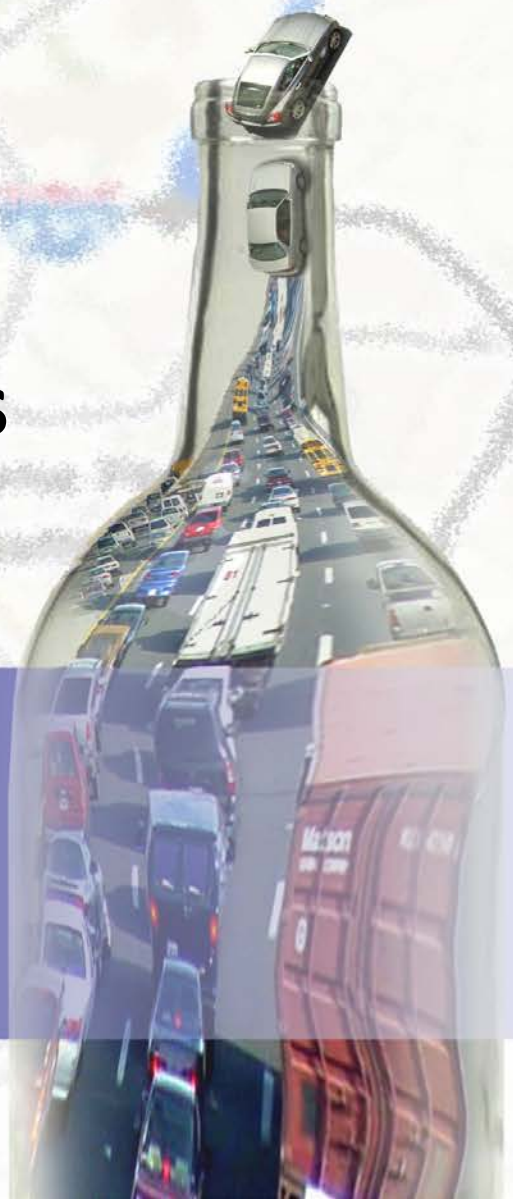
Baltimore Metropolitan Council

Quarterly Congestion Analysis Report for the Baltimore Region

Top 10 Bottleneck Locations

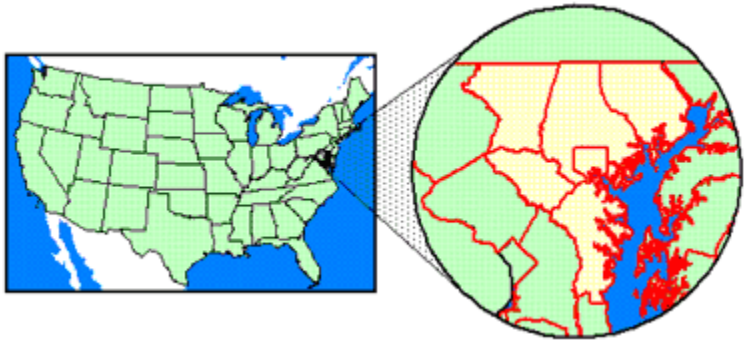


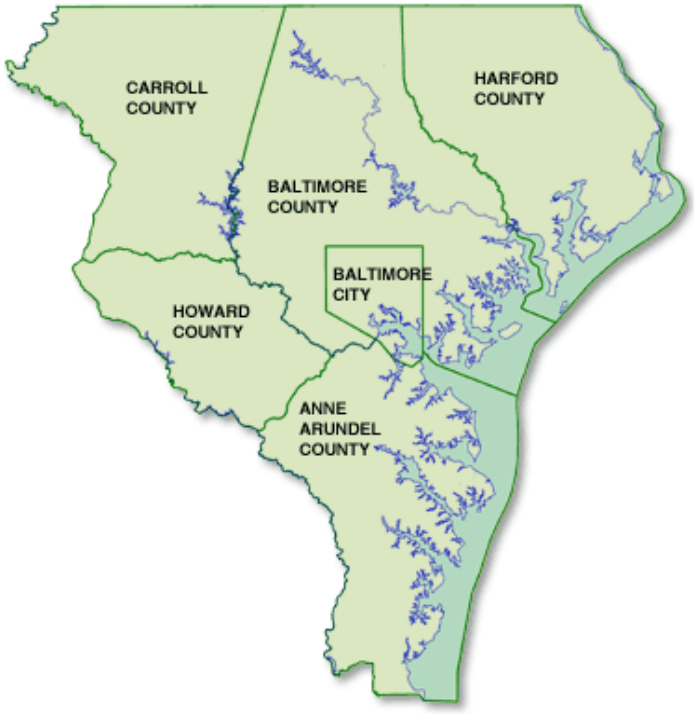
3rd Quarter 2015

Table of Contents

About the Region

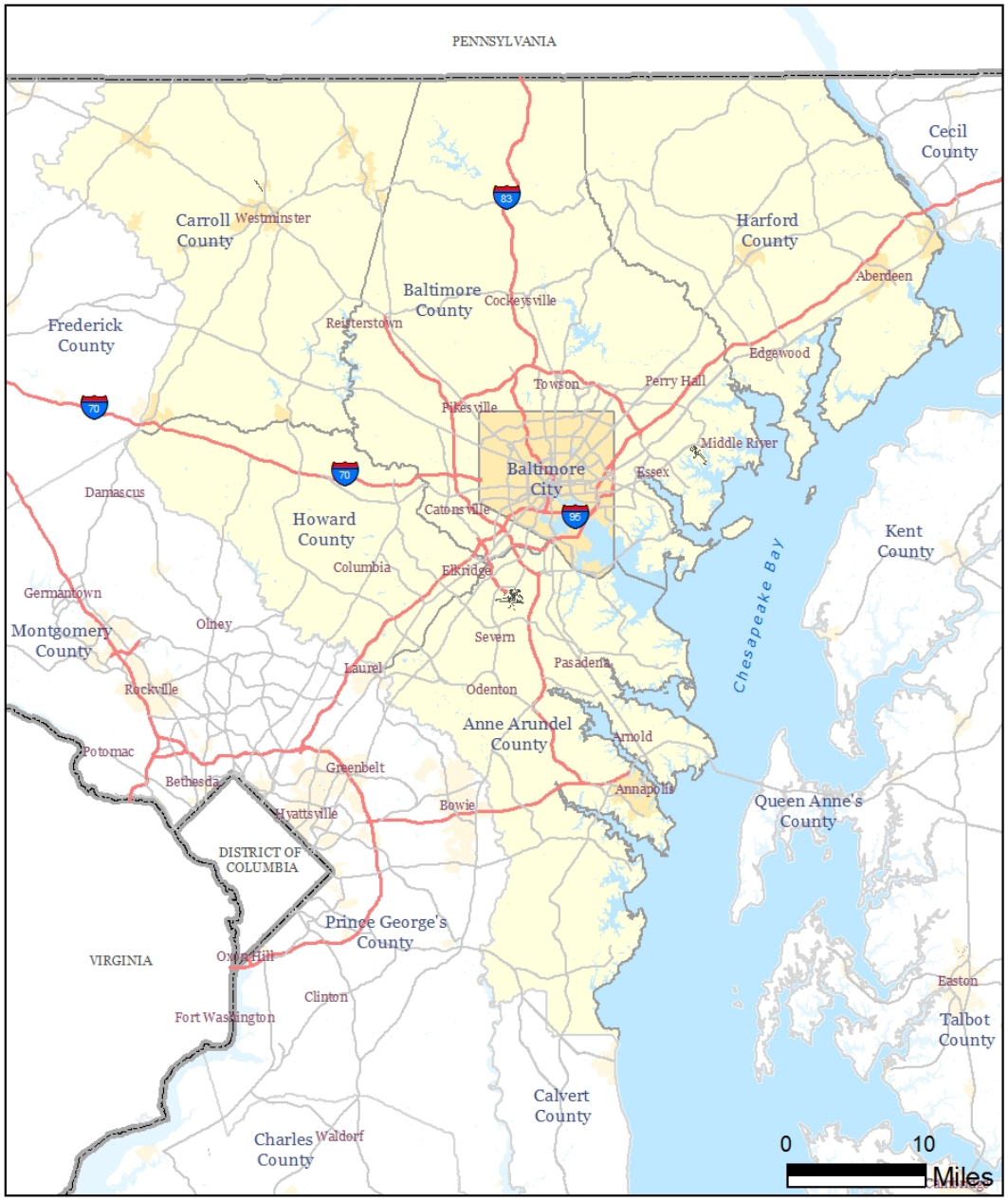
Located in the heart of the Mid-Atlantic on the east coast, the Baltimore region includes:

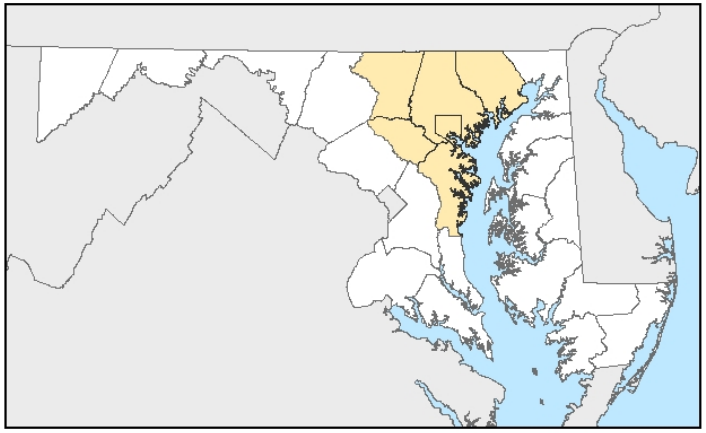




The Baltimore region is the nation's 19th largest market, with over 2.5 million people. The market also ranks among the top 20 in the country in the number of households, total effective buying income and retail sales.

Baltimore Metropolitan Region



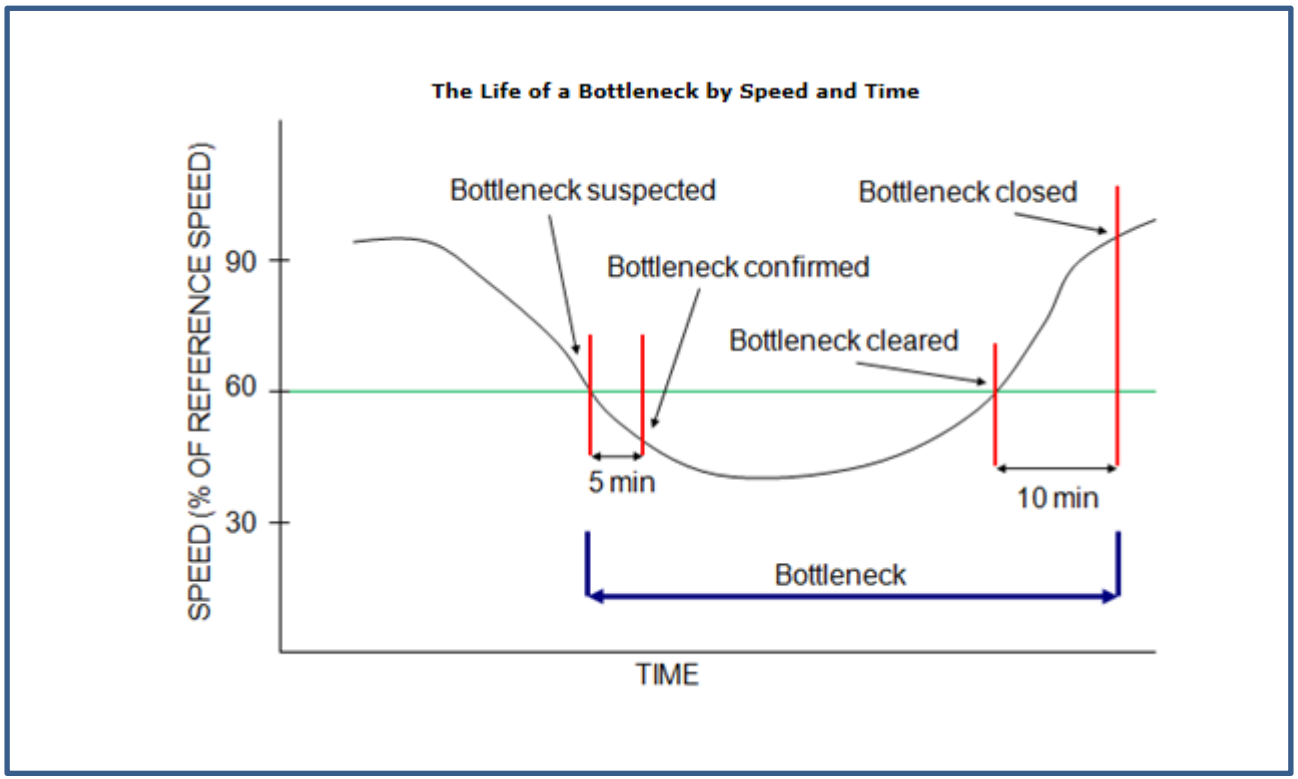


Prepared by
Transportation Planning Division
Projected Coordinate System: NAD 1983 State Plane (ft)
Data Source: BMC, © NAVTEQ 2013, TIGER/Line®, MTA
Printed - July 2013

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

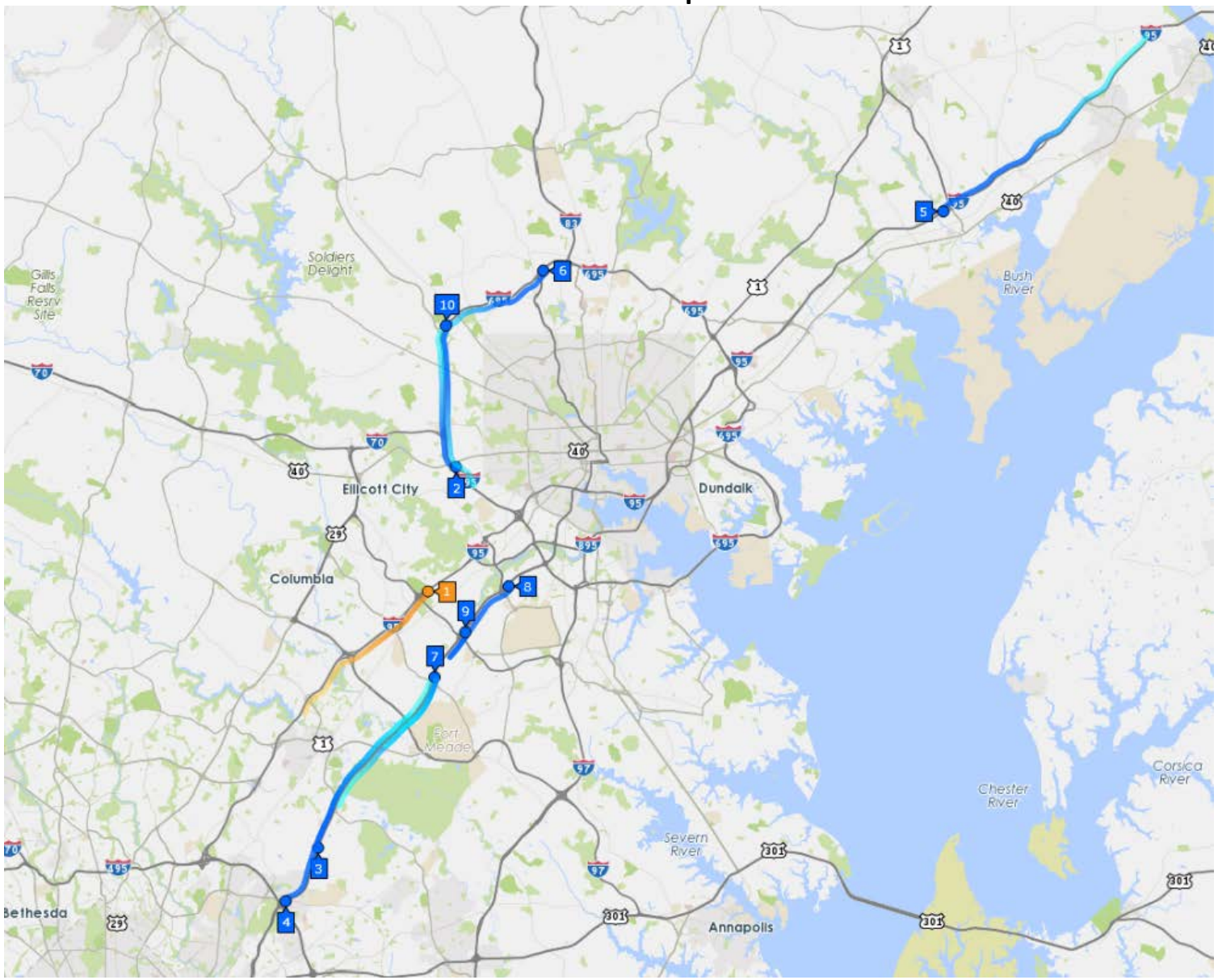
Yellow — All other events and incidents

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

Incident/Event Icons

Top 10 Bottlenecks in the Baltimore Region
3rd Quarter 2015

Overview Map



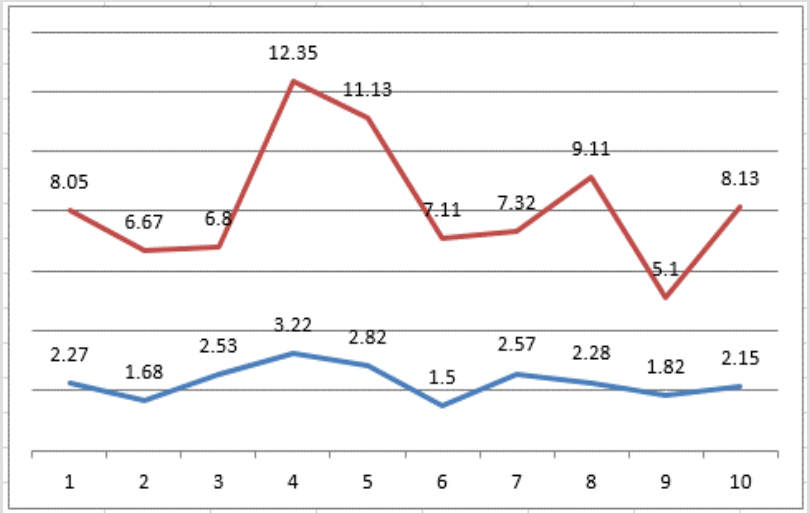
Top 10 Bottlenecks in the Baltimore Region
3rd Quarter 2015

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 16 m	8.05	177	203	193,763
2	I-695 CCW @ US-40/Exit 15	1 h 41 m	6.67	181	223	122,021
3	MD-295 S @ Powder Mill Rd	2 h 32 m	6.80	115	98	118,875
4	MD-295 S @ MD-193	3 h 13 m	12.35	45	145	107,283
5	I-95 S @ MD-24/Exit 77	2 h 49 m	11.13	54	220	101,583
6	I-695 CW @ I-83/MD-25/Exit 23	1 h 30 m	7.11	151	294	96,567
7	MD-295 N @ MD-175	2 h 34 m	7.32	80	71	90,123
8	MD-295 N @ I-195	2 h 17 m	9.11	65	160	81,108
9	MD-295 N @ MD-100	1 h 49 m	5.10	140	108	77,786
10	I-695 W @ I-795/Exit 19	2 h 09 m	8.13	73	308	76,578

CW = Clockwise CCW = Counterclockwise



Top 10 Bottlenecks in the Baltimore Region

By Impact Factor
(Number of Occurrences
x Average Duration in Minutes
x Average Length)

3rd Quarter 2015

Average max length (miles)

Average duration (hours)

Top 10 Bottlenecks in the Baltimore Region
3rd 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	MD-295 S @ I-495/I-95	3 h 40 m	11.73	13	140	33,535
2	MD-295 S @ Eastern Ave	3 h 36 m	15.97	3	162	10,347
3	I-95 S @ O'Donnell St/Exit 57	3 h 33 m	1.72	17	93	6,236
4	MD-295 N @ W Pratt St	3 h 30 m	2.51	50	16	26,351
5	MD-32 W @ I-70/US-40	3 h 15 m	10.16	7	2	13,870
6	MD-295 S @ MD-193	3 h 13 m	12.35	45	145	107,283
7	MD-32 W @ Ten Oaks Rd	3 h 13 m	6.00	7	1	8,107
8	MD-295 N @ W Lombard St	3 h 12 m	2.91	31	16	17,325
9	I-895 S @ I-895/6th Ave/Exit 6	3 h 11 m	1.25	8	34	1,912
10	MD-295 N @ US-40/Mulberry St/Franklin St	3 h 07 m	3.41	6	16	38,264

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

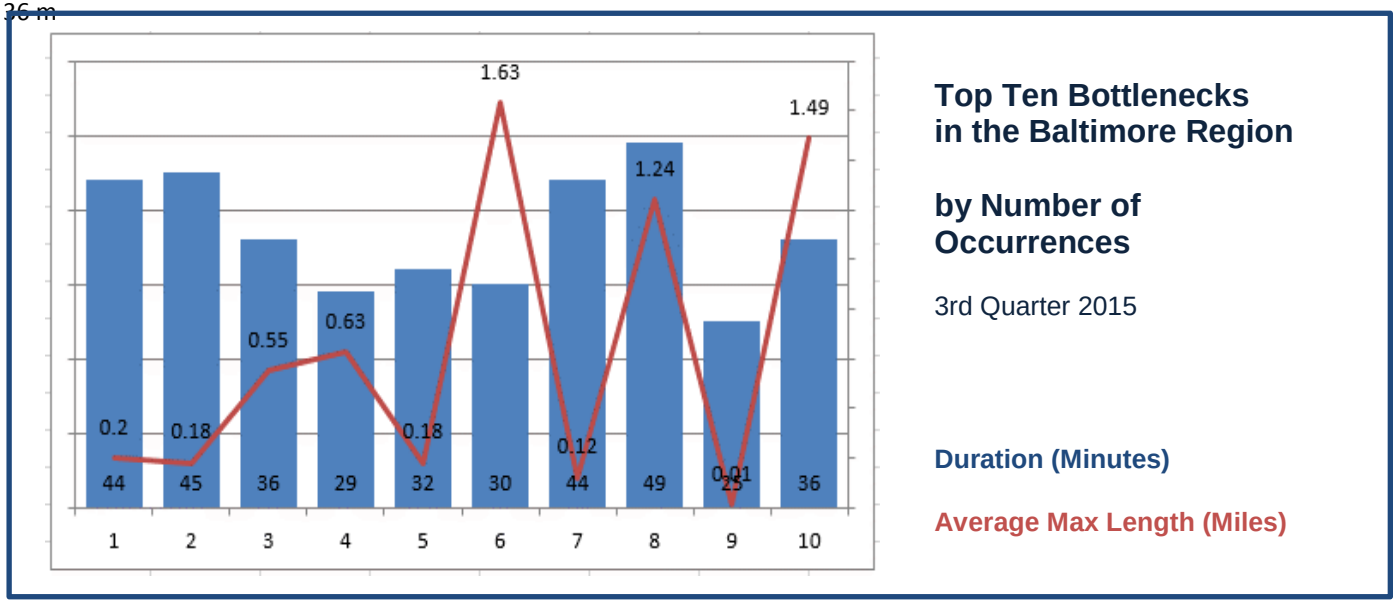
	Location	Average Duration	Average max length (miles)	Occurrences	Number of Incidents/ Events	Impact Factor
1	MD-295 S @ MD-450	3 h	16.46	3	199	8,889
2	MD-295 S @ Eastern Ave	3 h 36 m	15.97	3	162	10,347
3	MD-295 S @ Riverdale Rd	2 h 44 m	13.51	18	144	39,873
4	I-70 W @ MD-75/Exit 62	2 h 53 m	13.34	2	173	4,614
5	MD-295 S @ MD-193	3 h 13 m	12.35	45	145	107,283
6	MD-295 S @ I-495/I-95	3 h 40 m	11.73	13	140	33,535
7	I-695 CCW @ Md-144/Frederick Rd/Exit 13	1 h 57 m	11.17	19	361	24,826
8	I-95 S @ MD-24/Exit 77	2 h 49 m	11.13	54	220	101,583
9	MD-32 W @ I-70/US-40	3 h 15 m	10.16	7	2	13,870
10	MD-295 S @ Goddard Rd	2 h 55 m	9.85	31	102	53,431

Top 10 Bottlenecks in the Baltimore Region
3rd Quarter 2015

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

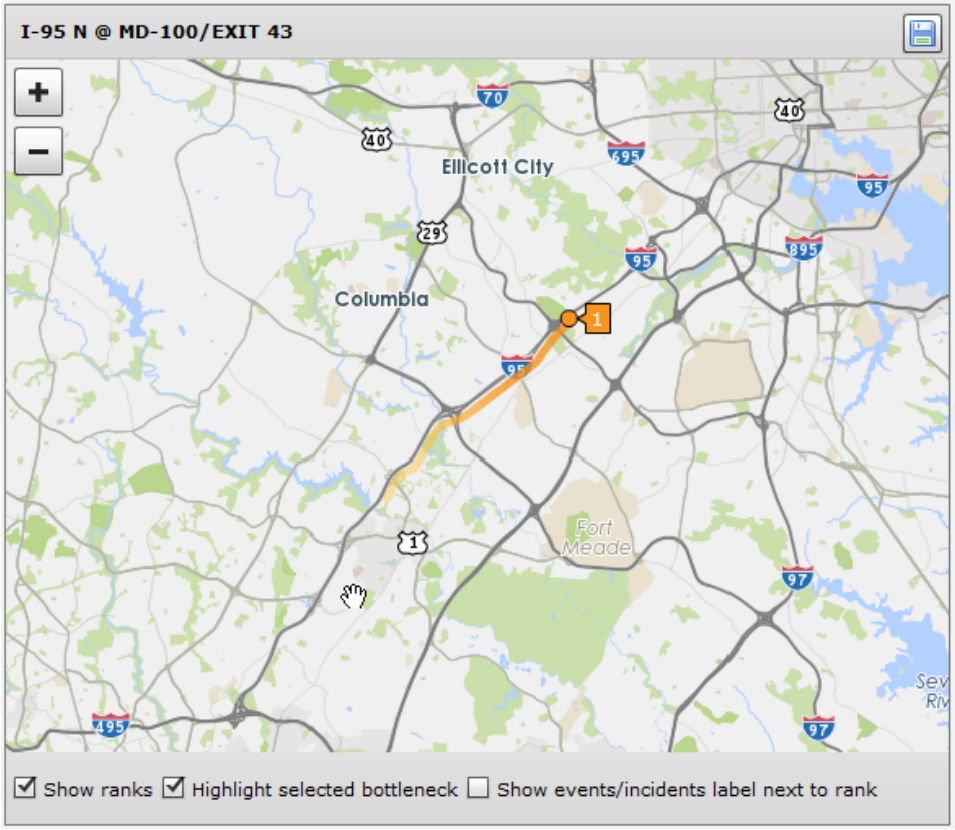
	Location	Average Duration	Average max length (miles)	Occurrences	Number of Incidents/ Events	Impact Factor
1	I-83 S @ Fayette St/Exit 1	44 m	0.20	1098	0	9,795
2	I-895 N @ Childs St/Exit 9	45 m	0.18	1063	70	8,386
3	I-95 N @ Keith Ave/Exit 56	36 m	0.55	774	43	15,336
4	I-95 S @ Keith Ave/Exit 56	29 m	0.63	767	22	14,121
5	MD-100 E @ MD-607/Magothy Bridge Rd	32 m	0.18	760	1	4,469
6	I-95 S @ Fort McHenry Tunnel	30 m	1.63	753	240	36,792
7	I-895 S @ Harbor Tunnel Toll Plaza	44 m	0.12	723	41	3,886
8	US-50 E @ Bay Bridge	49 m	1.24	571	326	34,709
9	I-83 N @ Fayette St/Exit 1	25 m	0.01	523	0	92
10	I-895 S @ Harbor Tunnel Thwy	36 m	1.49	496	0	26,554

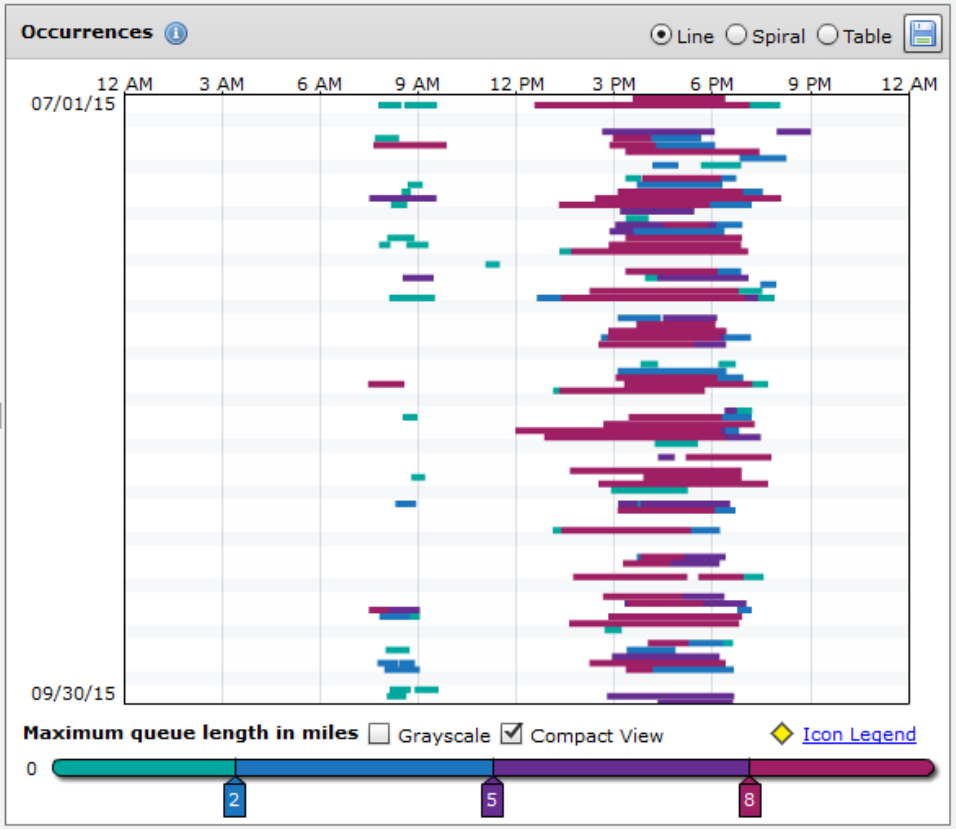
36 m



#1 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 N @ MD-100/Exit 43	2 h 16 m	8.05	177	203	193,763

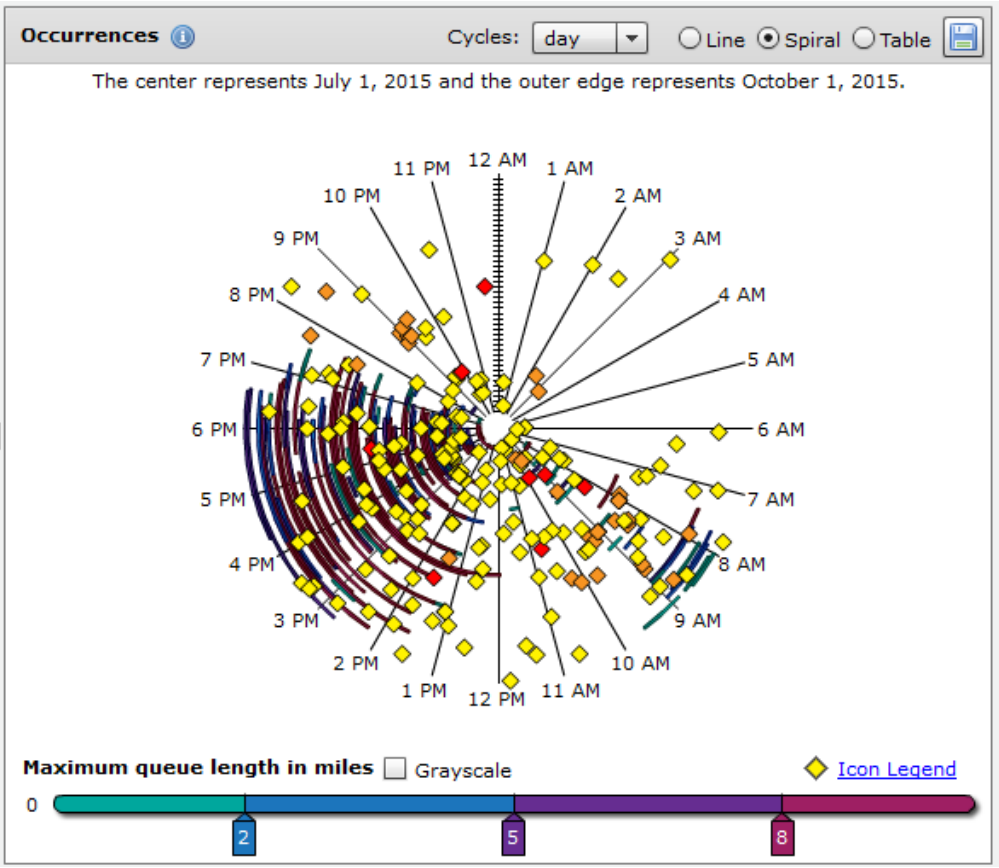




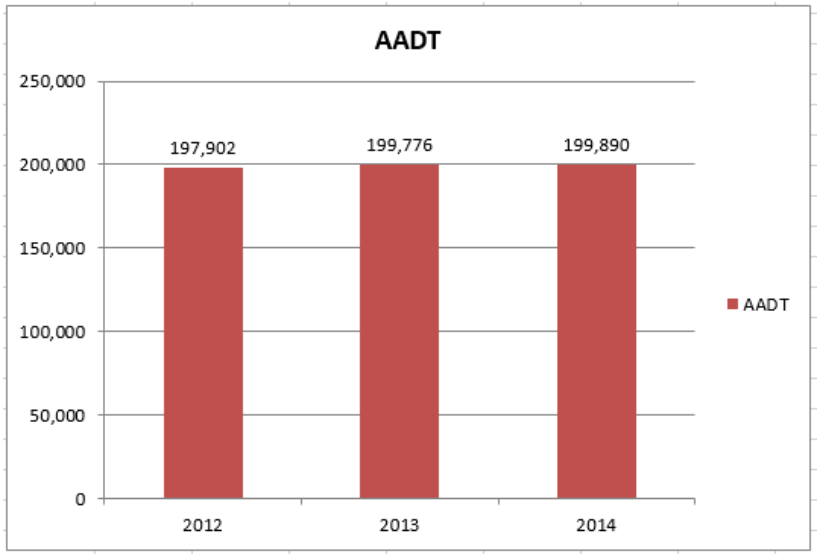
Notes: Congestion in the afternoon rush hour. Contributing factors include traffic entering at MD-175, weaving to exit at MD-100, and the half-mile uphill grade midway between MD-175 and MD-100.

#1 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 N @ MD-100/Exit 43	2 h 16 m	8.05	177	203	193,763

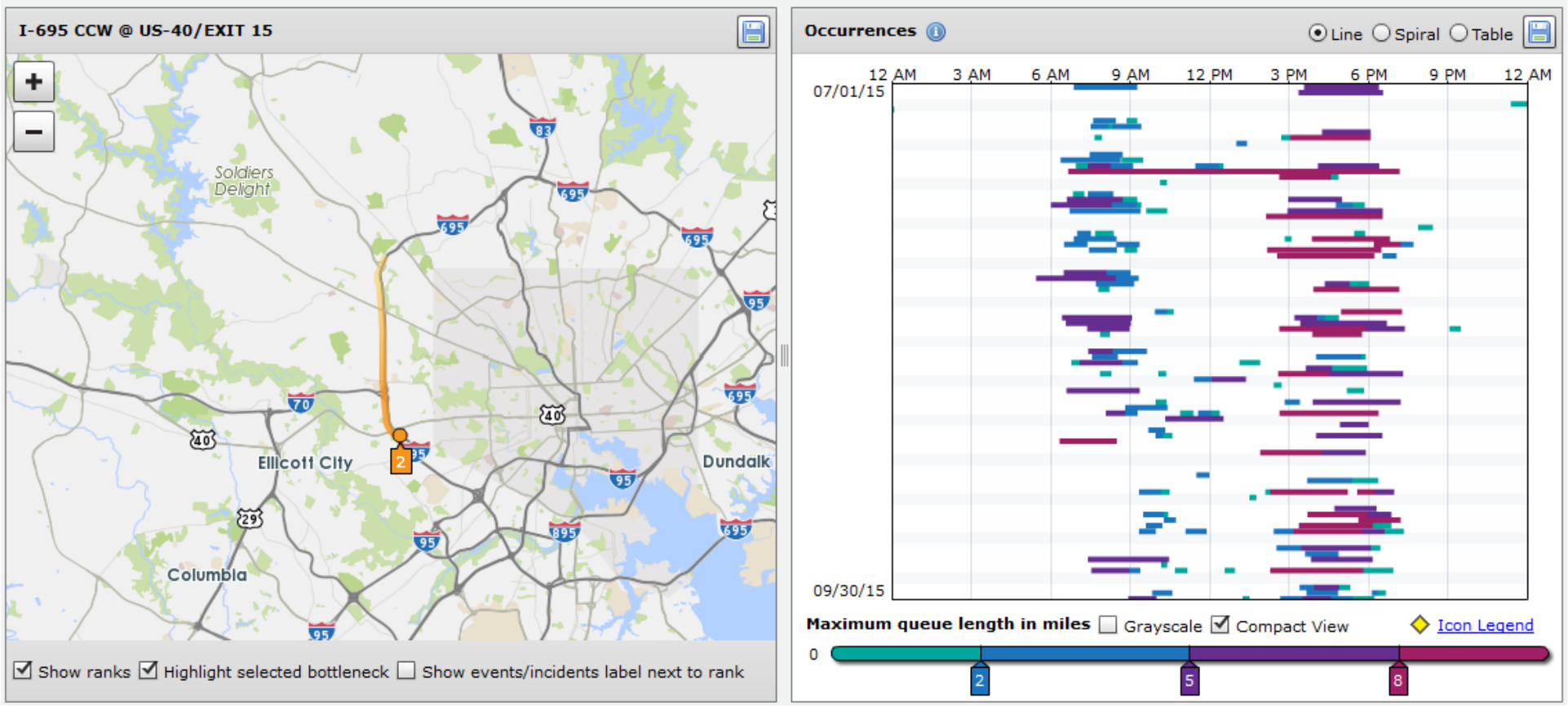


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS 95 South of MD 103 (ATR#39)



#2 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

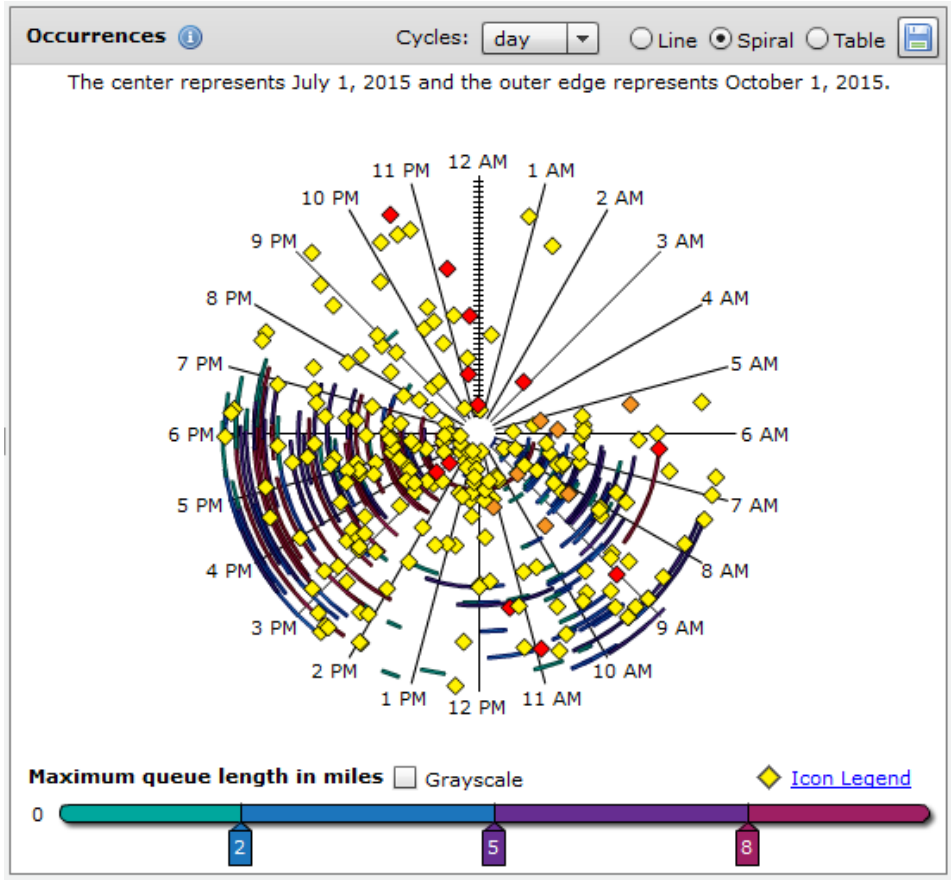
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CCW @ US-40/Exit 15	2 h 16 m	6.67	181	203	122,021



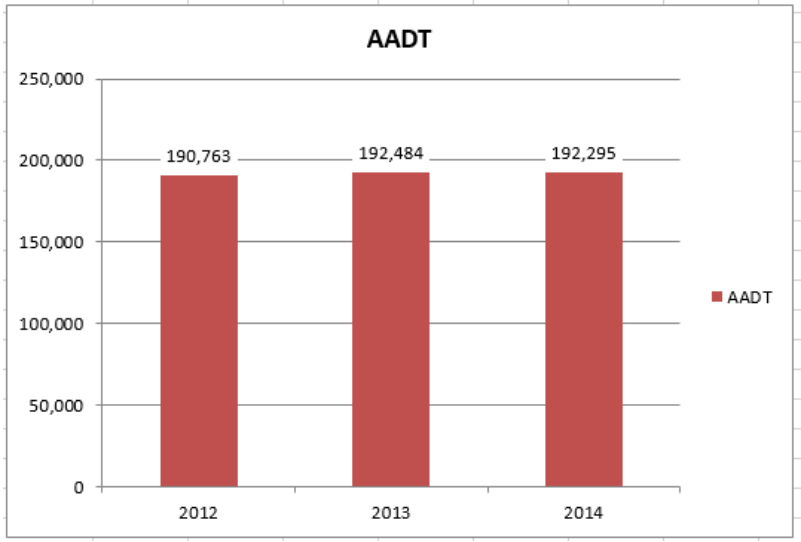
Notes: Delays found in both the morning and afternoon. Longstanding bottleneck on the outer loop of the beltway primarily during the morning rush. High traffic volume area. Delays extend back as far as MD-26/Liberty Rd. Also contributing to congestion in the area is a beltway widening project.

#2 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CCW @ US-40/Exit 15	2 h 16 m	6.67	181	203	122,021

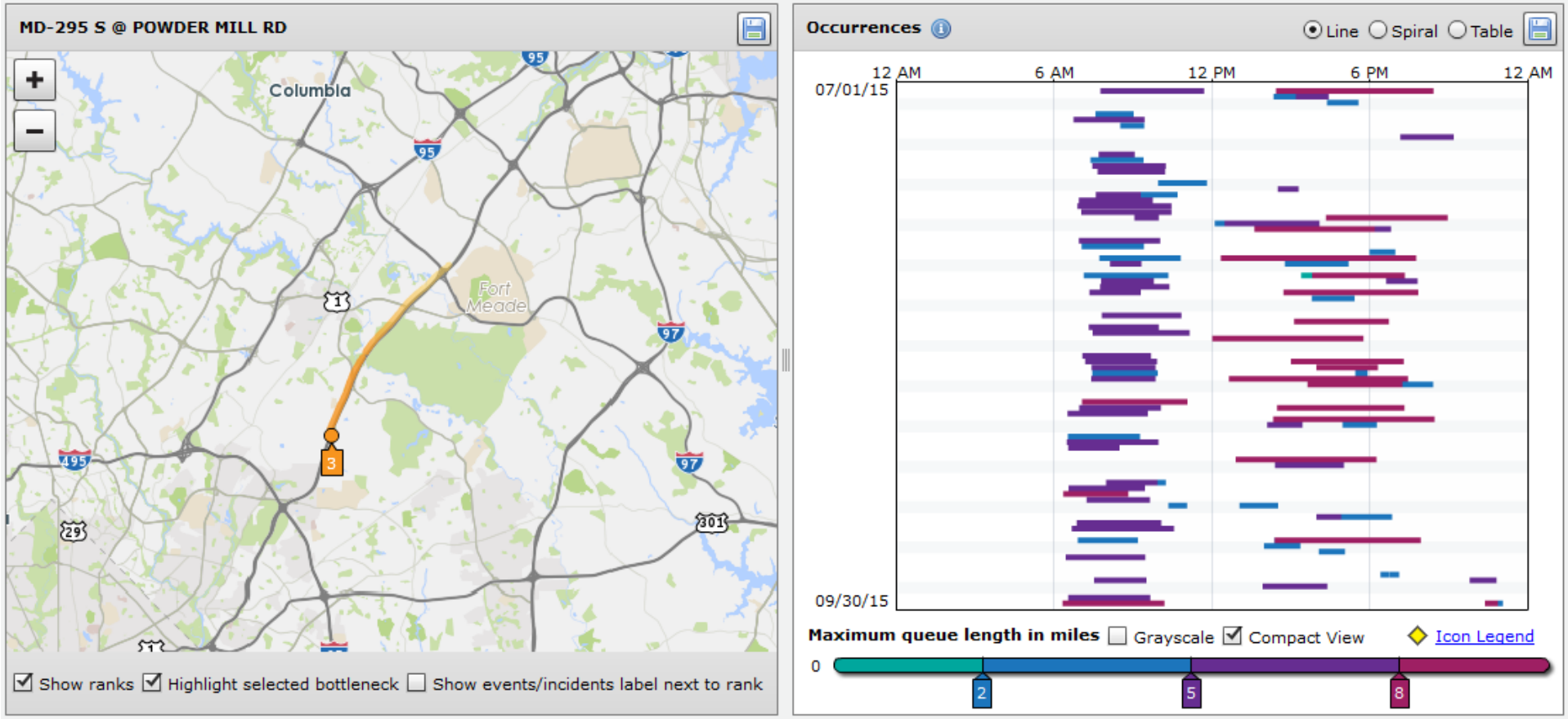


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS695-.50 MI S OF IS70



#3 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

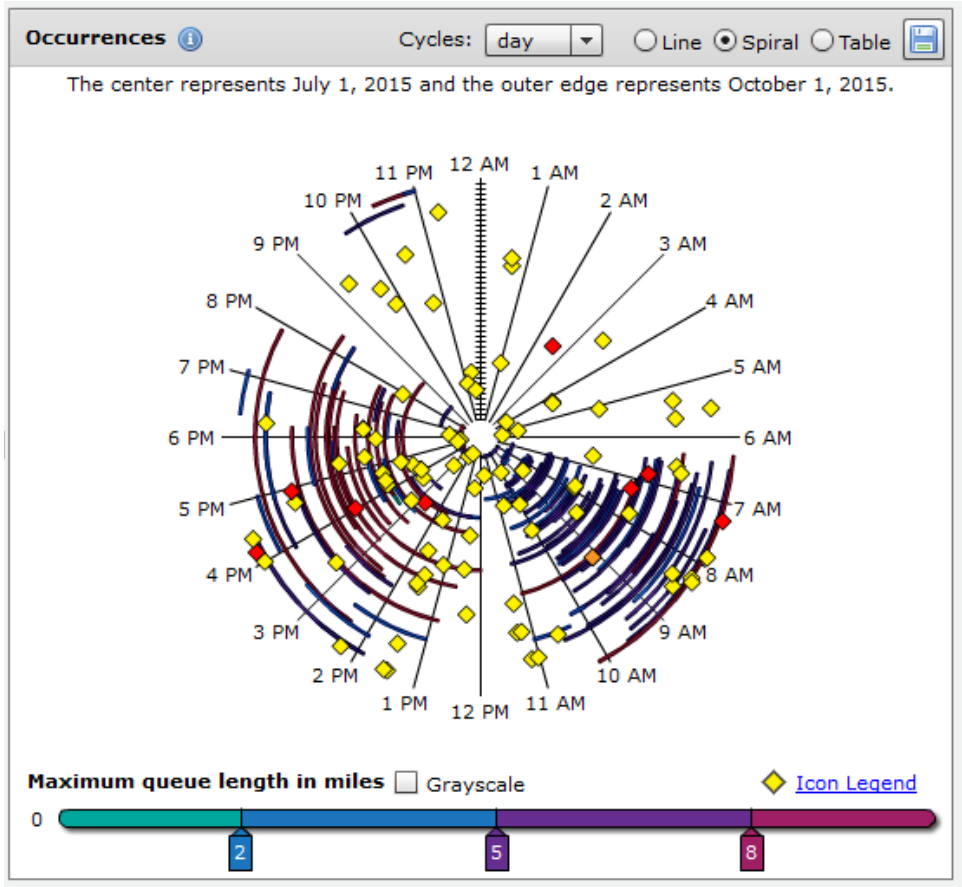
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ Powder Mill Rd	2 h 32 m	6.80	115	98	118,875



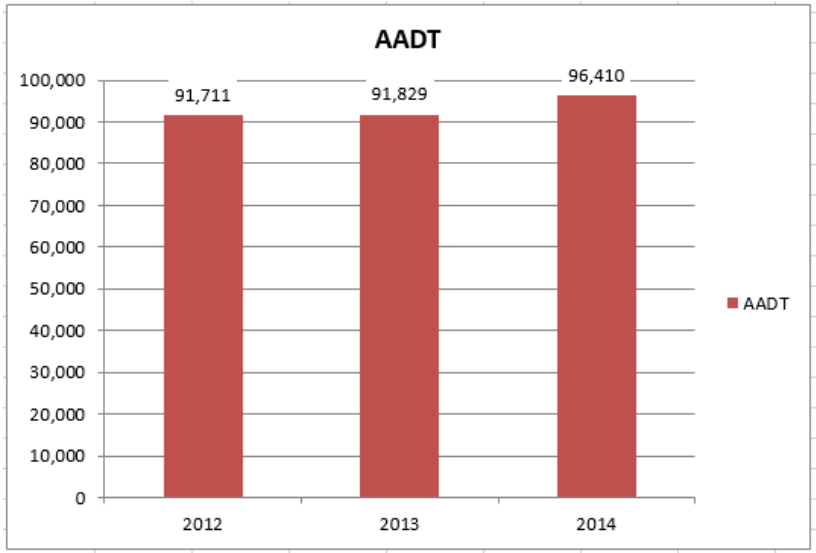
Notes: Southbound congestion extending from Powder Mill Rd just barely extending into the southern portion of the Baltimore region near Fort Meade occurring during both the morning and afternoon peak periods.

#3 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @Powder Mill Rd	2 h 32 m	6.80	115	98	118,875

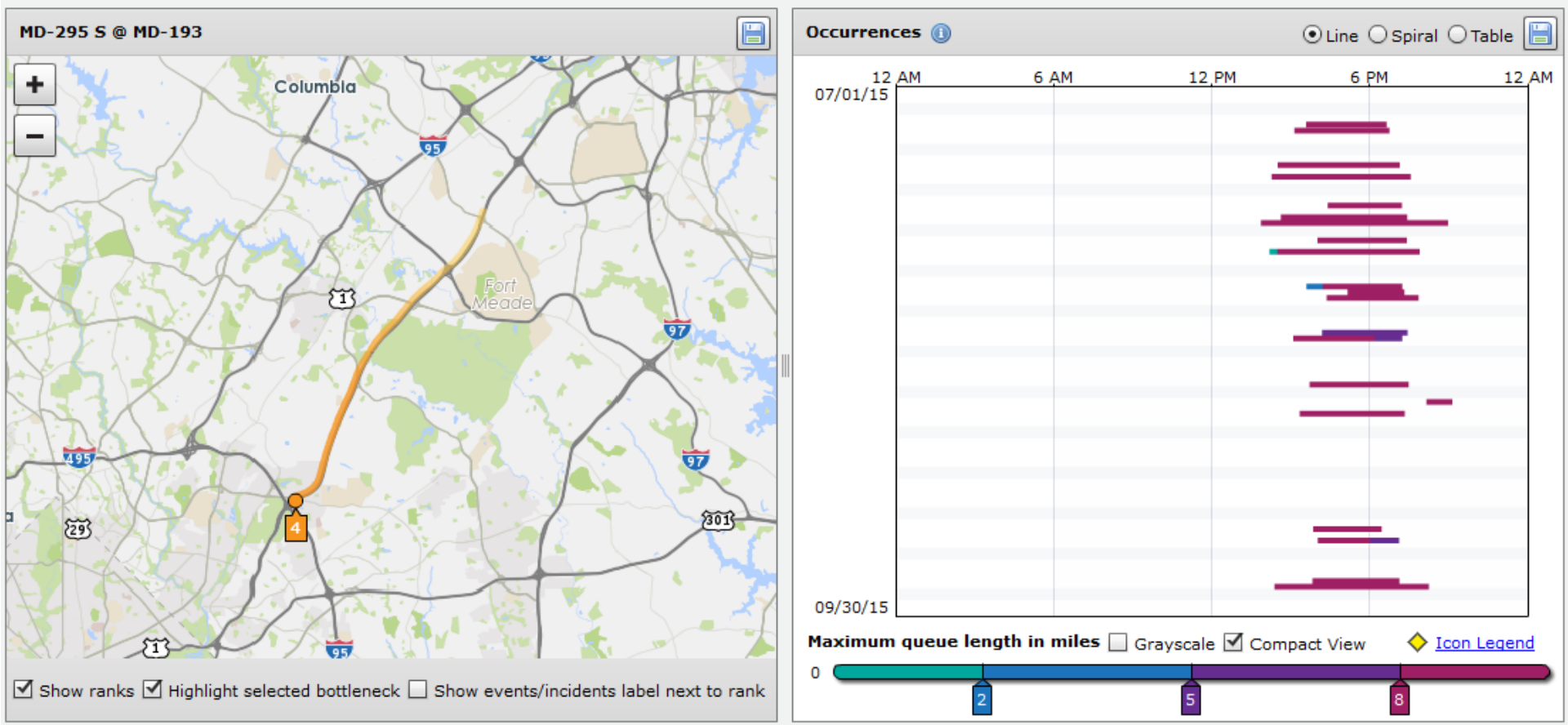


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.30 MI N OF MD197



#4 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

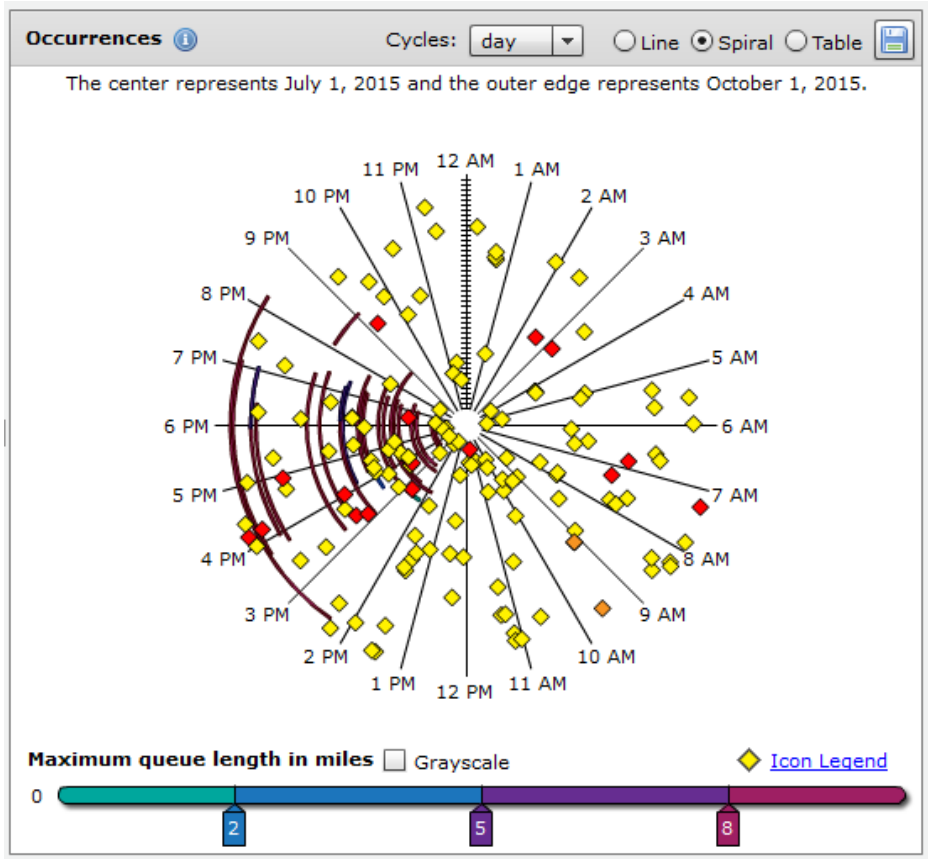
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ MD-193	3 h 13 m	12.35	45	145	107283



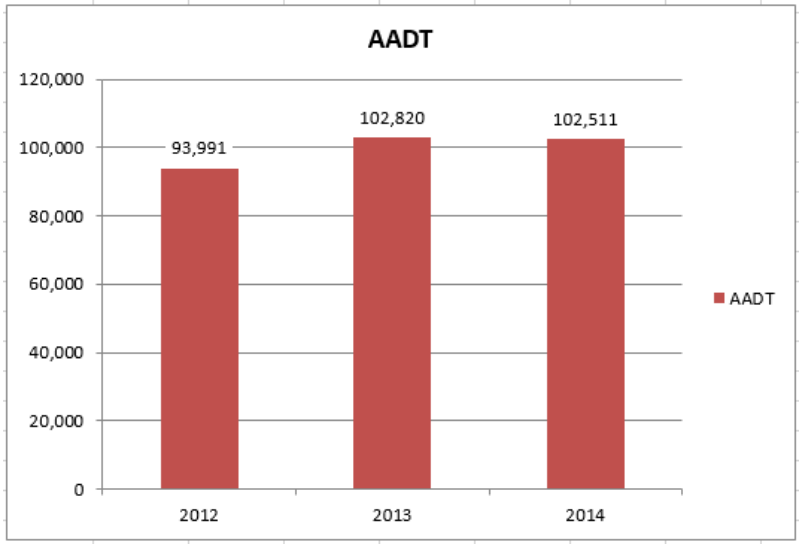
Notes: MD-295 merge with the Capital Beltway I-495. Congestion seen in the afternoon peak period sometimes extends into the southern portion of the Baltimore region near the Fort Meade area.

#4 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ MD-193	3 h 13 m	12.35	45	145	107283

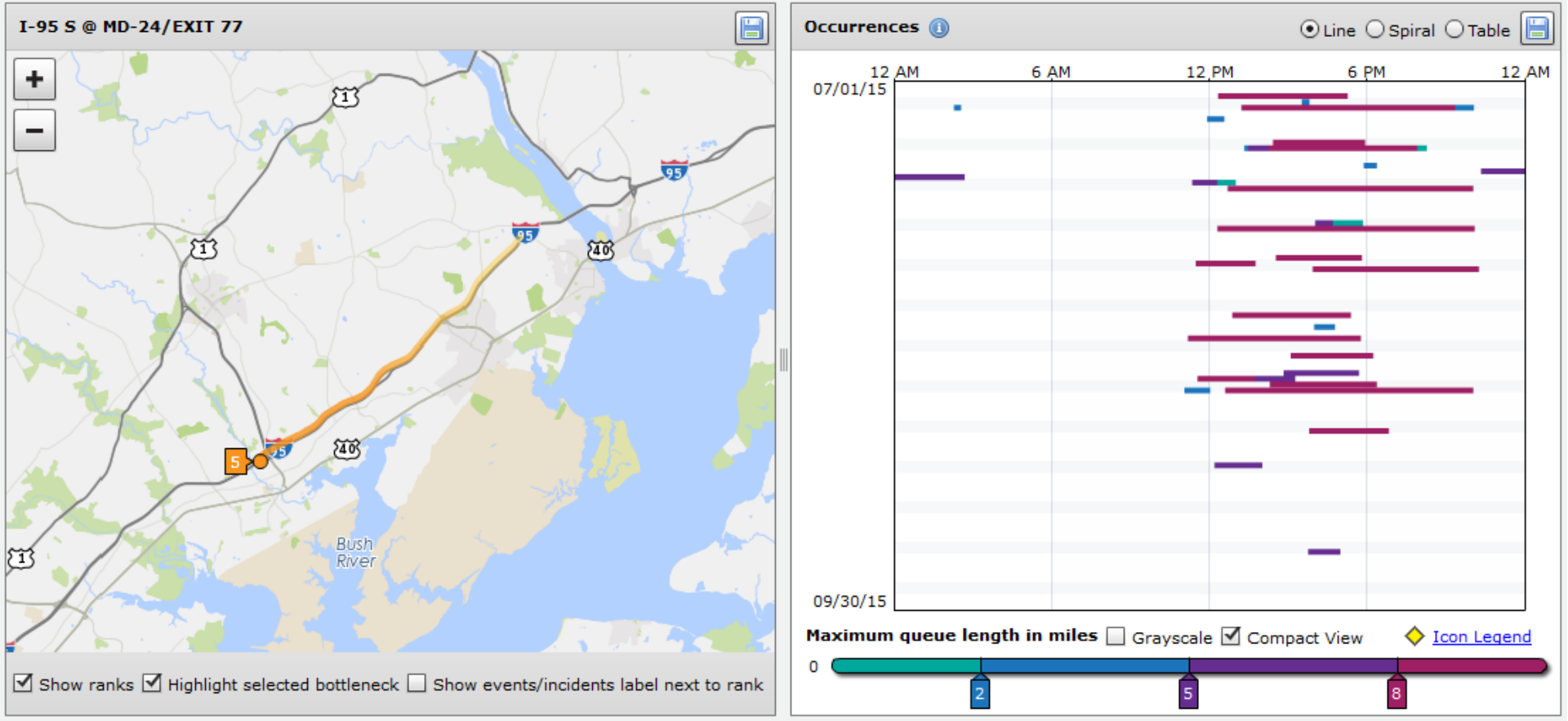


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.50 MI S OF MD32



#5 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

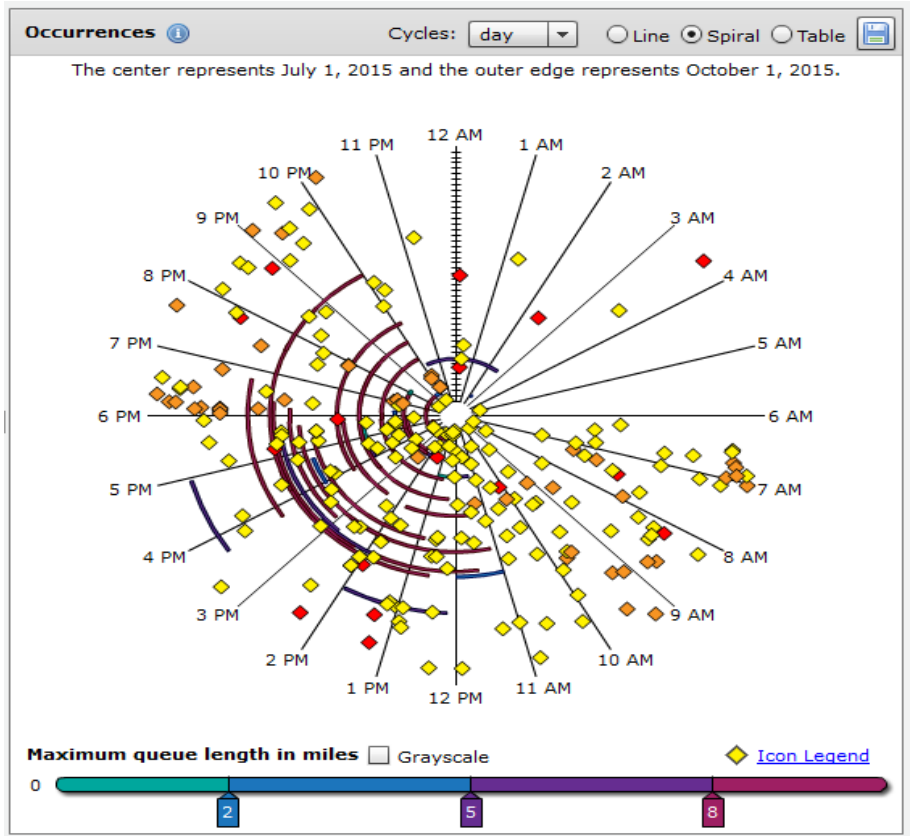
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 S @ MD-24/Exit 77	2 h 49 m	11.13	54	220	101,583



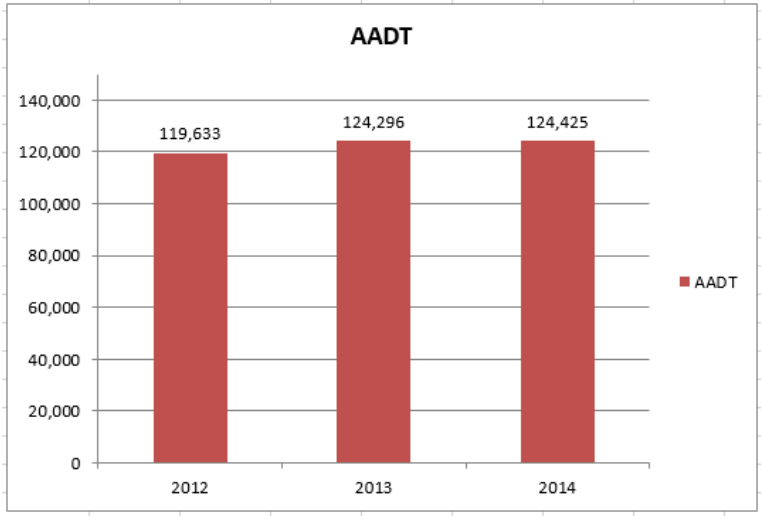
Notes: Right shoulder closures southbound on I-95 past Exit 77 B-A M.M. 76.5 to 75.5 contributed to this bottleneck throughout the summer months of 2015.

#5 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 S @ MD-24/Exit 77	2 h 49 m	11.13	54	220	101,583

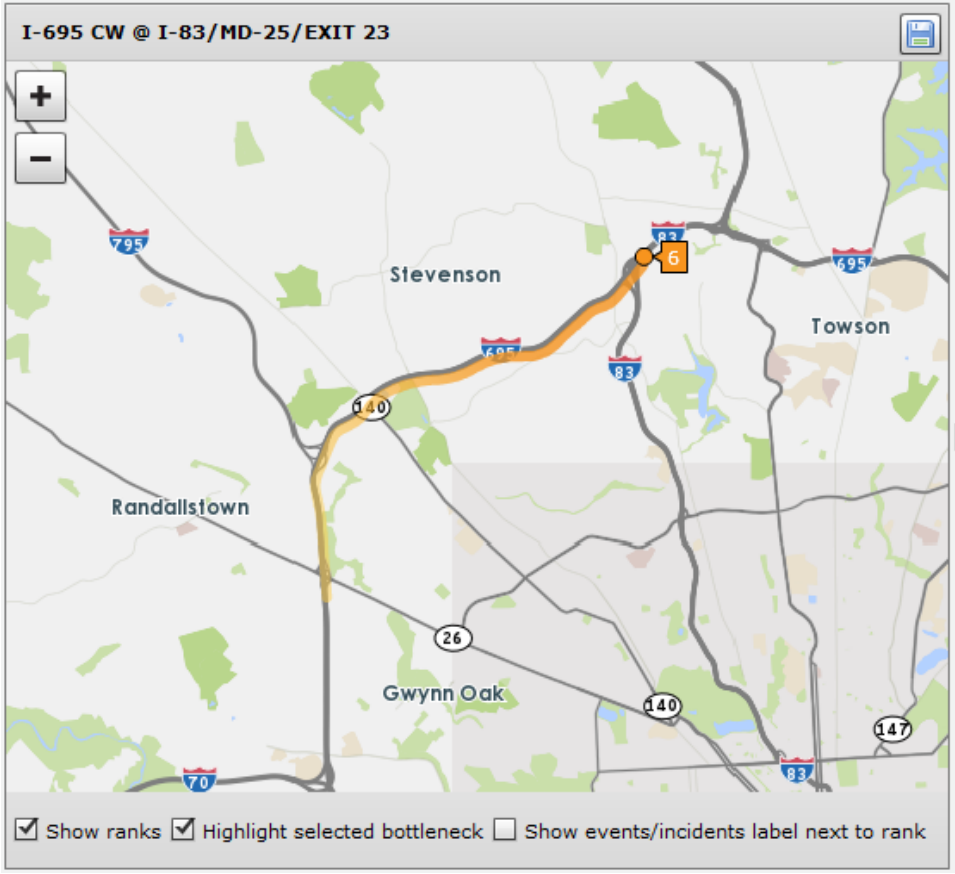


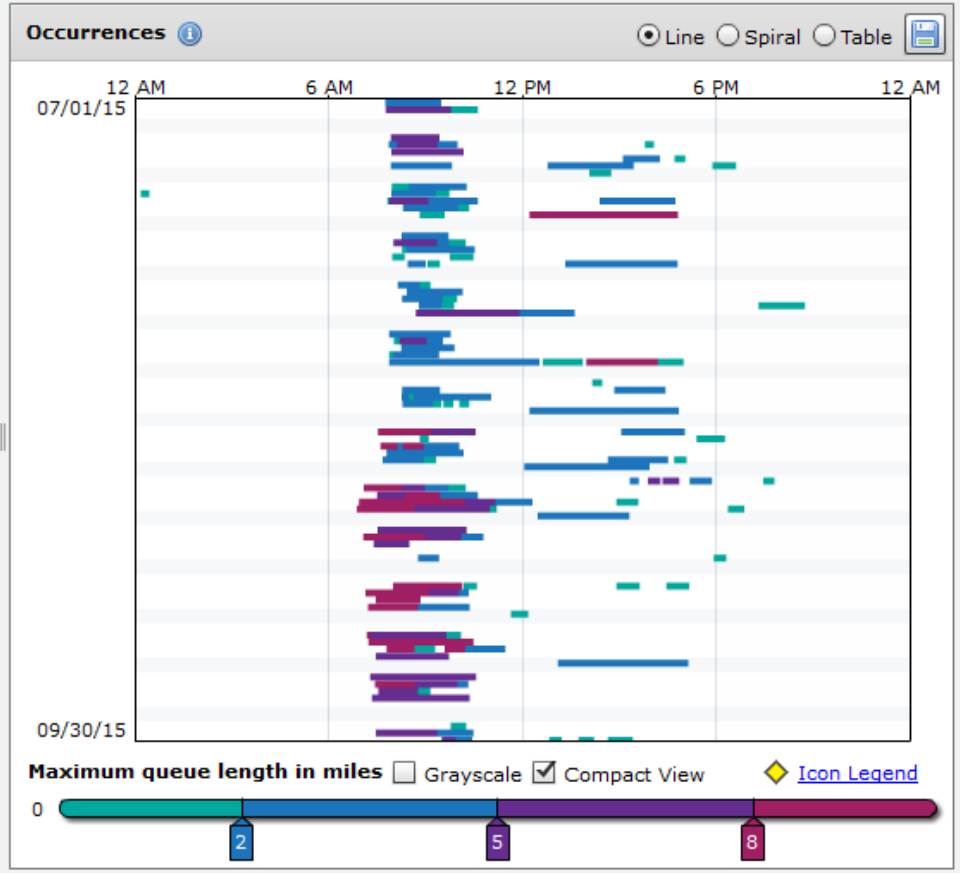
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS95-.50 MI N OF MD24



#6 Ranked Bottleneck in the Baltimore Region – 3rd 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 30 m	7.11	151	294	96,597

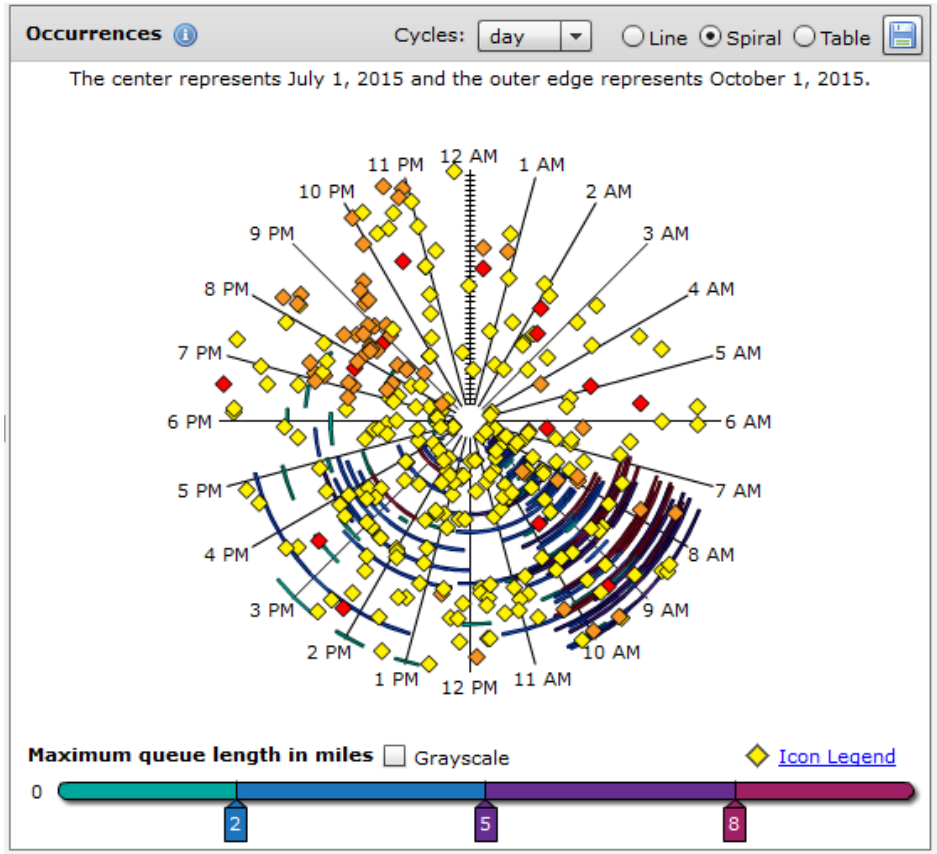




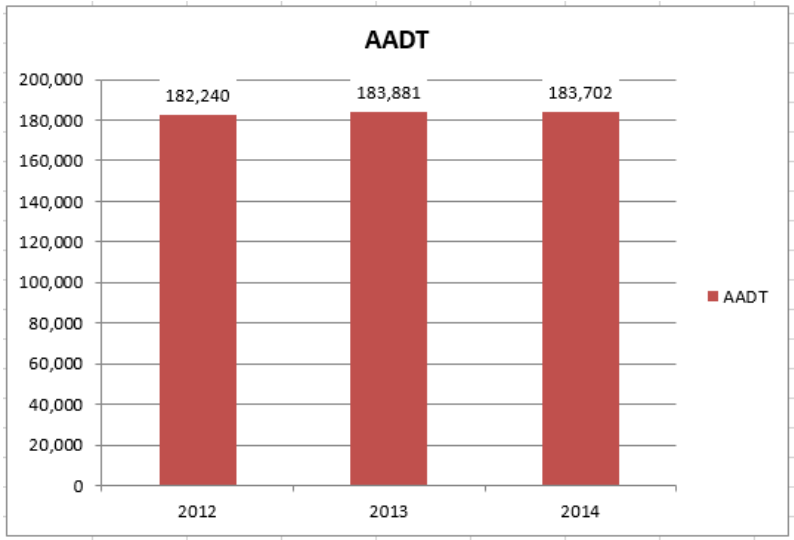
Notes: Morning rush hour congestion. The lane drop approaching the ramp to southbound I-83 is a contributing factor, as are merging and weaving at the interchanges in this segment.

#6 Ranked Bottleneck in the Baltimore Region – 3rd 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 30 m	7.11	151	294	96,597

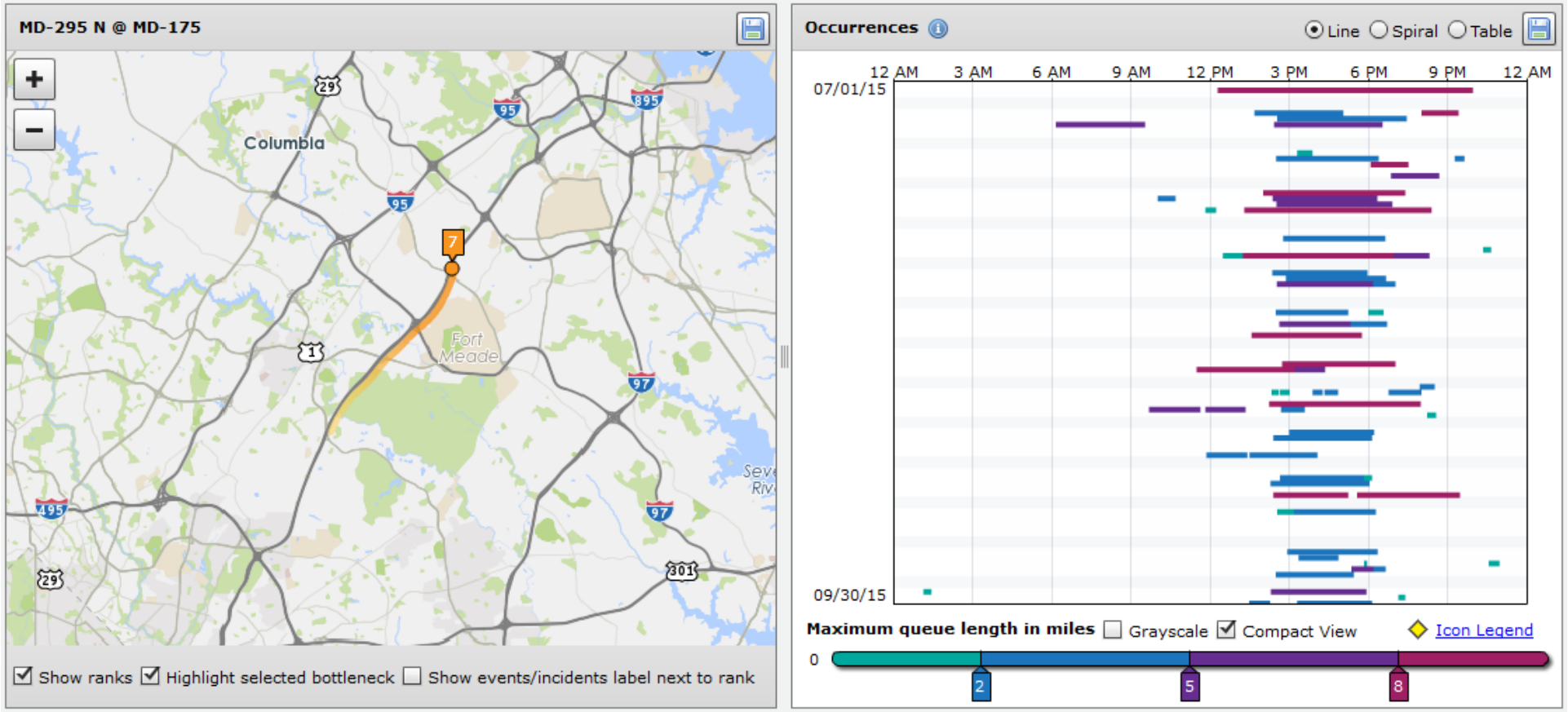


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS695-.50 MI N OF GREENSPRING AVE



#7 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

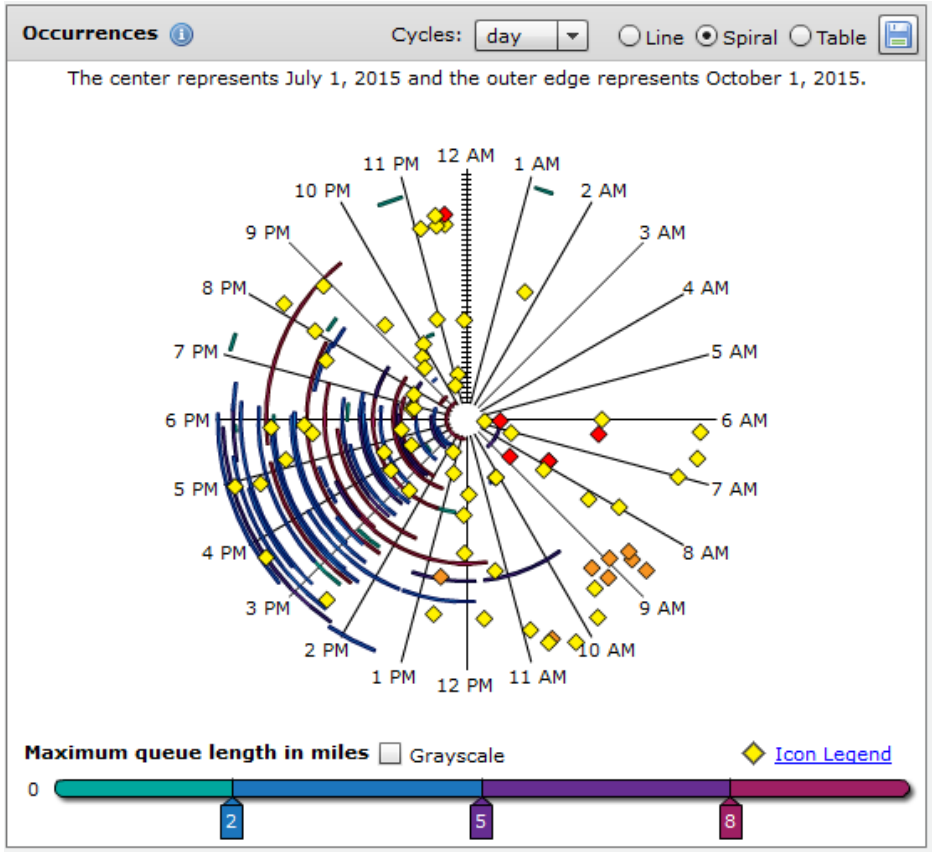
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ MD-175	2 h 34 m	7.32	80	71	90,123



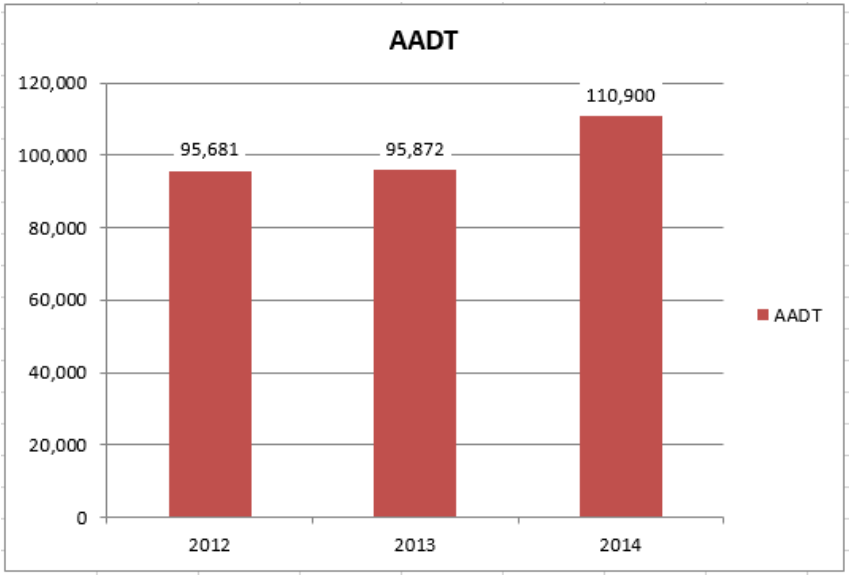
Notes: Recurring afternoon congestion. Level of Service "F" from 4:00 to 5:00pm. A primary cause appeared to be the discharge of traffic from NSA / Ft. Meade onto northbound MD 295 via the Connector Rd. Weaving and merging at the MD 32 interchange also contributed to the congestion.

#7 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ MD-175	2 h 34 m	7.32	80	71	90,123

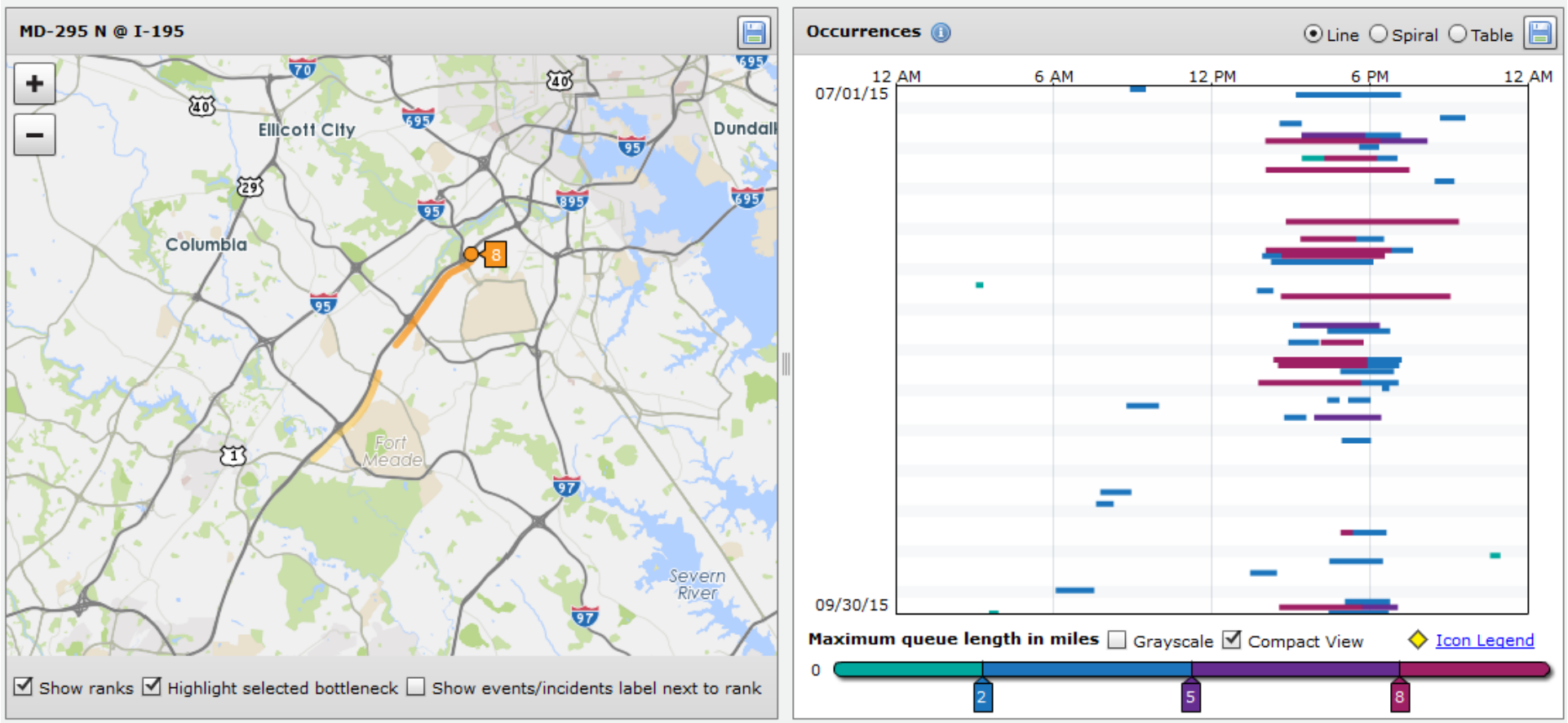


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.25 MI S OF MD175



#8 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

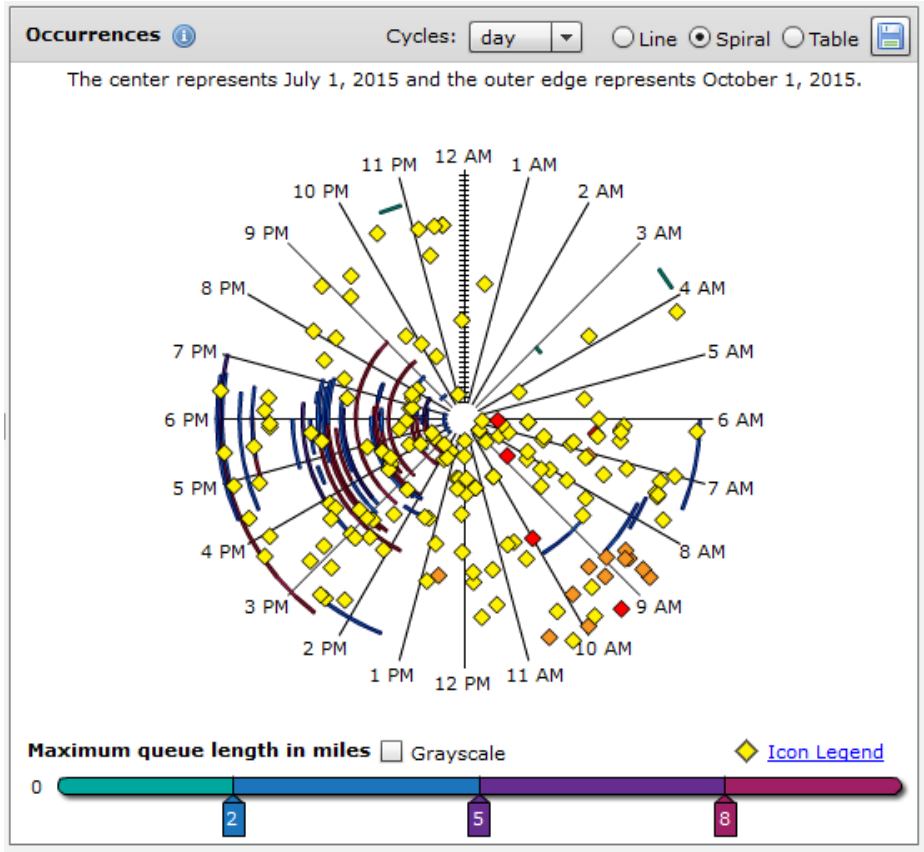
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ I-195	2 h 17 m	9.11	65	160	81,108



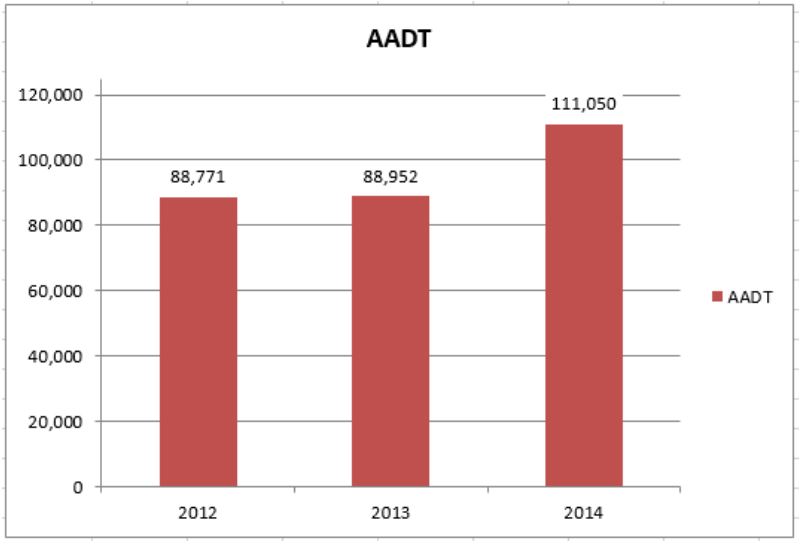
***Notes:** This moderate to severe congestion was primarily caused by merging traffic from Nursery Rd, probably exacerbated by additional traffic from MD 195. (The Nursery Rd merge occurs .5 miles before MD 295 widens to 3 northbound lanes.) Occasionally, upstream traffic was also affected by this bottleneck,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

#8 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ I-195	2 h 17 m	9.11	65	160	81,108

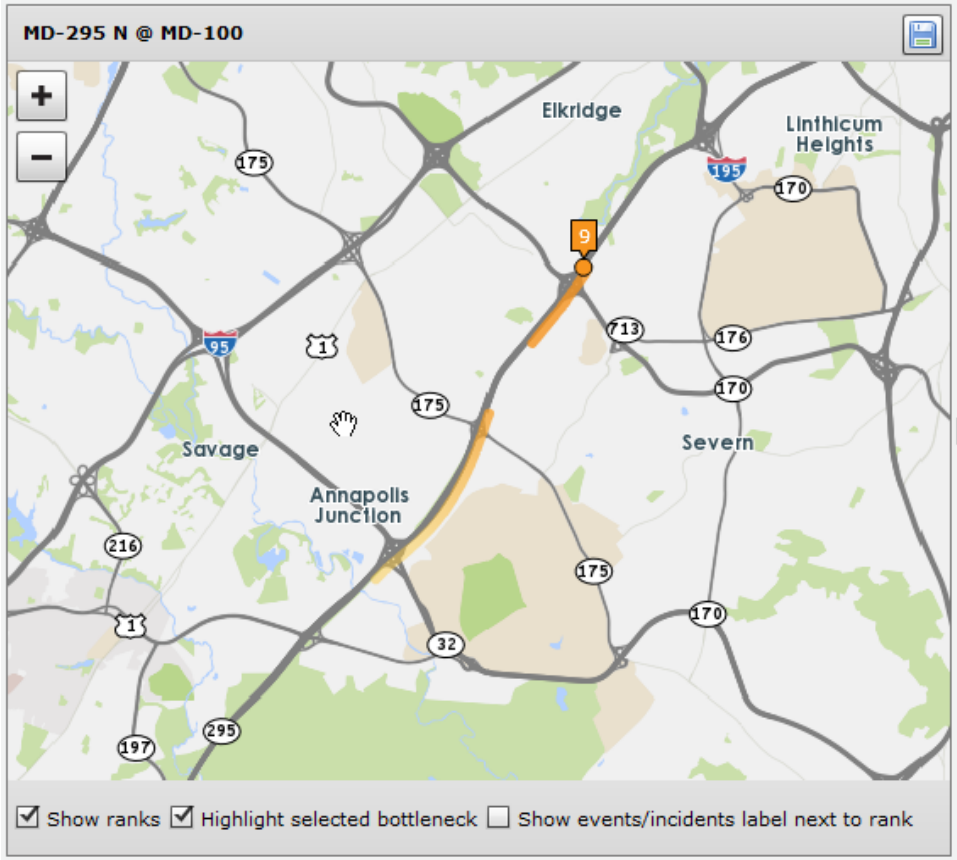


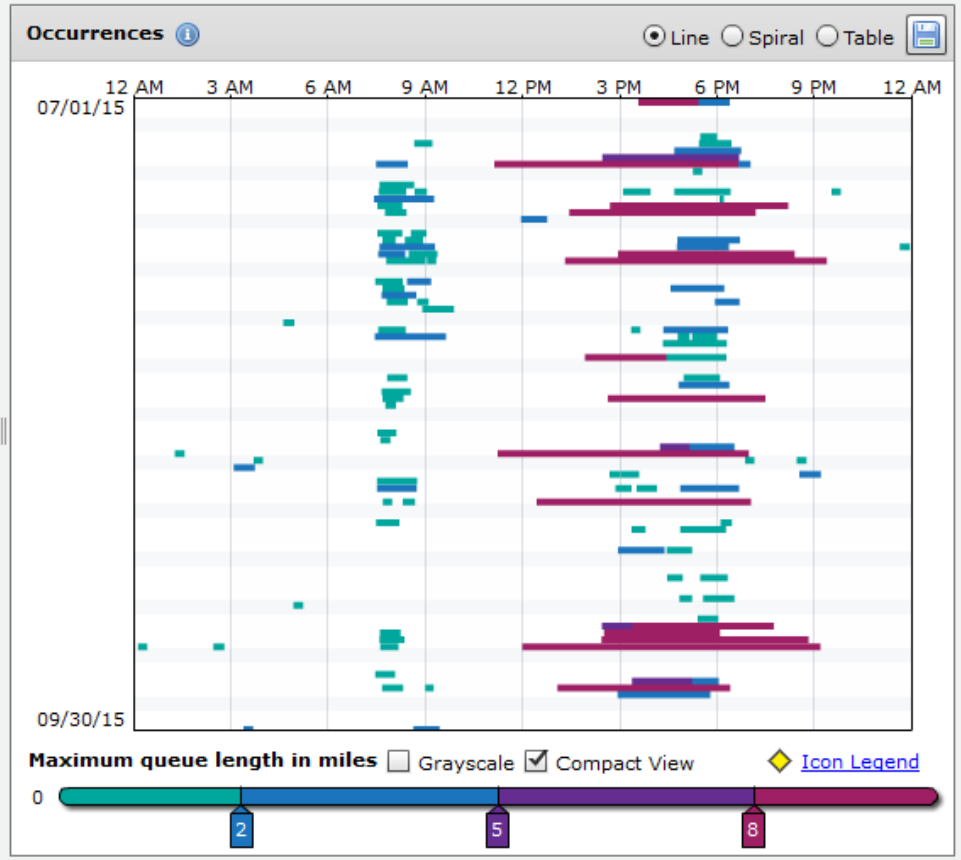
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.60 MI N OF IS195



#9 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ MD-100	1 h 49 m	5.10	140	108	77,786

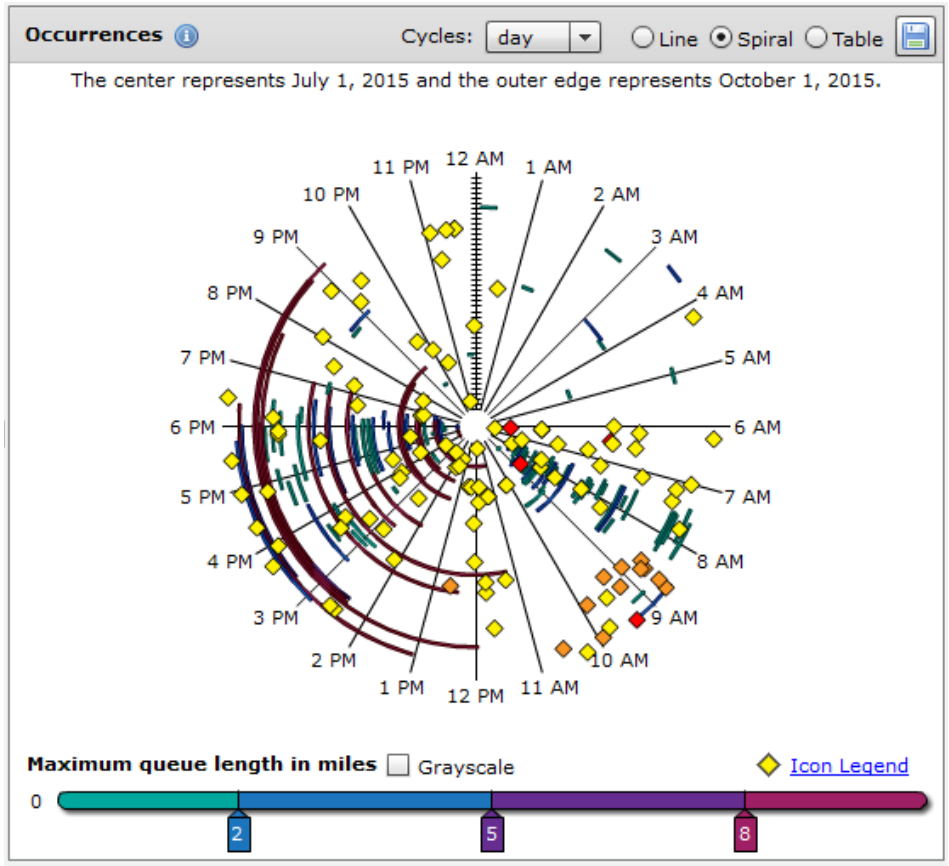




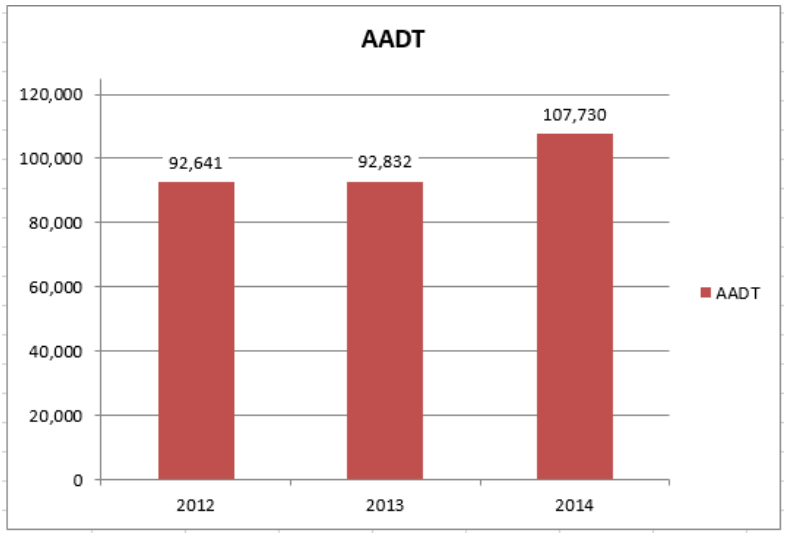
Notes: Recurring afternoon congestion. Level of Service "F" from 4:00 to 5:00pm. A primary cause appeared to be the discharge of traffic from NSA / Ft. Meade onto northbound MD 295 via the Connector Rd. Weaving and merging at the MD 32 interchange also contributed to the congestion.

#9 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ MD-100	1 h 49 m	5.10	140	108	77,786

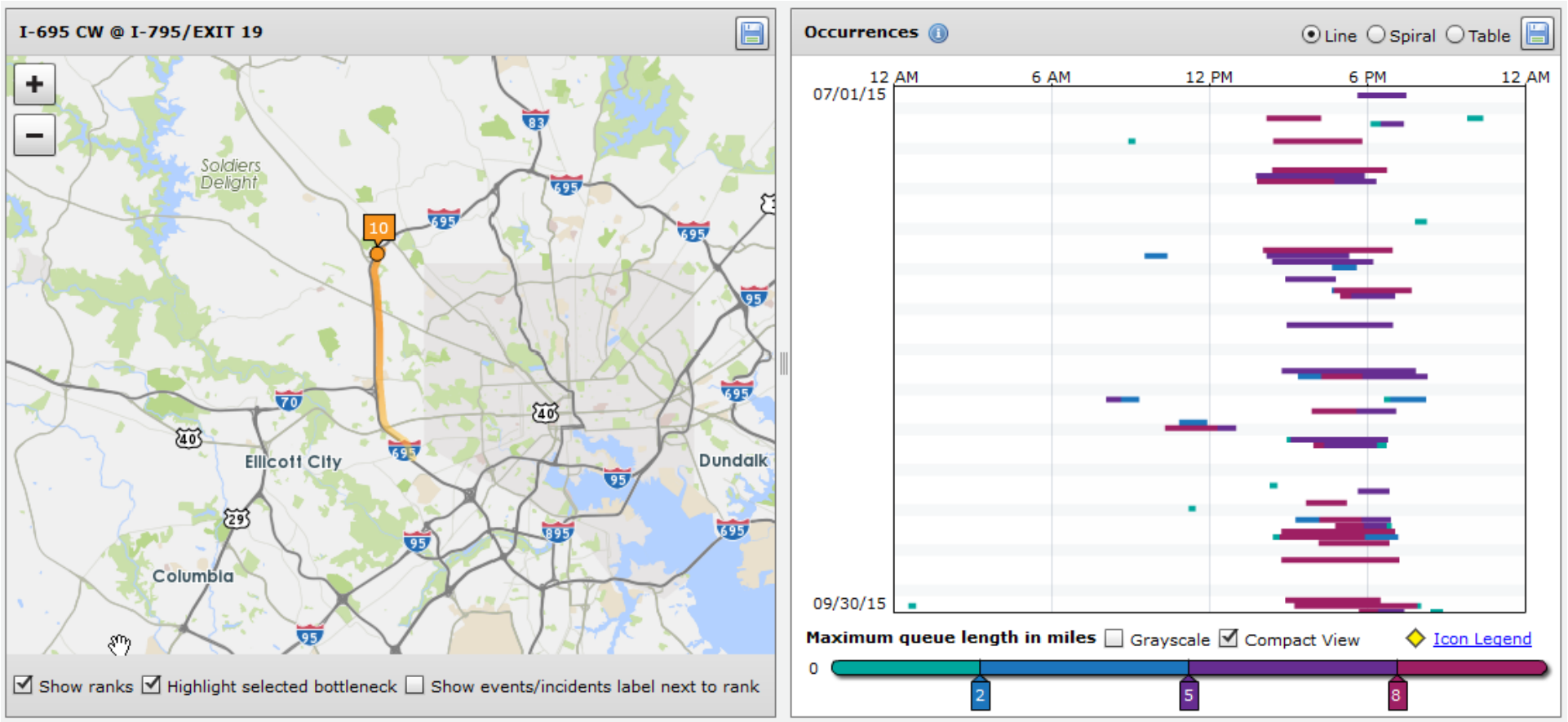


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.30 MI N OF MD100



#10 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

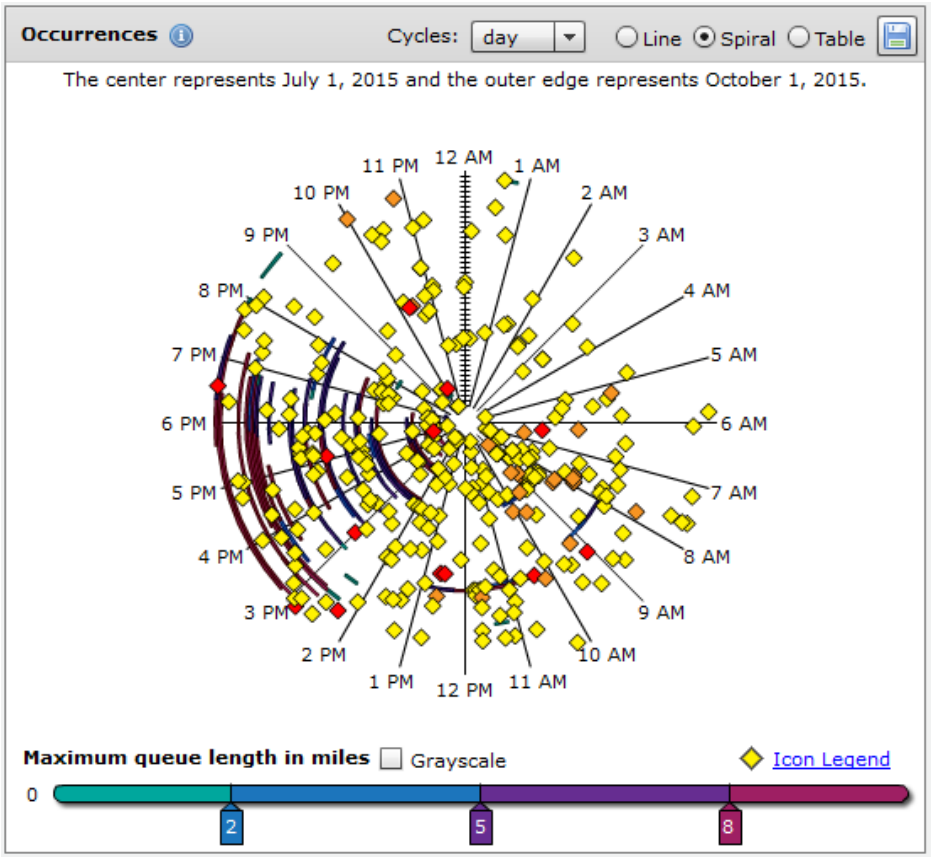
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ I-795/Exit 19	2 h 09 m	8.13	73	308	76,578



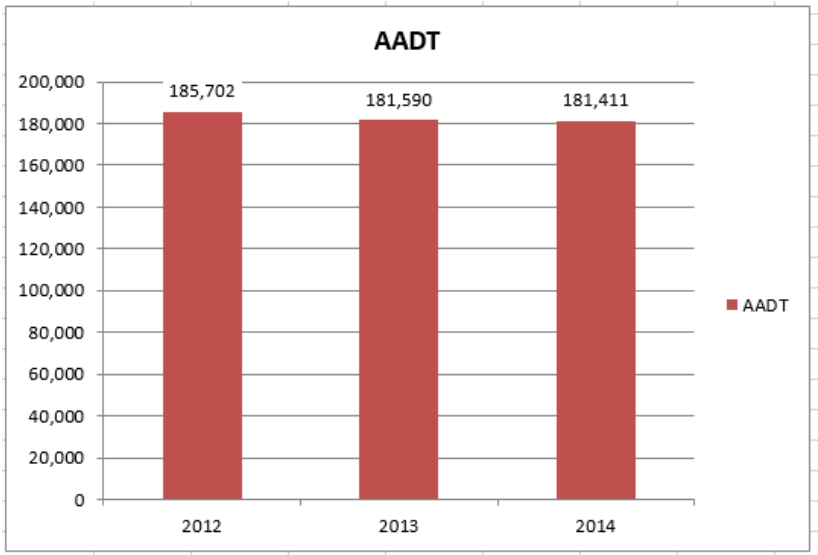
Notes: Longstanding westside beltway inner loop congestion in the afternoon.

#10 Ranked Bottleneck in the Baltimore Region – 3rd Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ I-795/Exit 19	2 h 09 m	8.13	73	308	76,578

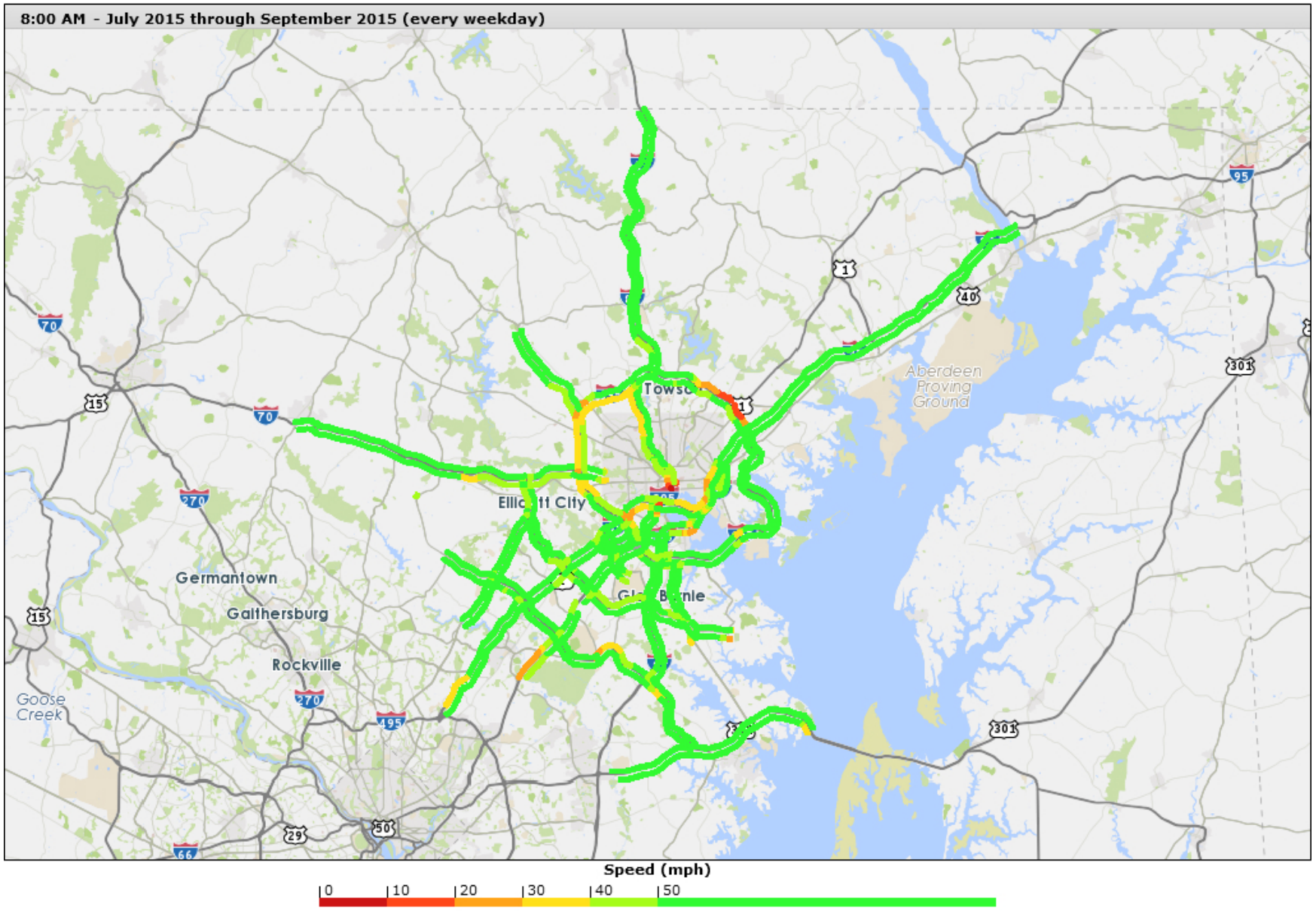


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS695-.30 MI N OF IS795



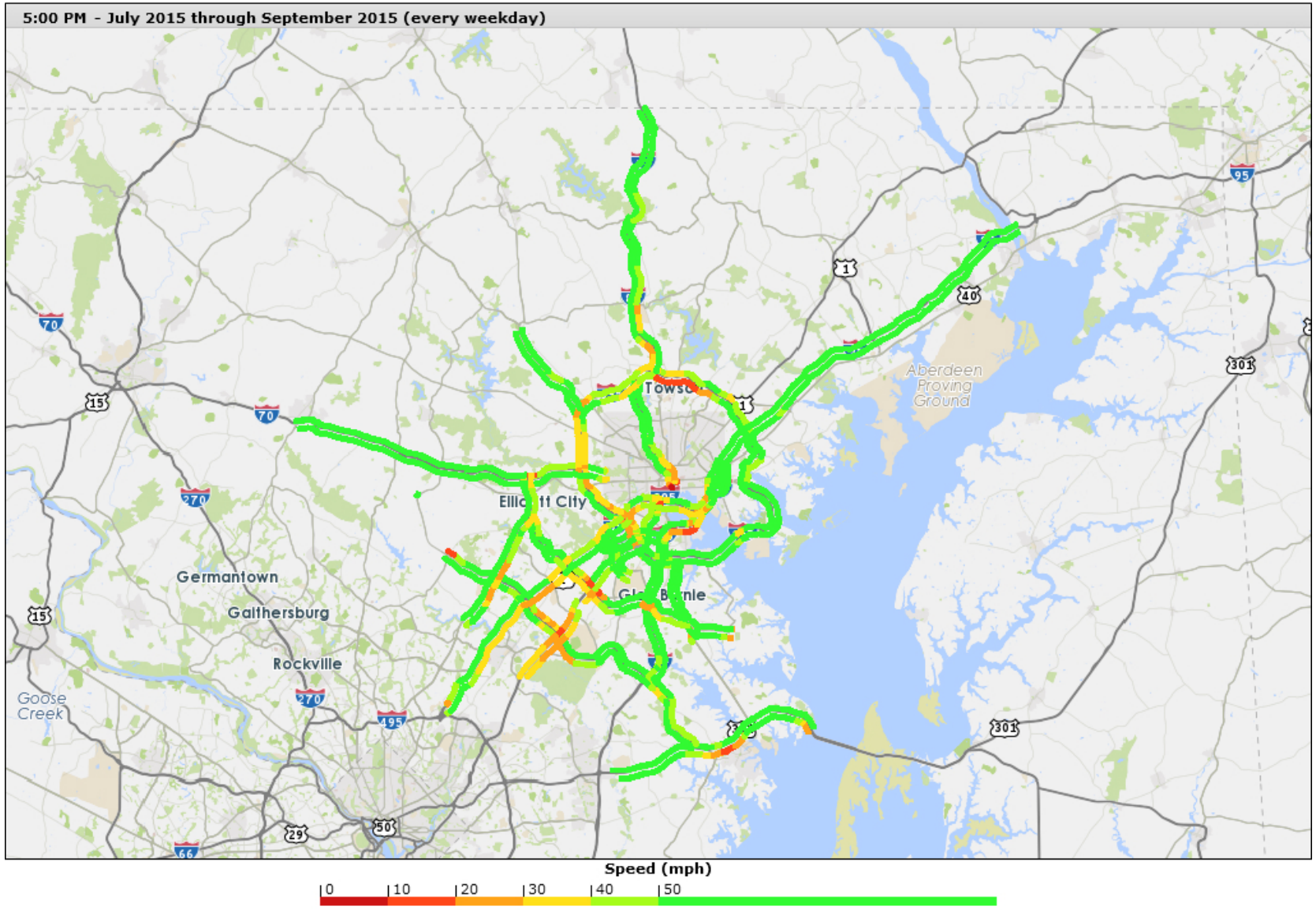
Average Speed Maps – AM Peak Period 8:00-9:00 Weekdays: 3rd Quarter 2015

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: 3rd 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 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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