Quarterly Congestion Analysis Report For The Baltimore Region

Top 10 Bottleneck Locations

2nd Quarter 2014

Baltimore Metropolitan Council

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The Vehicle Probe Project

Data and graphics in the following 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 and INRIX and has been providing comprehensive and continuous real-time travel information for more than two 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)
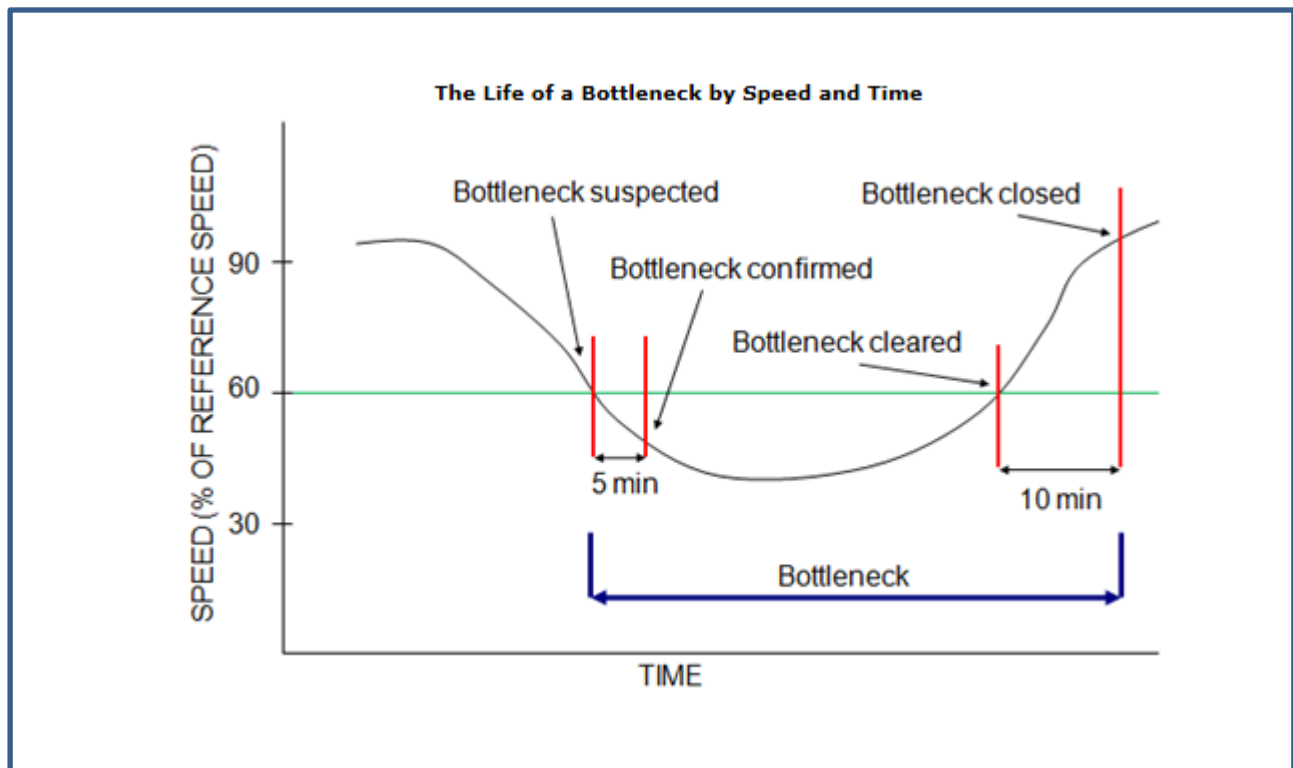UMD CATT Lab made the VPP suite to participating agencies. For the training video, please visit
http://vpp.ritis.org/suite/screencast/

Should you have any questions, please contact:

- For general project questions, Marygrace Parker at 518-852-4083 or *i95mgp@ttlc.net*
- For Data Validation, Stan Young at 301-403-4593 or *seyoung@umd.edu*
- For Data, Rick Schuman at 407-298-4346 or *rick@inrix.com*
- For the Vehicle Probe Project Suite, Michael L. Pack at 301-405-0722 or *packml@umd.edu*

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.
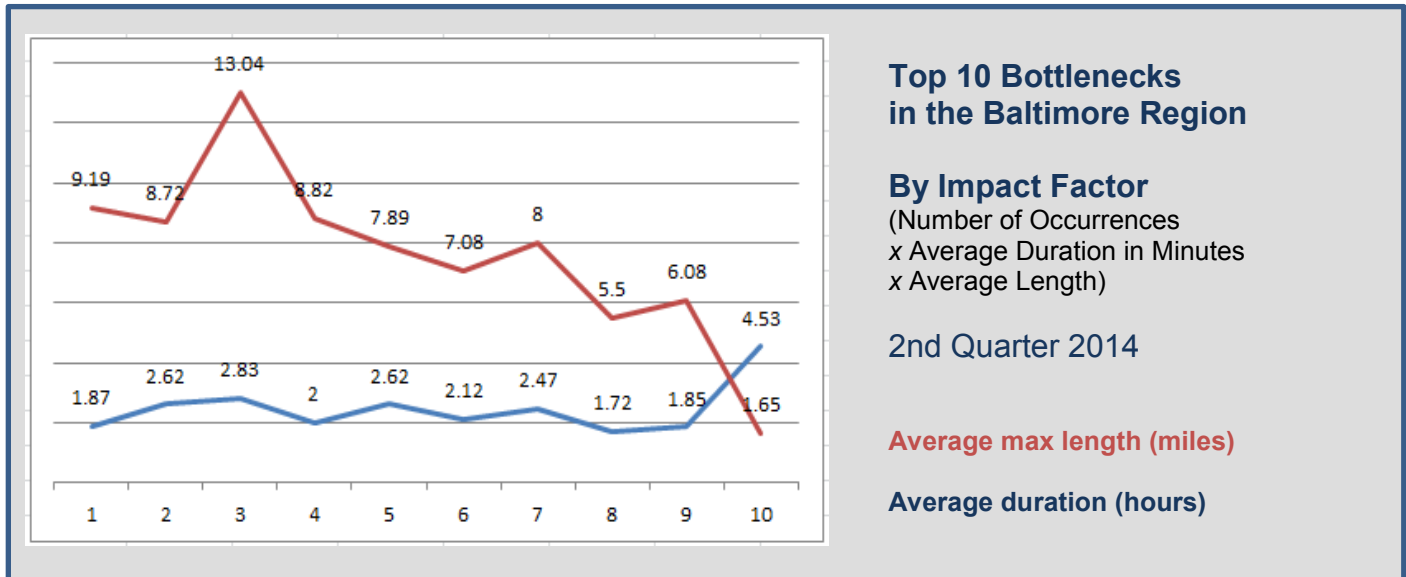
The Life of a Bottleneck by Speed and Time

Bottleneck suspected

Bottleneck confirmed

Bottleneck closed

Bottleneck cleared

SPEED (% OF REFERENCE SPEED)

90

60

30

5 min

10 min

Bottleneck

TIME

Top 10 Bottlenecks in the Baltimore Region
2nd Quarter 2014

By Impact Factor

(Number of Occurrences x Average Duration in Minutes x Average Length)

	Location	Average Duration	Average max length (miles)	Occurrences	Impact Factor
1	I-95 N @ MD-100/Exit 43	1 h 52 m	9.19	221	227,583
2	MD-295 S @ Powder Mill Rd	2 h 37 m	8.72	152	208,004
3	MD-295 N @ I-195	2 h 50 m	13.04	92	203,875
4	I-695 CCW @ Edmondson Ave/Exit 14	2 h	8.82	156	165,118
5	I-695 CW @ I-795/Exit 19	2 h 37 m	7.89	116	143,766
6	I-695 CW @ MD-41/Perring Pkwy/Exit 30	2h 07 m	7.08	108	97,125
7	I-695 CW @ MD-147/Harford Rd/Exit 31	2 h 28 m	8.00	77	91,169
8	MD-295 N @ MD-100	1 h 43 m	5.50	150	84,977
9	US-29 N @ MD-175	1 h 51 m	6.08	121	81,652
10	MD-295 N @ S Martin Luther King Jr Blvd	4 h 32 m	1.65	172	77,277

**Top 10 Bottlenecks
in the Baltimore Region**

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

2nd Quarter 2014

Average max length (miles)

Average duration (hours)

By Average Duration

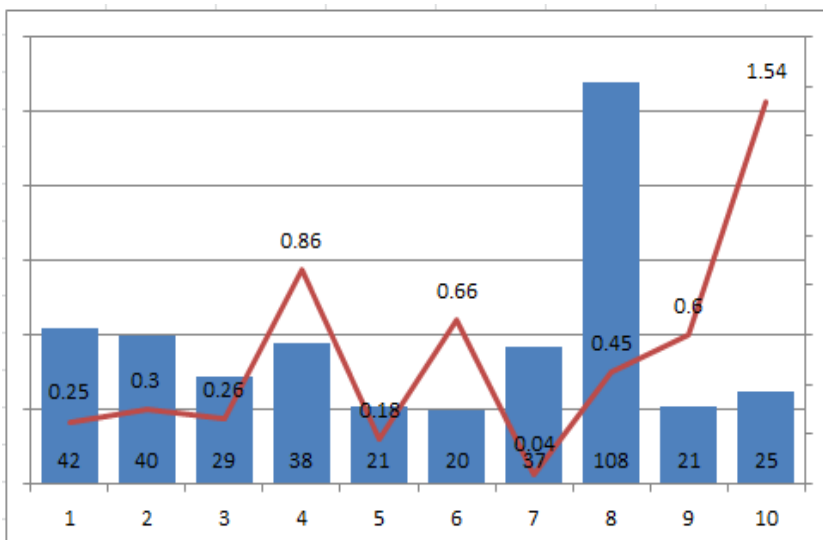|	Location	Average Duration	Average max length (miles)	Occurrences	Impact Factor
1	MD-295 N @ S Martin Luther King Blvd	4 h 32 m	1.65	172	77,277
2	I-695 CW/Greenspring Ave/Exit 22	2 h 52 m	3.93	4	2,701
3	MD-295 N @ I-195	2 h 50 m	13.04	92	203,875
4	I-695 CW @ I-795/Exit 19	2 h 37 m	7.89	116	143,766
5	MD-295 S @ Powder Mill Rd	2 h 37 m	8.72	152	208,004
6	I-95 S @ I-495/Exit 27-25	2 h 29 m	12.57	11	20,603
7	I-695 CW @ MD-147/Harford Rd/Exit 31	2 h 28 m	8.00	77	91,169
8	MD-32 W @ Burntwoods Rd	2 h 17 m	10.91	9	13,455
9	I-695 CCW @ MD-372/Wilkens Ave	2 h 11 m	7.31	6	5,743
10	I-695 CCW @ MD-170/Camp Meade Rd	2 h 09 m	4.71	62	37,685

Top 10 Bottlenecks in the Baltimore Region
2nd Quarter 2014

By Average Length

	Location	Average Duration	Average max length (miles)	Occurrences	Impact Factor
1	MD-295 N @ I-195	2 h 50 m	13.04	92	203,875
2	I-95 S @ I-495/Exit 25-25	2 h 29 m	12.57	11	20,603
3	MD-32 W @ Burntwoods Rd	2 h 17 m	10.91	9	13,455
4	I-95 N @ MD-152/Exit 74	1 h 38 m	9.91	11	10,681
5	I-95 N @ MD-100/Exit 43	1 h 52 m	9.19	221	227,583
6	I-95 S @ I-895/62nd St/Exit 62	2 h 01 m	9.06	29	31,787
7	I-695 CCW @ Edmondson Ave/Exit 14	2 h	8.82	156	165,118
8	MD-295 S @ Powder Mill Rd	2 h 37 m	8.72	152	208,004
9	I-695 CW @ MD-147/Harford Rd/Exit 31	2 h 28 m	8.00	77	91,169
10	I-95 N @ Tydings Memorial Bridge Toll Plaza	1 h 39 m	7.90	3	2,345

By Number of Occurrences

	Location	Average Duration	Average max length (miles)	Occurrences	Impact Factor
1	I-895 N @ Harbor Tunnel Toll Plaza	42 m	0.25	1621	16,708
2	I-895 S @ Childs St/Exit 9	40 m	0.30	1544	18,764
3	I-895 N @ Childs St/Exit 9	29 m	0.26	1463	10,896
4	US-50 E @ Bay Bridge	38 m	0.86	1429	46,849
5	I-895 S @ Frankfurst Ave/Shell Rd/Exit 8	21 m	0.18	1151	4,274
6	I-95 N @ Keith Ave/Exit 56	20 m	0.66	760	10,046
7	I-695 CW @ Authority Dr	37 m	0.04	665	982
8	I-695 CW @ Key Bridge Toll	1 h 48 m	0.45	539	26,173
9	I-95 S @ I-395/Exit 53	21 m	0.60	366	4,578
10	I-95 N @ Fort McHenry Tunnel	25 m	1.54	266	10,265

Top Ten Bottlenecks in the Baltimore Region

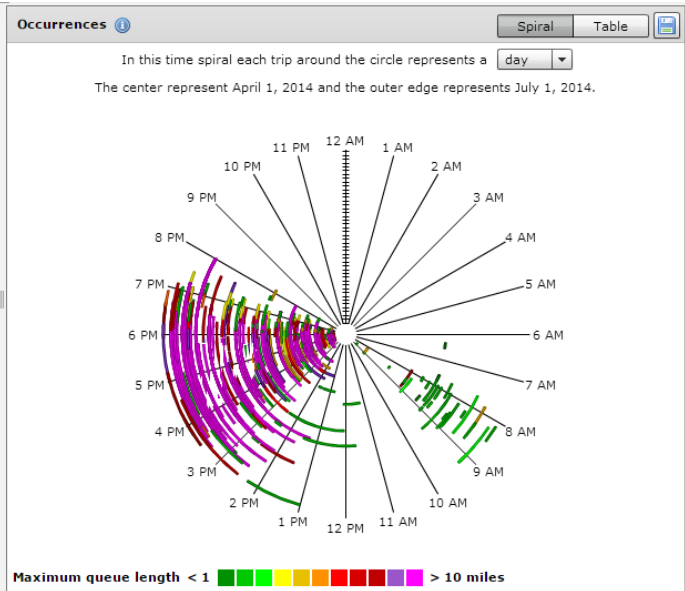**by Number of Occurrences**

2nd Quarter 2014

Duration (Minutes)

Average Max Length (Miles)

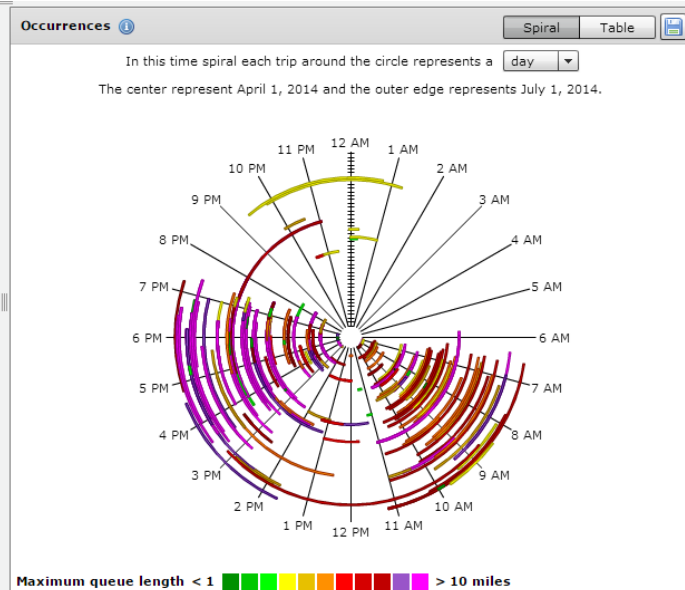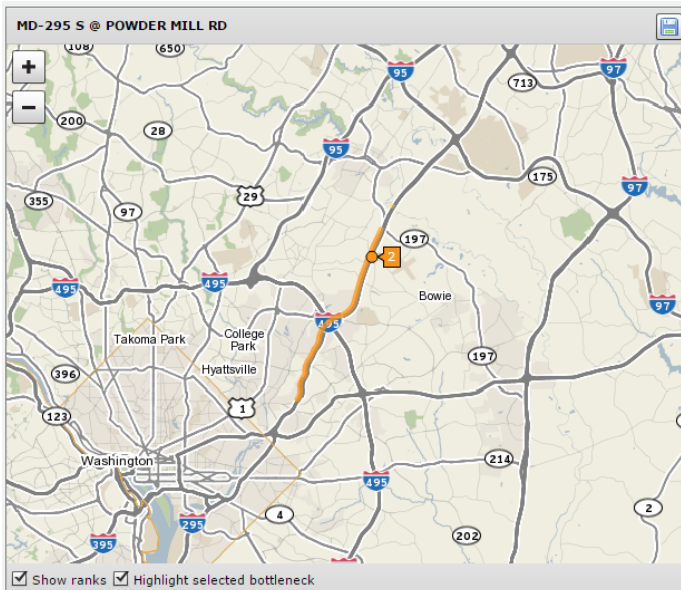## #1 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
I-95 N @ MD-100/Exit 43	1 h 52 m	9.19	221	227,583

Notes: 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
Source: Skycomp Report

#2 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

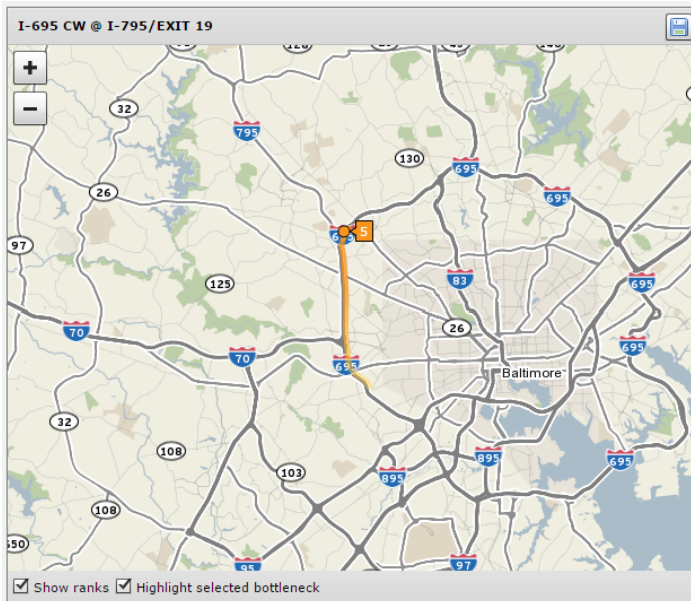| Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
MD-295 S @ Powder Mill Rd	2 h 37 m	8.72	152	208,004

Notes: Southbound congestion extending from Powder Mill Rd just barely extending into the southern portion of the Baltimore region near Fort Meade
Source: VPP Suite

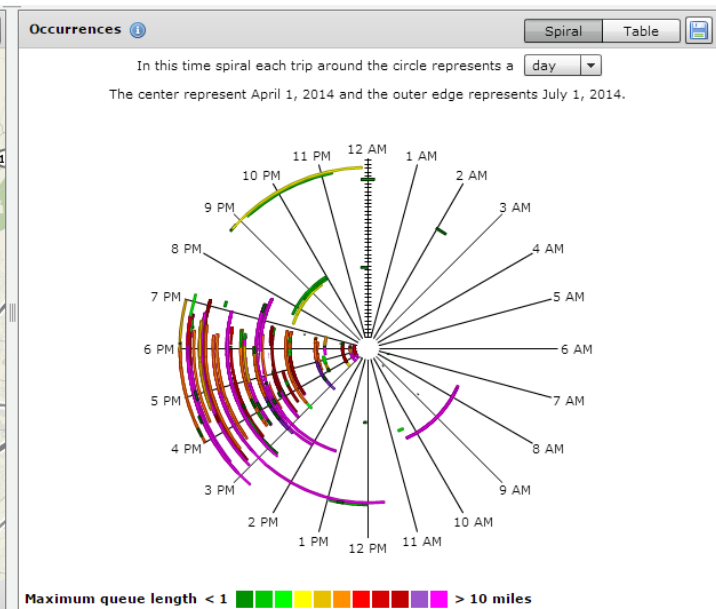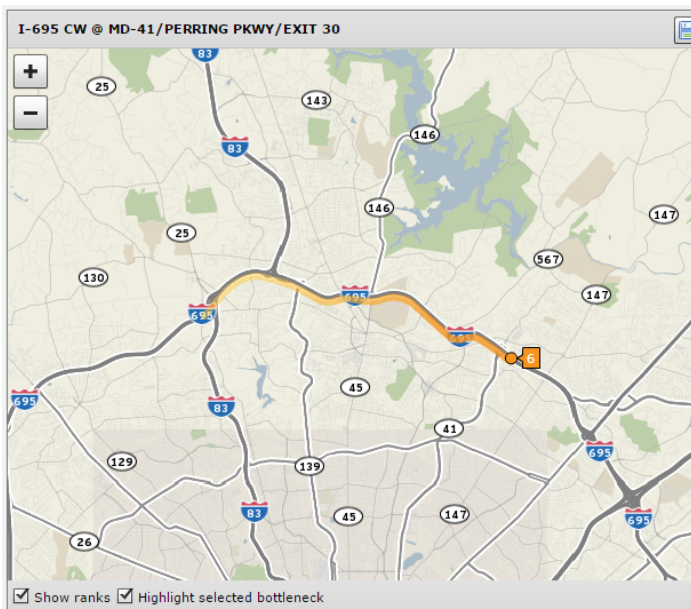## #3 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
MD-295 N @ I-195	2 h 50 m	13.04	92	203,875

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 boteleneck, almost as far back as MD 100.
Source: Skycomp Report

#4 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
I-695 CCW @ Edmondson Ave/Exit 14	2 h	8.82	156	165,118

Notes: Longstanding bottlenecks in both the morning and afternoon.
Source: VPP observations

#5 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
I-695 CW @ I-795/Exit 19	2 h 37 m	7.89	116	143,766
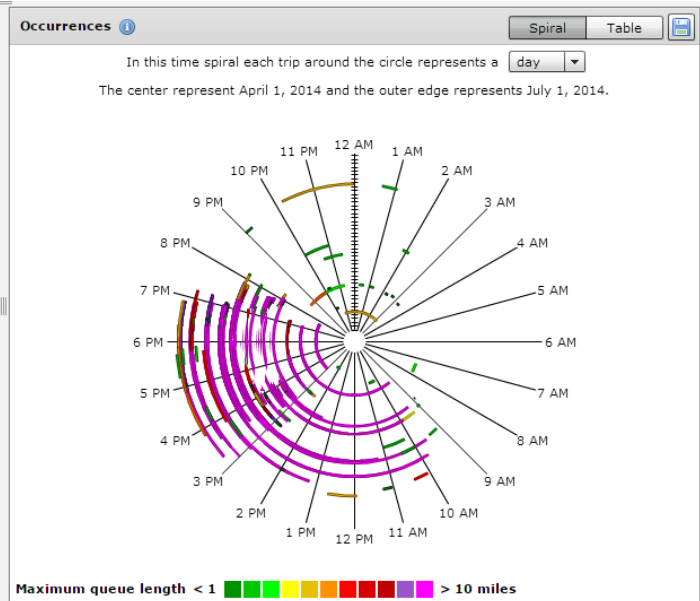
Notes: Longstanding westside beltway inner loop congestion in the afternoon.
Source: Skycomp Report

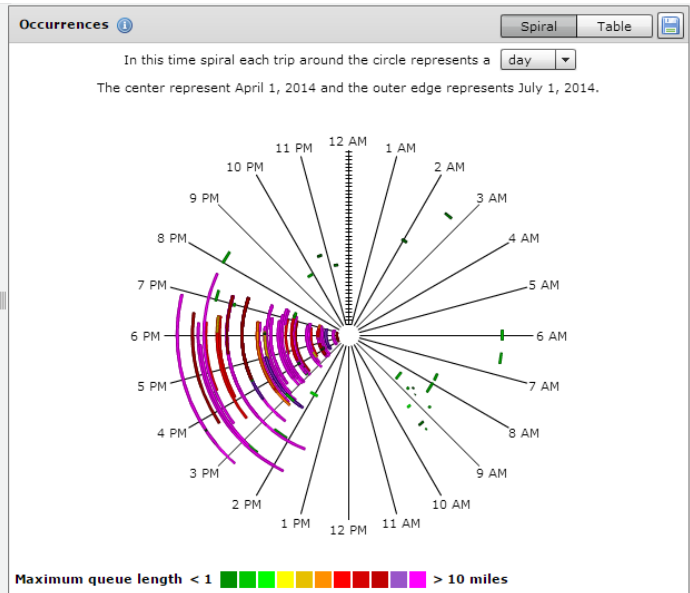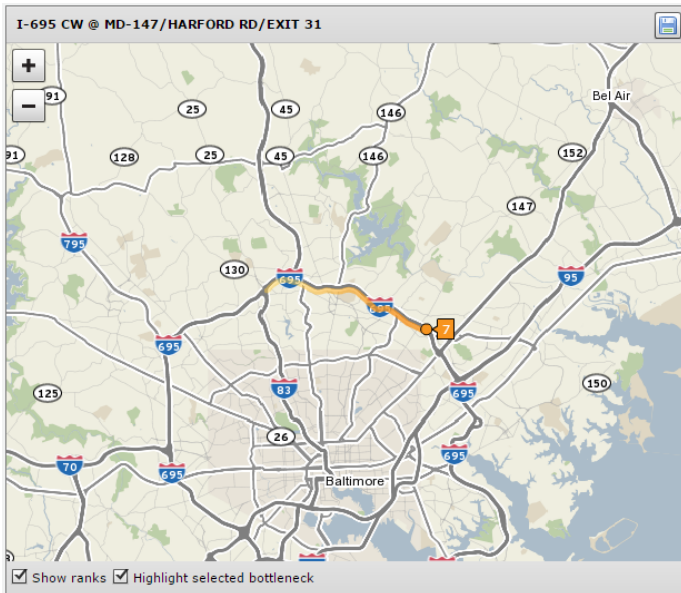# #6 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
I-695 CW @ MD-41/Perring Pky/Exit 30	2 h 07 m	7.08	108	97,125

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
Source: Skycomp Report

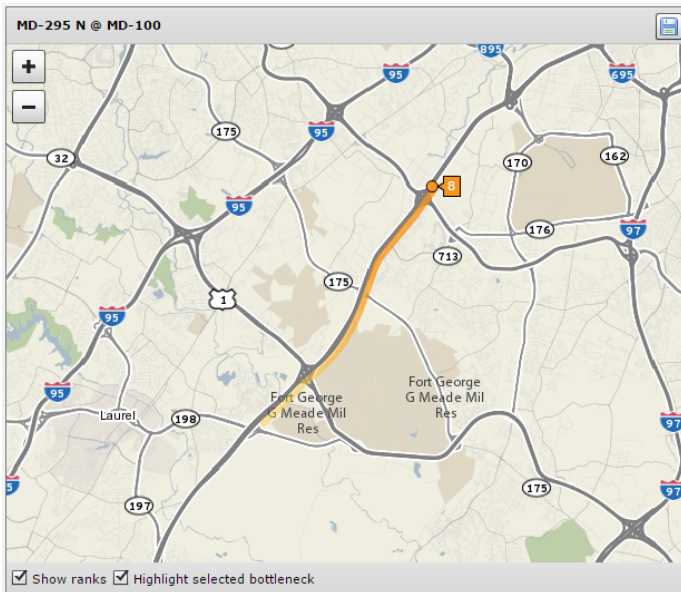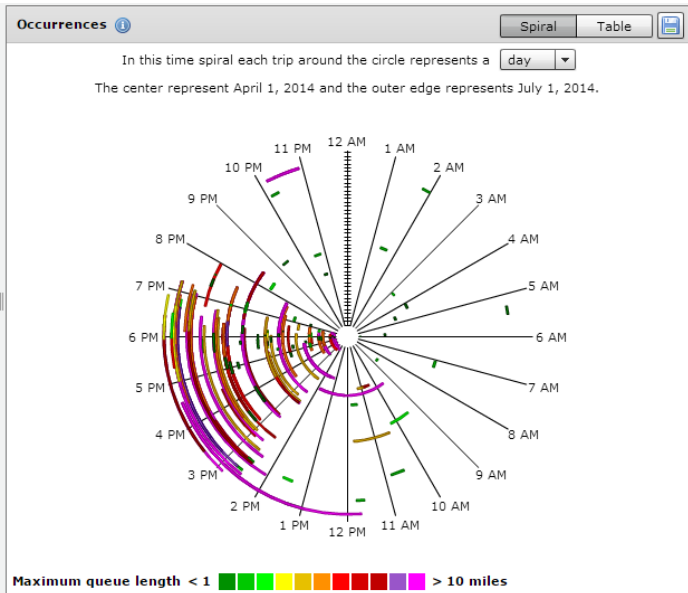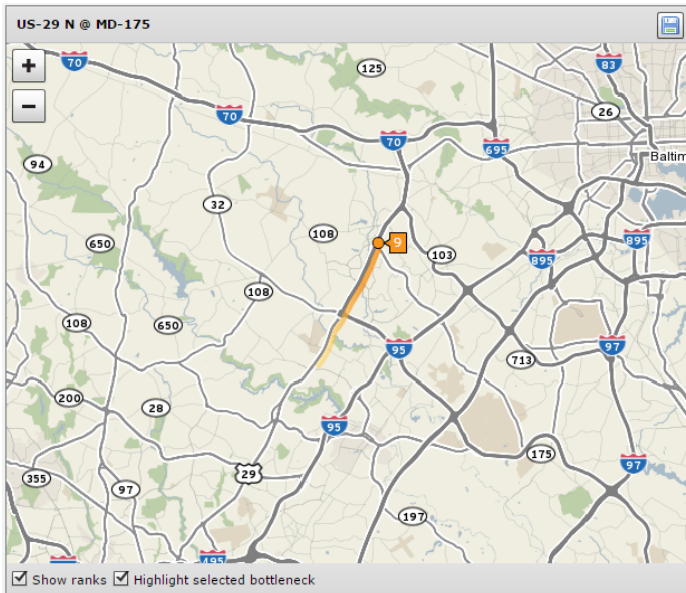# #7 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
I-695 CW @MD-147/Harford Rd/Exit 31	2 h 28 m	8.00	77	91,169

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.
Source: Skycomp Report

#8 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
MD-295 N @ MD-100	1 h 43 m	5.50	150	84,977
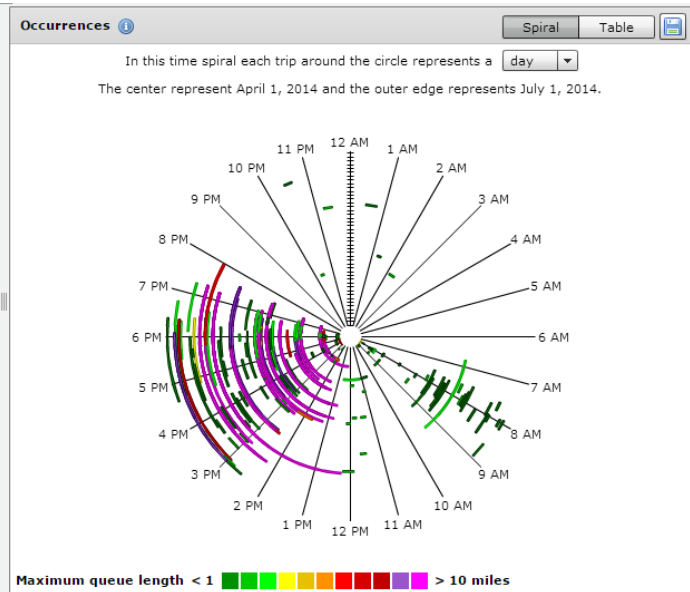
Notes: Recurring afternoon congestion. Level of Service "F" from 4:00 to 5:00pm. A primary cause appeared to be the discharge of traffic from NSA / Ft. Meade onto northbound MD 295 via the Connector Rd. Weaving and merging at the MD 32 interchange also contributed to the congestion
Source: Skycomp Report

#9 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

| Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
US-29 N @ MD-175	1 h 51 m	6.08	121	81,652

Notes: SHA widening project of US-29
Source: http://apps.roads.maryland.gov/webprojectlifecycle/ProjectInformation.aspx?projectno=HO3172113

#10 Ranked Bottlenecks in the Baltimore Region – 2nd Quarter 2014

Location	Average Duration	Average max length (miles)	Occurrences	*Impact Factor
MD-295 N @ S Martin Luther King Blvd	4 h 32 m	1.65	172	77,277
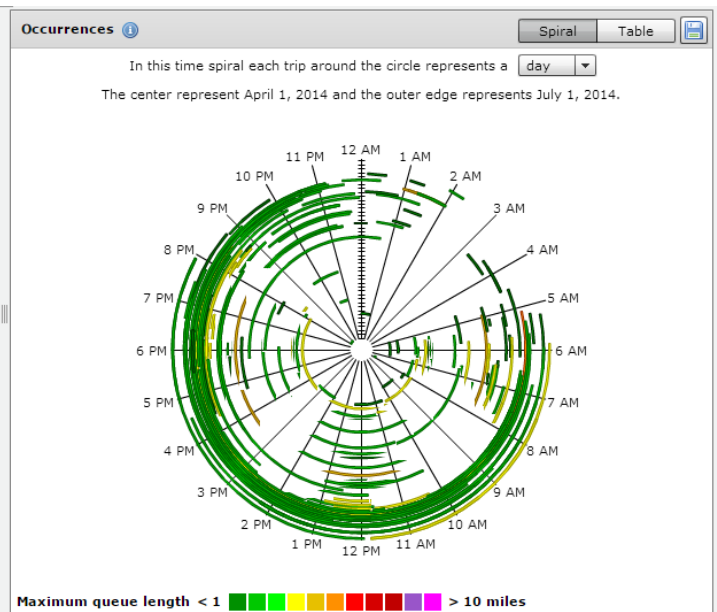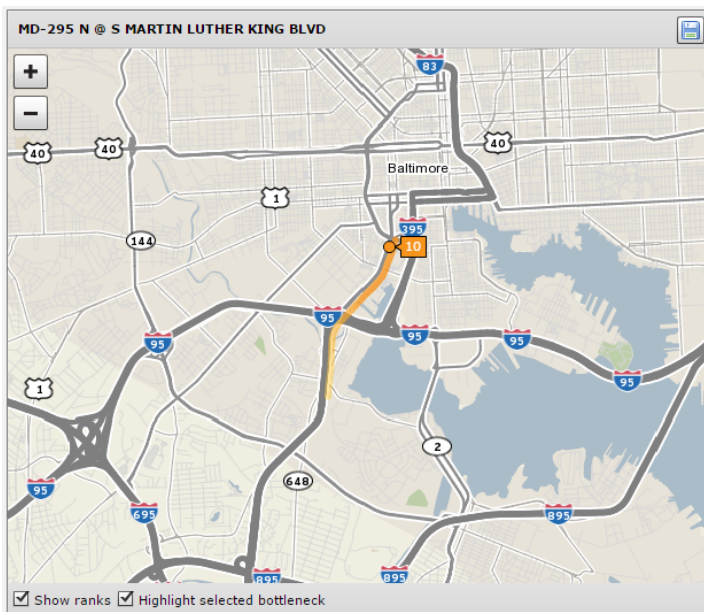
Notes: Construction of the Horseshoe Casino on Russell St caused congestion back onto MD-295
Source: http://articles.baltimoresun.com/2013-10-11/news/bs-md-ci-casino-road-construction-20131011_1_chad-barnhill-russell-street-casino-construction

Baltimore Metropolitan Council

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