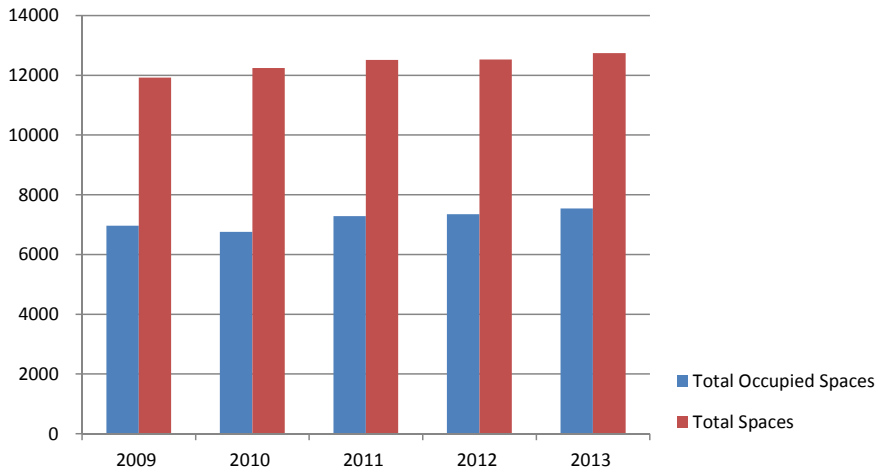
The SHA and MDTA have established a park and ride lot network throughout the State of Maryland. This assists in reducing vehicle trips to an urban area. Many of the lots are served by transit which increases the number of transit trips. Even in locations where transit service is not provided, carpools result in less total vehicle trips on the network, thereby, improving overall congestion and reliability. Together SHA and MDTA operate 105 park and ride lots in 20 counties providing a total of 12,742 spaces. These range in size from less than 15 spaces to over 800 spaces (MD 5 in the Waldorf area of Charles County and MD 665 at Riva Road in the Annapolis area of Anne Arundel County). A new 202 space park and ride lot was constructed in 2013 as part of the InterCounty Connector project (MD 200) at MD 97. Due to resurfacing projects at park and ride lots, capacity changes occurred in the number of spaces at I-695 and Cromwell Bridge Road (11 additional spaces were added) and at I-195/MD 166 (43 spaces reduced) lot. In addition, 735 LED luminaries were installed to upgrade lighting at the lots.

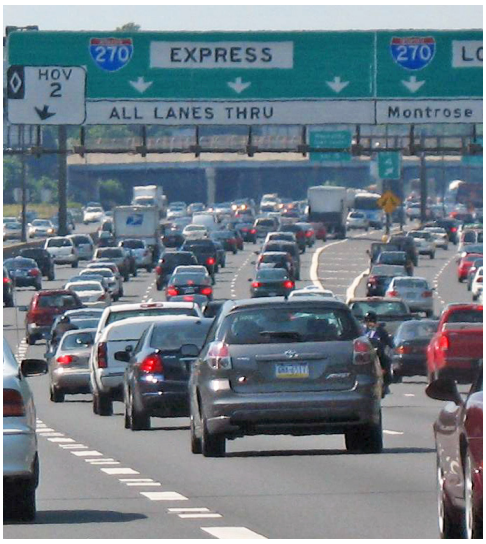
The 105 lots were surveyed during the spring and fall to determine the number of occupied spaces. Over 7,500 spaces were utilized on a given day accounting for about 60% of the total spaces. The park and ride lots which saw the largest increase in the number of motorists parking were:

- MD 665 @ Riva Road
- I-195 @ MD 166
- MD 5 @ Mattawoman - Beantown Road
- I-270 @ MD 124
- MD 210 @ MD 273

All of these lots experienced increased usage of between 20 and 60 additional spaces at these locations. It is estimated SHA and MDTA park and ride lot facilities saved motorists in Maryland over $5.9 million for the entire year and resulted in 106 million less VMT on roadways.

SHA/MDTA PARK AND RIDE
LOT SPACES AND USES

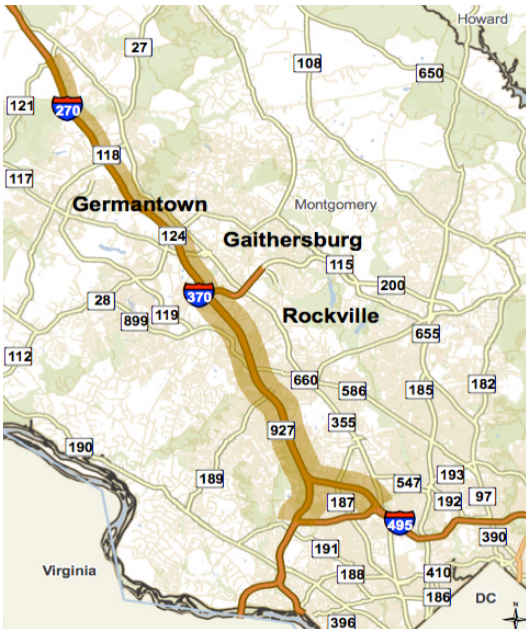




b. HOV Lane Operation

One strategy to improve the person throughput in a corridor is through the use of high occupancy vehicle (HOV) lanes. The lanes maximize person throughput instead of vehicle throughput by offering a travel time savings for multiple occupant vehicles over single occupant vehicles. The HOV lanes restrict access to vehicles with two or more occupants. This allows HOV lanes to operate near free flow speeds while the general purpose lanes experience congestion and lower travel speeds. The locations of HOV lanes in Maryland are as follows:

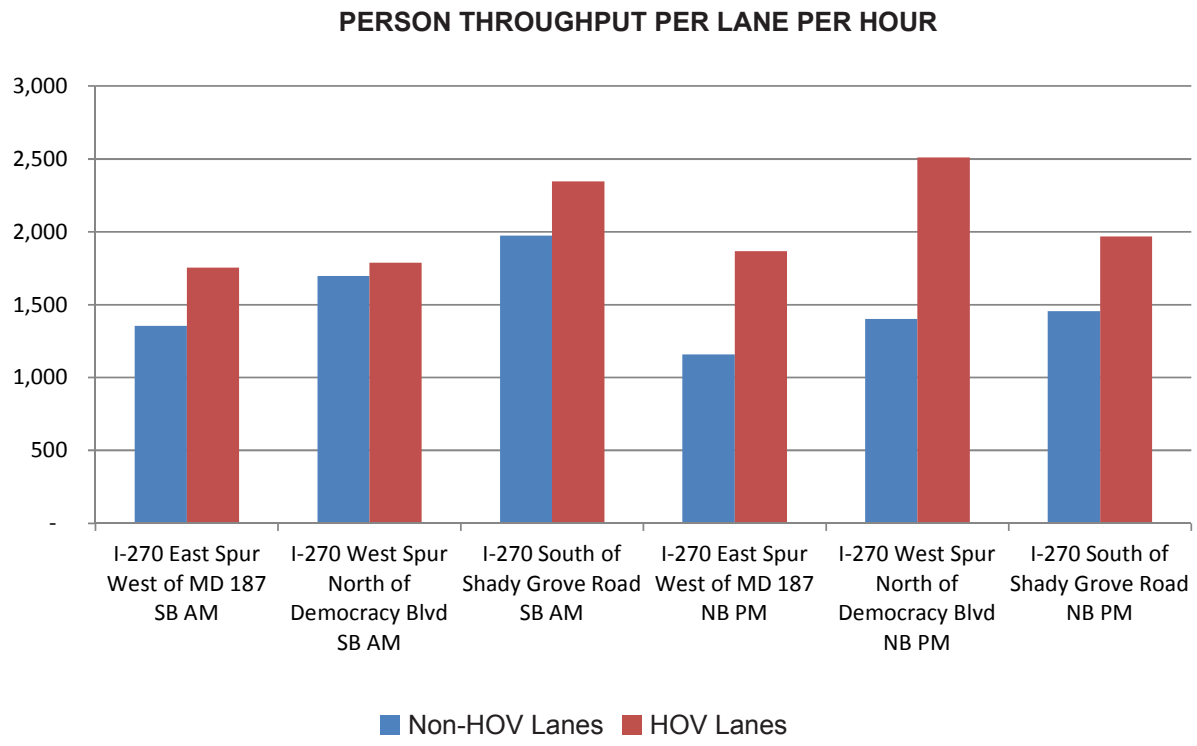
- I-270 – I-495 to MD 121 (Northbound)
- I-270 – MD 117 to I-495 (Southbound)
- US 50 – US 301 to I-95



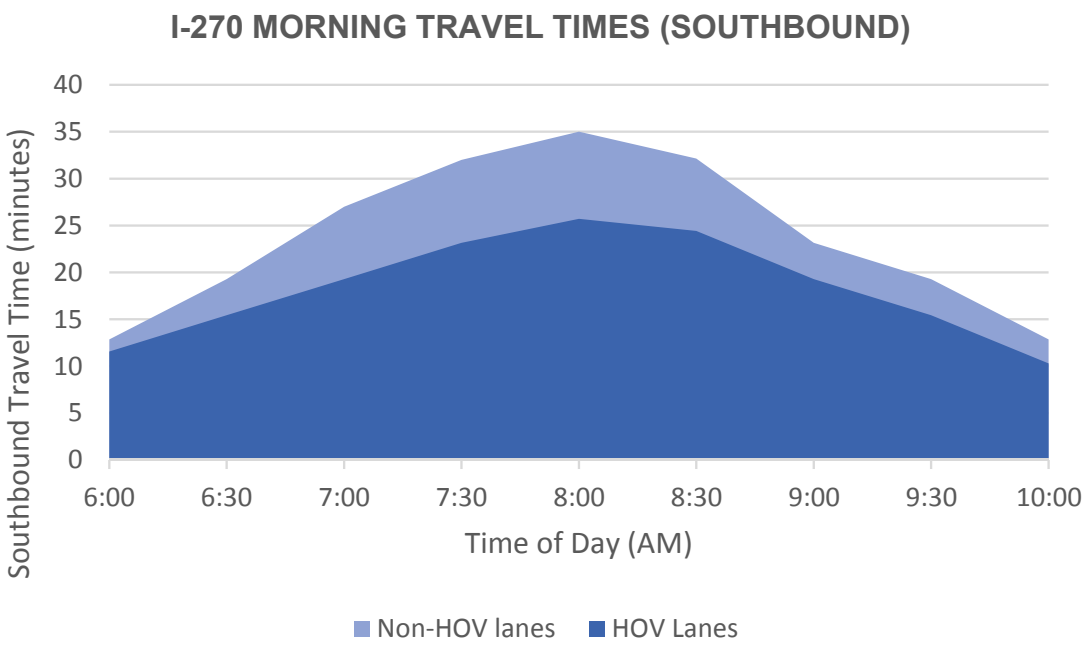
The I-270 HOV lanes operate southbound from 6:00 to 9:00 AM and northbound from 3:30 to 6:30 PM and are separated mainly by pavement markings and some barrier from the general purpose lanes. The US 50 HOV lanes operate the entire day with the separation of the HOV lanes and the general purpose lanes accomplished through pavement markings. The HOV lanes are restricted for automobiles with two plus occupants, transit vehicles, motorcycles, or plug-in hybrid vehicles (permit required). HOV lanes in combination with park and ride lots increase person throughput and provide a viable alternative transportation mode for commuters in Maryland. This provides an effective Active Travel Demand Management (ATDM) strategy.

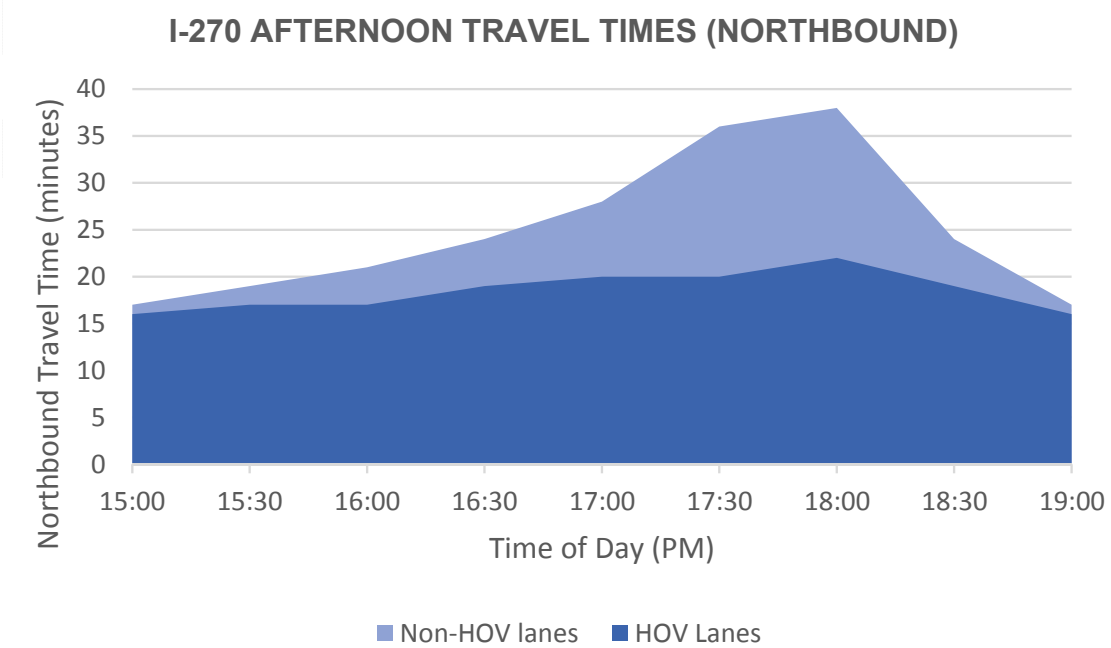
Surveys were performed along I-270 to evaluate the effectiveness of the HOV lanes. This included analyzing person throughput and travel time savings. Person throughput evaluates the total number of people moved in each lane not just vehicles. On I-270 the HOV lanes transported approximately 100 to 1,000 additional persons versus the general purpose lanes.

The HOV lane carries as much as 2,500 persons per lane per hour as shown in the following chart:



Motorists utilizing the HOV lanes experienced a significant savings in travel time. In the morning peak period, this amounted to up to 9 minutes with an average of 6 minutes. The afternoon peak period provided even greater travel time savings. This was measured to be a maximum of approximately 16 minutes with an average of 8 minutes for motorist utilizing the HOV lane versus the general purpose lanes. This resulted in a 1.2 million person-hour time savings amounting to $4.5 million dollars. These savings were calculated using travel time data collected from permanent Bluetooth directories on I-270. The following figures show the average travel time savings on the HOV lanes during the AM and PM peak period of operation.


I-270 MORNING TRAVEL TIMES (SOUTHBOUND)
Southbound Travel Time (minutes)
40
35
30
25
20
15
10
5
0
6:00
6:30
7:00
7:30
8:00
8:30
9:00
9:30
10:00
Time of Day (AM)
Non-HOV lanes
HOV Lanes


I-270 AFTERNOON TRAVEL TIMES (NORTHBOUND)
Northbound Travel Time (minutes)
40
35
30
25
20
15
10
5
0
15:00
15:30
16:00
16:30
17:00
17:30
18:00
18:30
19:00
Time of Day (PM)
Non-HOV lanes
HOV Lanes

c. Reversible Lane Operation

Maximizing the throughput of a roadway especially during the peak periods can involve many different solutions. This could include high occupancy vehicle lanes, managed lanes, truck lanes and reversible lanes. Reversible lanes are utilized where traffic volumes are very high in one direction and much lower in the other direction. The reversible lanes are usually limited to certain hours of the day. Among the issues that reversible lane operations face are driver lack of familiarity with the operations, left turning traffic, overhead lane signals or adequate signing, the hours the reversible lanes should operate and ease of implementing the operation.

There are four locations where reversible lane operation occurs along the State roadway system including:

- US 29 from Rock Creek Parkway to MD 97 (Georgia Ave) (Montgomery County)
- US 50/US 301 Bay Bridge (Anne Arundel/Queen Anne's County)
- MD 97 from I-495 to MD 390 (16th Street) (Montgomery County)
- MD 177 from MD 100 to West of South Carolina Avenue (Anne Arundel County)

The most recognizable reversible lane operation is the US 50/US 301 Bay Bridge. The two lane eastbound span and the three lane westbound span vary through the use of overhead lane signing and modifications at the toll booth on the east side of the bridge and the tie-in on the west side of the bridge. This allows for three eastbound lanes and two westbound lanes. The changeover occurs as needed with the major times being the PM peak period and on Saturdays mornings during the summer. The US 29 and MD 97 reversible lane operations improve traffic flow from residential areas into the Downtown Silver Spring employment center and the WMATA METRO Red Line in the morning and returning northbound in the PM peak period. MD 177 is the main roadway leading to Lake Shore and Gibson Island. Traffic volumes are directional leading off the island in the morning and returning home in the evening. This three lane roadway is converted from two lanes westbound in the AM peak period to two lanes eastbound in the PM peak period through the use of overhead lane control signals.

The following are the number of motorists in the peak hour that utilize the reversible lane or lanes:

Location	Volume of Motorists Traveling in Reversible Lane(s) (Vehicles Per Hour)
US 29	1,550
US 50/301	1,400
MD 97	600
MD 177	250

The use of reversible lanes in these four areas allows for increased person throughput and reduced congestion without significant capital investment and widening the roadway.

d. Bicycles and Pedestrians

The SHA is committed to improving access for bicycles and pedestrians. This provides for a clean form of transportation, reduces vehicles trips on the roadway system, reduces congestion and improves mobility. This can be provided through separate projects such as adding sidewalks or bicycle compatible lanes or shoulders or combined with a Complete Street approach to design. The Complete Streets policy strives to create a transportation system that balances all users of the roadway, including pedestrians, transit, bicyclists, and motorists. This policy impacts all divisions of SHA and how projects are developed from concepts to final design.

There are various system programs dedicated for the planning, design, and construction of bicycle and pedestrian facilities including:

Sidewalk Retrofit

The goals of the sidewalk retrofit program are to improve mobility for the general population and persons with disabilities, remove barriers that impede movement of citizens and lower potential safety risks. This program advances SHA's vision of multi-modal transportation by providing pedestrian facilities and enhancing access along urban state routes in existing communities as viable and safe modes of transportation. The major emphasis of these projects is to provide new sidewalks constructed as a part of a request from a local government, or due to a high rate of pedestrian crashes at a location. There were 8 miles of new sidewalk constructed and the reconstruction of 21 miles of sidewalk occured.

Bicycle Retrofit

The Bicycle Retrofit program was developed to ensure bicycling remains a viable mode of transportation. The program identifies projects along state roadways that enhance bicycle mobility and safety while minimizing the impacts to environmental features or requiring private property (right-of-way). The range of improvements could include minor enhancements to safety such as signing and marking corridors for bicycle access, remarking wide curb lanes or shoulders as bike lanes, changing the typical section of the roadway to accommodate bicyclists or creating new off-road bike trails parallel to a roadway. SHA spent $1.1 million on these improvements in 2013 including:

- MD 543 from Gilmer Way to Church Creek Road
- MD 117 from Steeple Road to Little Star Drive

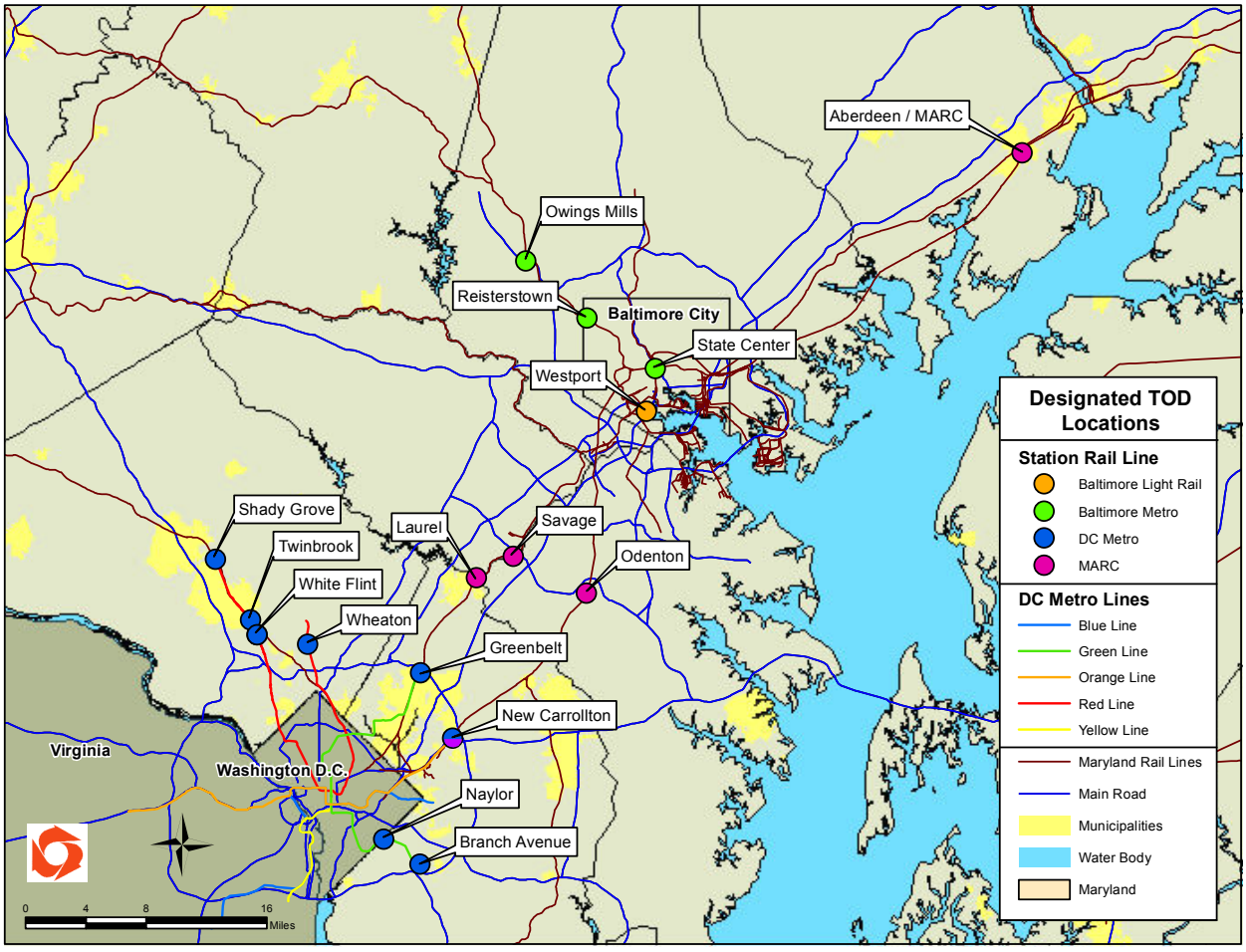
Bicycle and Pedestrian Priority Areas (BPPA)

Safe and efficient bicycle and pedestrian accommodations are important to creating a transportation network that accommodates all users of the road. These facilities become increasingly important in urban areas and at transit stations where there are significant numbers of pedestrians and cyclists. SHA and MDOT completed the "Maryland Twenty Year Bicycle and Pedestrian Master Plan" in January 2014. The master plan provides for the direction for bicycle and pedestrian improvements for the State of Maryland including the Bicycle and Pedestrian Priority Areas (BPPA's). The designation allows the state and the local counties to emphasize bicycle and pedestrian improvements as priority modes and requires a plan be developed in cooperation between the counties and SHA. In 2014, SHA will begin a pilot of a traffic management plan for the White Flint area, the first designated BPPA, in Montgomery County.

e. Transit Oriented Development

Transit Oriented Development (TOD) is a mix of land-uses that is physically and functionally integrated with transit, reduces auto dependency, increases pedestrian and bicycle trips, fosters safer station areas, offers attractive public spaces, enhances public transportation ridership, and encourages revitalization and smart growth. By achieving these principles a TOD could result in reduced traffic congestion, fuel consumption, air pollution, greenhouse gas emissions, sprawl, and local infrastructure costs, while increasing the mobility of citizens by providing more convenient access to mass transit.

This state designation allows TOD projects to get prioritization for funds and resources, financing assistance, tax credits, prioritization for the location of State offices, and support from the SHA on access improvements. Since 2008, 16 sites have been designated as TOD's including the Greenbelt Metro Station in Prince George's County which was approved as a Designated TOD in 2013.



Maryland adopted and instituted a state level TOD program that defines TOD in Transportation Article 7-101 (m): as a mix of private or public parking facilities, commercial and residential structures and uses, improvements and facilities customarily appurtenant to such facilities that (1) is part of a deliberate development plan or strategy involving: (I) property that is adjacent to the passenger boarding and alighting location of a planned or existing transit station; or (II) property, any part of which is located within one-half mile of the passenger boarding and alighting location of a planned or existing transit station and is (2) planned to maximize the use of transit, walking and bicycling by residents and employees and is designated as a TOD by the Secretary of MDOT after considering a recommendation of the Smart Growth Subcabinet established under§ 9-1406 of the State Government Article and the appropriate local government or multicounty agency with land use and planning responsibility for the relevant area.

Since 2013, MDOT, State Highway Administration (SHA), Maryland Transit Administration (MTA), and Washington Metropolitan Area Transit Authority (WMATA) have been worked together to develop and refine processes and policies to support TOD development. These documents detail the State's role in promoting TOD's and provide guidance to developers, county and local jurisdictions, and citizens on the TOD process in Maryland. This is useful for both official designated sites and for TOD at non-designated transit stations.

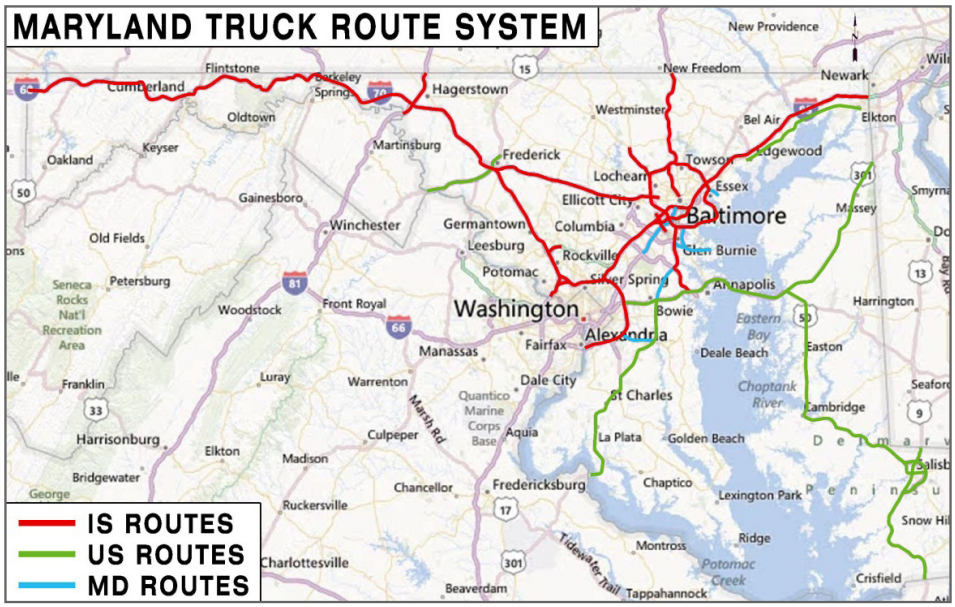
Maryland had a number success stories related to TOD's in 2013. This included receiving Board of Public Works approval on an amendment to the Master Development Agreement and an extension of the TIF Bond ordinance by Howard County for the Annapolis Junction Town Center (Savage). This will allow the development to move forward and to break ground on a parking garage in 2014. This revised amendment also includes provisions to potentially add a pedestrian bridge from the garage to the MARC station.

Another TOD success story continues to be progress at the Owings Mills Metro Station. In March 2013, Baltimore County completed construction of a new Baltimore County Public Library and Baltimore County Community College combined facility. In addition, the developer finished the first residential building with ground floor retail. The second parking garage will begin and be completed in 2014. The rest of the development will proceed as the market dictates.

Besides TOD's, another method to reduce VMT and increase mobility is through the construction of transit projects. The Maryland Department of Transportation and its sister agencies have two major new light rail lines in design. These are the Red Line in the Baltimore region and the Purple Line in the Washington region. Once complete, these new transit lines will provide increased accessibility and mobility for tens of thousands of Maryland residents. In addition, Montgomery County has partnered with SHA and MTA on planning for three new Bus Rapid Transit lines, on Veirs Mill Road, Georgia Avenue, and the Corridor Cities Transitway (CCT). The CCT will provide a connection from the end of the Red Line at Shady Grove to Metropolitan Grove.

3. Freight

To facilitate optimal freight movement in Maryland certain federal and state highways have been designated as the Maryland Truck Route System. The Maryland Truck Route System consists of approximately 900 miles of roadways throughout the State. This includes all interstate routes (481 miles), seven segments of U.S. Routes (320 miles) including US 13, US 40, US 50, US 301, US 340, US 13 Business and US 50 Business and seven segments of Maryland state routes (99 miles). The state routes include sections of Maryland 3, Maryland 4, Maryland 10, Maryland 100, Maryland 201, Maryland 295 and Maryland 702.



Freight is integrated into highway project planning as a result of the 2011 SHA/MDTA Freight Implementation Plan. This document provides direction for future transportation investments to enhance the safe and efficient movement of commercial vehicle freight.

Appendix

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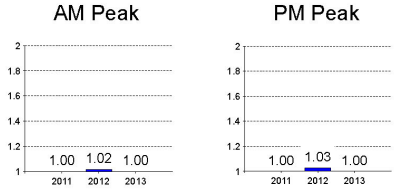
A. Regionally Significant Freeway Corridors

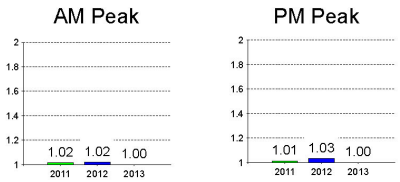
I-70 (Part 1)

Trends[a]

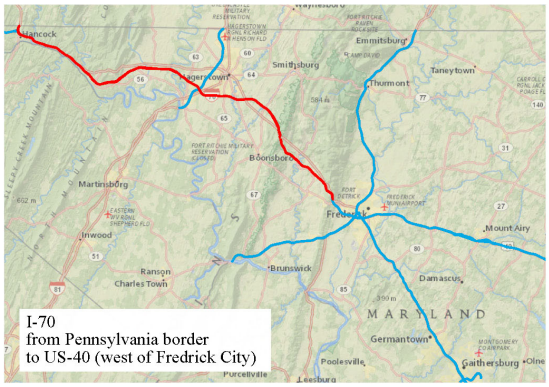
Travel Time Index[b]
measure of average delay



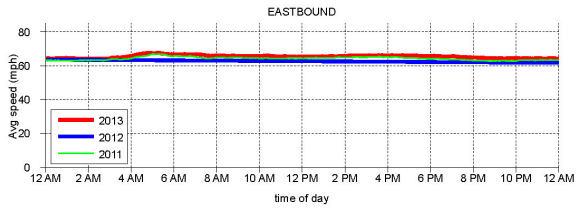
Planning Time Index[c]
measure of worst-case delay

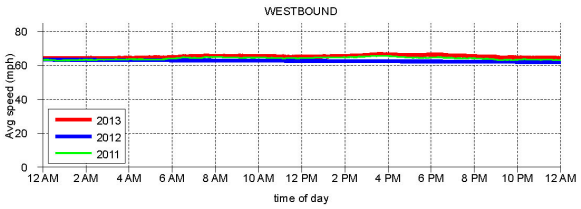


49 miles carrying 45,000 vehicles every day

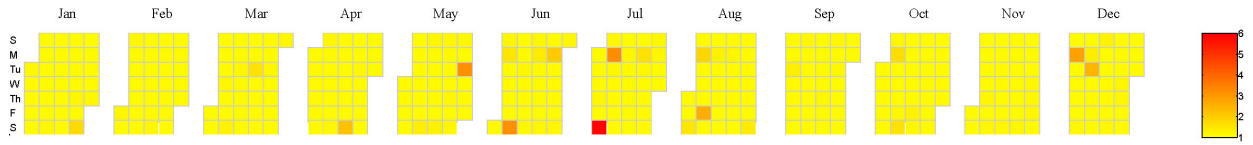


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
95	I-70 W @ MD-68/Exit 18	Westbound	13	25	26	18	96	8.2	**0.6**	272	-177
155	I-70 W @ US-40/Exit 9	Westbound	10	8	3	10	52	34.4	**0.4**	448	-293
172	I-70 E @ MD-63/Exit 24	Eastbound	27	26	39	35	63	5.3	**0.4**	200	-28
227	I-70 W @ MD-632/Downsville Pike/Exit 28	Westbound	5	26	25	32	68	6.6	**0.3**	87	140
262	I-70 W @ MD-66/Exit 35	Westbound	10	28	34	18	61	7.8	**0.2**	161	101
272	I-70 E @ MD-66/Exit 35	Eastbound	6	30	17	7	58	7.1	**0.2**	338	-66
292	I-70 E @ MD-17/Exit 42	Eastbound	26	19	31	24	63	4.2	**0.2**	160	132
297	I-70 W @ MD-17/Exit 42	Westbound		27			98	7.8	**0.2**	127	170
335	I-70 W @ MD-63/Exit 24	Westbound	28	38	47	40	50	4.1	**0.2**	377	-42
449	I-70 E @ US-40/Exit 32	Eastbound	10	27		12	56	3.7	**0.1**	154	295

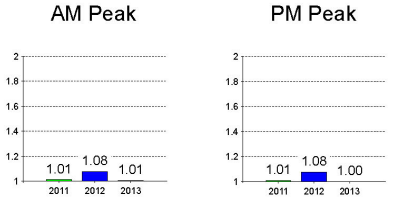
Notes

a - **Peak Hours** are considered as 8-9am and 5-6pm..
b - **Travel Time Index** (TTI) is the ratio of the *average* travel time during the peak hour to the time required under free flow.
c - **Planning Time Index** (PTI) is the ratio of the *worst-case* travel time (95th percentile) during peak hour to the free-flow time.
d - Typical work day speeds, calulcuated as the average speed of all weekdays for the entire year and shows it as varies by time-of-day.
e- Variability of worst-case travel experience along facility for each day of year, shown as plot of PTI by day of week and month, showing seasonal and weekly trends.
f - Top 10 bottlenecks on the facility, ranked by impact factor.
Impact factor is multiplication of total annual number of bottleneck occurences by their average duration and by their average length.
Bottlenecks are said to occur when speeds drop below 60% of free-flow speed for a period longer than 5 minutes.
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

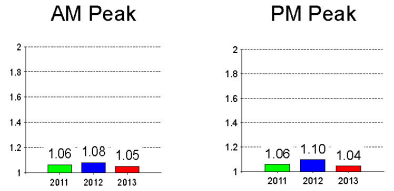
I-70 (Part 2)

Trends[a]

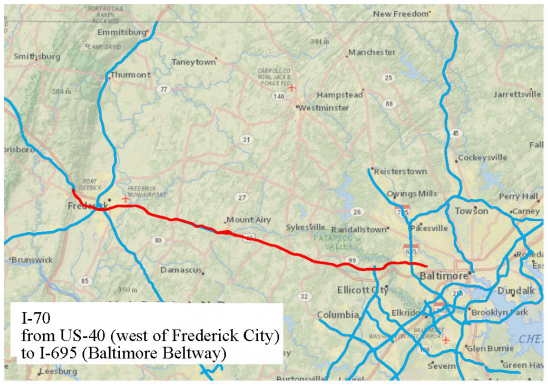
Travel Time Index[b]
measure of average delay



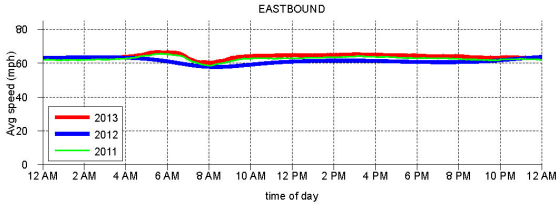
Planning Time Index[c]
measure of worst-case delay

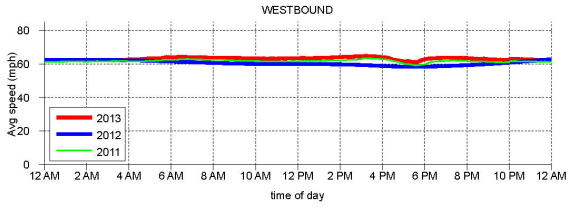


43 miles carrying 61,000 vehicles every day

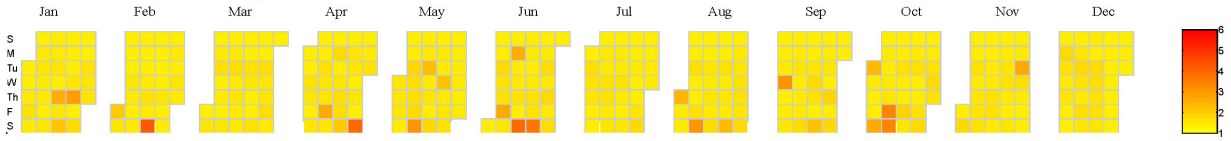


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
41	I-70 E @ US-29/Exit 87	Eastbound	39	51	54	47	102	5.8	**1.0**	48	-7
48	I-70 E @ I-695/Exit 91	Eastbound	65	98	92	134	54	6.6	**0.9**	83	-35
126	I-70 W @ US-29/Exit 87	Westbound	77	89	89	80	86	1.9	**0.5**	115	11
182	I-70 W @ US-15/US-340/Exit 52	Westbound	47	60	65	44	88	2.0	**0.4**	144	38
302	I-70 E @ I-270/US-40/Exit 53	Eastbound	6	24	51	18	69	16.2	**0.2**	512	-210
372	I-70 E @ Marriottsville Rd/Exit 83	Eastbound	37	42	26	33	63	2.0	**0.1**	222	150
483	I-70 E @ US-15/US-340/Exit 52	Eastbound	16	34	32	20	38	3.7	**0.1**	242	241
638	I-70 W @ Marriottsville Rd/Exit 83	Westbound		8	7		85	5.1	**0.1**	224	414
708	I-70 W @ MD-27 (Retired)	Westbound	16	18	30	16	21	6.5	**0.0**	690	18
713	I-70 E @ MD-32/Exit 80	Eastbound	8	4	4	9	34	6.8	**0.0**	255	458

Notes

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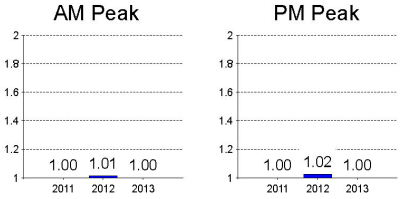
f - Top 10 bottlenecks on the facility, ranked by impact factor.
Impact factor is multiplication of total annual number of bottleneck occurences by their average duration and by their average length.
Bottlenecks are said to occur when speeds drop below 60% of free-flow speed for a period longer than 5 minutes.
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

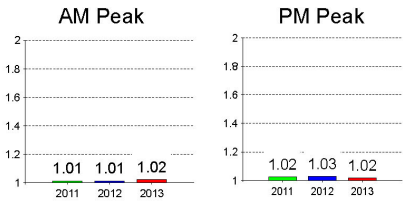
I-81

Trends[a]

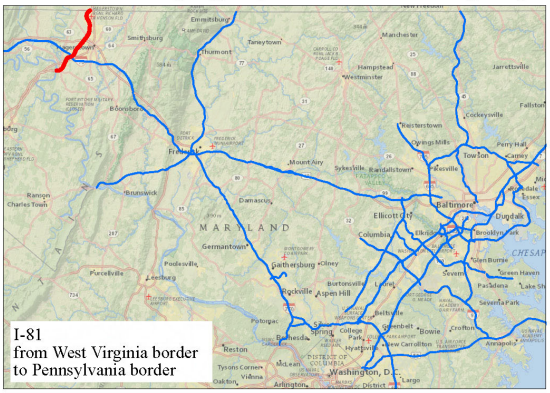
Travel Time Index[b]
measure of average delay



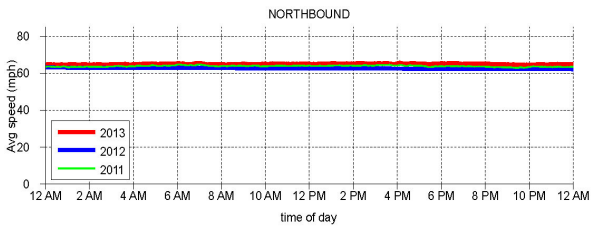
Planning Time Index[c]
measure of worst-case delay

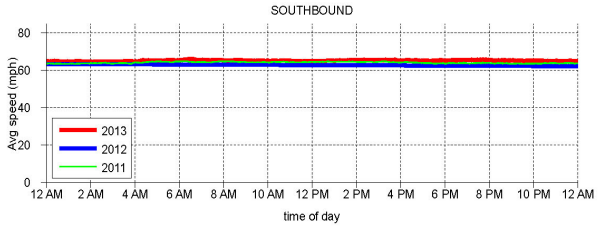


12 miles carrying 55,000 vehicles every day

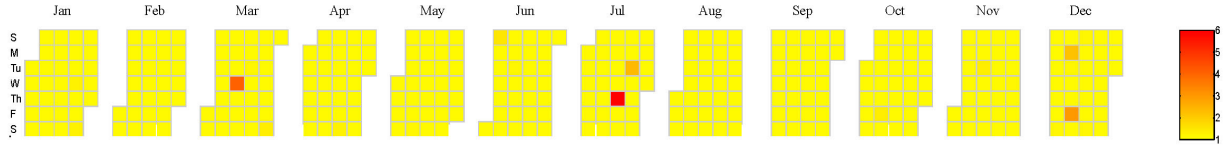


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
361	I-81 N @ Maryland/Pennsylvania State Ln	Northbound	8	6	4	10	72	7.4	0.2	381	-20
444	I-81 S @ Maryland/West Virginia St Line	Southbound	22	15	10	16	73	3.3	0.1	198	246
691	I-81 S @ Halfway Blvd/Exit 5	Southbound	12	8	4	9	48	3.9	0.0	307	384
711	I-81 N @ Maugans Ave/Exit 9	Northbound				5	133	6.5	0.0	362	349
954	I-81 N @ US-40/Exit 6	Northbound		9		10	42	2.7	0.0	367	587
1031	I-81 S @ US-40/Exit 6	Southbound	5	7	9	10	32	1.7	0.0	549	482
1055	I-81 S @ Maugansville Rd/Exit 8	Southbound	1			5	66	2.3	0.0	590	465
1063	I-81 N @ Maugans Ave/Exit 9 (External)	Northbound	2	1	2		58	5.0	0.0		1063
1096	I-81 N @ Maugansville Rd/Exit 8	Northbound	5	2	1	3	36	2.9	0.0	480	616
1115	I-81 N @ Halfway Blvd/Exit 5	Northbound	9	11	1	5	33	1.2	0.0	424	691

Notes

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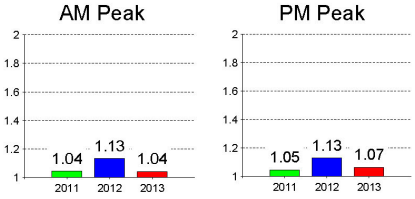
Impact factor is multiplication of total annual number of bottleneck occurences by their average duration and by their average length.
Bottlenecks are said to occur when speeds drop below 60% of free-flow speed for a period longer than 5 minutes.
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

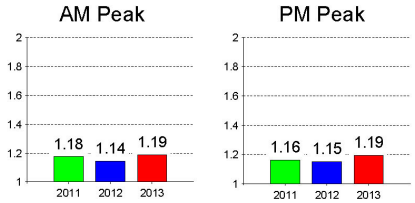
I-83

Trends[a]

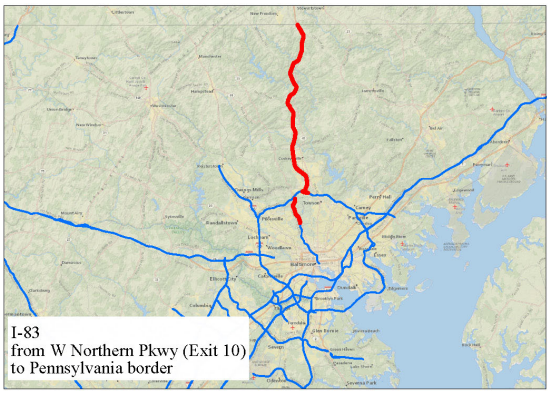
Travel Time Index[b]
measure of average delay



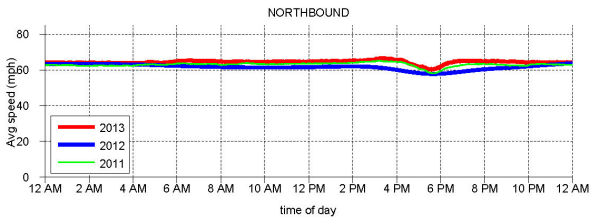
Planning Time Index[c]
measure of worst-case delay

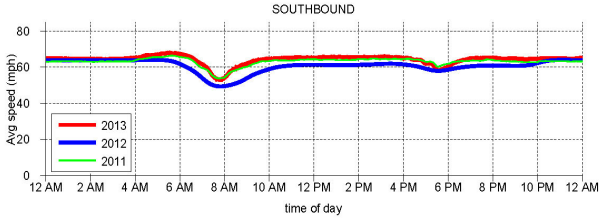


27 miles carrying 84,000 vehicles every day

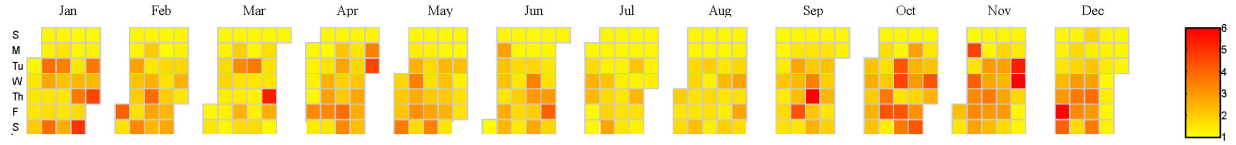


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
51	I-83 S @ I-695	Southbound	499	604	503	563	35	1.7	0.9	49	2
105	I-83 S @ Belfast Rd/Exit 24	Southbound	51	45	25	60	59	6.0	0.6	112	-7
118	I-83 N @ Belfast Rd/Exit 24	Northbound	21	31	25	69	69	9.8	0.5	93	25
120	I-83 N @ I-695/Jones Falls Expy/Exit 23	Northbound	68	70	46	70	59	4.6	0.5	119	1
133	I-83 S @ Fayette St/Exit 1	Southbound	1051	1051	992	894	52	0.3	0.5	99	34
149	I-83 N @ Middletown Rd/Exit 31	Northbound	66	79	56	57	48	3.8	0.4	153	-4
170	I-83 S @ US-1/North Ave/Exit 6	Southbound	82	44	44	86	46	3.7	0.4	86	84
263	I-83 S @ MD-25/Falls Rd/Exit 8	Southbound	53	36	116	51	40	3.1	0.2	163	100
269	I-83 S @ MD-137/Mount Carmel Rd/Exit 27	Southbound	28	52	18	42	46	4.3	0.2	136	133
270	I-83 S @ Timonium Rd/Exit 16	Southbound	58	60	57	67	45	2.2	0.2	191	79

Notes

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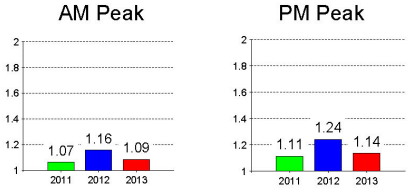
c - **Planning Time Index** (PTI) is the ratio of the *worst-case* travel time (95th percentile) during peak hour to the free-flow time.
d - Typical work day speeds, calulcuated as the average speed of all weekdays for the entire year and shows it as varies by time-of-day.
e- Variability of worst-case travel experience along facility for each day of year, shown as plot of PTI by day of week and month, showing seasonal and weekly trends.
f - Top 10 bottlenecks on the facility, ranked by impact factor.
Impact factor is multiplication of total annual number of bottleneck occurences by their average duration and by their average length.
Bottlenecks are said to occur when speeds drop below 60% of free-flow speed for a period longer than 5 minutes.
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

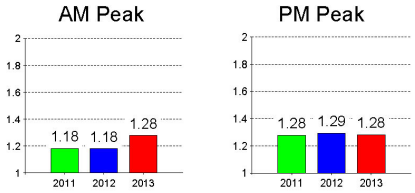
I-95 (Part 1)

Trends[a]

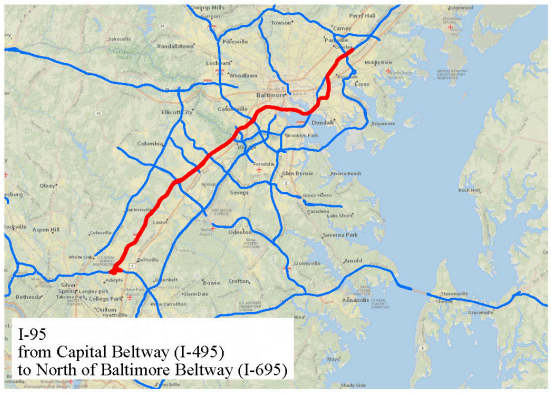
Travel Time Index[b]
measure of average delay



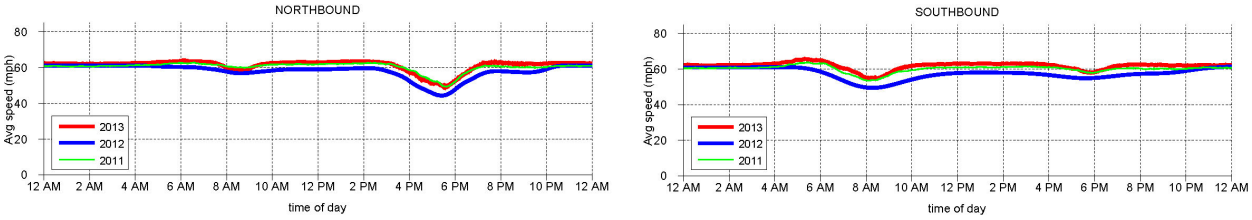
Planning Time Index[c]
measure of worst-case delay



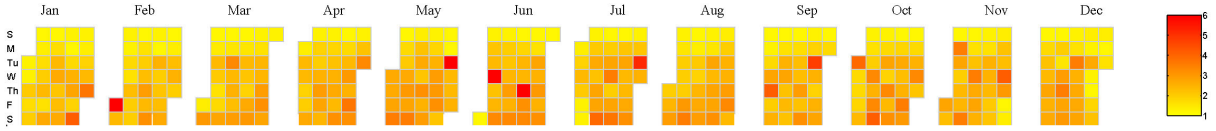
41 miles carrying 155,000 vehicles every day



Speed Profiles[d]



Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
3	I-95 N @ MD-100/Exit 43	Northbound	96	195	162	127	123	10.5	**7.0**	6	-3
20	I-95 S @ I-495/Exit 27-25	Southbound	113	179	163	155	85	3.6	**1.7**	25	-5
53	I-95 S @ I-695/Exit 64	Southbound	46	79	99	66	75	5.6	**0.9**	64	-11
59	I-95 N @ I-695/Exit 49	Northbound	52	44	47	58	74	7.3	**0.8**	80	-21
96	I-95 S @ MD-175/Exit 41	Southbound	39	56	61	81	71	4.3	**0.6**	125	-29
97	I-95 N @ I-895/Exit 46	Northbound	13	24	16	9	108	10.7	**0.6**	105	-8
131	I-95 S @ I-895/62nd St/Exit 62	Southbound	47	43	30	29	68	5.5	**0.5**	76	55
134	I-95 S @ Fort McHenry Tunnel	Southbound	56	147	48	77	41	12.2	**0.5**	72	62
137	I-95 N @ Keith Ave/Exit 56	Northbound	558	646	357	158	44	2.9	**0.5**	43	94
180	I-95 S @ MD-100/Exit 43	Southbound	27	34	40	49	55	5.3	**0.4**	156	24

Notes

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e- Variability of worst-case travel experience along facility for each day of year, shown as plot of PTI by day of week and month, showing seasonal and weekly trends.
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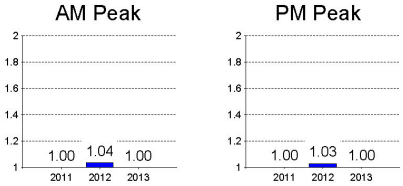
Impact factor is multiplication of total annual number of bottleneck occurences by their average duration and by their average length.
Bottlenecks are said to occur when speeds drop below 60% of free-flow speed for a period longer than 5 minutes.
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

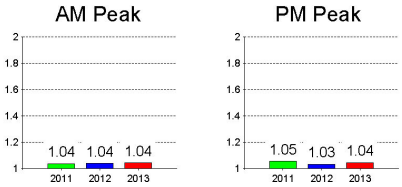
I-95 (Part 2)

Trends[a]

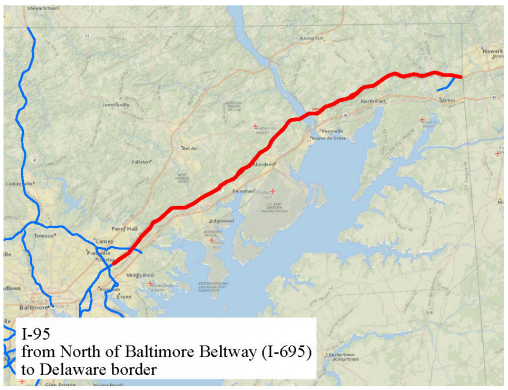
Travel Time Index[b]
measure of average delay



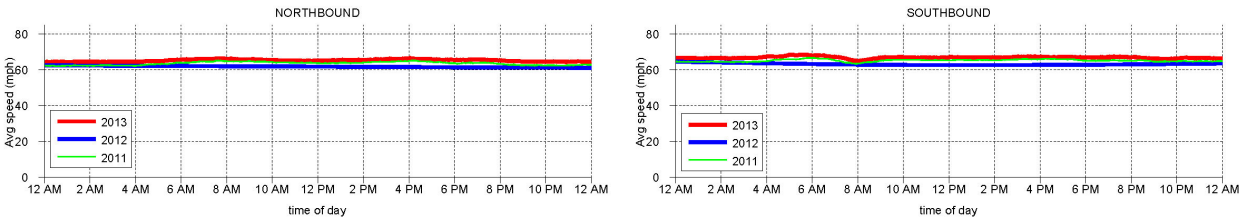
Planning Time Index[c]
measure of worst-case delay



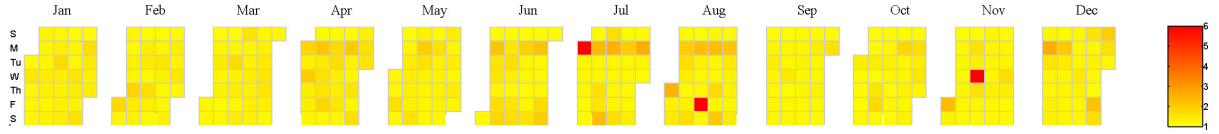
45 miles carrying 106,000 vehicles every day



Speed Profiles[d]



Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
13	I-95 N @ MD-43/Whitemarsh Blvd/Exit 67	Northbound	44	97	113	82	110	7.8	2.4	10	3
32	I-95 S @ MD-24/Exit 77	Southbound	18	16	37	29	125	13.0	1.2	20	12
39	I-95 N @ MD-152/Exit 74	Northbound	5	19	36	15	121	14.1	1.1	51	-12
54	I-95 N @ I-695/Exit 64	Northbound	49	62	90	68	81	5.3	0.9	70	-16
94	I-95 S @ Maryland House	Southbound	8	21	45	20	80	8.0	0.7	108	-14
109	I-95 N @ MD-DE State Border	Northbound	1	4	2	6	64	44.1	0.6		109
119	I-95 S @ MD-155/Exit 89	Southbound	130	74	44	24	53	6.5	0.5	54	65
145	I-95 N @ Tydings Memorial Brg Toll Plaza	Northbound	59	81	83	28	45	5.2	0.4	98	47
184	I-95 N @ MD-24/Exit 77	Northbound	15	38	57	28	84	3.1	0.4	134	50
206	I-95 S @ MD-43/Whitemarsh Blvd/Exit 67	Southbound	19	49	35	27	58	5.4	0.3	204	2

Notes

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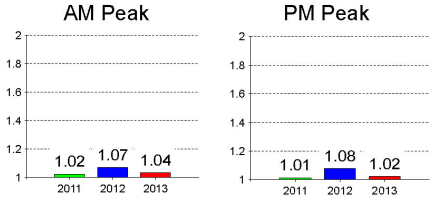
f - Top 10 bottlenecks on the facility, ranked by impact factor.
Impact factor is multiplication of total annual number of bottleneck occurences by their average duration and by their average length.
Bottlenecks are said to occur when speeds drop below 60% of free-flow speed for a period longer than 5 minutes.
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

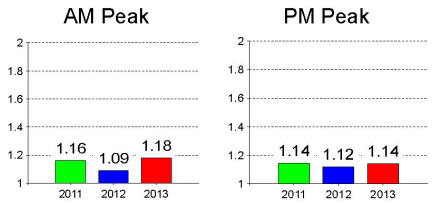
I-97

Trends[a]

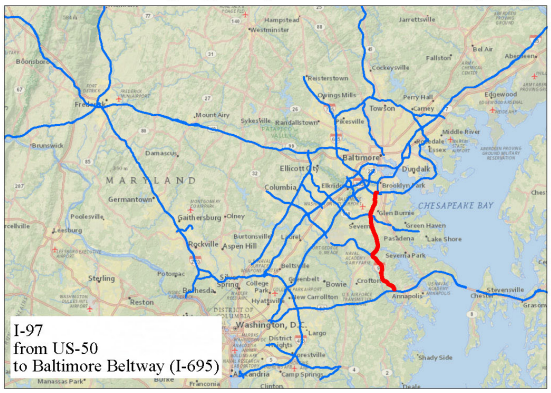
Travel Time Index[b]
measure of average delay



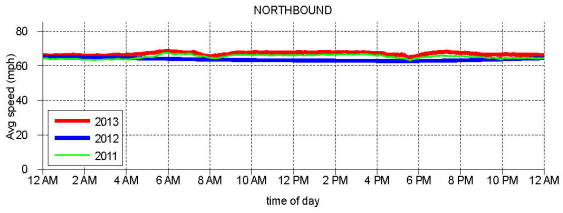
Planning Time Index[c]
measure of worst-case delay

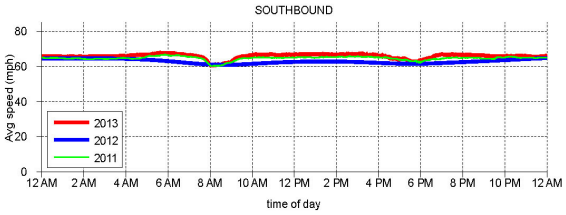


18 miles carrying 114,000 vehicles every day

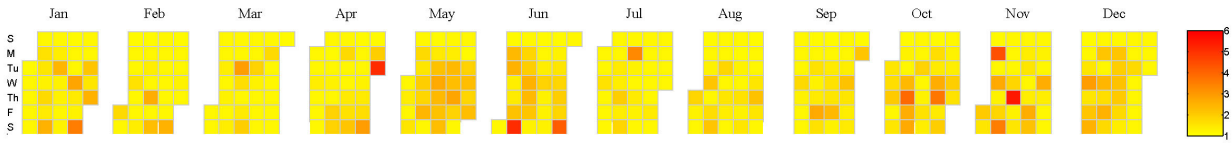


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
166	I-97 S @ MD-178/Exit 5	Southbound	68	88	89	87	54	2.6	0.4	146	20
394	I-97 N @ I-695/Exit 17	Northbound	26	66	36	35	42	2.9	0.1	337	57
398	I-97 N @ MD-178/Exit 5	Northbound	14	41	26	18	32	4.6	0.1	216	182
479	I-97 S @ US-301/US-50	Southbound	282				28	1.2	0.1	69	410
503	I-97 N @ MD-3 Bus/New Cut Rd/Exit 12	Northbound	8	17	17	15	40	4.7	0.1	386	117
584	I-97 S @ MD-3/Exit 7	Southbound	16	19	14	22	38	3.1	0.1	390	194
617	I-97 N @ I-895 Spur	Northbound	7	18	3	8	49	5.9	0.1	734	-117
680	I-97 N @ Benfield Blvd/Exit 10	Northbound	8	5		5	57	5.5	0.1	331	349
837	I-97 S @ Benfield Blvd/Exit 10	Southbound	5	8	7	5	43	2.9	0.0	217	620
845	I-97 S @ MD-3 Bus/New Cut Rd/Exit 12	Southbound		11	6	11	61	1.6	0.0	195	650

Notes

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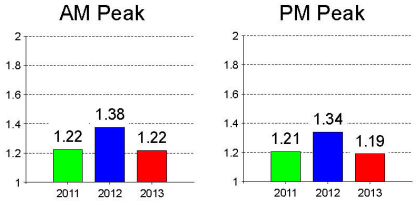
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

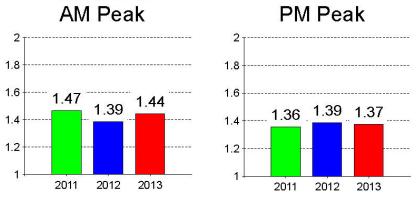
I-270

Trends[a]

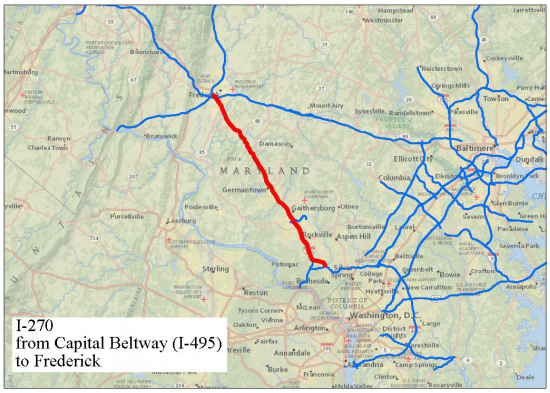
Travel Time Index[b]
measure of average delay



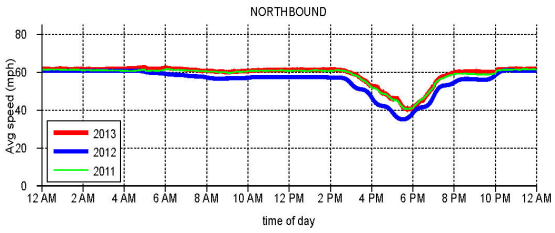
Planning Time Index[c]
measure of worst-case delay

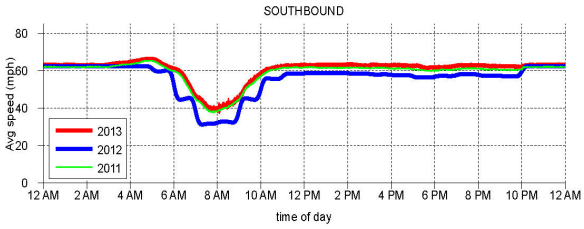


33 miles carrying 163,000 vehicles every day

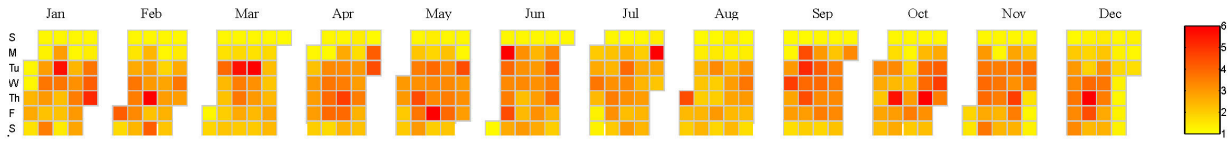


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
6	I-270 Spur S @ I-270	Southbound	182	251	210	241	101	7.4	5.9	3	3
9	I-270 N @ MD-80/Exit 26	Northbound	64	90	127	76	101	9.8	3.0	2	7
10	I-270 Local N @ I-270/Washington National Pike	Northbound	162	156	128	159	126	4.3	2.5		10
14	I-270 N @ I-70/US-40	Northbound	85	106	81	128	83	8.1	2.3	7	7
15	I-270 S @ MD-109/Exit 22	Southbound	126	178	156	118	84	4.6	2.1	15	0
25	I-270 N @ Middlebrook Rd/Exit 13	Northbound	98	91		83	104	6.0	1.4	11	14
46	I-270 N @ I-270	Northbound	138	155	151	120	120	1.6	1.0		46
67	I-270 N @ MD-85/Exit 31	Northbound	26	32	21	29	85	10.2	0.8	32	35
70	I-270 N @ MD-109/Exit 22	Northbound	288	263	213	190	41	3.0	0.8	62	8
77	I-270 S @ MD-121	Southbound	23	20	17	26	111	9.6	0.7	56	21

Notes

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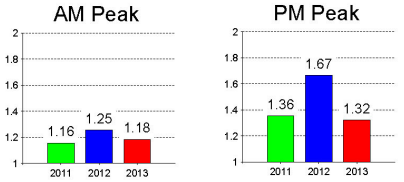
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

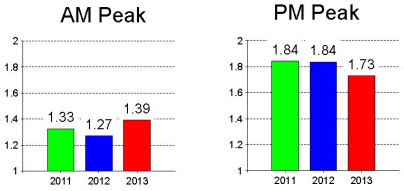
Capital Beltway

Trends[a]

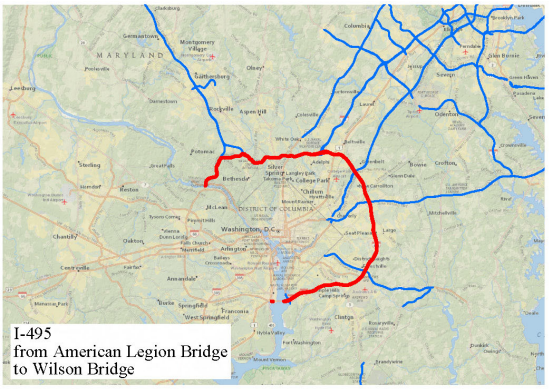
Travel Time Index[b]
measure of average delay



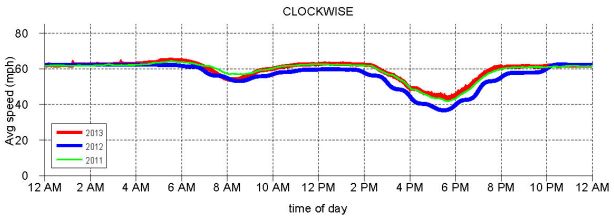
Planning Time Index[c]
measure of worst-case delay

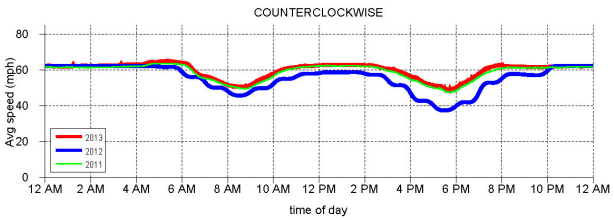


42 miles carrying 183,000 vehicles every day

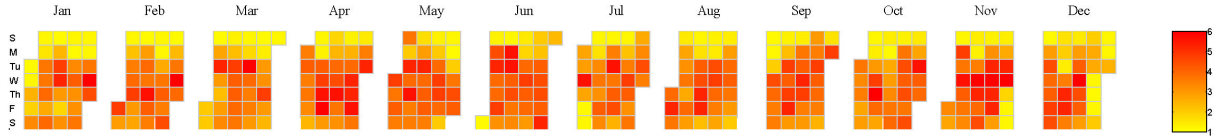


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
1	I-495 CW @ I-270/Exit 35	Innerloop	172	266	214	208	186	13.8	19.9	140	-139
7	I-495 CCW @ Greenbelt Metro Dr/Exit 24	Outerloop	88	125	105	90	133	10.8	5.2	28	-21
17	I-495 CCW @ MD-185/Connecticut Ave/Exit 33	Outerloop	68	79	60	63	127	6.2	1.9	23	-6
24	I-495 CCW @ MD-97/Georgia Ave/Exit 31	Outerloop	78	118	99	114	102	3.5	1.4	26	-2
27	I-495 CW @ MD-214/Central Ave/Exit 15	Innerloop	65	84	157	111	72	6.0	1.4	53	-26
30	I-495 CCW @ US-50/Exit 19	Outerloop		101	114	113	89	4.6	1.3	31	-1
40	I-495 CW @ MD-4/Pennsylvania Ave/Exit 11	Innerloop	46	52	103	44	73	7.4	1.1	29	11
42	I-495 CW @ I-270 Spur	Innerloop	51	59	50	46	163	3.3	1.0	18	24
44	I-495 CW @ Woodrow Wilson Memorial Bridge	Innerloop	51	66	49	63	96	5.0	1.0	81	-37
57	I-495 CCW @ MD-295/MD-193/Exit 22	Outerloop	25	56	30	32	78	8.4	0.9	57	0

Notes

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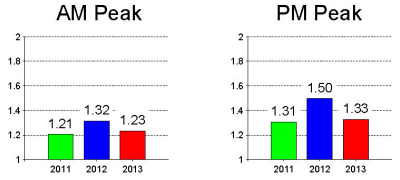
e- Variability of worst-case travel experience along facility for each day of year, shown as plot of PTI by day of week and month, showing seasonal and weekly trends.
f - Top 10 bottlenecks on the facility, ranked by impact factor.
Impact factor is multiplication of total annual number of bottleneck occurences by their average duration and by their average length.
Bottlenecks are said to occur when speeds drop below 60% of free-flow speed for a period longer than 5 minutes.
Q1: Jan-Mar, Q2: Apr-Jun, Q3: Jul-Sep, Q4: Oct-Dec

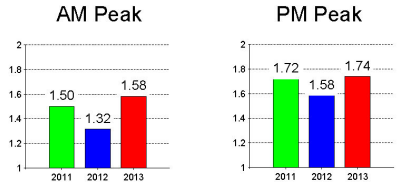
INTERSTATE 695 Baltimore Beltway

Trends[a]

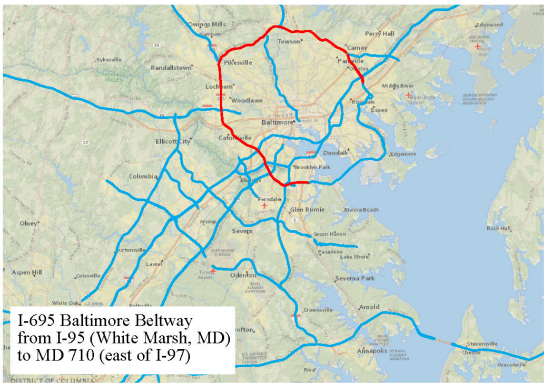
Travel Time Index[b]
measure of average delay



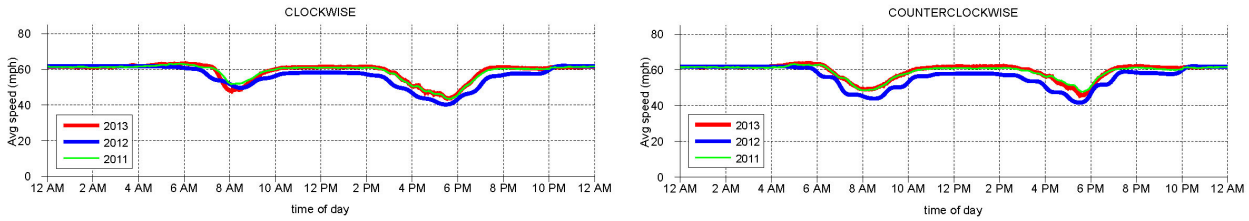
Planning Time Index[c]
measure of worst-case delay



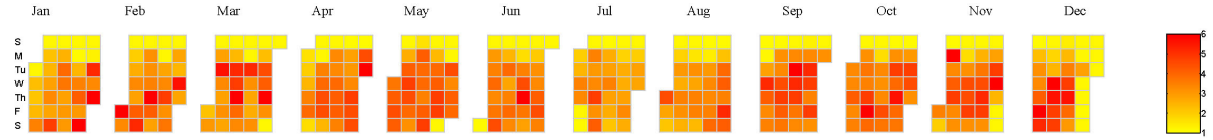
35 miles carrying 154,000 vehicles every day



Speed Profiles[d]



Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
2	I-695 CW @ MD-147/Harford Rd/Exit 31	Innerloop	95	105	97	116	165	10.6	**7.1**	5	-3
4	I-695 CCW @ Edmondson Ave/Exit 14	Outerloop	170	208	197	135	128	8.4	**7.0**	8	-4
12	I-695 CW @ Security Blvd/Exit 17	Innerloop	104	169	197	144	103	4.4	**2.5**		12
16	I-695 CCW @ MD-144/Frederick Rd/Exit 13	Outerloop	66	46	55	40	143	9.0	**2.0**	14	2
18	I-695 CW @ I-83/MD-25/Exit 23	Innerloop	94	117	111	104	82	5.2	**1.7**	27	-9
19	I-695 CW @ MD-26/Exit 18	Innerloop	33	54	60	55	132	6.8	**1.7**	22	-3
22	I-695 CW @ MD-41/Perring Pkwy/Exit 30	Innerloop	87	98	88	68	84	6.4	**1.7**	19	3
37	I-695 CCW @ Providence Rd/Exit 28	Outerloop	95	123	115	86	78	3.6	**1.1**	58	-21
75	I-695 CW @ US-1/Exit 32	Innerloop	74	65	40	72	71	6.2	**0.7**		75
76	I-695 CCW @ US-40/Exit 15	Outerloop	18	51	73	49	60	9.1	**0.7**	155	-79

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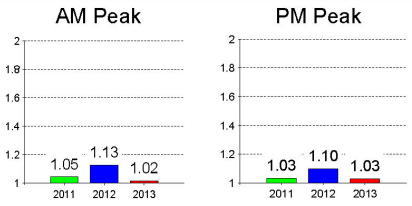
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

I-795

Trends[a]

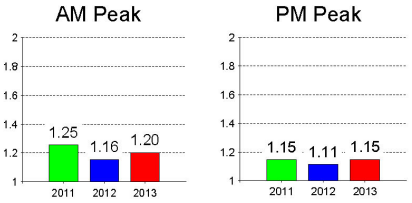
Travel Time Index[b]

measure of average delay

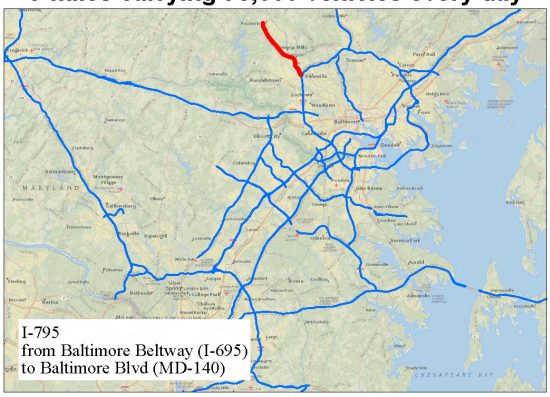


Planning Time Index[c]

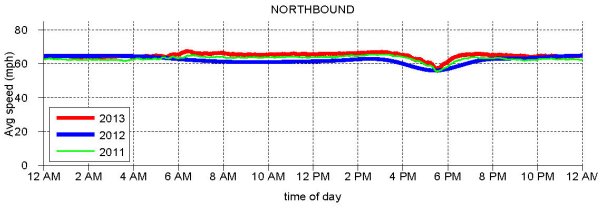
measure of worst-case delay

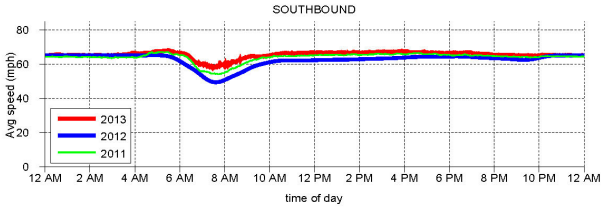


9 miles carrying 78,000 vehicles every day

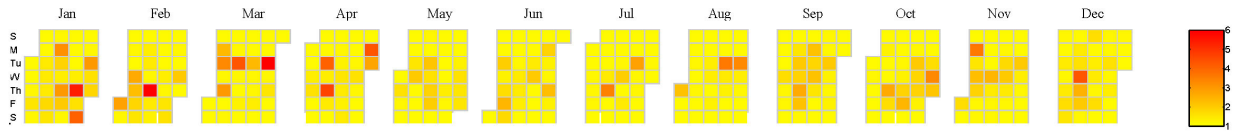


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
341	I-795 N @ Owings Mills Blvd/Exit 4	Northbound	62	57	55	50	39	2.1	0.2	152	189
618	I-795 N @ Franklin Blvd/Exit 7	Northbound	7	10	10	15	46	4.3	0.1	183	435
684	I-795 N @ MD-128/MD-140/MD-30/Exit 9	Northbound	3	1	2	8	63	6.1	0.0	355	329
721	I-795 S @ Owings Mills Blvd/Exit 4	Southbound	11	9	5	15	41	2.8	0.0	261	460
916	I-795 S @ Franklin Blvd/Exit 7	Southbound	22	14	22	28	23	1.3	0.0	397	519

Notes

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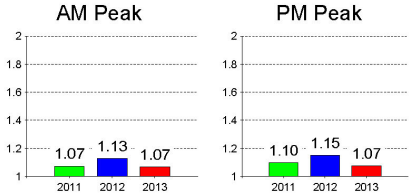
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

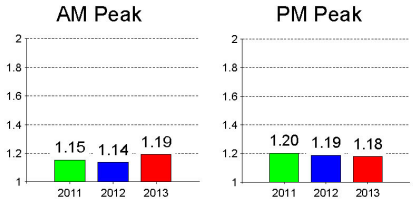
I-895

Trends[a]

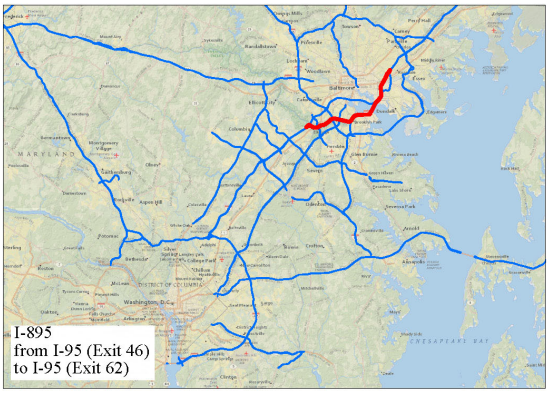
Travel Time Index[b]
measure of average delay



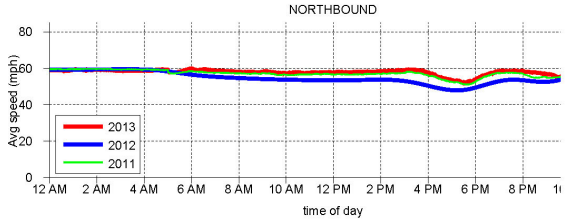
Planning Time Index[c]
measure of worst-case delay

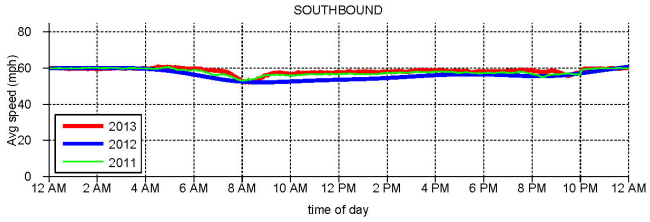


16 miles carrying 50,000 vehicles every day

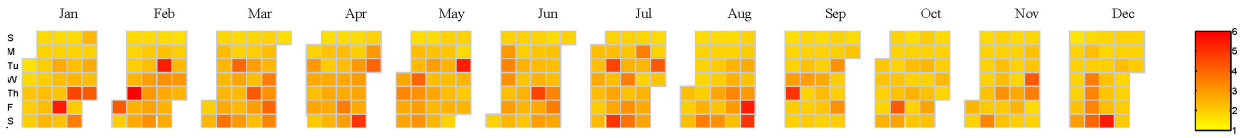


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
60	I-895 N @ I-95/62nd St/Exit62	Northbound	83	100	93	97	113	2.2	0.8	65	-5
71	I-895 S @ Frankfurst Ave/Shell Rd/Exit 8	Southbound	696	573	609	528	65	0.7	0.8	84	-13
142	I-895 N @ Holabird Ave/Exit 10	Northbound	52	57	48	57	63	3.7	0.4	39	103
207	I-895 N @ Harbor Tunnel Toll Plaza	Northbound	1993	2068	1449	871	23	0.3	0.3	106	101
326	I-895 S @ Harbor Tunnel Toll Plaza	Southbound	769	159	420	609	28	0.5	0.2	358	-32
359	I-895 S @ Holabird Ave/Exit 10	Southbound	154	165	152	130	32	1.0	0.2	184	175
420	I-895 S @ MD-2/Potee St/Exit 7	Southbound	35	31	43	64	75	1.3	0.1	130	290
525	I-895 Spur N @ I-895	Northbound	144	19	22	20	33	1.4	0.1	260	265
540	I-895 S @ MD-295/Baltimore Washington Pkwy/Exit 4	Southbound	7	12	216	28	28	1.9	0.1	699	-159
564	I-895 N @ MD-2/Potee St/Exit 7	Northbound	69	71	99	14	32	0.9	0.1	414	150

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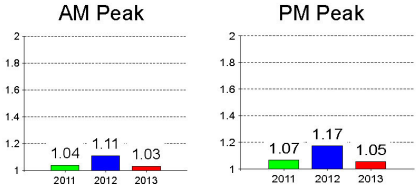
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

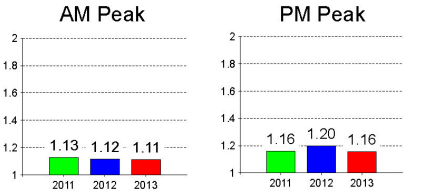
50 US-50

Trends[a]

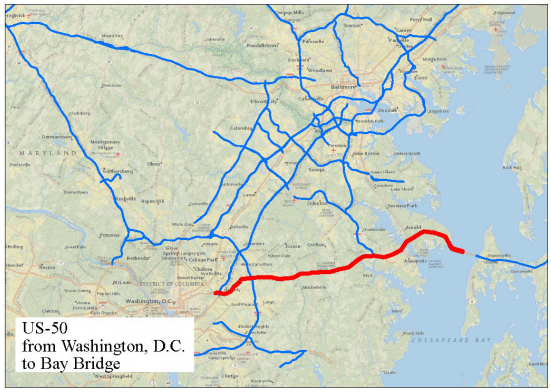
Travel Time Index[b]
measure of average delay



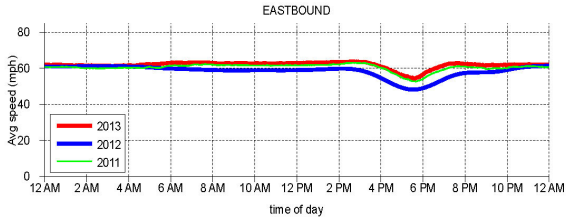
Planning Time Index[c]
measure of worst-case delay

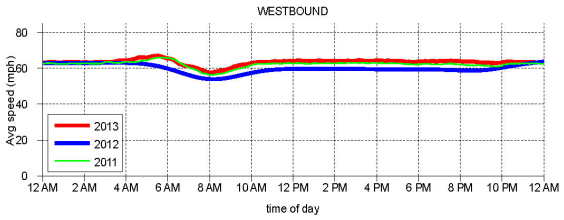


38 miles carrying 99,000 vehicles every day

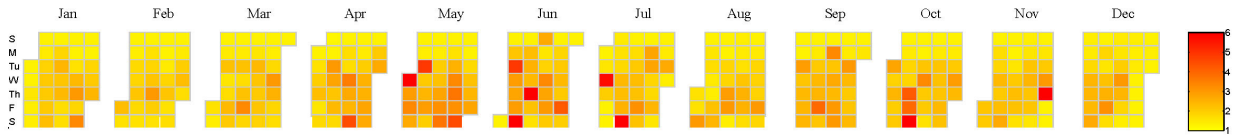


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
28	US-50 W @ William Preston Lane Brg	Westbound	22	121	199	41	51	5.6	**1.4**	35	-7
82	US-50 E @ Severn River Bridge	Eastbound	51	84	64	58	99	3.0	**0.7**	50	32
238	US-50 W @ DC-MD State Border		17	16	16	10	103	4.4	**0.3**		238
240	US-50 W @ MD-295/Kenilworth Ave	Westbound	41	42	69	40	61	2.5	**0.3**		240
404	US-50 W @ I-495/I-95/Capital Beltway/Exit 7	Westbound	51	53	37	60	36	2.8	**0.1**	308	96
409	US-50 E @ MD-197/Collington Rd/Exit 11	Eastbound	11	14	12	7	58	5.4	**0.1**	143	266
516	US-50 W @ William P Lane Brg Toll Plaza	Westbound	13	12	22	7	46	3.2	**0.1**	346	170
581	US-50 W @ MD-70/Rowe Blvd/Exit 24	Westbound	7	9		8	70	5.1	**0.1**	372	209
625	US-50 W @ MD-2/MD-450/Ritchie Hwy/Exit 27	Westbound	7	11	12		59	3.5	**0.1**	363	262
637	US-50 W @ MD-665/Aris Allen Blvd/Exit 21-22	Westbound	19	53	39	30	41	1.1	**0.1**	359	278

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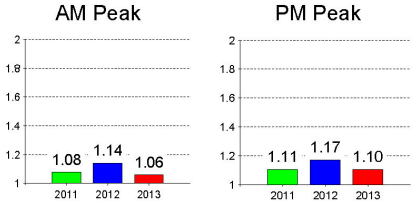
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

MARYLAND 32

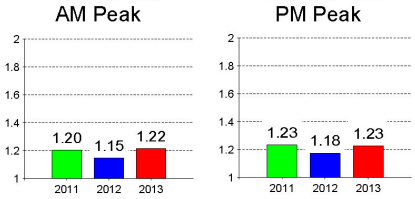
MD-32

Trends[a]

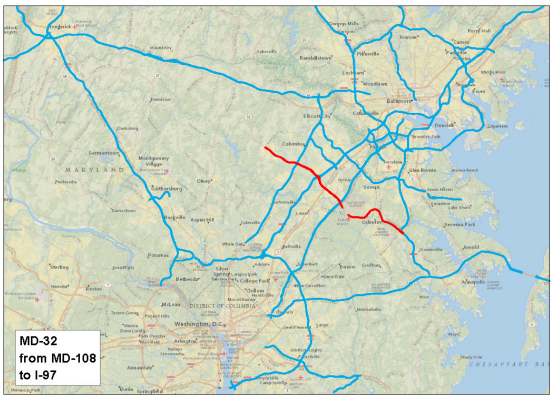
Travel Time Index[b]
measure of average delay



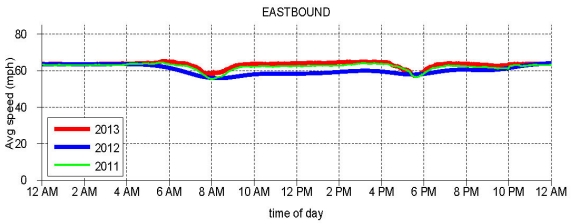
Planning Time Index[c]
measure of worst-case delay

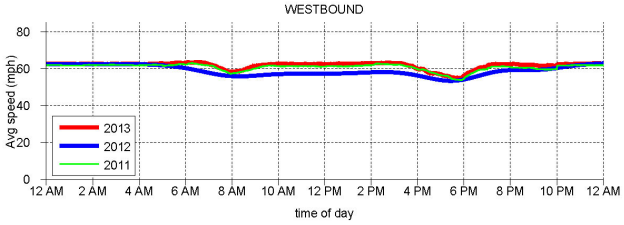


22 miles carrying 66,000 vehicles every day

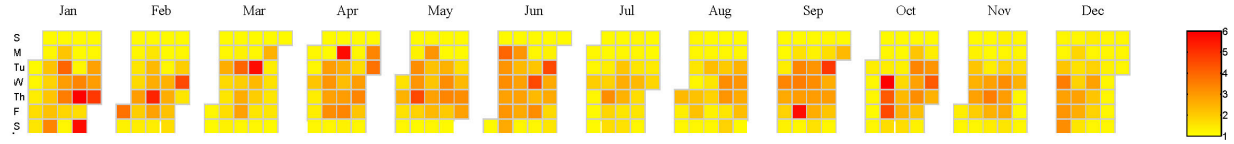


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
72	MD-32 E @ MD-198/Fort Meade Rd	Eastbound	60	75	71	57	81	4.0	0.8	125	-53
237	MD-32 W @ MD-175/Annapolis Rd	Westbound	50	47	48	40	73	2.2	0.3		237
261	MD-32 W @ MD-198/Fort Meade Rd	Westbound	18		19	17	98	5.0	0.2	108	153
267	MD-32 E @ US-1	Eastbound	21	17	18	33	82	4.2	0.2	307	-40
287	MD-32 W @ MD-108	Westbound	79	60	60	63	89	1.3	0.2	231	56
461	MD-32 E @ MD-175/Annapolis Rd	Eastbound	3	8			138	8.1	0.1	127	334
595	MD-32 W @ US-1	Westbound	44	42	32	30	32	1.7	0.1		595
640	MD-32 E @ I-97	Eastbound	37	49	30	55	31	2.4	0.1		640
651	MD-32 E @ MD-295/Baltimore Washington Pkwy (Jessup) (Retired)	Eastbound	20	5		5	33	4.6	0.1		651
662	MD-32 E @ Henkels Ln/Dorsey Run Rd	Eastbound	22	22	22	28	29	3.3	0.1		662

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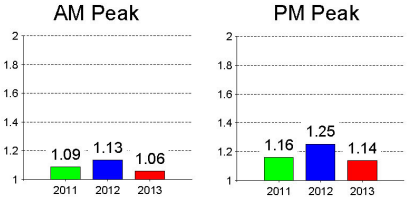
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

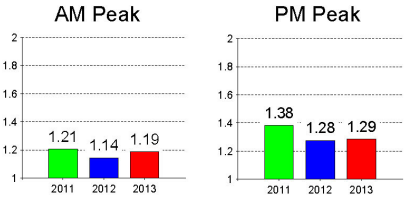
MD-100

Trends[a]

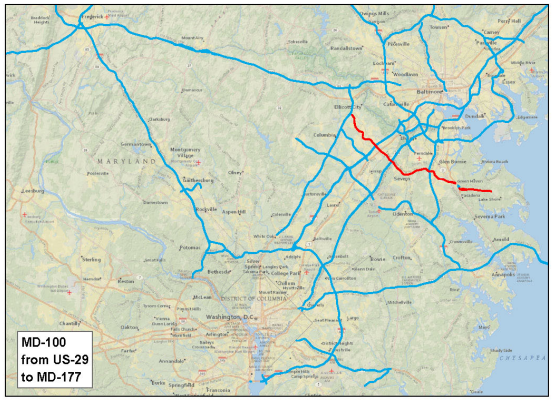
Travel Time Index[b]
measure of average delay



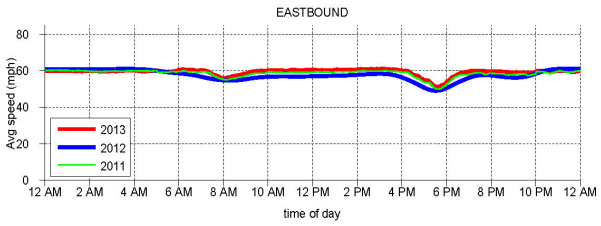
Planning Time Index[c]
measure of worst-case delay

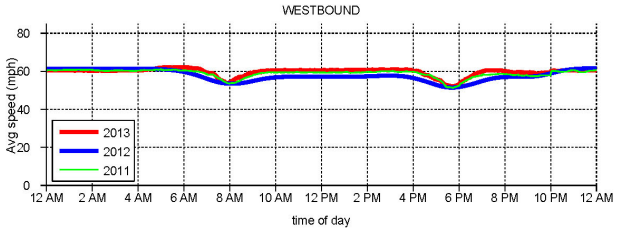


22 miles carrying 69,000 vehicles every day

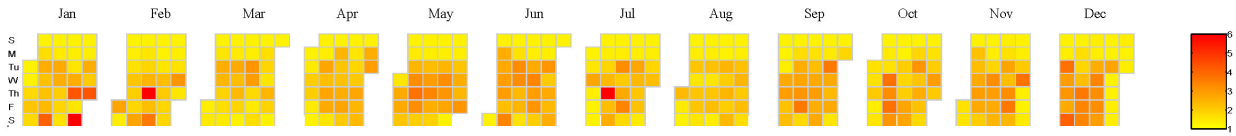


Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
58	MD-100 E @ MD-170/Telegraph Rd/Exit 11	Eastbound	50	88	84	74	66	4.7	0.8	74	-16
205	MD-100 W @ I-95/Exit 5	Westbound	119	125	114	115	44	2.4	0.3	462	-257
215	MD-100 W @ Marc Dorsey Station Access Rd/Exit 7	Westbound	94	94	83	44	57	2.5	0.3	200	15
216	MD-100 E @ Oakwood Rd	Eastbound	21	38	24	37	81	4.0	0.3	427	-211
228	MD-100 E @ Marc Dorsey Station Access Rd/Exit 7	Eastbound	96	65	49	65	54	2.2	0.3	229	-1
303	MD-100 W @ US-29	Westbound	62	63		76	54	2.9	0.2	334	-31
314	MD-100 W @ MD-174/Quarterfield Rd	Westbound	38	26	18	30	64	2.9	0.2	308	6
392	MD-100 W @ MD-607/Magothy Bridge Rd	Westbound	225	260	279	427	20	0.7	0.1	215	177
414	MD-100 E @ MD-177	Eastbound	47	7	22	14	46	3.4	0.1		414
480	MD-100 W @ Oakwood Rd	Westbound	35	41	37	36	43	1.7	0.1		480

Notes

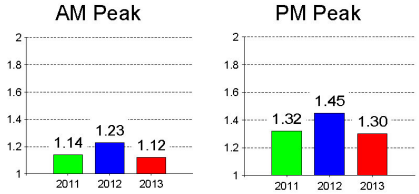
a - **Peak Hours** are considered as 8-9am and 5-6pm..
b - **Travel Time Index** (TTI) is the ratio of the *average* travel time during the peak hour to the time required under free flow.
c - **Planning Time Index** (PTI) is the ratio of the *worst-case* travel time (95th percentile) during peak hour to the free-flow time.
d - Typical work day speeds, calulcuated as the average speed of all weekdays for the entire year and shows it as varies by time-of-day.
e- Variability of worst-case travel experience along facility for each day of year, shown as plot of PTI by day of week and month, showing seasonal and weekly trends.
f - Top 10 bottlenecks on the facility, ranked by impact factor.
Impact factor is multiplication of total annual number of bottleneck occurences by their average duration and by their average length.
Bottlenecks are said to occur when speeds drop below 60% of free-flow speed for a period longer than 5 minutes.
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

MARYLAND 295

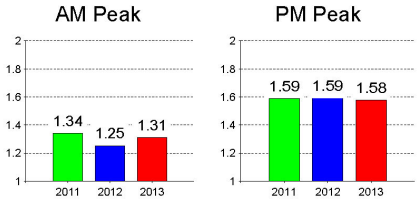
MD-295

Trends[a]

Travel Time Index[b]
measure of average delay

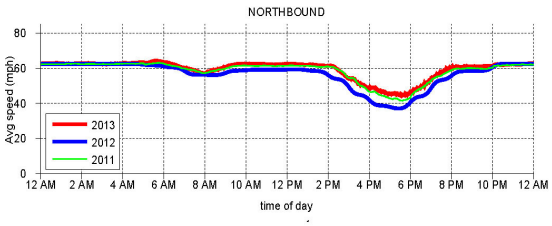


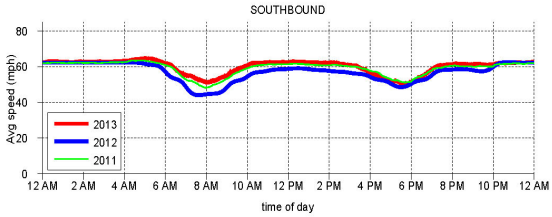
Planning Time Index[c]
measure of worst-case delay



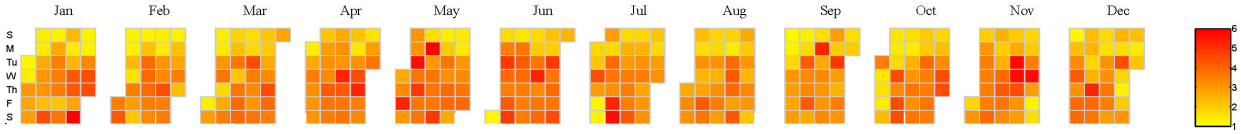
30 miles carrying 96,000 vehicles every day

Speed Profiles[d]





Daily Variability[e]



Top Bottlenecks[f]

2013 Rank	LOCATION	Direction	Number of Occurences Q1	Q2	Q3	Q4	Average Duration (minute)	Average Length (mile)	Impact Factor	2012 Rank	Change
8	MD-295 N @ MD-197/Exit 11	Northbound	91	115	122	116	167	7.4	5.0	4	4
11	MD-295 S @ MD-193	Southbound	112	101	92	85	96	7.6	2.5	12	-1
21	MD-295 S @ Powder Mill Rd	Southbound	61	135	166	114	83	4.7	1.7	66	-45
23	MD-295 N @ Canine Rd	Northbound	41	74	75	46	92	7.5	1.5	40	-17
26	MD-295 S @ Eastern Ave	Southbound	91	95	103	78	115	4.1	1.4	34	-8
29	MD-295 S @ MD-198	Southbound	79	123	147	113	88	3.3	1.3	37	-8
34	MD-295 N @ Powder Mill Rd	Northbound	151	150	156	133	68	3.2	1.2	82	-48
50	MD-295 S @ Riverdale Rd	Southbound	66	89	53	84	63	5.3	0.9	89	-39
66	MD-295 N @ MD-198	Northbound	30	44	25	37	86	8.4	0.8	74	-8
99	MD-295 N @ Arundel/Prince George's Co Line (Laurel) (North)	Northbound	51	77	71	49	77	3.9	0.6	85	14

Notes

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d - Typical work day speeds, calulcuated as the average speed of all weekdays for the entire year and shows it as varies by time-of-day.
e- Variability of worst-case travel experience along facility for each day of year, shown as plot of PTI by day of week and month, showing seasonal and weekly trends.
f - Top 10 bottlenecks on the facility, ranked by impact factor.
Impact factor is multiplication of total annual number of bottleneck occurences by their average duration and by their average length.
Bottlenecks are said to occur when speeds drop below 60% of free-flow speed for a period longer than 5 minutes.
Q1: Jan-Mar Q2: Apr-Jun Q3: Jul-Sep Q4: Oct-Dec

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B. Regionally Significant Arterial Corridors

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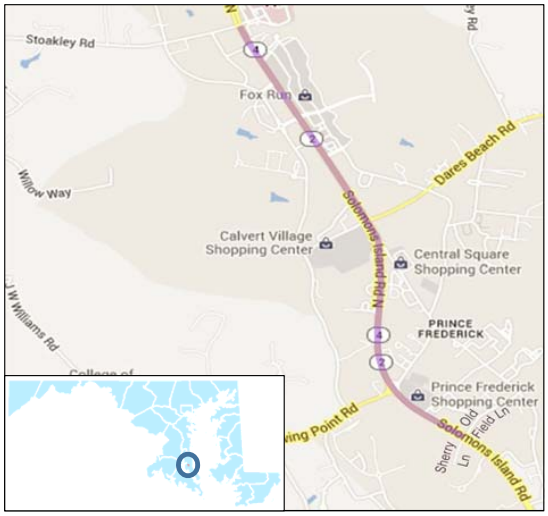
MD 2/4

Limits:	Prince Frederick from MD 231 to Stoakley Rd
Corridor Length:	2 miles
Speed Limit:	45 MPH
Travel Lanes:	(2 - 3) Northbound (2 - 3) Southbound
Signal Controlled Intersections:	7
Grade Separated Interchanges:	0
Major Cross Streets:	Stoakley Rd, MD 402, MD 231



Routes and Ridership	Routes	Avg. Daily Ridership
	MTA 902	1,365
	MTA 904	1,051

2013 AADT	**Trucks**	**Peak Hour Traffic**
31,000 - 38,000 vpd	6.5%	8%

Intersection Operations

Signalized Intersections*:	**AM Peak Hour**	**PM Peak Hour**
LOS D or Better	2	2
LOS E	0	0
LOS F	0	0

Segment Operations

Level of Service	**Northbound AM / PM (Miles of Roadway)**	**Southbound AM / PM (Miles of Roadway)**
LOS D or Better	N/A	N/A
LOS E	N/A	N/A
LOS F	N/A	N/A

LOS 'E' Intersections

LOS 'F' Intersections

Color Key

PTI	**TTI**
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

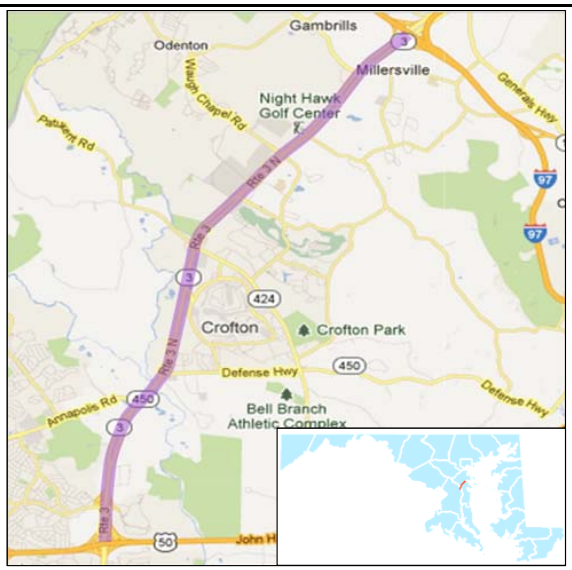
Functional Class	**Roadway Segment North to South**	**Length (miles)**	**TTI**					**PTI**			
			AM		**PM**			**AM**		**PM**	
			NB	**SB**	**NB**	**SB**		**NB**	**SB**	**NB**	**SB**
Rural Other Principal Arterial	Stoakley Rd./Hospital Rd. - Traskers Blvd.	0.3									
	Traskers Blvd. - Fox Run Blvd.	0.2									
	Fox Run Blvd. - Dares Beach Rd. (MD-402)	0.5									
	DarsBchRd(MD-402)-HrrwngPntRd/ChrchSt(MD231)	0.7									
	Harrowing Point Rd/Church St (MD-231)-Sherry Ln /OldField Ln	0.3									

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time) TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 3

Limits:	US 50/301 to I-97
Corridor Length:	8.8 miles
Speed Limit:	45 - 50 MPH
Travel Lanes:	(2 - 4) Northbound (2 - 4) Southbound
Signal Controlled Intersections:	12
Grade Separated Interchanges:	3
Major Cross Streets:	I-97, MD 175, MD 424, Waugh Chapel Rd, Defense Hwy, MD 450 Belair Rd, US 50



Routes and Ridership

Routes	Avg. Daily Ridership
METRO B29 / 31	261

2012 AADT	Trucks	Peak Hour Traffic
60,000 - 75,000 vpd	5% - 8%	8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	10	6
LOS E	1	4
LOS F	1	2

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	0.8/1.7	0.8/1.7
LOS E	6.3/1.3	0.8/5.9
LOS F	1.7/5.8	2.2/1.3

LOS 'E' Intersections

MD 3 at MD 450 East (AM,PM)
MD 3 at MD 450 West (PM)
MD 3 at Riedel Rd / Waugh Chapel Rd (PM)
MD 3 at South Main Chapel Way (PM)

LOS 'F' Intersections

MD 3 at MD 976 (Columbian Way) / Forest Dr (AM)
MD 3 at MD 424 / Conway Rd (PM)
MD 3 at Crawford Blvd / Cronson Blvd (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	Patuxent Fwy (MD-32) - Annapolis Rd (MD-175)/Millersville Rd	0.8				W				W
	Annapolis Rd (MD-175)/Millersville Rd - St. Stephens Ch Rd	1.2					W	W		
	St. Stephens Church Rd - Waugh Chapel Rd/Riedel Rd	0.5	W		W		W	W	W	
	Waugh Chapel Rd/Riedel Rd - John Hopkins Rd	0.8							W	
	Johns Hopkins Rd - Conway Rd/Davidsonville Rd (MD-424)	0.9						I		
	CnwayRd/DvdsonvilleRd(MD-424)-CrawfordBlvd/CrnsnBlvd	0.7			W			I	W	
	Crawford Blvd/Cronson Blvd - Defense Hwy (MD-450)	1.3								
	Defense Hwy (MD-450) - Annapolis Rd (MD-450)	0.5			W				W	
	Annapolis Rd (MD-450) - Belair Drive/Melford Blvd	1.6			W				W	
	Belair Drive/Melford Blvd - US-50	0.5							W	

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

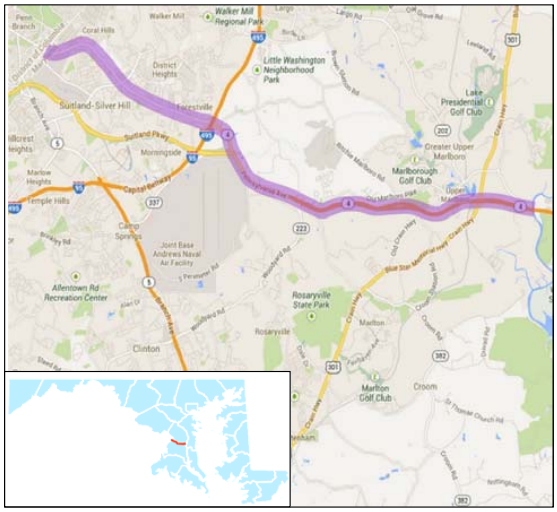
TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 4

Limits:	DC Line to Anne Arundel County Line
Corridor Length:	14.1 miles
Speed Limit:	35 - 55 MPH
Travel Lanes:	(2 - 3) Northbound (2 - 3) Southbound
Signal Controlled Intersections:	12
Grade Separated Interchanges:	7
Major Cross Streets:	MD 458, Forestville Rd, I-95, MD 337, MD 223, US 301 MD 725, Westphalia Rd

Routes and Ridership

Routes	Avg. Daily Ridership
METRO K12 / K13	2,020



2013 AADT	Trucks	Peak Hour Traffic
24,000 -70,000 vpd	5% - 11%	7% - 9.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	6	6
LOS E	1	1
LOS F	2	2

Segment Operations

Level of Service	Eastbound AM / PM (Miles of Roadway)	Westbound AM / PM (Miles of Roadway)
LOS D or Better	12.2 / 9.9	10.6 / 12.2
LOS E	1.3 / 2.3	1.4 / 1.9
LOS F	0.6 / 1.9	2.1 / 0.0

LOS 'E' Intersections
MD 4 at Forestville Rd (AM,PM)

LOS 'F' Intersections
MD 4 at MD 337/Presidential Pkwy (AM,PM)
MD 4 at Dower House Rd (AM,PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment West to East	Length (miles)	TTI AM EB	TTI AM WB	TTI PM EB	TTI PM WB	PTI AM EB	PTI AM WB	PTI PM EB	PTI PM WB
Urban Other Principal Arterial	Southern Ave - Alton St/ Shadyside Ave.	0.8								
	Alton St/ Shadyside Ave. - Spaulding Ave./Quarter Ave.	0.5								
	Spaulding Ave./Quarter Ave. - Brooks Dr.	0.4								
	Brooks Dr. - Silver Hill Rd. (MD-458)	0.7								
	Silver Hill Rd. (MD-458) - Parkland Dr.	0.3								
	Parkland Dr. - Walters Ln.	0.8								
	Walters Ln. - Donnell Dr.	0.4								
	Donnell Dr. - Forestville Rd.	0.6								
	Forestville Rd. - I95/I495	0.4			I			W	I	W
Urban Freeway Expressway	I95/I495 - Old Marlboro Pike/ Westphalia Rd.	0.3			I			W	I	W
	Old Marlboro Pike/ Westphalia Rd. - MD-337	0.6							I	
	MD-337 - Dowerhouse Rd.	0.8								
	Dowerhouse Rd. - Woodyard Rd. (MD-223)	1.4						I		
	Woodyard Rd. (MD-223) - Ritchie Marlboro Rd.	2.7						I		
	Ritchie Marlboro Rd. - Water St (MD-717)	1.4							I	
	Water St (MD-717) - US-301	0.6							I	
	US-301 - Marlboro Pike (MD-725)	0.9		I						
Rural Other Principal Arterial	Marlboro Pike (MD-725) - Anne Arundel County	0.5	I	I						

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time) TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 5

Limits:	I-95 to Washington DC Line
Corridor Length:	3.1 miles
Speed Limit:	30 - 35 MPH
Travel Lanes:	(1 - 4) Northbound (1 - 4) Southbound
Signal Controlled Intersections:	10
Grade Separated Interchanges:	3
Major Cross Streets:	Suitland Pkwy, MD 458, MD 414, I-95

Routes and Ridership

Routes	Avg. Daily Ridership
Green Line Branch Ave	6,605
Green Line Suitland Rd	6,668
Green Line Naylor Rd	3,100
METRO C12	605
METRO C14	605
METRO H12	1,378

2012 AADT	Trucks	Peak Hour Traffic
27,000 - 67,000 vpd	2% - 3%	7.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	4	4
LOS E	0	0
LOS F	0	0

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	0.0 / 0.6	2.1 / 1.6
LOS E	1.5 / 1.0	1.0 / 1.5
LOS F	1.6 / 1.5	0.0 / 0.0

LOS 'E' Intersections

LOS 'F' Intersections

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

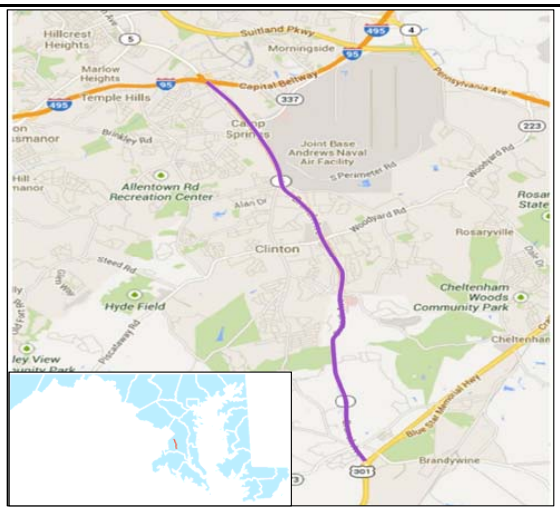
Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Freeway Expressway	Suitland Pkwy - Naylor Rd. (MD-637)	0.3					W			
	Naylor Rd. (MD-637) - Iverson St/Silver Hill Rd (MD-458)	0.7								
	Iverson St/Silver Hill Rd (MD-458) - St. Barnabas Rd. (MD-414)	0.6								
	St. Barnabas Rd. (MD-414) - I-95/I-495	1.5							W	

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time) TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 5

Limits:	US 301 to I-95
Corridor Length:	9.6 miles
Speed Limit:	50 - 55 MPH
Travel Lanes:	(2 - 3) Northbound (2 - 3) Southbound
Signal Controlled Intersections:	3
Grade Separated Interchanges:	8
Major Cross Streets:	I-95, MD 337, MD 223 MD 381 / MD 373, US 301



Routes and Ridership	Routes	Avg. Daily Ridership
	METRO C11 / C13	543
	MTA 903	N/A
	MTA 905	1,755
	MTA 909	318

2012 AADT	**Trucks**	**Peak Hour Traffic**
69,000 - 73,000 vpd	5% - 6%	6.5% - 8%

Intersection Operations

Signalized Intersections*:	**AM Peak Hour**	**PM Peak Hour**
LOS D or Better	0	3
LOS E	0	0
LOS F	3	0

Segment Operations

Level of Service	**Northbound AM / PM (Miles of Roadway)**	**Southbound AM / PM (Miles of Roadway)**
LOS D or Better	4.2 / 9.0	9.6 / 5.8
LOS E	1.3 / 0.6	0.0 / 0.0
LOS F	4.1 / 0.0	0.0 / 3.8

LOS 'E' Intersections

LOS 'F' Intersections

MD 5 at Brandywine Rd (AM)
MD 5 at MD 373D (AM)
MD 5 at Suratts Rd (AM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	**Roadway Segment North to South**	**Length (miles)**	**TTI**				**PTI**			
			AM		**PM**		**AM**		**PM**	
			NB	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**
Urban Freeway Expressway	I-95/I-495 - Allentown Rd. (MD-337)	1.3								
	Allentown Rd. (MD-337) - Kirby Rd/ Old Alexandria Ferry Rd.	1.4								
	Kirby Rd/ Old Alexandria Ferry Rd.-Woodyard Rd. (MD-223)	1.5								W
	Woodyard Rd. (MD-223) - Surratts Rd.	1.3								W
	Surratts Rd. - Burch Hill Rd/Earnshaw Dr.	1.6					I			
	Burch Hill Rd/Earnshaw Dr. -Brandywine Rd./ Accpleel Rd (MD-373)	1.9								
Rural Other Princ. Arterial	Brandywine Rd./ Accpleel Rd (MD-373)-Crain Hwy. (US-301)	0.6					I		W	W

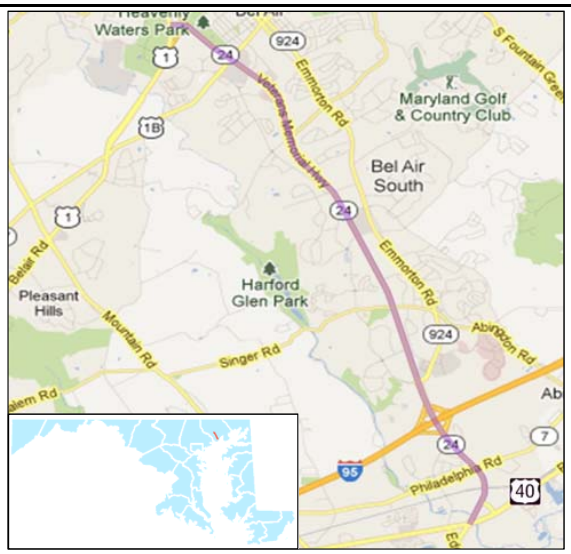
I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 24

Limits:	US 40 (Pulaski Highway) to US 1 (Bel Air Bypass)
Corridor Length:	7.9 miles
Speed Limit:	40 - 55 MPH
Travel Lanes:	(2 - 3) Northbound (2 - 3) Southbound
Signal Controlled Intersections:	15
Grade Separated Interchanges:	3
Major Cross Streets:	US 40, I-95, MD 7, MD 924 US 1 BU, US 1



Routes and Ridership

Routes	Avg. Daily Ridership
MTA 410	N/A

2013 AADT	Trucks	Peak Hour Traffic
21,000 - 72,000 vpd	3% - 6%	8% - 8.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	9	5
LOS E	0	1
LOS F	0	3

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	6.8 / 1.1	6.8 / 3.8
LOS E	1.1 / 5.3	1.1 / 4.1
LOS F	0.0 / 1.5	0.0 / 0.0

LOS 'E' Intersections

MD 24 at Wheel Rd (PM)

LOS 'F' Intersections

MD 24 at Ramps 4, 5 & 9 to and from I-95 (PM)
MD 24 at Ring Factory Rd (PM)
MD 24 at Singer Rd (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Freeway Expressway	Bel Air Bypass (US-1) - Baltimore Pike (Bus US-1)	0.5							W	
	Baltimore Pike (Bus US-1) - Ring Factory Rd.	1.3								
	Ring Factory Rd. - Plumtree Rd.	0.9								
	Plumtree Rd. - Bel Air Pkwy	0.4			W				W	W
	Bel Air Pkwy - Wheel Rd.	0.3								
	Wheel Rd. - Singer Rd.	1.0								W
	Singer Rd. - Tollgate Rd./Emmorton Rd (MD-924)	1.0								
	Tollgate Rd./Emmorton Rd (MD-924) - I-95	0.6								
	I-95 - Edgewood Rd.	0.4								
	Edgewood Rd. - Philadelphia Rd. (MD-7)	0.4			W				W	
	Philadelphia Rd. (MD-7) - Pulaski Hwy (US-40)	0.5								
	Pulaski Hwy (US-40) - Edgewood Rd. (MD-775)	0.6								

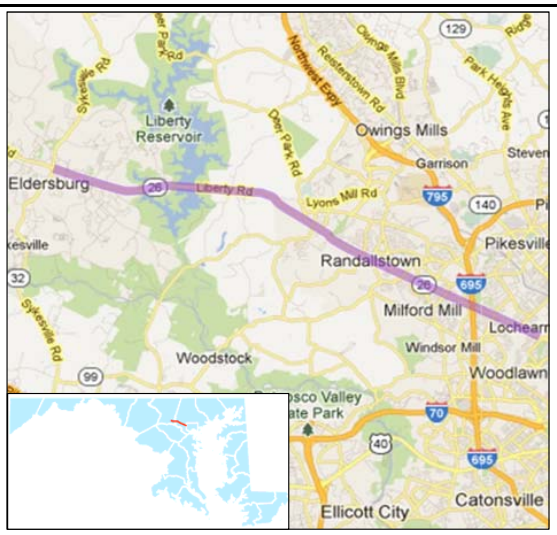
I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 26

Limits:	MD 32 (Sykesville Road) to Baltimore City Line
Corridor Length:	14.1 miles
Speed Limit:	35 - 50 MPH
Travel Lanes:	(1 - 2) Eastbound (1 - 3) Westbound
Signal Controlled Intersections:	27
Grade Separated Interchanges:	1
Major Cross Streets:	I-695, Rolling Rd, Old Court Rd, MD 32



Routes and Ridership	Routes	Avg. Daily Ridership
	MTA 52	6,610
	MTA 54	9,550
	MTA 77	4,836
	MTA 99	720

2013 AADT	Trucks	Peak Hour Traffic
9,000 - 48,000 vpd	4% - 6%	7% - 9%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	18	19
LOS E	0	0
LOS F	1	0

Segment Operations

Level of Service	Eastbound AM / PM (Miles of Roadway)	Westbound AM / PM (Miles of Roadway)
LOS D or Better	11.9 / 9.0	10.0 / 8.7
LOS E	1.7 / 4.2	3.2 / 4.5
LOS F	0.5 / 0.9	0.9 / 0.9

LOS 'E' Intersections

LOS 'F' Intersections

MD 26 at Lord Baltimore Dr / Ramp 5 from I-695 (AM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment West to East	Length (miles)	TTI AM EB	TTI AM WB	TTI PM EB	TTI PM WB	PTI AM EB	PTI AM WB	PTI PM EB	PTI PM WB
Urban Other Principal Arterial	Sykesville Rd. (MD-32) -Georgetown Blvd.	0.3								
	Georgetown Blvd.- Ridge Rd./ Oklahoma Rd	0.7								
	Ridge Rd./ Oklahoma Rd. - Oakland Mills Rd.	2.0								
Rural Minor Arterial	Oakland Mills Rd. - Wards Chapel Rd.	1.7	I				I			
	Wards Chapel Rd. - Lyons Mill Rd.	1.2								
Urban Other Principal Arterial	Lyons Mill Rd. - Deer Park Rd.	1.3								
	Deer Park Rd. - Marriottsville Rd.	0.2								
	Marriottsville Rd. - Offutt Rd.	1.5								
	Offutt Rd.- Greens Ln/McDonogh Rd.	0.2								
	Greens Ln/McDonogh Rd. - Brenbrook Dr.	0.6								
	Brenbrook Dr. - Old Court Rd.	0.3								
	Old Court Rd. - Rolling Rd.	0.8								
	Rolling Rd. - Milford Mill Rd.	0.4								W
	Milford Mill Rd. - Washington Ave.	0.5							W	
	Washington Ave. - I-695	0.3								
	I-695 -St. Lukes Lane	1.0								
	St. Lukes Lane - Patterson Ave.	0.3								
	Patterson Ave. - Northern Parkway/Baltimore City	0.8								

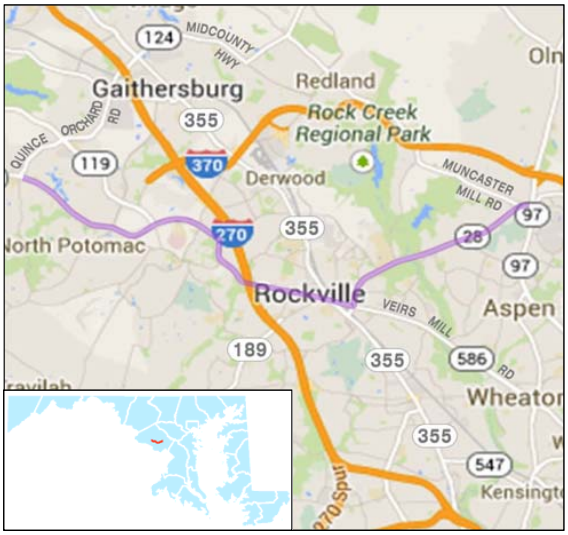
I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 28

Limits:	MD 124 to MD 97
Corridor Length:	11.4 miles
Speed Limit:	40 - 50 MPH
Travel Lanes:	(1 - 3) Northbound (1 - 3) Southbound
Signal Controlled Intersections:	30
Grade Separated Interchanges:	1
Major Cross Streets:	MD 124, MD 119, Shady Grove Dr, Gude Dr, I-270, MD 189, MD 355, MD 115, MD 97



Routes and Ridership	Routes	Avg. Daily Ridership
	Ride On 52	146
	Ride On 54	2,078
	Ride On 63	651

2013 AADT	**Trucks**	**Peak Hour Traffic**
25,000 - 48,000 vpd	4% - 7%	8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	14	16
LOS E	1	2
LOS F	3	0

Segment Operations

Level of Service	Eastbound AM / PM (Miles of Roadway)	Westbound AM / PM (Miles of Roadway)
LOS D or Better	3.8 / 3.8	4.7 / 6.4
LOS E	5.3 / 2.4	5.1 / 3.5
LOS F	2.3 / 5.2	1.6 / 1.5

LOS 'E' Intersections

MD 28 at Muddy Branch Rd (AM)
MD 28 at MD 586 / MD 911 (PM)
MD 28 at Baltimore Rd (West Leg) (PM)

LOS 'F' Intersections

MD 28 at Bauer Dr (AM)
MD 28 at MD 97 (AM)
MD 28 at MD 586 / MD 911 (AM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment West to East	Length (miles)	TTI AM EB	TTI AM WB	TTI PM EB	TTI PM WB	PTI AM EB	PTI AM WB	PTI PM EB	PTI PM WB
Urban Other Principal Arterial	Quince Orchard Rd (MD-124) - Muddy Branch Rd.	2.1								
	Muddy Branch Rd. - Great Seneca Hwy (MD-119)	0.8								
	Great Seneca Hwy (MD-119) - Shady Grove Rd.	0.9								
	Shady Grove Rd. - Fallsgrove Dr/ Gude St.	0.4								
	Fallsgrove Dr/ Gude St. - Darnestown Rd.	0.5								
	Darnestown Rd. - I-270	0.7			W				W	
	I-270 - Great Falls Rd. / Van Buren St.	0.9								
	Great Falls Rd. / Van Buren St. - Rockville Pike (MD-355)	0.6								
	Rockville Pike (MD-355)-Veirs Mill Rd (MD-586)/1stSt(MD-911)	0.4			I				I	
	Veirs Mill Rd (MD-586)/ 1st St (MD-911) - Gude Dr.	0.9								
	Gude Dr. - Baltimore Rd.	1.0			I		I	W		
	Baltimore Rd. - Bel Pre Rd.	0.7	I					I		I
	Bel Pre Rd. - Muncaster Mill Rd. (MD-115)	1.3								
	Muncaster Mill Rd. (MD-115)- Georgia Ave. (MD-97)	0.2								

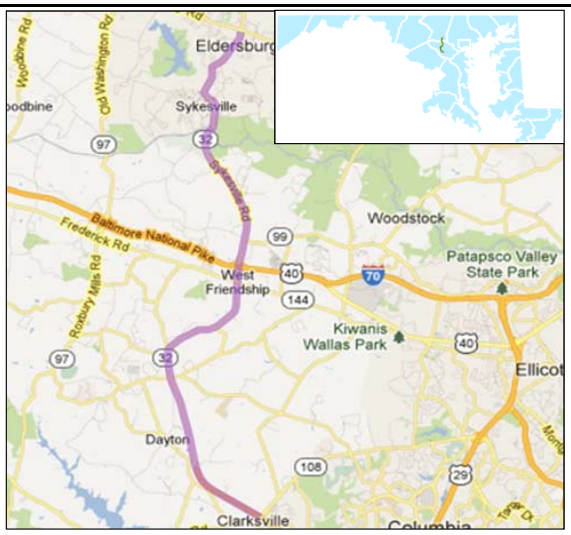
I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 32

Limits:	MD 108 (Clarksville Pike) to MD 26 (Liberty Road)
Corridor Length:	16.3 miles
Speed Limit:	40 - 50 MPH
Travel Lanes:	(1 - 2) Northbound (1 - 2) Southbound
Signal Controlled Intersections:	11
Grade Separated Interchanges:	3
Major Cross Streets:	MD 108, Burntwoods Rd, MD 144, MD 26



Routes and Ridership	Routes	Avg. Daily Ridership
	N/A	N/A

2013 AADT	Trucks	Peak Hour Traffic
20,000 - 26,000 vpd	7% - 11%	8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	3	3
LOS E	0	0
LOS F	0	0

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	7.7 / 16.3	16.3 / 3.8
LOS E	3.2 / 0.0	0.0 / 6.3
LOS F	5.4 / 0.0	0.0 / 6.2

LOS 'E' Intersections

LOS 'F' Intersections

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment West to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	Liberty Rd. (MD-26) - Springfield Ave. (MD-851)	2.2								
	Springfield Ave. (MD-851) - Sandosky Rd./Raincliffe Rd.	0.7					W			
	Sandosky Rd./Raincliffe Rd. - Friendship Rd. (MD-851)	0.8					W			
Rural Minor Arterial	Friendship Rd. (MD-851) - River Rd.	1.7								
	River Rd. - Old Frederick Rd. (MD-99)	1.3								I
	Old Frederick Rd. (MD-99) - I-70/US-40	0.8								
Rural Other Principal Arterial	I-70/US-40 - Frederick Rd. (MD-144)	0.4								W
	Frederick Rd. (MD-144) - Burntwoods Rd./ Andrea Dr.	3.0								
	Burntwoods Rd./ Andrea Dr. - Clarksville Pike (MD-108)	5.4	W				W			

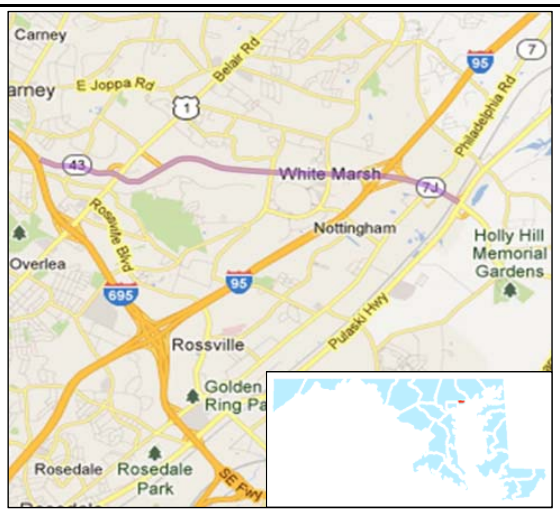
I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 43

Limits:	I-695 to US 40
Corridor Length:	6 miles
Speed Limit:	45 - 50 MPH
Travel Lanes:	2 Eastbound 2 Westbound
Signal Controlled Intersections:	6
Grade Separated Interchanges:	4
Major Cross Streets:	I-695, US 1, Perry Hall Blvd, Honeygo Blvd, I-95, US 40



Routes and Ridership

Routes	Avg. Daily Ridership
MTA 58	2,432

2013 AADT	Trucks	Peak Hour Traffic
29,000 - 56,000 vpd	2% - 6%	7.5% - 8.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	1	1
LOS E	1	0
LOS F	0	1

Segment Operations

Level of Service	Eastbound AM / PM (Miles of Roadway)	Westbound AM / PM (Miles of Roadway)
LOS D or Better	2.8 / 2.2	1.8 / 1.8
LOS E	2.3 / 2.1	1.1 / 2.3
LOS F	0.9 / 1.7	3.1 / 1.9

LOS 'E' Intersections
MD 43 at Honeygo Blvd (AM)

LOS 'F' Intersections
MD 43 at Honeygo Blvd (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment West to East	Length (miles)	TTI AM EB	TTI AM WB	TTI PM EB	TTI PM WB	PTI AM EB	PTI AM WB	PTI PM EB	PTI PM WB
Urban Freeway Expressway	I-695 - Walther Blvd	0.6								W
	Walther Blvd - Belair Rd (US-1) SB	0.4			W			W	W	
	Belair Rd (US-1) SB - Belair Rd (US-1) NB	0.6	I		I			W	W	
	Belair Rd (US-1) NB - Perry Hall Blvd	1.8								
	Perry Hall Blvd - Honeygo Blvd	0.7							W	
	Honeygo Blvd - I-95	0.9	W	W			W		W	
	I-95 - Philadelphia Rd	0.6		W			W	W		W
	Philadelphia Rd - Pulaski Hwy (US-40)	0.4		W		W		W	W	W

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

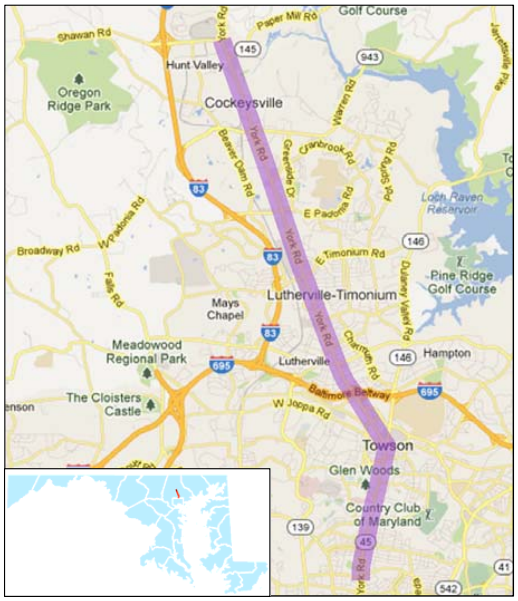
TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 45

Limits:	Baltimore City Line to Shawan Road
Corridor Length:	9.3 miles
Speed Limit:	35 - 40 MPH
Travel Lanes:	(1 – 2) Northbound (1 – 2) Southbound
Signal Controlled Intersections:	31
Grade Separated Interchanges:	1
Major Cross Streets:	Stevenson Ln, Towsontown Blvd, Joppa Rd Fairmount Ave, I-695, MD 131, Timonium Rd Padonia Rd, Warren Rd, Shawan Rd

Routes and Ridership

Routes	Avg. Daily Ridership
Light Rail - Gilroy Rd	235
Light Rail - Hunt Valley	832
Light Rail - Lutherville	903
Light Rail - McCormick Rd	496
Light Rail - Pepper Rd	181
Light Rail - Timonium BP	354
Light Rail - Timonium Rd	1,098
Light Rail - Warren Rd	315
MTA 8	12,515
MTA 9	1,587
MTA 12	328



2013 AADT	Trucks	Peak Hour Traffic
20,000 - 55,000 vpd	2% - 5%	6.5% - 8.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	20	17
LOS E	0	3
LOS F	1	1

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	5.2 / 1.1	5.2 / 1.5
LOS E	4.1 / 7.5	4.1 / 6.6
LOS F	0.0 / 0.7	0.0 / 1.2

LOS 'E' Intersections

MD 45 at Fairmount Ave (PM)
MD 45 at Timonium Rd (PM)
MD 45 at Shawan Rd (PM)

LOS 'F' Intersections

MD 45 at Shawan Rd (AM)
MD 45 at MD 131 / Seminary Rd (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

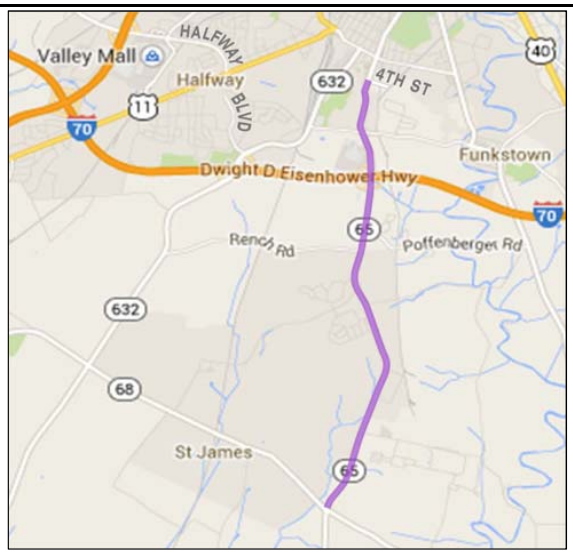
Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	Shawan Rd. - Paper Mill Rd. (MD-145)	0.3							W	W
	Paper Mill Rd. (MD-145) - Warren Rd. (MD-483)	1.2								
	Warren Rd. (MD-483) - Cranbrook Rd.	0.8							W	
	Cranbrook Rd. - Padonia Rd.	0.5								
	Padonia Rd. - Timonium Rd.	1.1								W
	Timonium Rd. - Ridgely Rd	0.8								W
	Ridgely Rd. - Bellona Ave./Margate Rd.	0.5								W
	Bellona Ave./Margate Rd. - Seminary Ave. (MD-131)	0.2								
	Seminary Ave. (MD-131) - I-695	0.5								
	I-695 - Fairmount Ave	0.3							W	
	Fairmount Ave. - Bosley Ave.	0.2								
Urban Minor Arterial	Bosley Ave. - Dulaney Valley Rd. (MD-146)/ Joppa Rd.	0.4								W
Urban Other Principal Arterial	Dulaney Valley Rd. (MD-146)/ Joppa Rd. - Towsontown Blvd.	0.3			I					
	Towsontown Blvd. - Burke Ave.	0.2								
	Burke Ave. - Stevenson Ln.	0.8			W					
	Stevenson Ln. - Regester Ave.	0.4								
	Regester Ave. - Lake Ave.	0.8								

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time) TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 65

Limits:	MD 68 to 4th Street
Corridor Length:	4.8 miles
Speed Limit:	30 - 50 MPH
Travel Lanes:	(1 - 2) Northbound (1 - 2) Southbound
Signal Controlled Intersections:	9
Grade Separated Interchanges:	1
Major Cross Streets:	MD 68, Col. Henry Douglas Dr, I-70, West & East Oak Ridge Dr, 4th St



Routes and Ridership	Routes	Avg. Daily Ridership
	N/A	N/A

2013 AADT	**Trucks**	**Peak Hour Traffic**
9,000 - 22,000 vpd	8% - 11%	7.5% - 8.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	3	3
LOS E	0	0
LOS F	0	0

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	N/A	N/A
LOS E	N/A	N/A
LOS F	N/A	N/A

LOS 'E' Intersections

LOS 'F' Intersections

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	**Roadway Segment North to South**	**Length (miles)**	**TTI**					**PTI**			
			AM		**PM**			**AM**		**PM**	
			NB	**SB**	**NB**	**SB**		**NB**	**SB**	**NB**	**SB**
Urban Other Principal Arterial	4th St - Doub Way	0.3									
	Doub Way - Oak Ridge Rd.	0.3									
	Oak Ridge Rd. - I-70	0.5									
	I-70 - Col. Henry K Douglas Dr.	0.3									
	Col. Henry K Douglas Dr. - Lappans Rd. (MD-68)	3.4									

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

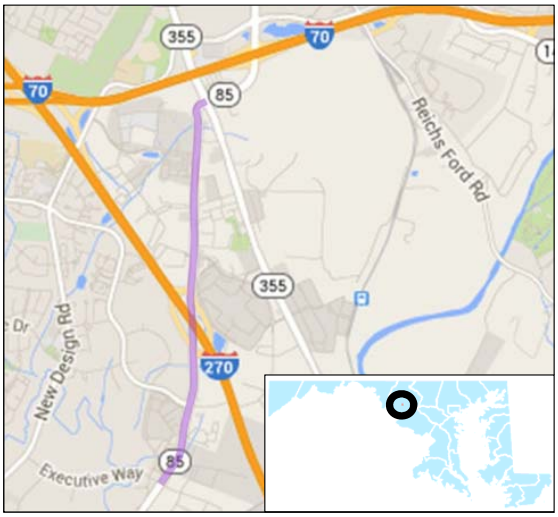
TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 85

Limits:	Executive Way to MD 355
Study Area Length:	2.0 miles
Speed Limit:	40 MPH
Travel Lanes:	(2 - 3) Northbound (1 - 3) Southbound
Signal Controlled Intersections:	10
Grade Separated Interchanges:	1
Major Cross Streets:	Executive Way, Crestwood Blvd / Shockley Way, I-270, Spectrum Dr, MD 355

Routes and Ridership

Routes	Avg. Daily Ridership
MARC Brunswick	N/A



2013 AADT	Trucks	Peak Hour Traffic
24,000 - 47,000 vpd	6% - 7%	8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	3	3
LOS E	0	0
LOS F	0	0

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	N/A	N/A
LOS E	N/A	N/A
LOS F	N/A	N/A

LOS 'E' Intersections

LOS 'F' Intersections

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	Urbana Pike/ Market St. (MD-355) - Guilford Dr.	0.3								
	Guilford Dr. - Grove Rd.	0.3								
	Grove Rd. - Spectrum Dr.	0.3								
	Spectrum Dr. - I-270	0.3								
	I-270 - Chestwood Blvd./ Shockley Dr.	0.4								
	Chestwood Blvd./ Shockley Dr. - Executive Way	0.4								

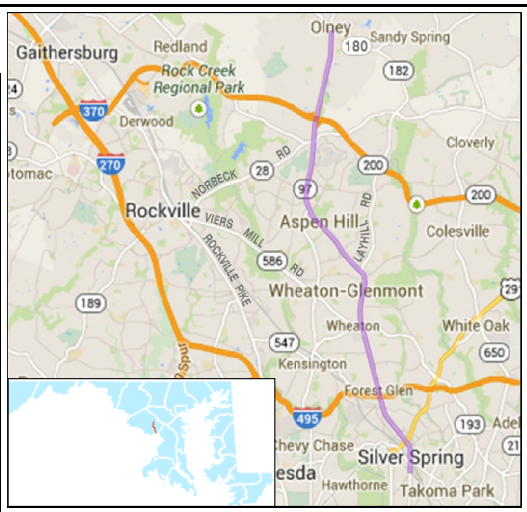
I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 97

Limits:	Washington DC Line to MD 108
Corridor Length:	12.7 miles
Speed Limit:	30 - 45 MPH
Travel Lanes:	(3 - 4) Northbound (3 - 4) Southbound
Signal Controlled Intersections:	48
Grade Separated Interchanges:	1
Major Cross Streets:	US 29, I-495, MD 586, Randolph Rd, MD 193, MD 182 MD 28, MD 200, MD 108



Routes and Ridership	Routes	Avg. Daily Ridership
	METRO Y5 / Y7 / Y8 / Y9	8,160
	Ride On 33	329
	Ride On 52	146
	Ride On 53	240

2013 AADT	Trucks	Peak Hour Traffic
33,000 - 64,000 vpd	3% - 6%	6.5% - 8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	23	27
LOS E	7	4
LOS F	4	3

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	3.4 / 1.3	2.3 / 0.5
LOS E	8.2 / 3.3	7.1 / 8.9
LOS F	1.1 / 8.1	3.3 / 3.3

LOS 'E' Intersections

MD 97 at MD 192 / Forest Glen RD (AM,PM)
MD 97 at MD 586 (AM,PM)
MD 97 at Bel Pre Rd (AM)
MD 97 at Emory Ln (AM)
MD 97 at Heathfield Rd / Postgate Terr (AM)
MD 97 at Randolph Rd (AM)
MD 97 at Ramp from I-495 EB (AM)
MD 97 at Arcola Ave (PM)
MD 97 at Dennis Ave (PM)

LOS 'F' Intersections

MD 97 at Seminary Rd / Columbia Blvd (AM,PM)
MD 97 at Seminary Pl (AM,PM)
MD 97 at Old Baltimore Rd (AM)
MD 97 at Plyers Mill Rd (AM)
MD 97 at MD 390 (NB/L) (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	Olney Sandy Spring/ Laytonsville Rd. (MD-108)-Emroy Lane	1.9						W		
	Emroy Lane - Norbeck Rd. (MD-28)	1.2								
	Norbeck Rd. (MD-28) - Rossmoor Blvd.	0.5								
	Rossmoor Blvd. - Bel Pre Rd.	0.6								
	Bel Pre Rd. - Connecticut Ave. (MD-185)	0.7						W		
	Connecticut Ave. (MD-185) - Hewitt Ave.	0.6								
	Hewitt Ave. - May St./Rippling Brook Dr.	0.5								
	May St./Rippling Brook Dr. - Layhill Rd.(MD-182)	1.1								
	Layhill Rd.(MD-182) - Randolph Rd.	0.2								
	Randolph Rd. - Shorefield Rd.	0.4							W	
	Shorefield Rd. - Arcola Ave.	0.4							W	
	Arcola Ave. - University Blvd. (MD-193)	0.4								
	University Blvd. (MD-193)- Veirs Mill Rd. (MD-586)	0.4	W		W	W	W		W	W
	Veirs Mill Rd. (MD-586) - Dennis Ave.	0.8								
	Dennis Ave. - I-495	0.8								
	I-495 - 16th St. (MD-390)	0.5			W		W		W	
	16th St. (MD-390) - Spring St	0.6							W	
	Spring St. - Colesville Rd (US-29)	0.3								
	Colesville Rd (US-29) - Silgo Ave.	0.4							W	
	Silgo Ave. - East-West Hwy/Philadelphia Ave. (MD-410)	0.2								
	East-West Hwy/Philadelphia Ave(MD-410) - Eastern Ave./ DC Line	0.2								

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

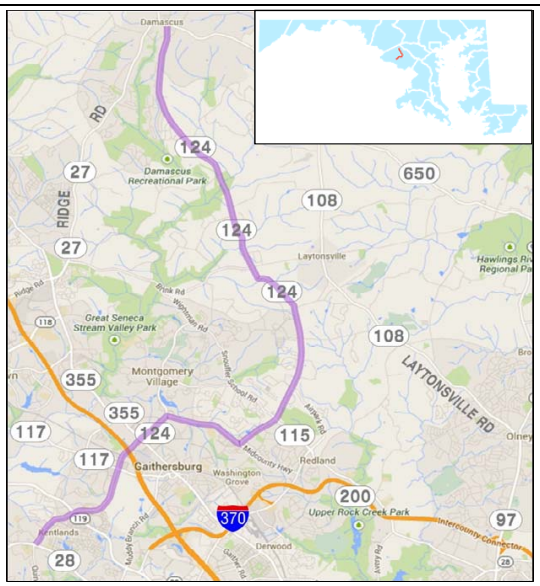
PTI: planning time index (95th percentile travel time / freeflow travel time) TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 124

Limits:	MD 28 to MD 108
Corridor Length:	16.7 miles
Speed Limit:	30 - 50 MPH
Travel Lanes:	(1 - 4) Northbound (1 - 4) Southbound
Signal Controlled Intersections:	31
Grade Separated Interchanges:	1
Major Cross Streets:	MD 28, MD 119, MD 117, I-270, MD 335, MD 115, MD 108

Routes and Ridership

Routes	Avg. Daily Ridership
Ride On 56	2,120
Ride On 57	2,224
Ride On 58	1,680
Ride On 59	3,924
Ride On 61	3,003
Ride On 65	245
Ride On 90	889



2013 AADT	Trucks	Peak Hour Traffic
11,000 - 76,000 vpd	3% - 8%	7%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	14	13
LOS E	0	1
LOS F	0	0

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	12.0 / 11.7	12.1 / 15.5
LOS E	4.7 / 3.8	1.9 / 1.2
LOS F	0.0 / 1.2	2.7 / 0.0

LOS 'E' Intersections

MD 124 at Christopher Ave / Lost Knife Rd (PM)

LOS 'F' Intersections

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

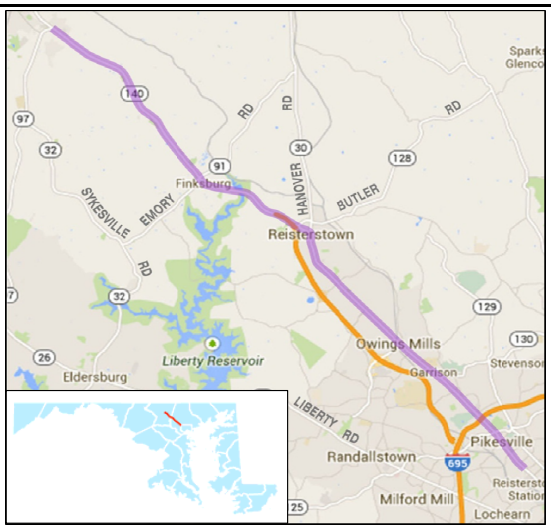
Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Minor Arterial	Main St. (MD-108) - Hawkins Creamery Rd.	1.0								
	Hawkins Creamery Rd. - Log House Rd/ Low Meadow Dr.	1.2								
	Log House Rd/ Low Meadow Dr. - Rocky Rd.	2.4								
	Rocky Rd. - Brink Rd.	1.4								
	Brink Rd. - Warfield Rd.	1.3								
	Warfield Rd. - Fieldcrest Rd./ Hadley Farms Dr.	0.7								
	Fieldcrest Rd./ Hadley Farms Dr. - Airpark Rd.	1.1								
	Airpark Rd. - Snouffer School Rd./Muncaster Mill Rd (MD-115)	0.7								
	SnoufferSchlRd/MncterMillRd(MD115) - MdctyHwy/WoodfieldRd.	0.9								
Urban Other Principal Arterial	Midcounty Hwy./Woodfield Rd. - Goshen Rd.	1.1								
	Goshen Rd. - Montgomery Village Dr /Midcounty Hwy	0.6								
	MontgomeryVillage/MidcountyHwy - Frederick Rd/Ave(MD-355)	0.7								
	Frederick Rd/Ave (MD-355) - I-270	0.4							W	
	I-270 - Clopper Rd. /Diamond Av (MD-117)	0.5						W	W	
	Clopper Rd./Diamond Av(MD-117) - Gt Seneca Hwy(MD-119)	1.5								
	Great Seneca Hwy. (MD-119) - Darnestown Rd. (MD-28)	1.2								

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time) TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 140

Limits:	Baltimore City Line to MD 97
Corridor Length:	20.4 miles
Speed Limit:	30 - 55 MPH
Travel Lanes:	(1 - 3) Northbound (1 - 2) Southbound
Signal Controlled Intersections:	51
Grade Separated Interchanges:	3
Major Cross Streets:	Old Court Rd, I-695, MD 130, Painters Mill Rd, MD 940, MD 30, I-795, MD 91, MD 97



Routes and Ridership

Routes	Avg. Daily Ridership
MTA 53	4,946
MTA 56	2,818
MTA 59	2,190

2013 AADT	Trucks	Peak Hour Traffic
17,000 - 55,000 vpd	2% - 9%	8.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	15	15
LOS E	0	0
LOS F	0	0

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	16.1 / 12.0	14.3 / 10.8
LOS E	4.3 / 8.0	6.1 / 9.0
LOS F	0.0 / 0.4	0.0 / 0.6

LOS 'E' Intersections

LOS 'F' Intersections

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

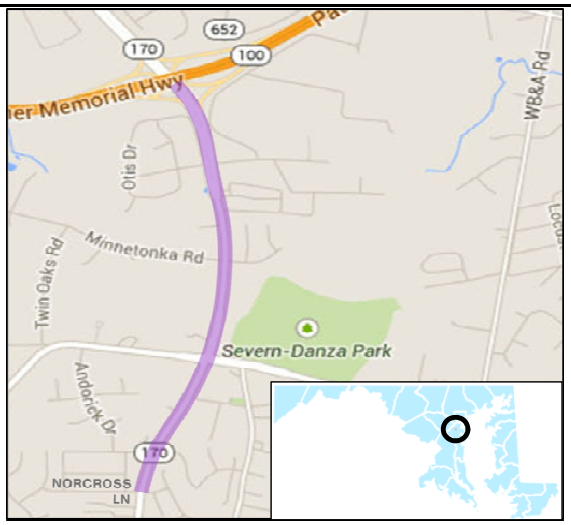
Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	New Washington Rd (MD-97) Malcom Dr. - Reese Rd.	2.5								
	Reese Rd. - Green Mill Rd./Suffolk Rd.	2.2							I	
	Green Mill Rd./Suffolk Rd. - Emroy/Gamber Rd (MD-91)	1.9								
Urban/Rural Other P. Arterial	Emroy/Gamber Rd (MD-91) - Butler Rd. (MD-795)	3.4								I
Urban Other Principal Arterial	Butler Rd. (MD-795) - Hanover Rd. (MD-30)	0.4								
	Hanover Rd. (MD-30) - Gyndon Dr/ Glyndon Trace Dr.	0.7								
	Gyndon Dr/ Glyndon Trace Dr. - Berrymans Ln.	0.4								
	Berrymans Ln. - Franklin Blvd./Cherry Hill Rd.	0.7						I		
	Franklin Blvd./Cherry Hill Rd. - Dolfield Blvd/ Richmar Rd.	1.2								
	Dolfield Blvd/ Richmar Rd. - Pleasant Hill Rd.	0.5								
	Pleasant Hill Rd. - Owings Mills Blvd. (MD-240) -	1						I		
	Owings Mills Blvd. (MD-240) - Painters Mill Rd. -	0.4	I	I	I	I	I		I	I
	Painters Mill Rd. - Greenspring Valley Rd (MD-130)	1.2							I	
	Greenspring Valley Rd (MD-130) - McDonogh Rd./ Craddock Ln.	0.6								
	McDonogh Rd./ Craddock Ln. - I-695	1.2								
	I-695 - Old Court Rd.	0.6								
	Old Court Rd. - Sudbrook Ln	0.4								
	Sudbrook Ln. - Slade Ave/ Milford Mill Rd.	0.5								
	Slade Ave/ Milford Mill Rd. - Baltimore City Line/ Fallstaff Rd	0.6								

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time) TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 170

Limits:	Norcross Rd to MD 100
Corridor Length:	1.3 miles
Speed Limit:	50 MPH
Travel Lanes:	(1 - 2) Northbound (1 - 2) Southbound
Signal Controlled Intersections:	2
Grade Separated Interchanges:	1
Major Cross Streets:	Norcross Ln, MD 174, Minnetonka Rd / Morgan Station Dr, Denson Dr / Wieker Rd, MD 100



Routes and Ridership

Routes	Avg. Daily Ridership
MTA K	N/A

2013 AADT	Trucks	Peak Hour Traffic
22,000 - 23,000 vpd	No Data	7.5% - 8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	0	0
LOS E	0	0
LOS F	0	0

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	0.9 / 0.9	0.0 / 0.0
LOS E	0.0 / 0.0	0.0 / 0.0
LOS F	0.0 / 0.0	0.9 / 0.9

LOS 'E' Intersections **LOS 'F' Intersections**

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

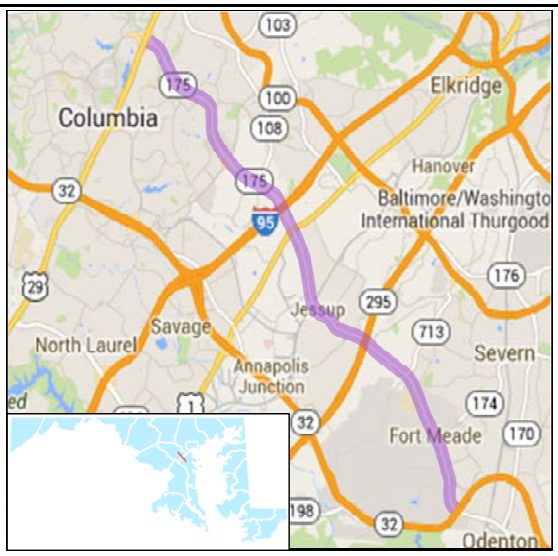
Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	MD-100 - Reece Rd/Donaldson Ave (MD-174)	0.9								
	Reece Rd/Donaldson Ave (MD-174) - Norcross Ln/Gander Way	0.4								

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time) TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 175

Limits:	MD 32 (Patuxent Freeway) to US 29 (Columbia Pike)
Corridor Length:	12.2 miles
Speed Limit:	35 - 50 MPH
Travel Lanes:	(1 - 3) Northbound (1 - 4) Southbound
Signal Controlled Intersections:	19
Grade Separated Interchanges:	5
Major Cross Streets:	MD 32, MD 174, MD 713, MD 295, US 1, I-95 Snowden River Pkwy, US 29



Routes and Ridership

Routes	Avg. Daily Ridership
MTA 310	341
MTA 320	198	

2013 AADT	Trucks	Peak Hour Traffic
17,000 - 47,000 vpd	3% - 15%	7.5% - 8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	8	5
LOS E	1	2
LOS F	0	2

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	5.1 / 4.1	8.7 / 3.6
LOS E	7.1 / 3.6	3.5 / 8.6
LOS F	0.0 / 4.5	0.0 / 0.0

LOS 'E' Intersections

MD 175 at MD 713 / Rockenbach Rd (AM)
MD 175 at Brock Bridge Rd (PM)
MD 175 at Llewellyn Ave / Blue Water Rd (PM)

LOS 'F' Intersections

MD 175 at MD 713 / Rockenbach Rd (PM)
MD 175 at Tamar Dr (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Freeway Expressway	Columbia Pike (US-29) - Thunder Hill Rd.	0.6								
	Thunder Hill Rd. - Tamar Dr	1.1								
	Tamar Dr - Dobbin Rd.	0.9								
	Dobbin Rd - Snowden River Pkwy	0.6								
	Snowden River Pkwy - Waterloo Rd (MD-108)	0.8								
	Waterloo Rd (MD-108)- I-95	0.7					W			W
	I-95 - Washington Blvd (US-1)	0.5								W
Urban Minor Arterial	Washington Blvd (US-1) - Dorsey Run Rd.	1.3								
	Dorsey Run Rd. - MD-295	1.6								
	MD-295 - Ridge Rd/Rockenbach Rd (MD-713)	1.1								
	Ridge Rd/Rockenbach Rd. (MD-713) - Reece Rd	1.3								
	Reece Rd - Charter Oaks Blvd.	0.6								
	Charter Oaks Blvd.- MD-32	1.1								

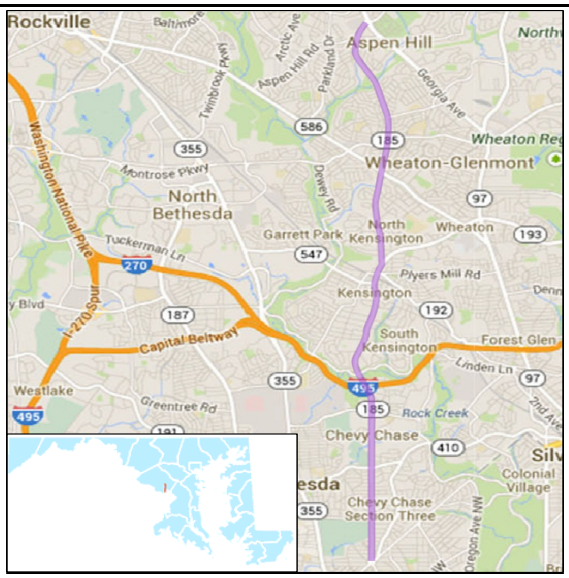
I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 185

Limits:	Washington DC Line to MD 97
Corridor Length:	8.3 miles
Speed Limit:	30 - 45 MPH
Travel Lanes:	(1 - 3) Northbound (3 - 4) Southbound
Signal Controlled Intersections:	26
Grade Separated Interchanges:	1
Major Cross Streets:	MD 410, I-495, MD 547, MD 193, MD 586, Randolph Rd, MD 97



Routes and Ridership	Routes	Avg. Daily Ridership
	METRO L8	2,667
	Ride On 1	2,459
	Ride On 11	884
	Ride On 26	3,127
	Ride On 34	2,946
	Ride On 41	697

2013 AADT	Trucks	Peak Hour Traffic
33,000 - 64,000 vpd	4% - 6%	7.5% - 8.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	8	8
LOS E	4	3
LOS F	2	3

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	7.5 / 0.6	0.0 / 3.8
LOS E	0.8 / 4.0	2.6 / 3.4
LOS F	0.0 / 3.7	5.7 / 1.1

LOS 'E' Intersections

MD 185 at Manor Rd (AM,PM)
MD 185 at MD 586 (AM,PM)
MD 185 at Randolph Rd (AM,PM)
MD 185 at MD 191 / Bradley Dr (AM)

LOS 'F' Intersections

MD 185 at MD 410 (AM,PM)
MD 185 at Jones Bridge Rd / Kensington Pkwy (AM)
MD 185 at MD 191 / Bradley Dr (PM)
MD 185 at MD 192 (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	Georgia Ave. (MD-97) - Aspen Hill Rd.	0.3		W				W	W	I
	Aspen Hill Rd. - Randolph Rd.	0.4								
	Randolph Rd. - Veirs Mill Rd. (MD-586)	1.7								
	Veirs Mill Rd. (MD-586) - University Blvd. (MD-193)	1.4						W		
	University Blvd (MD-193) - Saul Rd.	1.2			W				W	
	Saul Rd. - I495	0.6		I				I		
	I-495-Jones Bridge Rd.	0.5						W	W	I
	Jones Bridge Rd. - East West Hwy (MD-410)	0.8			I			W	I	
	East West Hwy (MD-410) - Bradley Ln. (MD-191)	0.8								
	Bradley Ln. (MD-191) -Western Ave/ DC Line	0.6			W				W	

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

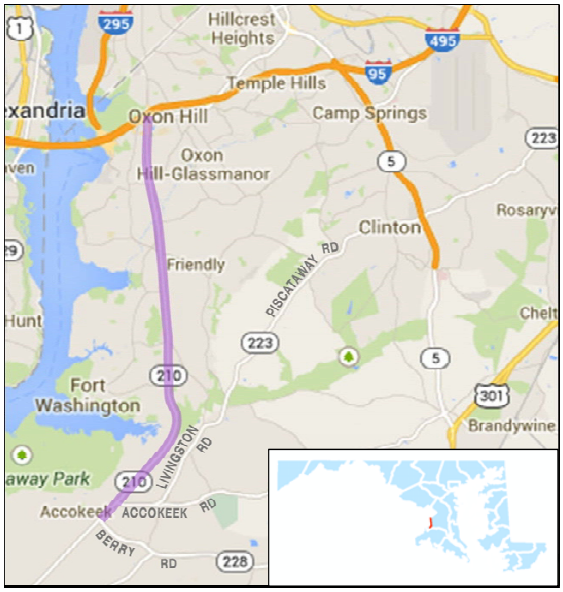
TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 210

Limits:	MD 228 to I-95
Corridor Length:	10.2 miles
Speed Limit:	40 - 45 MPH
Travel Lanes:	(2 - 3) Northbound (2 - 4) Southbound
Signal Controlled Intersections:	10
Grade Separated Interchanges:	1
Major Cross Streets:	I-95, Livingston Rd, MD 373, MD 228

Routes and Ridership

Routes	Avg. Daily Ridership
METRO D13 / D14	5,121
METRO W15	369
METRO W19	465
MTA 610	875
MTA 620	821
MTA 630	515
MTA 650	662



2013 AADT	Trucks	Peak Hour Traffic
27,000 - 71,000 vpd	4% - 7%	7% - 8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	1	2
LOS E	2	1
LOS F	2	2

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	3.9 / 7.1	6.8 / 5.4
LOS E	2.1 / 0.9	2.9 / 0.8
LOS F	3.7 / 1.7	0.0 / 3.5

LOS 'E' Intersections

MD 210 at Old Fort Rd (south) (AM,PM)
MD 210 at Swan Creek Rd / Livingston Rd (AM)

LOS 'F' Intersections

MD 210 at Livingston Rd / Kerby Hill Rd (AM,PM)
MD 210 at Wilson Bridge Dr (AM,PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Freeway Expressway	I-495/I-95 - Livingston Rd. /Kerby Hill Rd.	1.8								W
	Livingston Rd. /Kerby Hill Rd. - Palmer Rd.	1.0								W
	Palmer Rd. - Old Fort Rd.	0.7					W			W
	Old Fort Rd. - Fort Washington Rd.	0.9	I				W			
	Fort Washington Rd. - Livingston Rd. /Swan Creek Rd.	1.1	I				W			
	Livingston Rd/Swan Creek Rd. - Washington Ln.	0.8	I		I		I		I	
	Washington Ln. - Farmington Rd.	2.1	I	I	I	I	I	I	I	I
	Farmington Rd. - Livingston Rd. (MD-373)	1.4	I		I	I	I		I	I
	Livingston Rd. (MD-373)- Berry Rd. (MD-228)	0.5								

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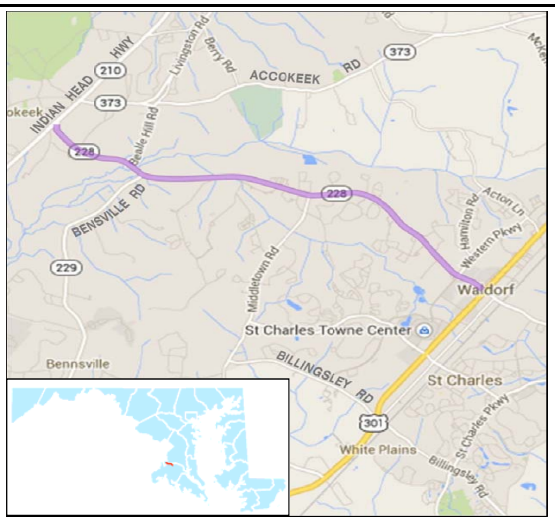
PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 228

Limits:	MD 210 to US 301
Corridor Length:	6.8 miles
Speed Limit:	35 - 50 MPH
Travel Lanes:	(2 - 3) Eastbound 2 Westbound
Signal Controlled Intersections:	11
Grade Separated Interchanges:	0
Major Cross Streets:	MD 210, MD 229, US 301



Routes and Ridership	Routes	Avg. Daily Ridership
	MTA 610	875
	MTA 620	821
	MTA 630	515
	MTA 650	662

2013 AADT	**Trucks**	**Peak Hour Traffic**
38,000 - 39,000 vpd	2% - 4%	8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	2	1
LOS E	0	0
LOS F	1	2

Segment Operations

Level of Service	Eastbound AM / PM (Miles of Roadway)	Westbound AM / PM (Miles of Roadway)
LOS D or Better	6.8 / 2.3	6.8 / 6.8
LOS E	0.0 / 3.0	0.0 / 0.0
LOS F	0.0 / 1.5	0.0 / 0.0

LOS 'E' Intersections

LOS 'F' Intersections

MD 228 at MD 229 (AM,PM)
MD 228 at Bealle Hill Rd (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment West to East	Length (miles)	TTI AM EB	TTI AM WB	TTI PM EB	TTI PM WB	PTI AM EB	PTI AM WB	PTI PM EB	PTI PM WB
Urban Other Principal Arterial	Indian Head Hwy (MD-210) - Manning Rd	0.5							W	
	Manning Rd - Bensville Rd (MD-229)	1.0								
	Bensville Rd (MD-229) - Bunker Hill Rd.	1.3								
	Bunker Hill Rd. - Middletown Rd./Ironwood Dr.	1.0								
	Middletown Rd./Ironwood Dr. - Western Pkwy	2.6								
	Western Pkwy - Crain Highway (US-301)	0.4								

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 235

Limits:	Airport Rd to MD 246
Corridor Length:	5.6 miles
Speed Limit:	35 - 55 MPH
Travel Lanes:	3 Northbound 3 Southbound
Signal Controlled Intersections:	16
Grade Separated Interchanges:	0
Major Cross Streets:	MD 4, MD 237 Pegg Rd, MD 246

Routes and Ridership	Routes	Avg. Daily Ridership
	MTA 905	1,755
	MTA 909	318

2013 AADT	**Trucks**	**Peak Hour Traffic**
26,000 - 59,000 vpd	3% - 5%	8.5% - 9.5%

Intersection Operations

Signalized Intersections*:	**AM Peak Hour**	**PM Peak Hour**
LOS D or Better	2	2
LOS E	3	2
LOS F	2	3

Segment Operations

Level of Service	**Northbound AM / PM (Miles of Roadway)**	**Southbound AM / PM (Miles of Roadway)**
LOS D or Better	N/A	N/A
LOS E	N/A	N/A
LOS F	N/A	N/A

LOS 'E' Intersections	**LOS 'F' Intersections**
MD 235 at Rue Purchase Rd / Buck Hewitt Rd (AM,PM)	MD 235 at MD 237 / Maple Dr (AM,PM)
MD 235 at First Colony Blvd (AM)	MD 235 at Town Creek Dr / Taylor Ln (AM,PM)
MD 235 at Shady Mile Dr / Old Rolling Rd (AM)	MD 235 at Shady Mile Dr / Old Rolling Rd (PM)
MD 235 at MacArthur Blvd / Millstone Landing Rd (PM)	

Color Key

PTI	**TTI**
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	**Roadway Segment North to South**	**Length (miles)**	**TTI**					**PTI**			
			AM		**PM**			**AM**		**PM**	
			NB	**SB**	**NB**	**SB**		**NB**	**SB**	**NB**	**SB**
Urban Other Principal Arterial	Airport Rd. - Wildewood Blvd.	0.4									
	WildewoodBlvd.-St.AndrewsChurchRd/PtuxntBeachRd.(MD4)	0.7									
	St.AndrwsChrchRd/PatuxentBeachRd.(MD-4)-FirstColonyBl	0.4									
	First Colony Blvd. - Old Rolling Rd/Shady Mile Dr.	0.3									
	Old Rolling Rd/Shady Mile Dr. - Miramar Way/Town Creek Dr.	0.5									
	MirmarWy/TownCreekDr-ChncllorsRunRd(MD-237)/Maple Rd	0.4									
	ChncellrsRnRd(MD-237)/MapleRd-MacArtrBl/MillstneLndngRd.	0.5									
	MacArtrBlvd./MillstneLnding Rd.-Hewitt Rd/RuePurchaseRd.	0.4									
	Hewitt Rd. / Rue Purchase Rd. - Pegg Rd./ Buse Rd.	1.1									
	Pegg Rd./ Buse Rd. - Great Mills Rd/ Cedar Point Rd (MD-246)	0.9									

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

MD 355

Limits:	Washington DC Line to MD 27
Corridor Length:	19.7 miles
Speed Limit:	25 - 45 MPH
Travel Lanes:	(2 - 4) Northbound (2 - 4) Southbound
Signal Controlled Intersections:	80
Grade Separated Interchanges:	3
Major Cross Streets:	MD 191, MD 410, MD 547, MD 187, Montrose Pkwy, MD 28, Shady Grove Rd, I-370, MD 117, MD 124, Middlebrook Rd, MD 118, MD 27

Routes and Ridership

Ride On Routes	Avg. Daily Ridership
Ride On 5	1,918
Ride On 30	710
Ride On 46	3,719
Ride On 55	8,083
Ride On 59	3,924
Ride On 67	147
Ride On 75	444
Ride On 81	181
Ride On 83	491

Red Line Routes	Avg. Daily Ridership
Bethesda	10,608
Grosvenor	5,857
Medical Center	6,221
Rockville	4,900
Shady Grove	13,444
Twinbrook	4,569
White Flint	3,951

2013 AADT	Trucks	Peak Hour Traffic
33,000 - 67,000 vpd	2% - 6%	7.5% - 8.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	29	27
LOS E	4	4
LOS F	4	6

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	9.0 / 5.4	4.5 / 5.1
LOS E	7.4 / 6.3	8.1 / 4.4
LOS F	3.3 / 8.0	7.1 / 10.2

LOS 'E' Intersections

MD 355 at E&W Gude Dr (AM,PM)
MD 355 at MD 124 (AM,PM)
MD 355 at Edmondson Dr (AM)
MD 355 at Tuckerman Ln (North) (AM)
MD 355 at Grosvenor Ln (PM)
MD 355 at MD 191 (PM)

LOS 'F' Intersections

MD 355 at Cedar Ln (AM,PM)
MD 355 at MD 911 (AM,PM)
MD 355 at Shady Grove Rd (AM,PM)
MD 255 at Grosvenor Ln (AM)
MD 355 at Rollins Ave / Twinbrook Pkwy (PM)
MD 355 at North Wood Rd (PM)
MD 355 at Tuckerman Ln (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	Ridge Rd. (MD-27) -Germantown Rd. (MD-188)	0.9								
	Germantown Rd. (MD-188) - Middlebrook Road	0.8								
	Middlebrook Road - Christopher Ave.	2.3								
	Christopher Ave. - Montgomery Village Ave (MD-124)	0.3						I		
	Montgomery Village Ave. (MD-124) - Odendhal Ave.	0.4			W					
	Odendhal Ave - Summit Ave.	1.0							W	
	Summit Ave. - Shady Grove Rd./ I-370	1.2								
	Shady Grove Rd./ I-370 - Redland Blvd.	1.0								
	Redland Blvd. - Gude Dr.	0.8								
	Gude Dr. - Washington St.	1.0							W	
	Washington St. - Veirs Mill Rd/ Jefferson St (MD-28)	0.9		W		W		W	W	W
	Veirs Mill Rd/ Jefferson St (MD-28) - Wootton Pkwy (MD-911)	0.4				W			W	
	Wootton Pkwy (MD-911) - Montrose Pkwy	2.1				W			W	W
	Montrose Pkwy - Strathmore Ave (MD-547)	1.3								
	Strathmore Ave (MD-547) -Grosvenor Lane	0.9								
	Grosvenor Lane - I-495	0.3								
	I-495 - Cedar Lane	0.9		I				I		
	Cedar Lane - Jones Bridge Rd.	0.6			I					
	Jones Bridge Rd - Montgomery Lane(MD-410)	0.9								
	Montgomery Lane(MD-410) - Bradley Blvd./ Lane (MD 191)	0.5	I	I	I		I	I		
	Bradley Blvd./ Lane (MD 191) - Dorset Ave	0.7								
	Dorset Ave. - DC Line	0.5		I		W		I		

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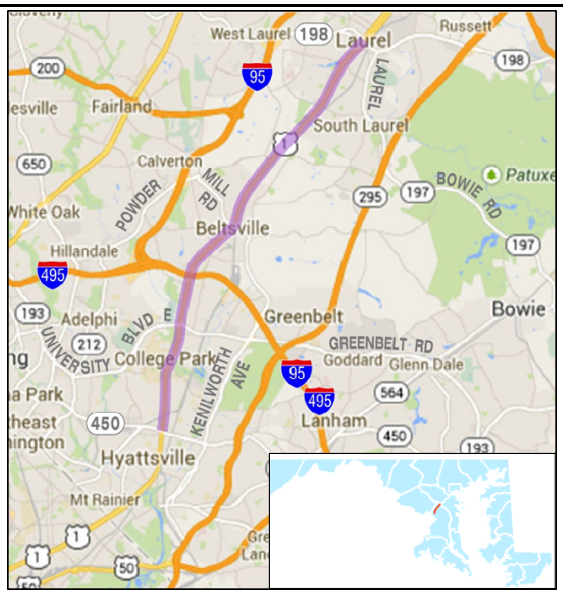
PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

US 1

Limits:	MD 410 to MD 198
Corridor Length:	10.7 miles
Speed Limit:	35 - 50 MPH
Travel Lanes:	(2 - 4) Northbound (2 - 4) Southbound
Signal Controlled Intersections:	40
Grade Separated Interchanges:	3
Major Cross Streets:	MD 410, MD 193, I-95, Rhode Island Ave, Ewing Rd, MD 212, Muirkirk Rd, Contee Rd, Cherry Lane



Routes and Ridership	Routes	Avg. Daily Ridership
	Green Line Greenbelt	6,757
	Green Line College Park	4,454
	METRO 86	4,668
	METRO 87	904
	METRO 88	904
	METRO 89M	803

2013 AADT	Trucks	Peak Hour Traffic
19,000 - 49,000 vpd	3% - 7%	6.5% - 8.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	21	20
LOS E	1	1
LOS F	2	2

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	6.4 / 1.8	3.6 / 1.3
LOS E	3.7 / 3.6	7.1 / 5.8
LOS F	0.6 / 5.3	0.0 / 3.6

LOS 'E' Intersections

US 1 at Edgewood Rd / Ramp 6 from I-95 SB (AM)
US 1 (NB/L) at MD 198 (Talbott Ave) (PM)

LOS 'F' Intersections

US 1 at MD 410 (AM,PM)
US 1 at Cherry Hill Rd (AM)
US 1 at Edgewood Rd / Ramp 6 from I-95 SB (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	Gorman Ave (MD-198) - Cherry Ln.	0.6								
	Cherry Ln. - Cypress St.	0.7								
	Cypress St. - Contee Rd.	0.5								
	Contee Rd. - Muirkirk Rd.	1.3							W	
	Muirkirk Rd. - Ritz Way	0.4								
	Ritz Way - Powder Mill Rd. (MD-212)	1.8								
	Powder Mill Rd. (MD-212) - Rhode Island Ave.	0.6								
	Rhode Island Ave. - I-495/I-95	1.0								
	I-495/I-95 - Cherry Hill Rd.	0.3								
	Cherry Hill Rd. - Greenbelt Rd./ Metzerott Rd.	1.1								
	Greenbelt Rd./ Metzerott Rd. - Campus Dr./ Painted Branch Pkwy	0.7								
	Campus Dr./ Painted Branch Pkwy - Guilford Rd/Dr	0.8		I				I	I	I
	Guilford Rd/Dr - East West Hwy (MD-410)	0.9								

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PTI: planning time index (95th percentile travel time / freeflow travel time)

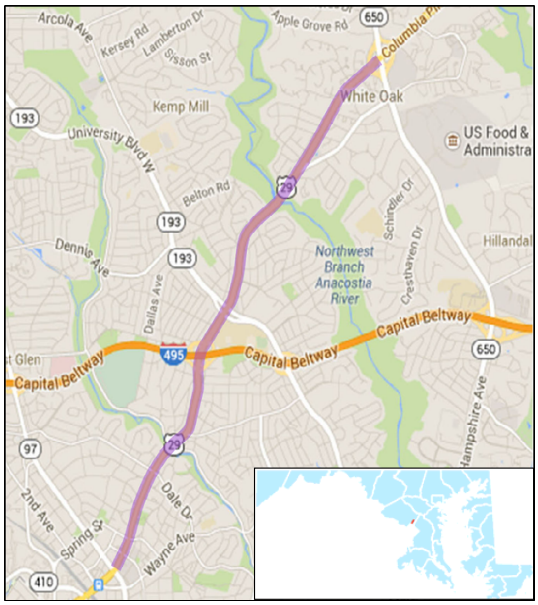
TTI: travel time index (50th percentile travel time/ freeflow travel time)

US 29

Limits:	MD 97 to MD 650
Corridor Length:	3.8 miles
Speed Limit:	35 - 45 MPH
Travel Lanes:	(3 - 4) Northbound (2 - 4) Southbound
Signal Controlled Intersections:	13
Grade Separated Interchanges:	2
Major Cross Streets:	MD 97, Spring St / Cedar St, Dale Dr Sligo Creek Pkwy / St Andrews Way I-495, MD 193, Lockwood Dr, MD 650

Routes and Ridership

Routes	Avg. Daily Ridership	METRO Routes	Avg. Daily Ridership
Ride On 8	685		
Ride On 9	1,302		
Ride On 13	301	Z2	1,087
Ride On 14	887	Z6	3,117
Ride On 21	233	Z8	3,268
Ride On 22	419	Z9	796
MTA 915	N/A	Z10	1,015
MTA 929	N/A	Z13	1,015
MTA 995	N/A	Z29	796



2013 AADT	Trucks	Peak Hour Traffic
33,000 - 66,000 vpd	3% - 6%	7.5% - 8%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	7	9
LOS E	1	0
LOS F	2	1

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	2.8 / 0.5	0.0 / 0.8
LOS E	1.0 / 0.0	0.5 / 2.0
LOS F	0.0 / 3.3	3.3 / 1.0

LOS 'E' Intersections	LOS 'F' Intersections
US 29 at MD 193 (EB/L) (AM)	US 29 at Dale Dr (AM,PM) US 29 at Southwood Dr (AM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	New Hampshire Ave. (MD-650) - Lockwood Dr.	0.9								
	Lockwood Dr. - University Blvd. (MD-193)	1.1								
	University Blvd. (MD-193) - I-495	0.3	I					W		
	I-495 - Franklin Ave.	0.5						I		
	Franklin Ave. - Dale Dr.	0.3		I				I	W	
	Dale Dr. - Cedar St./Spring St.	0.5								
	Cedar St./Spring St. - Georgia Ave. (MD-97)	0.2								

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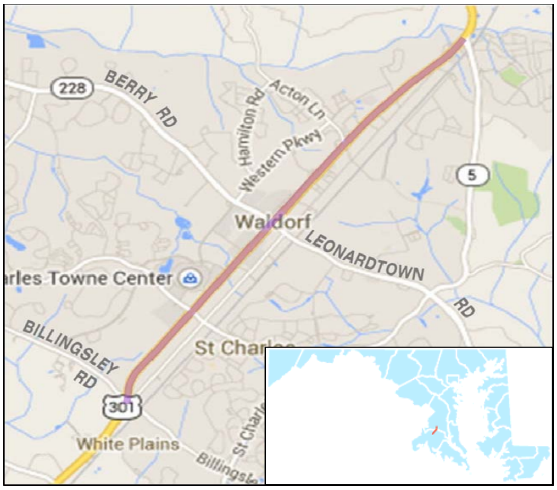
PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

US 301

Limits:	Billingsley Rd to MD 5
Corridor Length:	7.8 miles
Speed Limit:	45 - 55 MPH
Travel Lanes:	(2 - 3) Northbound (2 - 4) Southbound
Signal Controlled Intersections:	13
Grade Separated Interchanges:	0
Major Cross Streets:	Billingsley Rd, Smallwood Dr, MD 228, Acton Ln, MD 5



Routes and Ridership	Routes	Avg. Daily Ridership
	MTA 905	1,755
	MTA 909	318

2013 AADT	**Trucks**	**Peak Hour Traffic**
38,000 - 57,000	7% - 12%	7.5%

Intersection Operations

Signalized Intersections*:	**AM Peak Hour**	**PM Peak Hour**
LOS D or Better	13	12
LOS E	1	1
LOS F	0	1

Segment Operations

Level of Service	**Northbound AM / PM (Miles of Roadway)**	**Southbound AM / PM (Miles of Roadway)**
LOS D or Better	5.9 / 3.1	1.2 / 5.9
LOS E	1.9 / 3.0	6.2 / 0.0
LOS F	0.0 / 1.7	0.4 / 1.9

LOS 'E' Intersections

US 301 at MD 5BU / MD 228 (AM)
US 301 at Acton Ln (PM)

LOS 'F' Intersections

US 301 at MD 5BU / MD 228 (PM)

Color Key

PTI	**TTI**
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	**Roadway Segment North to South**	**Length (miles)**	**TTI AM NB**	**TTI AM SB**	**TTI PM NB**	**TTI PM SB**	**PTI AM NB**	**PTI AM SB**	**PTI PM NB**	**PTI PM SB**
Rural Other Principal Arterial	Branch Ave. (MD-5) - Timothy Branch/Chadds Ford Dr.	1.1								
	TmthyBranch/ChaddsFordDr-CedarvilleRd/McKendreeRd	0.8								
	CedarvilleRd./McKendree Rd.-MattawmnBeantownRd(MD-5)	0.5					W			
Urban Other Principal Arterial	Mattawoman Beantown Rd. (MD-5) - Sub-Station Rd.	0.4								
	Sub-Station Rd. - Acton Ln.	1.3								
	Acton Ln. - Berry Rd. (MD-228)/Leonardtown Rd. (Bus-5)	1.2								
	Berry Rd. (MD-228)/Leonardtown Rd. (Bus-5)-St Patricks Dr.	0.7								
	St Patricks Dr. - Smallwood Dr.	0.6								
	Smallwood Dr. - Billingsley Rd.	1.2								

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time)

TTI: travel time index (50th percentile travel time/ freeflow travel time)

C. 2013 Capital Project Fact Sheets

BEFORE

AFTER: BALTIMORE BELTWAY AT MD 372

I-695 and MD 372 (Wilkens Avenue)

This project is a part a series of bridge widening projects to accommodate the ultimate Southwest Beltway widening project, which will continue between MD 144 (Frederick Road) and US 40 (Baltimore National Pike).

The I-695 northbound bridge over Wilkens Avenue was reconstructed and widened. The widening allowed for a painted collector distributor roadway to be created combining the two ramp diverges. The basic ramp configuration for the interchange did not change. This ramp improvement reduces the number of egress points along I-695 and allows Wilkens Avenue westbound traffic from mainline I-695 to exit sooner, which saves travel time since this section of the Beltway is typically congested in the evening peak period.

LOCATION: ARBUTUS, BALTIMORE COUNTY

Year Completed: 2013

Project Cost: $14,872,000

Annual Average Time Savings: $172,000

Annual Fuel Cost Savings: $24,000

Safety Benefit: Potential reduction in rear-end crashes

Time to Recoup Project Cost: >25 years

BEFORE

AFTER

MD 32 (Sykesville Road) and Linden Church Road

The scope of this project included the following elements:

- Construction of a full diamond interchange at MD 32 and Linden Church Road
- Construction of a roundabout at Linden Church Road and the northbound ramp termini
- Realignment of Linden Church Road west of MD 32
- Reconstruction of Ten Oaks Road

This will reduce the number of stops for motorists on MD 32, thereby decreasing the potential for rear-end and left-turn crashes.

LOCATION: CLARKSVILLE, HOWARD COUNTY

Year Completed: 2013

Project Cost: $16,037,000

Annual Average Time Savings: $3,068,000

Annual Fuel Cost Savings: $69,000

Safety Benefit: Rear-end & left-turn crashes reduction

Time to Recoup Project Cost: Approximately 5 years

BEFORE

AFTER:
SOUTHBOUND MD 30

AFTER:
EASTBOUND MD 91

MD 30 (Hanover Pike) and MD 91 (Emory Road)

The following roadway capacity improvements were provided at the intersection:

- MD 30 southbound second thru lane
- MD 91 eastbound dedicated left turn lane

These improvements addressed cycle failures on MD 30 southbound in the AM peak hour and improved the existing shared thru-right lane condition with an additional dedicated thru lane. This reduces delays on MD 30 southbound.

LOCATION: UPPERCO, BALTIMORE COUNTY

Year Completed: 2013

Project Cost: $3,023,000

Annual Average Time Savings: $878,000

Annual Fuel Cost Savings: $19,000

Safety Benefit: Potential reduction in rear-end crashes

Time to Recoup Project Cost: Approximately 3 ½ years

BEFORE

AFTER

MD 27 (Ridge Road) and Sweepstakes Road/Marlboro Drive

The MD 27/Sweepstakes Road intersection was improved by widening to provide a dedicated right turn lane along northbound MD 27. This results in reduced delay for through and right turning motorists. This improvement decreased the need for northbound through vehicles to lower their speed to accommodate right turning vehicles.

LOCATION: DAMASCUS, MONTGOMERY COUNTY

Year Completed: 2013

Project Cost: $421,000

Annual Average Time Savings: $68,000

Annual Fuel Cost Savings: $4,000

Safety Benefit: Reduces conflict between the through motorists and slower right turning motorists. Potential reduction in rear-end crashes.

Time to Recoup Project Cost: Approximately 6 years

BEFORE

AFTER: NORTHBOUND BOWIE MILL ROAD

MD 108 (Olney Laytonsville Road) and Bowie Mill Road

The MD 108/Bowie Mill Road intersection was stopped controlled on the Bowie Mill Road approach. During the PM peak hour, queues and delay were excessive along this approach.

In order to decrease the delay for the Bowie Mill Road approach, a traffic signal was installed and a separate left and right turn lanes on Bowie Mill Road were provided.

This project improved safety for Bowie Mill Road motorists accessing MD 108 and westbound MD 108 left turning motorists by providing a protected left turn signal phase.

LOCATION: OLNEY, MONTGOMERY COUNTY

Year Completed: 2013

Project Cost: $325,000

Annual Average Time Savings: $479,000

Annual Fuel Cost Savings: $6,000

Safety Benefit: Reduced angle crashes

Time to Recoup Project Cost: Less than 1 year

BEFORE

AFTER

US 40 (National Pike) and MD 63 (Greencastle Pike)

MD 63 was widened to provide for a dedicated left turn lanes for both the northbound and southbound approaches. Signal phasing along MD 63 was changed from split-phased to exclusive/permissive left turn phasing.

These modifications improved overall intersection operations and safety by improving signal timing and removing turning motorists from the MD 63 through movement.

LOCATION: HAGERSTOWN, WASHINGTON COUNTY

Year Completed: 2013

Project Cost: $1,269,000

Annual Average Time Savings: $967,000

Annual Fuel Cost Savings: $20,000

Safety Benefit: Removes stopped vehicles from through lane and reduces potential for rear-end crashes

Time to Recoup Project Cost: Approximately 1 ½ years

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FOR FURTHER INFORMATION, PLEASE CONTACT:

GREGORY I. SLATER, DIRECTOR
Office of Planning and Preliminary Engineering
gslater@sha.state.md.us

MORTEZA TADAYON, CHIEF
Data Services Engineering Division
mtadayon@sha.state.md.us

SUBRAT MAHAPATRA, MANAGER
Data Services Engineering Division
smahapatra@sha.state.md.us

MARYLAND STATE HIGHWAY ADMINISTRATION
707 North Calvert Street, C411
Baltimore, MD 21202
410-545-0412
shamobmd@sha.state.md.us