

# Quarterly Congestion Analysis Report

Top 10 Bottlenecks in the Baltimore Region

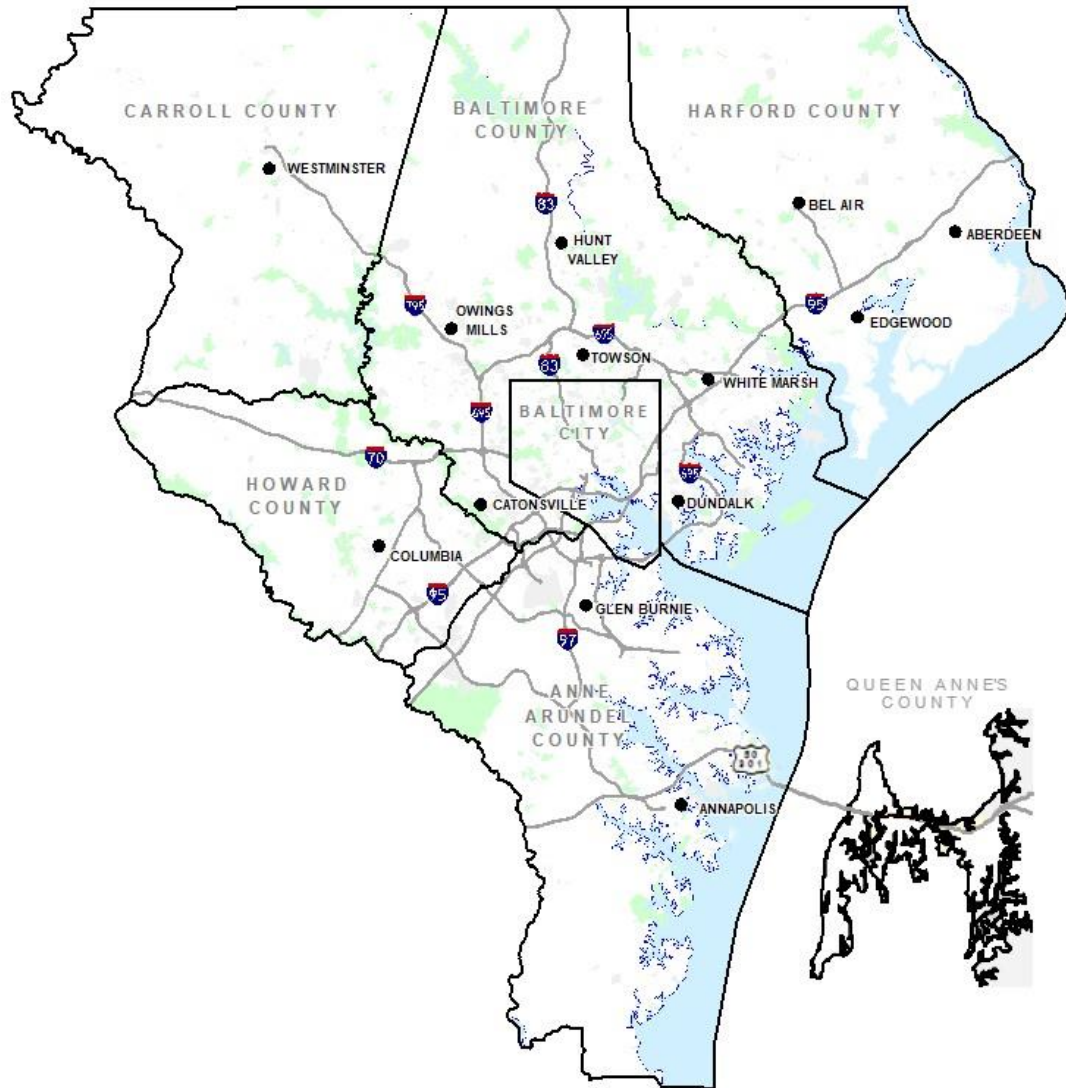
4<sup>th</sup> Quarter 2023

# Table of Contents

Page	Description
3	About the Region
6	Bottleneck Analytics (How Bottleneck conditions are tracked)
9	Top 10 Bottleneck Rankings
11	Top 10 Bottlenecks by Location
22	Top 10 Bottleneck Rankings on non Limited Access Roads
24	Top 10 Bottleneck Rankings by Jurisdiction
29	Vehicle Miles Traveled (VMT) Trend Graphs
34	Regional Speed Maps
37	System Reliability
39	Ranked Monthly Bottleneck Comparison
40	Credits
41	For More Information

# About the Region

# Baltimore Region



The Baltimore region is the nation's 19<sup>th</sup> largest market, with over 2.8 million people. The market also ranks among the top 20 in the number of households, total effective buying income and retail sales.

County	2020 Census	2010 Census	Change	Area
Anne Arundel	588,261	537,656	+9.41%	414.90 sq mi
Baltimore City	585,708	620,961	-5.68%	80.94 sq mi
Baltimore	854,535	805,029	+6.15%	598.30 sq mi
Carroll	172,891	167,134	+3.44%	447.59 sq mi
Harford	260,924	244,826	+6.58%	437.09 sq mi
Howard	332,317	287,085	+15.76%	250.74 sq mi
Queen Anne's	49,874	47,798	+4.34%	371.91 sq mi
<b>Total</b>	<b>2,844,510</b>	<b>2,710,489</b>	<b>+4.94%</b>	<b>2,601.47 sq mi</b>



# Baltimore Region



Prepared by  
 Transportation Planning Division  
 Projected Coordinate System: NAD 1983 State Plane (ft)  
 Data Source: BMC, © NAVTEQ 2016, TIGER/Line®, MTA  
 Printed - April 2017

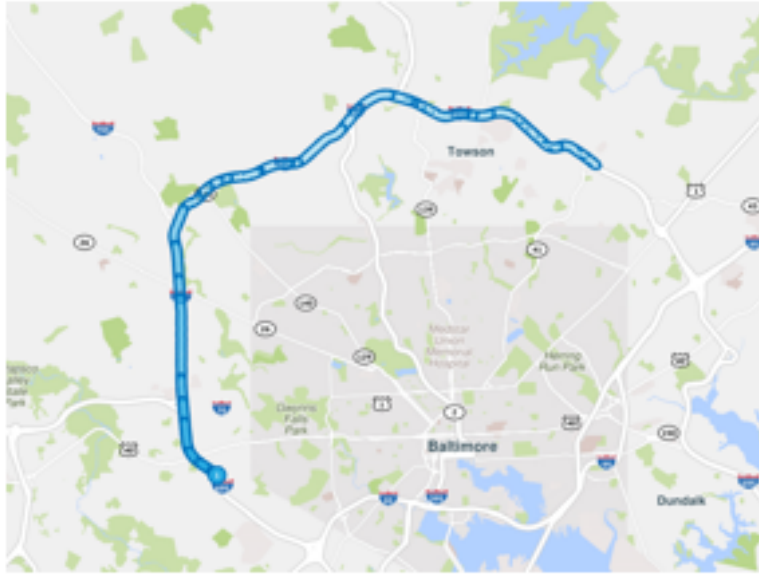
# Bottleneck Analytics

## How are bottleneck conditions tracked?

- **Rank** - The ranked position of the location according to the current table ordering by **Base Impact** – the aggregation of queue length over time for congestion at each location in mile minutes. It is then weighted by **Total Delay** – Raw speed drop weighted by VMT factor.
- **Previous Quarter Ranking** - Bottleneck ranking from the previous report if the bottleneck was in the Top 10.
- **Average max length** - The average maximum length, in miles, of queues formed by congestion originating at the location.
- **Average daily duration** - The average amount of time per day that congestion is identified originating at the location.
- **Volume Estimate** - AADT weighted by queue length.
- **Total Delay** - Raw Speed drop weighted by VMT Factor (in millions).

Rank	Location	Previous Quarter Ranking	Avg. Max. Length (mi)	Avg. Daily Duration	Volume Estimate (AADT)	Total Delay (Millions)
1	I-695 OL @MD-26/LIBERTY RD/EXIT 18	1	1.88	2 h 6 m	98,434	82.4
2	I-95 N @ MD-152/MOUNTAIN RD/EXIT 74	3	7.18	40 m	85,463	67.0
3	I-695 IL @ MD-372/WILKENS AVE/EXIT 12	5	2.00	1 h 45 m	98,964	63.7
4	I-95 N @ MD-100/EXIT 43	3	3.79	1 h 54 m	103,385	60.9
5	I-95 S @ MD-24/EXIT 77	2	4.26	1 h 10 m	58,863	43.9
6	I-695 OL @ PROVIDENCE RD/EXIT 28		3.72	38 m	78,288	37.1
7	I-97 S @ MD-178/EXIT 5		2.27	1 h 45 m	58,228	35.6
8	I-695 OL @ I-83/MD-25/EXIT 23		3.50	51 m	93,455	34.6
9	I-695 IL @ MD-22/SECURITY BLVD/EXIT 17		2.18	1 h 15 m	102,889	34.2
10	MD-295 N @ CANINE RD		2.48	1 h 18 m	49,927	31.4

## Maps



The Map view displays selected bottlenecks on a map. Each element occurring at the selected location is layered on the map, extending upstream from the head location to the maximum length of the specific *element*. As each element adds another layer on the map, road segments become more opaque. Segments closest to the head become the most opaque as they are more frequently affected by congestion at the selected location.



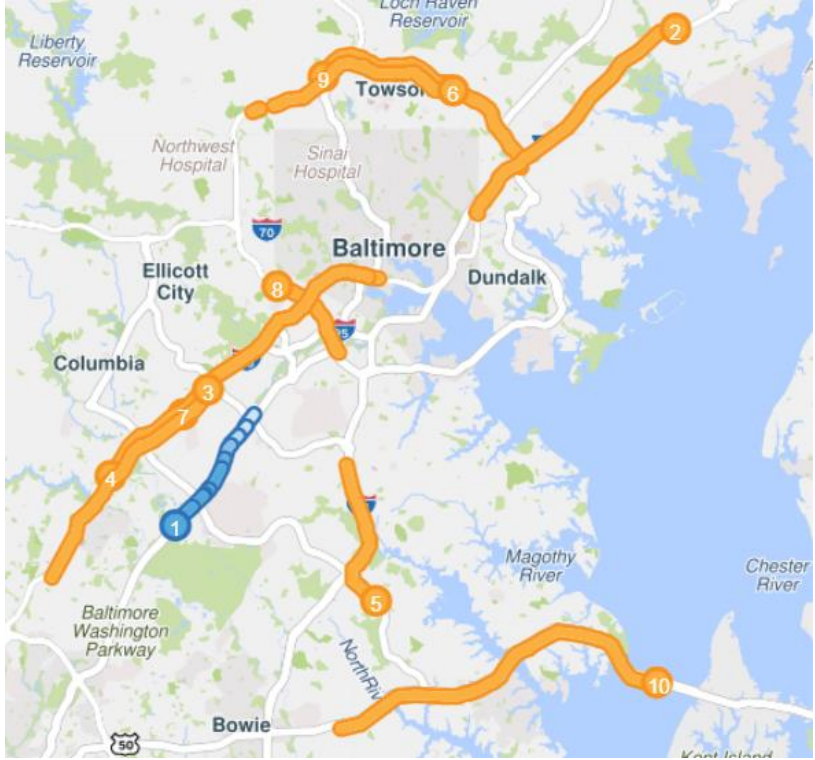


# Top 10 Bottleneck Rankings in the Baltimore Region – 4th Quarter 2023

# Top 10 Bottlenecks in the Region

Q4 2023

Rank	Location	Previous Quarter Ranking	Avg. Max. Length (mi)	Avg. Daily Duration	Volume Estimate (AADT)	Total Delay (Millions)
1	MD-295 S @ MD-198	2	3.11	4 h 30 m	47,377	94.3
2	I-95 N @ MD-152/EXIT 74		7.13	55 m	85,628	92.4
3	I-95 N @ MD-100/EXIT 43		4.05	2 h 15 m	102,507	91.4
4	I-95 S @ MD-216/EXIT 35	6	5.25	1 h 20 m	100,138	75.5
5	I-97 S @ MD-178/EXIT 5		3.22	2 h 06 m	58,835	61.5
6	I-695 IL @ MD-41/PERRING PKWY/EXIT 30		5.13	49 m	84,002	57.3
7	I-95 S @ MD-175/EXIT 41		3.24	1 h 31 m	100,105	49.1
8	I-695 IL @ MD-372/WILKENS AVE/EXIT 12	4	2.07	1 h 17 m	98,080	45.3
9	I-695 OL @ I-83/MD-25/EXIT 23		3.24	1 h 21 m	100,169	43.0
10	US-50 E @ BAY BRIDGE		4.08	1 h 13 m	38,820	42.1



Bottlenecks are ranked by **Base Impact** – the sum of queue lengths over the duration of the bottleneck and weighted by speed differential, congestion and **total delay**.

IL = Inner Loop      OL = Outer Loop      **Red #s** = highest value for that metric

**Total Delay** = Raw Speed drop weighted by VMT Factor (in millions)

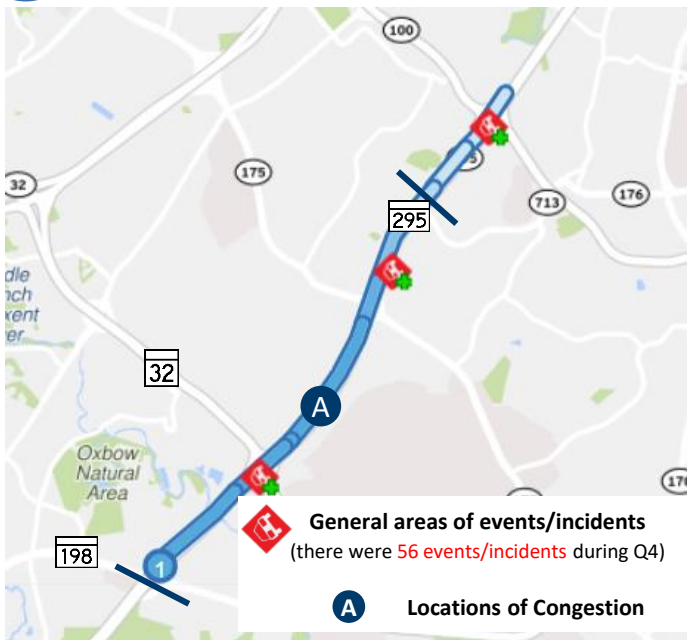
# Top 10 Bottleneck Rankings in the Baltimore Region – 4th Quarter 2023 by Location

## Includes:

- Location Maps with notes on each bottleneck condition
- Animated Speed Maps
- Travel Time Graphs
- Congestion Scan Heat Diagrams

1

# MD-295 S @ MD-198



Southbound PM congestion starting at MD-198 extending into the southern portion of the Baltimore region near Fort Meade occurring primarily during the afternoon peak period.

Volume related delays are most likely caused by factors such as Baltimore commuters traveling to DC and Fort Meade and the MD-295 merge with the heavily congested Capital Beltway.

# Quarterly Bottleneck Evaluation Summary

# Q4 2023

**PK. AVG. SPEED**

AM Peak | 7:50 AM  
**40.6 mph**  
 (42% slower than free flow)

PM Peak | 4:05 PM  
**26.9 mph**  
 (57% slower than free flow)

**PK. TRAVEL TIME**

AM Peak | 7:50 AM  
**9.7 min**

PM Peak | 4:05 PM  
**14.7 min**

**Q4 DELAY COST**

Delay Cost  
**\$3.730 M**

Veh-hrs. of Delay  
**123,523 h**

## Congested Locations

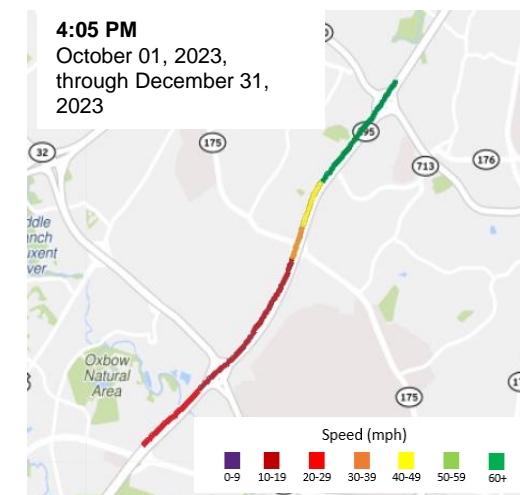
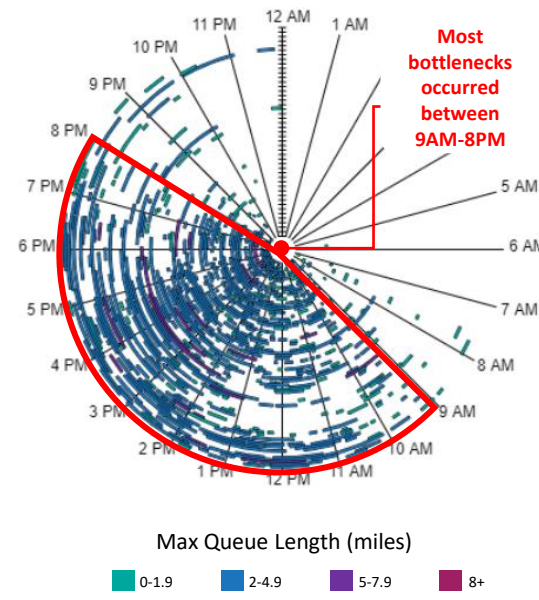
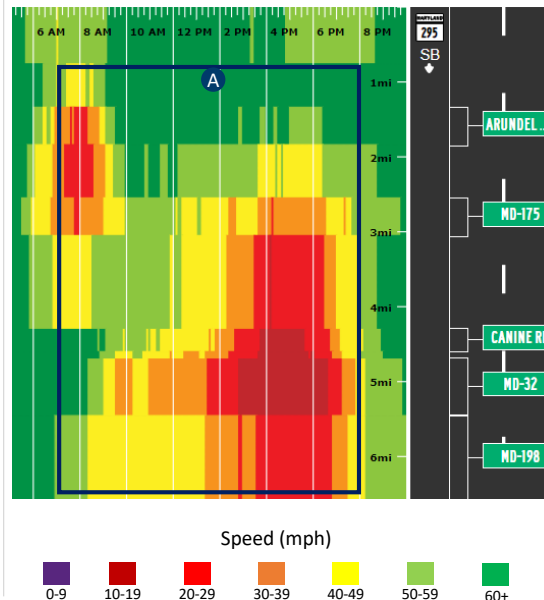
A 6AM – 8PM Arundel Mills Blvd to MD-198

## Bottleneck Occurrences

The center represents the beginning of 10.01.23 and the outer edge the end of 12.31.23

## Corridor Speeds Over Time

For animated playback of corridor speeds over time, click anywhere on the map below



# 2 I-95 N @ MD-152/EXIT 74

# Quarterly Bottleneck Evaluation Summary

# Q4 2023



## PK. AVG. SPEED

AM Peak | 7:30 AM  
**58.7 mph**  
 (19% slower than free flow)

PM Peak | 5:30 PM  
**54.8 mph**  
 (23% slower than free flow)

## PK. TRAVEL TIME

AM Peak | 7:50 AM  
**13.5 min**

PM Peak | 5:30 PM  
**14.6 min**

## Q4 DELAY COST

Delay Cost  
**\$1.620 M**

Veh-hrs. of Delay  
**53,635 h**

### Congested Locations

- A 11:30AM – 1:30PM** MD-43/White Marsh Blvd/Exit 67 to MD-543/Exit 80
- B 3:30PM – 6:00PM** MD-43/White Marsh Blvd/Exit 67 to MD-543/Exit 80

### Bottleneck Occurrences

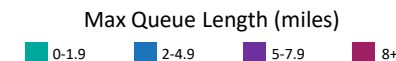
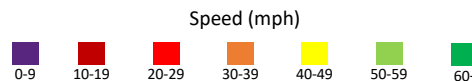
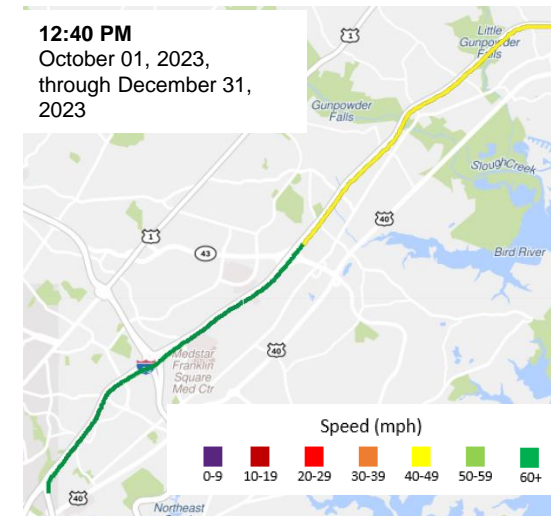
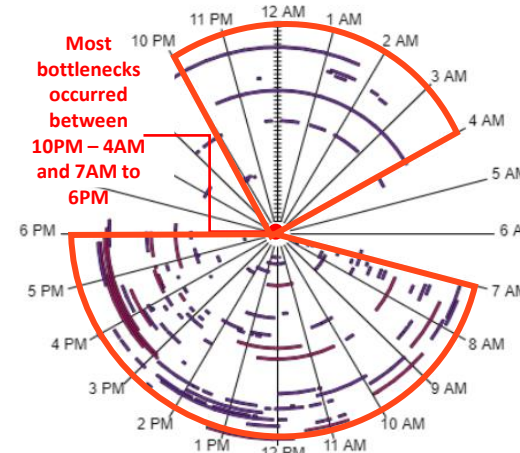
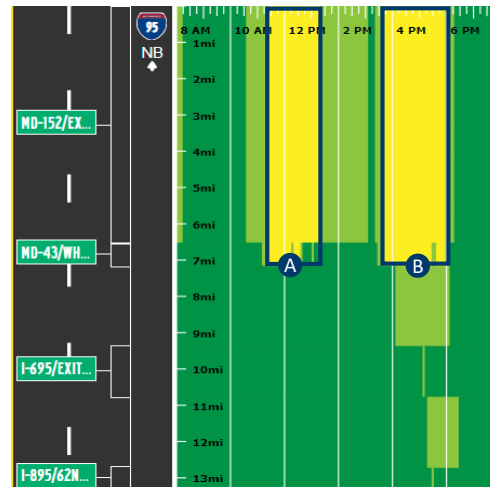
The center represents the beginning of **10.01.23** and the outer edge the end of **12.31.23**

### Corridor Speeds Over Time

For animated playback of corridor speeds over time, click anywhere on the map below

*I-95 Express Toll Lanes Northbound Extension From MD 43 to MD 152 is responsible for shoulder and lane closures on select dates throughout all hours of the day.*

*The extension is expected to be open to traffic by the end of 2023 to MD 152, with the full extension to north of MD 24 open to traffic by the end of 2026. This includes the Old Joppa Road Overpass Replacement and off peak shoulder and lane closures.*

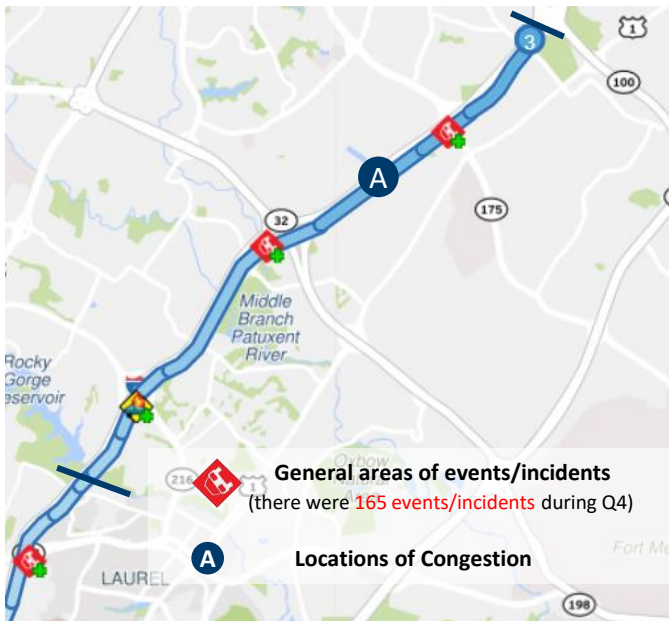




# 3 I-95 N @ MD-100/EXIT 43

# Quarterly Bottleneck Evaluation Summary

# Q4 2023



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.

## PK. AVG. SPEED

AM Peak | 7:55 AM  
**59.8 mph**  
 (19% slower than free flow)

PM Peak | 4:30 PM  
**43.2 mph**  
 (40% slower than free flow)

## PK. TRAVEL TIME

AM Peak | 7:55 AM  
**12.0 min**

PM Peak | 4:30 PM  
**16.6 min**

## Q4 DELAY COST

Delay Cost  
**\$2.345 M**

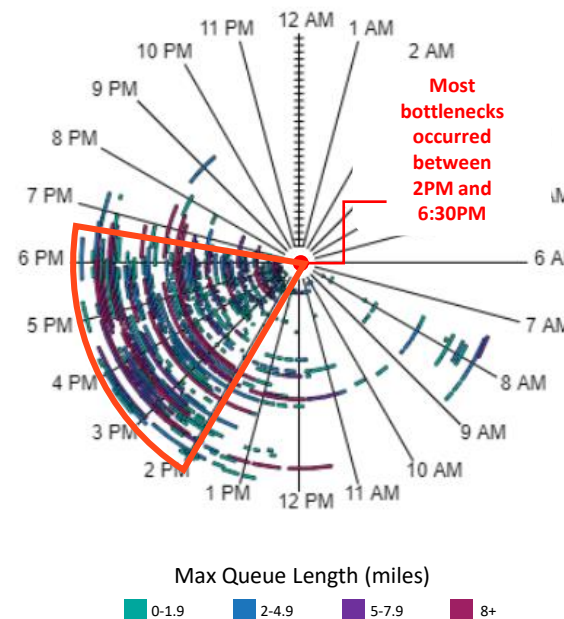
Veh-hrs. of Delay  
**77,670 h**

## Congested Locations

**A** 2PM – 6:30PM MD-198/Exit 33 to MD-100/Exit 33

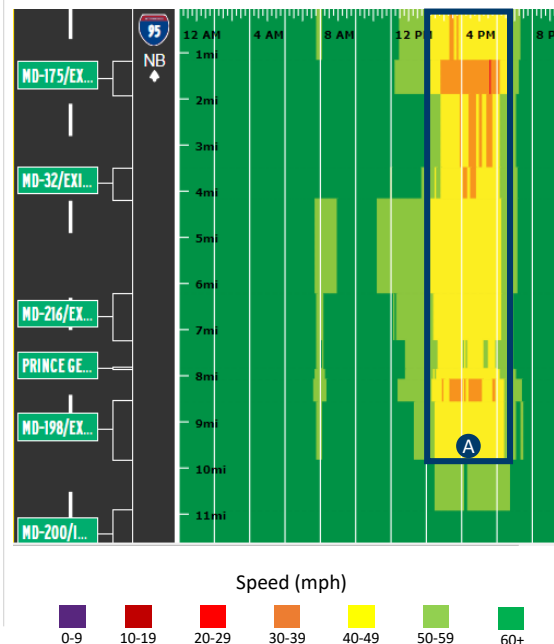
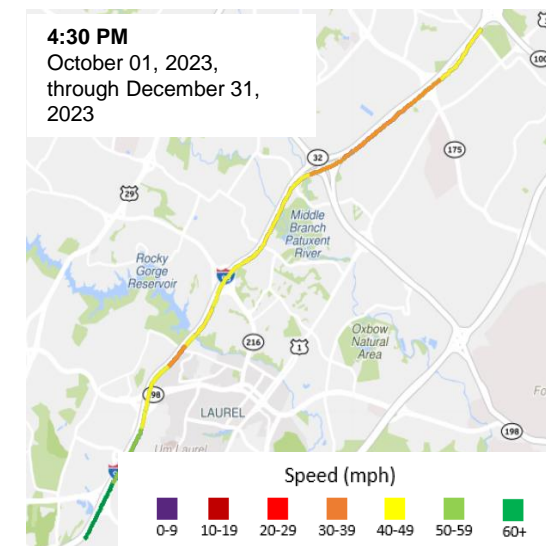
## Bottleneck Occurrences

The center represents the beginning of 10.01.23 and the outer edge the end of 12.31.23



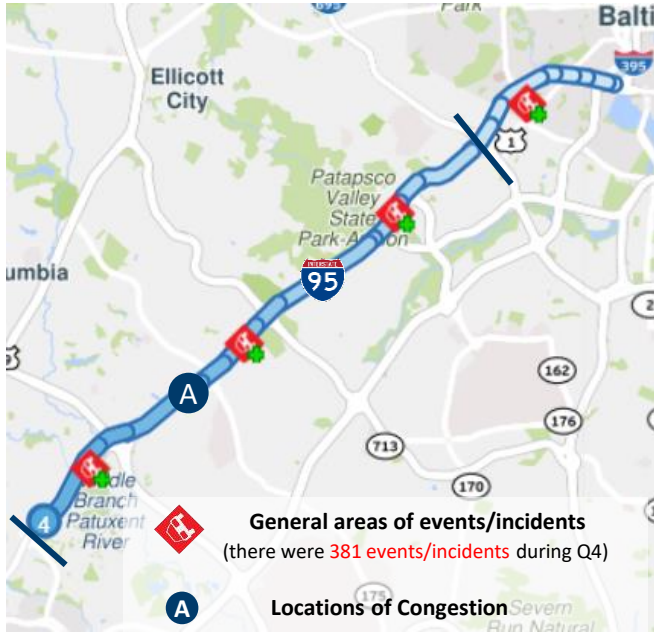
## Corridor Speeds Over Time

For animated playback of corridor speeds over time, click anywhere on the map below



# Quarterly Bottleneck Evaluation Summary

Q4 2023



High traffic volume corridor primarily in the afternoon with 3 major merge areas at MD-216, MD-32 and MD-175 near Columbia, MD.

## PK. AVG. SPEED

AM Peak | 7:55 AM  
**58.7 mph**  
 (19% slower than free flow)

PM Peak | 4:40 PM  
**39.6 mph**  
 (42% slower than free flow)

## PK. TRAVEL TIME

AM Peak | 7:55 AM  
**16.6 min**

PM Peak | 4:40 PM  
**24.6 min**

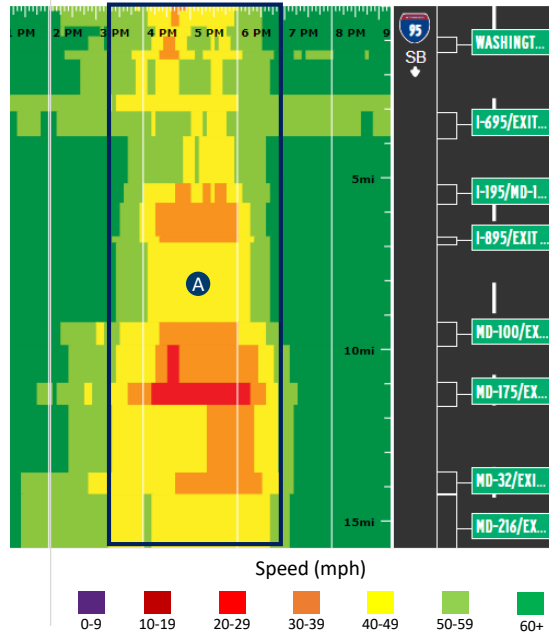
## Q4 DELAY COST

Delay Cost  
**\$2.264 M**

Veh-hrs. of Delay  
**74,998 h**

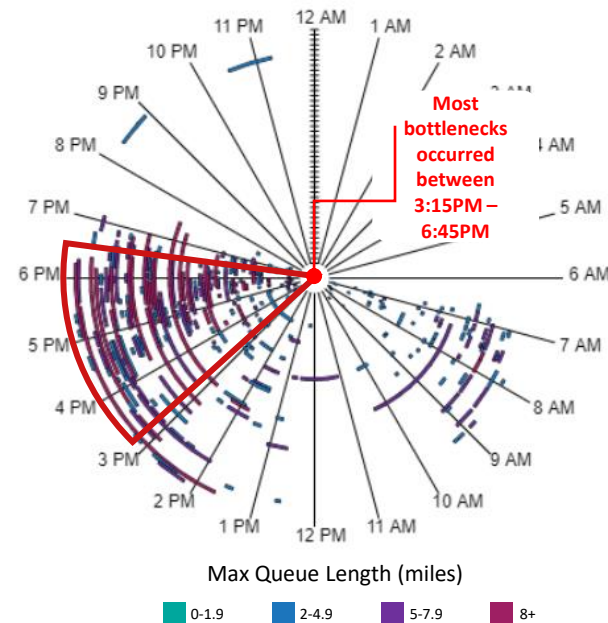
### Congested Locations

**A** 3:15PM – 6:45PM Washington Blvd/Exit 51 to MD-216/Exit 35



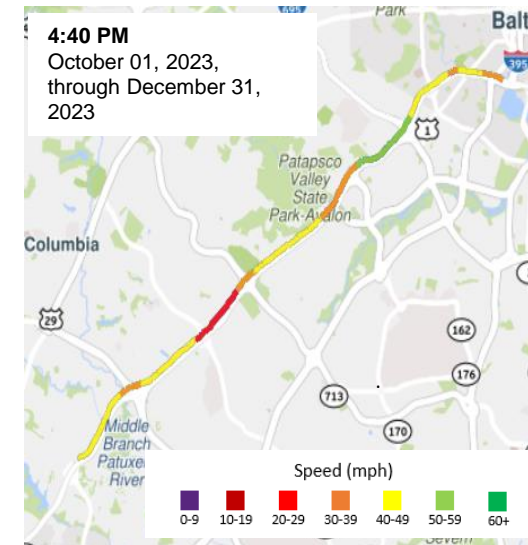
### Bottleneck Occurrences

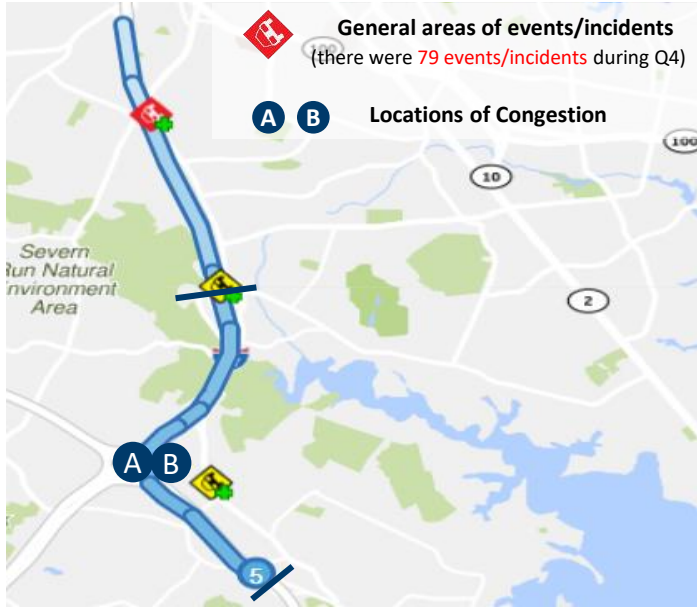
The center represents the beginning of 10.01.23 and the outer edge the end of 12.31.23.



### Corridor Speeds Over Time

For animated playback of corridor speeds over time, click anywhere on the map below





**PK. AVG. SPEED**

AM Peak | 7:55 AM  
**38.0 mph**  
 (48% slower than free flow)

PM Peak | 4:55 PM  
**40.0 mph**  
 (44% slower than free flow)

**PK. TRAVEL TIME**

AM Peak | 7:55 AM  
**11.7 min**

PM Peak | 4:55 PM  
**11.1 min**

**Q4 DELAY COST**

Delay Cost  
**\$1.526 M**

Veh-hrs. of Delay  
**50,525 h**

**Congested Locations**

- A** 7:15AM – 9AM Benfield Blvd/Exit 10 to MD-178/Exit 5
- B** 2:45PM – 6:30PM Benfield Blvd/Exit 10 to MD-178/Exit 5

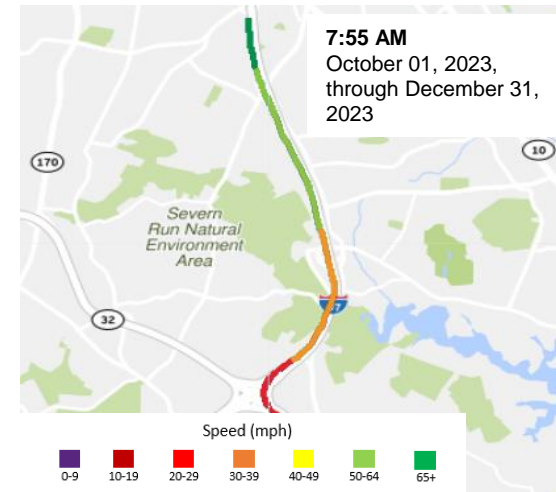
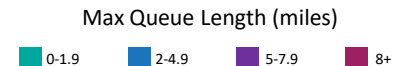
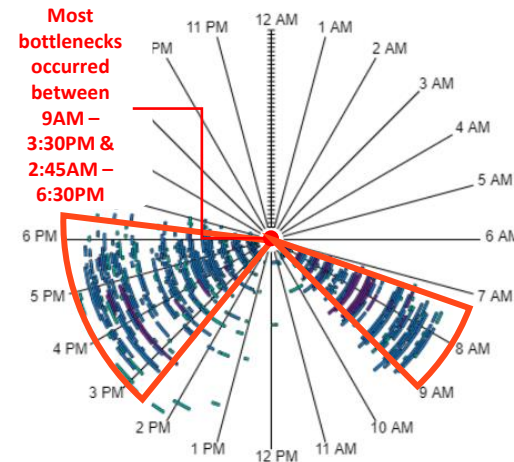
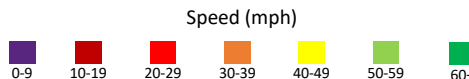
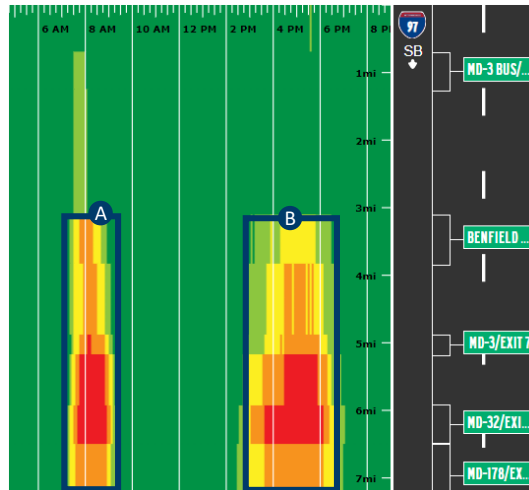
**Bottleneck Occurrences**

The center represents the beginning of **07.01.23** and the outer edge the end of **09.30.23**

**Corridor Speeds Over Time**

For animated playback of corridor speeds over time, click anywhere on the map below

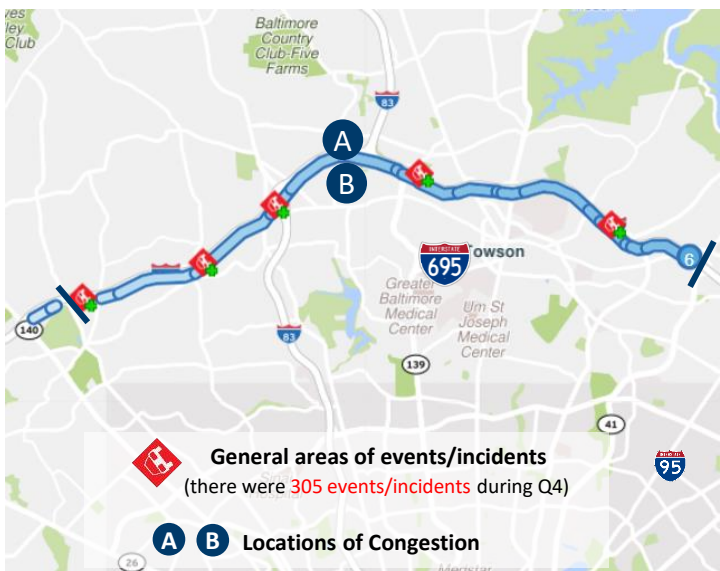
High traffic volumes traveling from Baltimore to the Annapolis area. Road geometry has a hard curve on I-97 at MD-32.





# Quarterly Bottleneck Evaluation Summary

# Q4 2023



## PK. AVG. SPEED

AM Peak | 8:00 AM  
**29.2 mph**  
 (43% slower than free flow)

PM Peak | 5:35 PM  
**28.5 mph**  
 (56% slower than free flow)

## PK. TRAVEL TIME

AM Peak | 8:00 AM  
**15.6 min**

PM Peak | 5:35 PM  
**21.5 min**

## Q4 DELAY COST

Delay Cost  
**\$4.185 M**

Veh-hrs. of Delay  
**138,602 h**

### Congested Locations

- A 7:30AM – 8:45AM** Stevenson La/Exit 21 to MD-41/Perring Pkwy/Exit 30
- B 3:15PM – 7:00PM** Stevenson La/Exit 21 to MD-41/Perring Pkwy/Exit 30

### Bottleneck Occurrences

The center represents the beginning of **10.01.23** and the outer edge the end of **12.31.23**

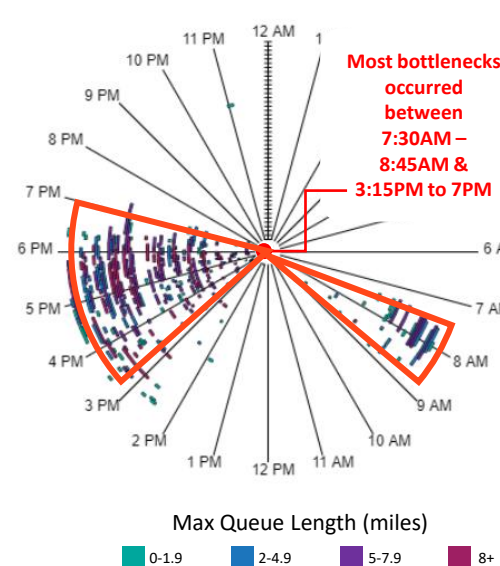
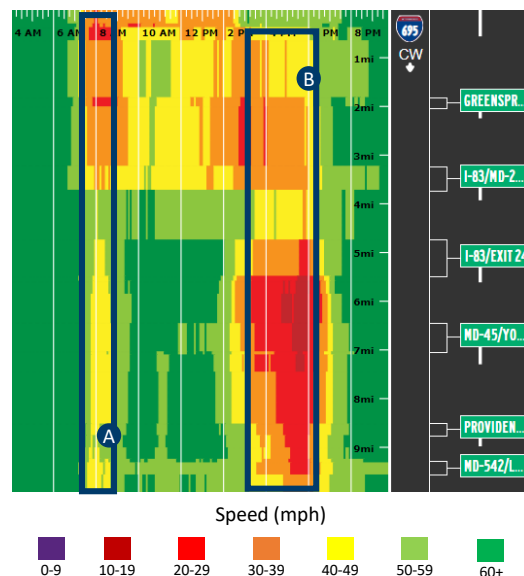
### Corridor Speeds Over Time

For animated playback of corridor speeds over time, click anywhere on the map below

Congestion was most severe between I-83 and Providence Rd in the PM rush. Factors contributing to this long-standing and extended congested zone: merging and weaving associated with traffic at each interchange; and a lane drop (to three lanes) at MD 45 (York Rd).

This section overlaps with a bottleneck the sometimes originates at I-83/Exit 23.

TSMO Construction project is underway in this stretch of I-695 from I-70 to MD-43 and a median shoulder conversion project at Stevenson Lane/Exit 21.



# 7 I-95 S @ MD-175/EXIT 41

# Quarterly Bottleneck Evaluation Summary

# Q4 2023

## PK. AVG. SPEED

AM Peak | 8:20 AM  
**58.7 mph**  
 (19% slower than free flow)

PM Peak | 4:35 PM  
**38.8 mph**  
 (43% slower than free flow)

## PK. TRAVEL TIME

AM Peak | 8:20 AM  
**12.3 min**

PM Peak | 4:35 PM  
**18.7 min**

## Q4 DELAY COST

Delay Cost  
**\$1.331 M**

Veh-hrs. of Delay  
**44,090 h**

## Congested Locations

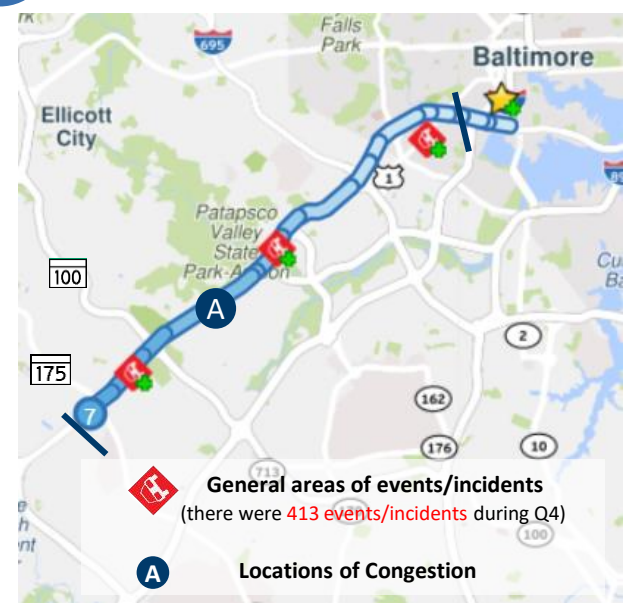
**A** 3:15PM – 6:45PM MD-295/Baltimore Washington Pkwy/Exit 52 to MD-175/Exit 41

## Bottleneck Occurrences

The center represents the beginning of **07.01.23** and the outer edge the end of **09.30.23**

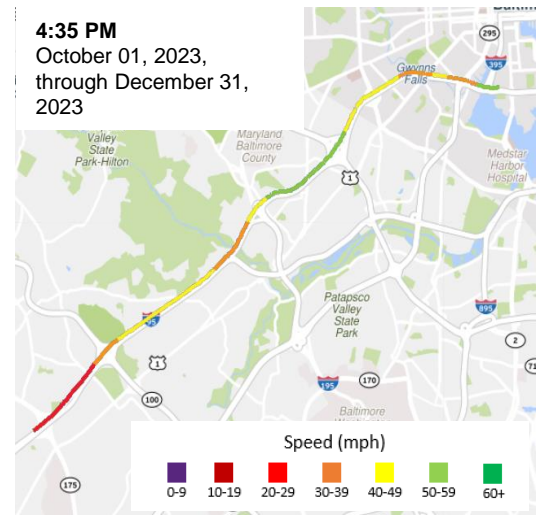
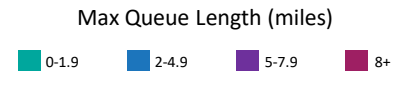
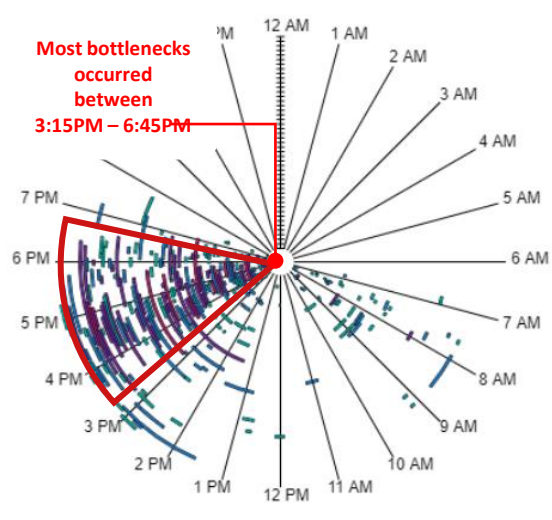
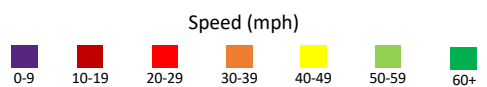
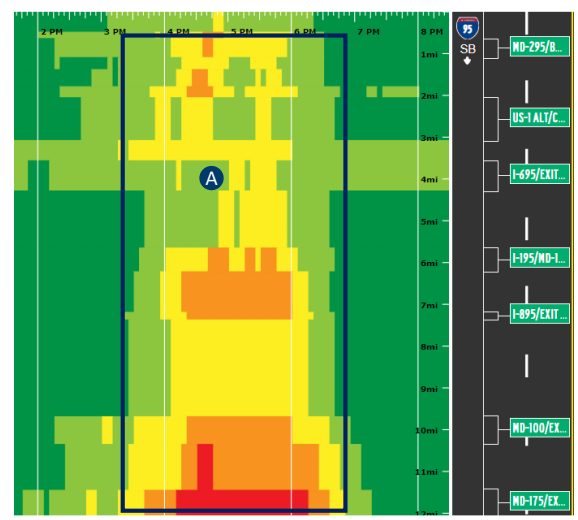
## Corridor Speeds Over Time

For animated playback of corridor speeds over time, click anywhere on the map below



High traffic volume corridor primarily in the afternoon with major merge areas at near Columbia, MD.

Overlapping bottleneck with #4 originating at MD-216.





# Quarterly Bottleneck Evaluation Summary

# Q4 2023



The Maryland Department of Transportation State Highway Administration (MDOT SHA) is constructing new noise barriers along northbound I-695 (Baltimore Beltway Inner Loop) from MD 144 (Frederick Road) to south of US 40 (Baltimore National Pike).

## PK. AVG. SPEED

AM Peak | 8:25 AM  
**52.0 mph**  
 (26% slower than free flow)

PM Peak | 5:30 PM  
**30.1 mph**  
 (55% slower than free flow)

## PK. TRAVEL TIME

AM Peak | 8:25 AM  
**5.2 min**

PM Peak | 5:30 PM  
**9.1 min**

## Q4 DELAY COST

Delay Cost  
**\$1.067 M**

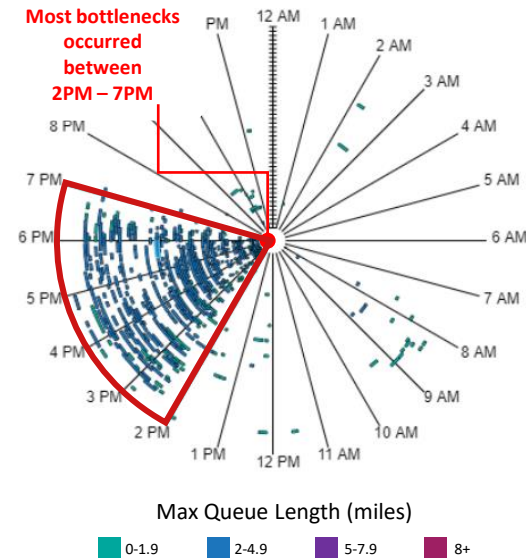
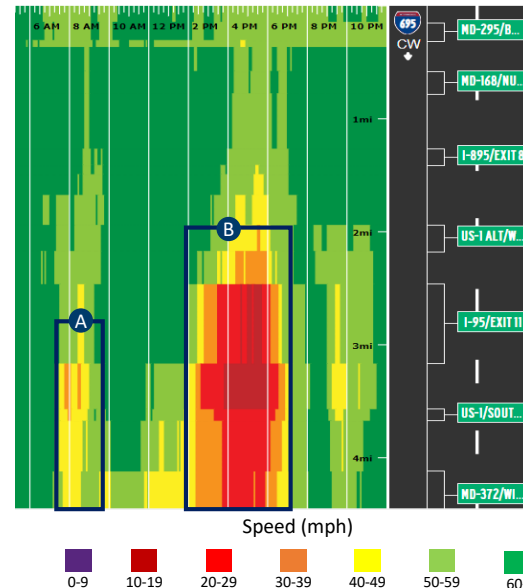
Veh-hrs. of Delay  
**43,285 h**

### Congested Locations

- A 7:30AM – 9AM** I-95/Exit 11 to MD-372/Wilkens Ave/Exit 12
- B 2PM – 7PM** US-1 ALT/Washington Blvd/Exit 10 to MD-372/Wilkens Ave/Exit 12

### Bottleneck Occurrences

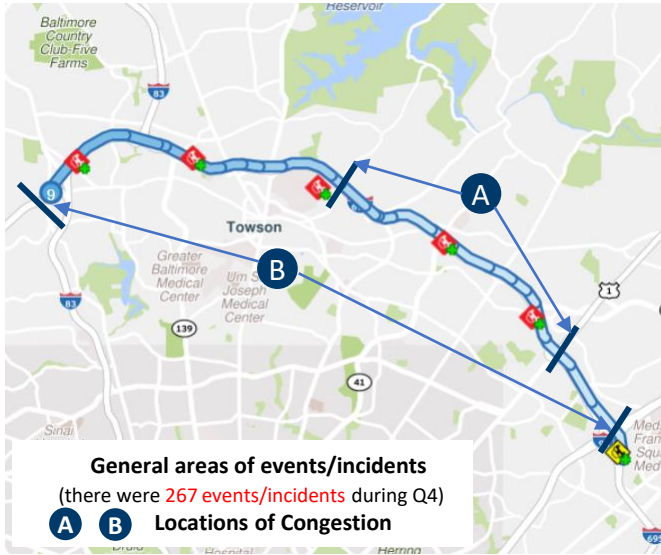
The center represents the beginning of **10.01.23** and the outer edge the end of **12.31.23**



### Corridor Speeds Over Time

For animated playback of corridor speeds over time, click anywhere on the map below





Historically long term rush hour delays in both the AM and PM rush. Road geometry, traffic volume and the amount of exits and merges close together contribute to delays. Morning congestion is of a shorter extent only appearing from US-1 westbound to Providence Rd/Exit 28 which doesn't appear in the pinwheel graphic.

A Transportation Systems Management and Operations (TSMO) project is being developed to reduce congestion and delay and increase reliability of travel within the project area from I-70 to MD 43.

## PK. AVG. SPEED

AM Peak | 7:50 AM  
**36.8 mph**  
(47% slower than free flow)

PM Peak | 4:30 PM  
**36.4 mph**  
(45% slower than free flow)

## PK. TRAVEL TIME

AM Peak | 7:50 AM  
**19.8 min**

PM Peak | 4:30 PM  
**20.0 min**

## Q4 DELAY COST

Delay Cost  
**\$2.067 M**

Veh-hrs. of Delay  
**68,433 h**

## Congested Locations

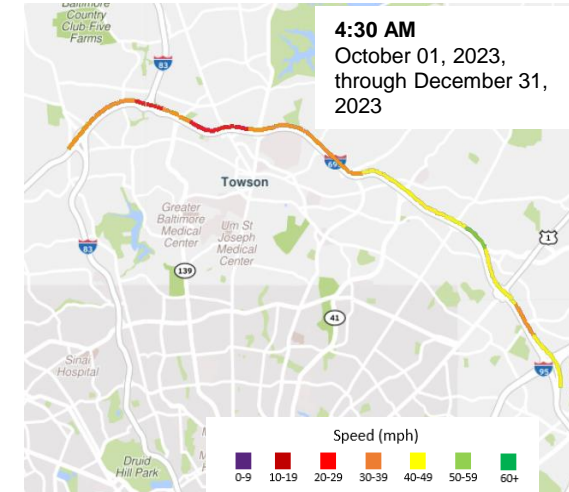
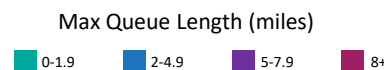
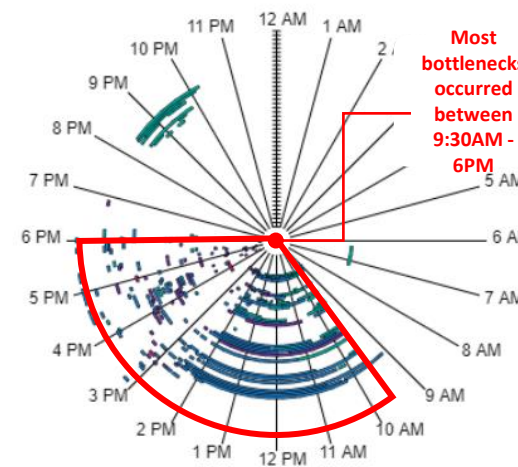
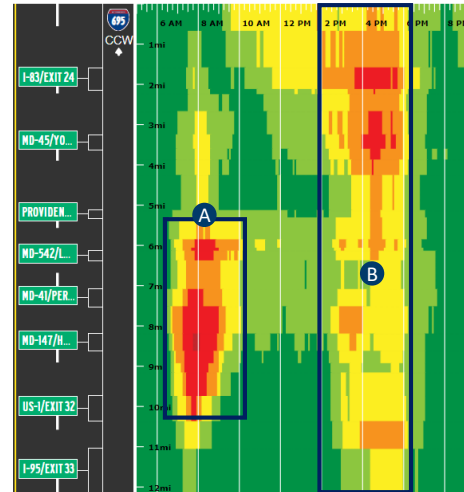
- A** 6:45AM – 10AM US-1/Exit 32 to Providence Rd/Exit 28
- B** 1:30PM – 6:00PM I-95/Exit 33 to I-83/MD-25/Exit 23

## Bottleneck Occurrences

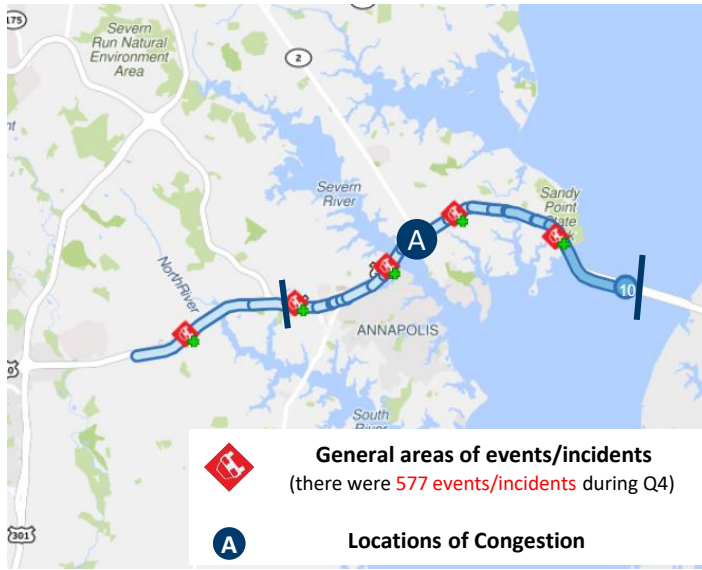
The center represents the beginning of 10.01.23 and the outer edge the end of 12.31.23

## Corridor Speeds Over Time

For animated playback of corridor speeds over time, click anywhere on the map below



# 10 US-50 E @ BAY BRIDGE



Eastbound William Preston Lane, Jr. Memorial (Bay) Bridge Rehabilitation, redecking. Off peak, lane, shoulder and bridge closures. Bottlenecks occurred on select dates anytime after the morning rush hour.

High traffic volumes from trips to Maryland beach resorts.

## Quarterly Bottleneck Evaluation Summary

# Q4 2023

**PK. AVG. SPEED**

AM Peak | 9:30 AM  
**62.5 mph**  
 (12% slower than free flow)

PM Peak | 5:25 PM  
**49.2 mph**  
 (28% slower than free flow)

**PK. TRAVEL TIME**

AM Peak | 9:30 AM  
**17.0 min**

PM Peak | 5:25 PM  
**21.6 min**

**Q4 DELAY COST**

Delay Cost  
**\$1.420 M**

Veh-hrs. of Delay  
**47,019 h**

### Congested Locations

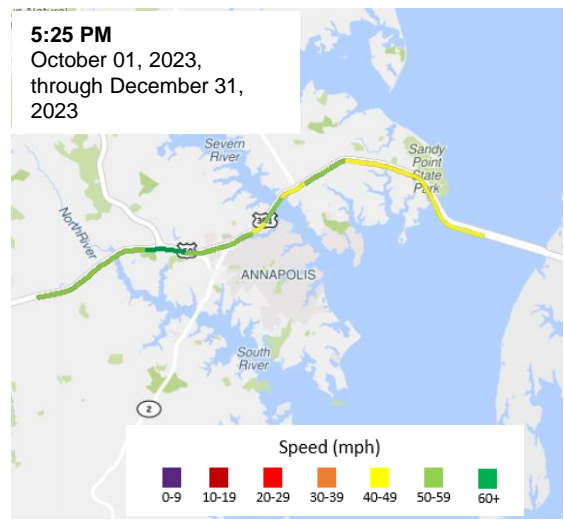
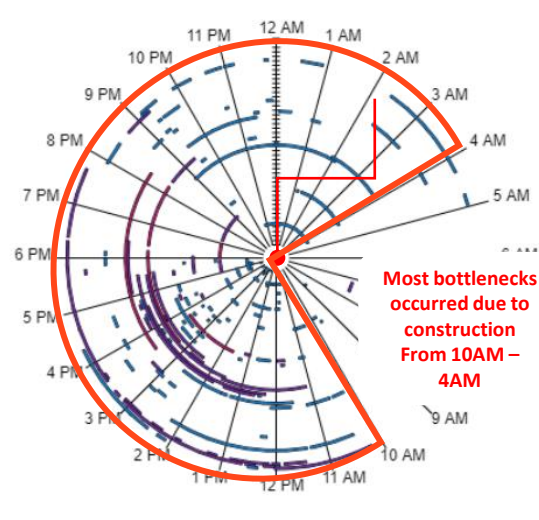
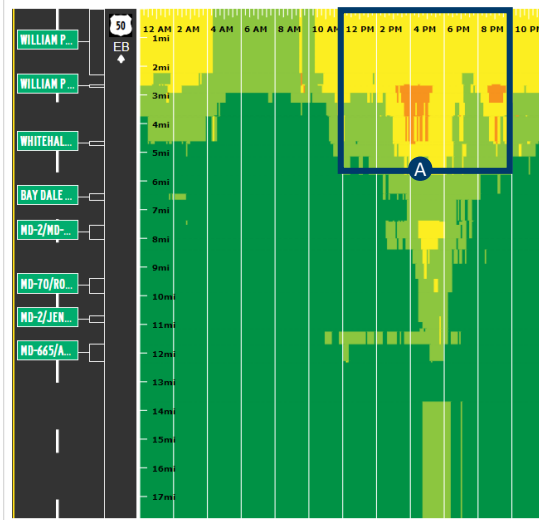
**A** 12PM – 9:30PM MD-179/Cape St Claire Rd/Exit 29 to Bay Bridge

### Bottleneck Occurrences

The center represents the beginning of **07.01.23** and the outer edge the end of **09.30.23**

### Corridor Speeds Over Time

For animated playback of corridor speeds over time, click anywhere on the map below



# **Top 10 Bottlenecks on Non-Limited Access Roads**



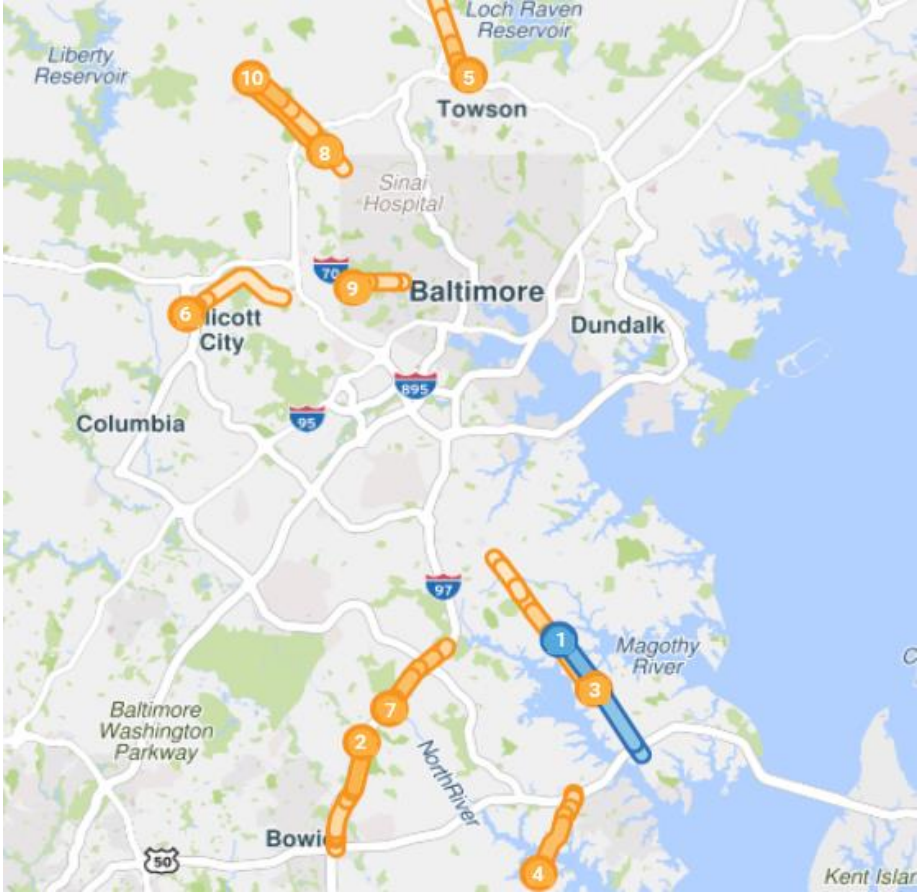
# Top 10 Bottlenecks in the Region – Non Limited Access Roads

Q4 2023

Rank	Location	Avg. Max. Length (mi)	Avg. Daily Duration	Volume Estimate (AADT)	Total Delay (Millions)
1	MD-2 N @ ROBINSON RD	3.39	1 h 58 m	29,450	25.6
2	MD-3 N @ MD-424/CONWAY RD/DAVIDSONVILLE RD	2.27	2 h 04 m	34,907	19.0
3	MD-2 S @ COLLEGE PKWY	3.08	1 h 13 m	29,961	12.9
4	MD-2 S @ MD-253/MAYO RD	2.78	1 h 05 m	25,748	9.9
5	MD-45 S @ MD-131/SEMINARY AVE	0.72	4 h 16 m	18,867	8.2
6	US-40 W @ ST JOHNS LN	0.22	9 h 09 m	25,549	8.0
7	MD-3 S @ WAUGH CHAPEL RD	1.10	1h 22 m	28,665	7.1
8	MD-140 E @ SUDBROOK LN	0.57	5 h 38 m	15,658	7.1
9	US-40 W @ COOKS LN	0.76	1 h 30 m	26,665	5.6
10	MD-140 W @ OWINGS MILLS BLVD	0.92	2 h 47 m	18,391	5.4

Red #s = highest value for that metric

Total Delay = Raw Speed drop weighted by VMT Factor (in millions)



Bottlenecks are ranked by **Base Impact** – the sum of queue lengths over the duration of the bottleneck and weighted by speed differential, congestion and **total delay**.



# **Ranked Bottleneck Lists by Jurisdiction**

# Top 20 Bottlenecks in Local Jurisdictions -4th Quarter 2023

**Ranked by Base Impact** - the aggregation of queue length over time for congestion at each location in mile minutes. It is then weighted by **Total Delay** – Raw speed drop weighted by VMT factor.

## Anne Arundel County

Rank	Location
1	MD-295 S @ MD-198
2	I-97 S @ MD-178/EXIT 5
3	US-50 E @ BAY BRIDGE
4	MD-295 N @ MD-175
5	MD-295 N @ CANINE RD
6	MD-2 N @ ROBINSON RD
7	MD-3 N @ MD-424/CONWAY RD/DAVIDSONVILLE RD
8	MD-295 S @ CANINE RD
9	MD-295 N @ MD-100
10	MD-295 S @ ARUNDEL--PRINCE GEORGE'S COUNTY BORDER
11	I-695 OL @ MD-170/CAMP MEADE RD/EXIT 6
12	MD-295 N @ I-195
13	MD-295 N @ MD-32
14	MD-295 N @ PRINCE GEORGE'S/ARUNDEL CO LINE
15	MD-2 S @ COLLEGE PKWY
16	I-695 OL @ MD-295/BALTIMORE WASHINGTON PKWY/EXIT 7
17	MD-32 E @ I-97
18	MD-295 S @ MD-175
19	MD-2 S @ MD-253/MAYO RD
20	MD-100 E @ MD-170/TELEGRAPH RD/EXIT 11

## Baltimore City

Rank	Location
1	I-95 N @ FORT MCHENRY TUNNEL
2	I-95 S @ FORT MCHENRY TUNNEL
3	I-895 S @ HARBOR TUNNEL THWY (SOUTH)
4	I-95 N @ I-95 (NORTH)
5	I-95 N @ I-95 (EAST)
6	I-95 N @ I-95 (BALTIMORE)/FORT MCHENRY TUNNEL(EAST)
7	I-95 N @ MCCOMAS ST/EXIT 55 SOUTH
8	I-83 S @ MD-25/FALLS RD/EXIT 8
9	I-895 N @ HARBOR TUNNEL THWY (SOUTH)
10	MD-295 N @ I-95/MONROE ST
11	I-95 N @ MD-295/BALTIMORE WASHINGTON PKWY/EXIT 52
12	US-40 W @ COOKS LN
13	CONWAY ST E @ MD-2/LIGHT ST
14	I-95 S @ I-95 (BALTIMORE)/FORT MCHENRY TUNNEL(WEST)
15	MD-295 N @ BAYARD ST
16	I-83 S @ COLD SPRING LN/EXIT 9
17	HOWARD ST N @ W LOMBARD ST
18	I-395 N @ W CONWAY ST
19	FOREST PARK AVE N @ WINDSOR MILL RD
20	I-895 S @ HARBOR TUNNEL THWY (NORTH)

# Top 20 Bottlenecks in Local Jurisdictions – 4th Quarter 2023

**Ranked by Base Impact** - the aggregation of queue length over time for congestion at each location in mile minutes. It is then weighted by **Total Delay** – Raw speed drop weighted by VMT factor.

## Baltimore County

Rank	Location
1	I-95 N @ MD-152/EXIT 74
2	I-695 IL @ MD-41/PERRING PKWY/EXIT 30
3	I-695 IL @ MD-372/WILKENS AVE/EXIT 12
4	I-695 OL @ I-83/MD-25/EXIT 23
5	I-83 S @ I-695
6	I-695 OL @ I-70/EXIT 16
7	I-695 OL @ PROVIDENCE RD/EXIT 28
8	I-695 IL @ I-83/MD-25/EXIT 23
9	I-695 IL @ SECURITY BLVD/EXIT 17
10	I-695 IL @ PROVIDENCE RD/EXIT 28
11	I-695 OL @ MD-26/EXIT 18
12	I-695 IL @ MD-542/LOCH RAVEN BLVD/EXIT 29
13	I-695 OL @ I-795/EXIT 19
14	I-695 IL @ EDMONDSON AVE/EXIT 14
15	I-695 IL @ MD-147/HARFORD RD/EXIT 31
16	I-695 IL @ MD-26/EXIT 18
17	I-695 IL @ STEVENSON RD/EXIT 21
18	I-695 OL @ GREENSPRING AVE/EXIT 22
19	I-695 IL @ MD-144/FREDERICK RD/EXIT 13
20	I-695 IL @ I-70/EXIT 16

IL = Inner Loop

## Carroll County

Rank	Location
1	MD-30 N @ MD-27/MANCHESTER RD
2	MD-32 W @ MD-26/LIBERTY RD
3	MD-30 S @ MD-27/MANCHESTER RD
4	MD-32 W @ UNIONTOWN RD
5	MD-97 N @ MD-496/BACHMANS VALLEY RD
6	MD-140 W @ MD-27/MANCHESTER RD
7	MD-27 N @ MD-30/MAIN ST
8	MD-97 S @ MD-496/BACHMANS VALLEY RD
9	MD-32 E @ E MAIN ST
10	MD-26 W @ MD-97/NEW WASHINGTON RD
11	MD-32 W @ RAINCLIFFE RD/SANDOSKY RD
12	MD-97 N @ MAGNA WAY/AIRPORT DR
13	MD-26 E @ WHITE ROCK RD
14	MD-482 W @ MD-27/MANCHESTER RD
15	I-70 E @ CARROLL--HOWARD COUNTY LINE
16	MD-32 E @ MD-26/LIBERTY RD
17	MD-140 E @ MD-91/EMORY RD/GAMBER RD
18	MD-97 N @ HOOK RD
19	MD-91 S @ MD-140/BALTIMORE BLVD
20	MD-26 W @ MD-32/SYKESVILLE RD

OL = Outer Loop

# Top 20 Bottlenecks in Local Jurisdictions – 4th Quarter 2023

**Ranked by Base Impact** - the aggregation of queue length over time for congestion at each location in mile minutes. It is then weighted by **Total Delay** – Raw speed drop weighted by VMT factor.

## Harford County

Rank	Location
1	I-95 S @ MD-24/EXIT 77
2	I-95 N @ MD-24/EXIT 77
3	I-95 S @ MD-152/EXIT 74
4	I-95 S @ MD-543/EXIT 80
5	I-95 N @ MD-152/EXIT 74
6	I-95 N @ MD-22/EXIT 85
7	I-95 N @ TYDINGS MEMORIAL BRIDGE
8	I-95 N @ MD-543/EXIT 80
9	I-95 S @ MARYLAND HOUSE
10	MD-152 N @ OLD JOPPA RD
11	MD-924 N @ MD-24
12	MD-24 N @ PLUMTREE RD
13	MD-24 N @ I-95
14	MD-24 N @ SINGER RD
15	US-1-BR N @ US-1/HICKORY BYP
16	US-1-BR S @ MD-24
17	MD-155 E @ MD-22/CHURCHVILLE RD
18	MD-24 S @ WHEEL RD
19	MD-24 N @ US-1-BR/BALTIMORE PIKE/BEL AIR RD
20	MD-543 N @ US-1/HICKORY BYP

## Howard County

Rank	Head Location
1	I-95 N @ MD-100/EXIT 43
2	I-95 S @ MD-216/EXIT 35
3	I-95 S @ MD-175/EXIT 41
4	MD-32 W @ I-95
5	I-95 S @ MD-32/EXIT 38
6	I-95 S @ MD-100/EXIT 43
7	I-95 N @ MD-175/EXIT 41
8	MD-32 E @ I-95
9	I-70 W @ US-29/EXIT 87
10	MD-100 W @ MARC DORSEY STATION ACCESS RD/EXIT 7
11	US-29 N @ MD-32/EXIT 16
12	I-95 N @ PRINCE GEORGE'S/HOWARD CO LINE
13	US-29 N @ MD-175
14	I-95 N @ I-895/EXIT 46
15	US-40 W @ ST JOHNS LN
16	I-95 S @ I-895/EXIT 46
17	I-95 N @ MD-216/EXIT 35
18	MD-144 W @ ELLICOTT MILLS DR
19	US-29 N @ MD-103
20	COLUMBIA GATEWAY DR S @ ROBERT FULTON DR



# Top 20 Bottlenecks in Local Jurisdictions – 4th Quarter 2023

**Ranked by Base Impact** - the aggregation of queue length over time for congestion at each location in mile minutes. It is then weighted by **Total Delay** – Raw speed drop weighted by VMT factor.

## Queen Anne's County

Rank	Location
1	US-50 W @ BAY BRIDGE
2	US-50 E @ BAY BRIDGE
3	US-301 S @ US-50
4	US-50 W @ US-301/BLUE STAR MEMORIAL HWY
5	US-50 W @ MD-213/CENTREVILLE RD
6	US-50 W @ MD-8/EXIT 37
7	US-50 E @ MD-456/DEL RHODES AVE
8	US-50 E @ MD-8/EXIT 37
9	US-50 E @ MD-662/WYE MILLS RD
10	US-50 E @ DUNDEE AVE/EXIT 40B
11	US-50 W @ MD-404/QUEEN ANNE HWY
12	US-50 E @ BEGIN FREEWAY
13	US-50 E @ MD-18/MAIN ST/EXIT 43A
14	US-50 E @ MD-404/QUEEN ANNE HWY
15	US-50 W @ THOMPSON CREEK RD/DUKE ST
16	US-50 E @ MD-213/CENTREVILLE RD
17	US-50 W @ MD-456/DEL RHODES AVE
18	MD-404 W @ MD-309/STARR RD/MAIN ST
19	MD-313 N @ MD-544/MCGINNIS RD
20	US-50 E @ MD-18/MAIN ST/EXIT 42

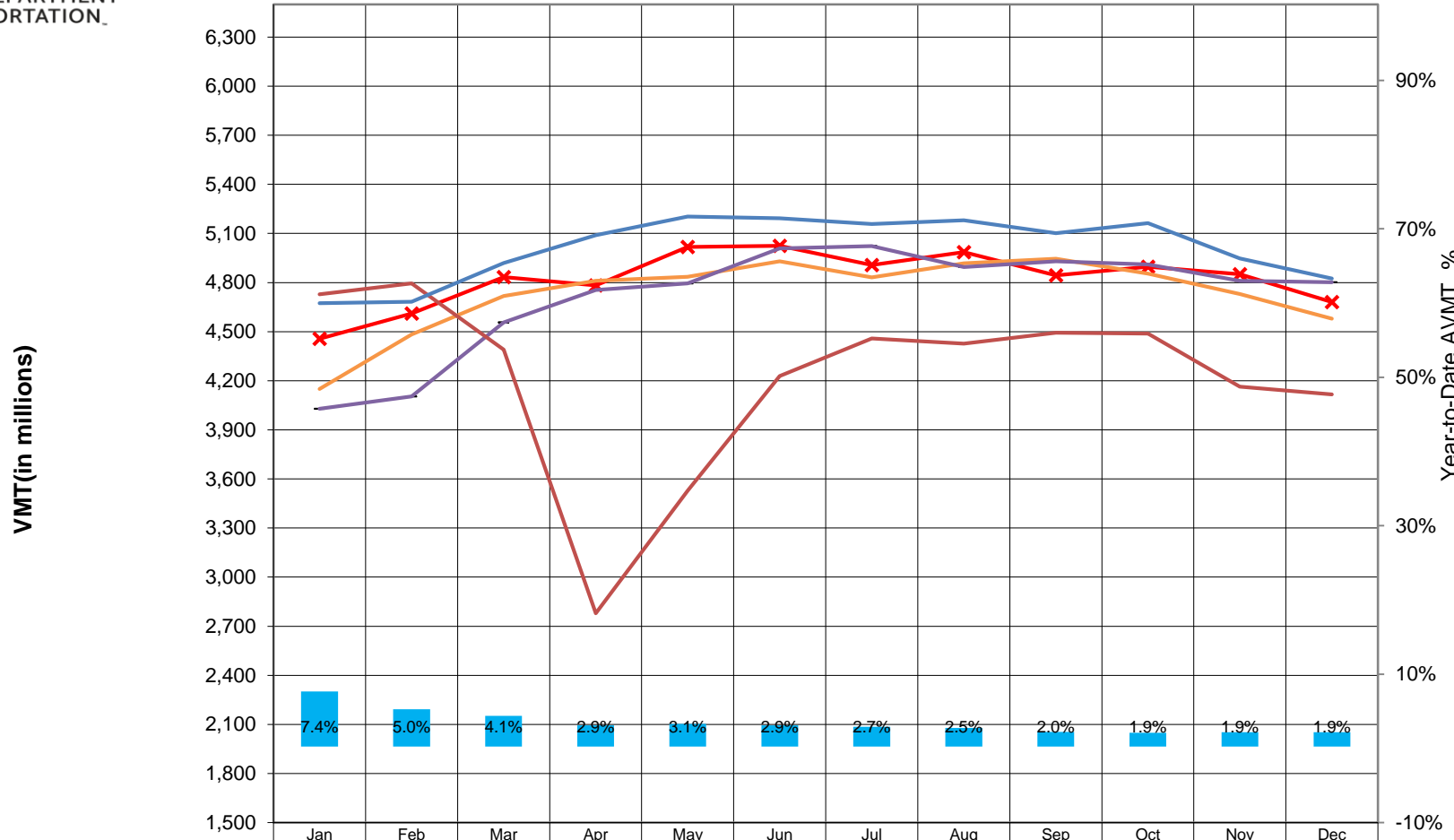
# **Vehicle Miles Traveled (VMT) Trend Graphs**

**From MDOT/SHA Automated Traffic Recorders  
(ATR's)**

Estimated Monthly Distribution of Annual (VMT) Vehicle Miles of Travel for : Dec-2023										
Dec	2019 VMT (Millions)	2020 VMT (Millions)	2021 VMT (Millions)	2022 VMT (Millions)	2023 VMT* (Millions)- Estimated	Percent Change 2019- 2020	Percent Change 2020- 2021	Percent Change 2021- 2022	Percent Change 2022- 2023	Cumulative Year-to-Date Change 2022- 2023
Jan	4674	4728	4028	4149	4456	1.2%	-14.8%	3.0%	7.4%	7.4%
Feb	4683	4794	4104	4483	4610	2.4%	-14.4%	9.2%	2.8%	5.0%
Mar	4919	4389	4556	4718	4834	-10.8%	3.8%	3.6%	2.5%	4.1%
Apr	5089	2779	4755	4811	4783	-45.4%	71.1%	1.2%	-0.6%	2.9%
May	5204	3527	4795	4835	5017	-32.2%	36.0%	0.8%	3.8%	3.1%
Jun	5193	4229	5009	4929	5025	-18.6%	18.4%	-1.6%	1.9%	2.9%
Jul	5158	4458	5023	4832	4907	-13.6%	12.7%	-3.8%	1.6%	2.7%
Aug	5180	4427	4894	4918	4986	-14.5%	10.5%	0.5%	1.4%	2.5%
Sep	5102	4494	4930	4945	4843	-11.9%	9.7%	0.3%	-2.1%	2.0%
Oct	5162	4488	4910	4854	4896	-13.1%	9.4%	-1.1%	0.9%	1.9%
Nov	4947	4163	4810	4730	4850	-15.8%	15.5%	-1.7%	2.5%	1.9%
Dec	4825	4116	4802	4580	4681	-14.7%	16.7%	-4.6%	2.2%	1.9%
<b>TOTAL</b>	<b>60,136</b>	<b>50,592</b>	<b>56,616</b>	<b>56,784</b>	<b>57,888</b>	<b>-15.9%</b>	<b>11.9%</b>	<b>0.3%</b>	<b>1.9%</b>	<b>1.9%</b>
Note										
1	The Dec-2023 Monthly AVMT is up compared to Dec-2022 by 2.2%									
2	The Cumulative Year-to-Date Change till Dec-2023 AVMT is up compared to same time last year 2022 by 1.9%									
3	* Preliminary 2023 VMT Estimates based on 2022 Final VMT.									
Data Source:Based on data collected at 50+ continuous count stations by SHA's Data Services Division in Office Of Planning & Preliminary Engineering										
	Report Updated on :02/20/2024									



### Estimated Monthly Distribution of Annual (VMT) Vehicle Miles of Travel for : Dec-2023



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cumulative Year-to-Date Change 2022-2023	7.4%	5.0%	4.1%	2.9%	3.1%	2.9%	2.7%	2.5%	2.0%	1.9%	1.9%	1.9%
2023 VMT* (Millions)-Estimated	4456	4610	4834	4783	5017	5025	4907	4986	4843	4896	4850	4681
2022 VMT (Millions)	4149	4483	4718	4811	4835	4929	4832	4918	4945	4854	4730	4580
2021 VMT (Millions)	4028	4104	4556	4755	4795	5009	5023	4894	4930	4910	4810	4802
2020 VMT (Millions)	4728	4794	4389	2779	3527	4229	4458	4427	4494	4488	4163	4116
2019 VMT (Millions)	4674	4683	4919	5089	5204	5193	5158	5180	5102	5162	4947	4825

NOTE: This chart displays estimated monthly Vehicle Miles of Travel compared with the previous year based on data collected at approximately 50+ continuous count stations throughout the State.

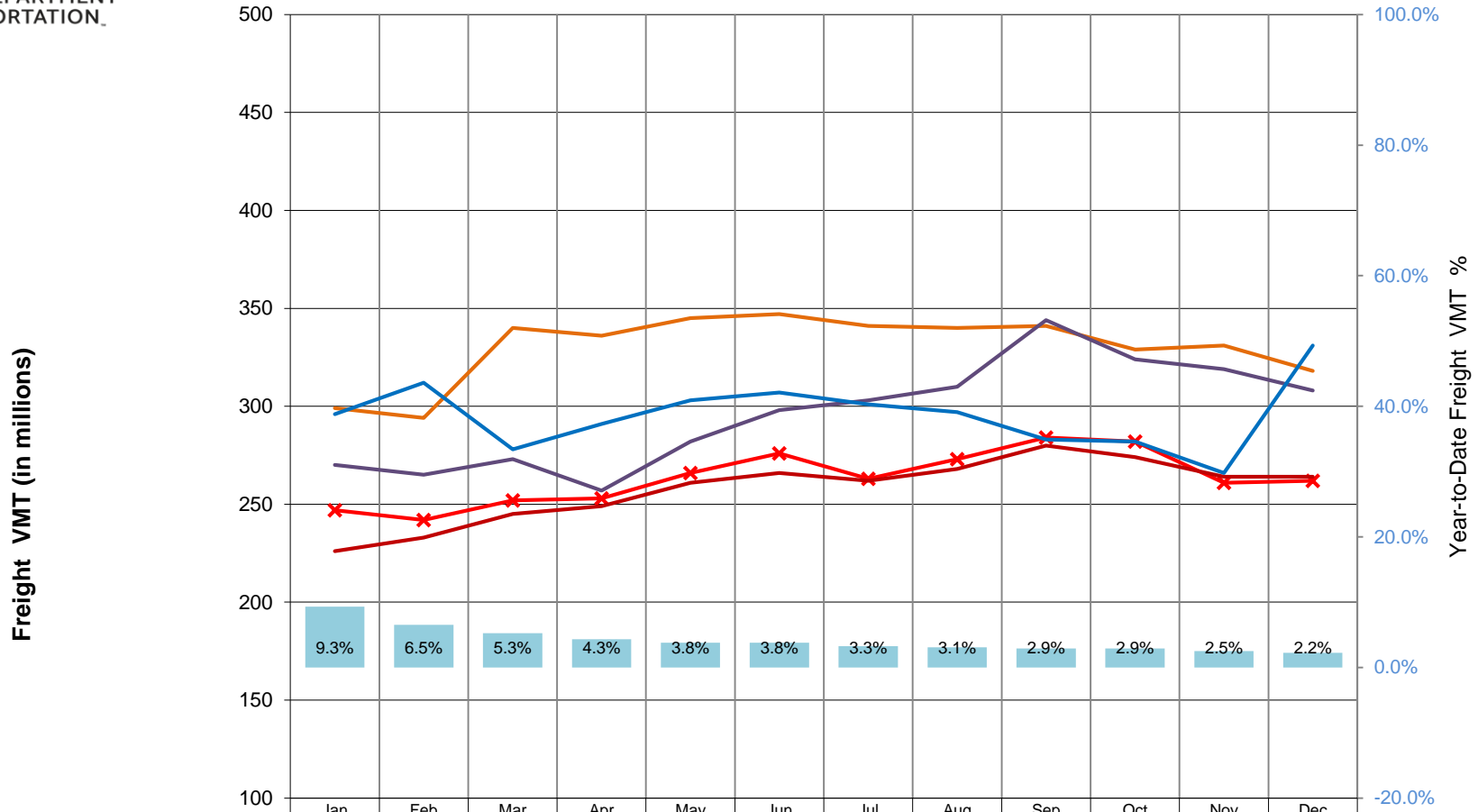
Report Updated on :02/20/2024



Estimated Monthly Distribution of Freight Vehicle Miles of Travel for : Dec-2023										
Dec	2019 Freight VMT (Millions)	2020 Freight VMT (Millions)	2021 Freight VMT (Millions)	2022 Freight VMT (Millions)	2023 Freight VMT (Millions)* Estimated	Percent Change 2019-2020 Freight VMT	Percent Change 2020-2021 Freight VMT	Percent Change 2021-2022 Freight VMT	Percent Change 2022-2023 Freight VMT	Cumulative Year-to-Date Freight VMT 2022-2023
Jan	296	270	299	226	247	-8.8%	10.7%	-24.4%	9.3%	9.3%
Feb	312	265	294	233	242	-15.1%	10.9%	-20.7%	3.9%	6.5%
Mar	278	273	340	245	252	-1.8%	24.5%	-27.9%	2.9%	5.3%
Apr	291	257	336	249	253	-11.7%	30.7%	-25.9%	1.6%	4.3%
May	303	282	345	261	266	-6.9%	22.3%	-24.3%	1.9%	3.8%
Jun	307	298	347	266	276	-2.9%	16.4%	-23.3%	3.8%	3.8%
Jul	301	303	341	262	263	0.7%	12.5%	-23.2%	0.4%	3.3%
Aug	297	310	340	268	273	4.4%	9.7%	-21.2%	1.9%	3.1%
Sep	283	344	341	280	284	21.6%	-0.9%	-17.9%	1.4%	2.9%
Oct	282	324	329	274	282	14.9%	1.5%	-16.7%	2.9%	2.9%
Nov	266	319	331	264	261	19.9%	3.8%	-20.2%	-1.1%	2.5%
Dec	331	308	318	264	262	-6.9%	3.2%	-17.0%	-0.8%	2.2%
<b>TOTAL</b>	<b>3547</b>	<b>3553</b>	<b>3961</b>	<b>3092</b>	<b>3161</b>	<b>0.17%</b>	<b>11.48%</b>	<b>-21.94%</b>	<b>2.2%</b>	<b>2.2%</b>
Note										
1	The Dec-2023 Monthly Freight VMT is down compared to Dec-2022 by -0.8%									
2	The Cumulative Year-to-Date Change till Dec-2023 Freight VMT is up compared to same time last year 2022 by 2.2%									
3	* Preliminary 2023 Freight VMT Estimates based on 2022 Freight Final VMT and 2022 HPMS Vehicle Class Summary .									
4	** VEHICLE CLASS software updated in 2022									
5	Freight VMT = Vehicle Class 5-13									
Data Source:Based on data collected at approximately 20+ class continuous count stations maintained by SHA's Data Services Division in OPPE										
Report Updated on :02/20/2024										



**Estimated Monthly Distribution of Freight Vehicle Miles of Travel for : Dec-2023**

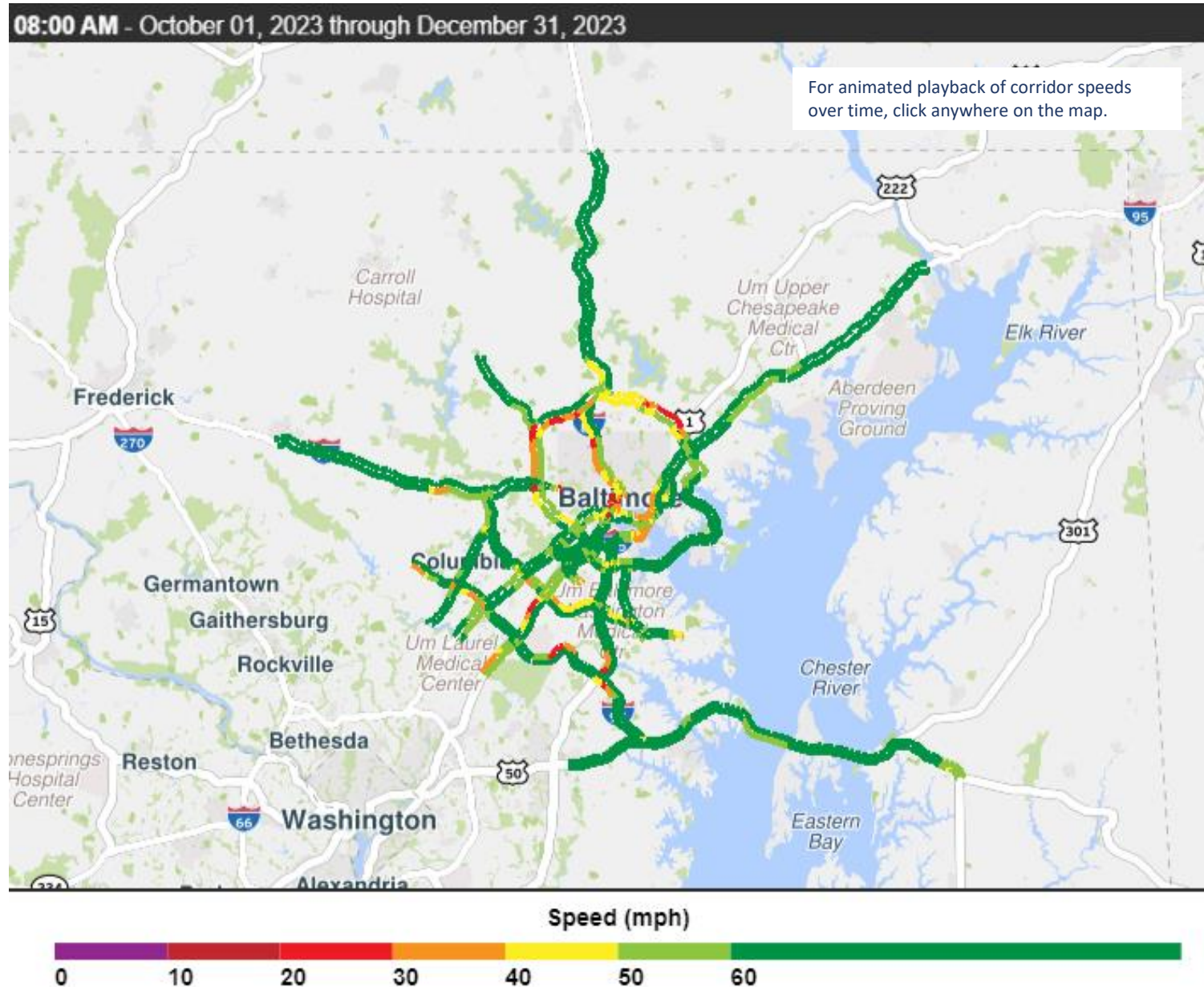


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cumulative Year-to-Date Freight VMT 2022-2023	9.3%	6.5%	5.3%	4.3%	3.8%	3.8%	3.3%	3.1%	2.9%	2.9%	2.5%	2.2%
2023 Freight VMT (Millions)* Estimated	247	242	252	253	266	276	263	273	284	282	261	262
2022 Freight VMT (Millions)	226	233	245	249	261	266	262	268	280	274	264	264
2021 Freight VMT (Millions)	299	294	340	336	345	347	341	340	341	329	331	318
2020 Freight VMT (Millions)	270	265	273	257	282	298	303	310	344	324	319	308
2019 Freight VMT (Millions)	296	312	278	291	303	307	301	297	283	282	266	331

NOTE: This chart displays estimated monthly Freight Vehicle Miles of Travel compared with the previous year based on data collected at approximately 20+ continuous count stations throughout the State.  
Report Updated on :02/20/2024

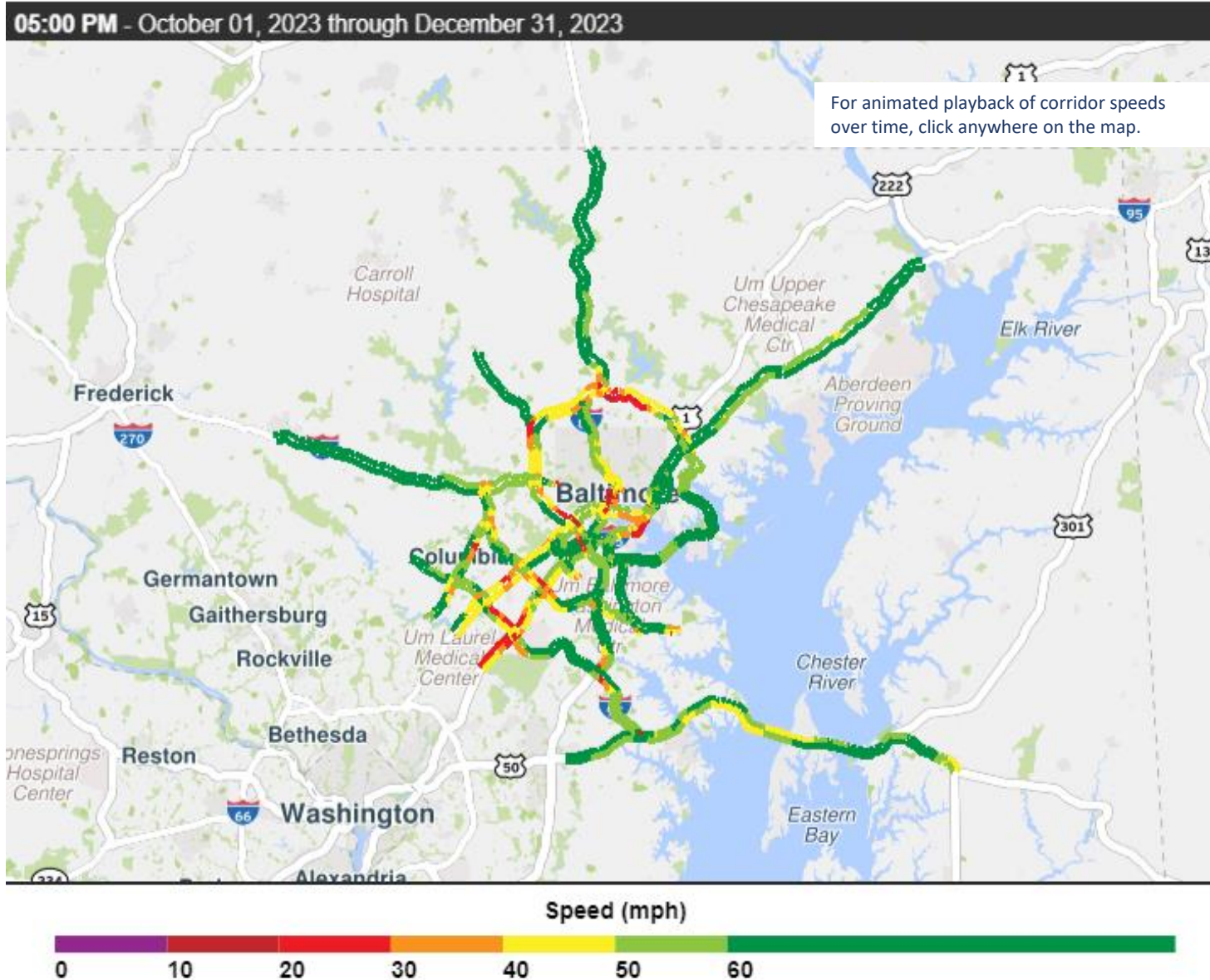
# Regional Speed Maps

# AM Peak Period Rush Hour: 4th Quarter 2023





# PM Peak Period Rush Hour: 4th Quarter 2023



# System Reliability Performance Measures

Percent of reliable person-miles traveled on the Interstate

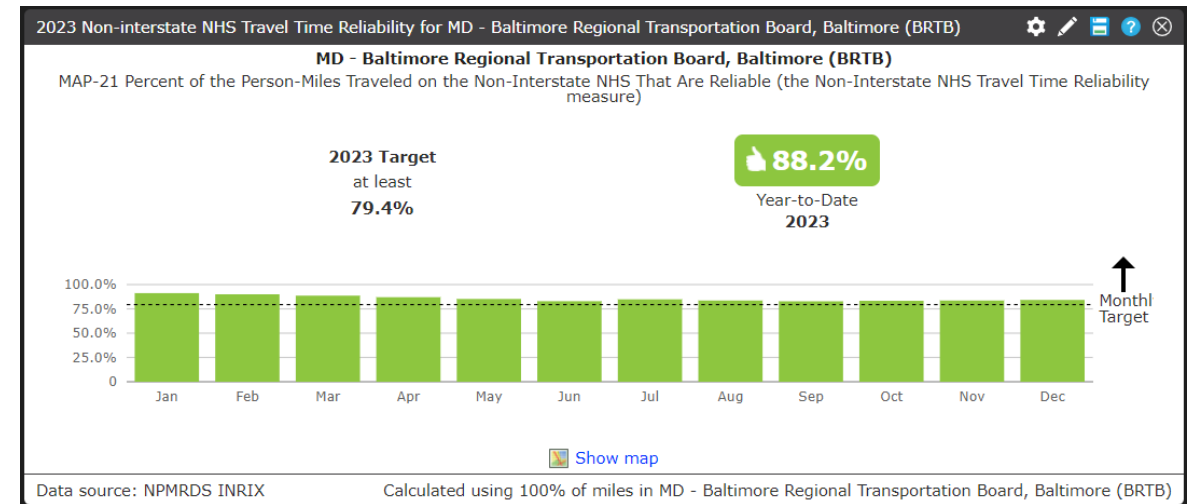
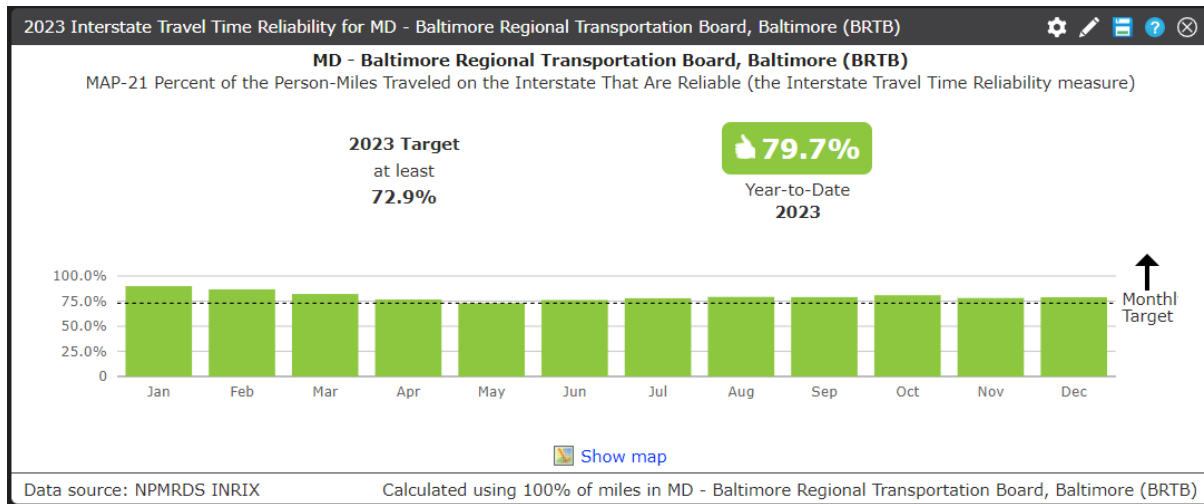
Percent of reliable person-miles traveled on the Non-Interstate NHS

Percentage of Interstate system mileage providing for reliable truck travel time (Truck Travel Time Reliability Index)

\* Each state must establish statewide targets and report findings to the Federal Highway Administration. Metropolitan Planning Organizations must either support the established state targets or develop regional targets of their own.

# Level of Travel Time Reliability: Interstates, Non-Interstates and Trucks

Travel time reliability is the consistency or dependability in travel times, as measured from day-to-day and/or across different times of the day.



# Ranked Bottleneck Monthly Comparison

2023												2023 Rank	2023 Locations
Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec		
2	2		4	3	1	1		1		4	5	1	MD-295 S @ MD-198
1	4	4	1	4	2		3	7		1	1	2	I-95 N @ MD-152/EXIT 74
10	14	2	11	1		3	5		2	2	4	3	I-95 N @ MD-100/EXIT 43
3	3	5	8	7	8		4	4	7	9	15	4	I-695 IL @ MD-372/WILKENS AVE/EXIT 12
	11	13	9	10	6	6	12	13	15	3	3	5	I-95 S @ MD-216/EXIT 35
4	1	1	3	2	11		16	12	5			6	I-695 OL @ MD-26/EXIT 18
	16	8	5	8	7	11	13			5	8	7	US-50 E @ BAY BRIDGE
			6	6	4	7	7		13			8	I-695 IL @ EDMONDSON AVE/EXIT 14
7		6	12	16	15			18	6	20	2	9	I-695 IL @ I-83/MD-25/EXIT 23
6	13	10	15	18	19	10	15	6	16	12	14	10	I-695 OL @ PROVIDENCE RD/EXIT 28
	20	18		17	20			2	4	17		11	I-695 OL @ I-70/EXIT 16
9	17	14	17	11		17	19	17	20	18		12	MD-295 N @ CANINE RD
18	19				13	18		15	9	11	13	13	I-83 S @ I-695
14	6	15							18	16	10	14	I-695 IL @ SECURITY BLVD/EXIT 17
						19	20	8	11			15	I-695 IL @ MD-542/LOCH RAVEN BLVD/EXIT 29
									14			16	I-695 IL @ PROVIDENCE RD/EXIT 28
											20	17	MD-32 W @ I-95
		17			9			16		15		18	I-695 IL @ MD-147/HARFORD RD/EXIT 31
				13		13				10		19	I-95 N @ MD-24/EXIT 77
			20	14	18							20	I-95 N @ FORT MCHENRY TUNNEL

**Conclusions/Observations:** The December-2023 Monthly AVMT is up compared to December-2022 by 2.2%. The Cumulative Year-to-Date Change till Dec-2023 AVMT is up compared to same time last year 2022 by 1.9%.

Inner Loop (IL)  
Outer Loop (OL)

The top ranked for 2023 was MD-295/Baltimore Washington Parkway southbound at MD-198 placing in the Top 5 for ten months and ranked #1 three times. The #2 Bottleneck – I-95 northbound at MD-152/Mountain Rd was in the top 5 for 11 months reflecting the high traffic volumes coupled with Electronic Toll Lane (ETL) construction work in Harford County.



# Credits



# For More Information



**BALTIMORE  
METROPOLITAN  
COUNCIL**

1500 Whetstone Way, Suite 300

Baltimore, MD 21230

p. 410.732.0500

**Ed Style (Author)**  
**Transportation Analyst**  
**(410) 732-0500 x1031**  
[estyle@baltometro.org](mailto:estyle@baltometro.org)  
[www.baltometro.org](http://www.baltometro.org)