# Quarterly Congestion Analysis Report For The Baltimore Region

## Top 10 Bottleneck Locations

4th Quarter 2014

Baltimore Metropolitan Council

# Table of Contents

# 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
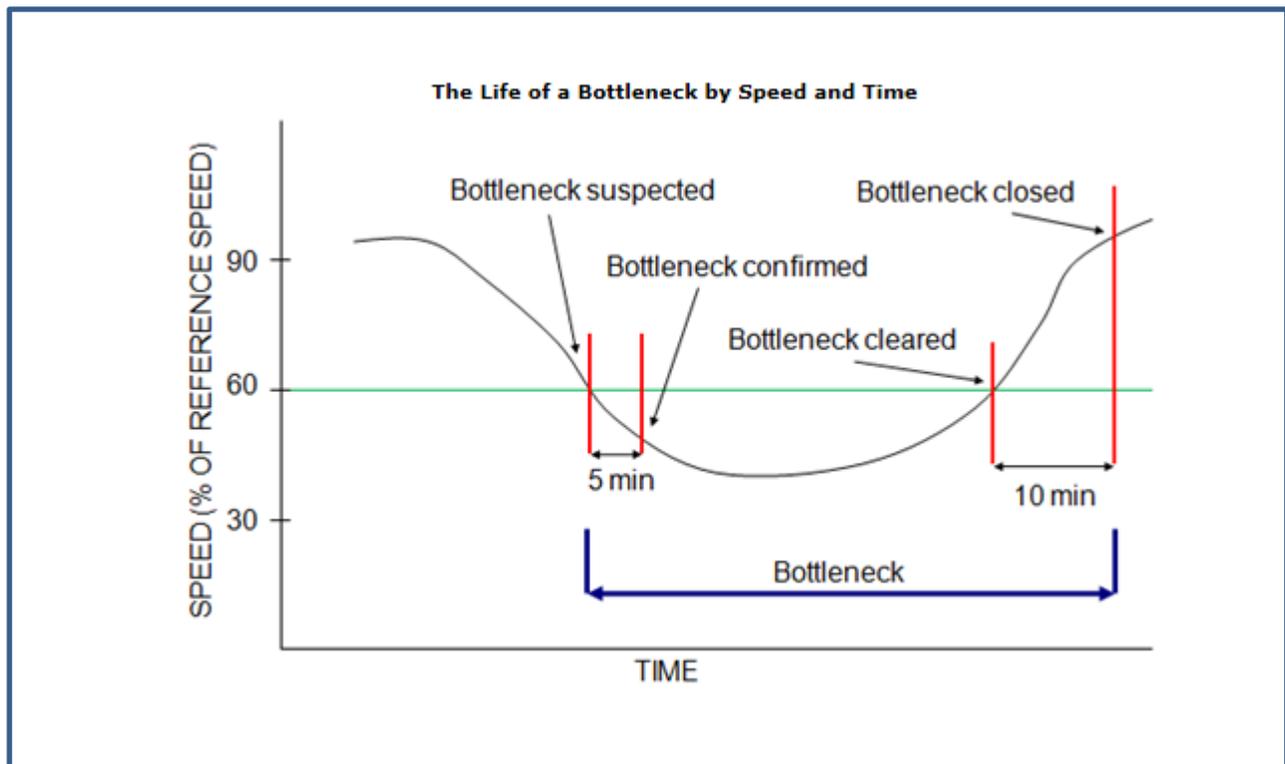
# Top 10 Bottlenecks in the Baltimore Region
## 4th Quarter 2014

**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-695 CW @ I-795/Exit 19 | 2 h 16 m | 8.68 | 153 | 180,532 |
| 2 | I-95 N @ MD-100/Exit 43 | 2 h 15 m | 8.68 | 138 | 161,735 |
| 3 | MD-295 S @ MD-193 | 2 h 50 m | 11.55 | 63 | 123,738 |
| 4 | MD-295 N @ I-195 | 2 h 25 m | 10.17 | 78 | 114,982 |
| 5 | I-695 CW @ MD-41/Perring Pkwy/Exit 30 | 1 h 47m | 6.01 | 161 | 103,602 |
| 6 | I-695 CW @ MD-147/Harford Rd/Exit 31 | 2 h 42 m | 8.39 | 70 | 95,189 |
| 7 | MD-295 N @ MD-175 | 2 h 22 m | 7.07 | 92 | 92,356 |
| 8 | I-695 CCW @ US-40/Exit 15 | 1 h 30 m | 6.68 | 145 | 87,182 |
| 9 | I-695 CCW @ Edmondson Ave/Exit 14 | 2 h 14 m | 6.44 | 98 | 84,580 |
| 10 | I-95 S @ MD-24/Exit 77 | 2 h 06 m | 13.13 | 47 | 77,767 |
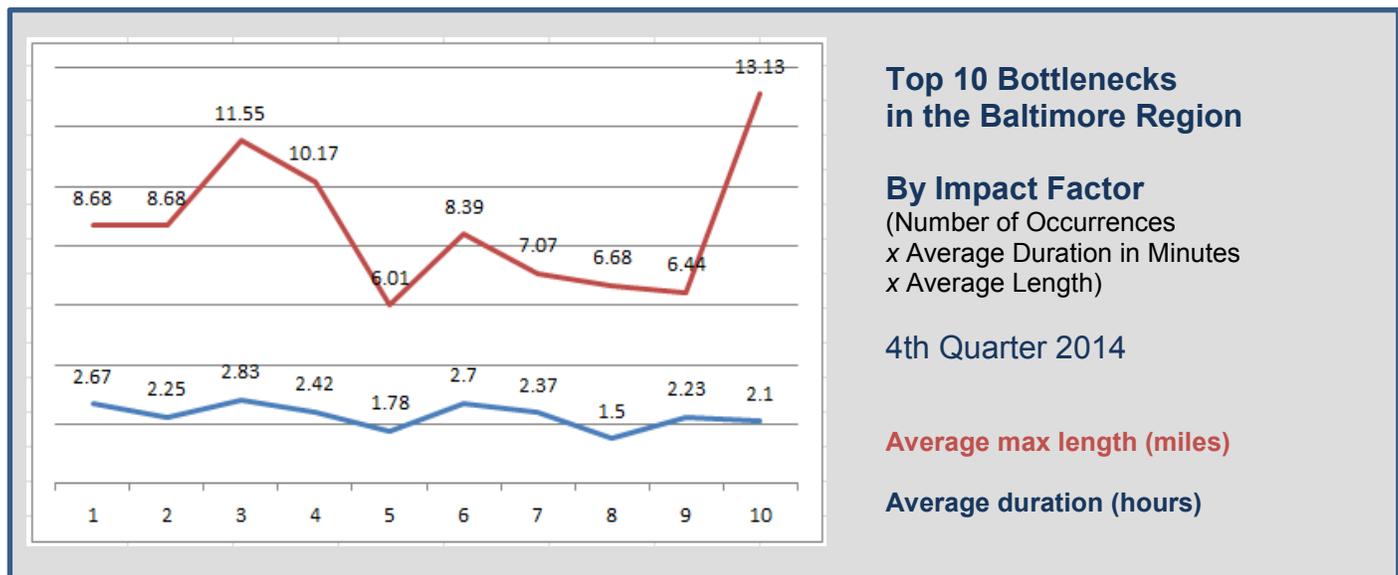


**Top 10 Bottlenecks in the Baltimore Region**

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

4th Quarter 2014

**Average max length (miles)**

**Average duration (hours)**

**By Average Duration**

| | Location | Average Duration | Average max length (miles) | Occurrences | Impact Factor |
|---|---|---|---|---|---|
| 1 | I-70 E @ MD-97/Exit 76 | 6 h 13 m | 5.38 | 5 | 10,034 |
| 2 | MD-295 S @ MD-450 | 3 h 48 m | 14.95 | 2 | 6,817 |
| 3 | MD-295 S @ Riverdale Rd | 3 h 42 m | 14.96 | 14 | 46,505 |
| 4 | MD-295 S @ I-495/I-95 | 3 h 10 m | 13.09 | 20 | 49,757 |
| 5 | MD-295 N @ US-40/Mulberry St/Franklin St | 3 h | 2.84 | 13 | 6,642 |
| 6 | MD-295 S @ Goddard Rd | 2 h 58 m | 9.78 | 18 | 31,328 |
| 7 | MD-295 S @ MD-193 | 2 h 50 m | 11.55 | 63 | 123,738 |
| 8 | MD-32 W @ Ten Oaks Rd | 2 h 47 m | 6.15 | 16 | 16,423 |
| 9 | I-695 CW @ MD-147/Harford Rd/Exit 31 | 2 h 42 m | 8.39 | 70 | 95,189 |
| 10 | US-29 S @ Briggs Chaney Rd | 2 h 40 m | 7.32 | 4 | 4,682 |

# Top 10 Bottlenecks in the Baltimore Region
## 4th Quarter 2014

**By Average Length**

| | Location | Average Duration | Average max length (miles) | Occurrences | Impact Factor |
|---|---|---|---|---|---|
| 1 | MD-295 S @ Riverdale Rd | 3 h 42 m | 14.96 | 14 | 46,505 |
| 2 | MD-295 S @ MD-450 | 3 h 48 m | 14.95 | 2 | 6,817 |
| 3 | I-95 S @ MD-24/Exit 77 | 2 h 06 m | 13.13 | 47 | 77,767 |
| 4 | MD-295 S @ I-495/I-95 | 3 h 10 m | 13.09 | 20 | 49,757 |
| 5 | MD-295 S @ MD-193 | 2 h 50 m | 11.55 | 63 | 123,738 |
| 6 | I-95 S @ I-495/Exit 27-25 | 1 h 55 m | 10.34 | 5 | 5,947 |
| 7 | MD-295 N @ I-195 | 2 h 25 m | 10.17 | 78 | 114,982 |
| 8 | MD-295 S @ Goddard Rd | 2 h 58 m | 9.78 | 18 | 31,328 |
| 9 | I-95 N @ Tydings Memorial Bridge/Toll Plaza | 1 h 55 m | 9.39 | 9 | 9,719 |
| 10 | I-95 S @ I-895/62nd St/Exit 62 | 2 h 01 m | 8.70 | 28 | 29,477 |

**By Number of Occurrences**

| | Location | Average Duration | Average max length (miles) | Occurrences | Impact Factor |
|---|---|---|---|---|---|
| 1 | US-50 E @ Bay Bridge | 38 m | 0.67 | 1334 | 33,772 |
| 2 | I-895 S @ Childs St/Exit 9 | 36 m | 0.31 | 1161 | 12,889 |
| 3 | I-895 N @ Childs St/Exit 9 | 33 m | 0.26 | 1077 | 9,115 |
| 4 | I-83 S @ Fayette St/Exit 1 | 39 m | 0.20 | 993 | 7,841 |
| 5 | I-895 N @ Harbor Tunnel Toll Plaza | 53 m | 0.31 | 865 | 14,035 |
| 6 | MD-100 E @ Magothy Bridge Rd | 32 m | 0.21 | 779 | 5,177 |
| 7 | MD-295 N @ Bayard St | 52 m | 0.32 | 703 | 11,623 |
| 8 | I-95 S @ Fort McHenry Tunnel Toll Plaza | 26 m | 1.56 | 644 | 26,157 |
| 9 | I-95 N @ Fort McHenry Tunnel Toll Plaza | 29 m | 1.55 | 622 | 27,982 |
| 10 | I-95 N @ Keith Ave/Exit 56 | 24 m | 0.54 | 614 | 8,024 |



**Top Ten Bottlenecks in the Baltimore Region**

**by Number of Occurrences**

4th Quarter 2014

**Duration (Minutes)**

**Average Max Length (Miles)**
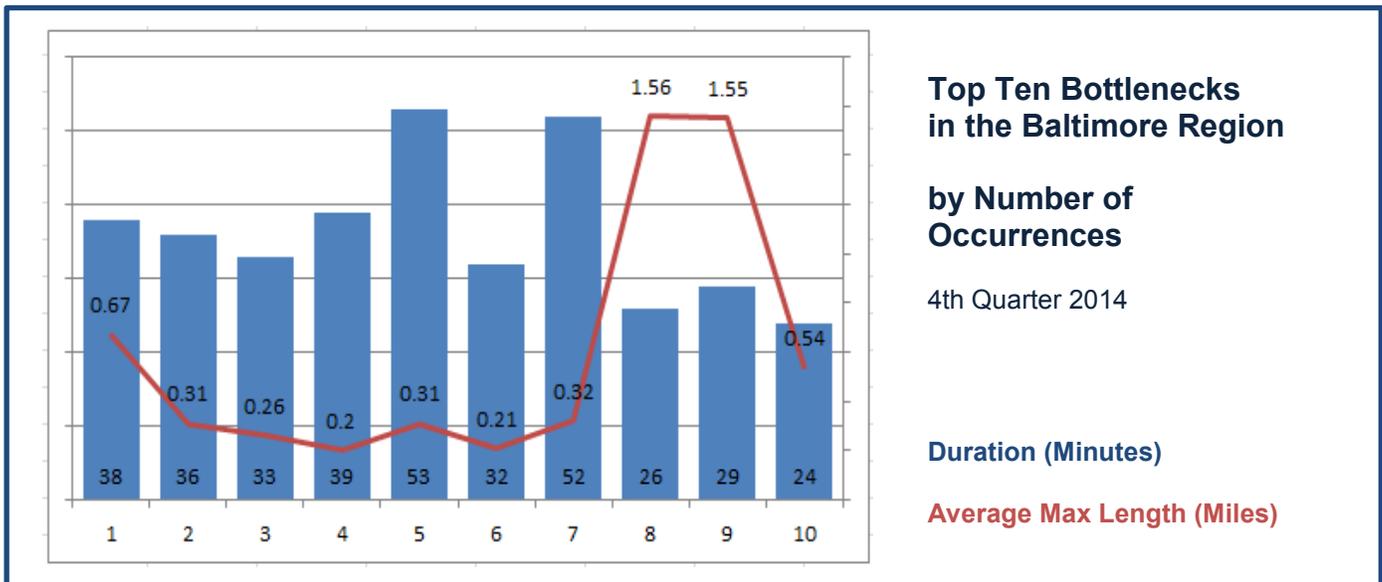
# #1 Ranked Bottlenecks in the Baltimore Region – 4th Quarter 2014

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|----------|------------------|----------------------------|-------------|----------------|
| I-695 CW @ I-795/Exit 19 | 2 h 16 m | 8.68 | 153 | 180,532 |
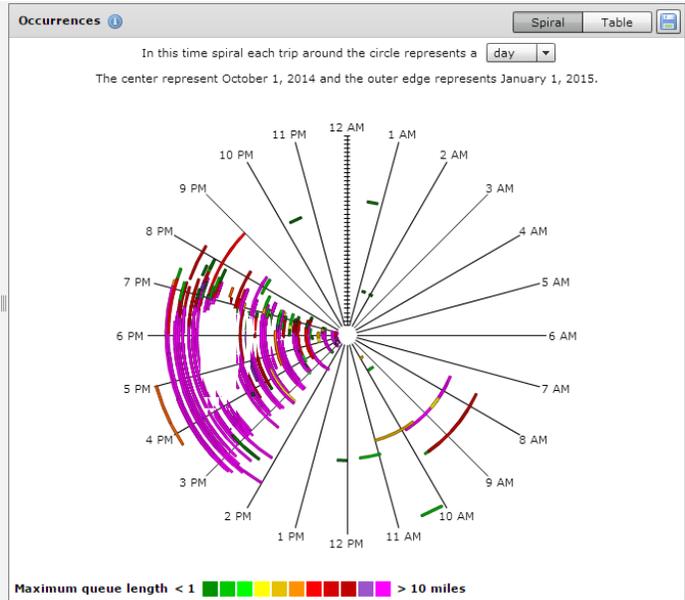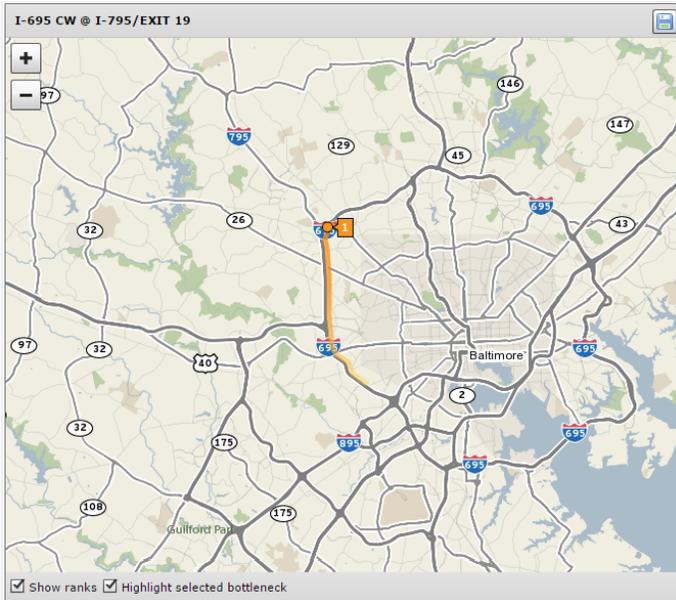


**Notes:** Longstanding westside beltway inner loop congestion in the afternoon.
**Source**: Skycomp Report

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

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|----------|------------------|----------------------------|-------------|----------------|
| I-95 N @ MD-100/Exit 43 | 2 h 15 m | 8.68 | 138 | 161,735 |
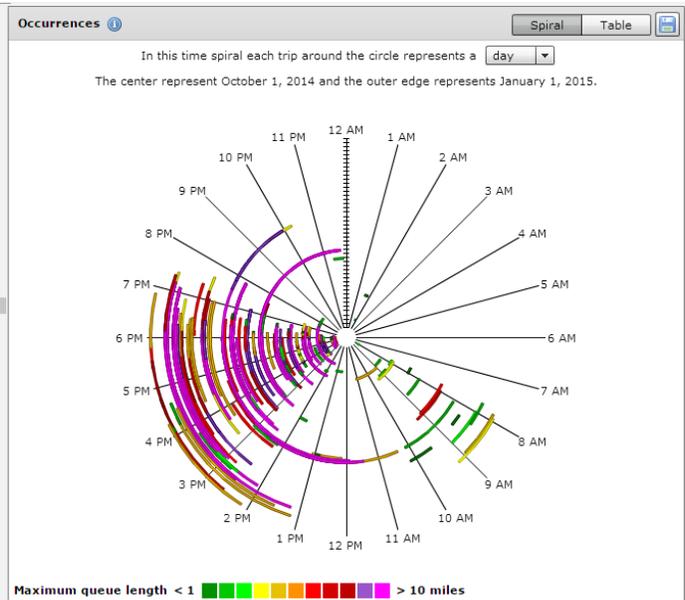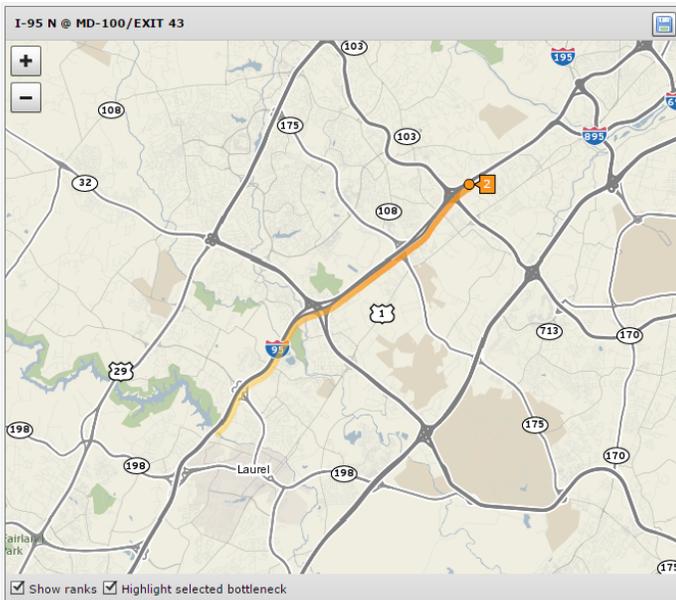


**Notes:** Contributing factors include traffic entering at MD-175, weaving to exit at MD-100, and the half-mile uphill grade midway between MD-175 and MD-100
**Source:** Skycomp Report

## #3 Ranked Bottlenecks in the Baltimore Region – 4th Quarter 2014

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|---|---|---|---|---|
| MD-295 S @ MD-193 | 2 h 50 m | 11.55 | 63 | 123,738 |
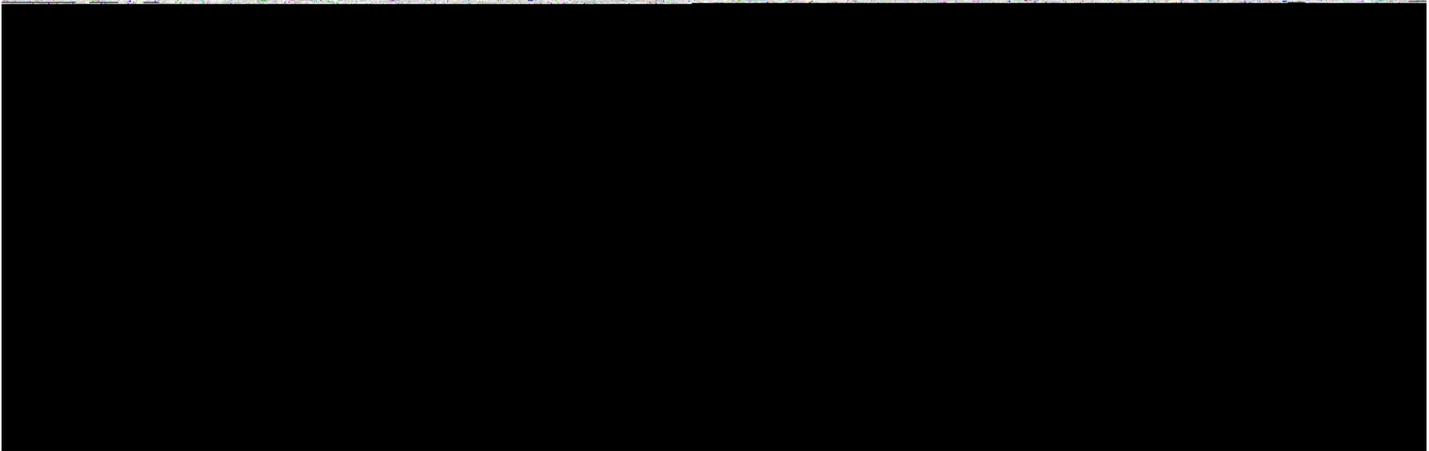


**Notes:** Southbound evening congestion extending from the Capital Beltway extending into the southern portion of the Baltimore region near MD-32
**Source**: VPP Suite

## #4 Ranked Bottlenecks in the Baltimore Region – 4th Quarter 2014

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|---|---|---|---|---|
| MD-295 N @ I-195 | 2 h 25 m | 10.17 | 78 | 114,982 |
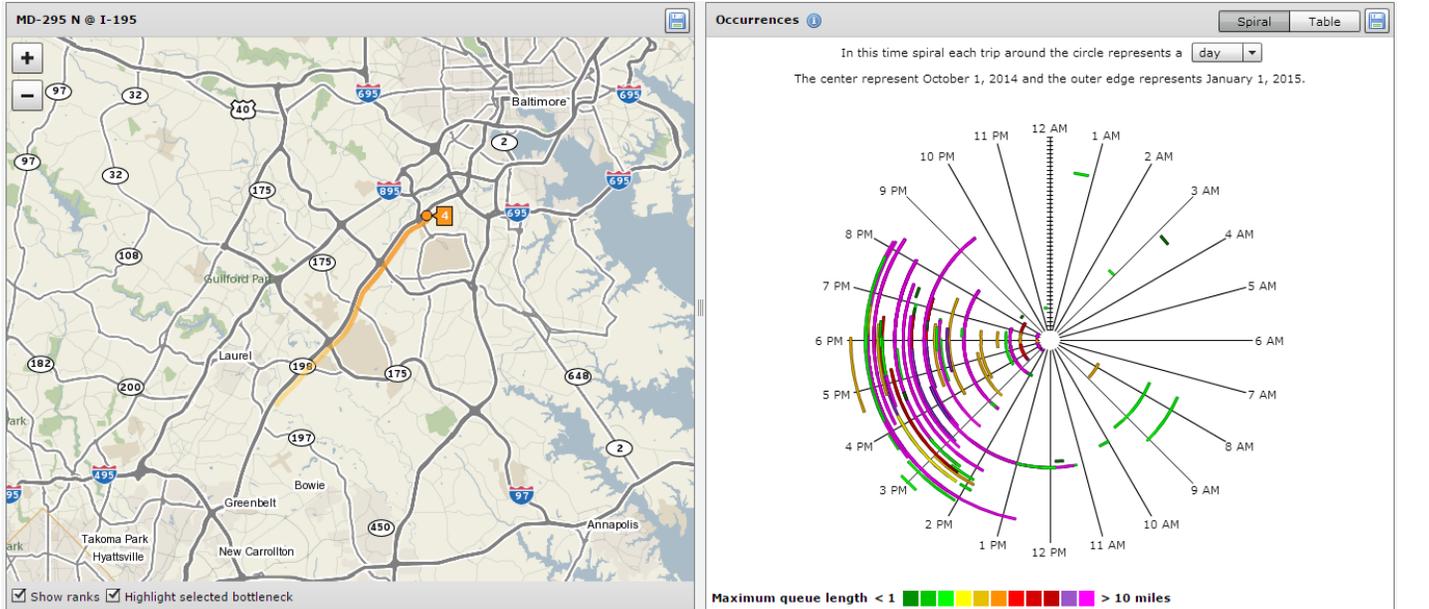


**Notes:** This moderate to severe congestion was primarily caused by merging traffic from Nursery Rd, probably exacerbated by additional traffic from MD 195. (The Nursery Rd merge occurs .5 miles before MD 295 widens to 3 northbound lanes.) Occasionally, upstream traffic was also affected by this boteleneck,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

# #5 Ranked Bottlenecks in the Baltimore Region – 4th Quarter 2014

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|---|---|---|---|---|
| I-695 CW @ MD-41/Perring  Pkwy/Exit 30 | 1 h 47 m | 6.01 | 161 | 103,602 |
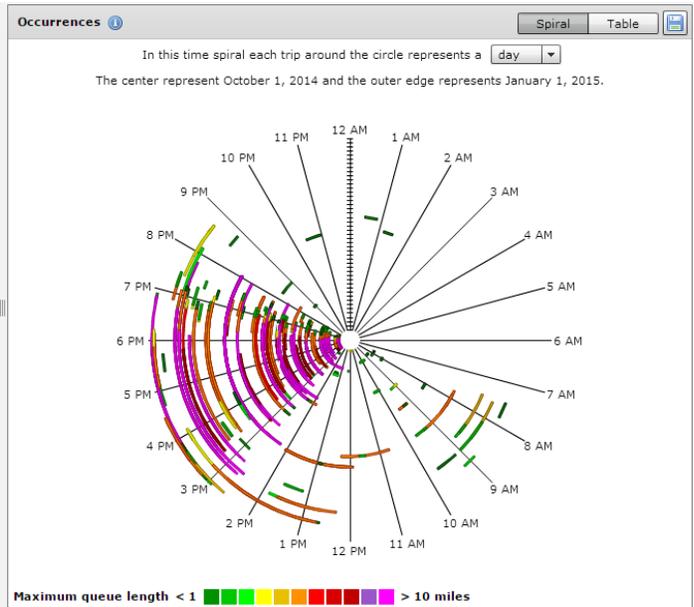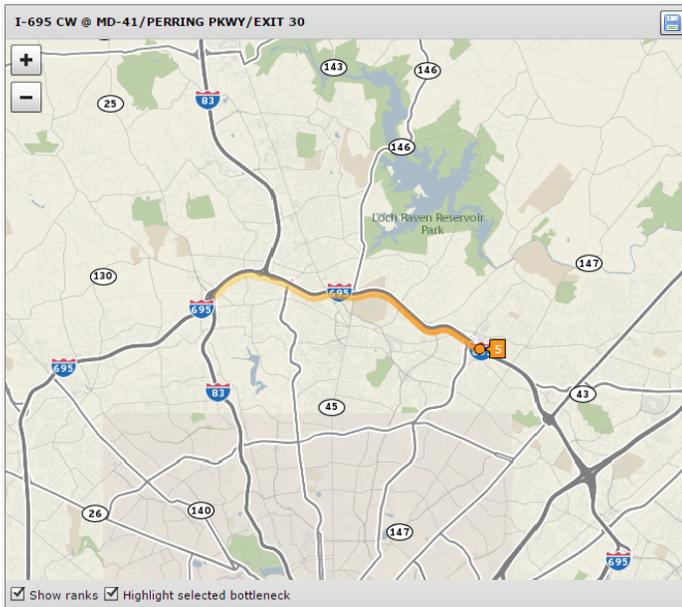


**Notes:** Congestion was most severe between I-83 and Providence Rd. Factors contributing to this long standing and extended congested zone: merging and weaving associated with traffic at each interchange and a lane drop (to 3 lanes) at MD-45/York Rd
**Source:** Skycomp Report

# #6 Ranked Bottlenecks in the Baltimore Region – 4th Quarter 2014

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|---|---|---|---|---|
| I-695 CW @ MD-147/Harford Rd/Exit 31 | 2 h 42 m | 8.39 | 70 | 95,189 |
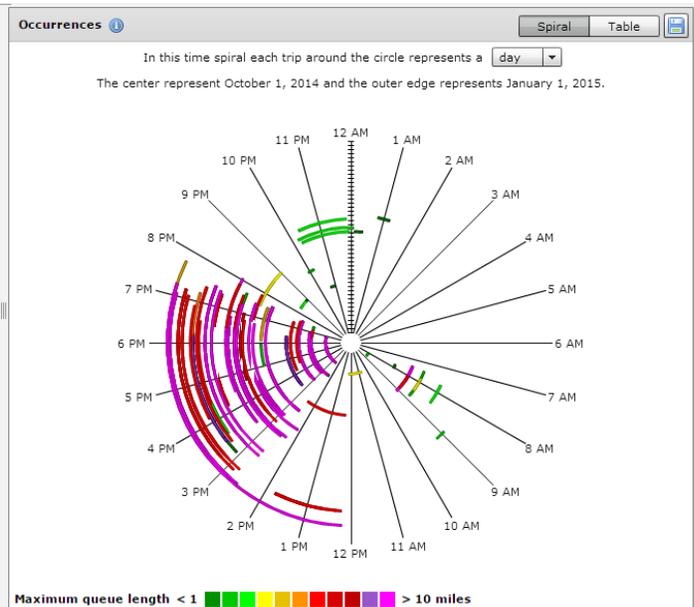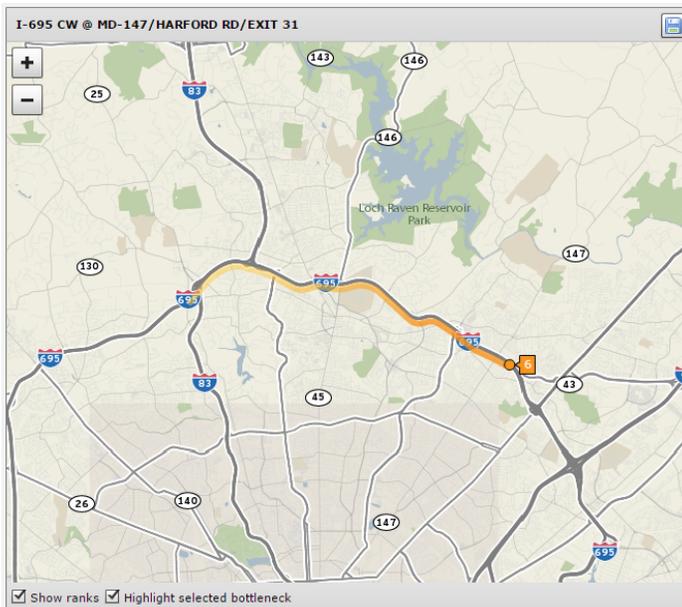


**Notes:** Congestion was most severe between I-83 and Providence Rd. Factors contributing to this long standing and extended congested zone: merging and weaving associated with traffic at each interchange and a lane drop (to 3 lanes) at MD-45/York Rd.
**Source:** Skycomp Report

# #7 Ranked Bottlenecks in the Baltimore Region – 4th Quarter 2014

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|---|---|---|---|---|
| MD-295 N @ MD-175 | 2 h 22 m | 7.07 | 92 | 92,356 |

**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

# #8 Ranked Bottlenecks in the Baltimore Region – 4th Quarter 2014

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|---|---|---|---|---|
| I-695 CCW @ US-40/Exit 15 | 1 h 30 m | 6.68 | 145 | 87,182 |

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

9

## #9 Ranked Bottlenecks in the Baltimore Region – 4th Quarter 2014

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|---|---|---|---|---|
| I-695 CCW @ Edmondson Ave/Exit 14 | 2 h 14 m | 6.44 | 98 | 84,580 |
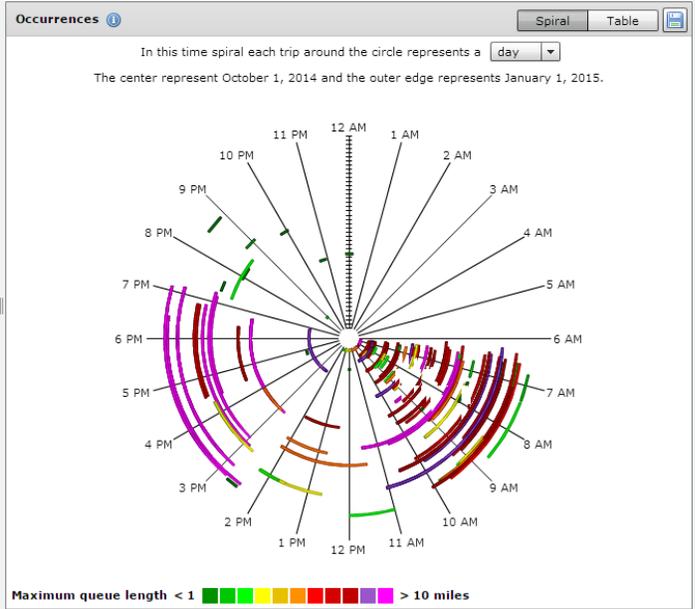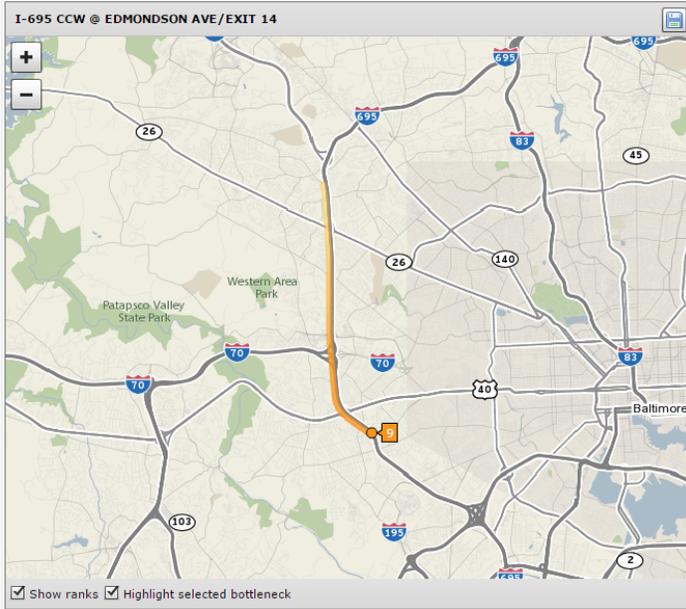


**Notes:** Longstanding bottlenecks primarily in the morning peak period.
**Source:** VPP observations

## #10 Ranked Bottlenecks in the Baltimore Region – 4th Quarter 2014

| Location | Average Duration | Average max length (miles) | Occurrences | *Impact Factor |
|---|---|---|---|---|
| I-95 S @ MD-24/Exit 77 | 2 h 06 m | 13.13 | 47 | 77,767 |
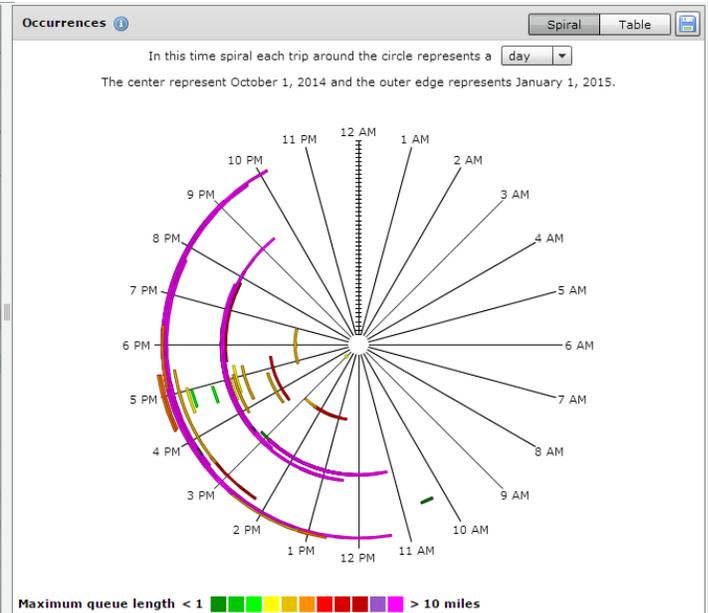


**Notes:** Non recurring traffic on I-95 during the Thanksgiving and Christmas travel holidays
**Source:** VPP Observations

*Project Manager* · Victor Henry

*Author* · Edward Stylc

Larry Klimovitz, Executive Director
Todd Lang, Director of Transportation Planning
Regina Aris, Assistant Director of Transportation Planning

**Baltimore Metropolitan Council**
Offices @ McHenry Row | 1500 Whetstone Way, Suite 300 | Baltimore, Maryland  21230
www.baltometro.org