Baltimore Metropolitan Council

Quarterly Congestion Analysis Report for the Baltimore Region

Top 10 Bottleneck Locations

2nd Quarter 2016

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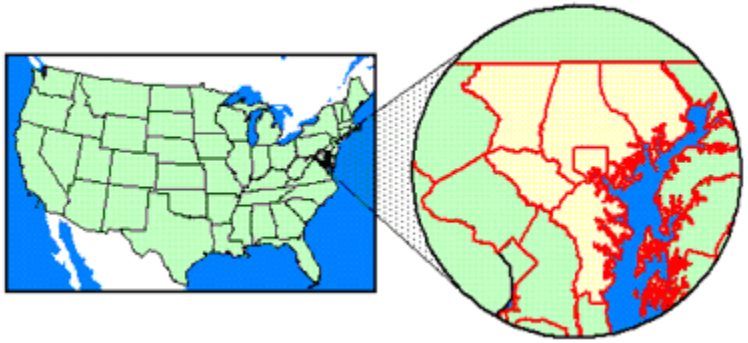
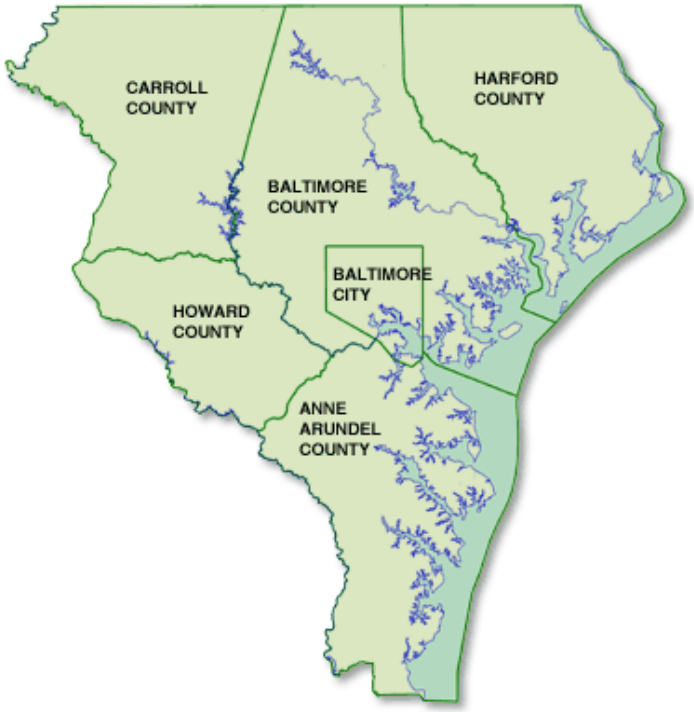
About the Region

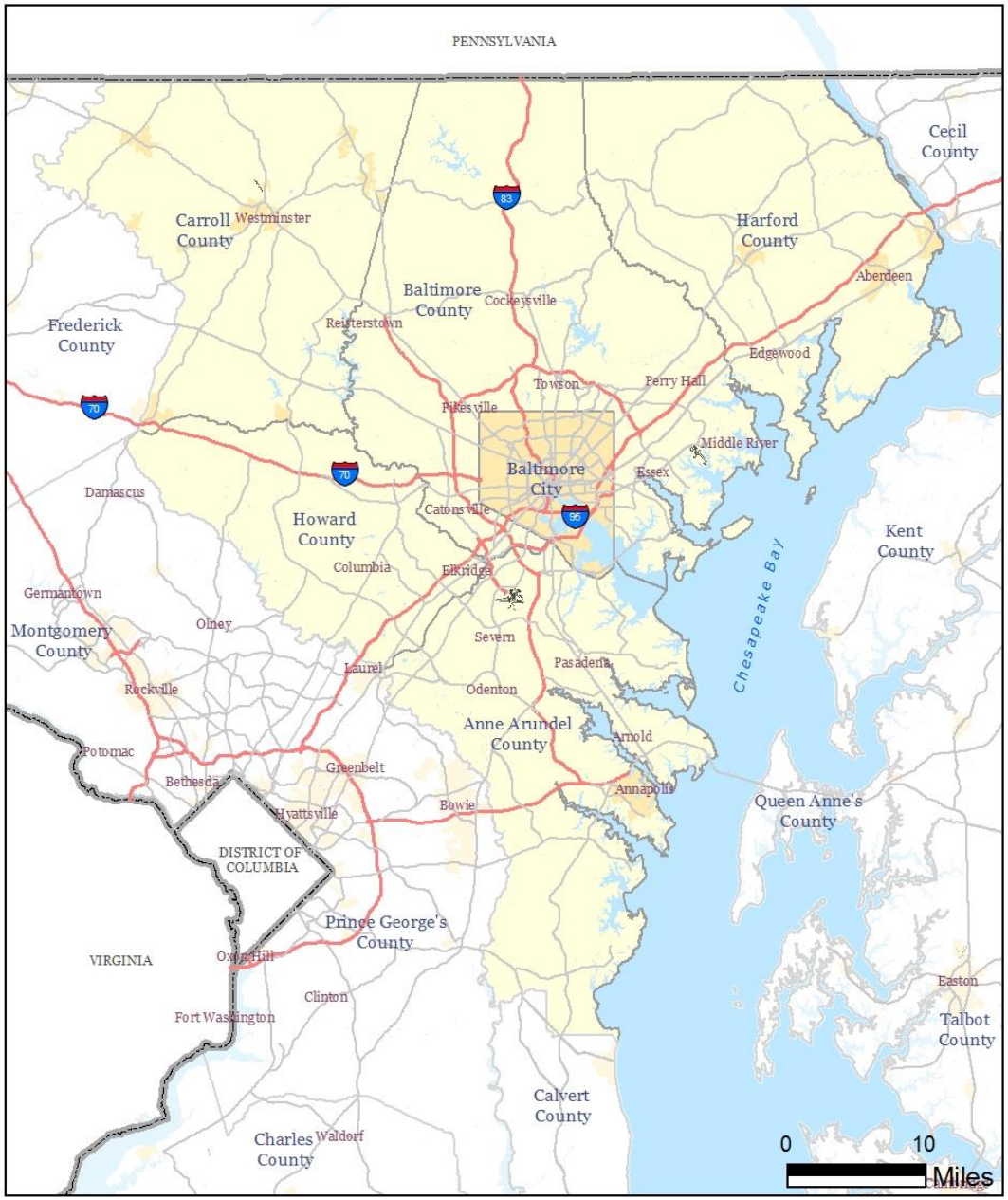
Located in the heart of the Mid-Atlantic on the east coast, the Baltimore region includes:

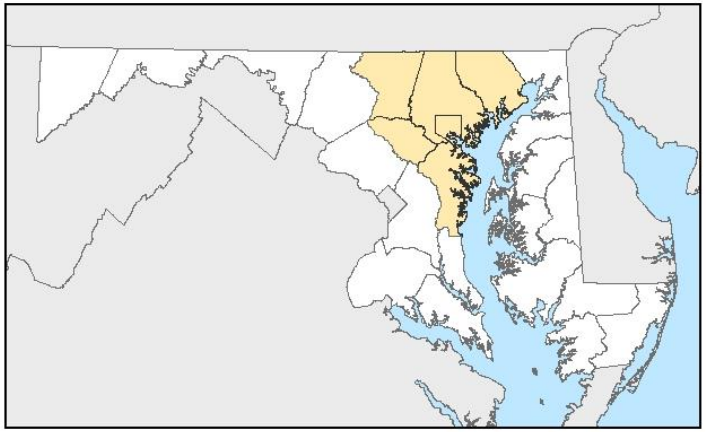




The Baltimore region is the nation's 19th largest market, with over 2.5 million people. The market also ranks among the top 20 in the country in the number of households, total effective buying income and retail sales.

Baltimore Metropolitan Region



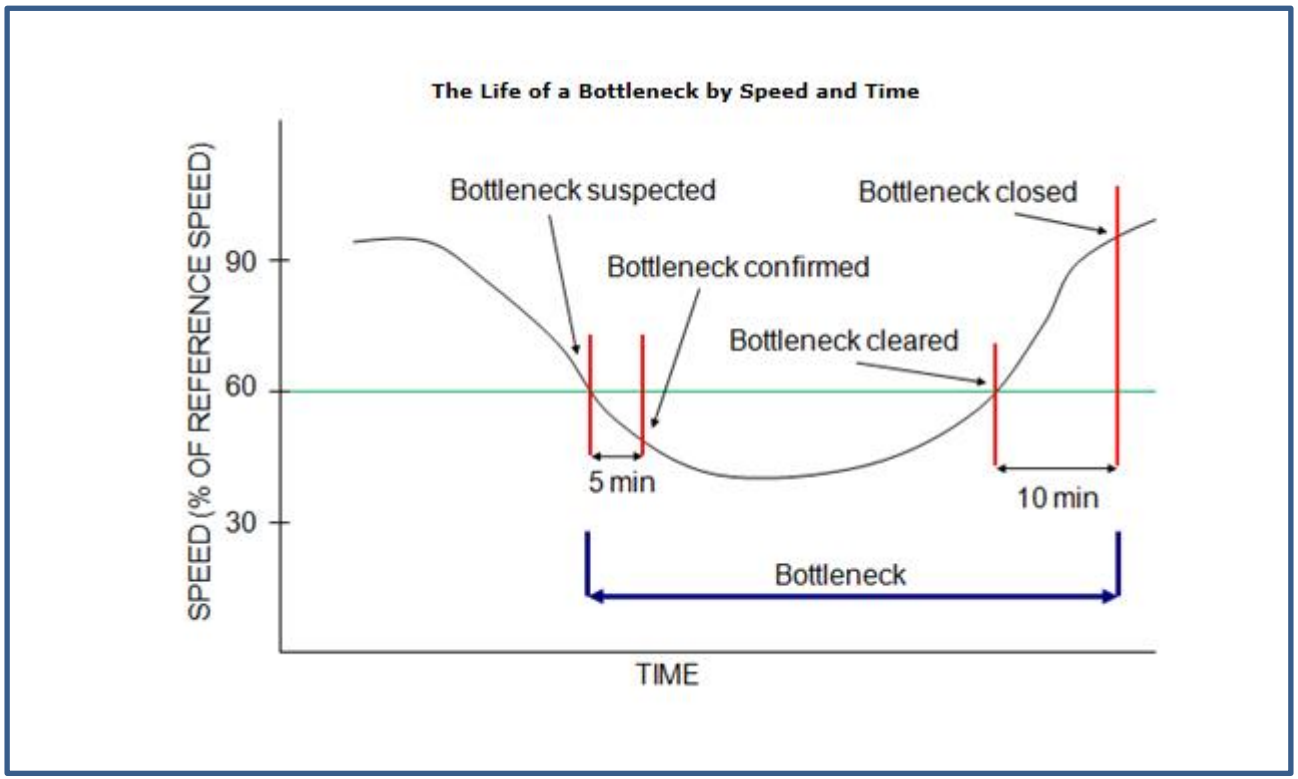


Prepared by
Transportation Planning Division
Projected Coordinate System: NAD 1983 State Plane (ft)
Data Source: BMC, © NAVTEQ 2013, TIGER/Line®, MTA
Printed - July 2013

How are bottleneck conditions tracked?

If the reported speed falls below 60% of the reference, the road segment is flagged as a potential bottleneck

Bottleneck conditions are determined by comparing the current reported speed to the reference speed for each segment of road. Reference speed values are provided by INRIX for each segment, and represent the 85th percentile observed speed for all time periods, with a maximum value of 65 mph. If the reported speed falls below 60% of the reference, the road segment is flagged as a potential bottleneck. If the reported speed stays below 60% for five minutes, the segment is confirmed as a bottleneck location. Adjacent road segments meeting this condition are joined together to form the bottleneck queue. When reported speeds on every segment associated with a bottleneck queue have returned to values greater than 60% of their reference values and remained that way for 10 minutes, the bottleneck is considered cleared. Bottlenecks whose total queue length, determined by adding the length of each road segment associated with the bottleneck is less than 0.3 miles are ignored. Queues may originate outside the Baltimore region but are reported on if any portion extends into the region.



How are bottleneck conditions tracked?

Bottleneck Ranking Table

Rank	Map	Bottleneck head location	Impact	Average max...	Average daily dur...	Total duration	All Events/Inc...
1	☑	I-495 CW @ CLARA BARTON PKWY/EXIT 41	32,170.11	3.67	5 h 51 m	7 d 07 h 57 m	18
2	☐	I-495 CW @ I-270 SPUR	27,167.59	5.25	2 h 45 m	3 d 10 h 48 m	57
3	☐	I-95 N @ MD-100/EXIT 43	23,117.99	5.08	2 h 50 m	3 d 13 h 01 m	113
4	☑	I-495 CCW @ MD-97/GEORGIA AVE/EXIT 31	22,657.46	2.72	4 h 35 m	5 d 17 h 30 m	205
5	☐	I-495 CW @ MD-214/CENTRAL AVE/EXIT 15	22,505.20	3.43	3 h 25 m	4 d 06 h 41 m	368
6	☐	I-270 S @ MD-109/EXIT 22	21,832.78	4.45	3 h 09 m	3 d 22 h 48 m	50
7	☐	I-695 CW @ MD-41/PERRING PKWY/EXIT 30	21,655.03	2.91	3 h 17 m	4 d 02 h 48 m	149

The Bottleneck Ranking Table will display a list of locations identified as being bottlenecks along with some additional information for each location, including:

- *Rank* - The ranked position of the location according to the current table ordering (*Impact* by default)
- *Impact* - The aggregation of queue length over time for congestion originating at each location in mile-minutes. For example, if at time t1 an element has congestion covering one mile of the roadway, it has an impact of 1. If the congestion then grows at time t2 to cover 2 miles, the location will now have an impact of 3. If at time t3 congestion shrinks to 1 mile, and at t4 there is no congestion, the element will have a final impact of 4.
- *Average max length* - The average maximum length, in miles, of queues formed by congestion originating at the location
- *Average daily duration* - The average amount of time per day that congestion is identified originating at the location
- *Total duration* - The total amount of time congestion was identified at the location
- *All Events/Incidents* - The number of traffic events and incidents that occurred within the space of the bottleneck at any time during the time period being analyzed

Bottleneck Ranking Incident Icons

When showing event/incident icons on some of the graphs in the Bottleneck Ranking tool a minimalist approach has been taken. In order to reduce clutter and confusion on the graphs, icons have been simplified down to single shape and color. Each represents the following:

Red — Severe events and incidents

- Emergency Roadwork
- Injury
- Medical Emergency

Orange — Roadwork

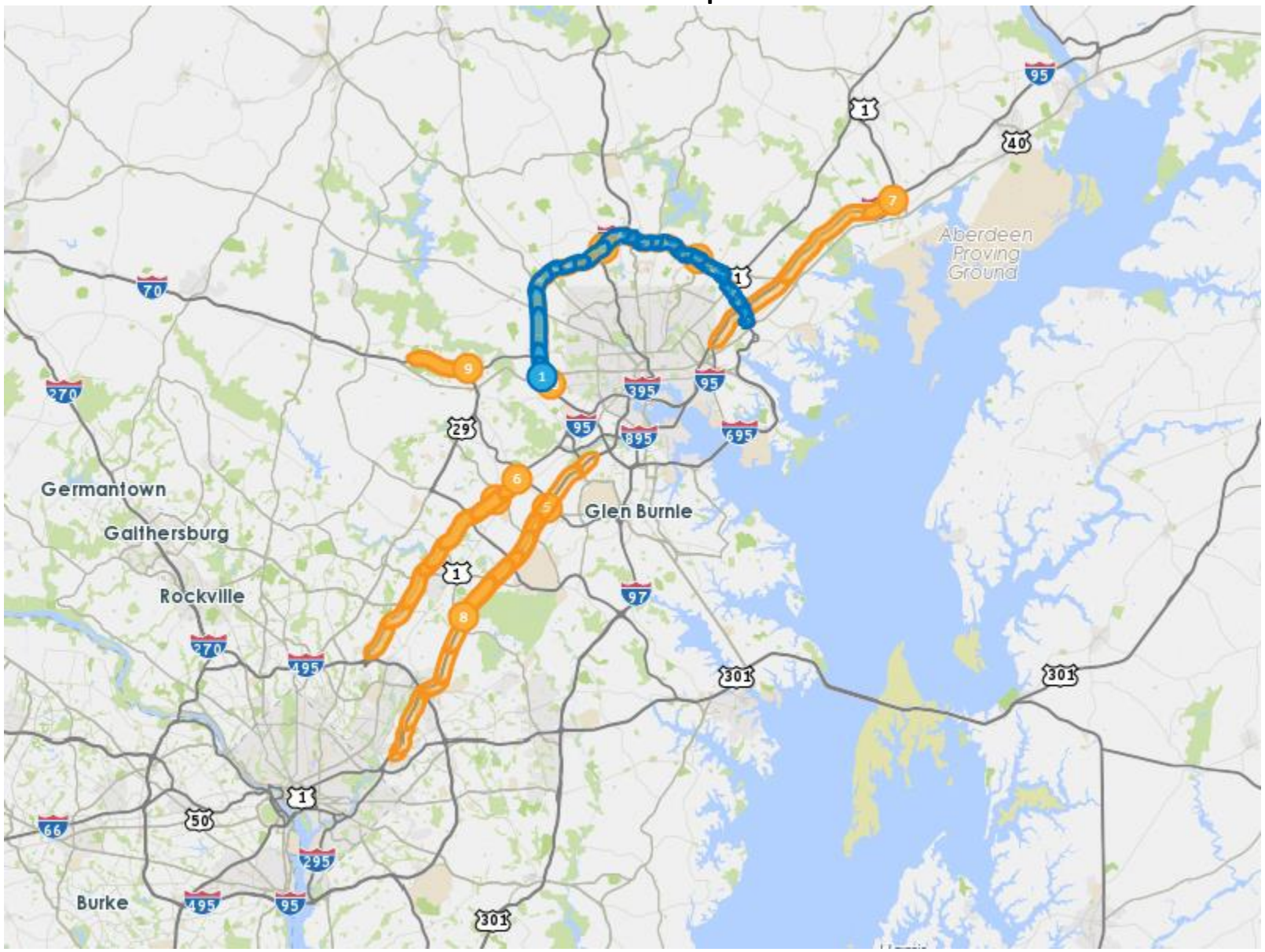
Yellow — All other events and incidents

More detailed icons may be used at times when a major incident was the cause of a bottleneck.

Incident/Event Icons

Top 10 Bottlenecks in the Baltimore Region
2nd Quarter 2016

Overview Map



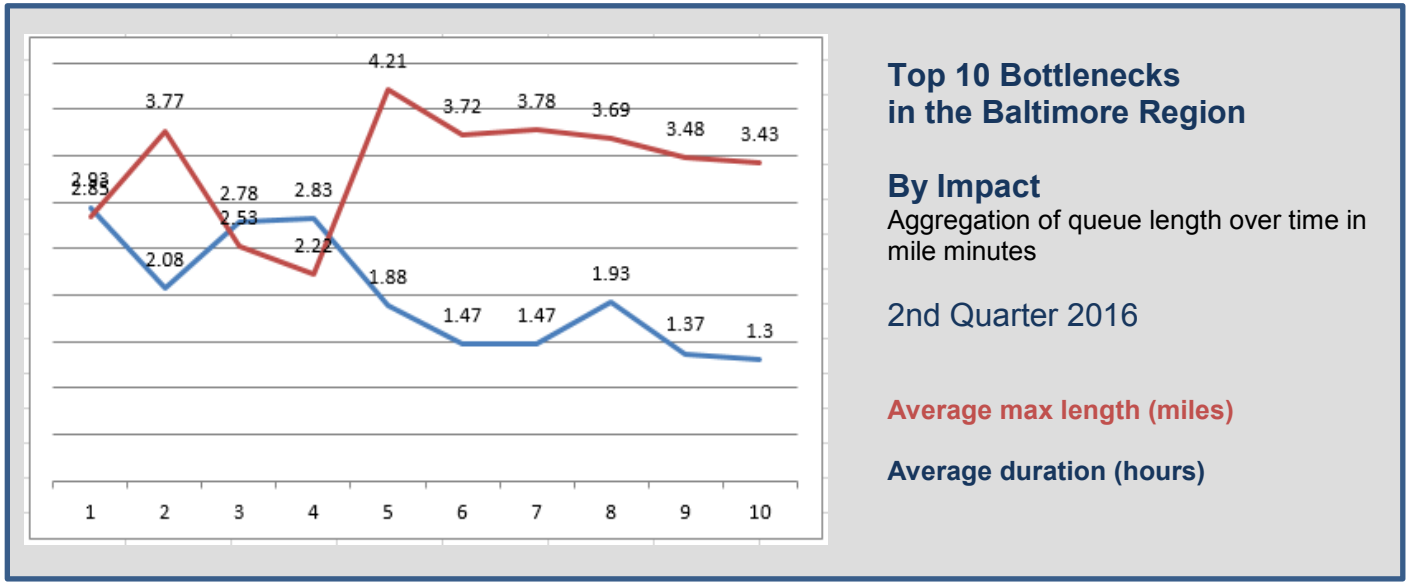
Top 10 Bottlenecks in the Baltimore Region
2nd Quarter 2016

By Impact

The aggregation of queue length over time for congestion originating at each location in mile minutes. This table indicates the top 10 congested corridors in the region.

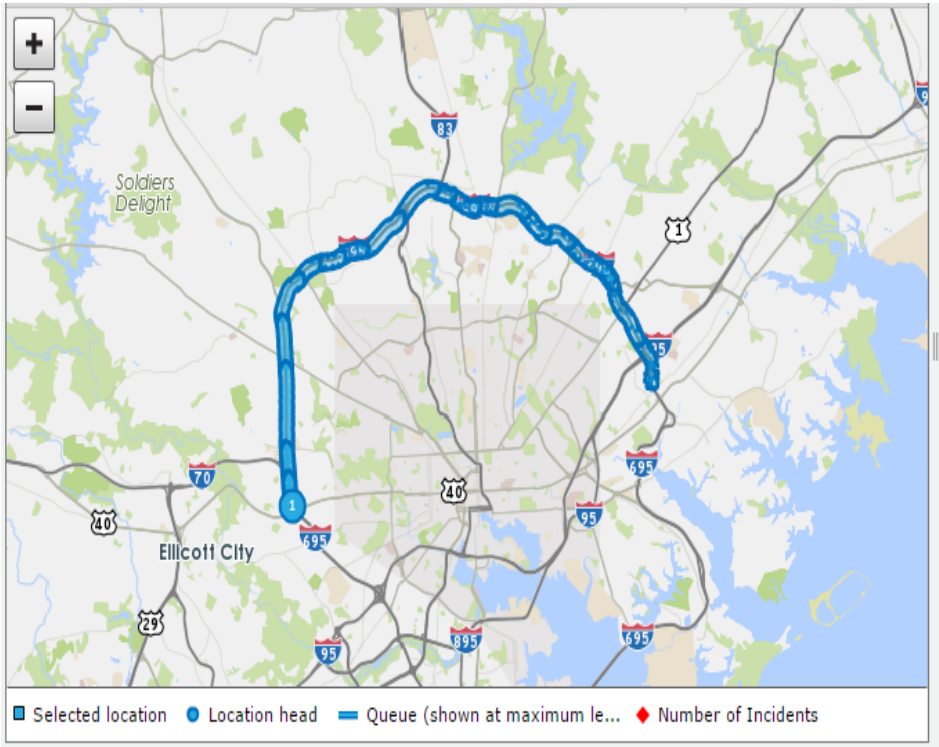
	Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events Incidents
1	I-695 OL @ US-40/EXIT 15	41729	2.85	2 h 56 m	11 d 03 h 42 m	754
2	I-95 N @ MD-175/EXIT 41	41482	3.77	2 h 05 m	7 d 21 h 53 m	280
3	I-695 IL @ MD-41/PERRING PKWY/EXIT 30	41303	2.53	2 h 47 m	10 d 14 h 03 m	518
4	I-695 IL @ I-83/MD-25/EXIT 23	36944	2.22	2 h 50 m	10 d 19 h 18 m	263
5	MD-295 N @ MD-100	36879	4.21	1 h 53 m	7 d 04 h 32 m	206
6	I-95 N @ MD-100/EXIT 43	30170	3.72	1 h 28 m	5 d 14 h 34 m	310
7	I-95 N @ MD-24/EXIT 77	29873	3.78	1 h 28 m	5 d 14 h 36 m	394
8	MD-295 S @ MD-197/EXIT 11	28763	3.69	1 h 56 m	7 d 09 h 20 m	257
9	I-70 E @ US-29/EXIT 87	26210	3.48	1 h 22 m	5 d 05 h 43 m	20
10	I-695 OL @ EDMONDSON AVE/EXIT 14	25895	3.43	1 h 18 m	4 d 23 h 03 m	778

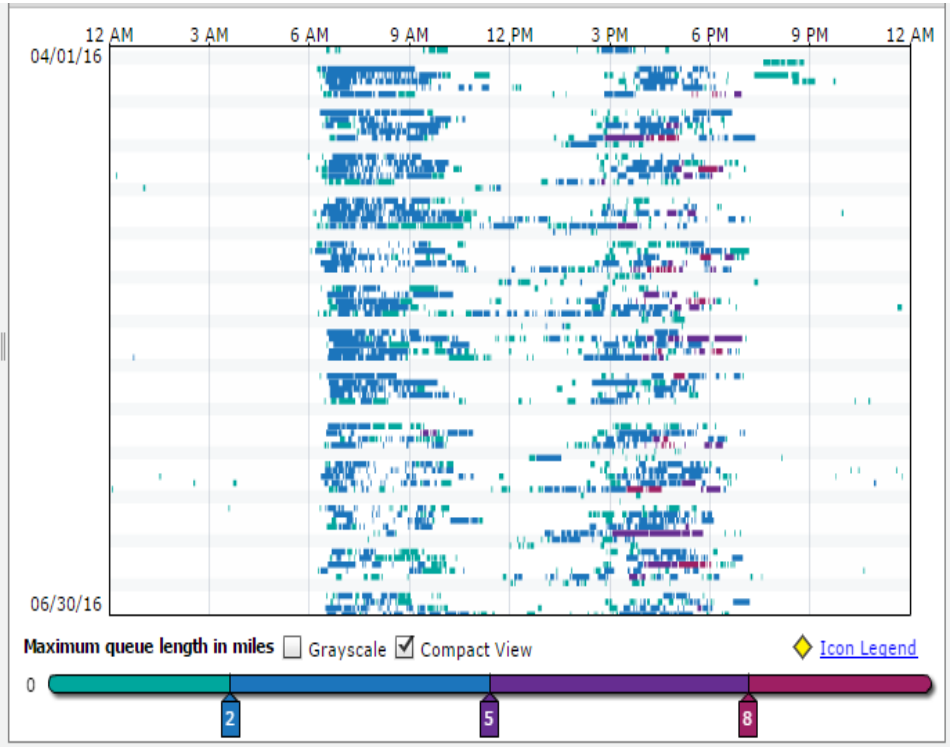
IL = Inner Loop OL = Outer Loop NB = Northbound SB = Southbound EB = Eastbound WB = Westbound



#1 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-695 OL @ US-40/Exit 15	41,729	2.85	2 h 56 m	11 d 03 h 42 m	754

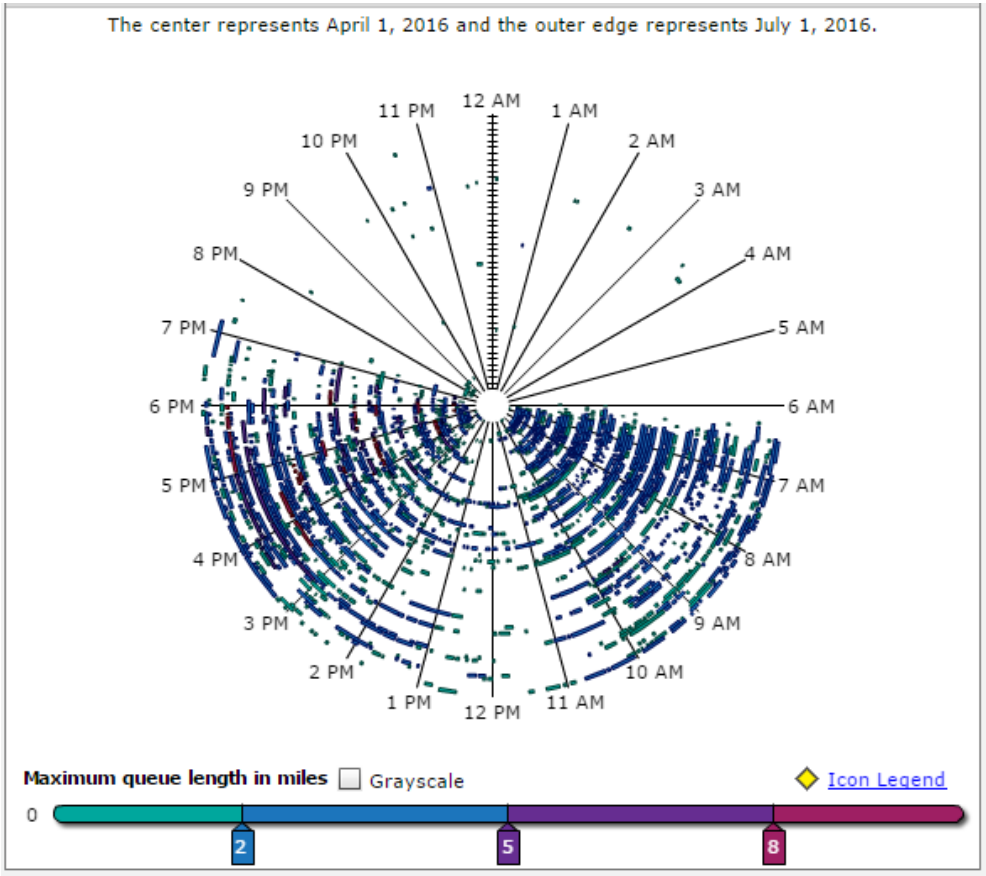




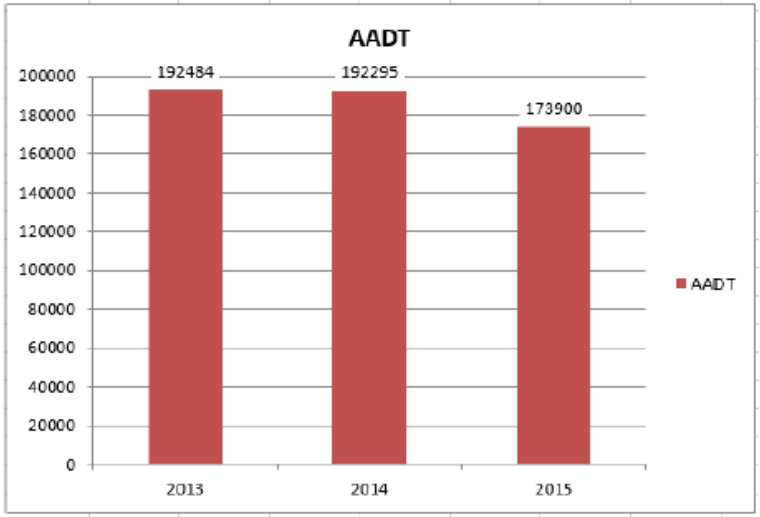
Notes: Delays found in both the morning and afternoon. Longstanding bottleneck on the outer loop of the beltway primarily during the morning rush. High traffic volume area. Also contributing to congestion in the area is a beltway widening project.

#1 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-695 OL @ US-40/Exit 15	41,729	2.85	2 h 56 m	11 d 03 h 42 m	754

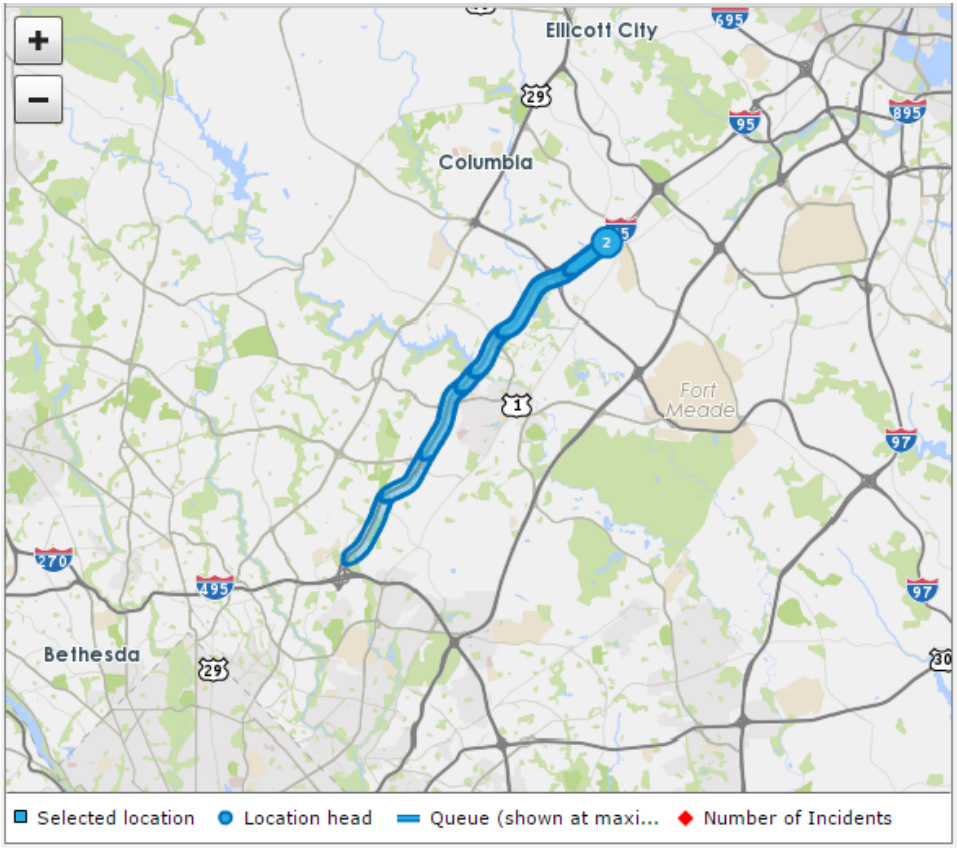


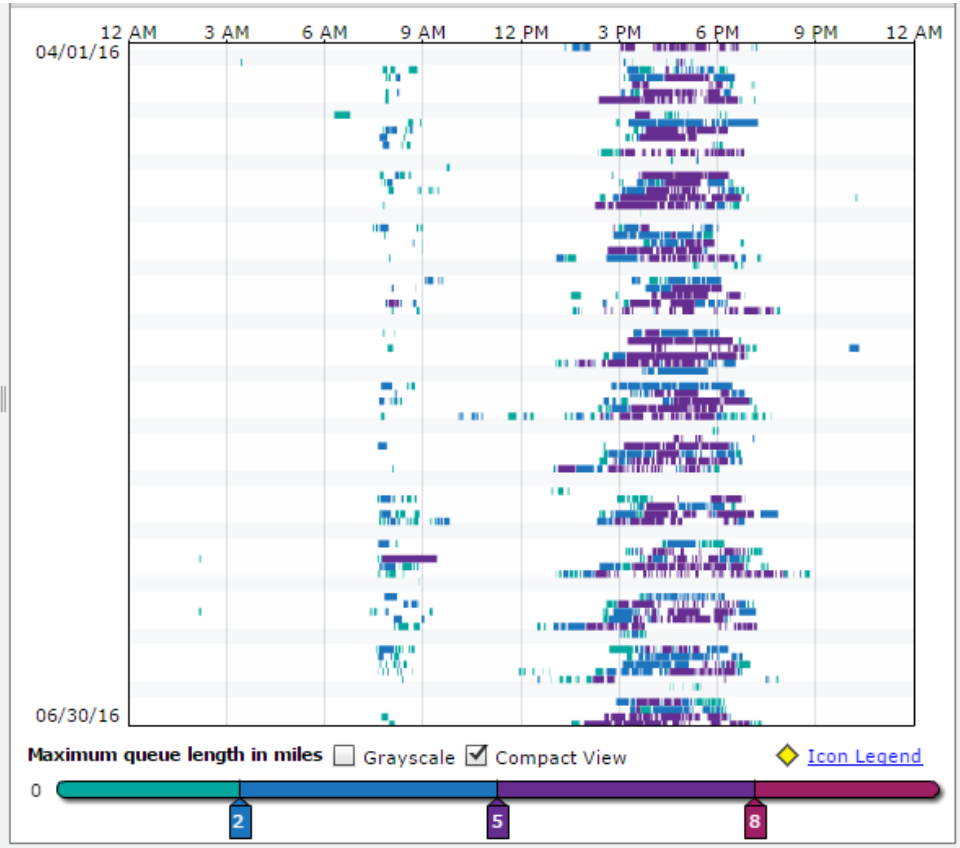
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS695-.50 MI S OF IS70



#2 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-95 N @ MD-175/Exit 41	41,482	3.77	2 h 05 m	7 d 21 h 53 m	280

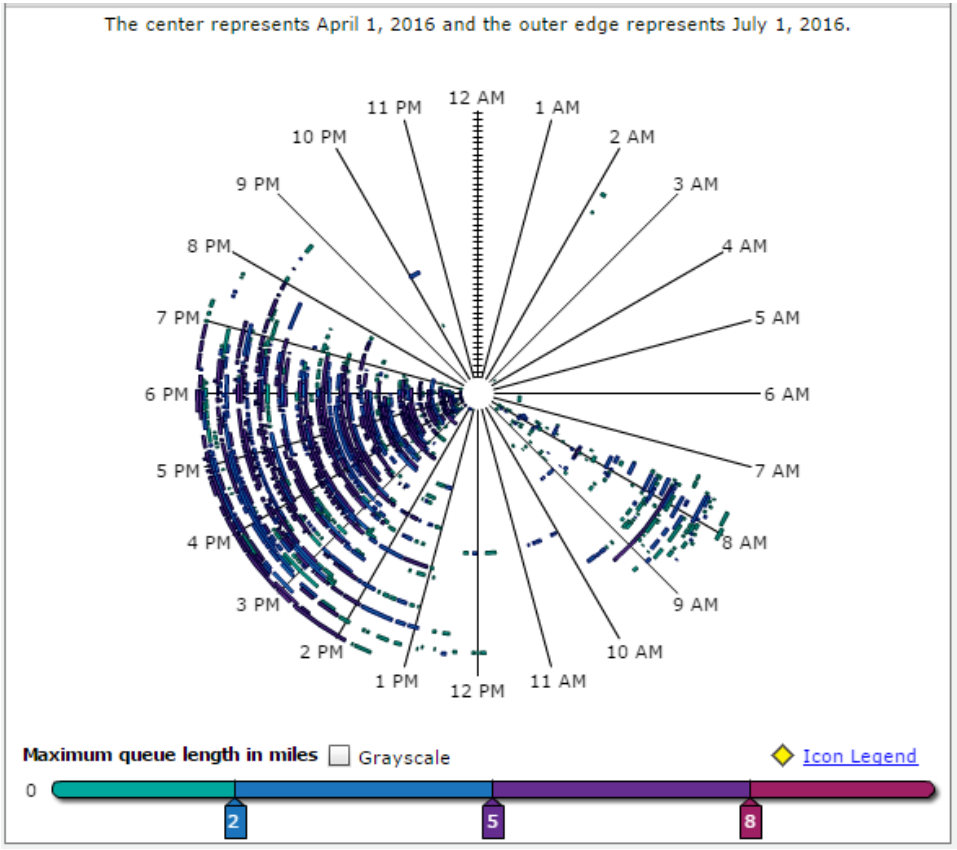




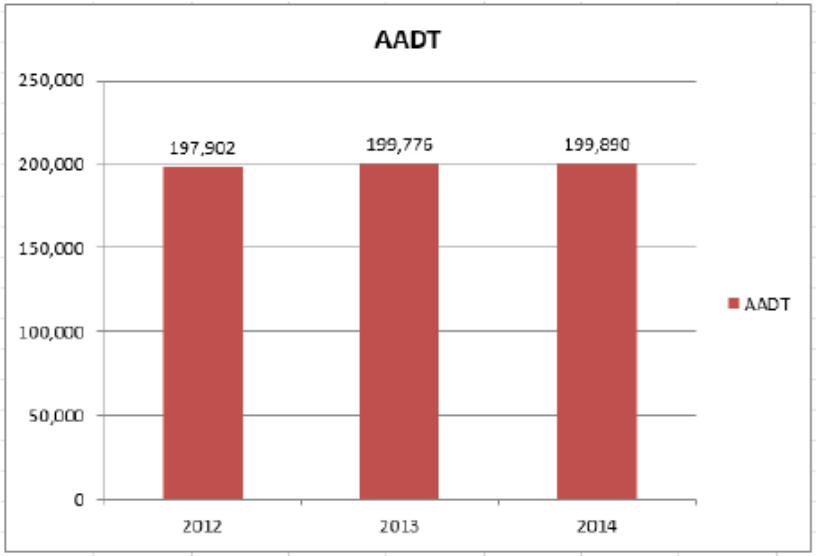
Notes: Congestion in the afternoon rush hour. Contributing factors include traffic entering at MD-175, weaving to exit at MD-100, and the half-mile uphill grade midway between MD-175 and MD-100.

#2 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-95 N @ MD-175/Exit 41	41,482	3.77	2 h 05 m	7 d 21 h 53 m	280

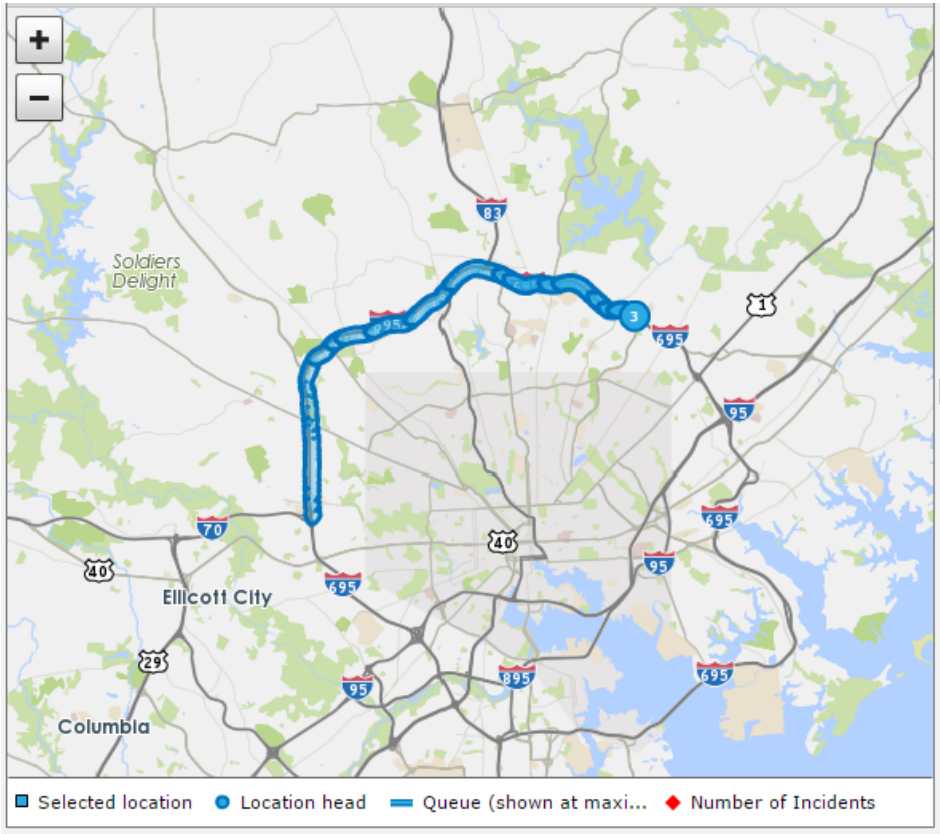


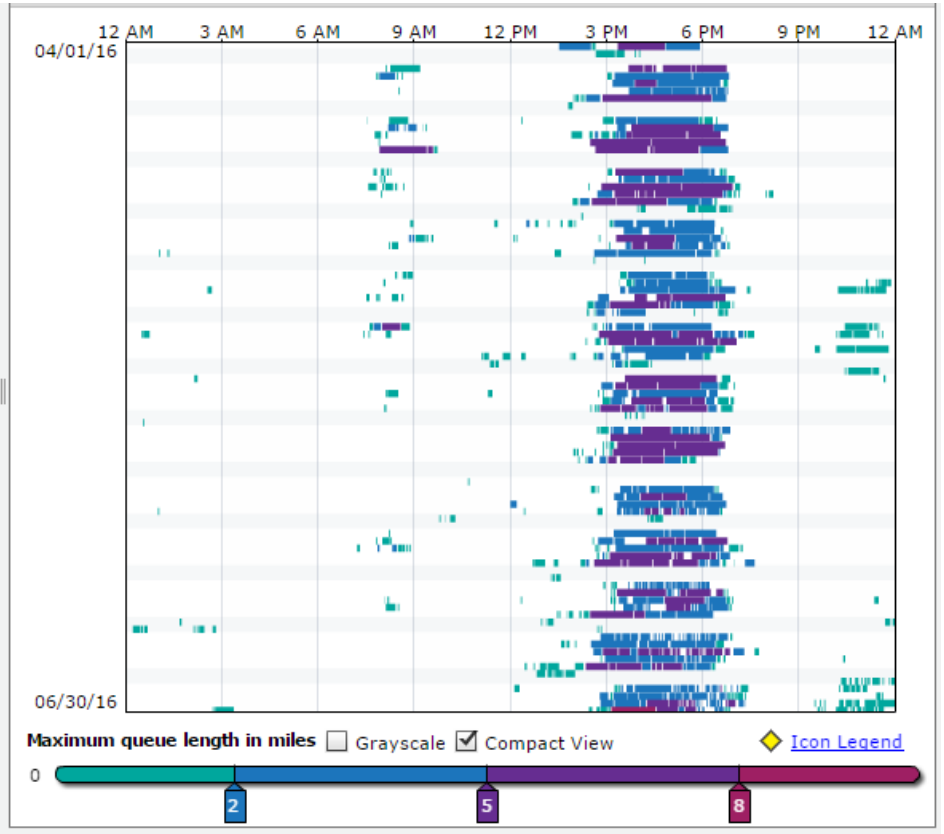
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS 95 South of MD 103 (ATR#39)



#3 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-695 IL @ MD-41/Perring Pkwy/Exit 30	41,303	2.53	2 h 47 m	10 d 14 h 03 m	518

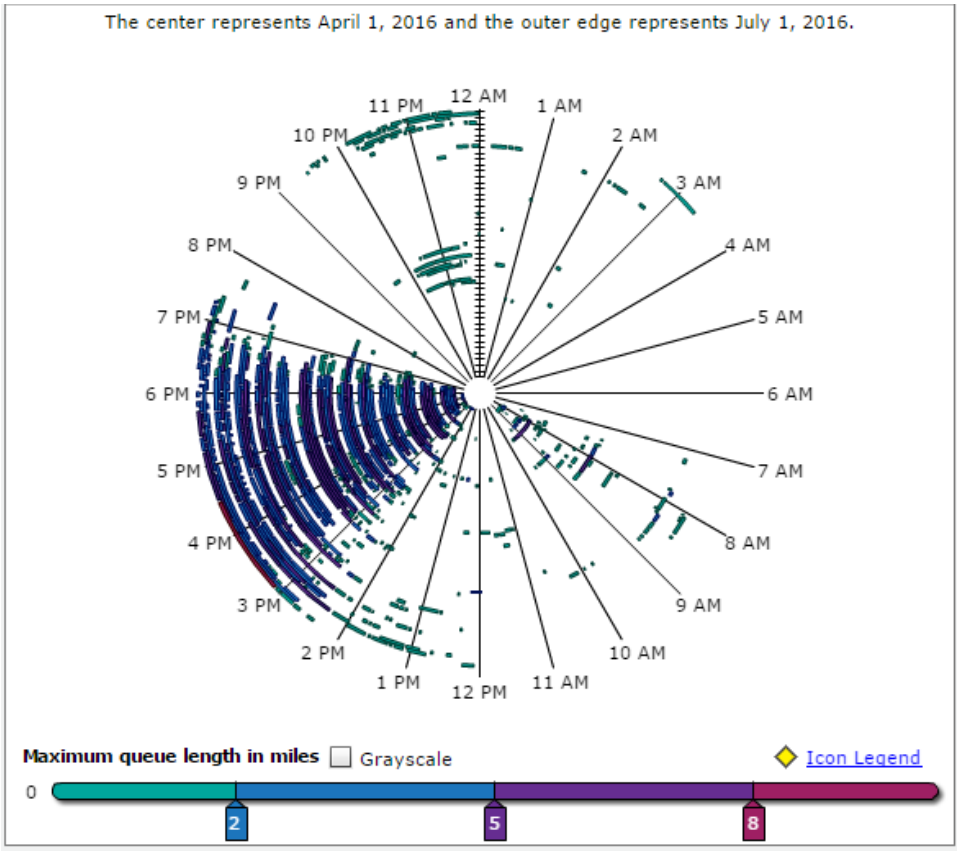




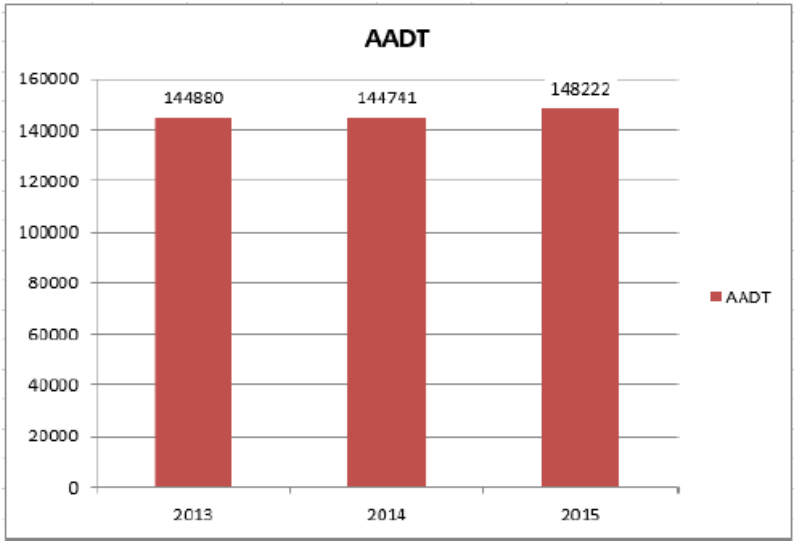
Notes: Congestion was most severe between I-83 and Providence Rd in the afternoon PM peak period. Factors contributing to this long standing and extended congested zone: merging and weaving associated with traffic at each interchange and a lane drop (to 3 lanes) at MD-45/York Rd.

#3 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-695 IL @ MD-41/Perring Pkwy/Exit 30	41,303	2.53	2 h 47 m	10 d 14 h 03 m	518

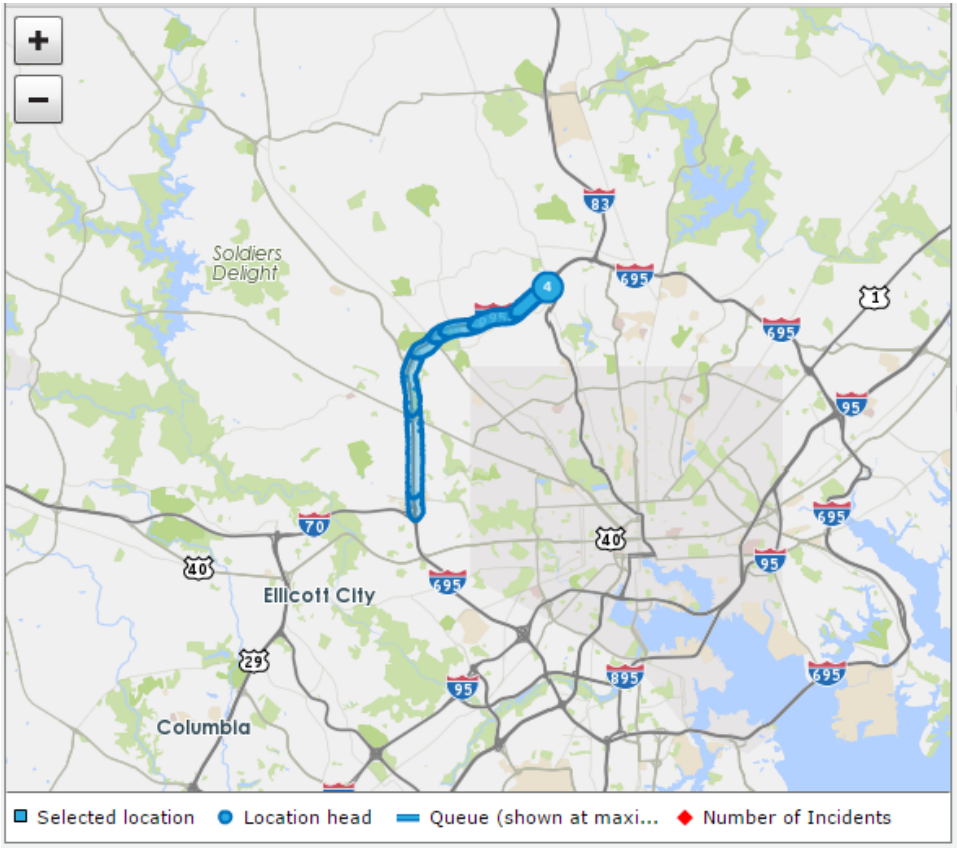


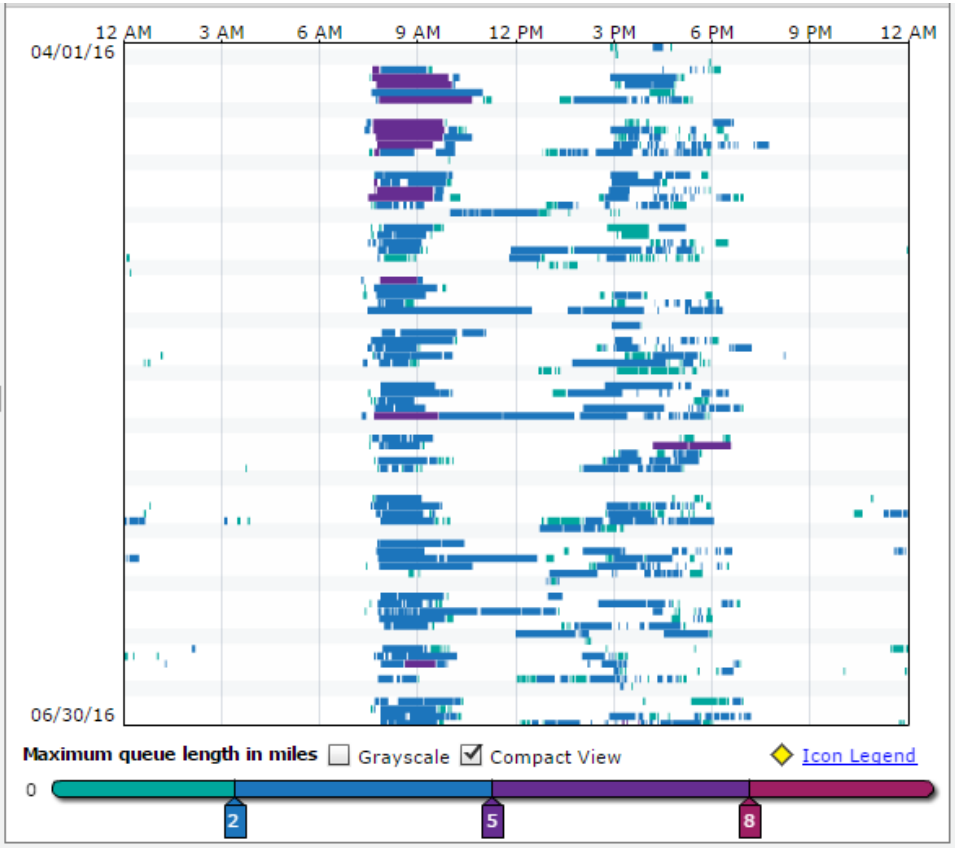
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS695-.20 MI E OF MD542



#4 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-695 IL @ I-83/MD-25/Exit 23	36,944	2.22	2 h 50 m	10 d 19 h 18 m	263

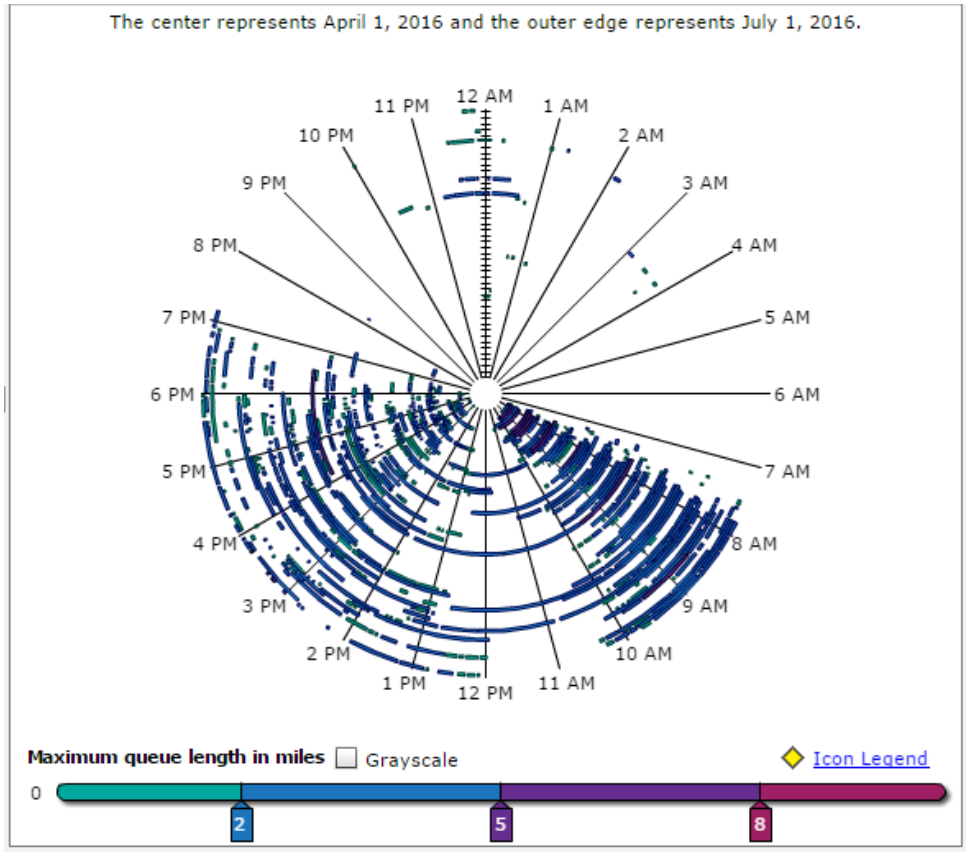




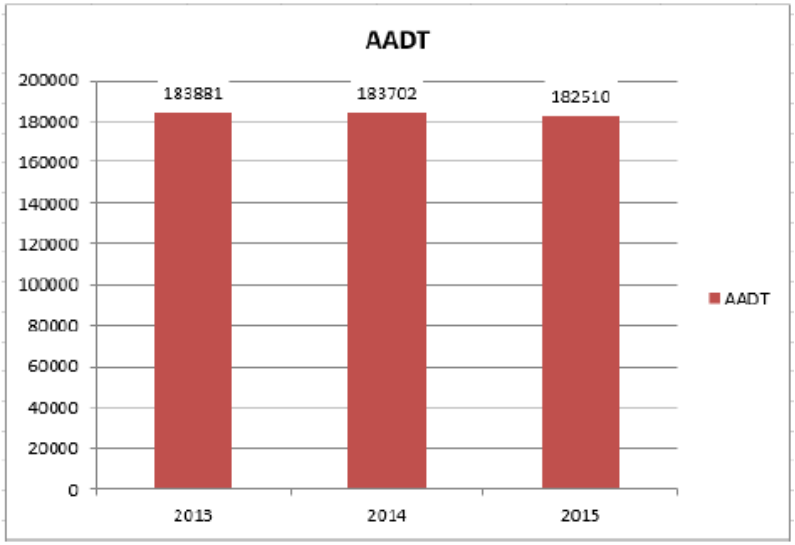
Notes: Rush hour congestion more severe during the AM peak period. The lane drop approaching the ramp to southbound I-83 is a contributing factor, as are merging and weaving at the interchanges in this segment.

#4 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2015

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-695 IL @ I-83/MD-25/Exit 23	36,944	2.22	2 h 50 m	10 d 19 h 18 m	263

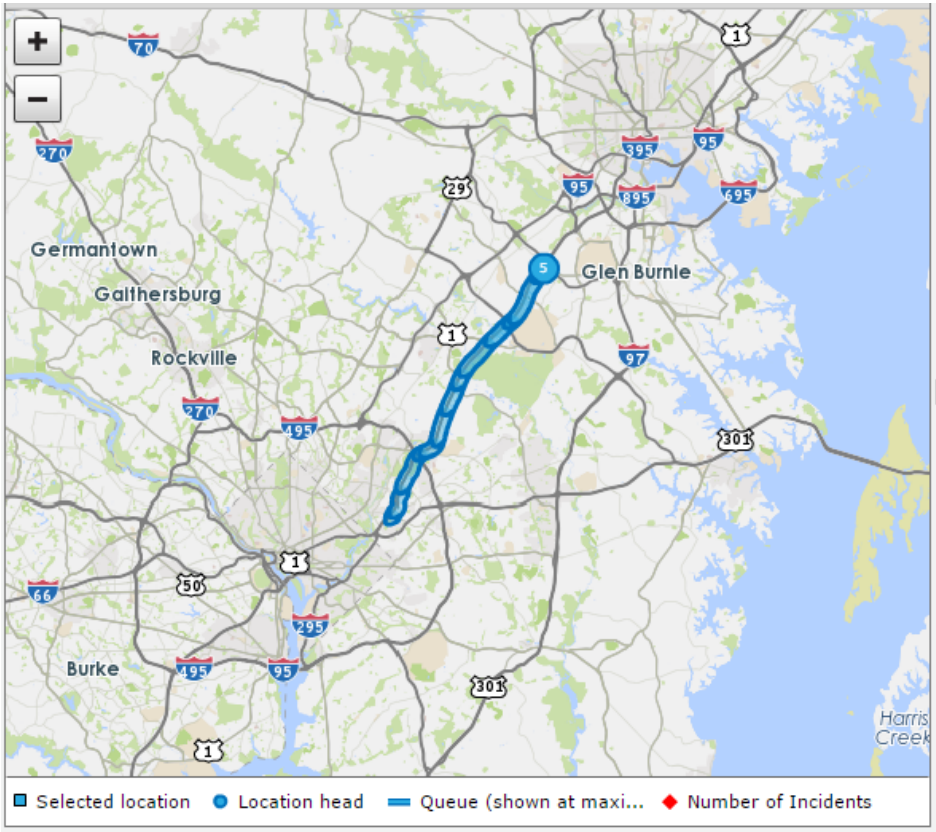


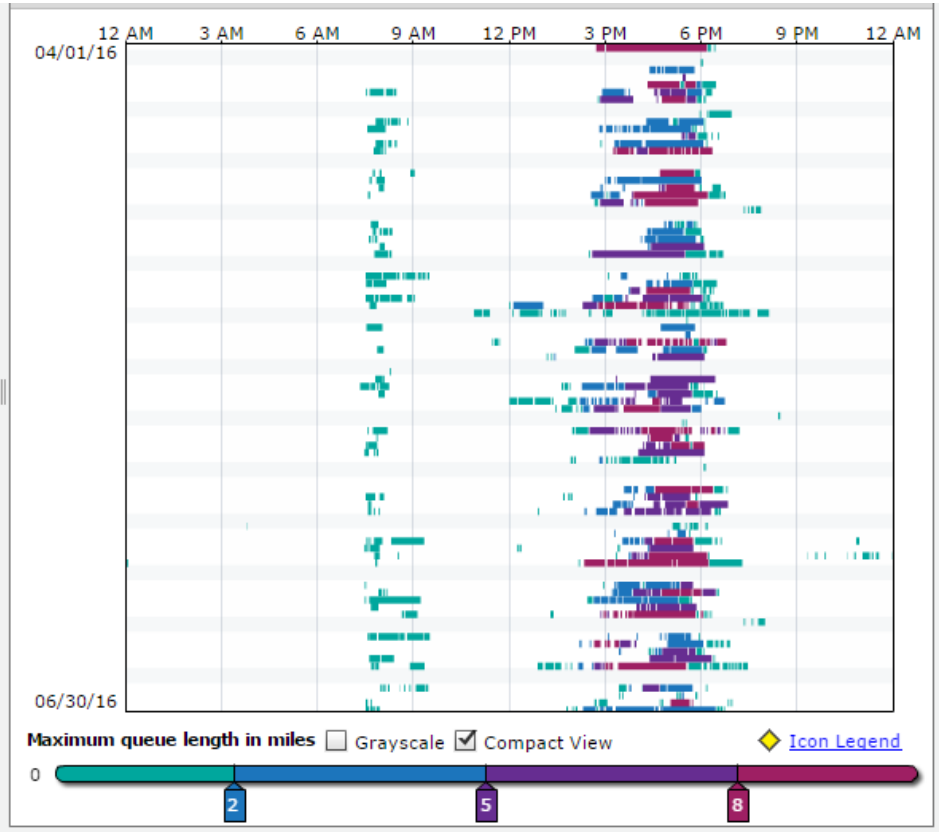
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS695-.50 MI N OF GREENSPRING AVE



#5 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
MD-295 N @ MD-100	36,879	4.21	1 h 53 m	7 d 04 h 32 m	206

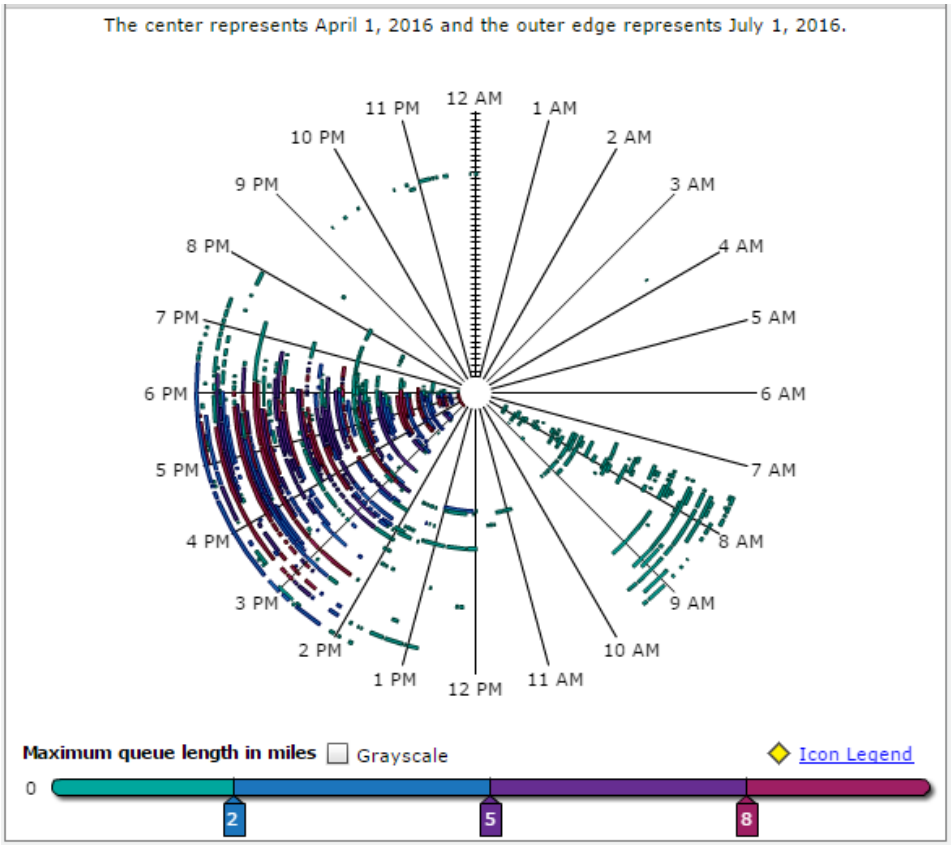




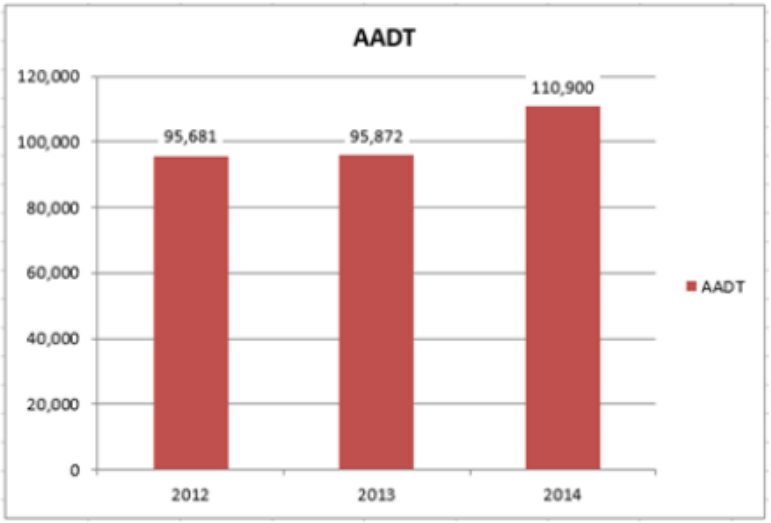
Notes: Recurring afternoon congestion. Level of Service "F" from 4:00 to 5:00pm. A primary cause appeared to be the discharge of traffic from NSA / Ft. Meade onto northbound MD 295 via the Connector Rd. Weaving and merging at the MD 32 interchange also contributed to the congestion.

#5 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
MD-295 N @ MD-100	36,879	4.21	1 h 53 m	7 d 04 h 32 m	206

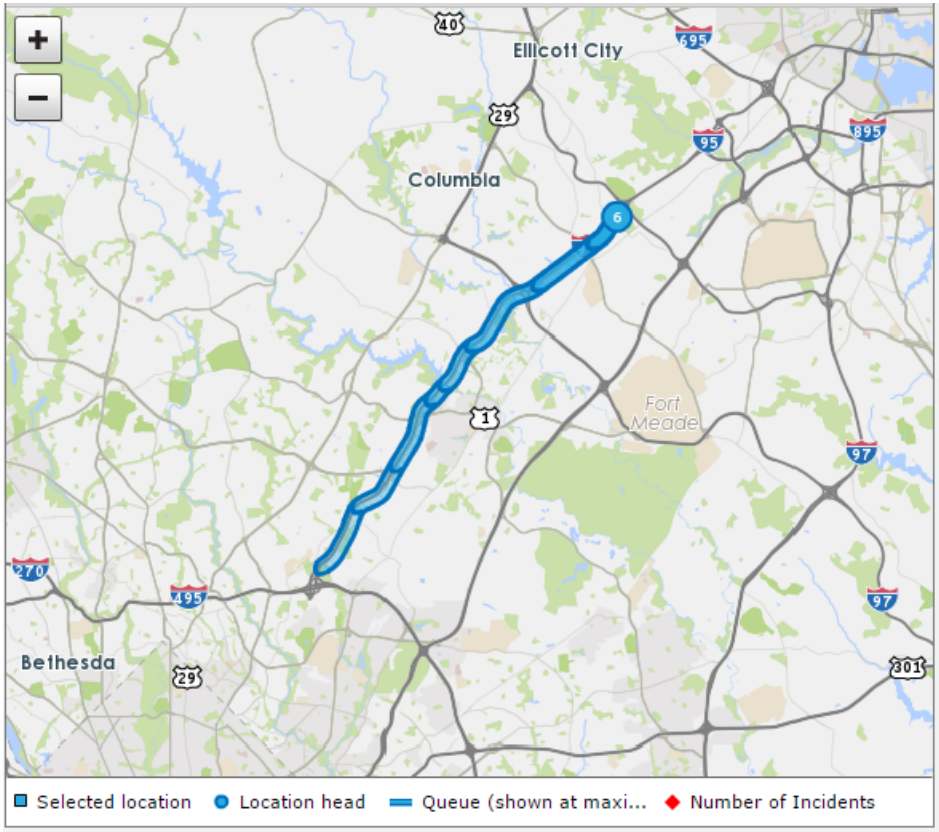


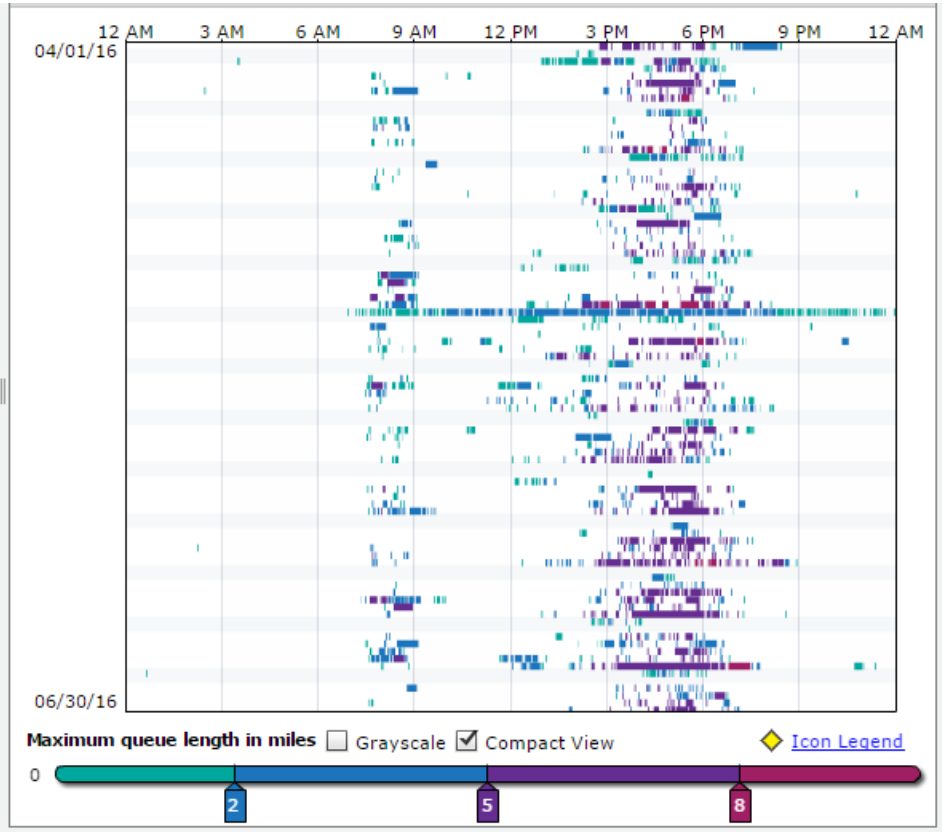
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.25 MI S OF MD175



#6 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 201

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-95 N @ MD-100/Exit 43	30,170	3.72	1 h 28 m	5 d 14 h 34 m	310

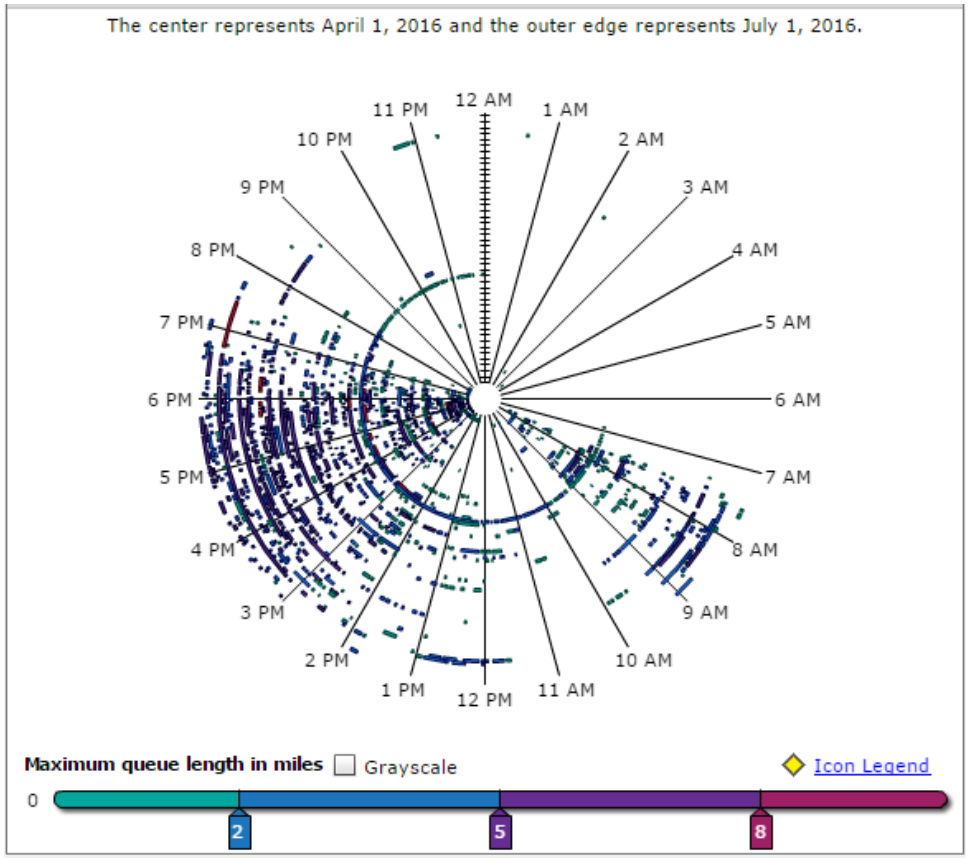




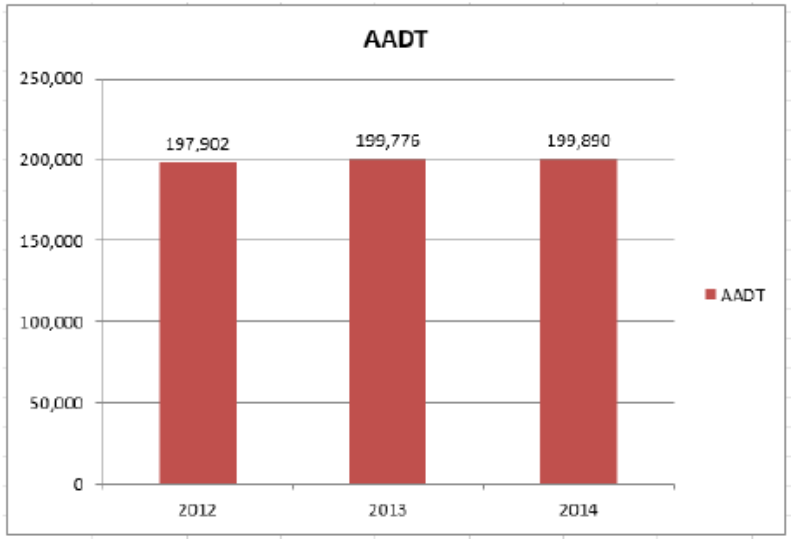
Notes: Congestion in the afternoon rush hour. Contributing factors include traffic entering at MD-175, weaving to exit at MD-100, and the half-mile uphill grade midway between MD-175 and MD-100.

#6 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-95 N @ MD-100/Exit 43	30,170	3.72	1 h 28 m	5 d 14 h 34 m	310

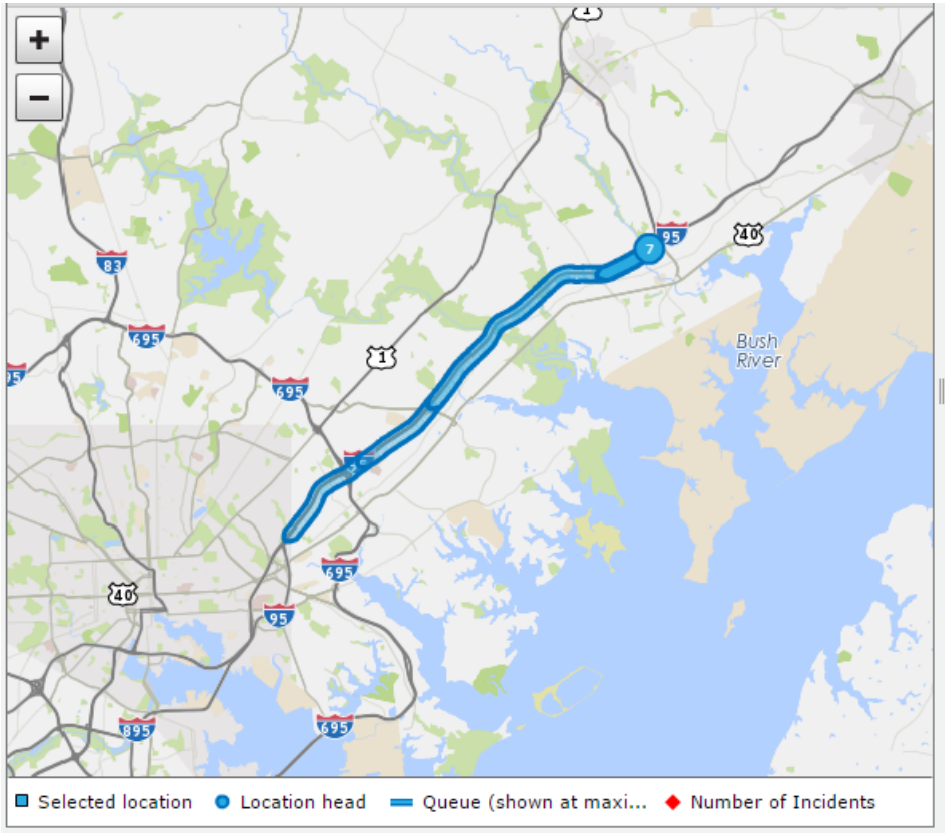


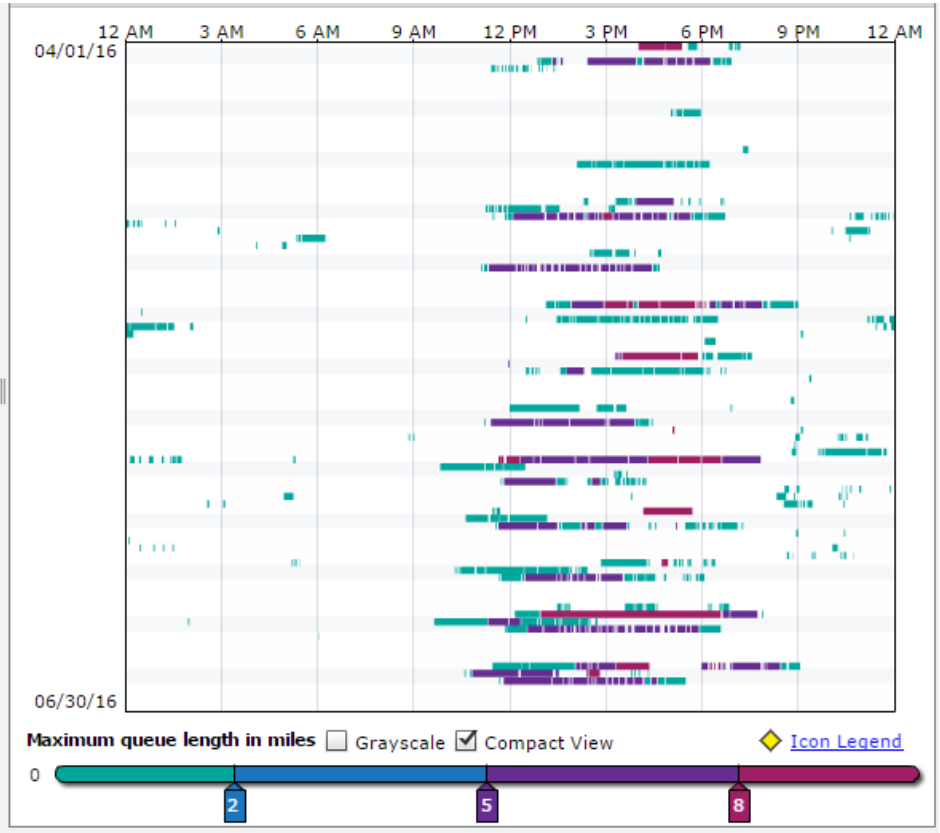
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS 95 South of MD 103 (ATR#39)



#7 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-95 N @ MD-24/Exit 77	29873	3.78	1 h 28 m	5 d 14 h 36 m	394

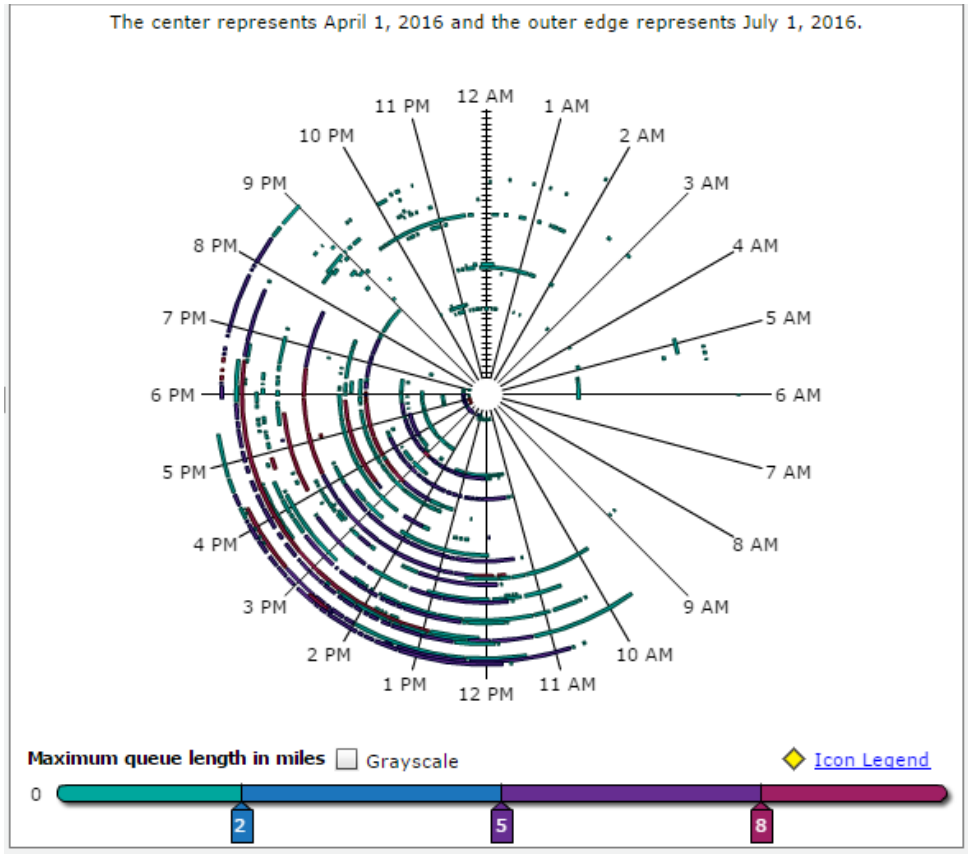




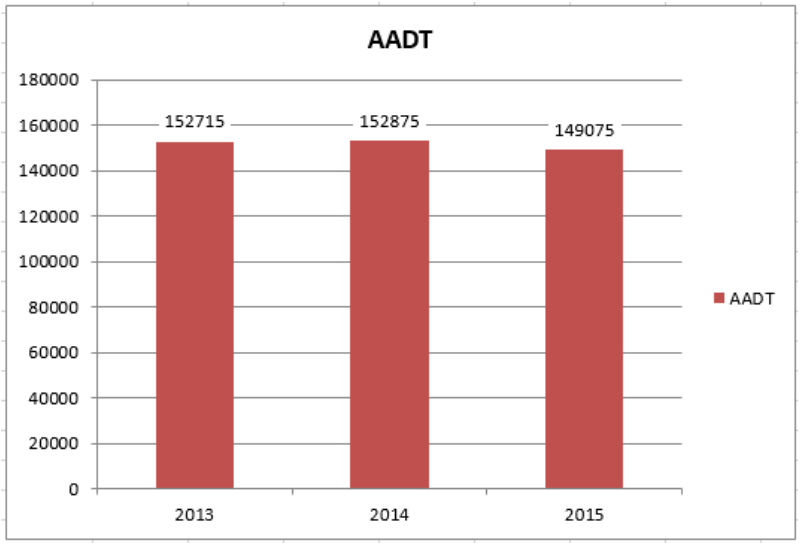
Notes: Heavy traffic generated minor delays north of MD-43 on some afternoons; weaving / merging associated with the end of the I-95 Express Toll Lane contributed to the congestion.

#7 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-95 N @ MD-24/Exit 77	29873	3.78	1 h 28 m	5 d 14 h 36 m	394

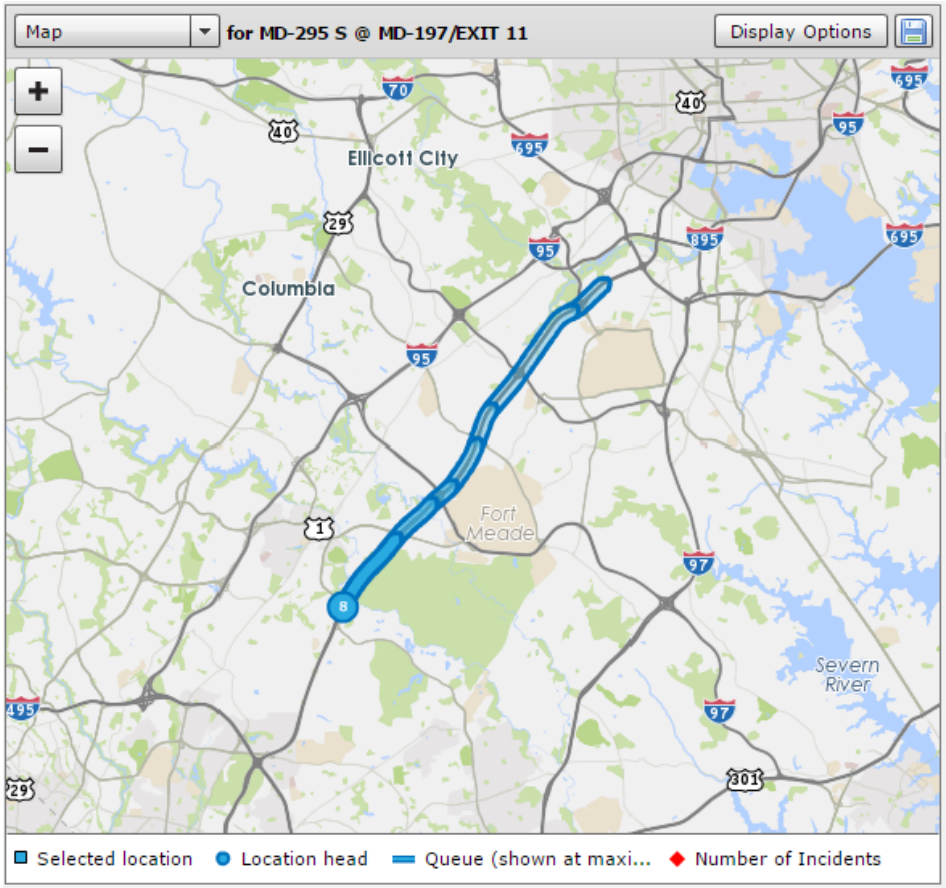


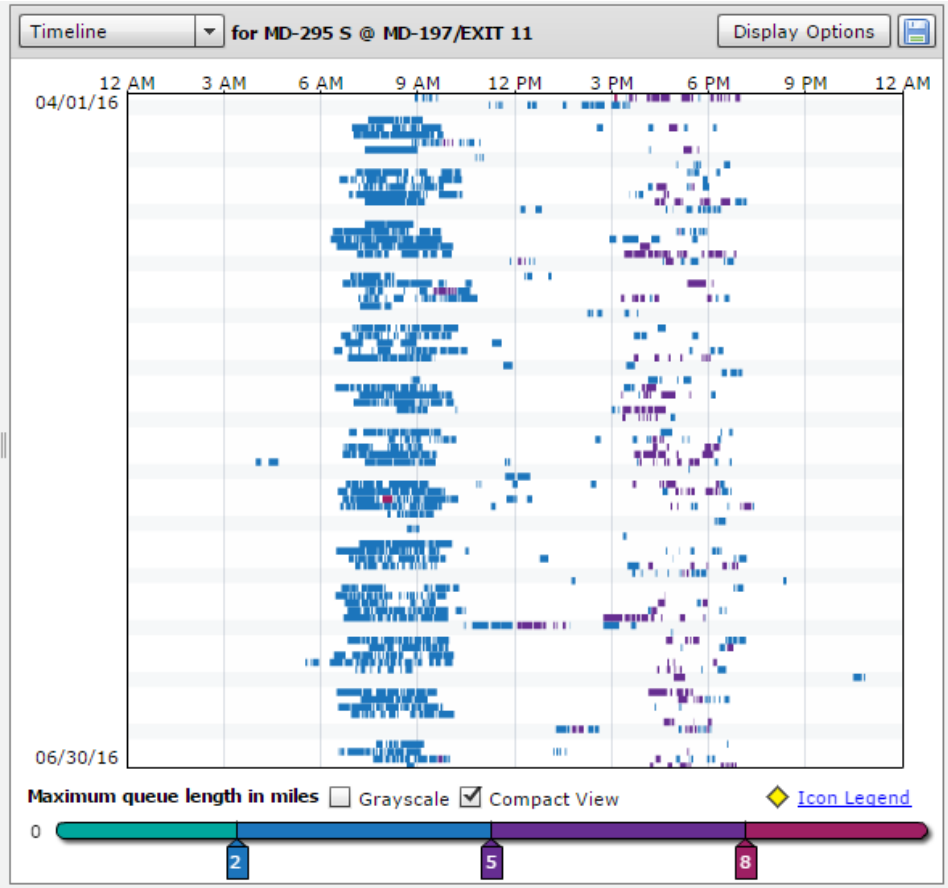
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION



#8 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
MD-295 S @ MD-197/Exit 11	28,763	3.69	1 H 56 M	7 D 09 H 20 M	257

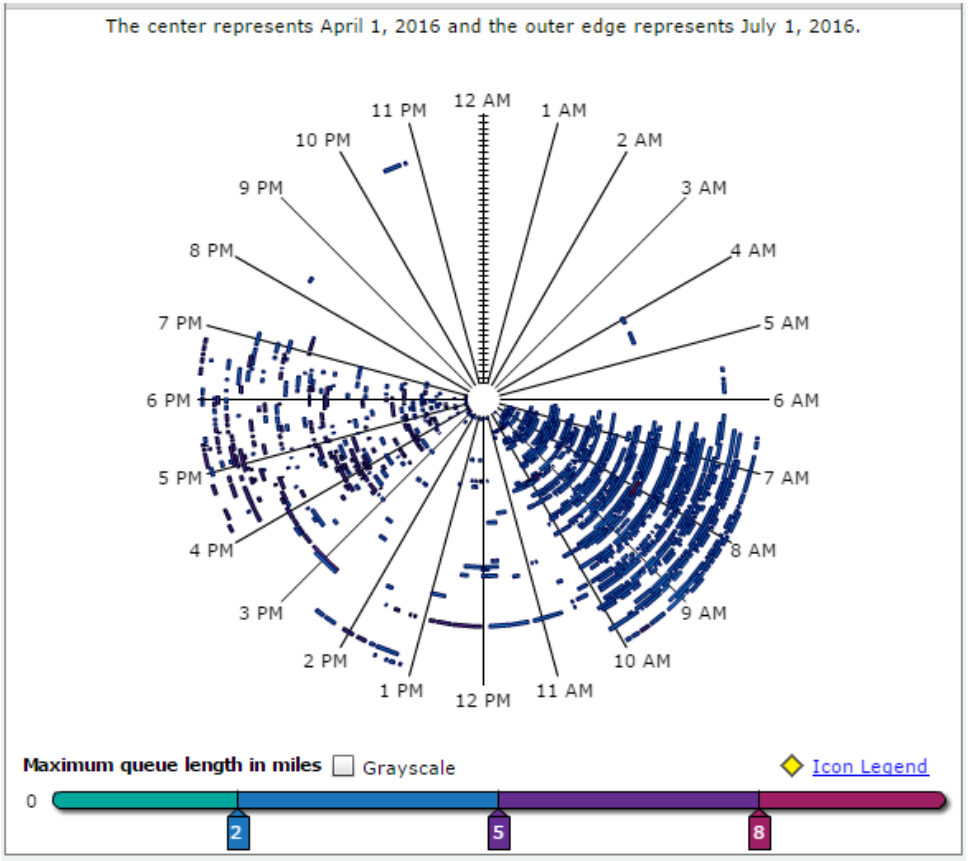




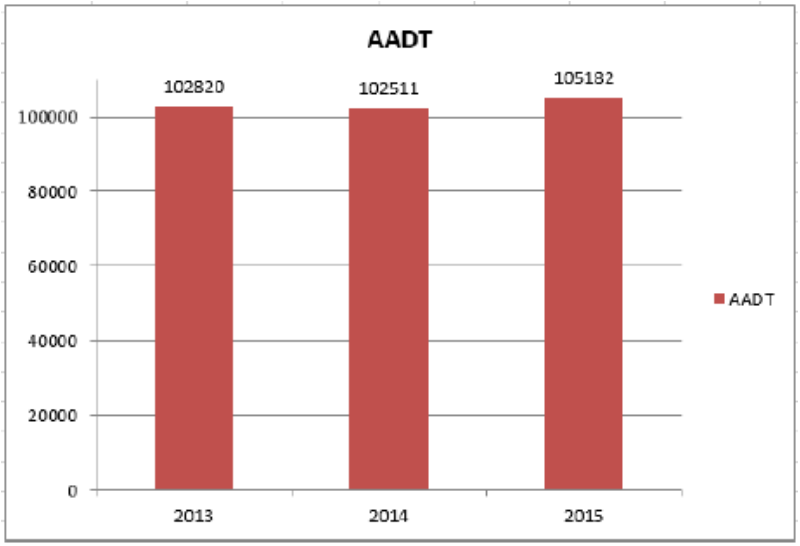
Notes: Southbound AM and PM congestion extending from MD-197 just barely extending into the southern portion of the Baltimore region near Fort Meade occurring during both the morning and afternoon peak periods. Volume related delays caused by factors such as Baltimore commuters to DC and Fort Meade and the MD-295 merge with the heavily congested Capital Beltway.

#8 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
MD-295 S @ MD-197/Exit 11	28,763	3.69	1 h 56 m	7 d 09 m 20 m	257

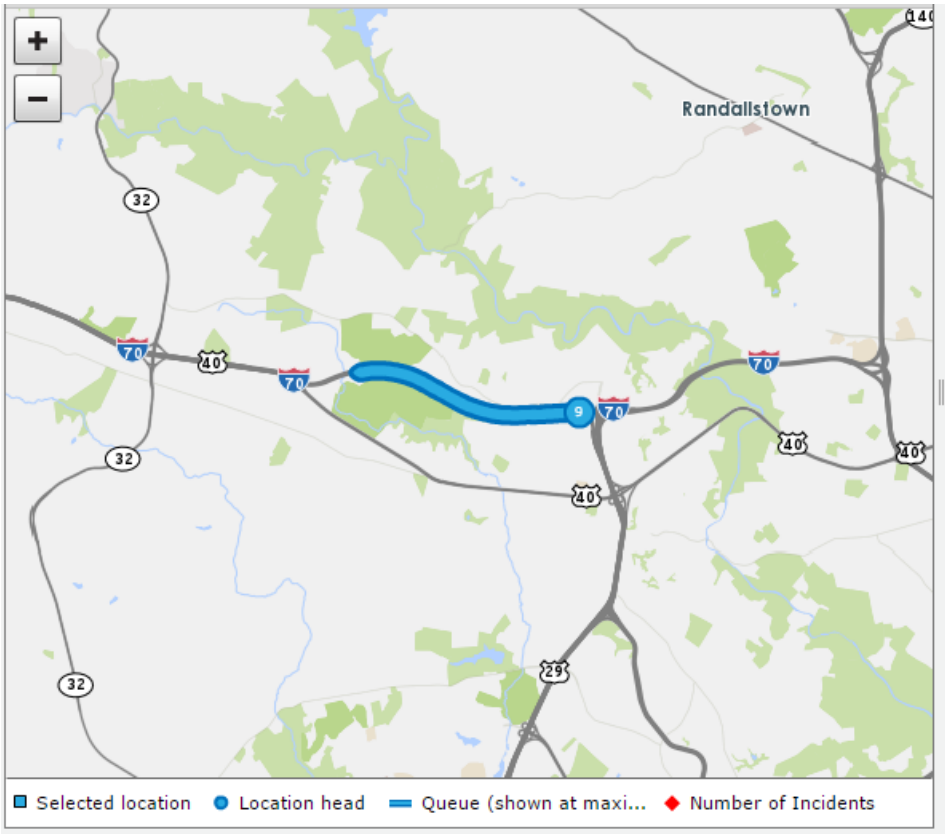


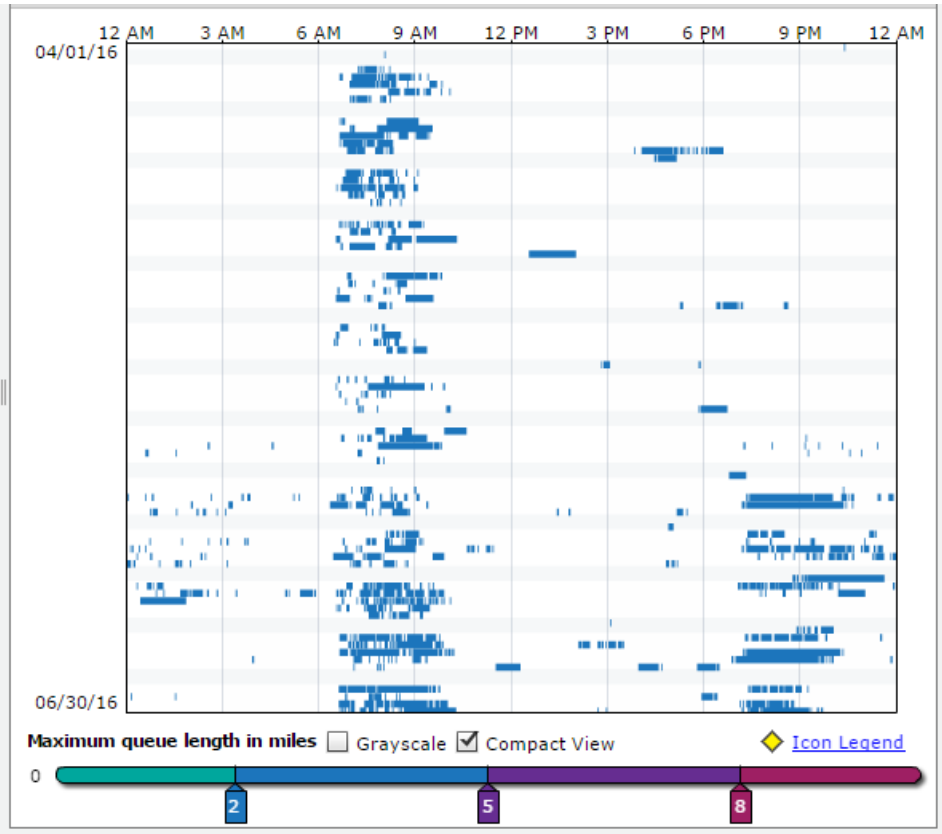
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.50 MI S OF MD32



#9 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-70 E @ US-29/Exit 87	26,210	3.48	1 h 22 m	5 d 05 h 43 m	20

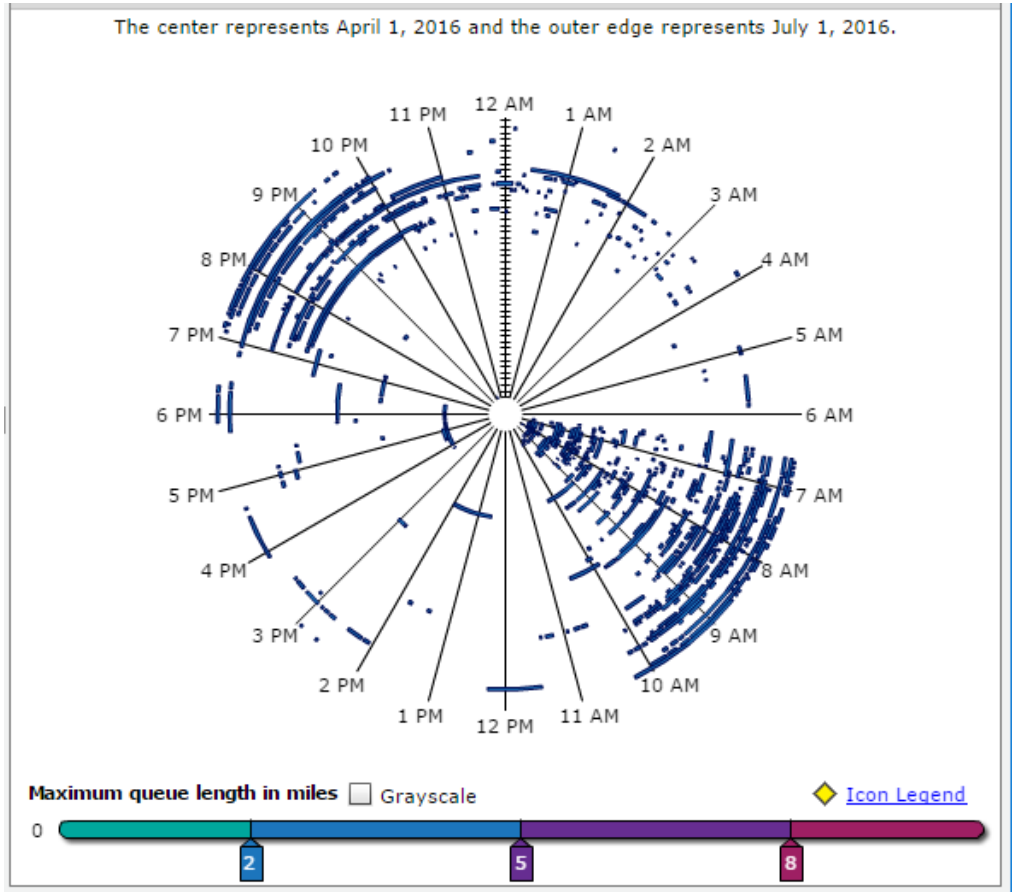




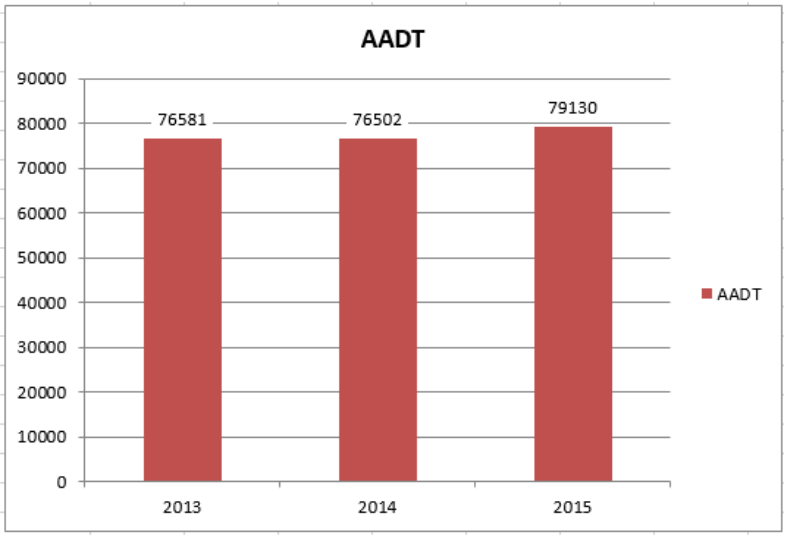
Notes: When congested, conditions varied widely between US 40 and US 29, from stop-and-go to steady 40-50 mph. Contributing factors were: 1) the lane drop to 2 lanes at US 40; 2) a short acceleration lane for merging traffic from Marriottsville Rd, oriented directly into the sunshine; and 3) weaving in preparation for the exit to US 29, where the deceleration lane is very short. While the merge at Marriottsville Rd appeared to be the primary bottleneck during some observations, at other times the congestion appeared to be generated closer to US 29.

#9 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-70 E @ US-29/Exit 87	26,210	3.48	1 h 22 m	5 d 05 h 43 m	20

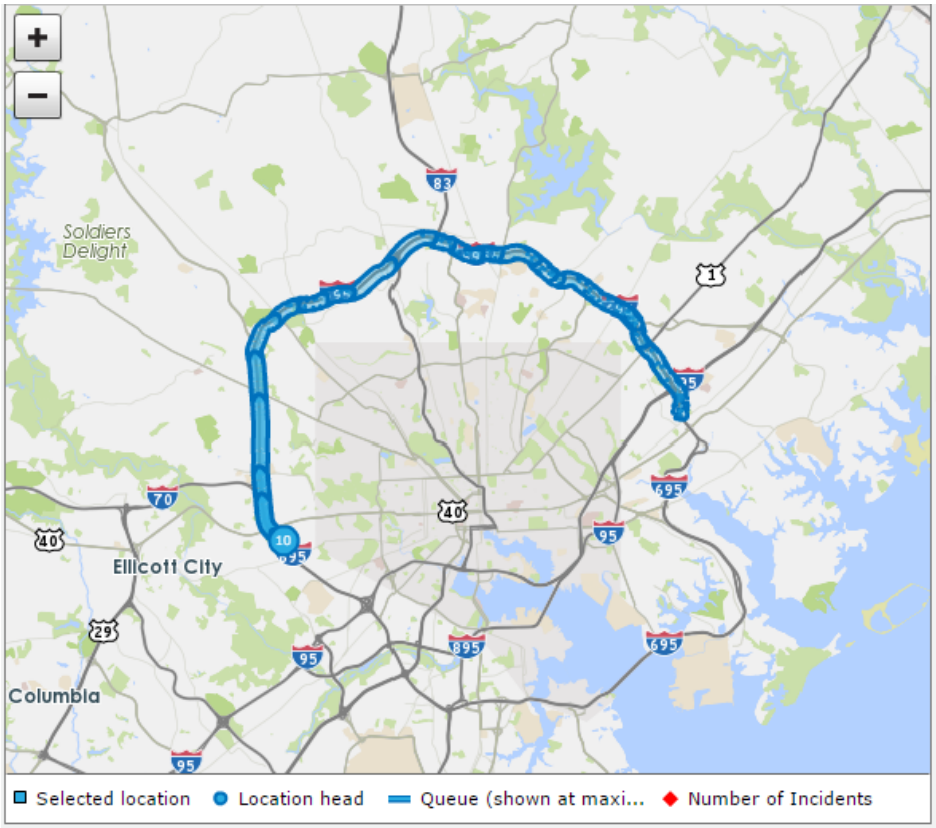


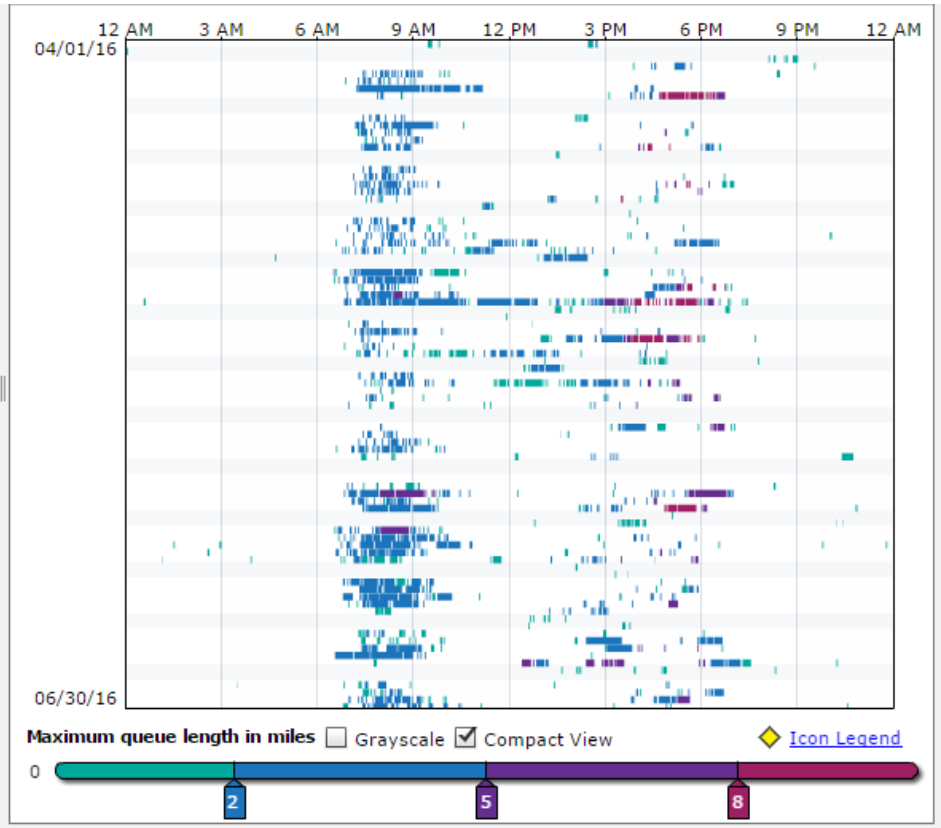
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS70-.50 MI W OF US29



#10 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-695 OL @ Edmondson Ave/Exit 14	25,895	3.43	1 h 18 m	4 d 23 h 03 m	778

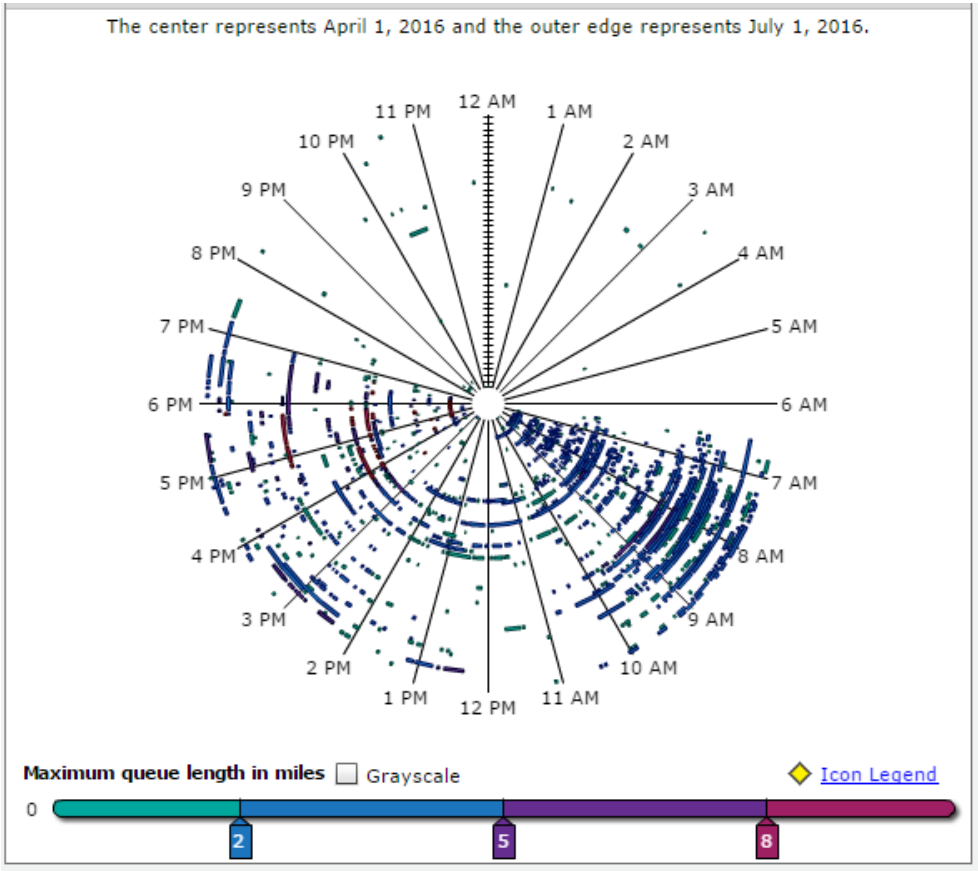




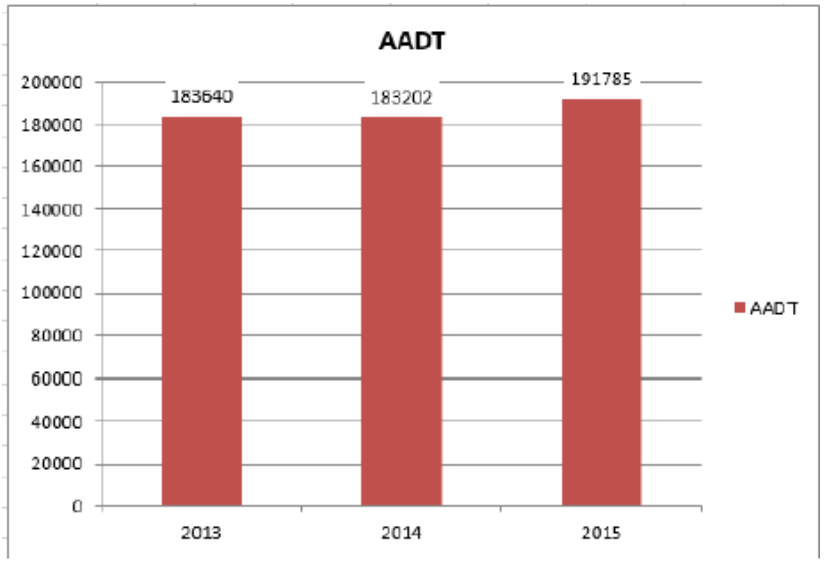
Notes: Longstanding bottleneck on the outer loop of the beltway primarily during the morning rush. High traffic volume area. Delays extend back as far as MD-26/Liberty Rd. Also contributing to congestion in the area is a beltway widening project which began in February. "The plan is for crews to add a fourth lane to the outer loop and widen the median in anticipation of a possible fifth lane. The bridges over Ingleside and Edmondson avenues will be replaced to increase the clearance height." (Source: The Baltimore Sun 2/23/15)

#10 Ranked Bottleneck in the Baltimore Region – 2nd Quarter 2016

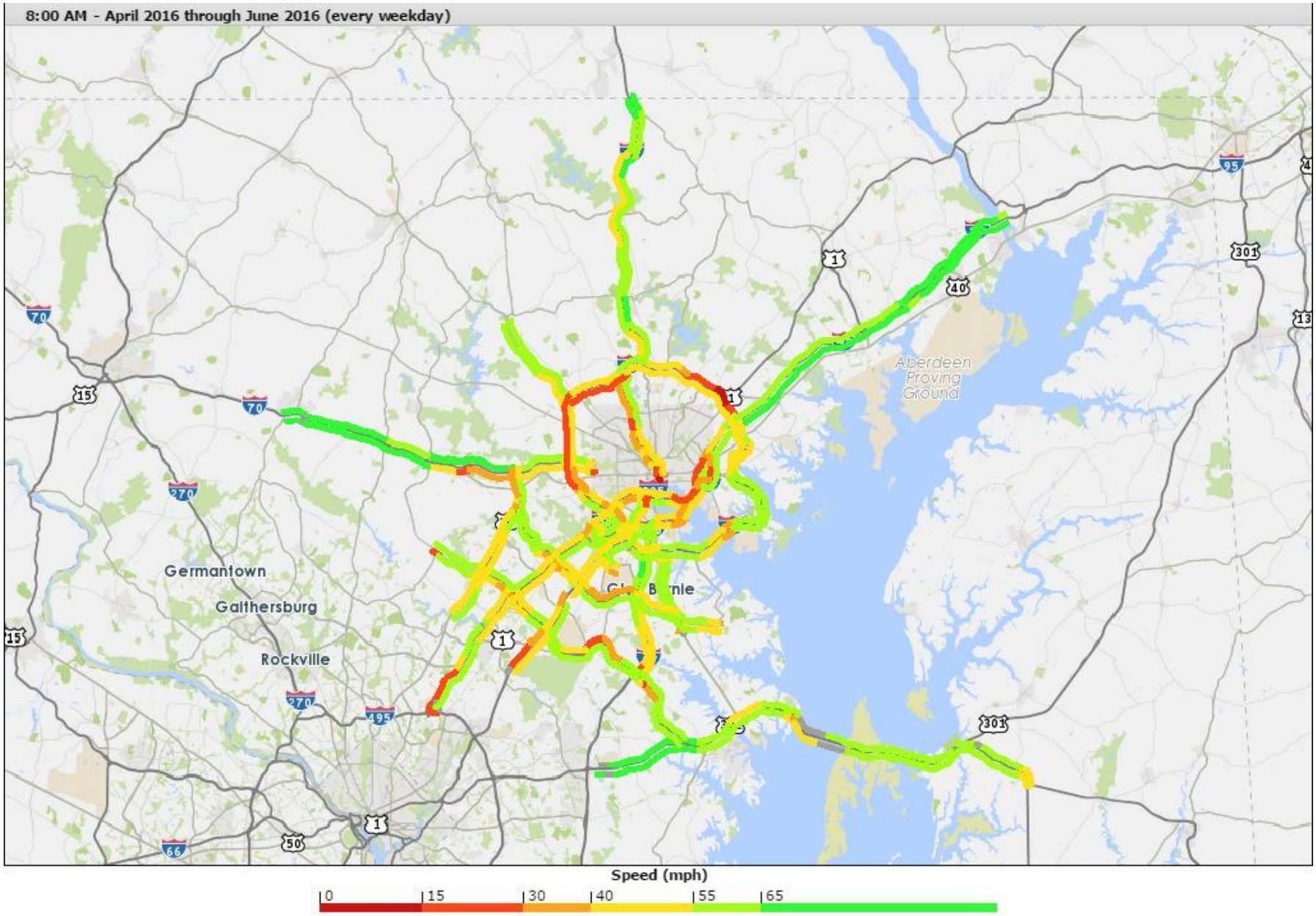
Location	Impact	Average max length (miles)	Average Daily Duration	Total Duration	All Events/Incidents
I-695 OL @ Edmondson Ave/Exit 14	25,895	3.43	1 h 18 m	4 d 23 h 03 m	778



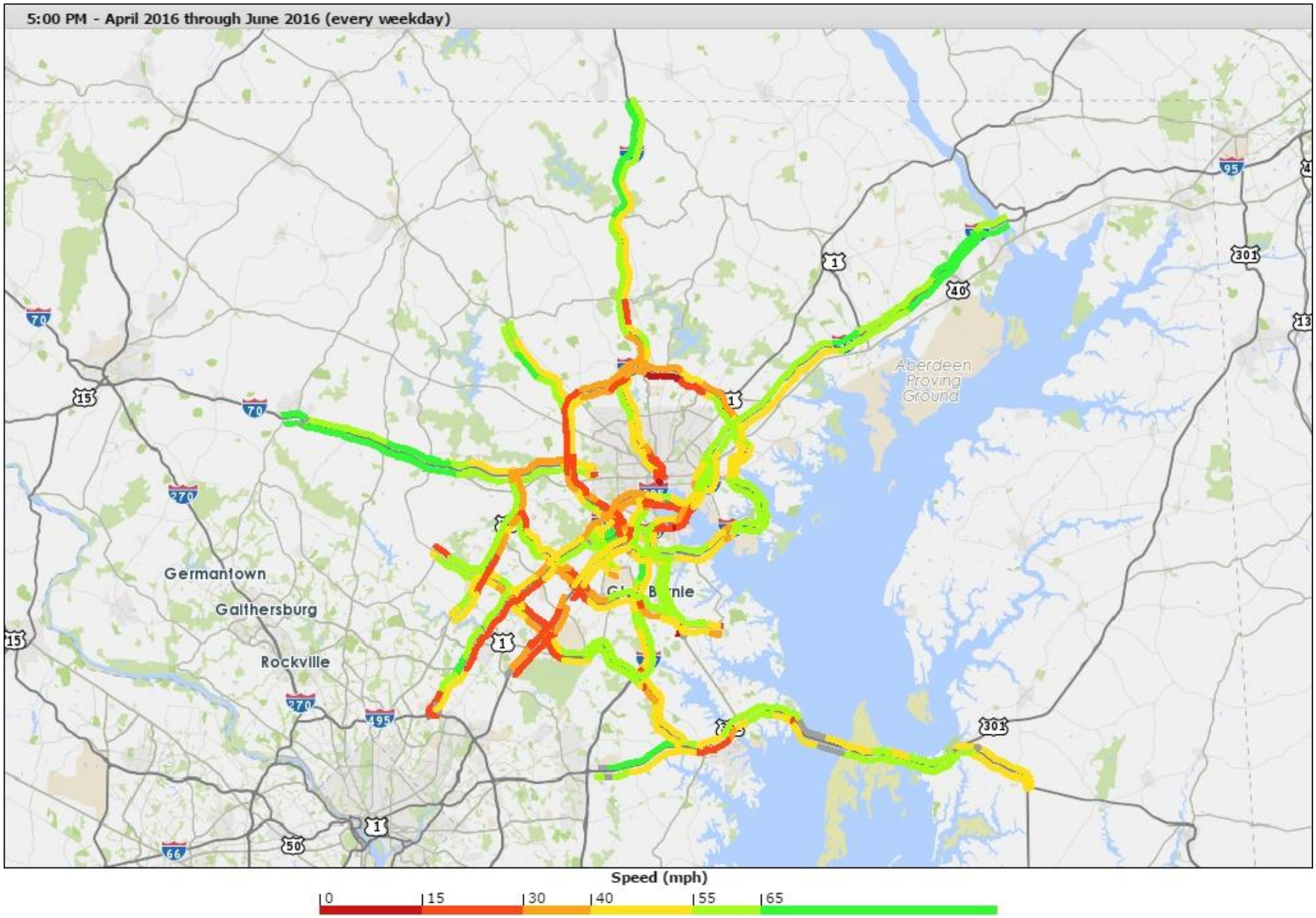
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION 695 - South of Ingleside Ave (ATR#32)



Average Speed Maps – AM Peak Period 8:00-9:00 Weekdays: 2nd Quarter 2016



Average Speed Maps – PM Peak Period 5:00-6:00 Weekdays: 2nd Quarter 2016



The Vehicle Probe Project

Data and graphics in this report were generated from the *Vehicle Probe Project* suite. *The Vehicle Probe Project* (VPP) is a groundbreaking initiative and collaborative effort among the I-95 Corridor Coalition, University of Maryland, INRIX, HERE and Tom Tom and has been providing comprehensive and continuous real-time travel information for more than seven years. Member agencies like the Baltimore Metropolitan Council have found numerous uses for the data beyond simply travel information.

There are **now** **7,000 centerline freeway miles**, more than **20,000 freeway and arterial miles** in all, including continuous coverage of the I-95 corridor from New Jersey through Florida. Coverage also exists in Rhode Island. The network includes full coverage of freeways and major arterials in North Carolina and the Tidewater area of Virginia, full or nearly full coverage of limited access roads in New Jersey, Maryland and South Carolina and the northern and eastern portions of Florida. In addition, coverage now includes ramps at 160 major highway-to- highway interchanges, with all states having interchanges included except Georgia.

Agency Participation
As the value of the data from the Vehicle Probe Project is realized through the various applications and the continued quality via the validation efforts, the member states have increased their commitment to this project. In fact, all of the participating states have committed their own funds to continue this project and many have increased their coverage far beyond the initial core area.

Numerous Uses for the Data
I-95 Corridor Coalition member agencies have found many uses for the vehicle probe data, including:

- Travel Information for 511 (web and phone) Systems, Dynamic Message Signs, and Kiosks
- Travel Time Calculations for Message Boards
- Performance Measures and Travel Time Reliability Support
- Traffic Pattern Observations (in-state and multi-state)
- Trip Planning (www.i95travelinfo.net)
- Performance Measures Tool – Continuing the momentum in performance analysis, the newest initiative from the Coalition is the Vehicle Probe Project Suite. The basic tools include:

Bottleneck and Incident dashboard
Massive Raw Data Downloader
Historical Data Visualizations and Performance Measures (Congestion Scan)
UMD CATT Lab made the VPP suite available to participating agencies. For the training video, please visit http://vpp.ritis.org/suite/screencast/

Should you have any questions, please contact:

- For general project questions, Marygrace Parker at 518-852-4083 or *i95mgp@ttlc.net*
  For the Vehicle Probe Project Suite, Michael L. Pack at 301-405-0722 or *packml@umd.edu*

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