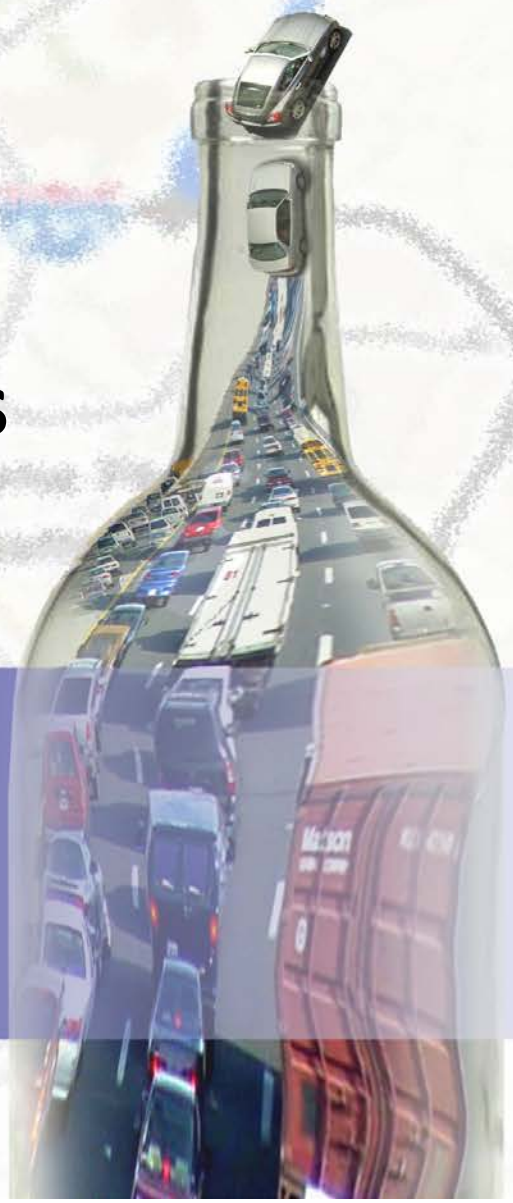
Baltimore Metropolitan Council

Quarterly Congestion Analysis Report for the Baltimore Region

Top 10 Bottleneck Locations



1st Quarter 2015

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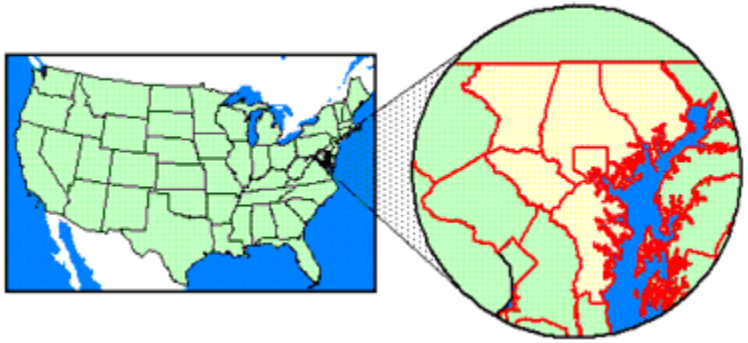
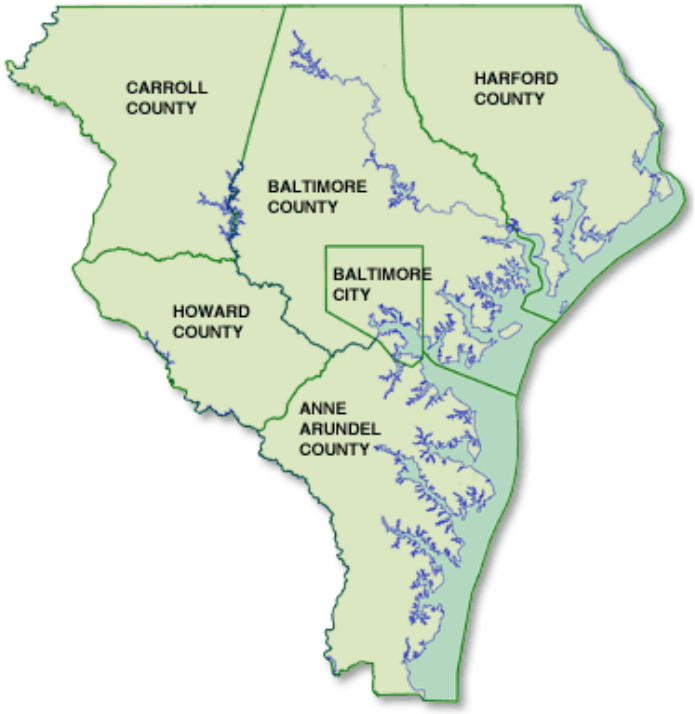
About the Region

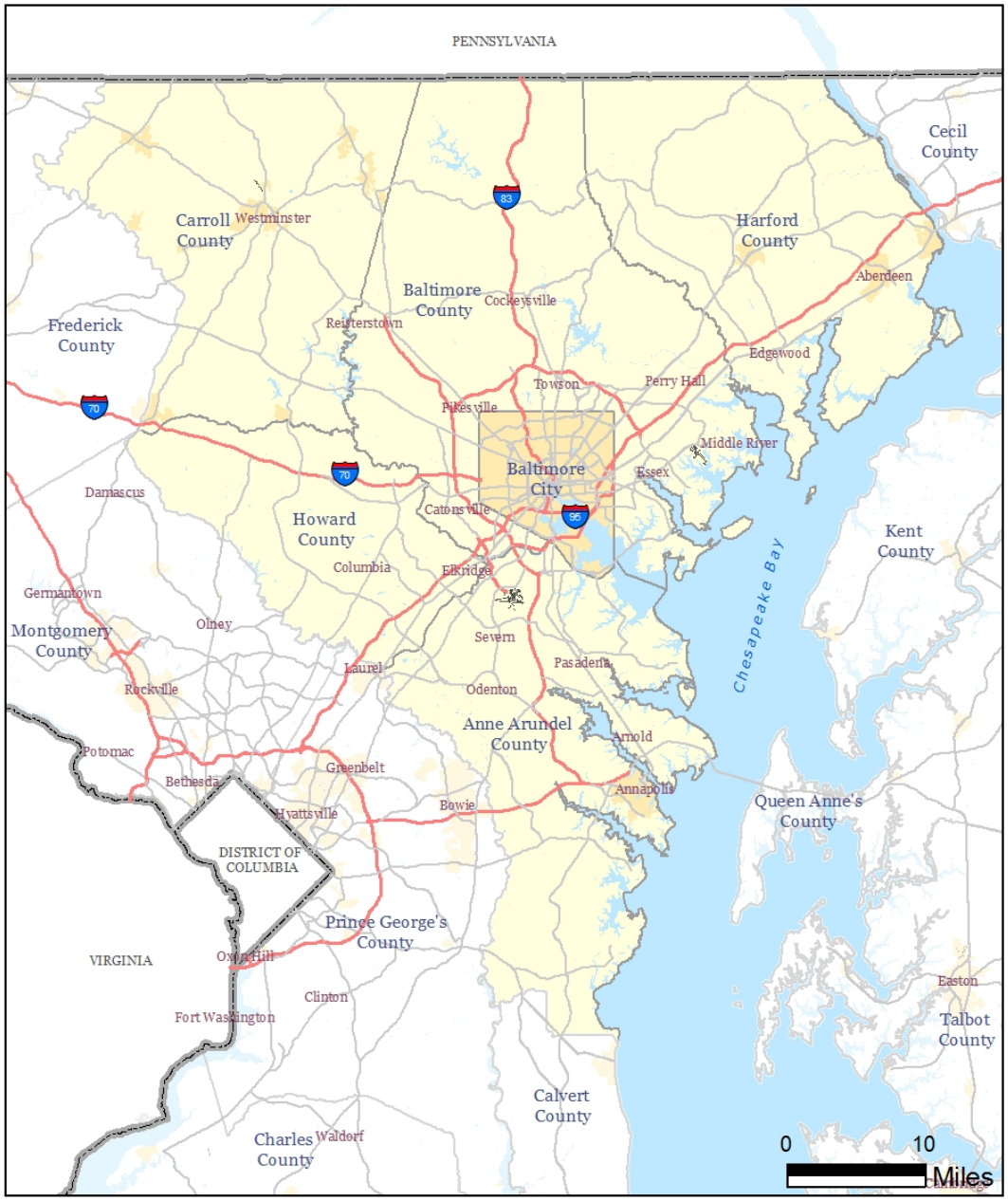
Located in the heart of the Mid-Atlantic on the east coast, the Baltimore region includes:

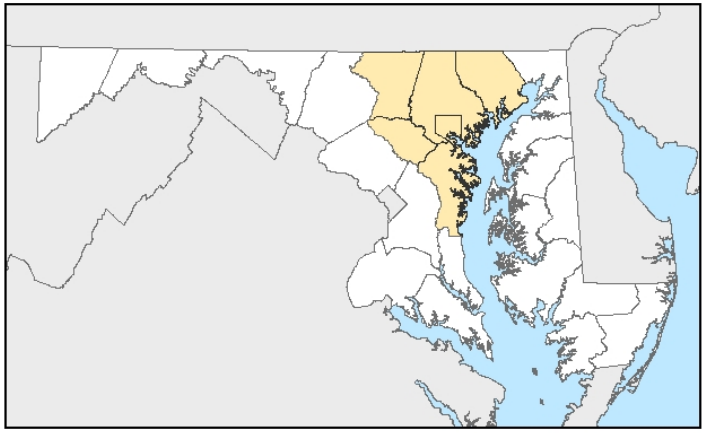




The Baltimore region is the nation's 19th largest market, with over 2.5 million people. The market also ranks among the top 20 in the country in the number of households, total effective buying income and retail sales.

Baltimore Metropolitan Region



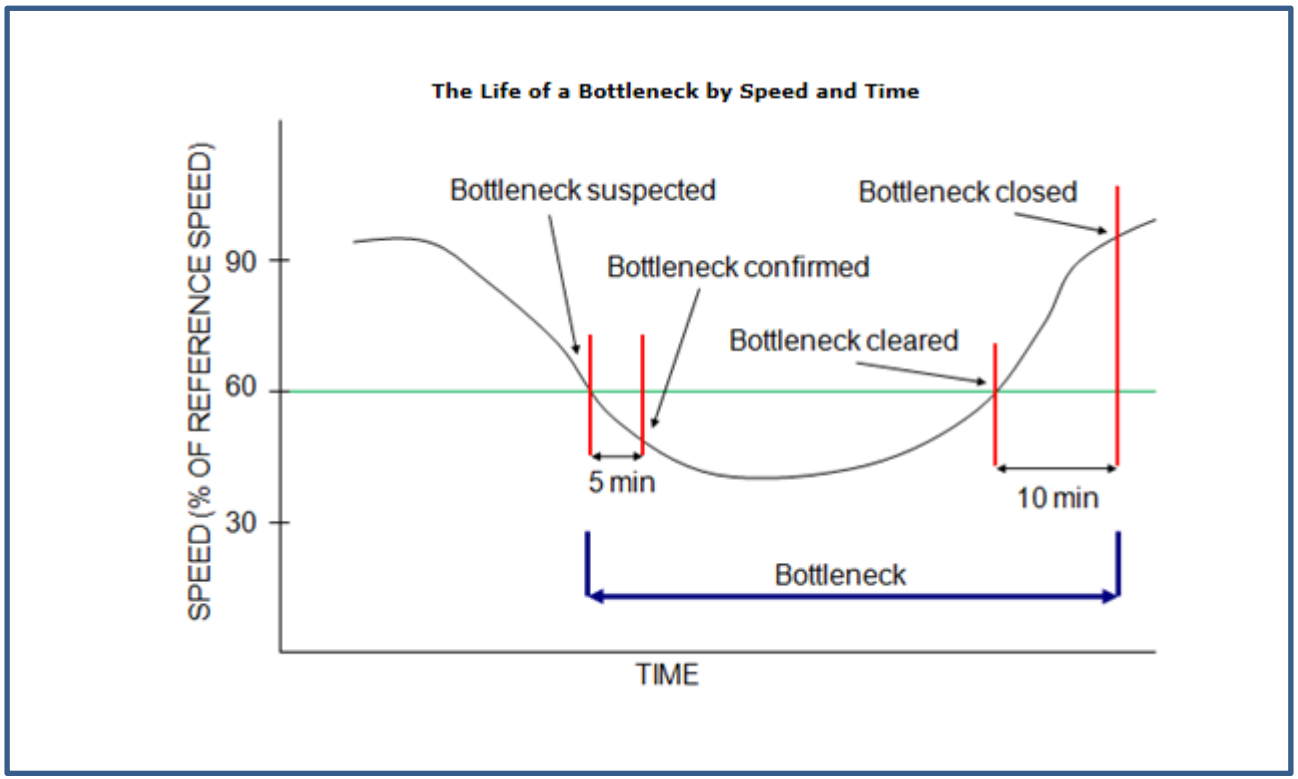


Prepared by
Transportation Planning Division
Projected Coordinate System: NAD 1983 State Plane (ft)
Data Source: BMC, © NAVTEQ 2013, TIGER/Line®, MTA
Printed - July 2013

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

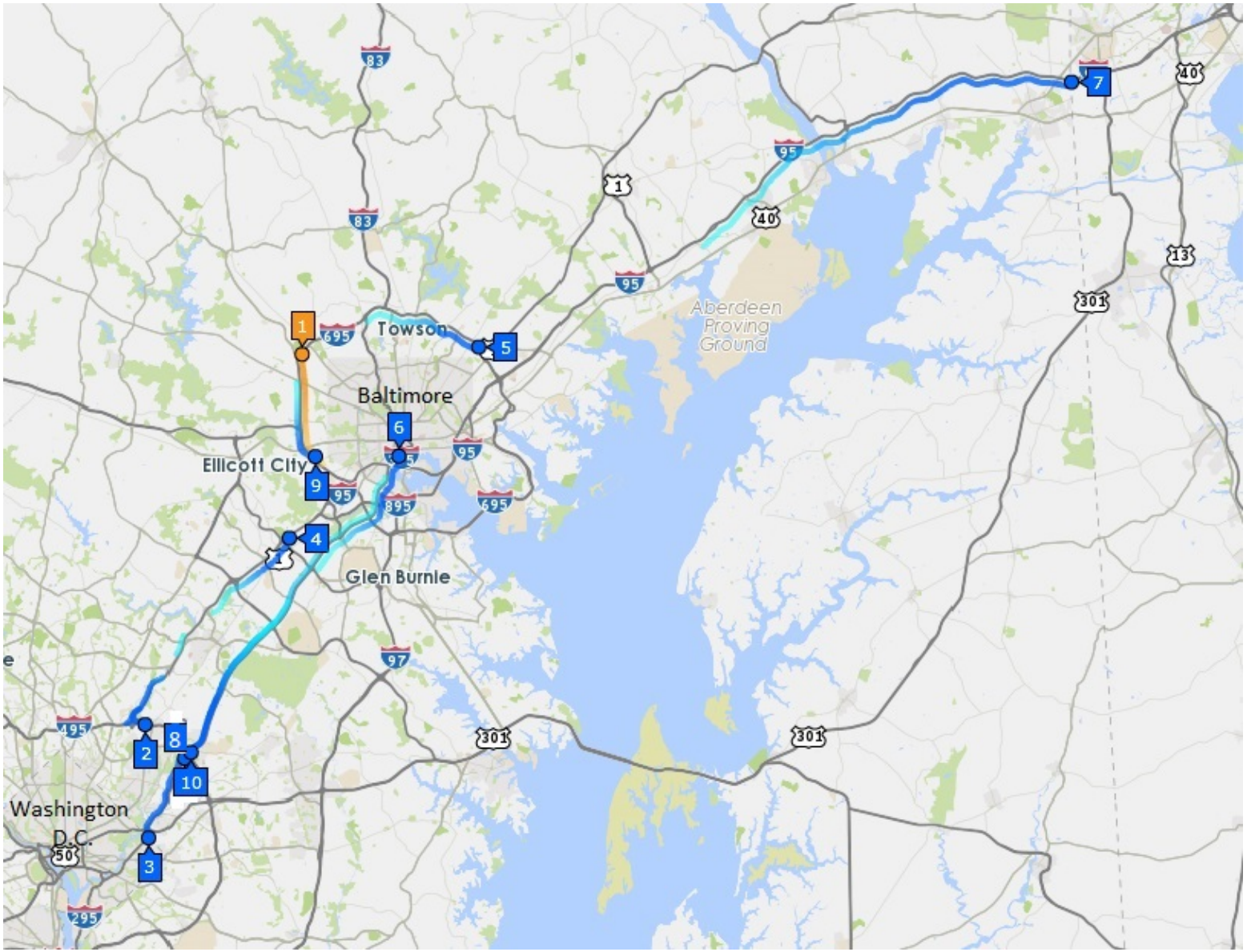
Yellow — All other events and incidents

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

Incident/Event Icons

Top 10 Bottlenecks in the Baltimore Region
1st Quarter 2015

Overview Map



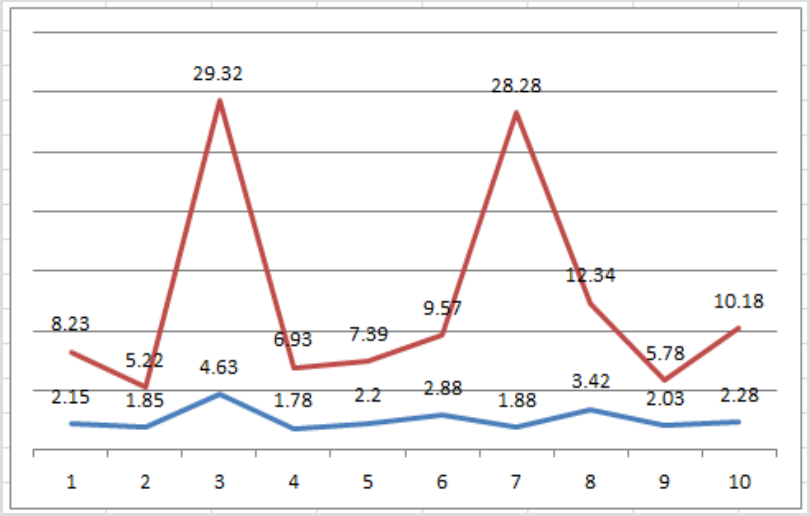
Top 10 Bottlenecks in the Baltimore Region
1st Quarter 2015

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-695 CW @ I-795/EXIT 19	2 h 9 m	8.23	184	392	195,285
2	I-95 S @ I-495/EXIT 27-25	1 h 51 m	5.22	231	245	133,750
3	MD-295 S @ EASTERN AVE	4 h 38 m	29.32	14	544	114,125
4	I-95 N @ MD-100/EXIT 43	1 h 47 m	6.93	130	111	96,463
5	I-695 CW @ MD-147/HARFORD RD/EXIT 31	2 h 12 m	7.39	84	268	81,946
6	MD-295 N @ S MARTIN LUTHER KING BLVD	2 h 53 m	9.57	49	203	81,089
7	I-95 N @ MD--DE STATE BORDER	1 h 53 m	28.28	25	196	79,904
8	MD-295 S @ I-495/I-95	3 h 25 m	12.34	28	141	70,835
9	I-695 CCW @ EDMONDSON AVE/EXIT 14	2 h 2 m	5.78	95	213	67,025
10	MD-295 S @ MD-193	2 h 17 m	10.18	43	93	59,943

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)

1st Quarter 2015

Average max length (miles)

Average duration (hours)

Top 10 Bottlenecks in the Baltimore Region
1st 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 @ Eastern Ave	4 h 38 m	29.32	14	544	114,125
2	MD-295 N @ W Pratt St	4 h 05 m	18.78	7	341	32,216
3	US-29 S @ MD-410/East West Hwy	4 h 01 m	25.45	2	79	12,267
4	MD-295 S @ I-495/I-95	3 h 25 m	12.34	28	141	70,835
5	MD-32 W @ Ten Oaks Rd	3 h 01 m	14.19	13	8	33,389
6	US-29 S @ MD-384/Colesville Rd	3 h 01 m	24.19	3	77	13,134
7	MD-295 N @ S MLK Blvd	2 h 53 m	9.57	49	203	81,089
8	MD-295 S @ MD-450	2 h 51 m	16.31	5	165	13,948
9	MD-295 S @ Goddard Rd	2 h 47 m	9.27	23	93	35,623
10	I-695 CCW @ MD-144/Frederick Rd/Exit 13	2 h 46 m	11.63	19	477	36,685

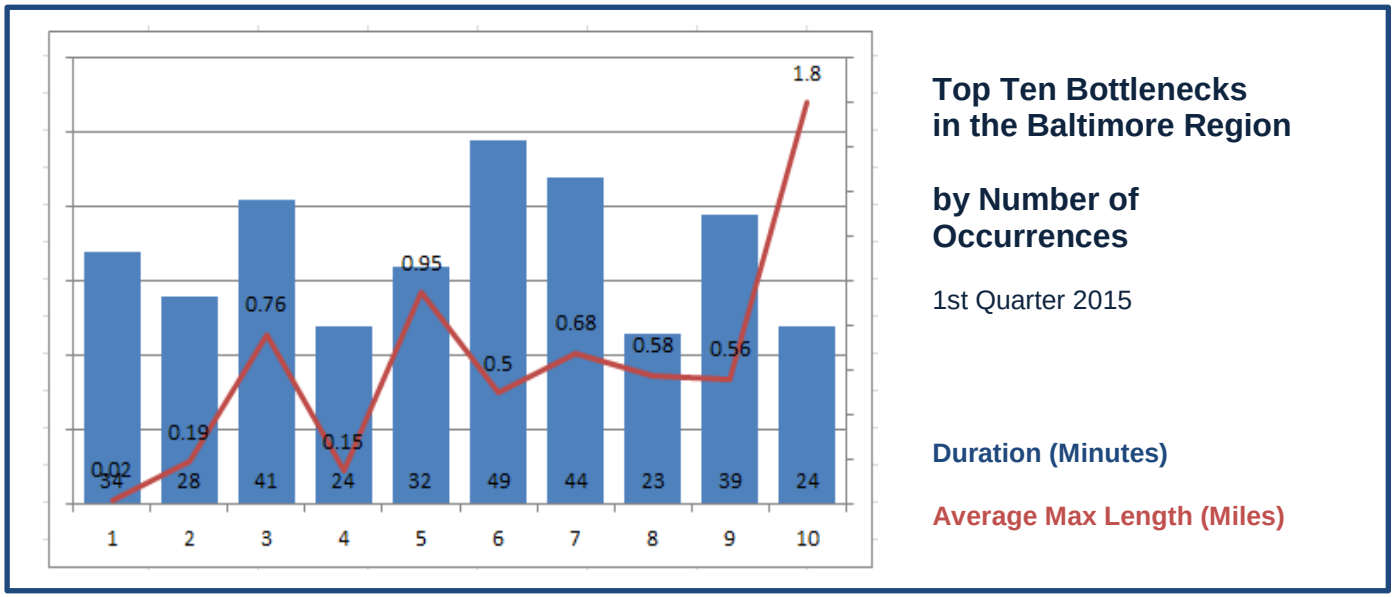
By Average Length - This table indicates the longest bottlenecks by distance.

	Location	Average Duration	Average max length (miles)	Occurrences	Number of Incidents/ Events	Impact Factor
1	MD-295 S @ Eastern Ave	4 h 38 m	29.32	14	544	114,125
2	I-95 N @ MD-DE State Border	1 h 53 m	28.28	25	196	79,904
3	I-83 N @ PA-181/Exit 22	2 h 15 m	27.24	3	91	11,031
4	US-29 S @ MD-410/East West Hwy	4 h 01 m	25.45	2	79	12,267
5	MD-295 S @ US-50/MD-201/Kenilworth Ave	2 h 22 m	24.90	13	372	45,966
6	I-83 N @ US-30/Exit 21A	2 h 07 m	24.54	2	82	6,234
7	US-29 S @ MD-384/Colesville Rd	3 h 01 m	24.19	3	77	13,134
8	I-695 CW @ MD-151/Exit 42	1 h 38 m	24.04	16	572	37,698
9	MD-295 N @ W Pratt St	4 h 05 m	18.78	7	341	32,216
10	I-83 N @ PA-182/Exit 14	1 h 23 m	18.04	1	58	1,497

Top 10 Bottlenecks in the Baltimore Region
1st Quarter 2015

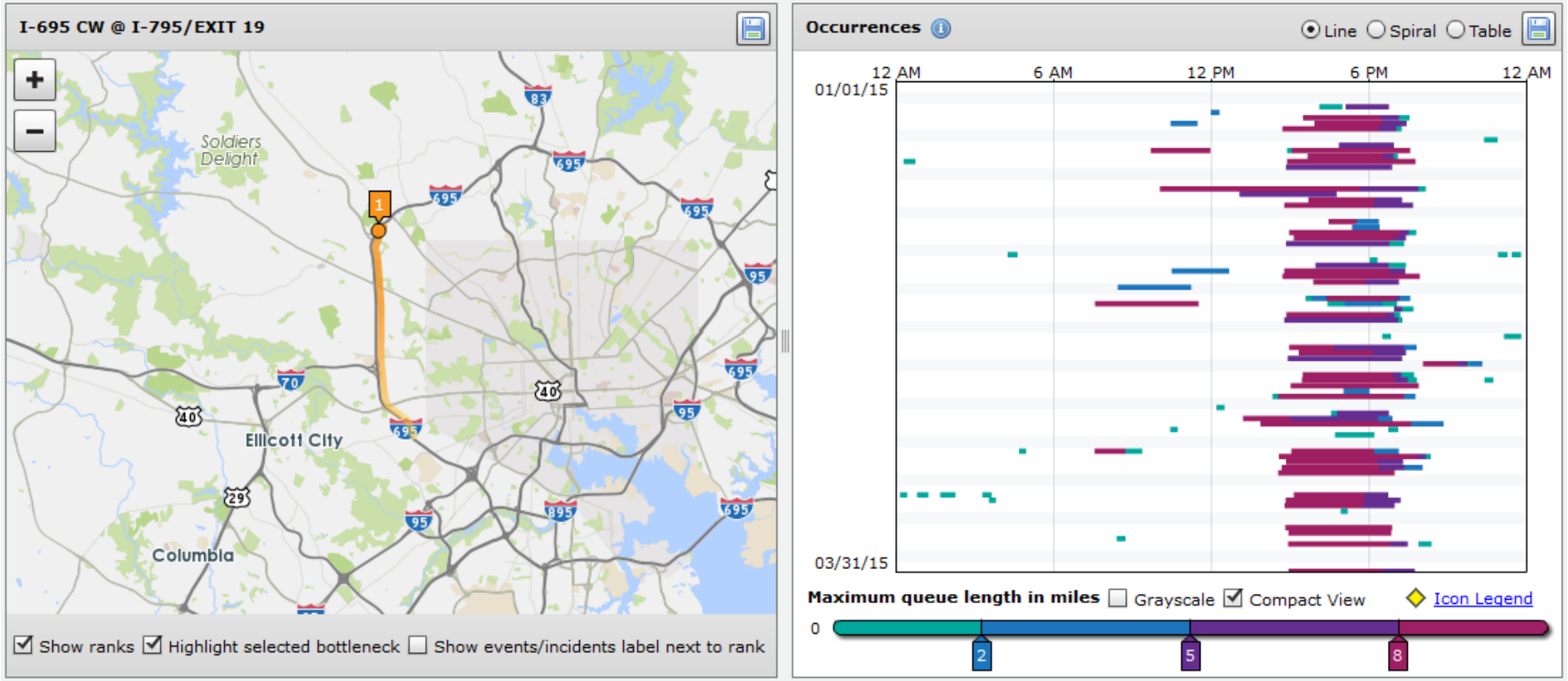
By Number of Occurrences - This table indicates the most frequently occurring bottlenecks.

	Location	Average Duration	Average max length (miles)	Occurrences	Number of Incidents/ Events	Impact Factor
1	I-895 N @ Harbor Tunnel Thwy (NORTH)	34 m	0.02	853	0	529
2	I-895 S @ Childs St/Exit 9	28 m	0.19	790	123	4,311
3	I-83 S @ Fayette St/Exit 1	41 m	0.76	760	0	23,812
4	I-895 N @ Childs St/Exit 9	24 m	0.15	661	68	2,311
5	US-50 E @ Bay Bridge	32 m	0.95	648	250	19,780
6	MD-295 N @ Bayard St	49 m	0.50	621	3	15,130
7	I-895 N @ Harbor Tunnel Thwy (SOUTH)	44 m	0.68	525	68	15,662
8	I-95 N @ MD-222/Exit 93	23 m	0.58	474	60	6,370
9	I-895 N @ Harbor Tunnel Toll Plaza	39 m	0.56	471	17	10,232
10	I-95 S @ Fort McHenry Tunnel	24 m	1.80	468	213	20,179



#1 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

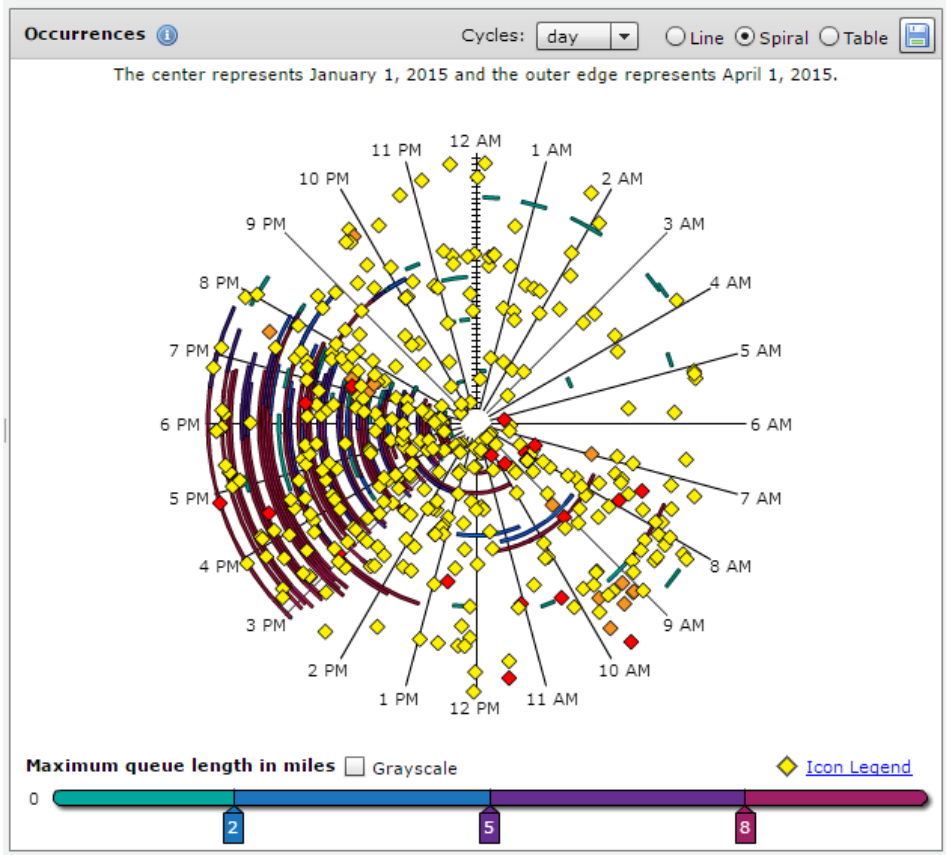
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ I-795/Exit 19	2 h 09 m	8.23	184	391	195,317



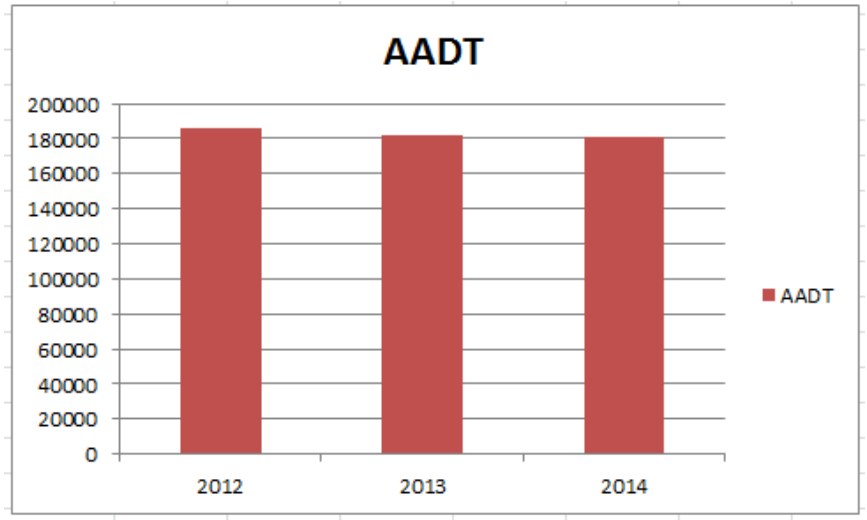
Notes: Longstanding west side beltway inner loop traffic in the afternoon generally between 3 and 7pm from Exit 19/I-795 often extending back to Exit 13/MD-44/Frederick Rd. High traffic volume.

#1 Ranked Bottleneck in the Baltimore Region – 1st 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	8.23	184	391	191,317

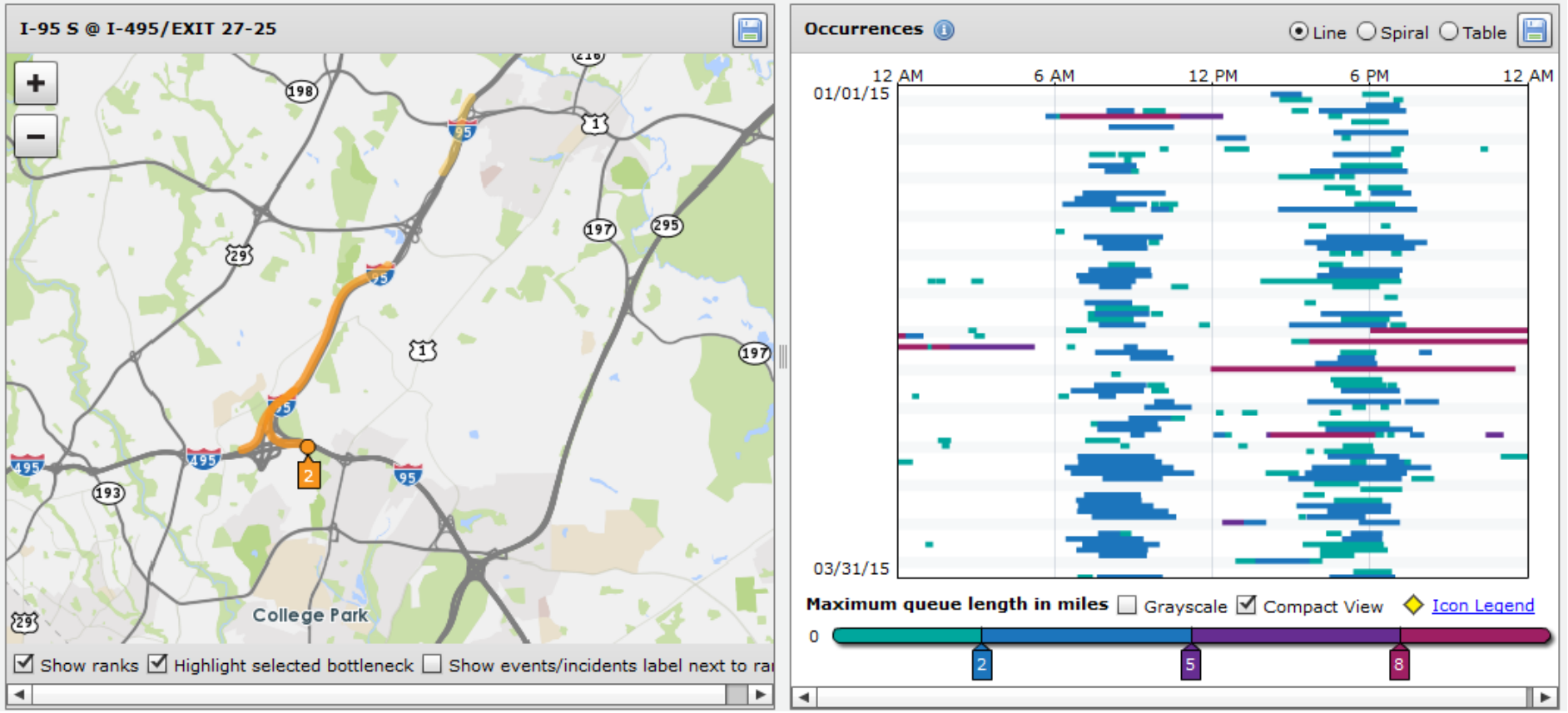


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS695-.30 MI N OF IS795



#2 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

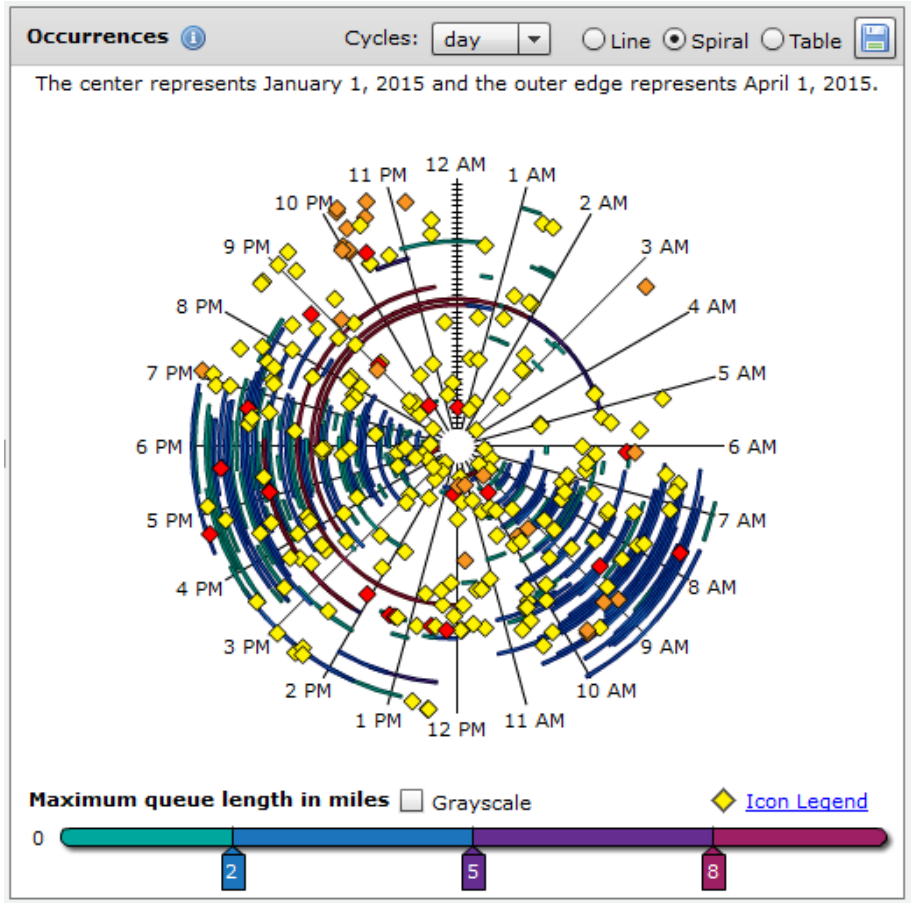
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 S @ I-495/Exit 27-25	1 h 51 m	5.22	231	245	133,750



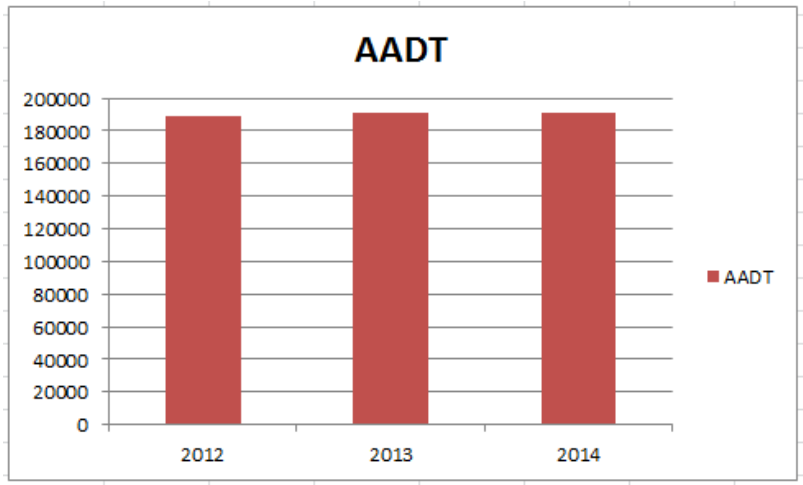
Notes: I-95 merge with the Capital Beltway I-495. Congestion seen in the morning and afternoon rush hour sometimes extending into the southern portion of the Baltimore region.

#2 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 S @ I-495/Exit 27-25	1 h 51 m	5.22	231	245	133,750

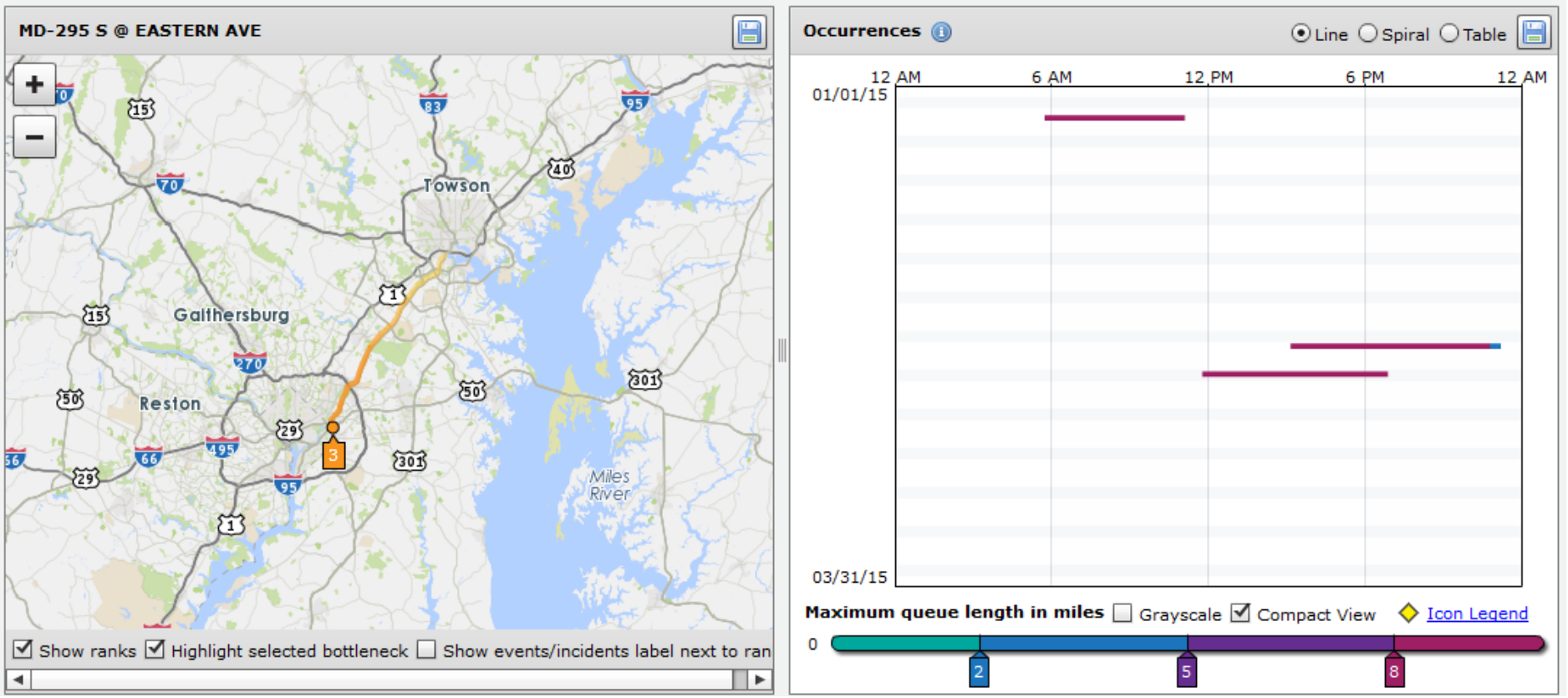


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS95 -.50 MI S OF MD216



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

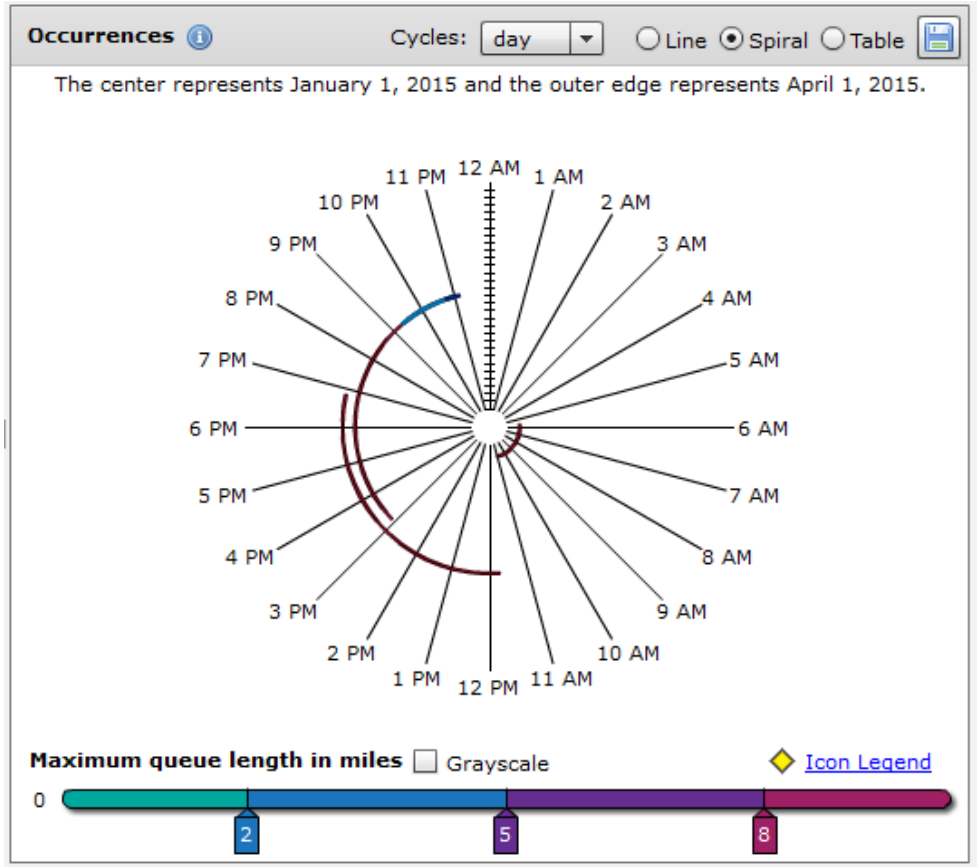
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ Eastern Ave	4 h 38 m	29.32	14	544	114,125



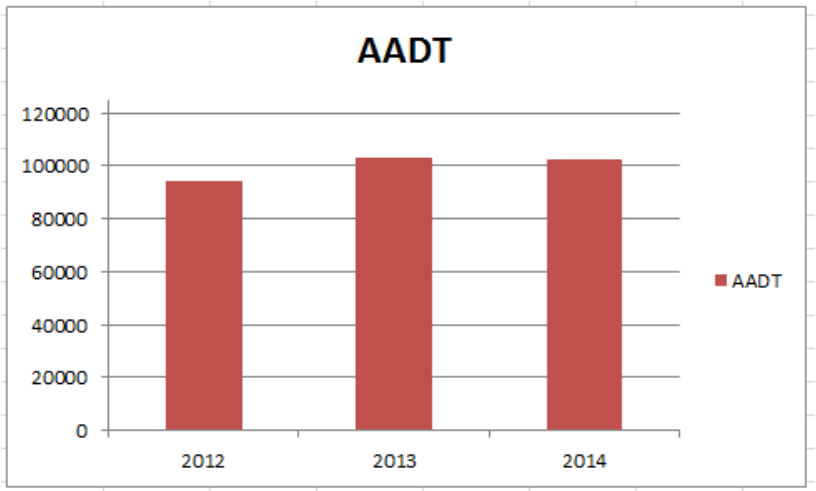
Notes: Non-recurring congestion due to several major incidents. Personal injury accident closing a ramp on Sunday 1/6; Multiple incidents including one closing the left lane and shoulder on February 16. Bottlenecks extended from Washington, DC up to the Baltimore Beltway.

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

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ Eastern Ave	4 h 38 m	29.32	14	544	114,125

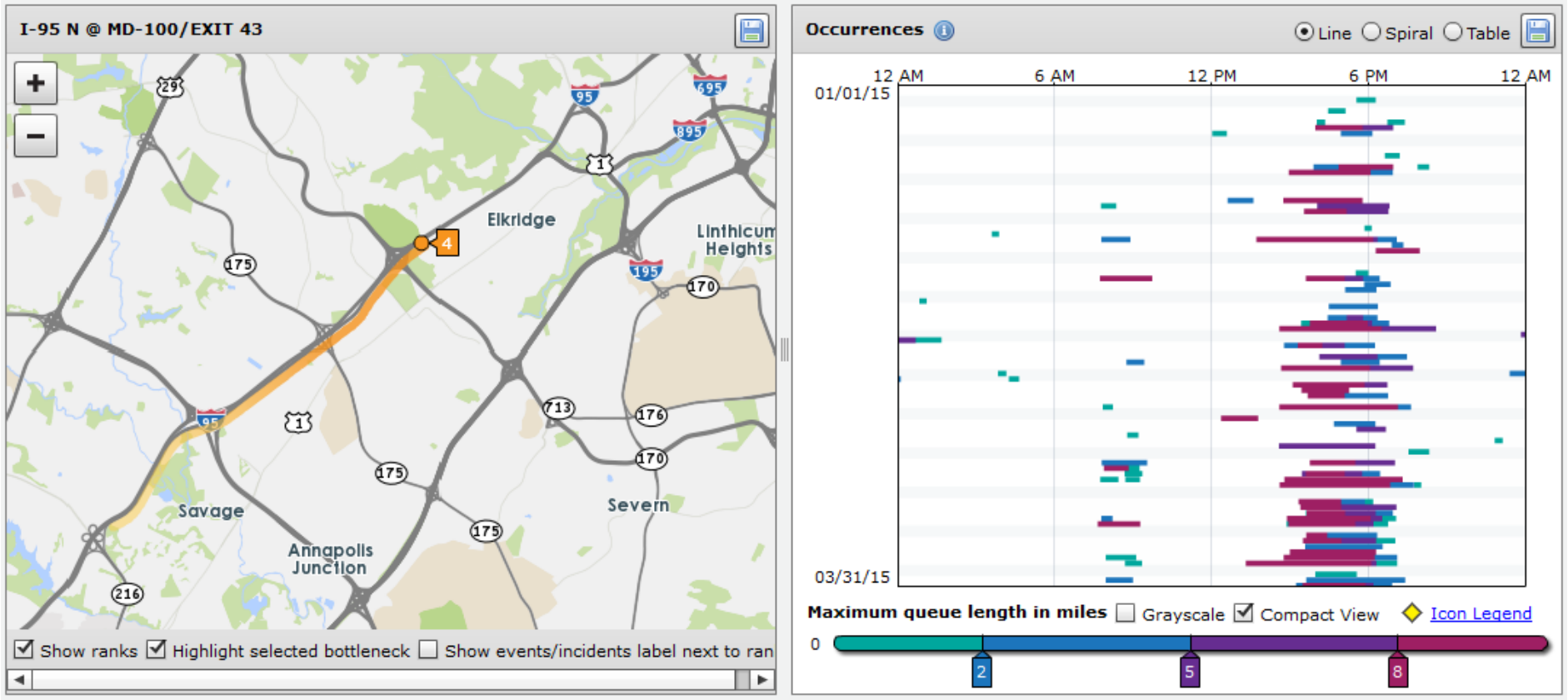


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.50 MI S OF MD32



#4 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

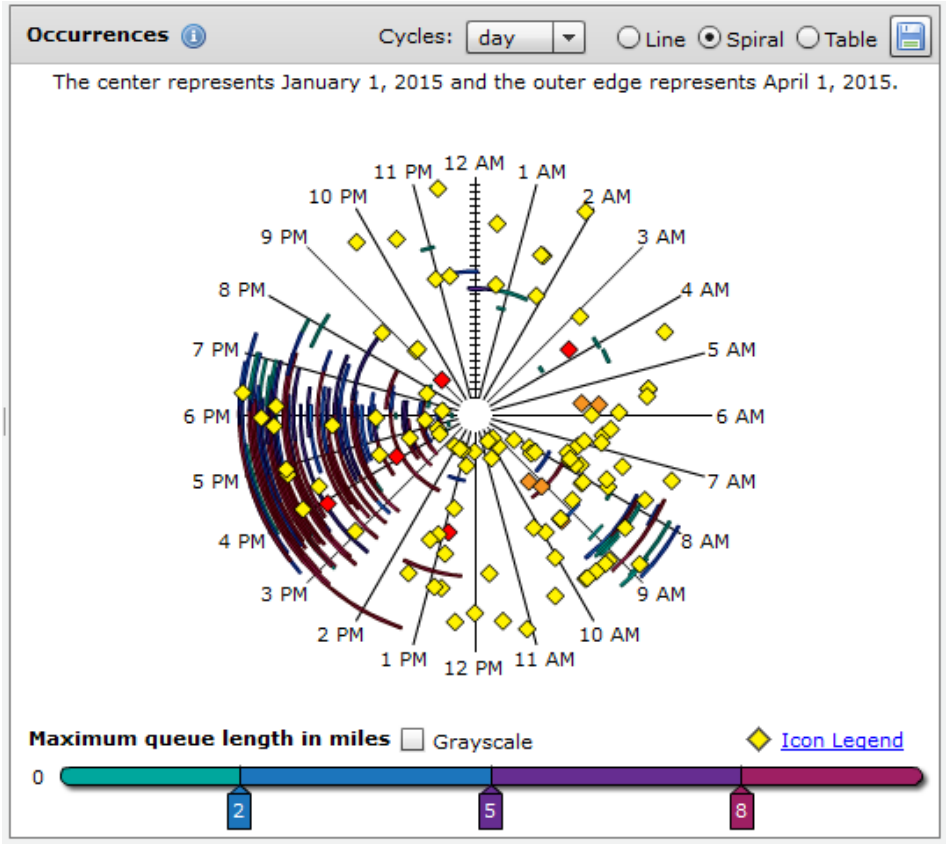
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 N @ MD-100/Exit 43	1 h 47 m	6.93	130	111	96,463



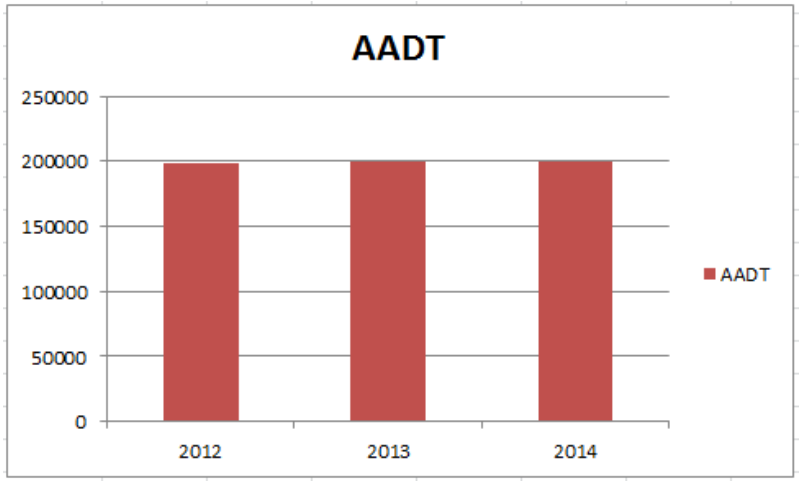
Notes: Congestion in the afternoon rush hour. Contributing factors include traffic entering at MD-175, weaving to exit at MD-100, and the half-mile uphill grade midway between MD-175 and MD-100.

#4 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 N @ MD-100/Exit 43	1 h 47 m	6.93	130	111	96,463

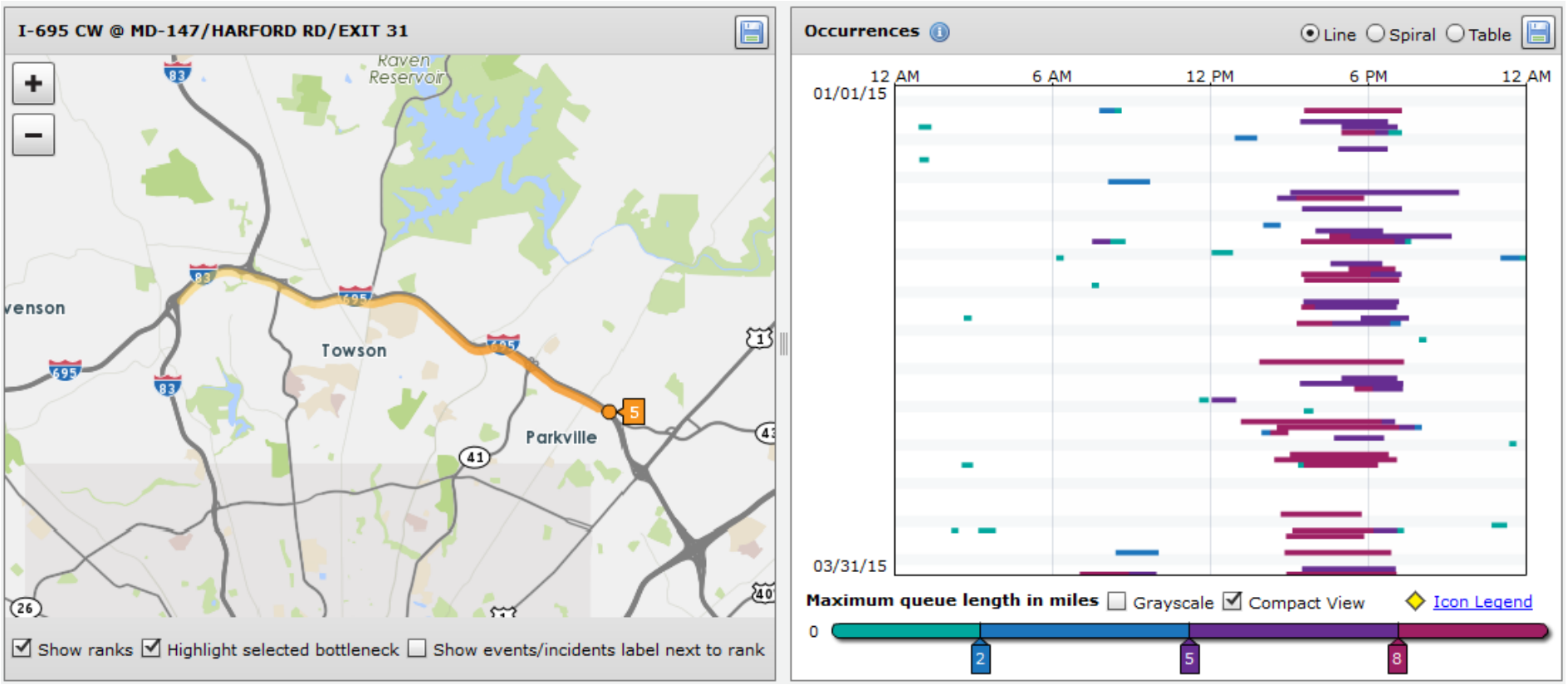


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS 95 South of MD 103 (ATR#39)



#5 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

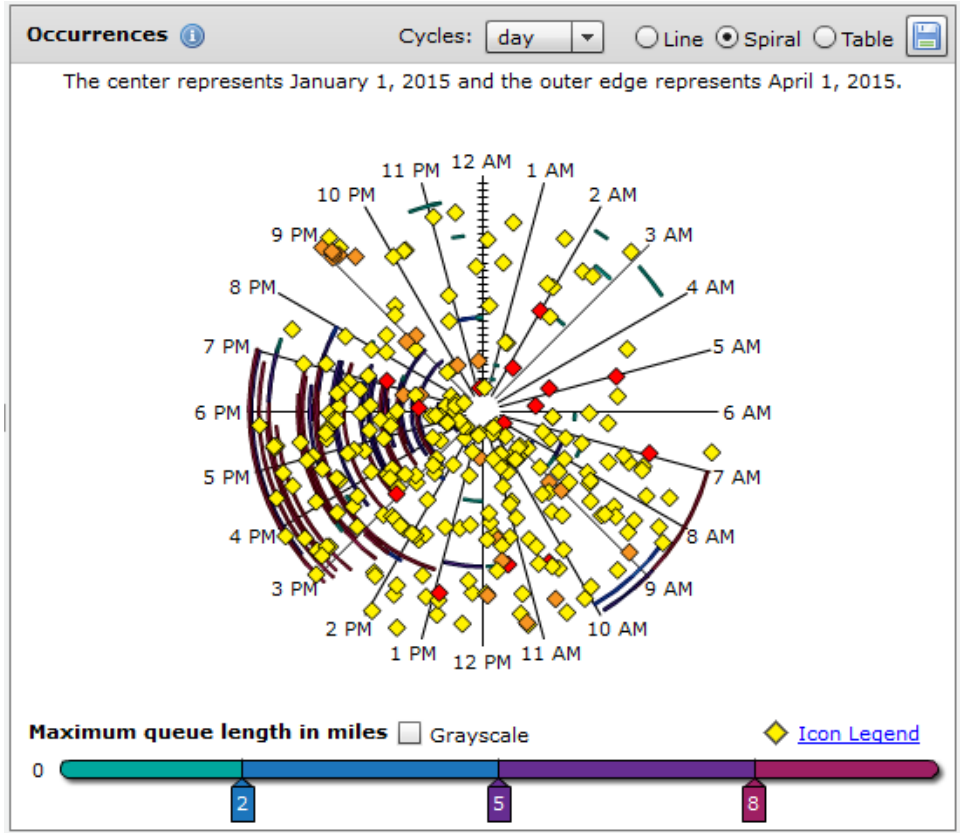
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ MD-147/Harford Rd/Exit 31	2 h 12 m	7.39	84	268	81,946



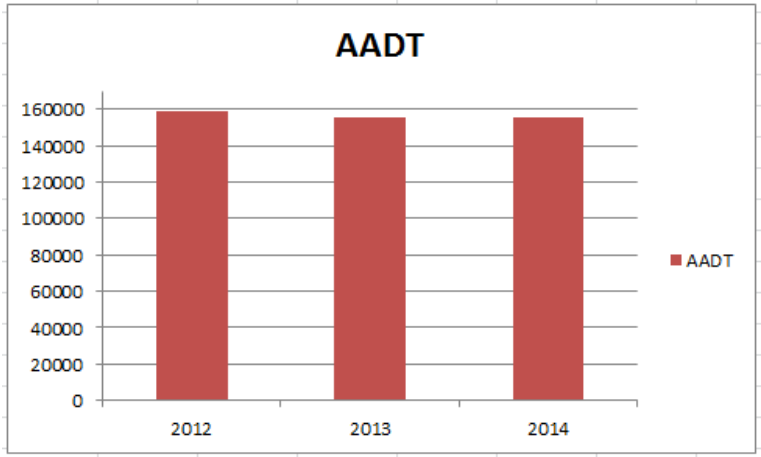
Notes: PM peak period congestion was most severe between I-83 and Providence Rd. Factors contributing to this long standing and extended congested zone: merging and weaving associated with traffic at each interchange and a lane drop (to 3 lanes) at MD-45/York Rd..

#5 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CW @ MD-147/Harford Rd/Exit 31	2 h 12 m	7.39	84	268	81,946

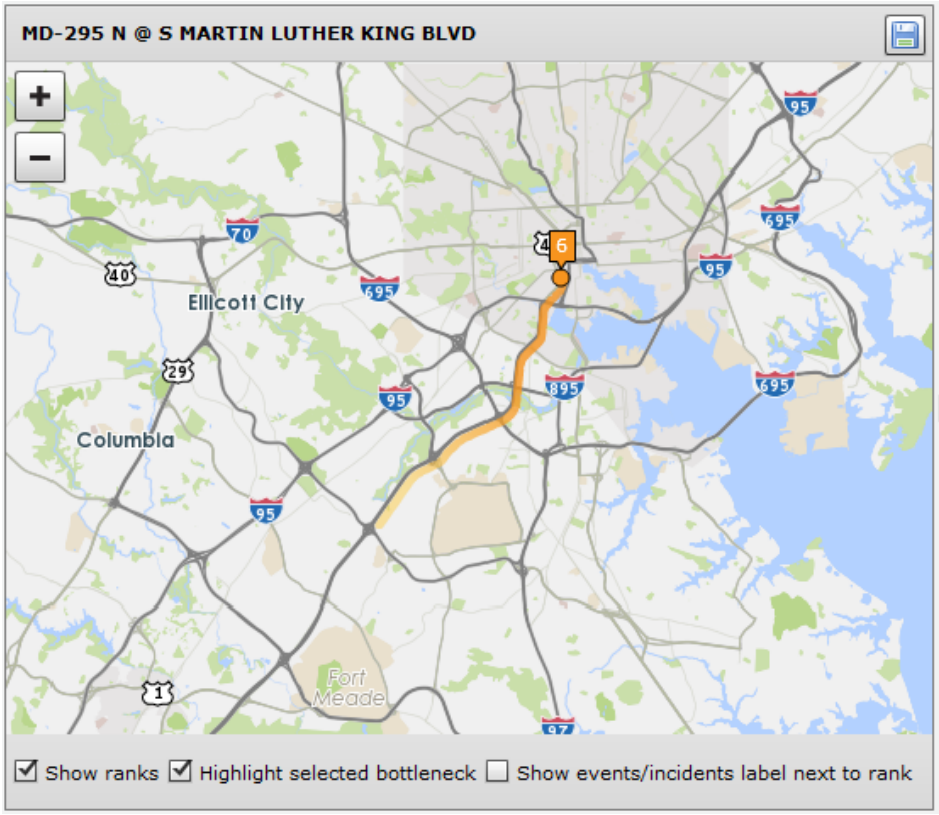


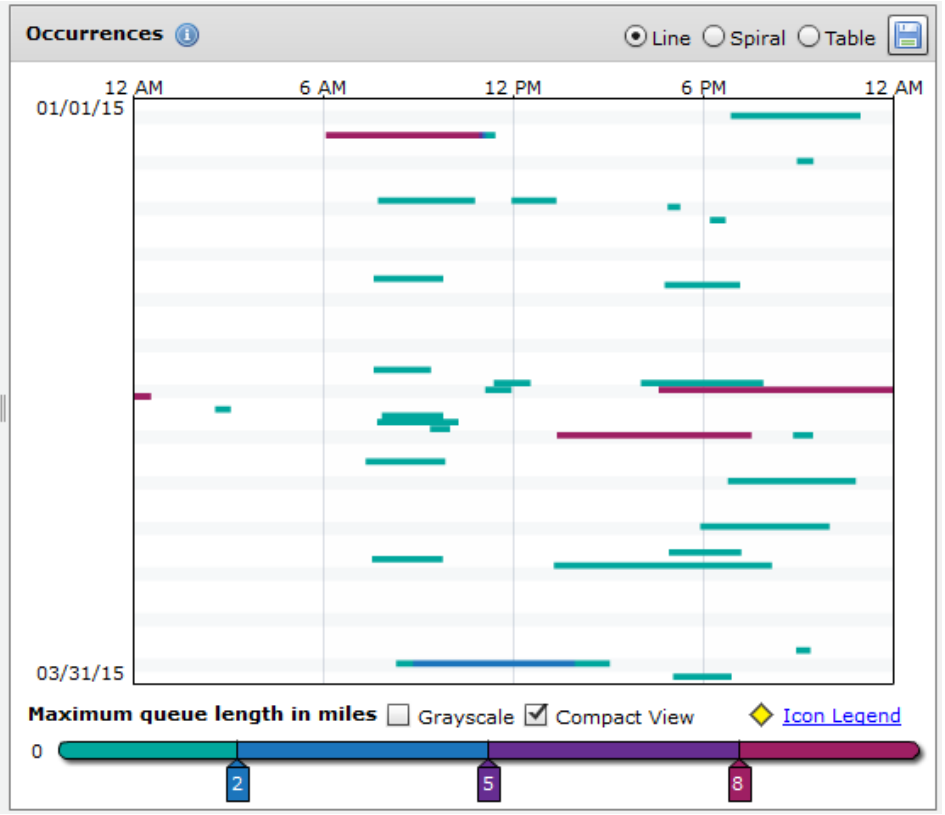
Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS695-.30 MI W OF MD147



#6 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ S Martin Luther King Blvd	2 h 53 m	9.57	49	203	81,089

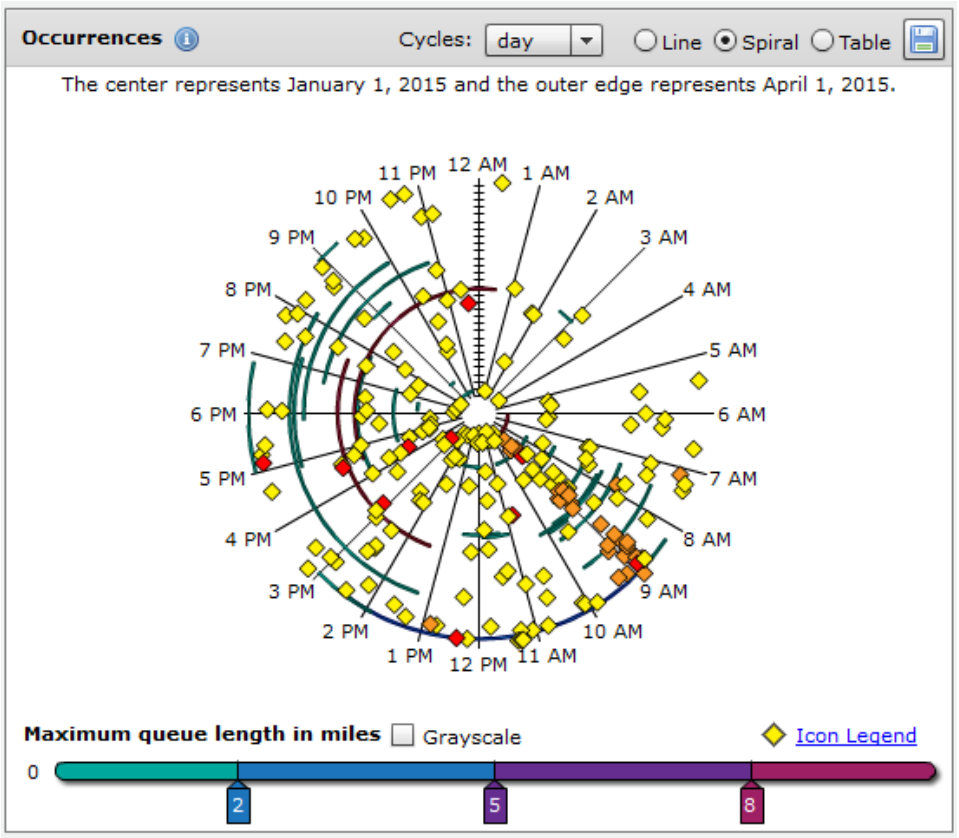




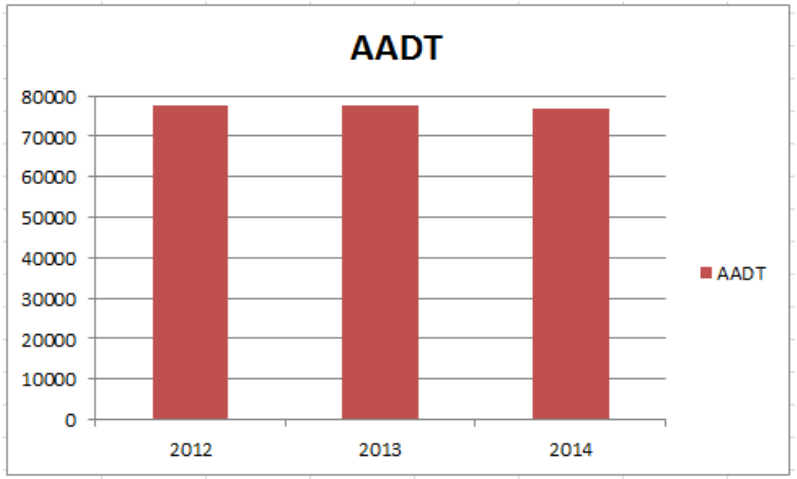
Notes: Non-recurring congestion due to incidents along Russell St which caused bottlenecks back to the limited access portions of MD-295/Baltimore Washington Parkway.

#6 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 N @ S Martin Luther King Blvd	2 h 53 m	9.57	49	203	81,089

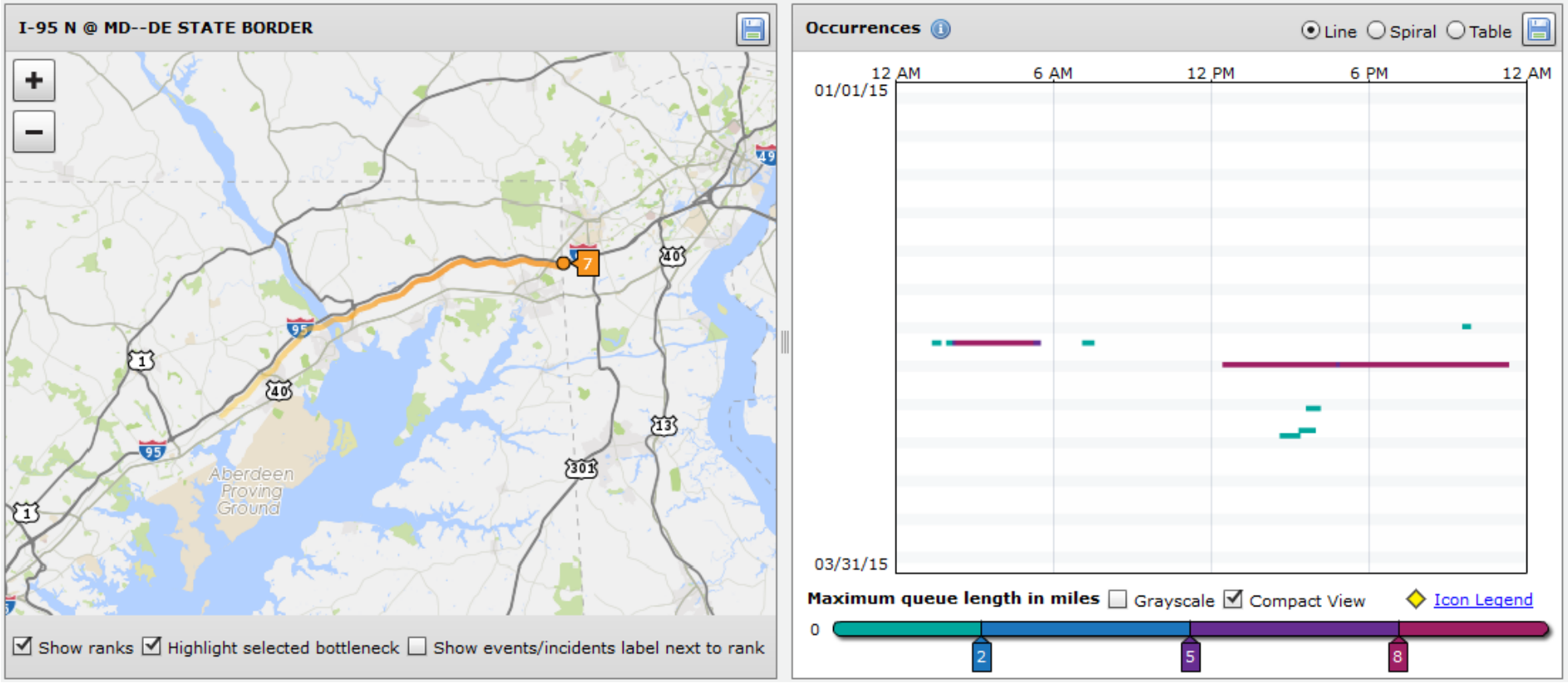


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.20 MI N OF IS895



#7 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

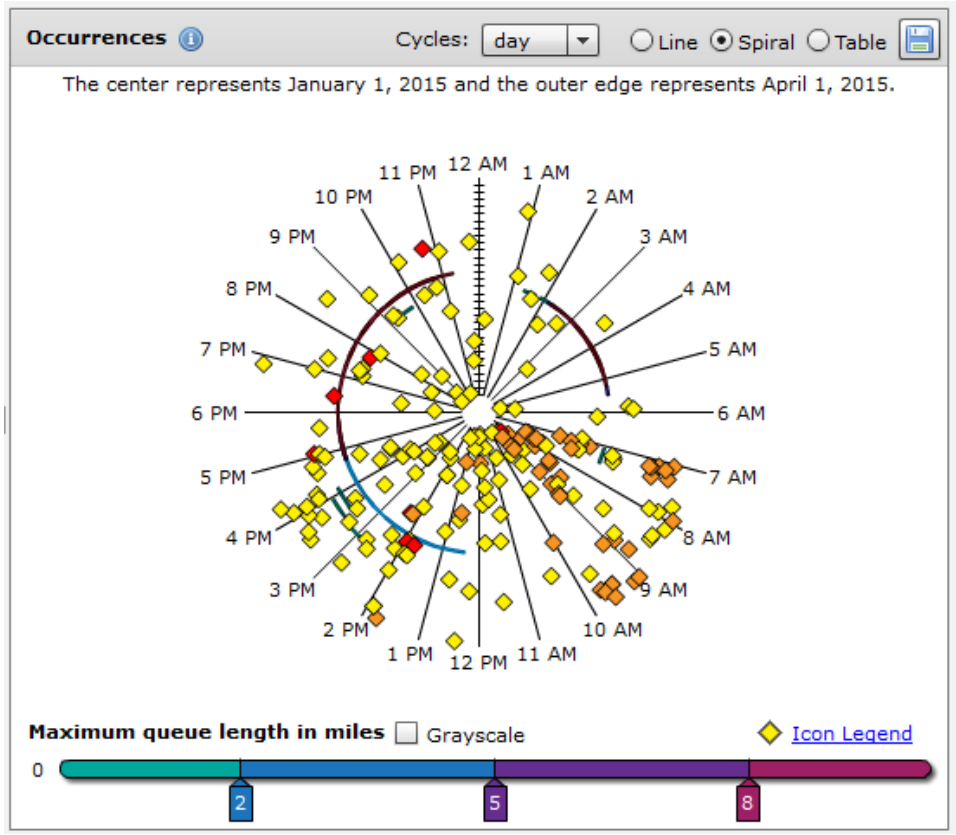
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 N @ MD—DE State Border	1 h 53 m	28.28	25	196	79,904



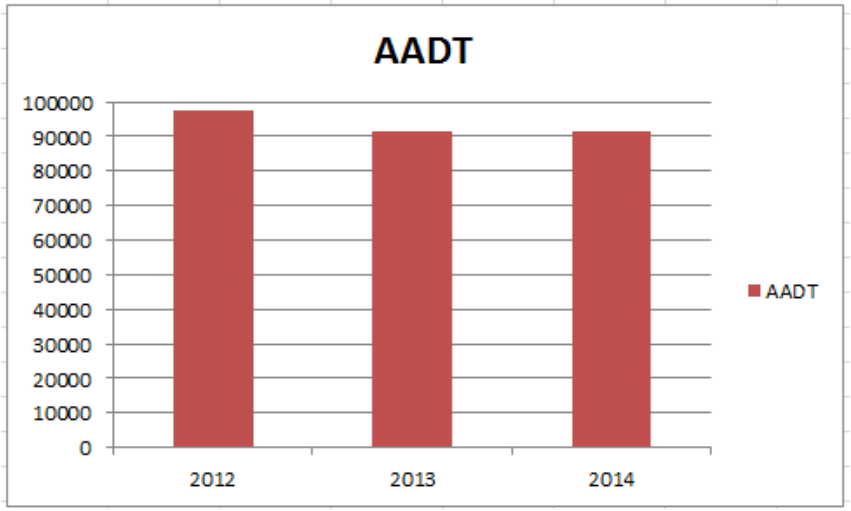
Notes: Non-recurring congestion due to 2 major incidents including a jackknifed tractor trailer in the early morning hours of Feb 17th and another incident related bottleneck on February 21th due to inclement weather. Average length of the 2 bottlenecks tracked from Cecil County south to the Baltimore Region well into Harford County.

#7 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-95 N @ MD—DE State Border	1 h 53 m	28.28	25	196	79,904

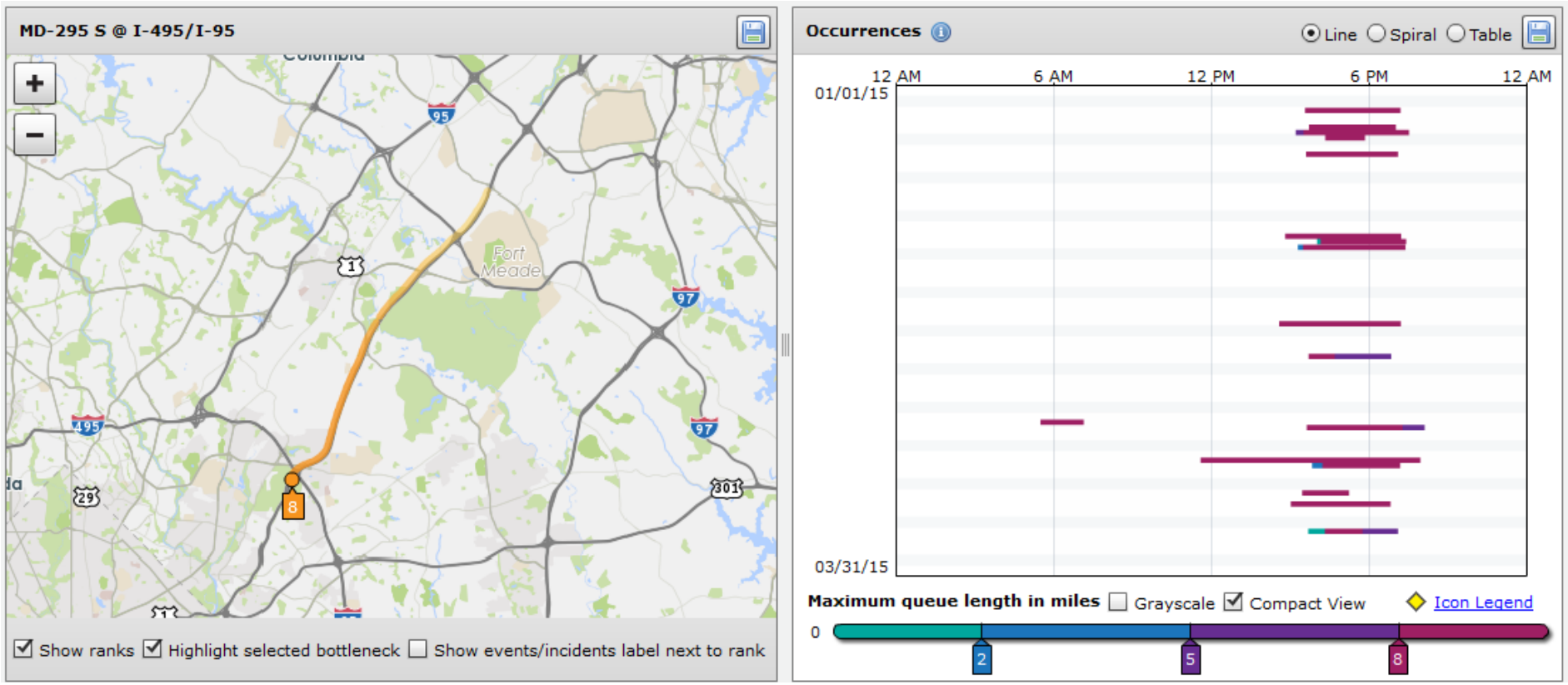


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS95-.20 MI N OF MD22



#8 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

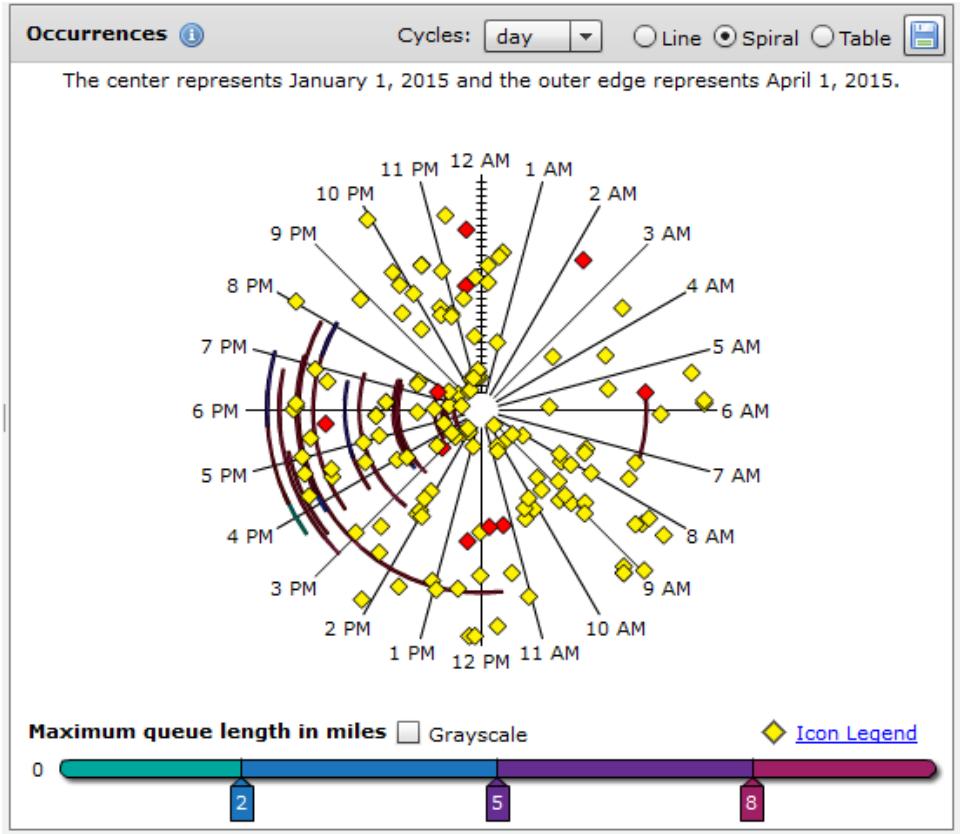
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ I-495/I-95	3 h 25 m	12.34	28	141	70,835



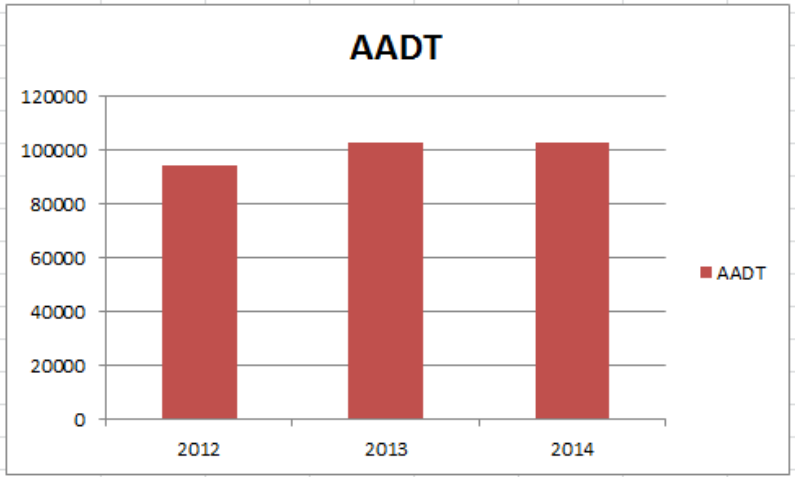
Notes: MD-295 merge with the Capital Beltway I-495. Congestion seen in the afternoon peak period sometimes extends into the southern portion of the Baltimore region near the Fort Meade area.

#8 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ I-495/I-95	3 h 25 m	12.34	28	141	70,835

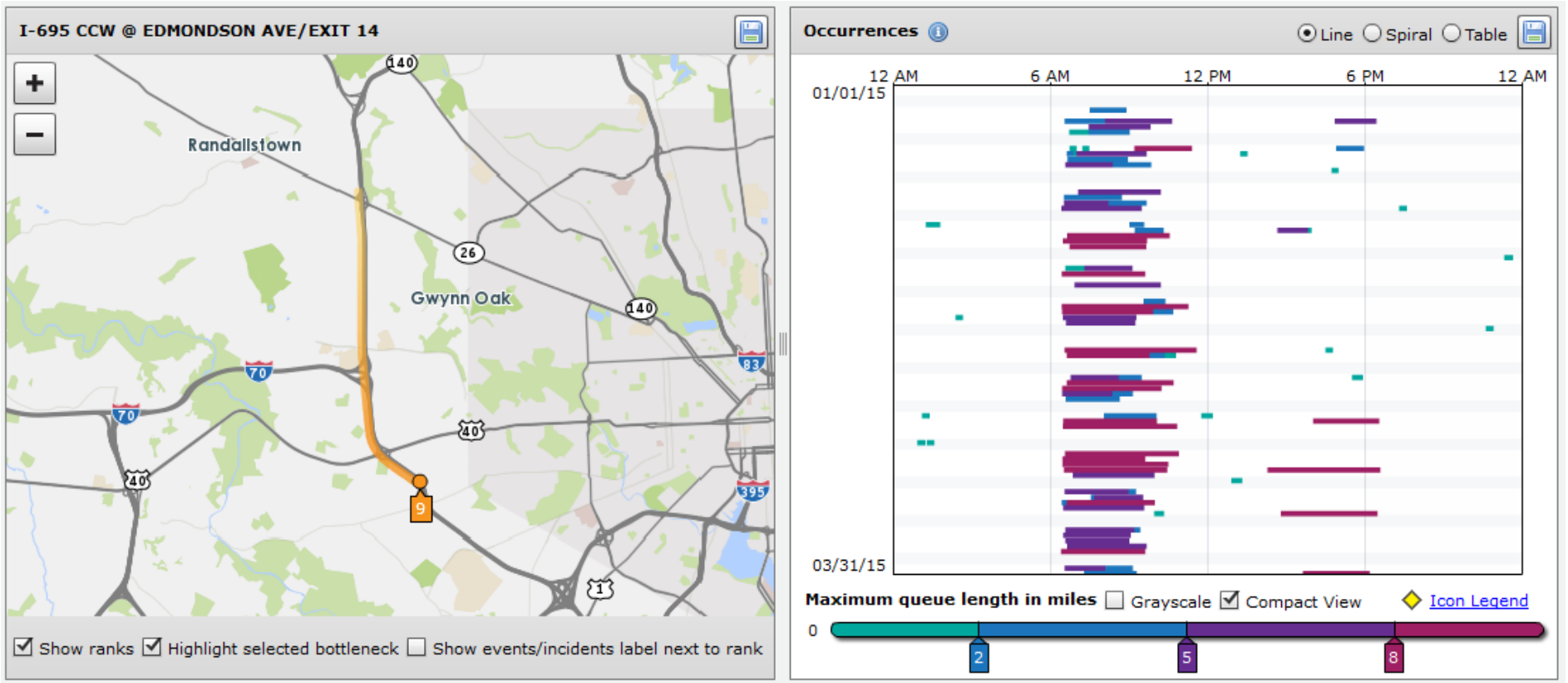


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.50 MI S OF MD32



#9 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

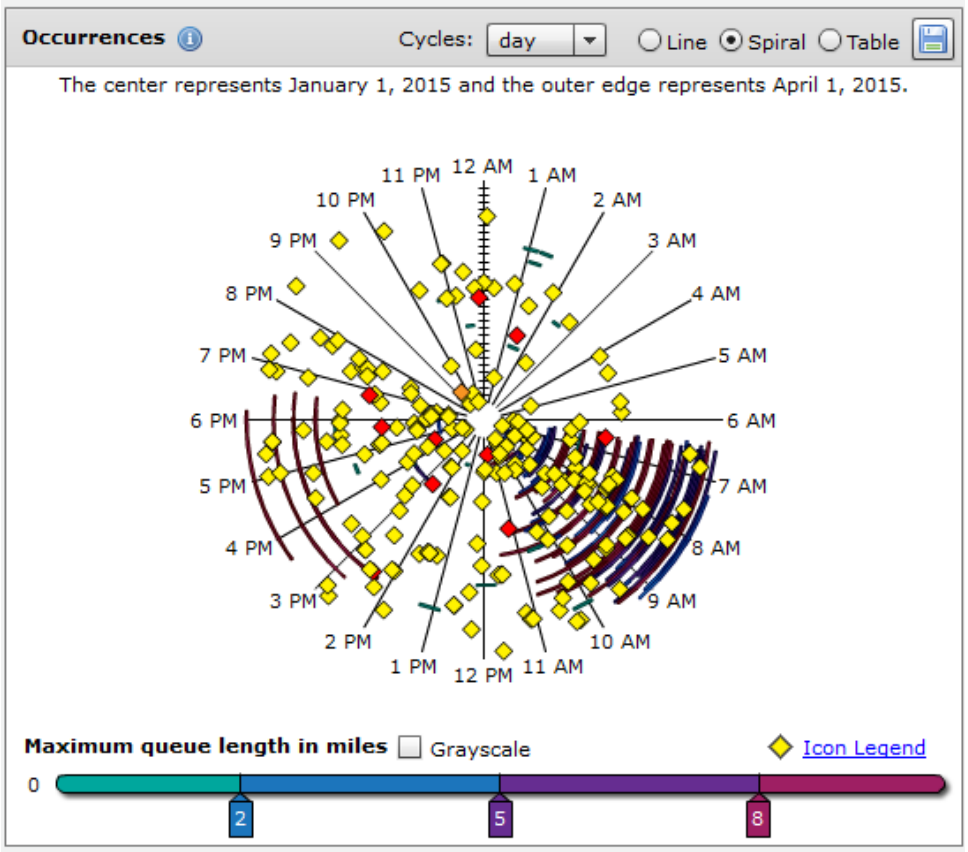
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CCW @ Edmondson Ave/Exit 14	2 h 02 m	5.78	95	213	67,025



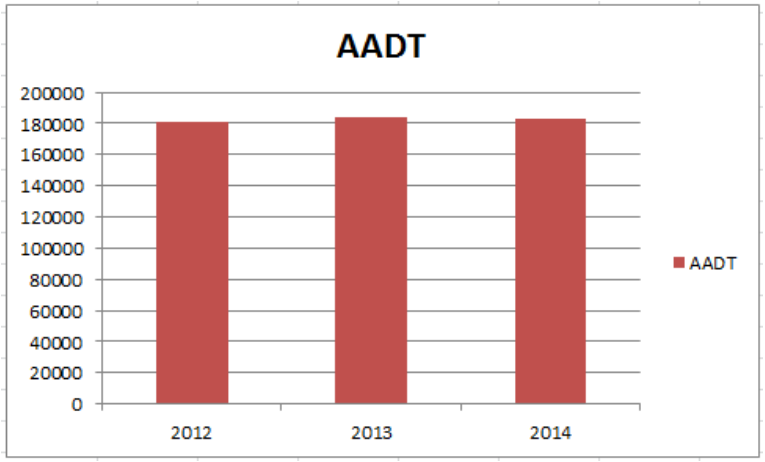
Notes: Longstanding bottleneck on the outer loop of the beltway primarily during the morning rush. High traffic volume area. Delays extend back as far as MD-26/Liberty Rd. Also contributing to congestion in the area is a beltway widening project which began in February. "The plan is for crews to add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

#9 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
I-695 CCW @ Edmondson Ave/Exit 14	2 h 02 m	5.78	95	213	67,025

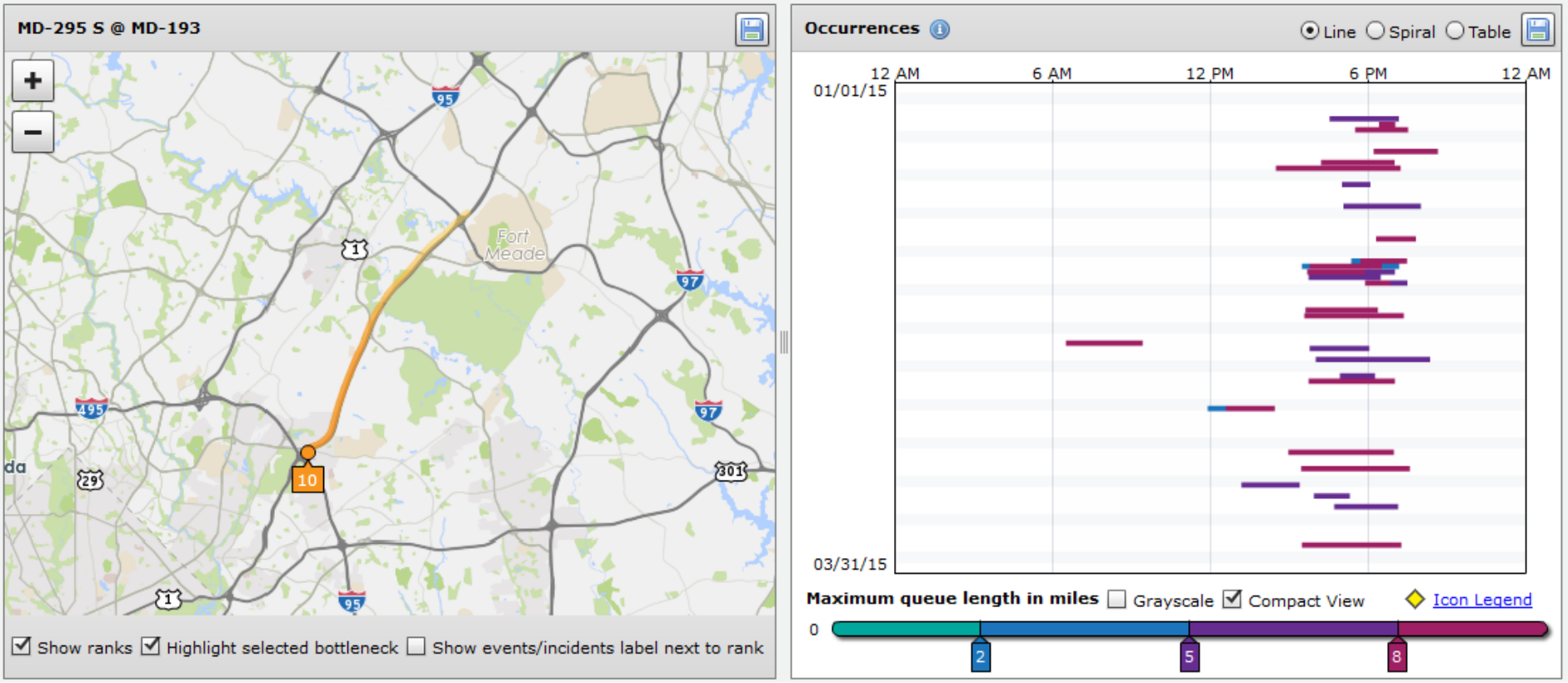


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION IS 695 - South of Ingleside Ave (ATR#32)



#10 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

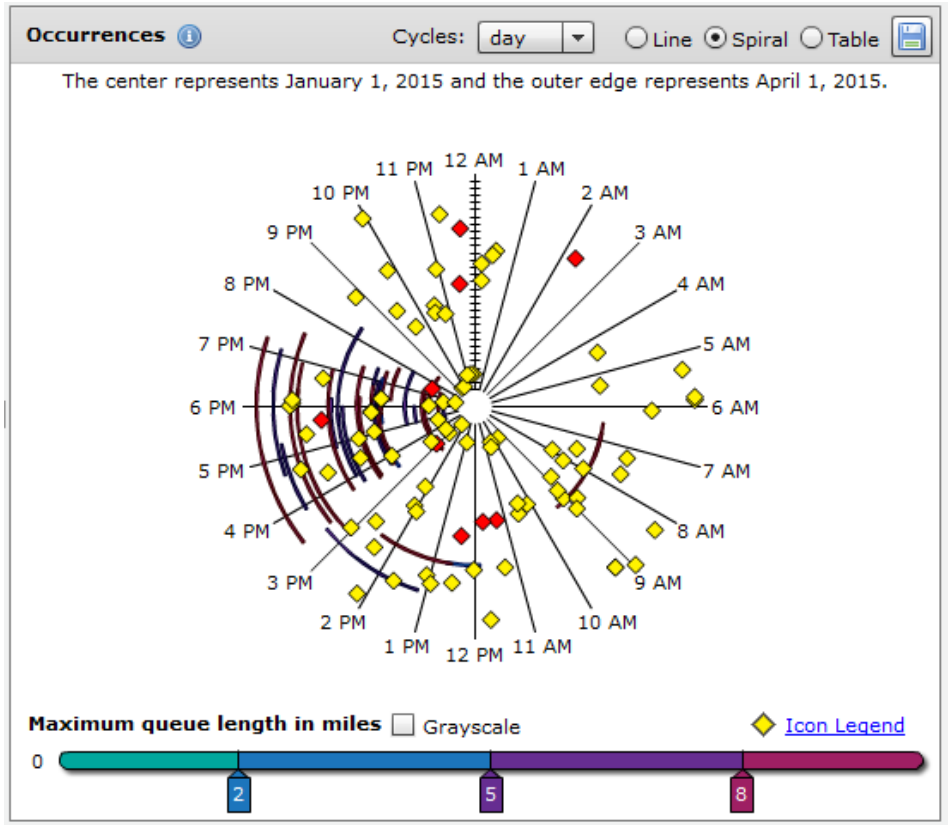
Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ MD-193	2 h 17 m	10.18	43	93	59,943



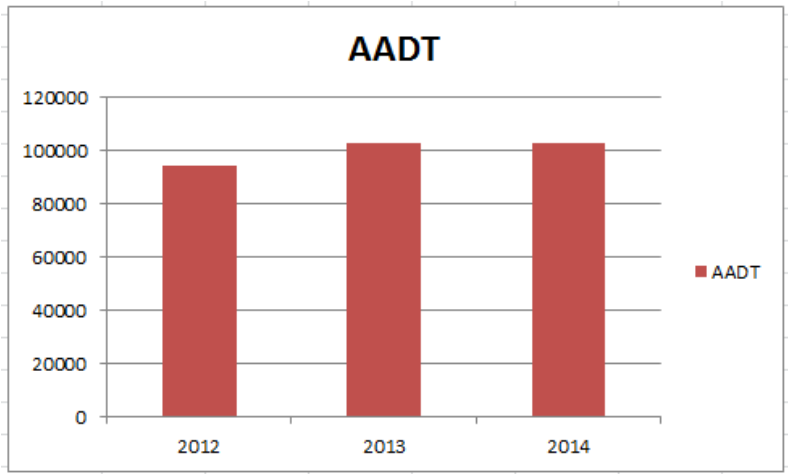
Notes: Overlapping bottleneck with #8. Could possibly be combined as one bottleneck which would raise the ranking by impact factor to #3

#10 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2015

Location	Average Duration	Average max length (miles)	Occurrences	All Events/ Incidents	*Impact Factor
MD-295 S @ MD-193	2 h 17 m	10.18	43	93	59,943

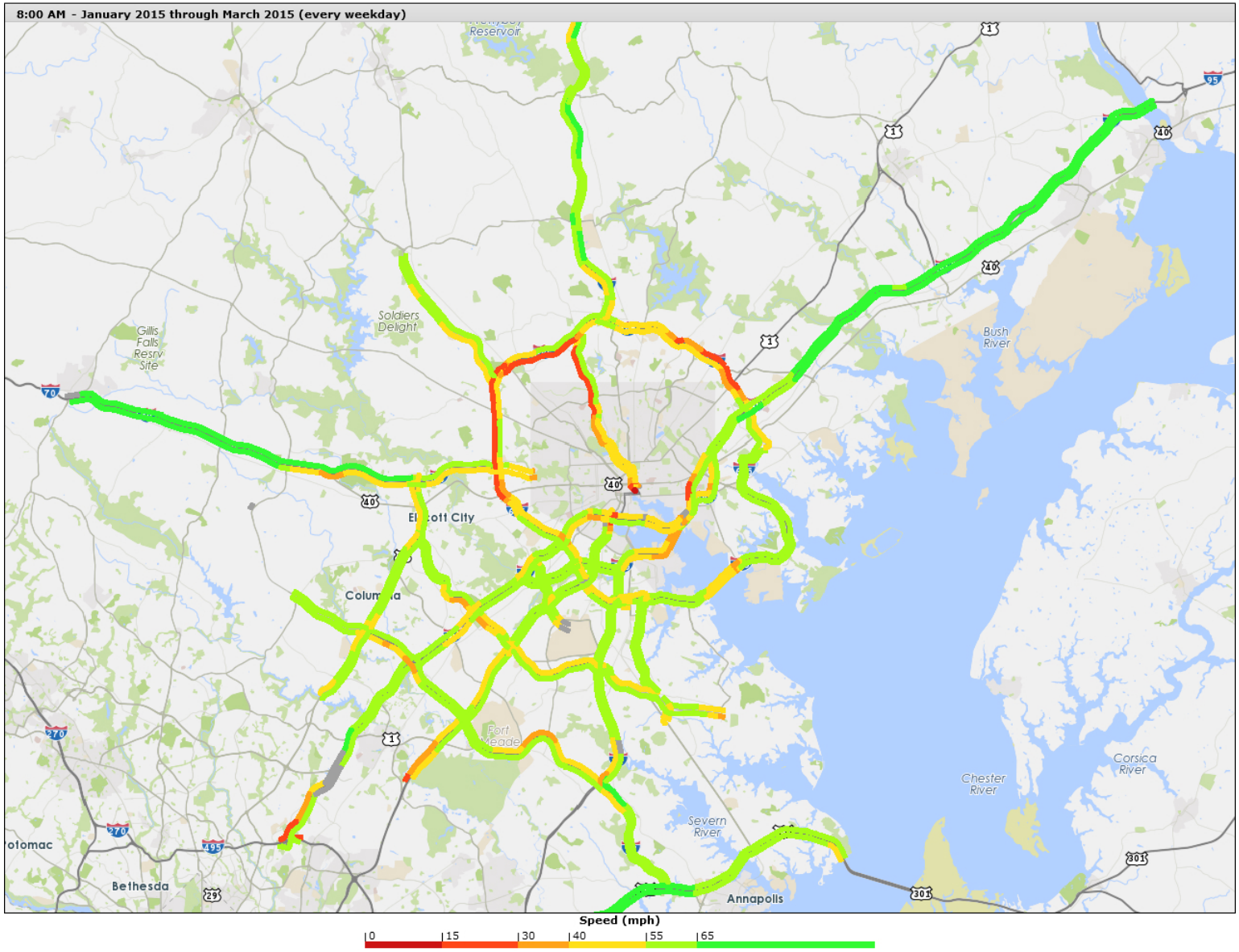


Traffic Volumes – Average Annual Daily Traffic (AADT)
STATION_DESCRIPTION MD295-.50 MI S OF MD32



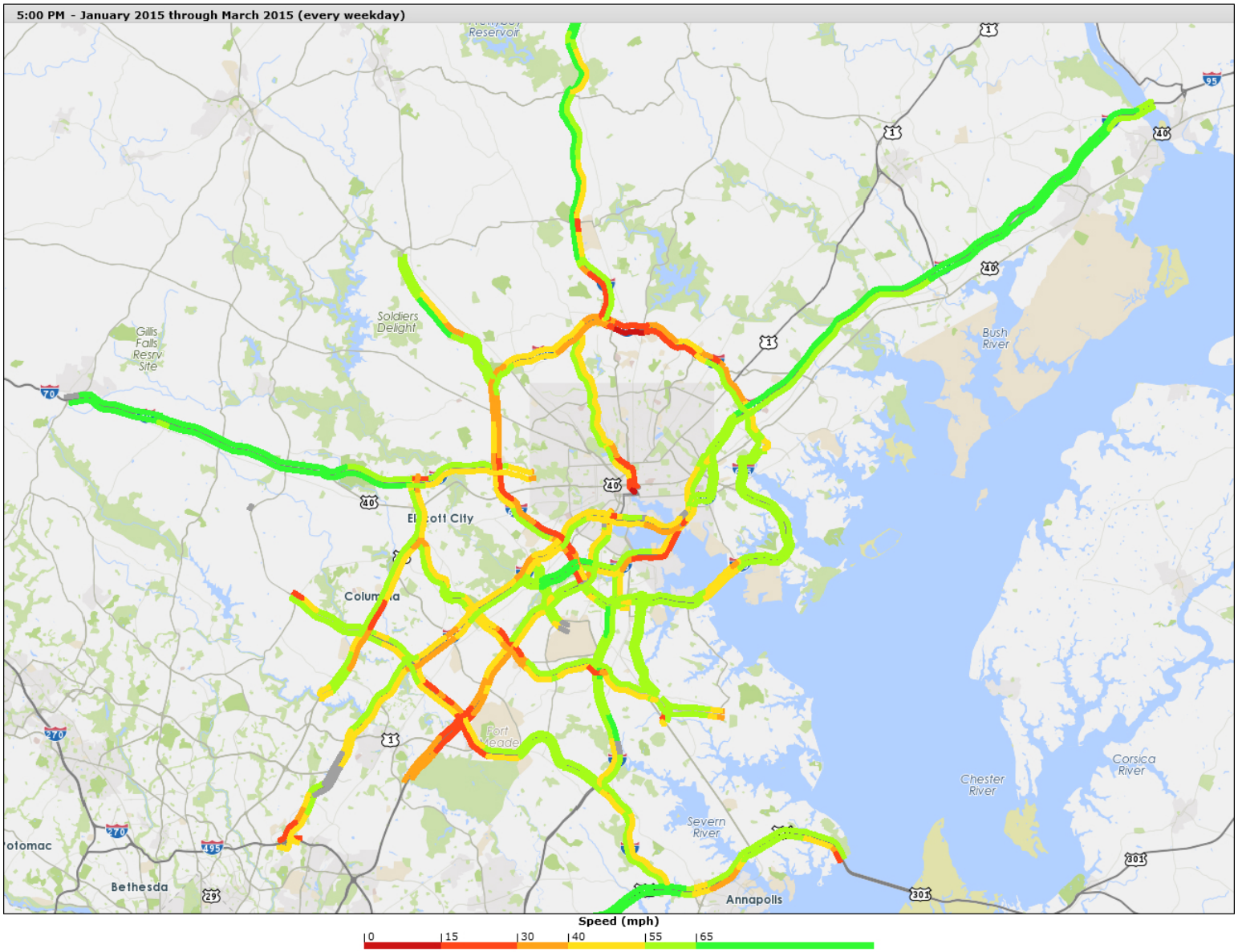
Average Speed Maps – AM Peak Period 8:00-9:00 Weekdays: 1st Quarter 2015

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: 1st 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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