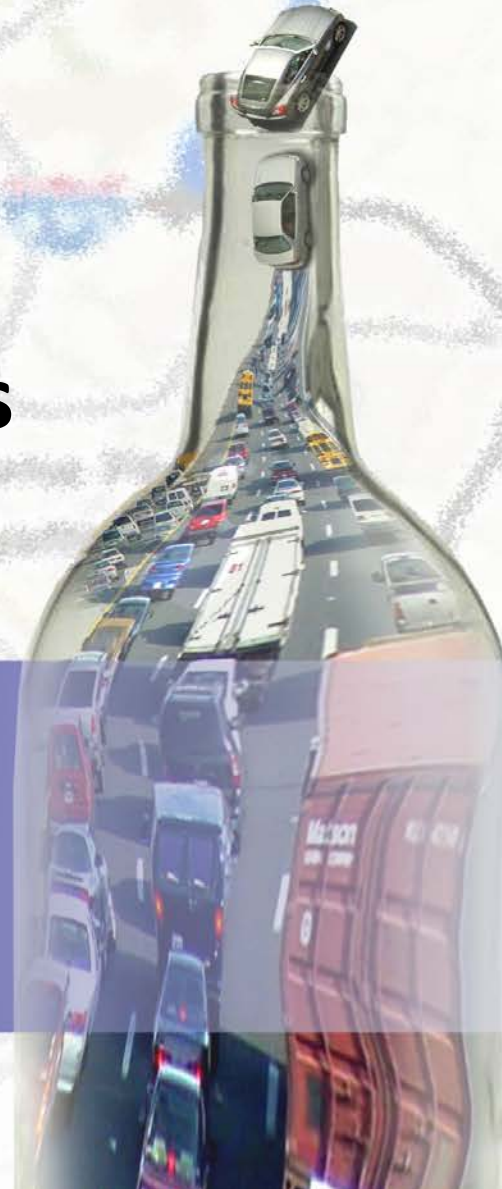


# Quarterly Congestion Analysis Report for the Baltimore Region

## Top 10 Bottleneck Locations

2<sup>nd</sup> Quarter 2015

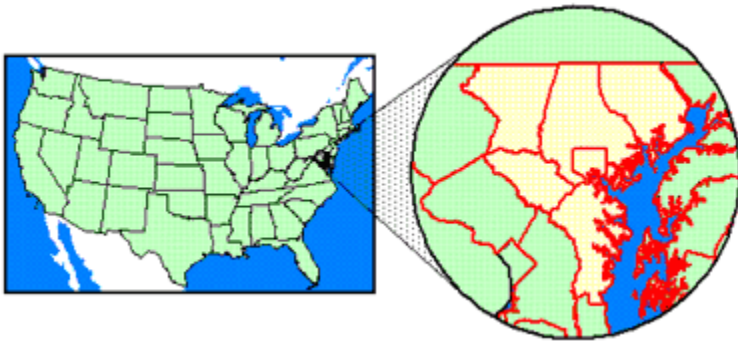
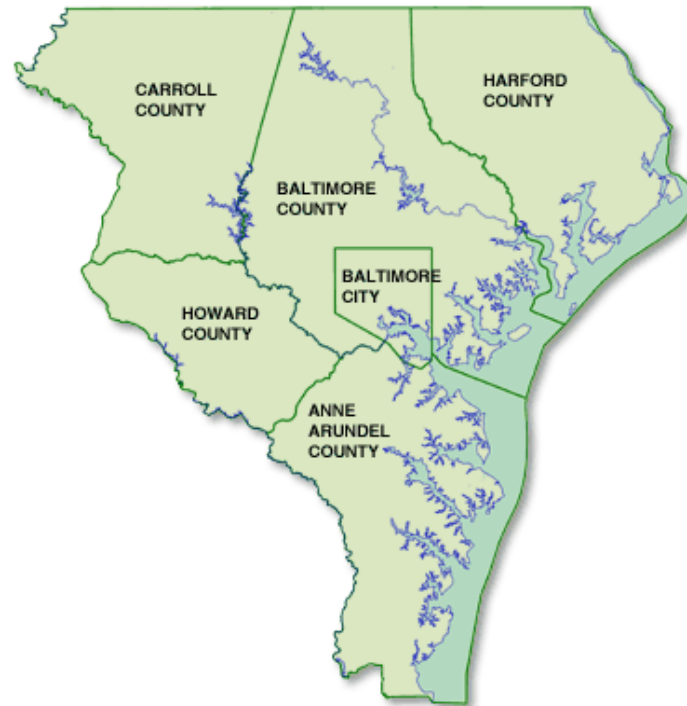


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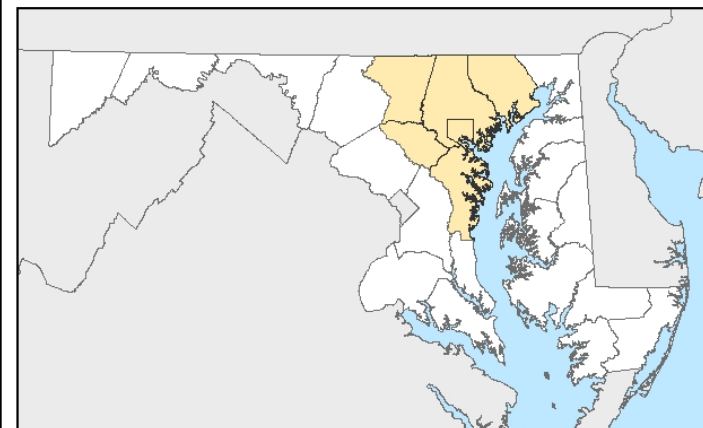
# About the Region

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



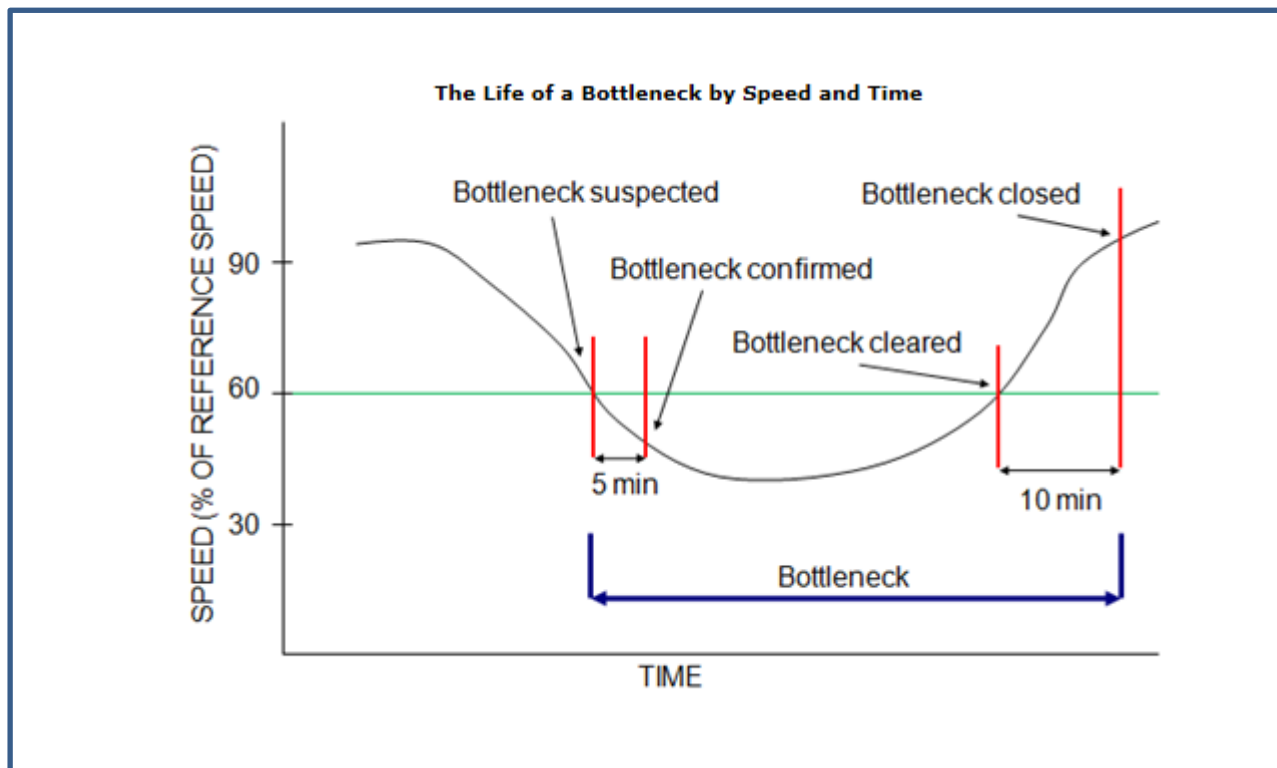
Prepared by  
 Transportation Planning Division  
 Projected Coordinate System: NAD 1983 State Plane (ft)  
 Data Source: BMC, © NAVTEQ 2013, TIGER/Line®, MTA  
 Printed - July 2013



## 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.



# 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



- Injury



- Police Activity



- Fire



- Closure



- Sports Event



- Delays



- Signal System



- Tornado



- Wind



- Fallen Tree



- Hazmat



- Debris



- Flood



- Animal Struck



- Special Event



- Congestion



- Incident



- Fog



- Fallen Rocks



- Other



- Vehicle Fire



- Collision



- Disabled Vehicle



- Roadwork



- Emergency Roadwork



- Draw Bridge Opening



- Water Main Work



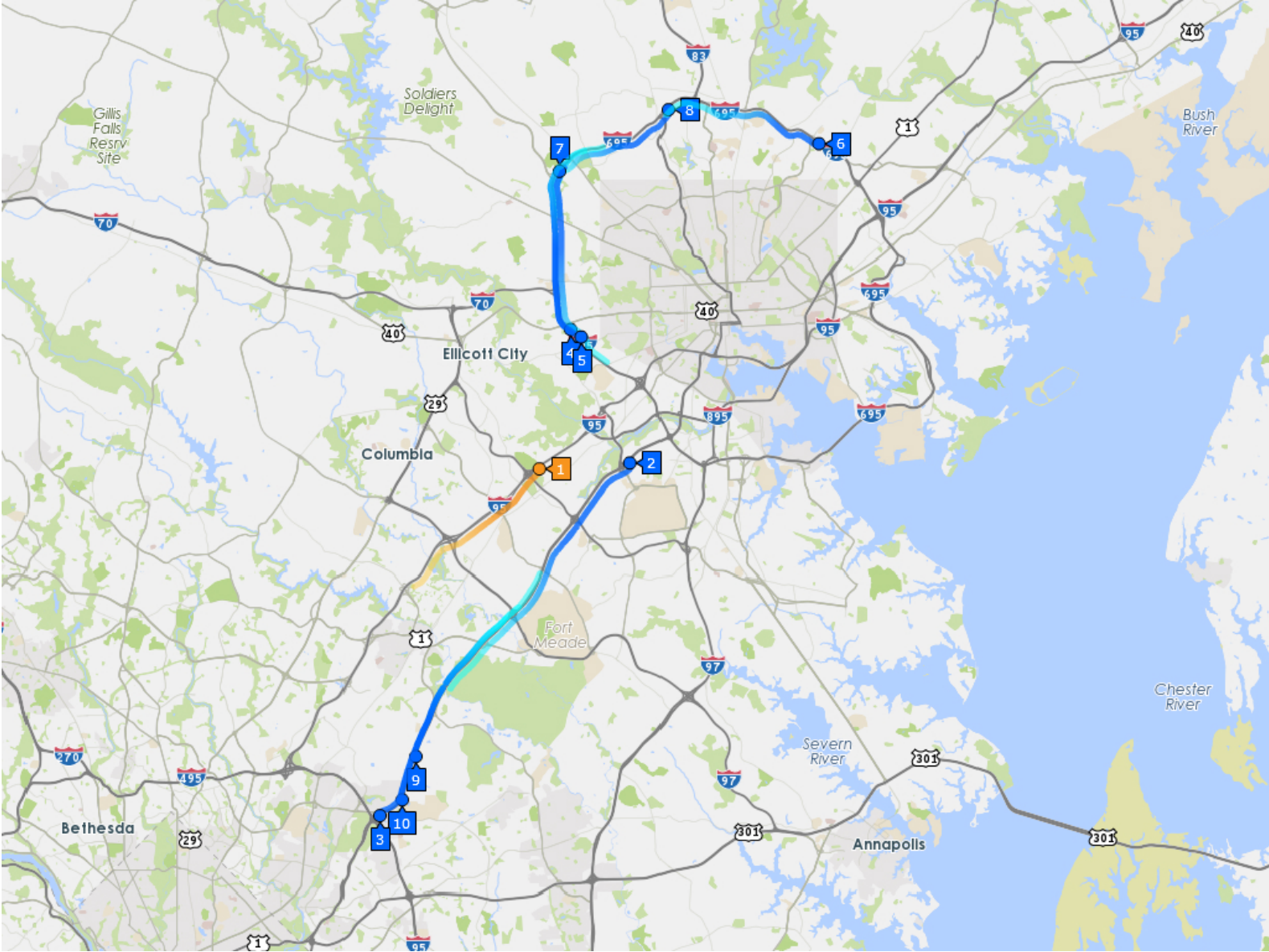
- Medical Emergency



- Overgrown Foliage

# Top 10 Bottlenecks in the Baltimore Region 2nd Quarter 2015

## Overview Map



# Top 10 Bottlenecks in the Baltimore Region 2nd Quarter 2015

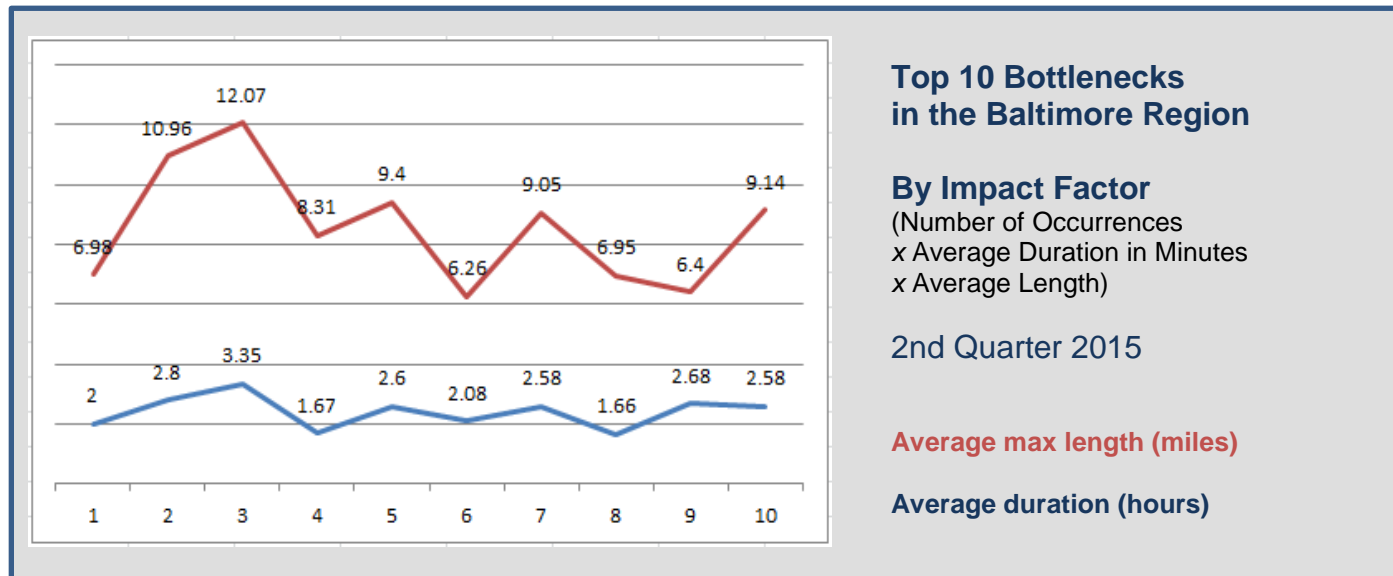
## By Impact Factor

Number of Occurrences x Average Duration in Minutes x Average Length This table indicates the top 10 congested corridors in the region.

	Location	Average Duration	Average max length (miles)	Occurrences	Number of Incidents/Events	Impact Factor
1	I-95 N @ MD-100/EXIT 43	2 h	6.98	234	117	196,087
2	MD-295 N @ I-195	2 h 48 m	10.96	89	169	163,871
3	MD-295 S @ MD-193	3 h 21 m	12.07	66	115	160,058
4	I-695 CCW @ US-40/EXIT 15	1 h 40 m	8.31	184	227	152,837
5	I-695 CCW @ EDMONDSON AVE/EXIT 14	2 h 36 m	9.4	103	269	151,099
6	I-695 CW @ MD-41/PERRING PKWY/EXIT 30	2 h 5 m	6.26	174	209	136,097
7	I-695 CW @ I-795/EXIT 19	2 h 35 m	9.05	86	358	120,622
8	I-695 CW @ I-83/MD-25/EXIT 23	1 h 39 m	6.95	154	231	105,980
9	MD-295 S @ POWDER MILL RD	2 h 41 m	6.4	102	82	105,134
10	MD-295 S @ GODDARD RD	2 h 35 m	9.14	59	112	83,585

CW = Clockwise

CCW = Counterclockwise





## Top 10 Bottlenecks in the Baltimore Region 2nd Quarter 2015

**By Average Duration** - This table indicates the longest lasting bottlenecks

	Location	Average Duration	Average max length (miles)	Occurrences	Number of Incidents/ Events	Impact Factor
1	I-95 N @ CHESAPEAKE HOUSE TRAVEL PLAZA	4 h 34 m	13.06	3	213	10,739
2	MD-32 W @ TEN OAKS RD	3 h 39 m	5.87	7	5	9,006
3	MD-295 S @ EASTERN AVE	3 h 28 m	21.15	2	305	8,799
4	MD-295 N @ US-40/MULBERRY ST/FRANKLIN ST	3 h 24 m	2.95	41	13	24,700
5	MD-295 S @ MD-193	3 h 21 m	12.07	66	115	160,058
6	MD-295 N @ W LOMBARD ST	3 h 5 m	2.77	24	13	12,304
7	MD-295 S @ MD-450	3 h 3 m	15.98	4	155	11,700
8	I-695 CW @ MD-43/WHITEMARSH BLVD/EXIT 31	3 h 3 m	9.85	5	320	9,014
9	MD-295 S @ RIVERDALE RD	3 h	14.46	17	155	44,257
10	I-895 S @ MD-2/POTEE ST/EXIT 7	3 h	2.73	16	200	7,862

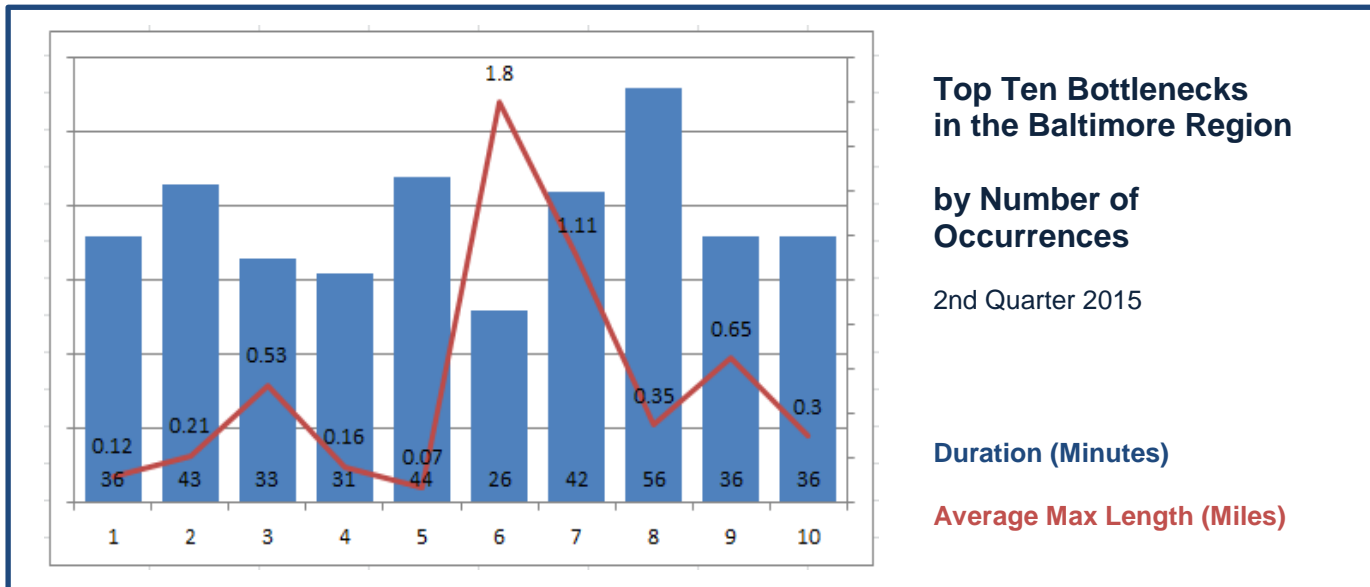
**By Average Length** - This table indicates the longest bottlenecks by distance.

	Location	Average Duration	Average max length (miles)	Occurrences	Number of Incidents/ Events	Impact Factor
1	MD-295 S @ EASTERN AVE	3 h 28 m	21.15	2	305	8,799
2	MD-295 S @ MD-450	3 h 3 m	15.98	4	155	11,700
3	MD-295 S @ RIVERDALE RD	3 h	14.46	17	155	44,257
4	I-95 N @ CHESAPEAKE HOUSE TRAVEL PLAZA	4 h 34 m	13.06	3	213	10,739
5	MD-295 S @ MD-193	3 h 21 m	12.07	66	115	160,058
6	MD-295 S @ I-495/I-95	2 h 12 m	11.17	9	139	13,273
7	MD-295 N @ I-195	2 h 48 m	10.96	89	169	163,871
8	I-95 S @ MD-43/WHITEMARSH BLVD/EXIT 67	1 h 39 m	10.88	45	235	48,487
9	I-695 CW @ MD-43/WHITEMARSH BLVD/EXIT 31	3 h 3 m	9.85	5	320	9,014
10	MD-32 W @ I-70/US-40	2 h 40 m	9.55	7	5	10,700

## Top 10 Bottlenecks in the Baltimore Region 2nd Quarter 2015

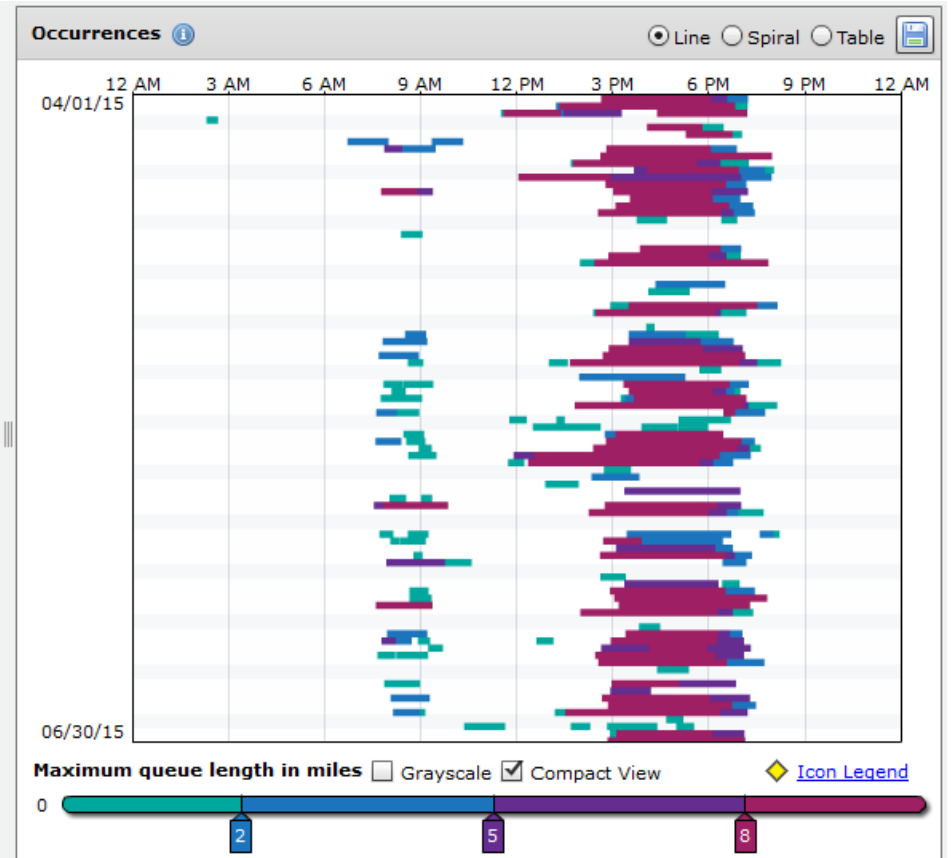
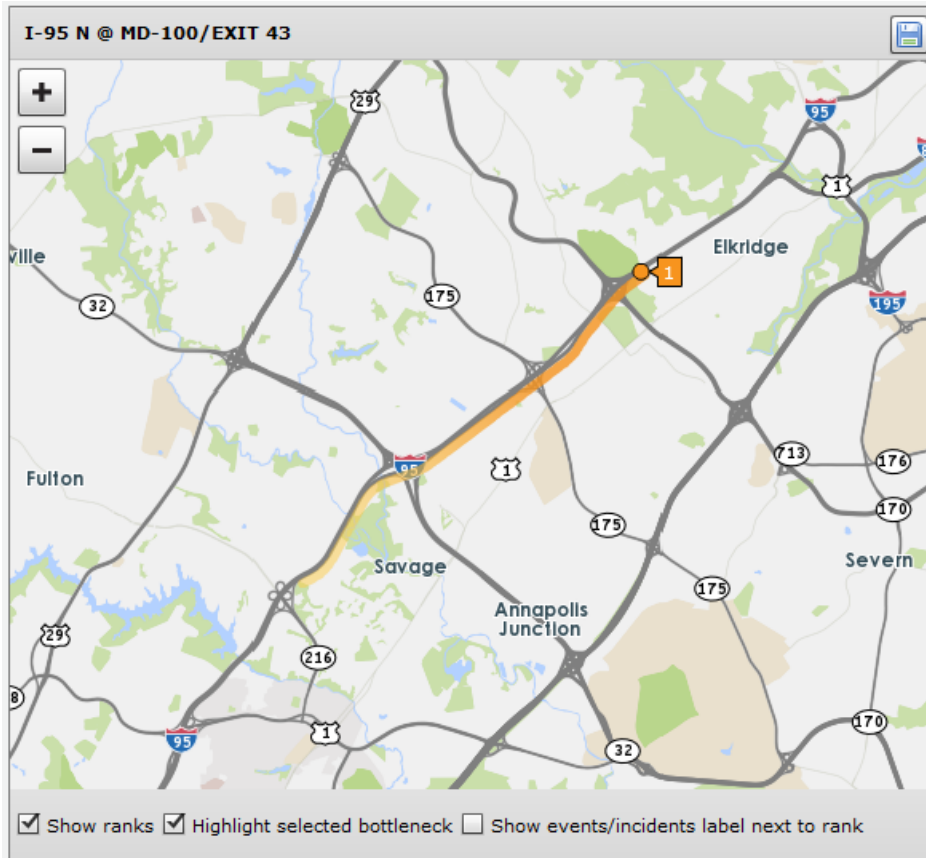
**By Number of Occurrences** - This table indicates the most frequently occurring bottlenecks.

	Location	Average Duration	Average max length (miles)	Occurrences	Number of Incidents/Events	Impact Factor
1	I-895 N @ CHILDS ST/EXIT 9	36 m	0.12	1088	79	4,555
2	I-83 S @ FAYETTE ST/EXIT 1	43 m	0.21	1083	0	9,730
3	I-95 N @ KEITH AVE/EXIT 56	33 m	0.53	801	33	14,062
4	MD-100 E @ MD-607/MAGOTHY BRIDGE RD	31 m	0.16	797	0	3,921
5	I-895 S @ HARBOR TUNNEL TOLL PLAZA	44 m	0.07	739	47	2,376
6	I-95 S @ FORT MCHENRY TUNNEL	26 m	1.8	698	223	32,610
7	US-50 E @ BAY BRIDGE	42 m	1.11	613	328	28,676
8	MD-295 N @ BAYARD ST	56 m	0.35	530	1	10,275
9	I-895 S @ HARBOR TUNNEL THWY (SOUTH)	36 m	0.65	529	0	12,427
10	MD-100 W @ MD-607/MAGOTHY BRIDGE RD	36 m	0.3	528	1	5,708



# #1 Ranked Bottleneck in the Baltimore Region - 2<sup>nd</sup> Quarter 2015

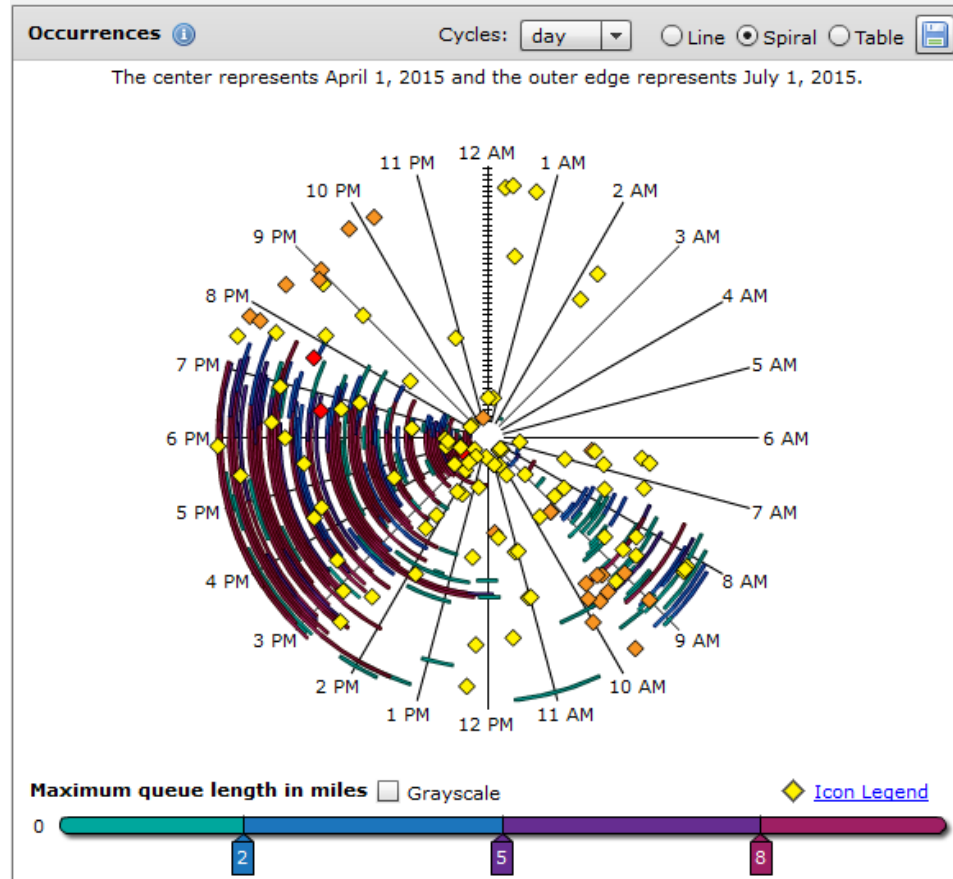
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 N @ MD-100/Exit 43	2 h	6.98	234	117	196,087



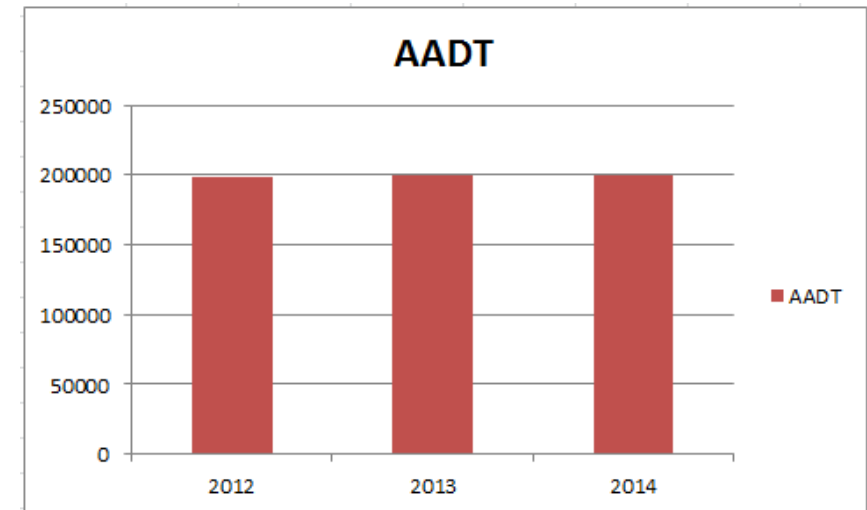
**Notes:** Congestion in the afternoon rush hour. Contributing factors include traffic entering at MD-175, weaving to exit at MD-100, and the half-mile uphill grade midway between MD-175 and MD-100.

# #1 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 N @ MD-100/Exit 43	2 h	6.98	234	117	196,087

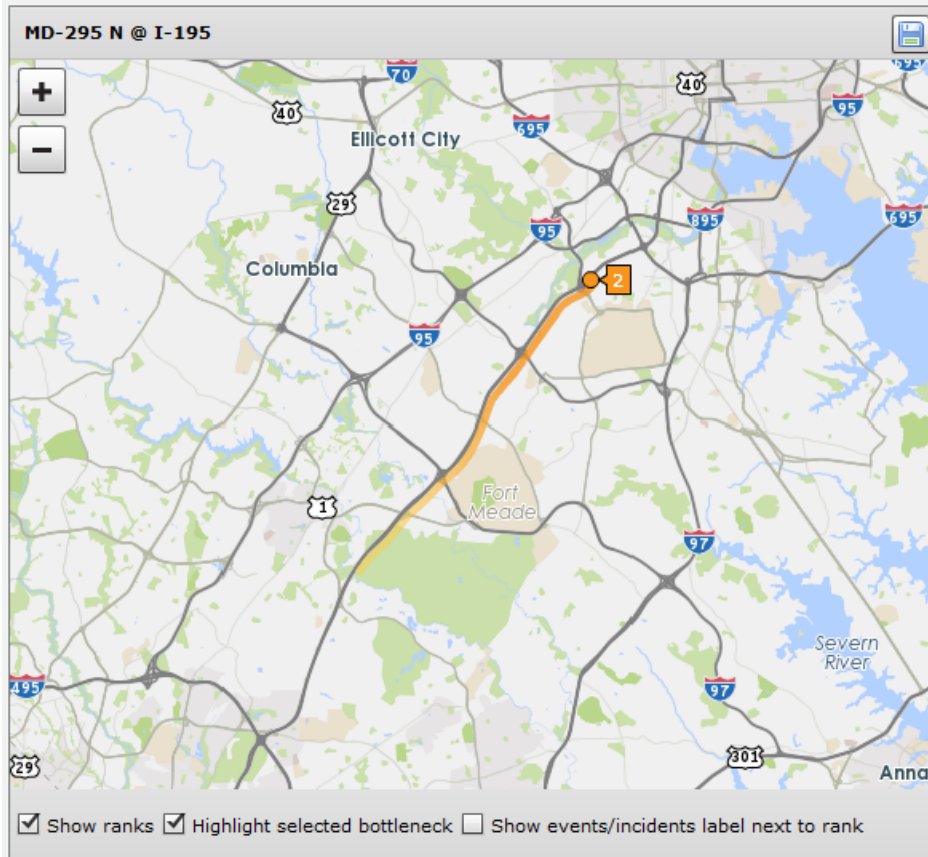


Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION IS 95 South of MD 103 (ATR#39)



## #2 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

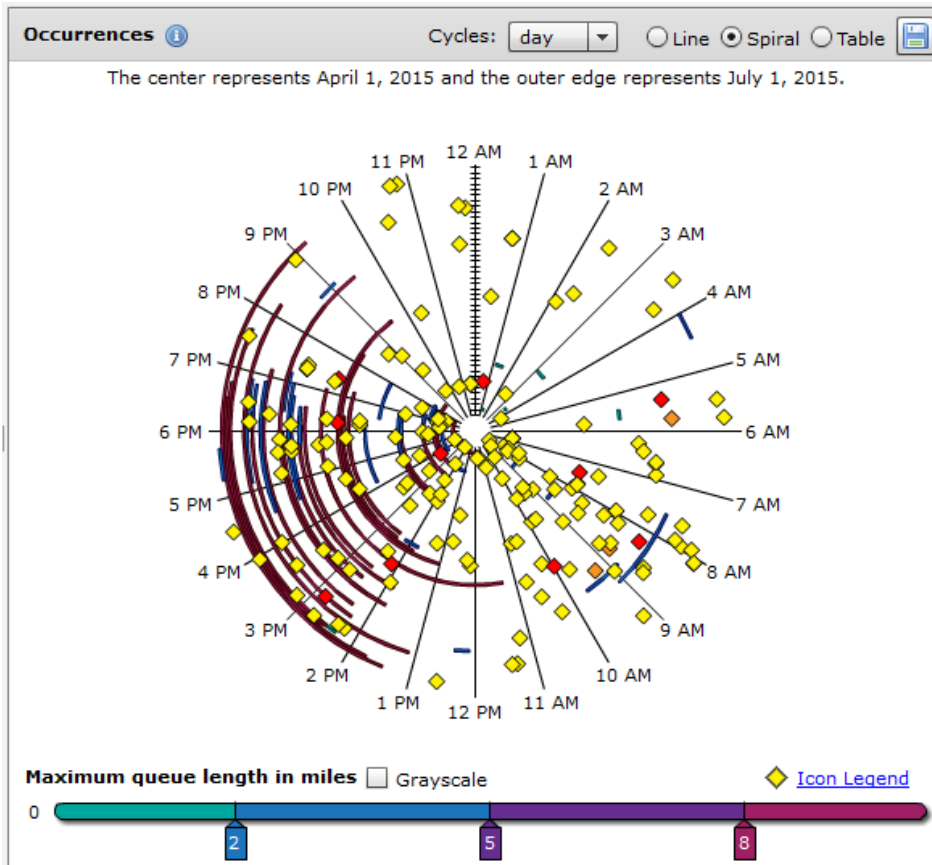
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ I-195	2 h 48 m	10.96	89	169	163,871



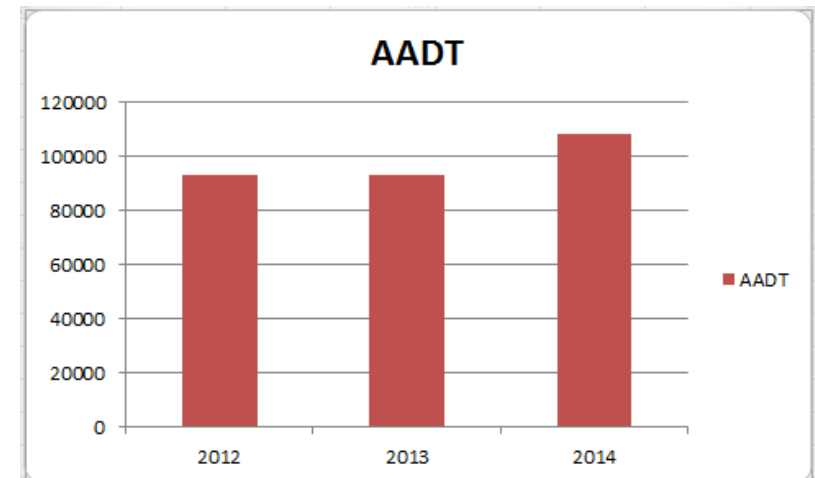
**Notes:** This moderate to severe congestion was primarily caused by merging traffic from Nursery Rd, probably exacerbated by additional traffic from MD 195. (The Nursery Rd merge occurs .5 miles before MD 295 widens to 3 northbound lanes.) Occasionally, upstream traffic was also affected by this bottleneck, almost as far back as MD 100.

## #2 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ I-195	2 h 48 m	10.96	89	169	163,871

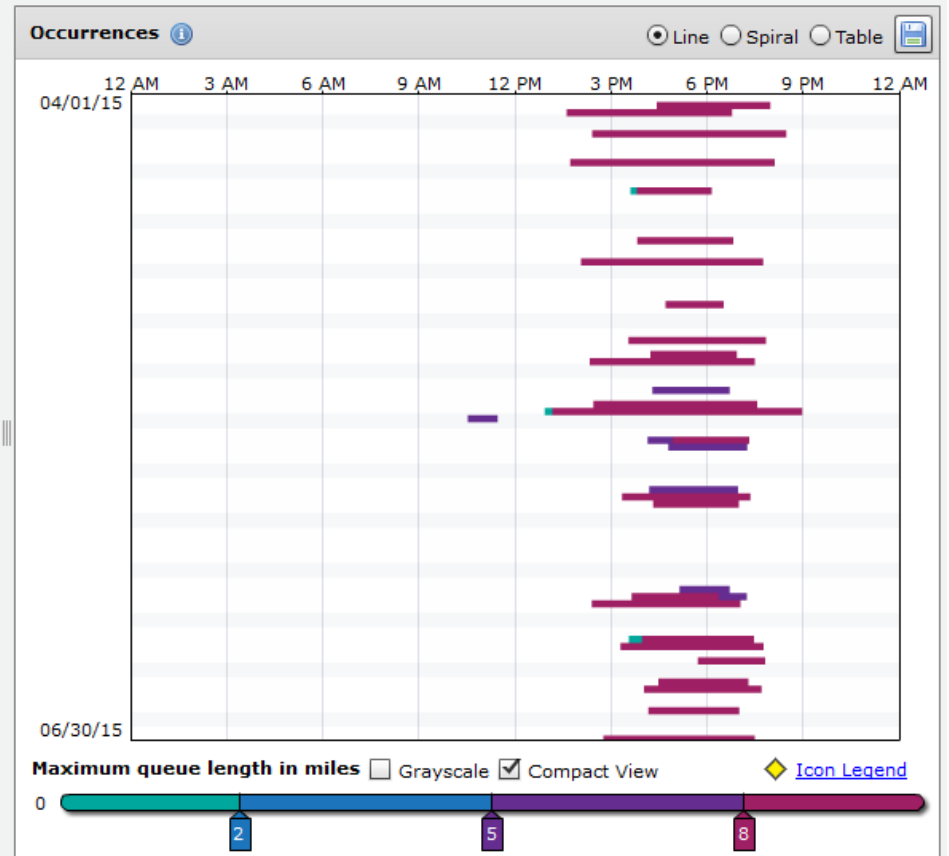
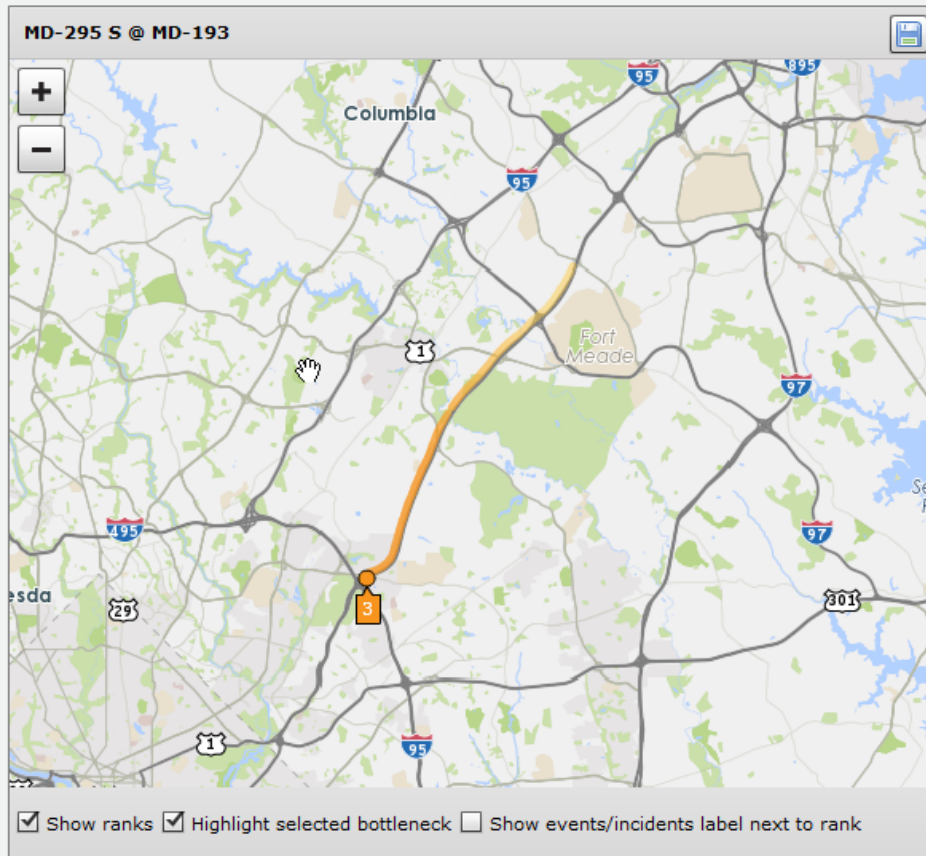


Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION MD295-.30 MI N OF MD100



### #3 Ranked Bottleneck in the Baltimore Region - 2<sup>nd</sup> Quarter 2015

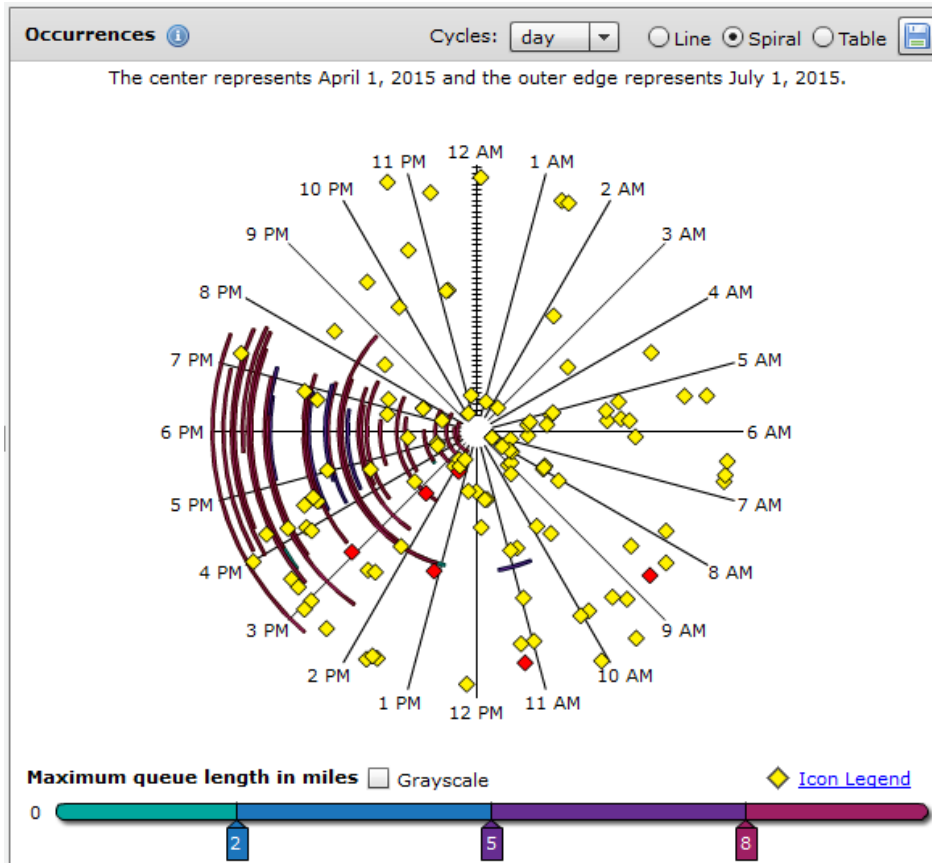
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ MD-193	3 h 21 m	12.07	66	115	160,058



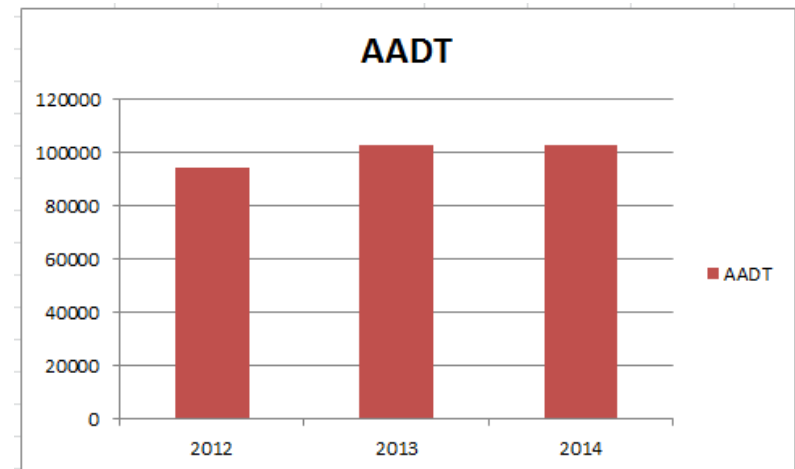
**Notes:** MD-295 merge with the Capital Beltway I-495. Congestion seen in the afternoon peak period sometimes extends into the southern portion of the Baltimore region near the Fort Meade area.

### #3 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ MD-193	3 h 21 m	12.07	66	115	160,058



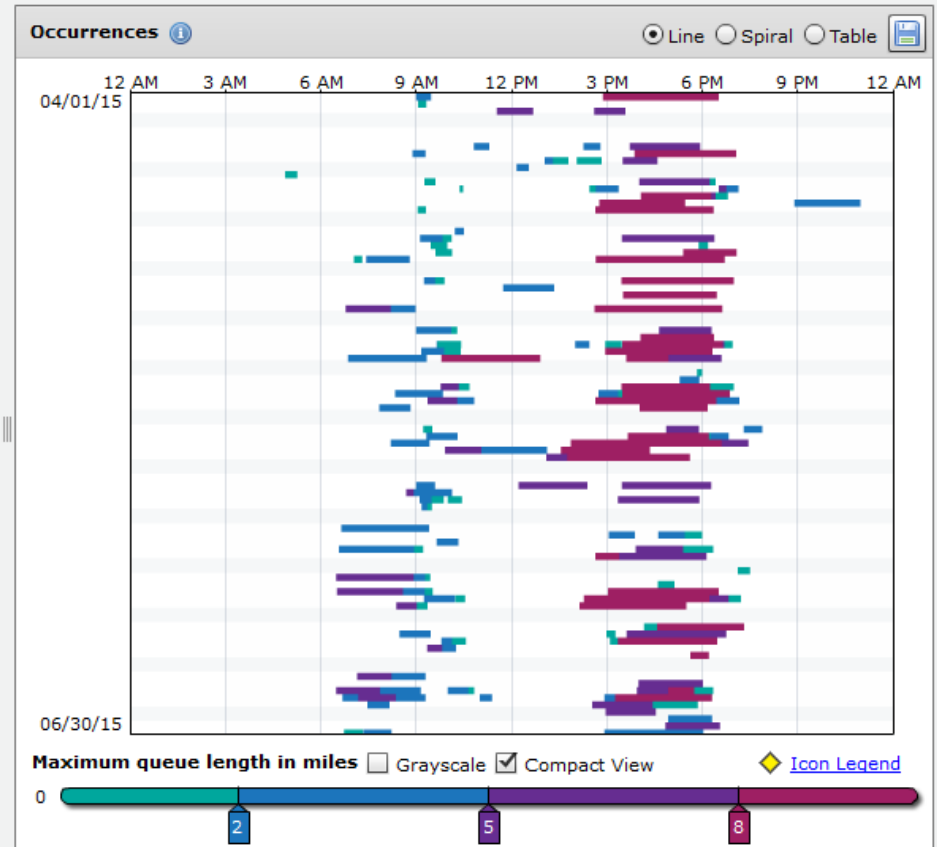
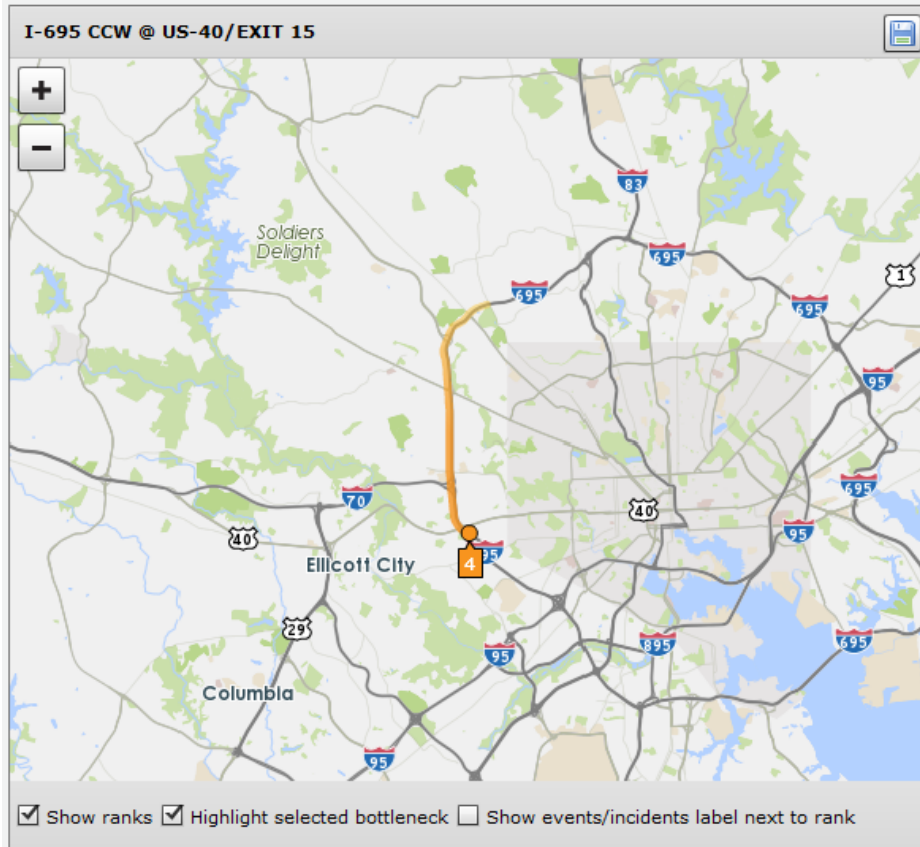
Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION MD295-.50 MI S OF MD32





## #4 Ranked Bottleneck in the Baltimore Region - 2<sup>nd</sup> Quarter 2015

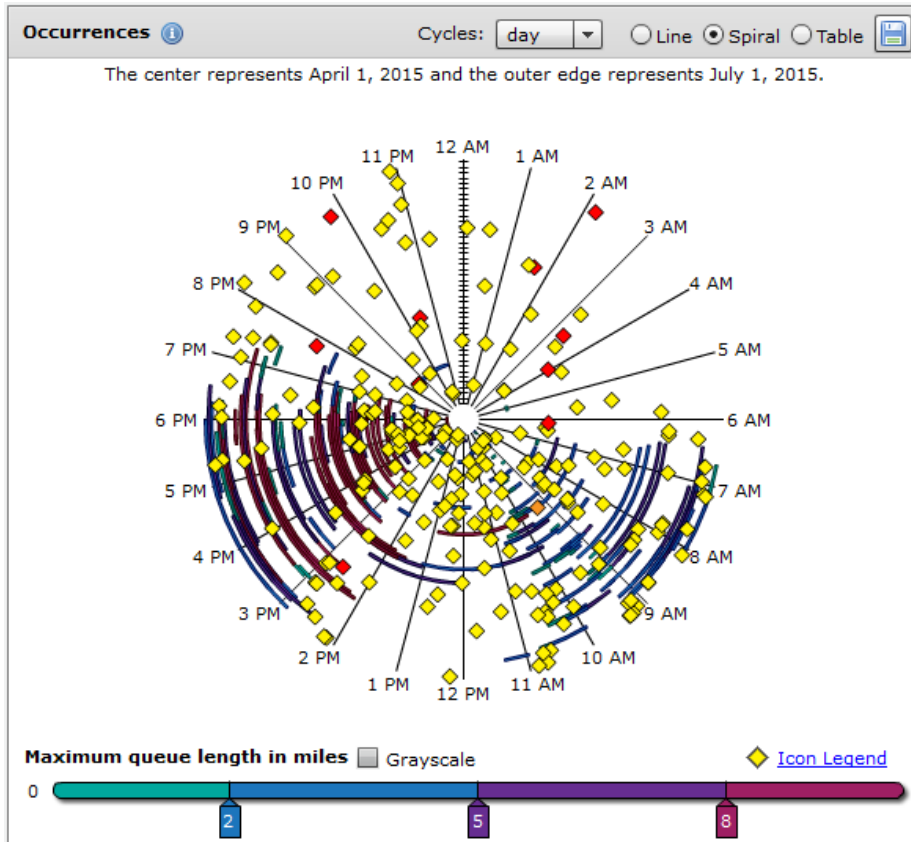
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CCW @ US-40/Exit 15	1 h 40 m	8.31	184	227	152,837



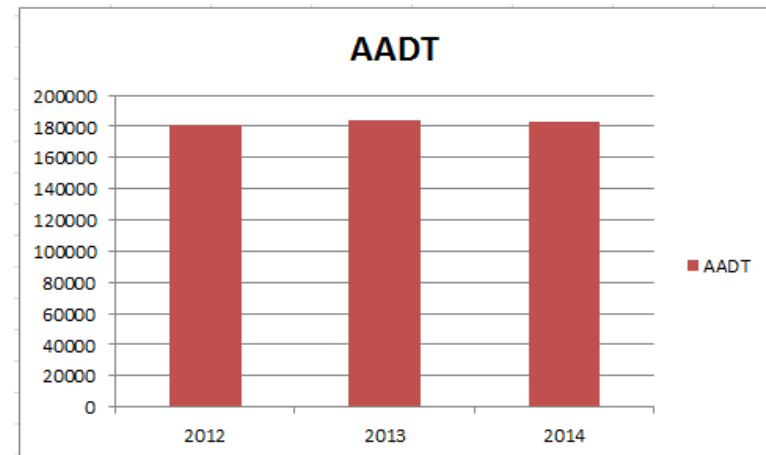
**Notes:** Delays found in both the morning and afternoon. Longstanding bottleneck on the outer loop of the beltway primarily during the morning rush. High traffic volume area. Delays extend back as far as MD-26/Liberty Rd. Also contributing to congestion in the area is a beltway widening project. Morning delays overlap with #5 ranked bottleneck beginning at US-40. See page 18 for more information.

## #4 Ranked Bottleneck in the Baltimore Region - 2<sup>nd</sup> Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CCW @ US-40/Exit 15	1 h 40 m	8.31	184	227	152,837

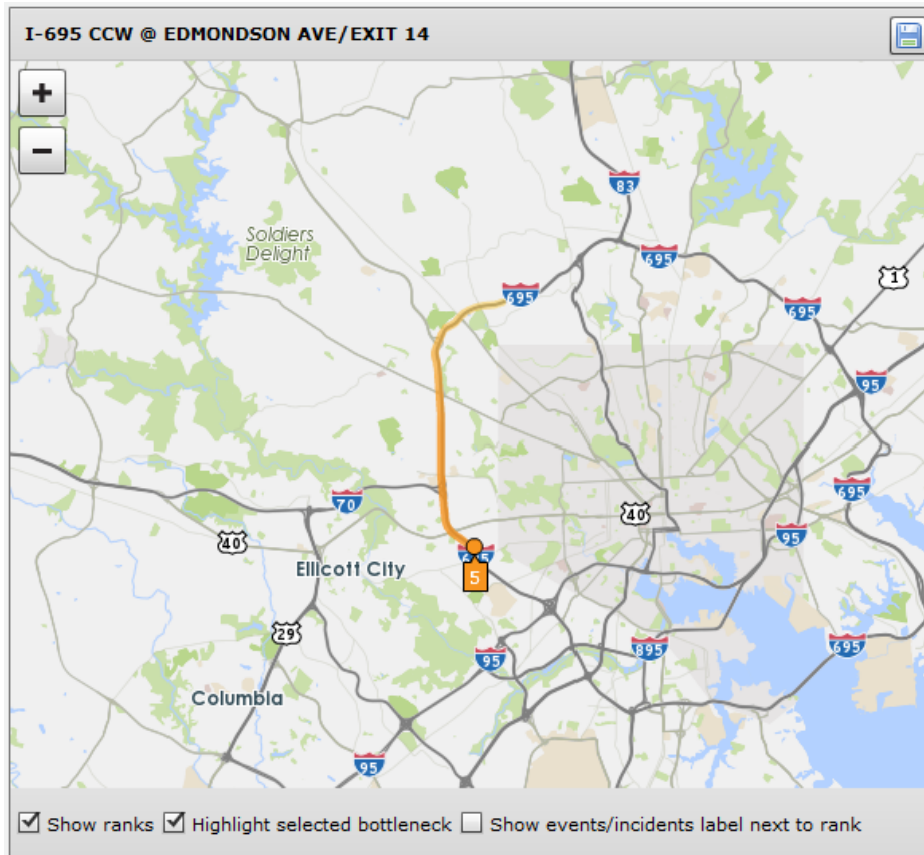


Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION IS 695 - South of Ingleside Ave  
 (ATR#32)



## #5 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

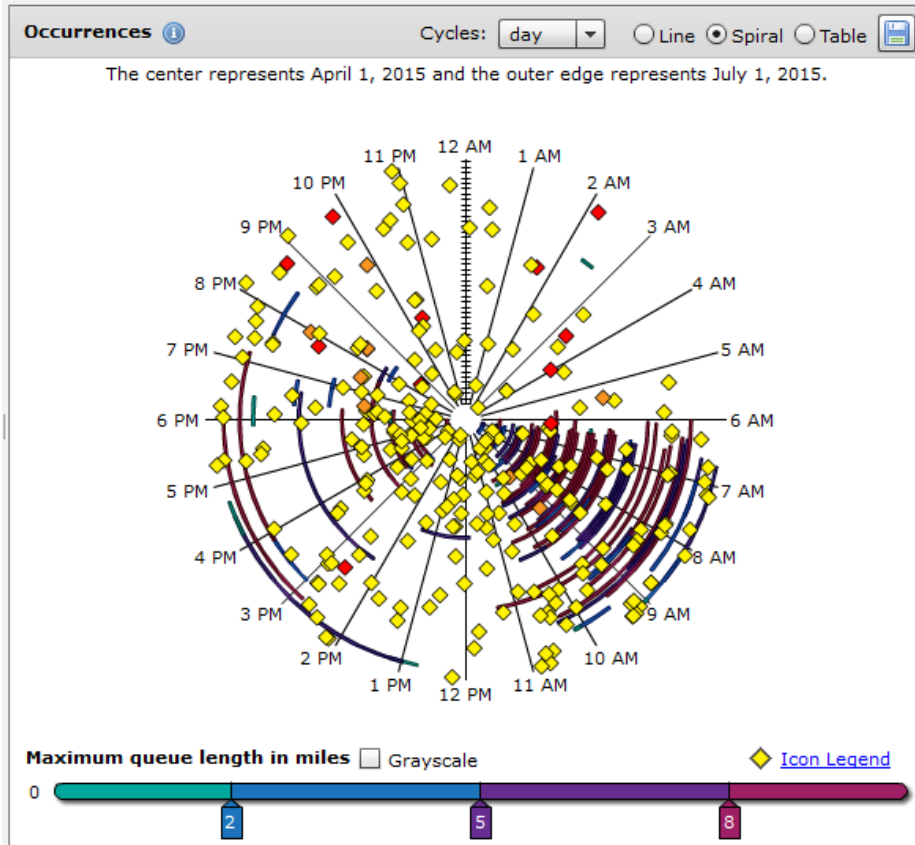
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CCW @ Edmondson Ave/Exit 14	2 h 36 m	9.4	103	269	151,099



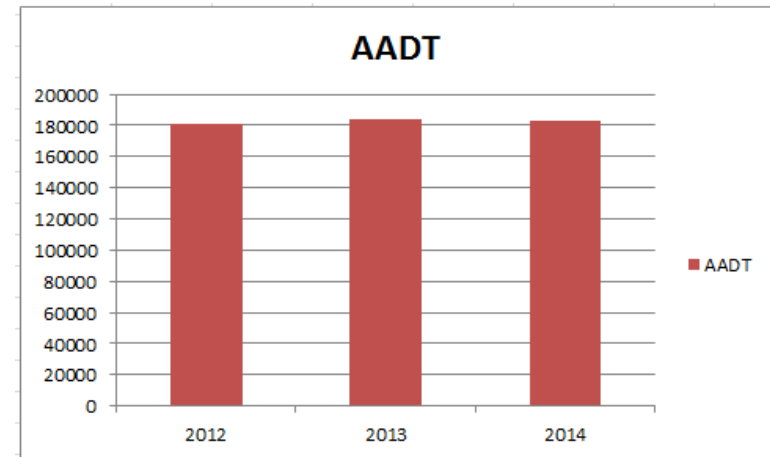
**Notes:** Longstanding bottleneck on the outer loop of the beltway primarily during the morning rush. High traffic volume area. Delays extend back as far as MD-26/Liberty Rd. Also contributing to congestion in the area is a beltway widening project which began in February. “The plan is for crews to 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)

## #5 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CCW @ Edmondson Ave/Exit 14	2 h 36 m	9.4	103	269	151,099

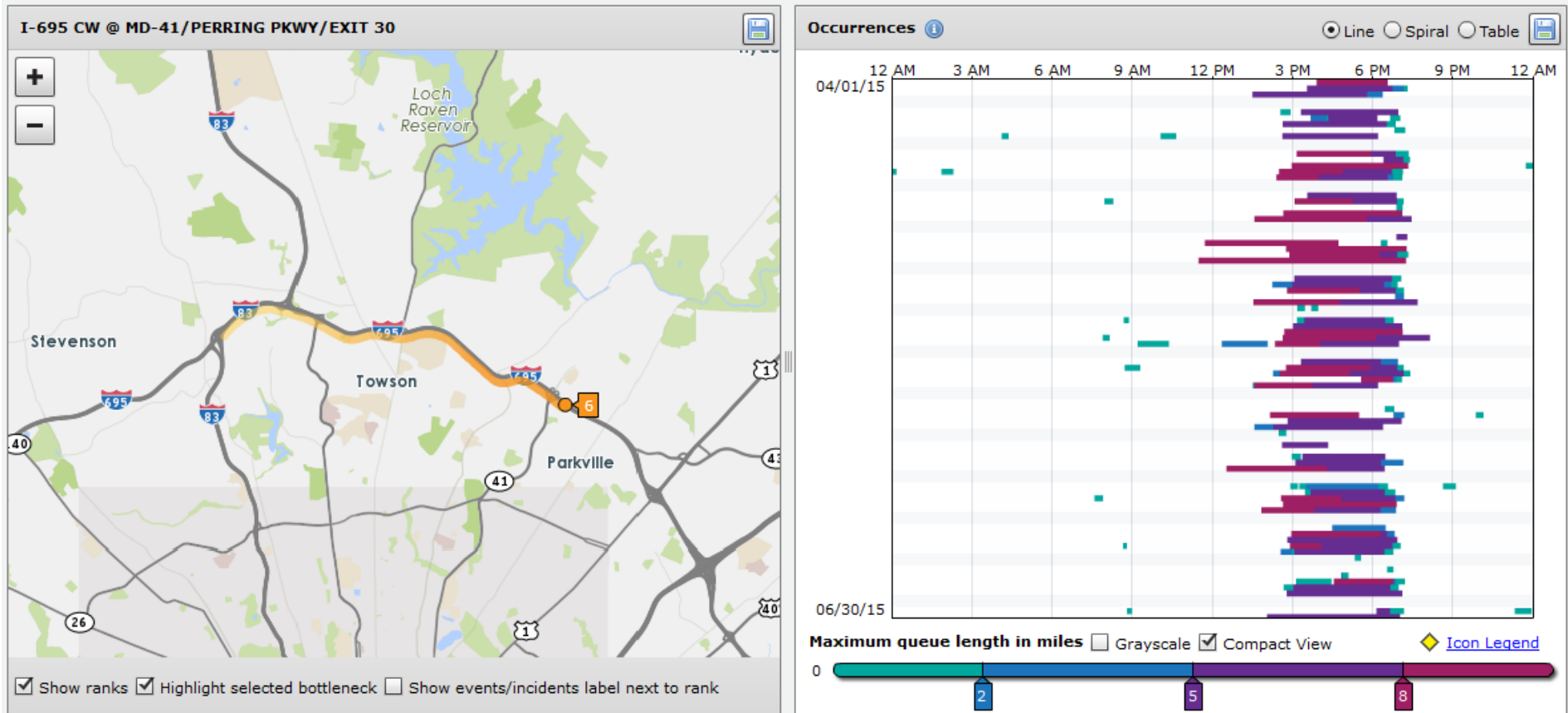


Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION IS 695 - South of Ingleside Ave (ATR#32)



## #6 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

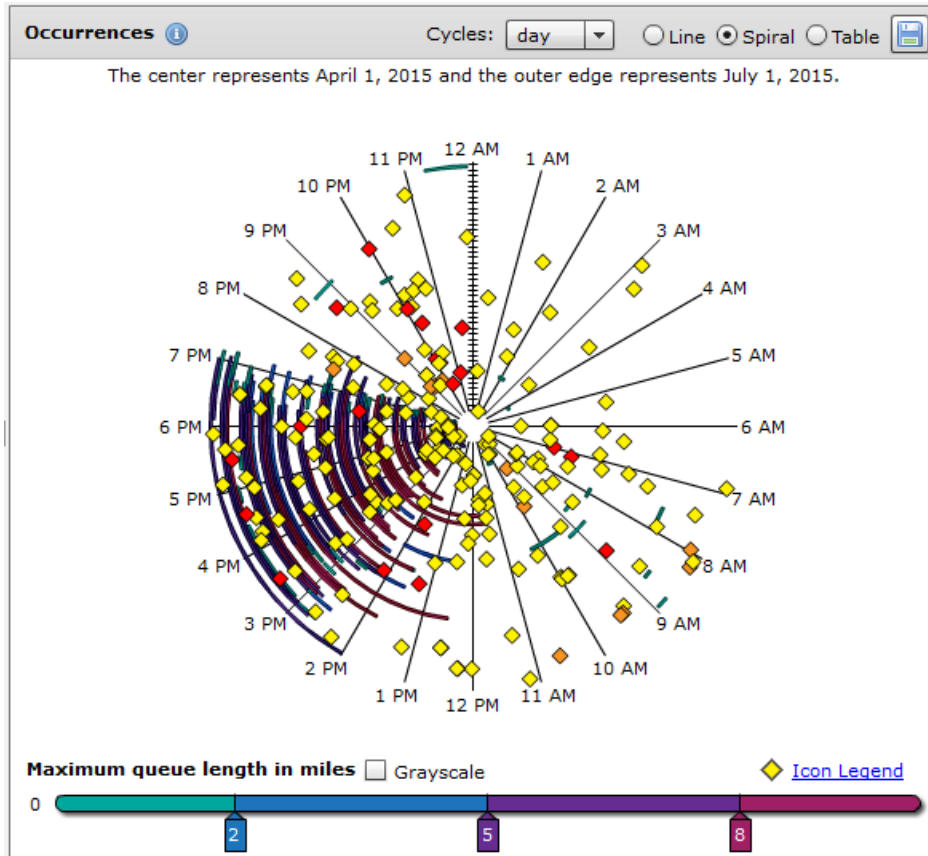
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ MD-41/Perring Pkwy	2 h 05 m	6.26	174	209	136,097



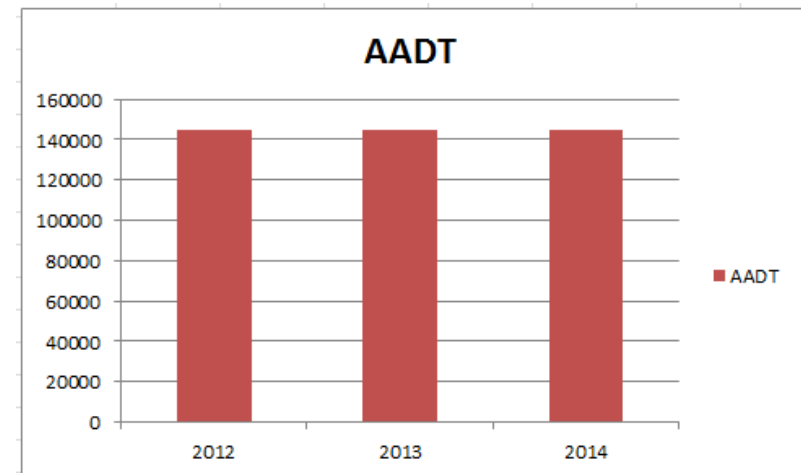
**Notes:** Congestion was most severe between I-83 and Providence Rd. Factors contributing to this long standing and extended congested zone: merging and weaving associated with traffic at each interchange and a lane drop (to 3 lanes) at MD-45/York Rd.

## #6 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ MD-41/Perring Pkwy/Exit 30	2 h 05 m	6.26	174	209	136,097

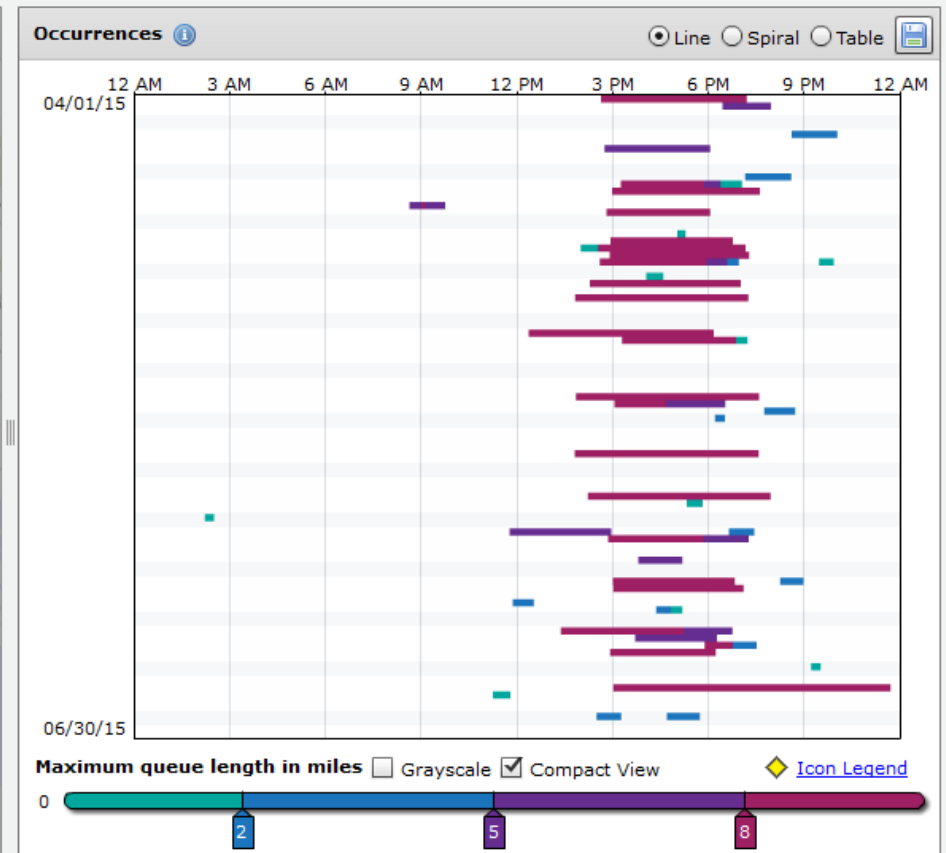
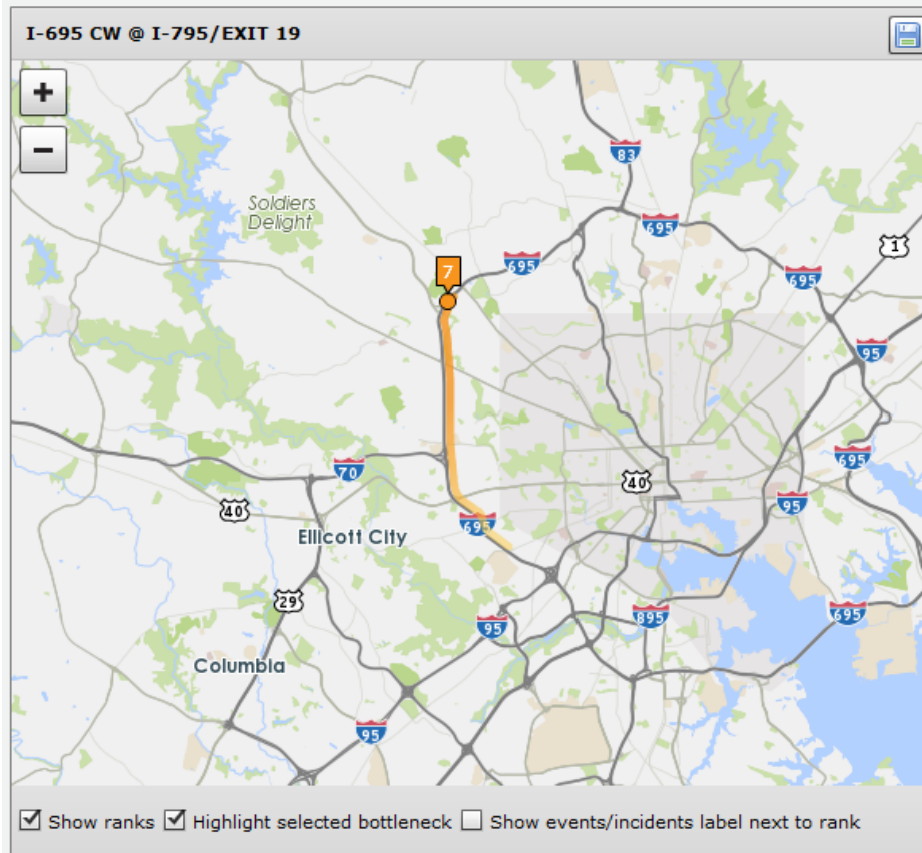


Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION IS695-.20 MI E OF MD542



## #7 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

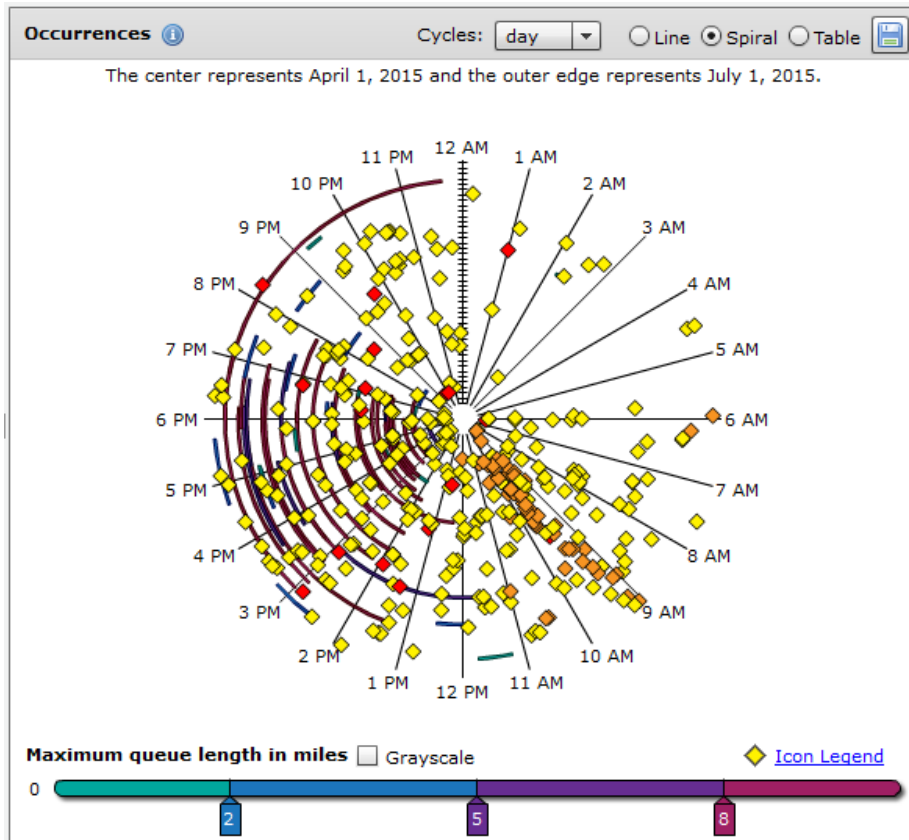
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ I-795/Exit 19	2 h 35 m	9.05	86	358	120,622



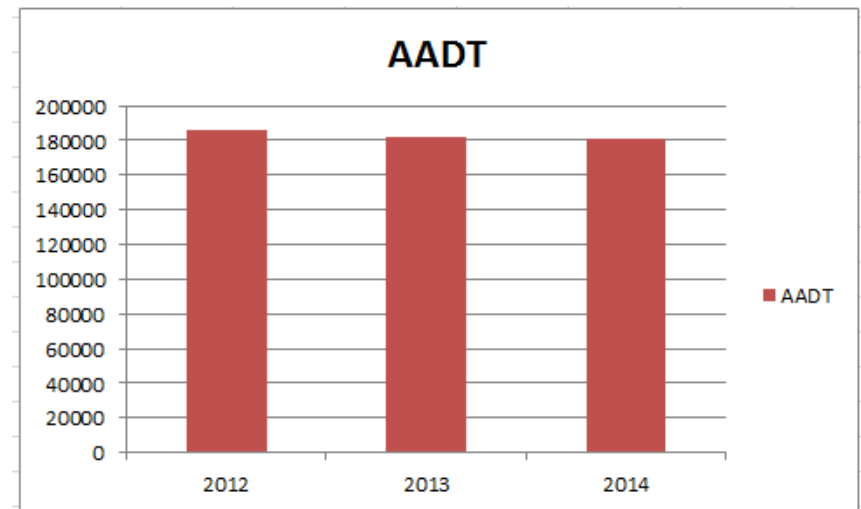
**Notes:** Longstanding west side beltway inner loop traffic in the afternoon generally between 3 and 7pm from Exit 19/I-795 often extending back to Exit 13/MD-44/Frederick Rd. High traffic volume.

## #7 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ I-795/Exit 19	2 h 35 m	9.05	86	358	120,622



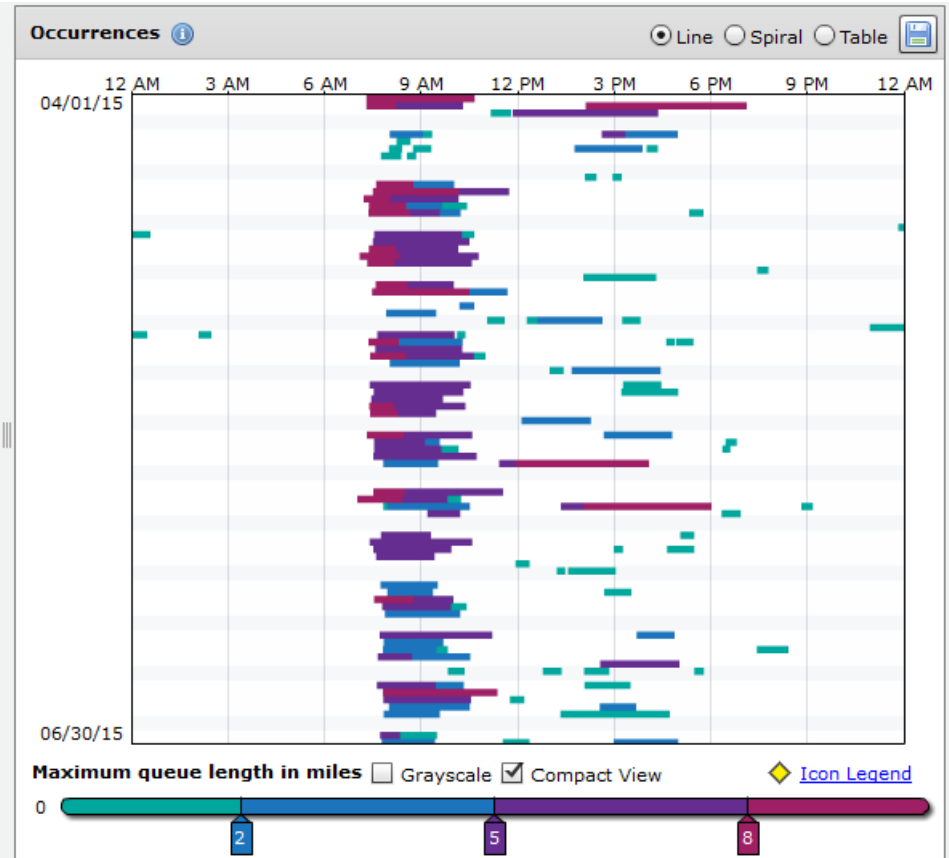
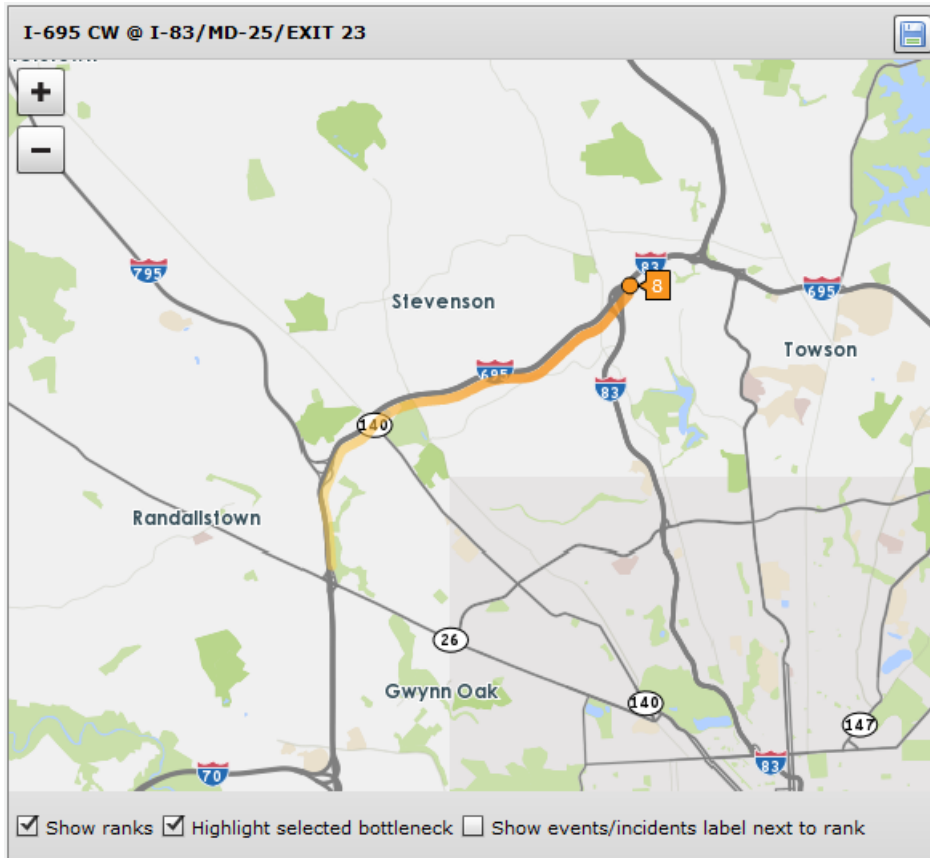
Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION IS695-.30 MI N OF IS795





## #8 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

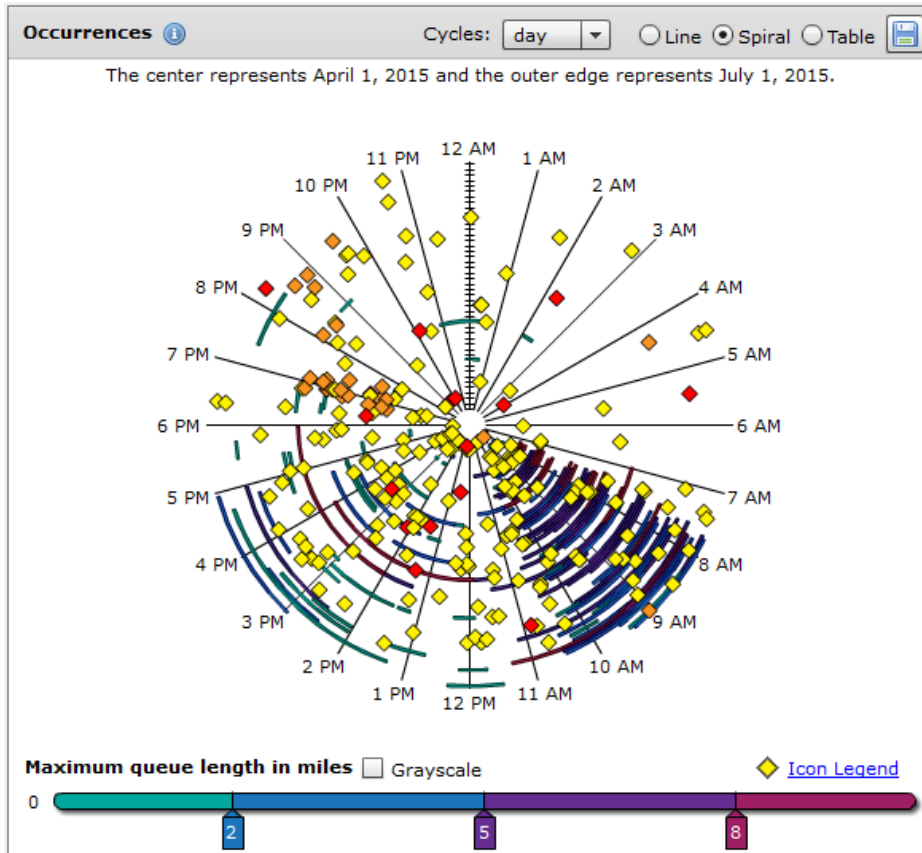
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ I-83/MD-25/Exit 23	1 h 39 m	6.95	154	231	105,980



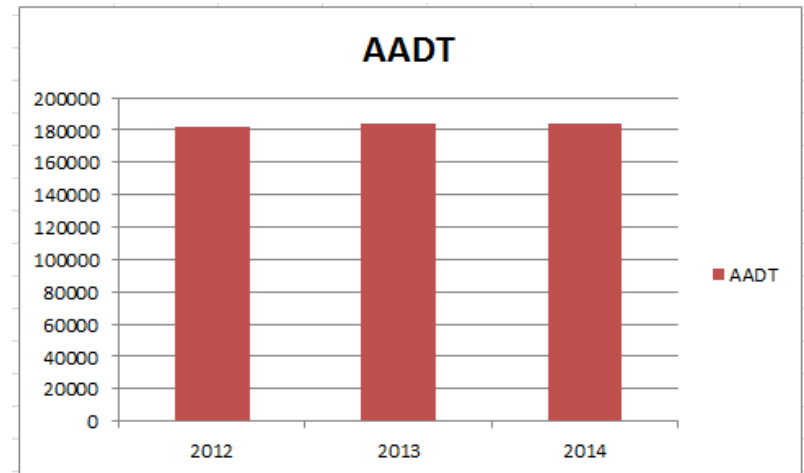
**Notes:** Morning rush hour congestion. The lane drop approaching the ramp to southbound I-83 is a contributing factor, as are merging and weaving at the interchanges in this segment.

## #8 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ I-83/MD-25/Exit 23	1 h 39 m	6.95	154	231	105,980

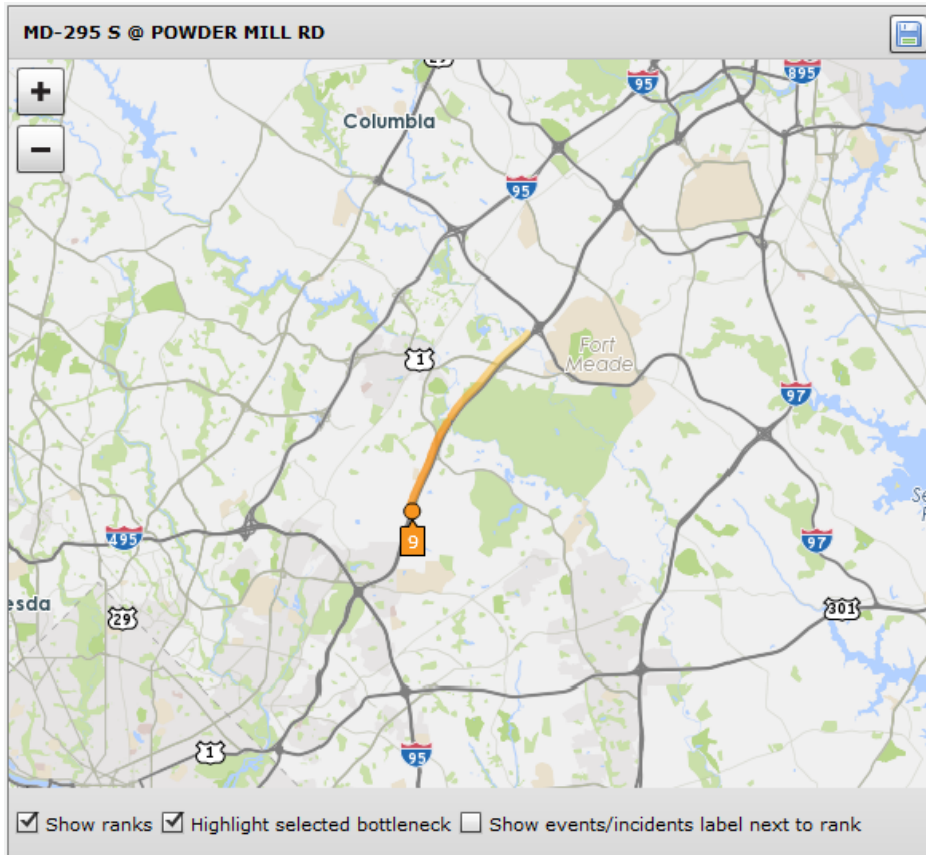


Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION IS695-.50 MI E OF  
 GREENSPRING AVE



## #9 Ranked Bottleneck in the Baltimore Region - 2<sup>nd</sup> Quarter 2015

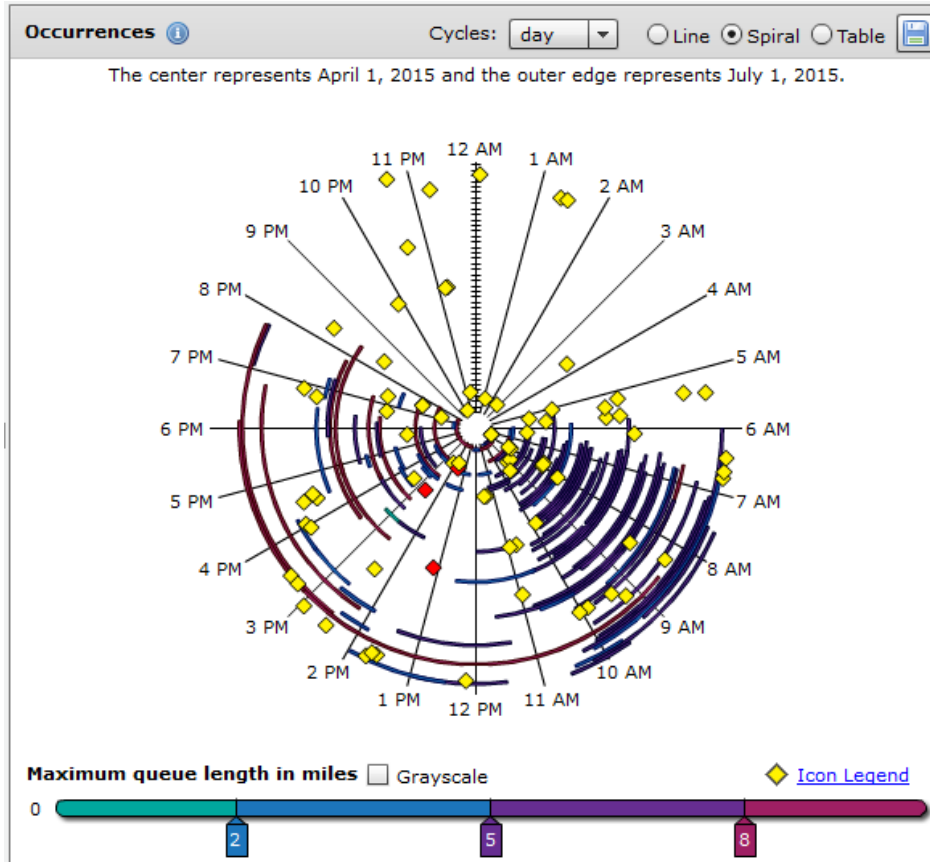
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ Powder Mill Rd	2 h 41 m	6.4	102	82	105,134



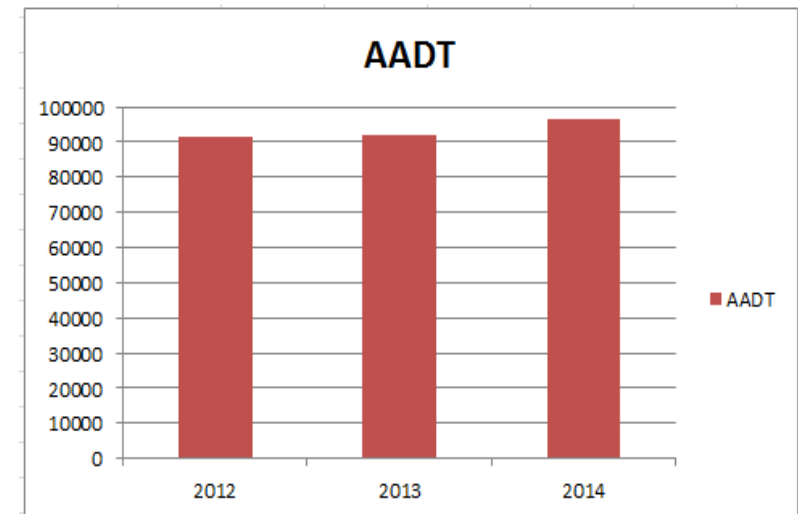
**Notes:** Southbound congestion extending from Powder Mill Rd just barely extending into the southern portion of the Baltimore region near Fort Meade occurring during both the morning and afternoon peak periods.

## #9 Ranked Bottleneck in the Baltimore Region – 2<sup>nd</sup> Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ Powder Mill Rd	2 h 41 m	6.4	102	82	105,134

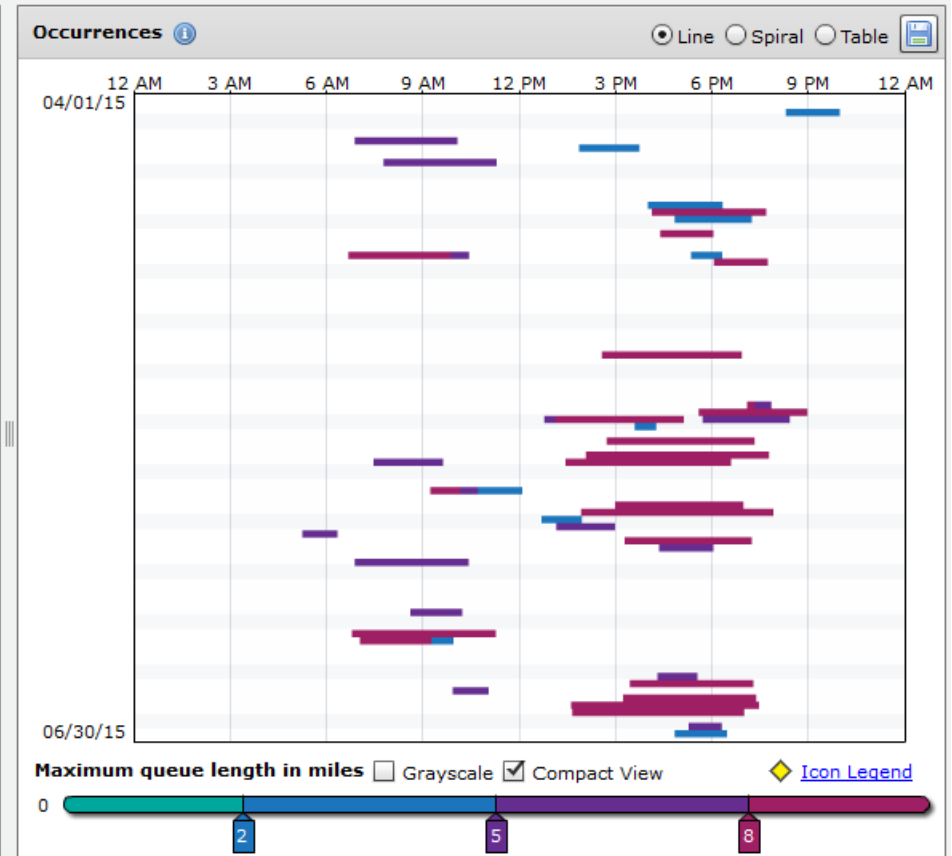
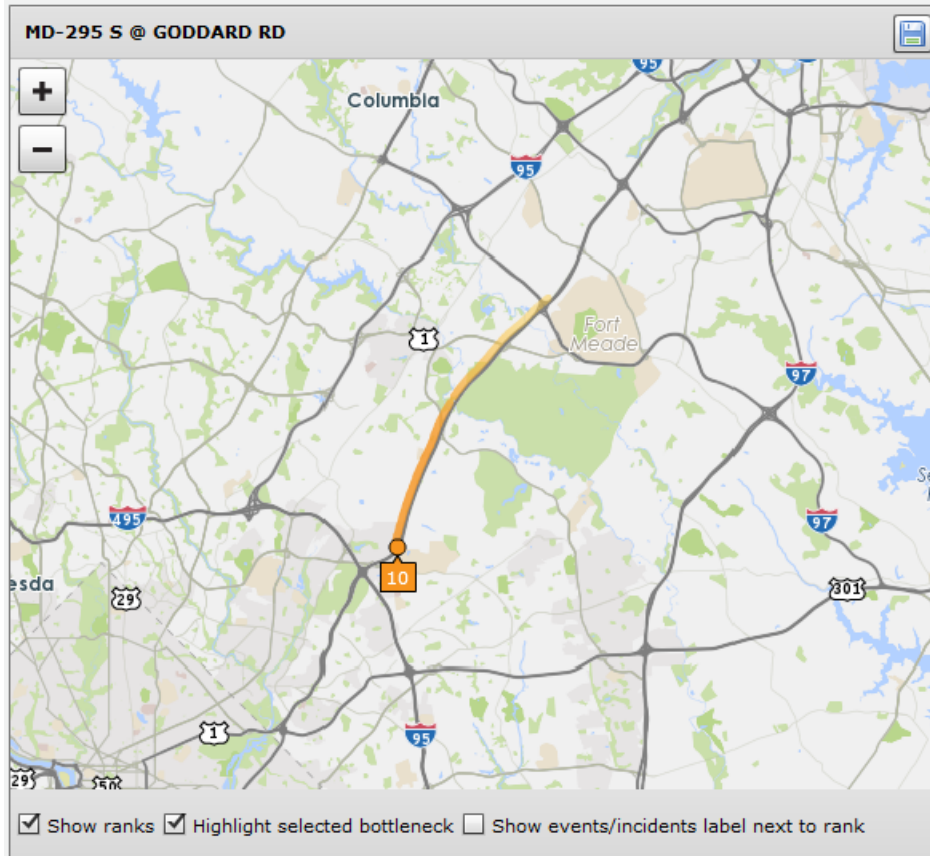


Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION MD295-.30 MI N OF MD197



## #10 Ranked Bottleneck in the Baltimore Region - 2<sup>nd</sup> Quarter 2015

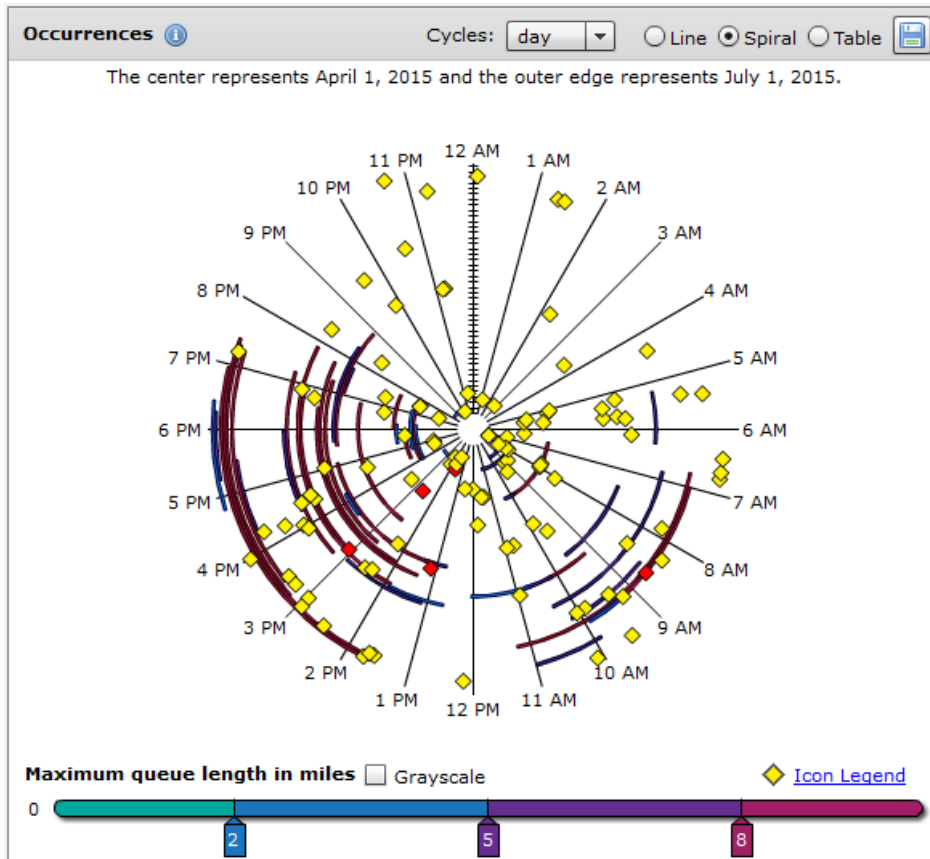
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ Goddard Rd	2 h 35 m	9.14	59	112	83,585



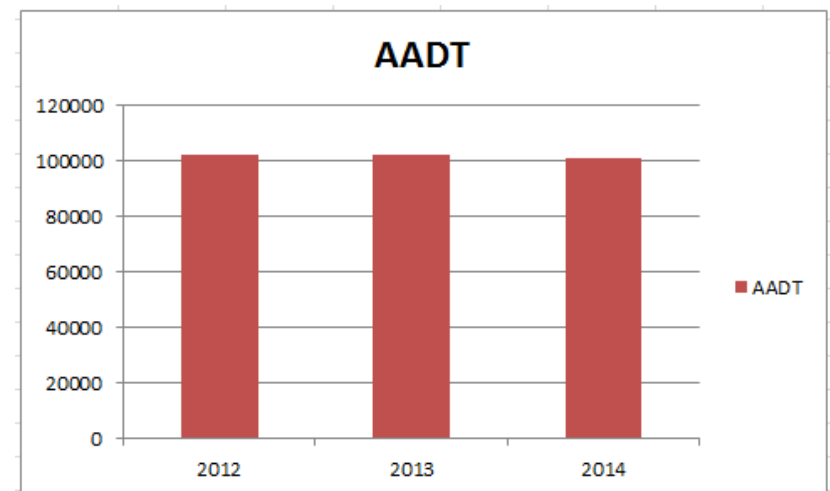
**Notes:** Southbound congestion extending from Powder Mill Rd just barely extending into the southern portion of the Baltimore region near Fort Meade occurring during both the morning and afternoon peak periods. This could be considered a continuation of bottleneck number #9 but primarily in the afternoon rush starting further south on MD-295.

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

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ Goddard Rd	2 h 35 m	9.14	59	112	83,585

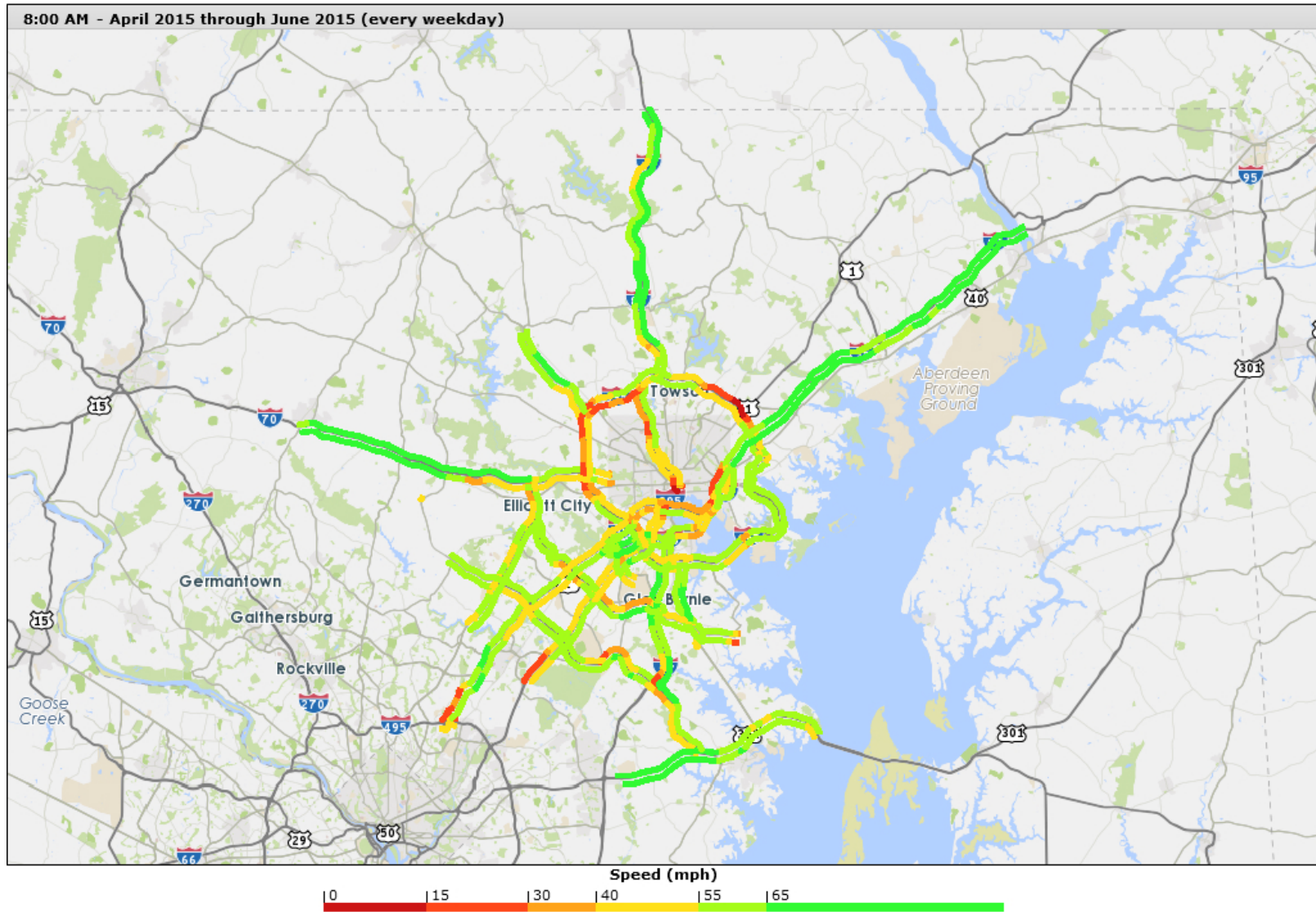


Traffic Volumes – Average Annual Daily Traffic (AADT)  
 STATION\_DESCRIPTION MD295-.40 MI N OF MD193



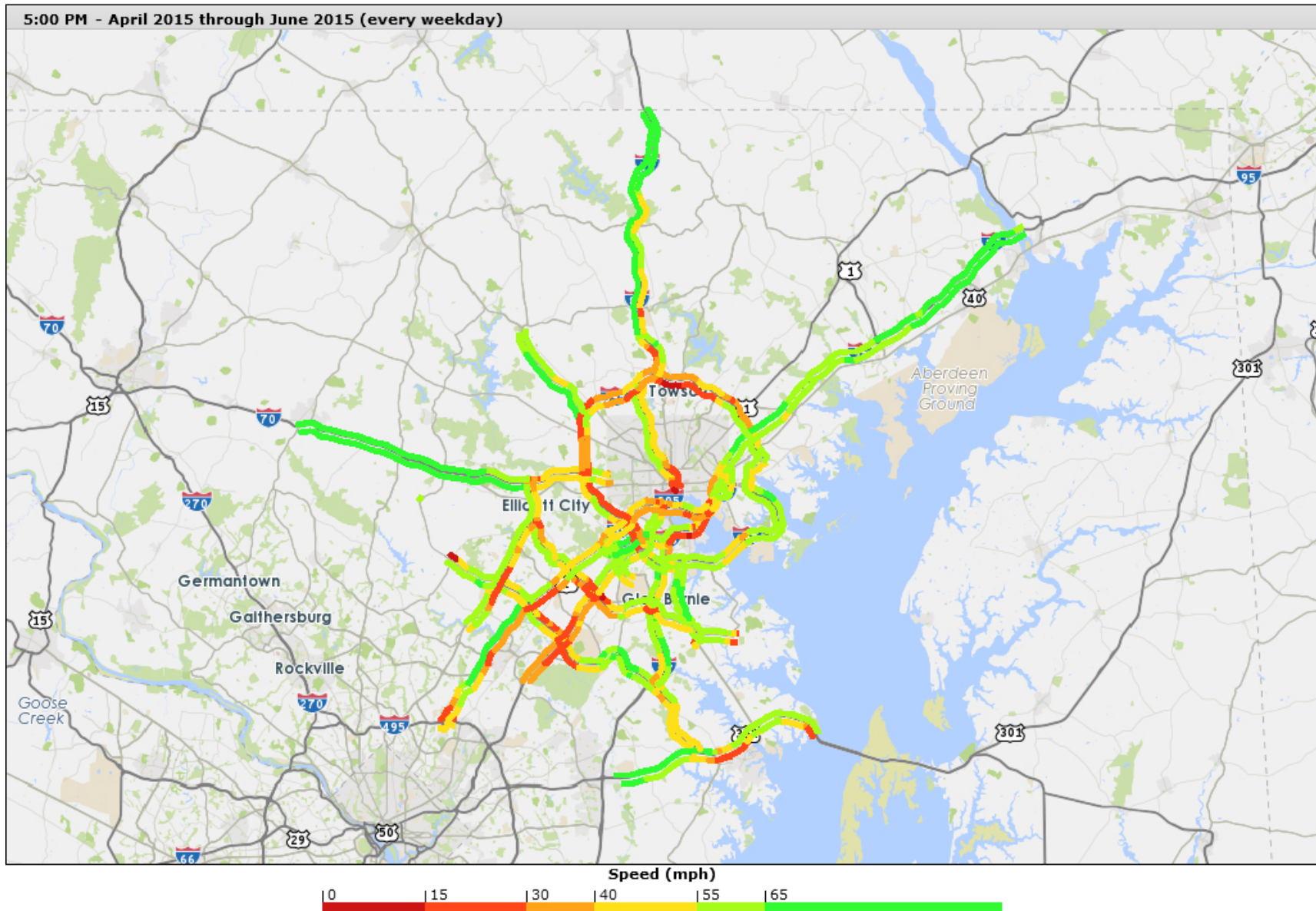
## Average Speed Maps - AM Peak Period 8:00-9:00 Weekdays: 2<sup>nd</sup> Quarter 2015

I-695, I-83, I-70, I-795, I-97, I-895, I-895 SPUR, US-50, MD-10, MD-100, MD-32, I-195, US-29, MD-295, and I-95  
using INRIX data



## Average Speed Maps - PM Peak Period 5:00-6:00 Weekdays: 2<sup>nd</sup> Quarter 2015

I-695, I-83, I-70, I-795, I-97, I-895, I-895 SPUR, US-50, MD-10, MD-100, MD-32, I-195, US-29, MD-295, and I-95  
using INRIX data





## 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 TomTom 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](http://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 [i95mvp@ttlc.net](mailto:i95mvp@ttlc.net)  
For the Vehicle Probe Project Suite, Michael L. Pack at 301-405-0722 or [packml@umd.edu](mailto:packml@umd.edu)

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