



Quarterly Congestion Analysis Report. Top 10 Bottlenecks with Special Edition Covid-19 Report

1st Quarter 2020

May 28, 2020



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 2016, TIGER/Line®, MTA
Printed - April 2017



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.
- **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
- **All Events/Incidents** - The number of traffic events and incidents that occurred within the space of the bottleneck at any time during the time period being analyzed
- **Volume Estimate** - AADT weighted by queue length

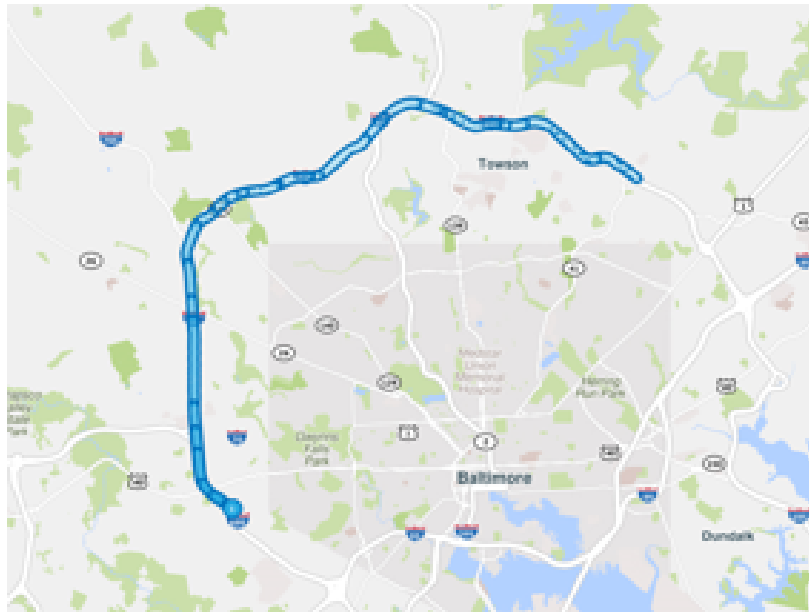
the aggregation of queue length over time for congestion at each location in mile minutes

Rank	Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
1	I-695 OL @ EDMONDSON AVE/EXIT 14	5.01	2 h 43 m	834	88946
2	I-695 IL @ I-83/MD-25/EXIT 23	3.53	2 h 56 m	463	95048
3	I-695 IL @ I-70/EXIT 16	2.11	2 h 54 m	233	95068
4	I-695 OL @ US-40/EXIT 15	3.57	1 h 48 m	766	89650
5	I-95 N @ MD-100/EXIT 43	4.23	1 h 22 m	310	95604
6	I-95 N @ MD-295/BALTIMORE WASHINGTON PKWY/EXIT 52	2.26	1 h 50 m	641	93260
7	MD-295 S @ POWDER MILL RD	5.26	1 h 24 m	318	45940
8	I-695 IL @ MD-542/LOCH RAVEN BLVD/EXIT 29	3.71	53 m	496	85789
9	I-95 N @ MD-175/EXIT 41	3.23	1 h 12 m	243	95344
10	I-695 OL @ I-83/MD-25/EXIT 23	3.48	1 h 06 m	484	79378

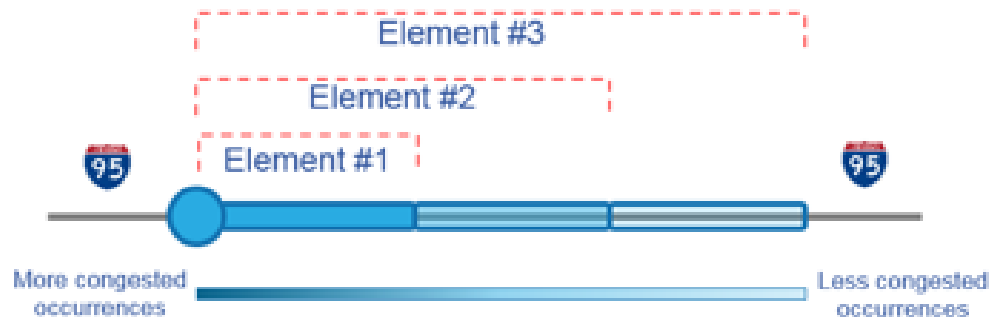
IL = Inner Loop

OL = Outer Loop

Maps

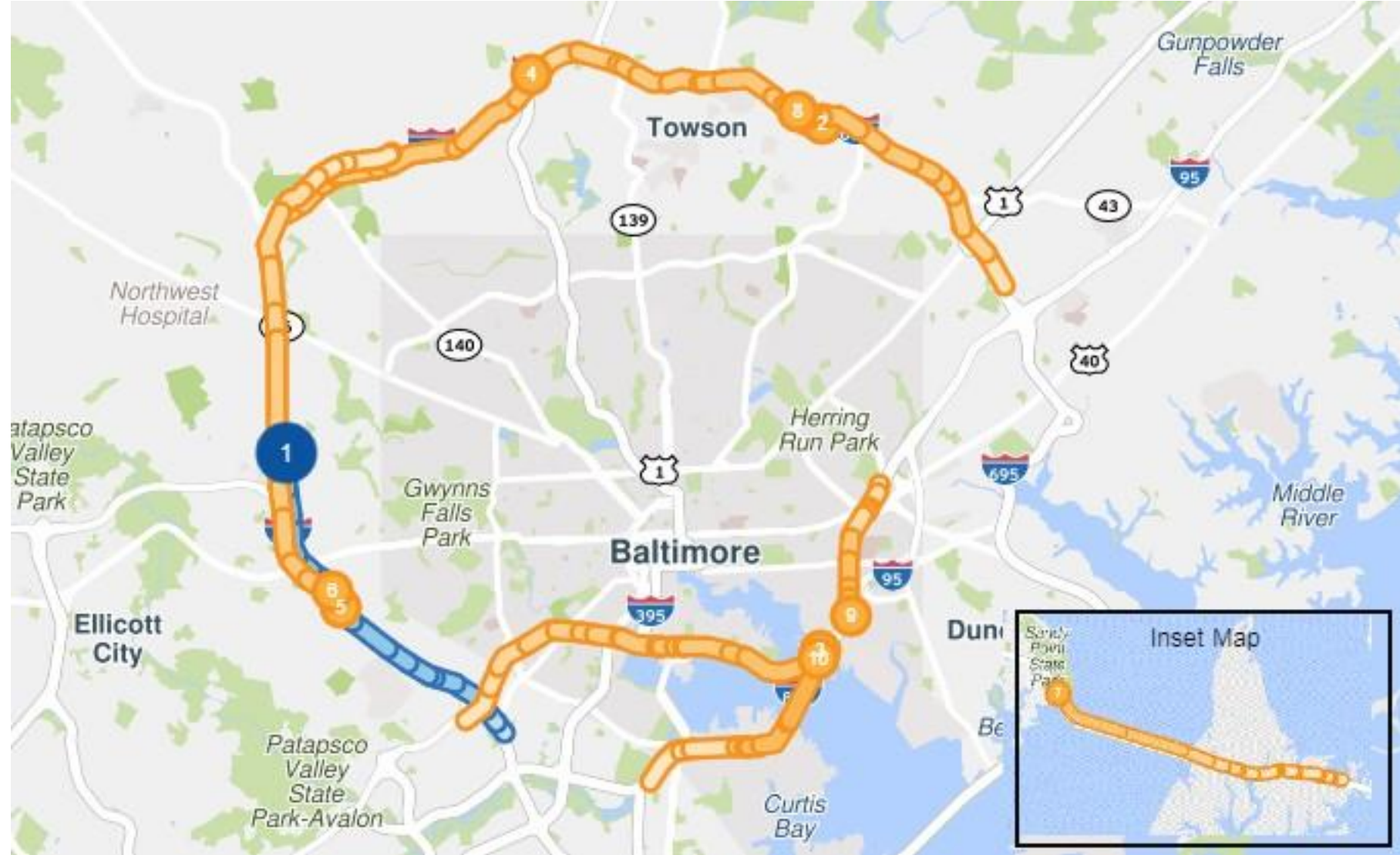


The Map view displays selected bottlenecks on a map. Each element occurring at the selected location is layered on the map, extending upstream from the head location to the maximum length of the specific *element*. As each element adds another layer on the map, road segments become more opaque. Segments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



Top 10 Bottlenecks in the Baltimore Region
1st Quarter 2020

Overview Map



Top 10 Bottlenecks in the Baltimore Region 1st Quarter 2020

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

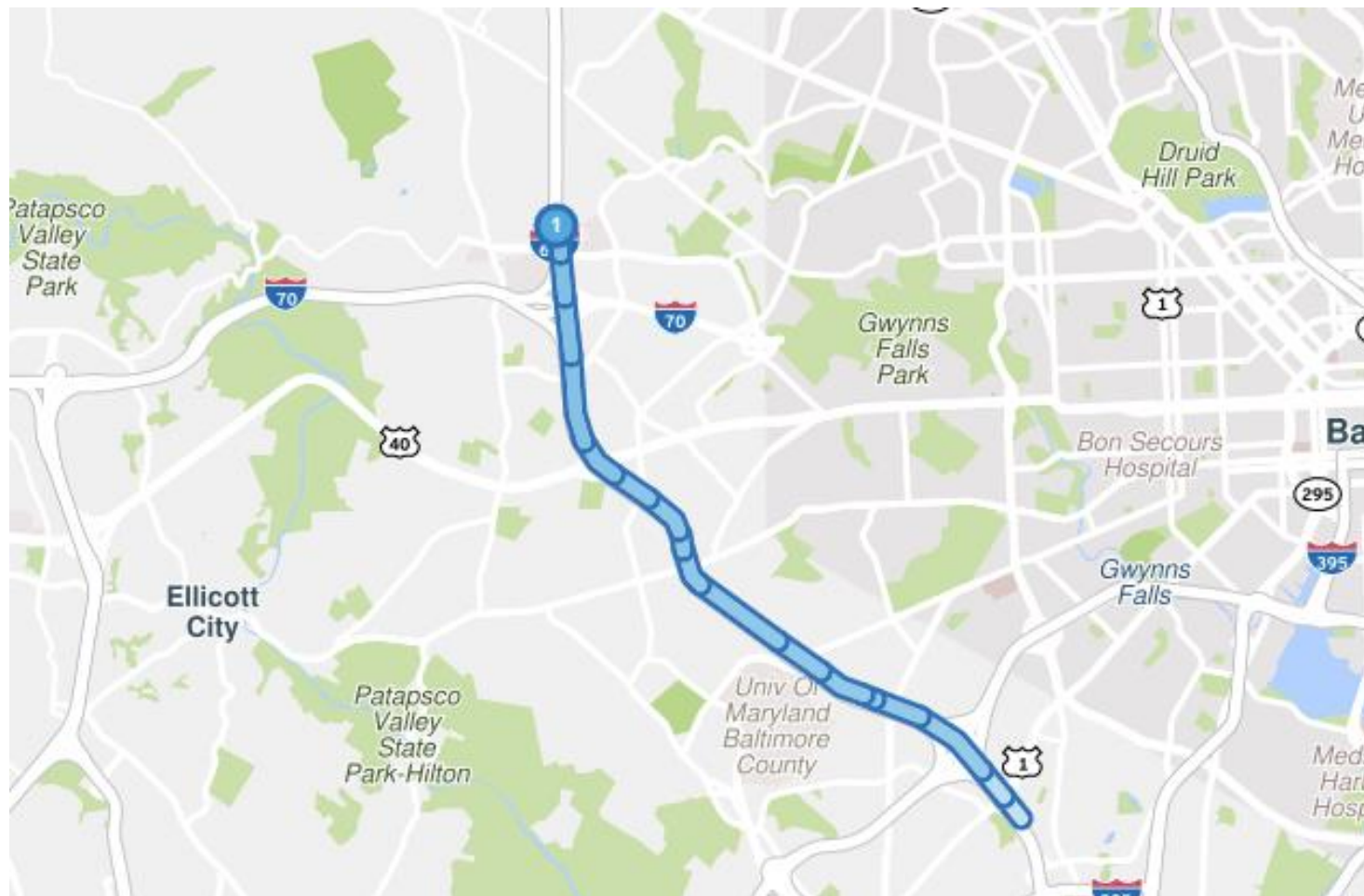
Rank	Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
1	I-695 IL @ SECURITY BLVD/EXIT 17	3.36	2 h 7 m	232	101,876
2	I-695 IL @ MD-542/LOCH RAVEN BLVD/EXIT 29	4.05	49 m	286	83,792
3	I-95 N @ FORT MCHENRY TUNNEL	3.77	1 h 7 m	411	72,090
4	I-695 IL @ I-83/MD-25/EXIT 23	3.37	51 m	146	97,599
5	I-695 OL @ MD-144/FREDERICK RD/EXIT 13	4.7	16 m	276	102,337
6	I-695 OL @ EDMONDSON AVE/EXIT 14	4.67	24 m	249	101,946
7	US-50 W @ BAY BRIDGE	4.3	54 m	260	36,526
8	I-695 OL @ CROMWELL BRIDGE RD/EXIT 29	2.63	1 h 16 m	140	79,005
9	I-895 S @ HOLABIRD AVE/EXIT 10	1.1	2 h 4 m	59	27,914
10	I-895 N @ HARBOR TUNNEL THWY (NORTH)	1.76	2 h 56 m	144	34,444

IL = Inner Loop

OL = Outer Loop

#1 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 IL @ SECURITY BLVD/EXIT 17	3.36	2 h 07 m	232	101,876



Notes: Afternoon congestion on the inner loop of the beltway with the greatest delays between MD 144 and the lane drop at I-70. High-volume ramps from Security Blvd, I-70 and US 40 contributed to the congestion.

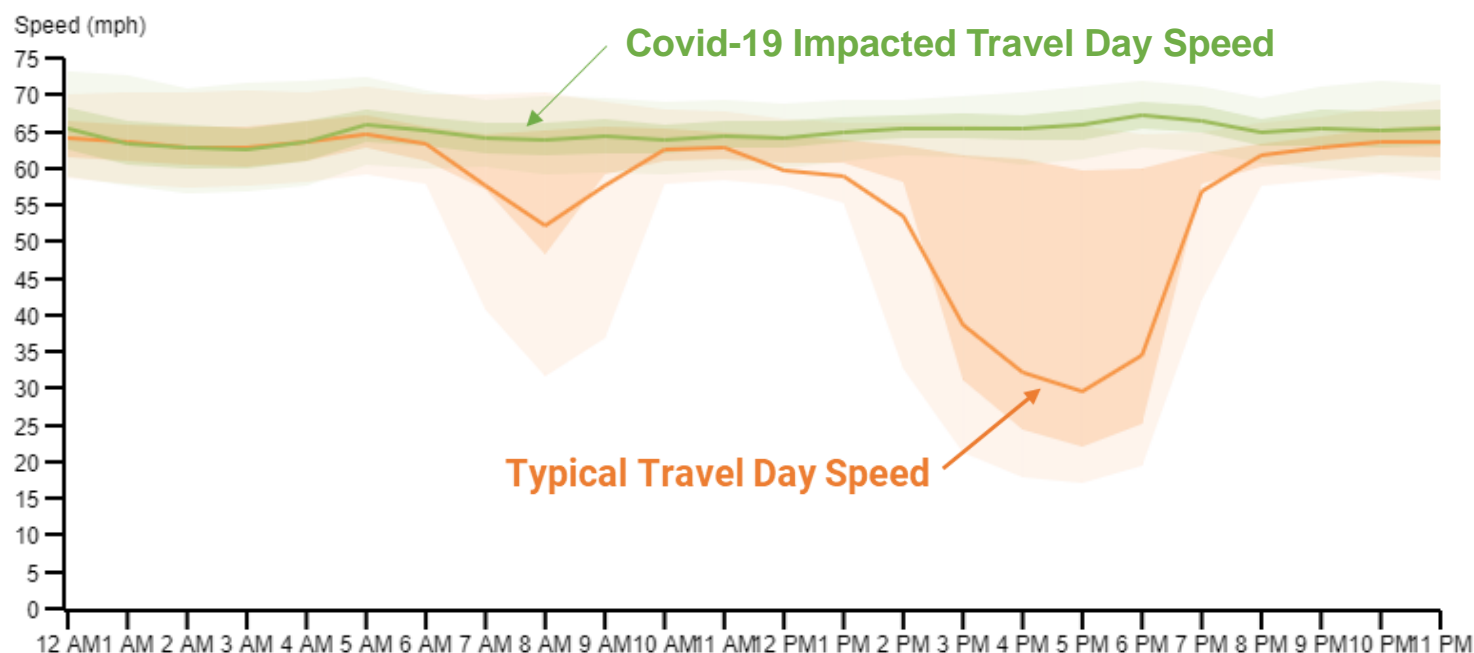
#1 Ranked Bottleneck in the Baltimore Region –1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 IL @ SECURITY BLVD/EXIT 17	3.36	2 h 07 m	232	101,876

Speed for I-695 Inner Loop between Edmondson Ave/Exit 14 and Security Blvd/Exit 17

Averaged per hour for January 01, 2020 through March 15, 2020 and March 16, 2020 through March 31, 2020

Inner Loop

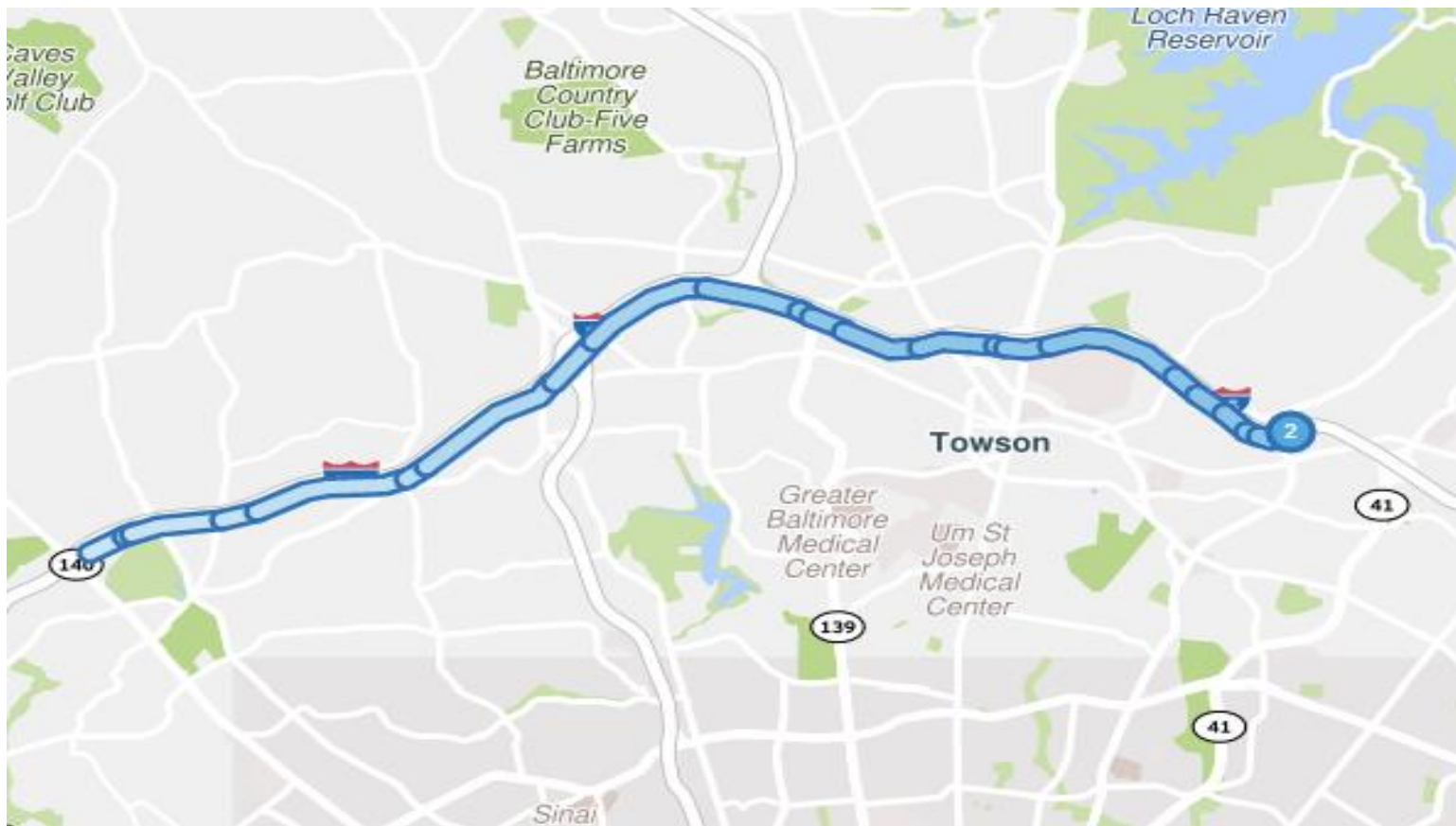


Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

#2 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 IL @ MD-542/LOCH RAVEN BLVD/EXIT 29	4.05	49m	286	83,792



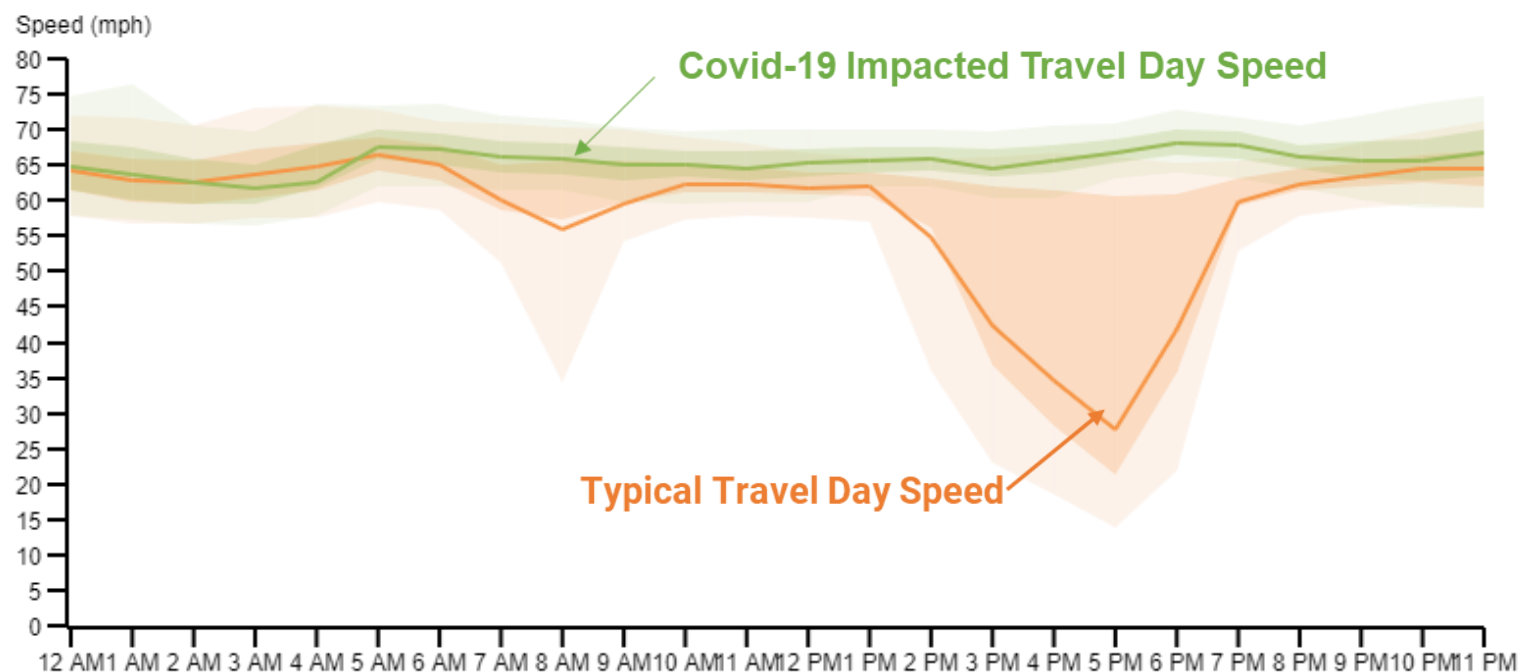
Notes: Congestion was most severe between I-83 and Providence Rd in the PM rush. Factors contributing to this long-standing and extended congested zone: merging and weaving associated with traffic at each interchange; and a lane drop (to three lanes) at MD 45 (York Rd).

#2 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 IL @ MD-542/LOCH RAVEN BLVD/EXIT 29	4.05	49m	286	83,792

Speed for I-695 Inner Loop between I-83/Exit 24 and MD-542/Loch Raven Blvd/Exit 29
Averaged per hour for January 01, 2020 through March 15, 2020 and March 16, 2020 through March 31, 2020

Inner Loop

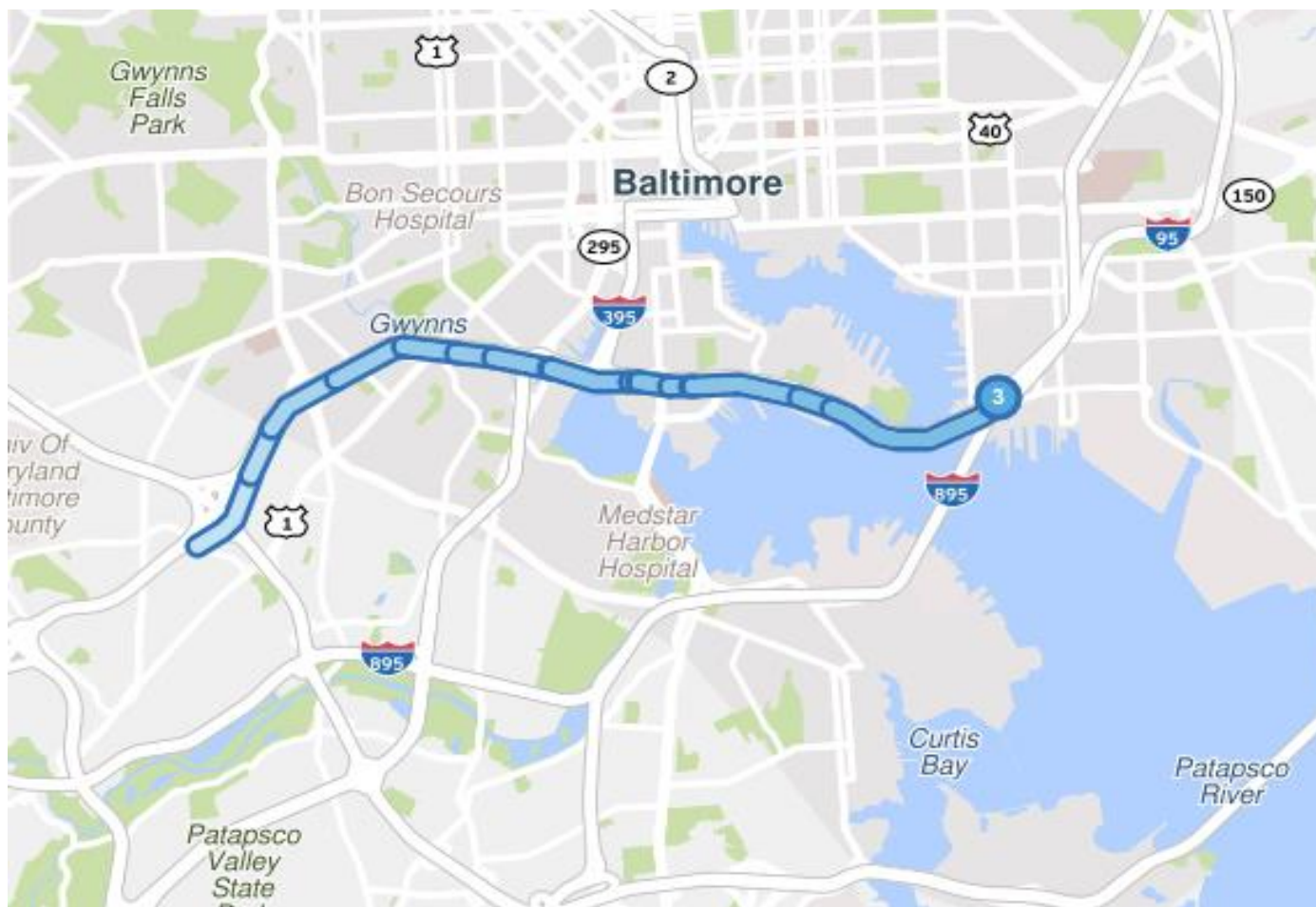


Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

#3 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-95 N @ FORT MCHENRY TUNNEL	377	1 h 07 m	411	72,090

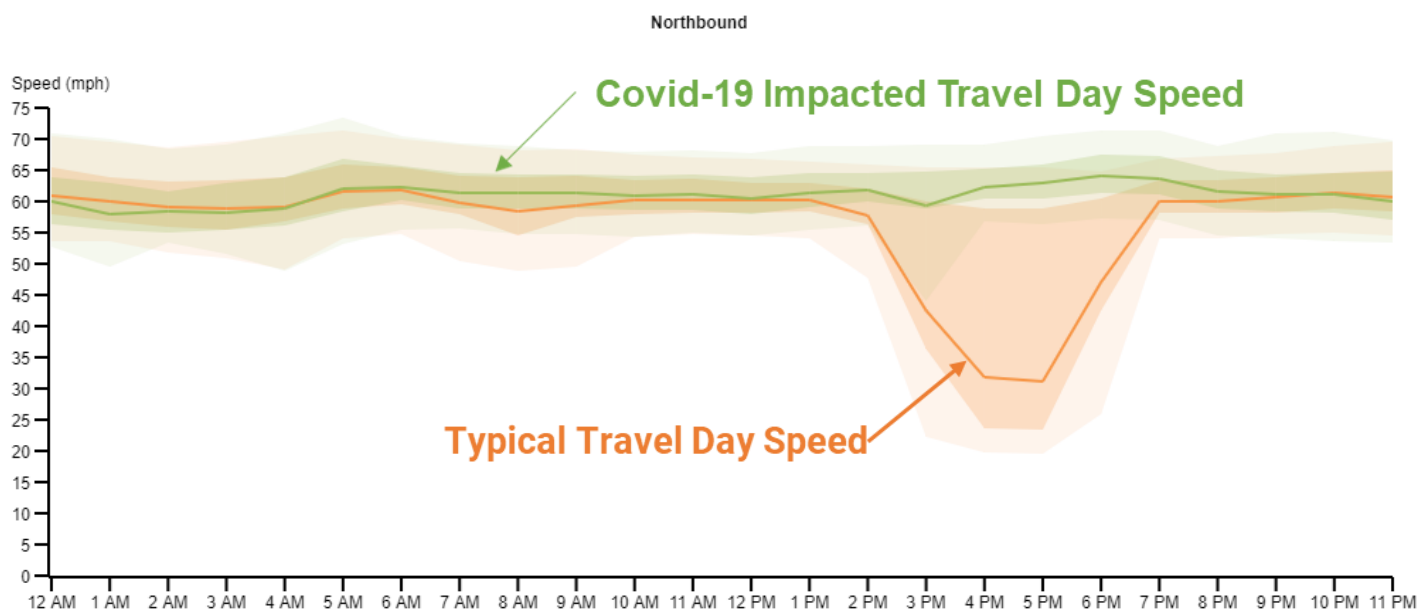


Notes: One of the most heavily traveled corridors in the region with major entrances to I-95 in short proximity from each other near downtown Baltimore and merging to enter the 2 tunnel portals. Traffic flow tends to improve once inside the tunnel only to begin again when exiting and drivers go through the toll facility. These conditions are more prominent in the PM peak.

#3 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-95 N @ FORT MCHENRY TUNNEL	377	1 h 07 m	411	72,090

Speed for I-95 Northbound between MD-295/Baltimore Washington Pkwy/Exit 52 and Fort Mchenry Tunnel
Averaged per hour for January 01, 2020 through March 15, 2020 and March 16, 2020 through March 31, 2020

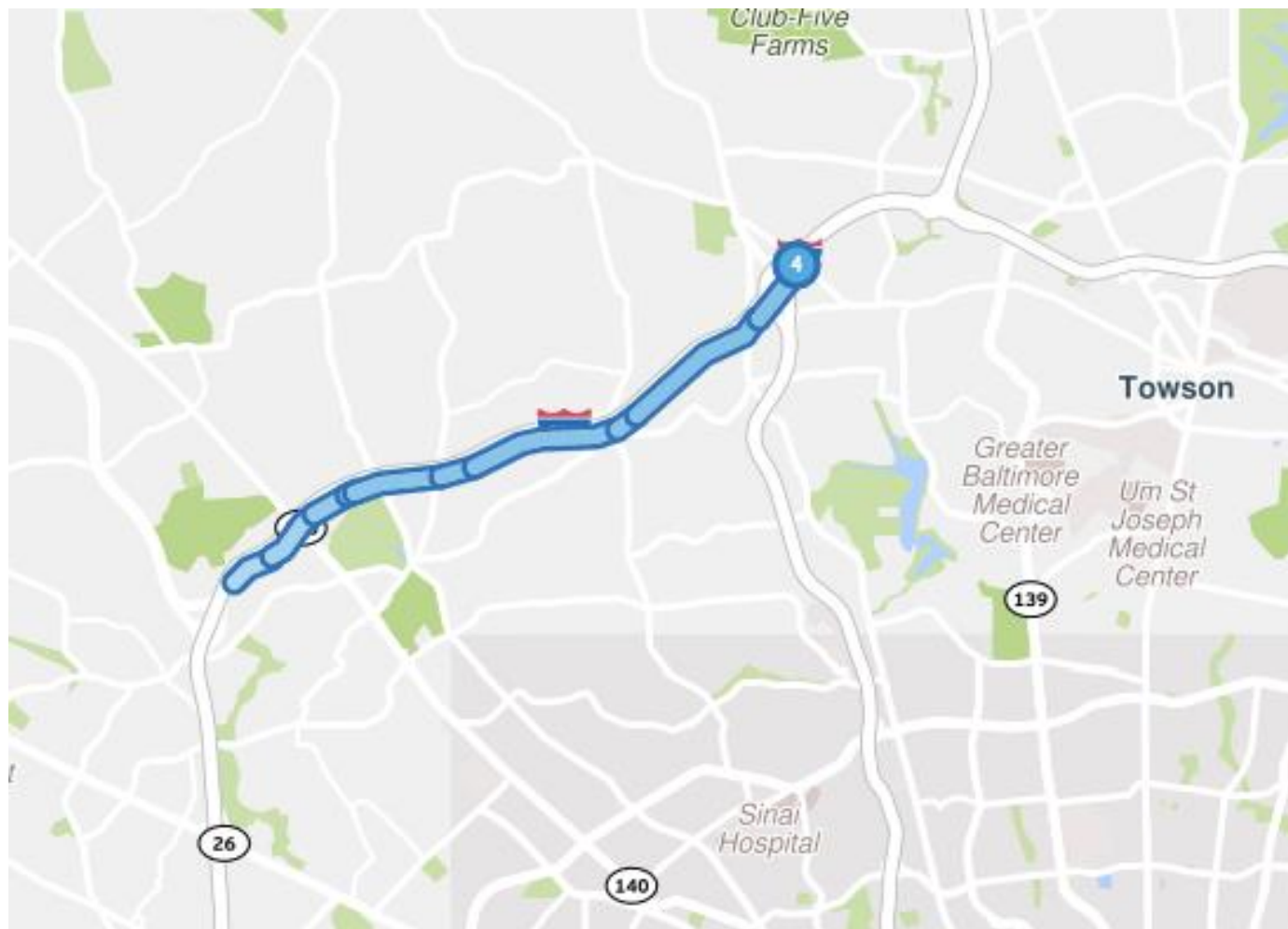


Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

#4 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 IL @ I-83/MD-25/EXIT 23	3.37	51 m	146	97,599



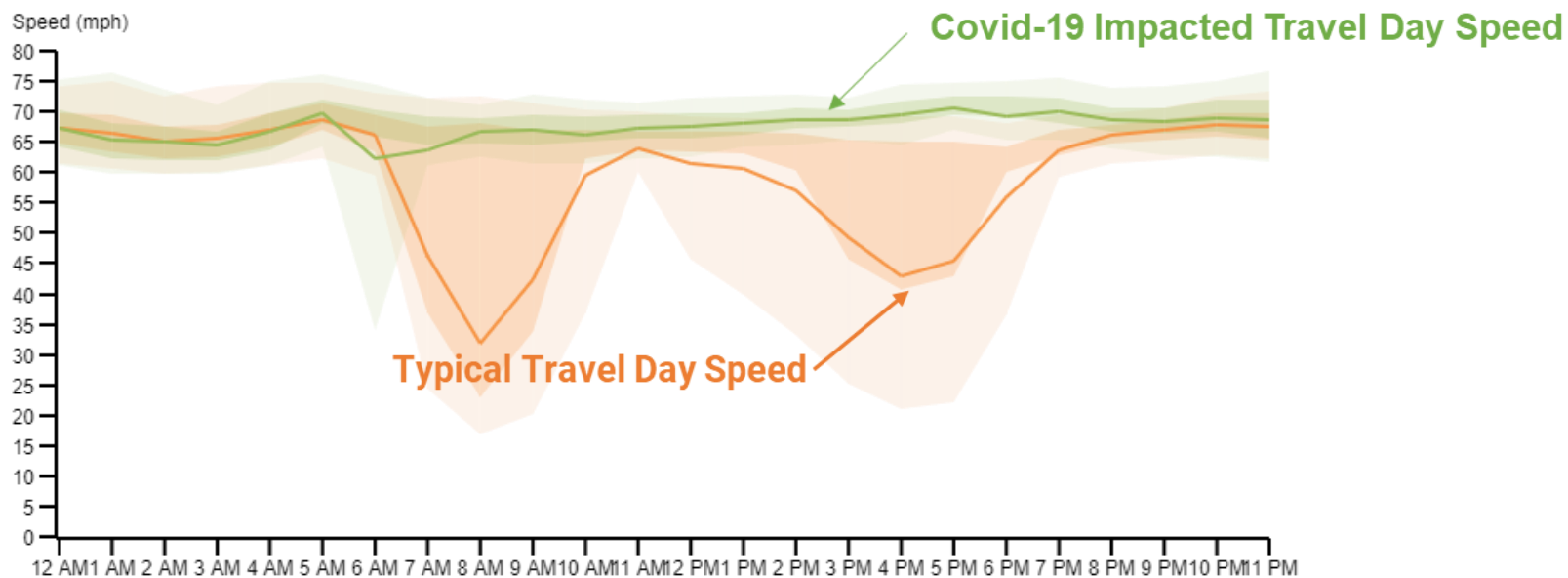
Notes: Rush hour congestion more severe during the AM peak period. The lane drop approaching the ramp to southbound I-83 is a contributing factor, as are merging and weaving at the interchanges in this segment

#4 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 IL @ I-83/MD-25/EXIT 23	3.37	51 m	146	97,599

Speed for I-695 Inner Loop between MD-129/Park Heights Ave/Exit 21 and I-83/MD-25/Exit 23
Averaged per hour for January 01, 2020 through March 15, 2020 and March 16, 2020 through March 31, 2020

Inner Loop

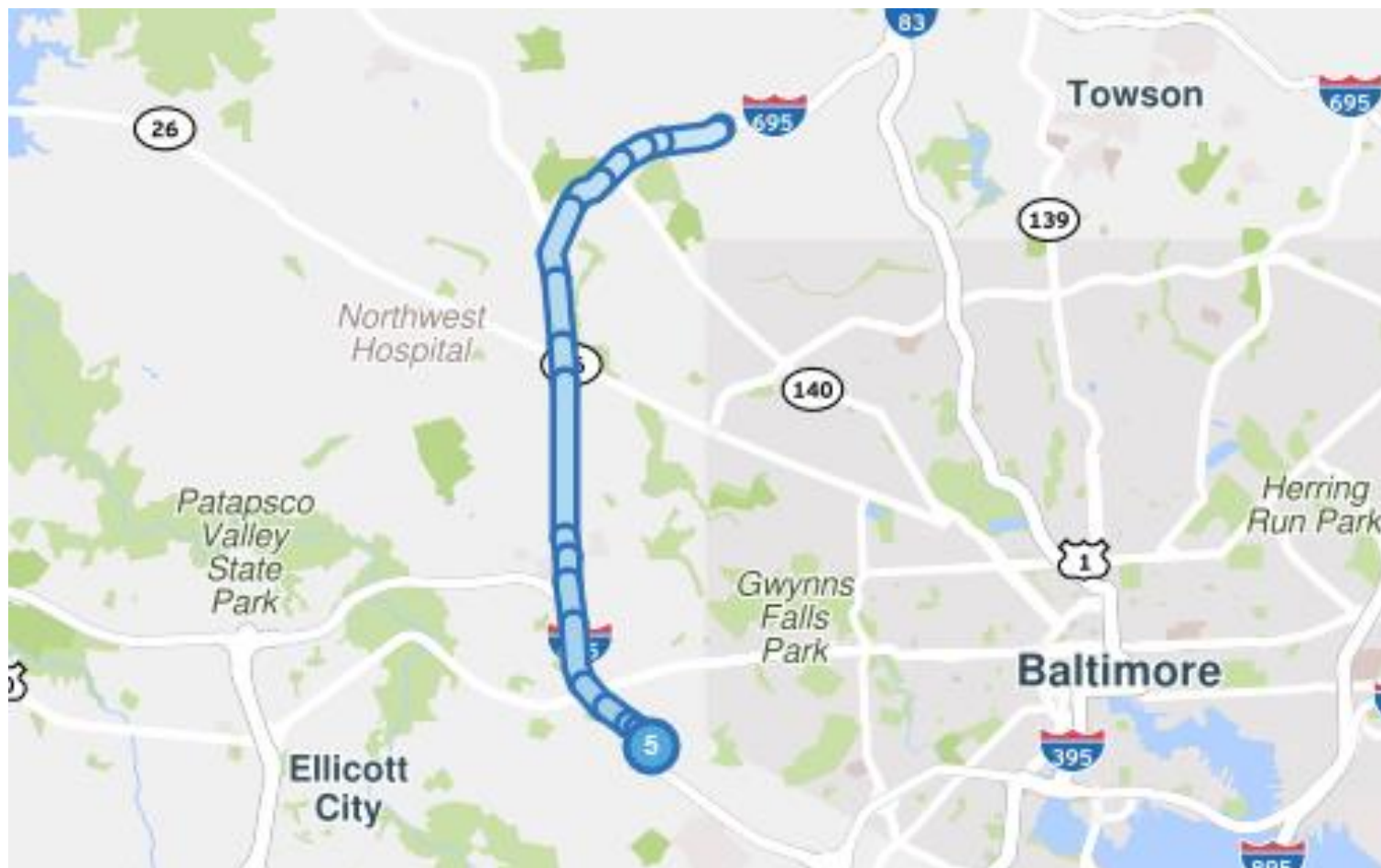


Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

#5 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 OL @ MD-144/FREDERICK RD/EXIT 13	4.70	16 m	276	112,337

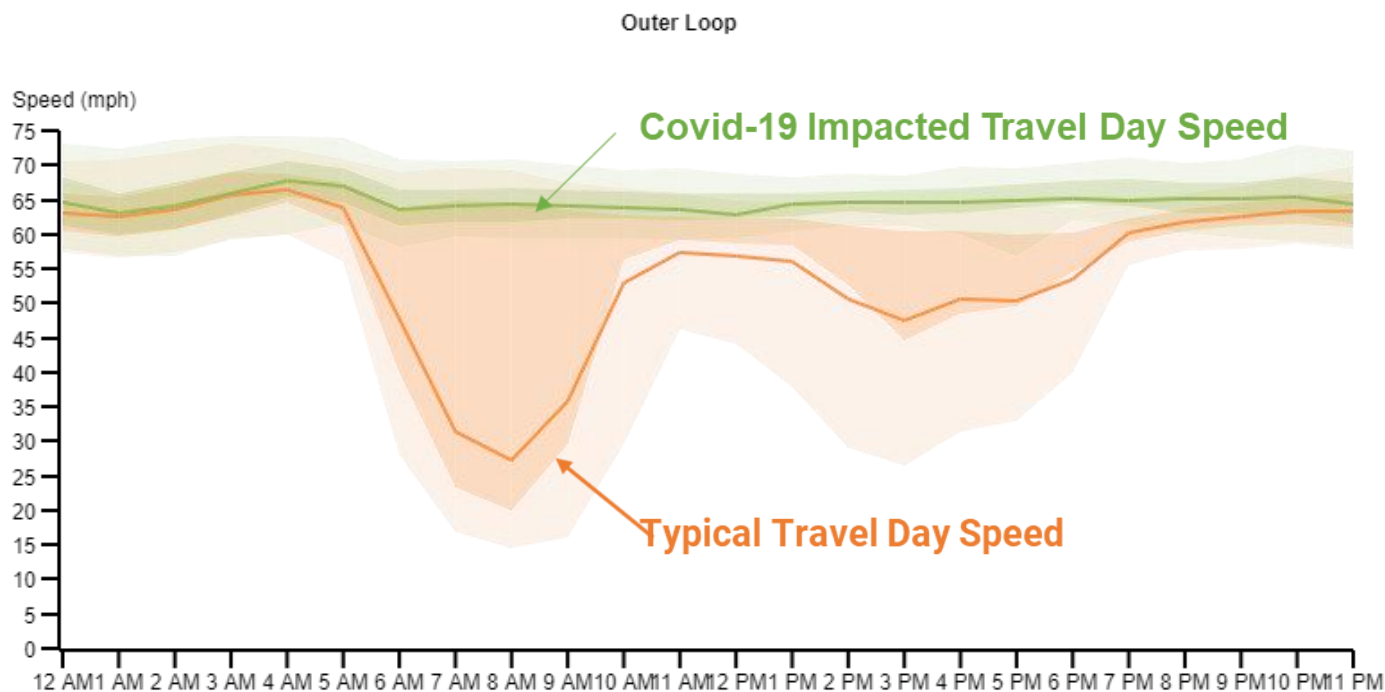


Notes: The core congestion extends from just south of US-40/Baltimore National Pike to MD-140/Reisterstown Rd in both the morning and afternoon rush hour with the AM rush being more severe. A beltway widening project is underway in the area.

#5 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 OL @ MD-144/FREDERICK RD/EXIT 13	4.70	16 m	276	112,337

Speed for I-695 Outer Loop between MD-144/Frederick Rd/Exit 13 and MD-26/Exit 18
Averaged per hour for January 01, 2020 through March 15, 2020 and March 16, 2020 through March 31, 2020

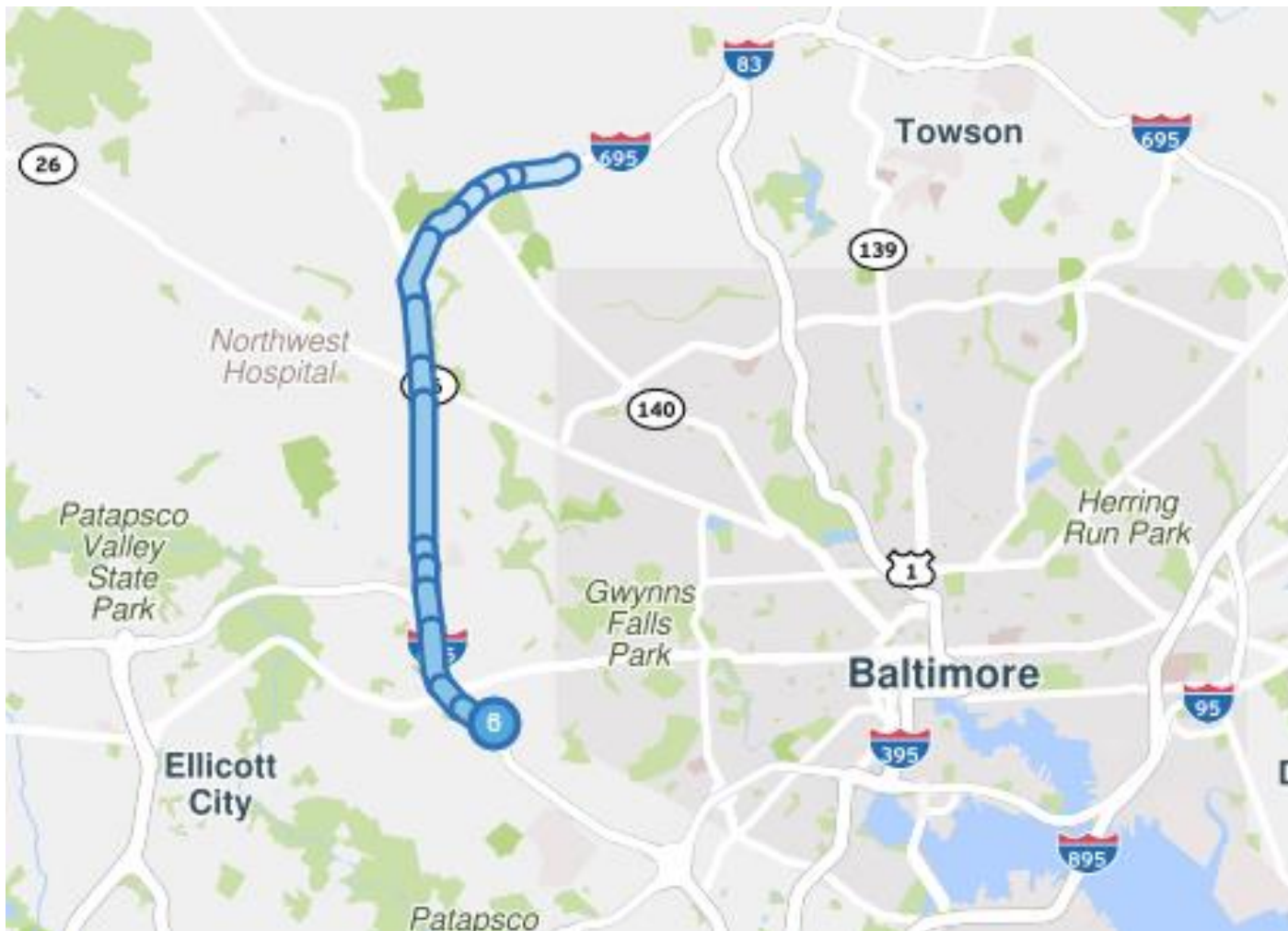


Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

#6 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

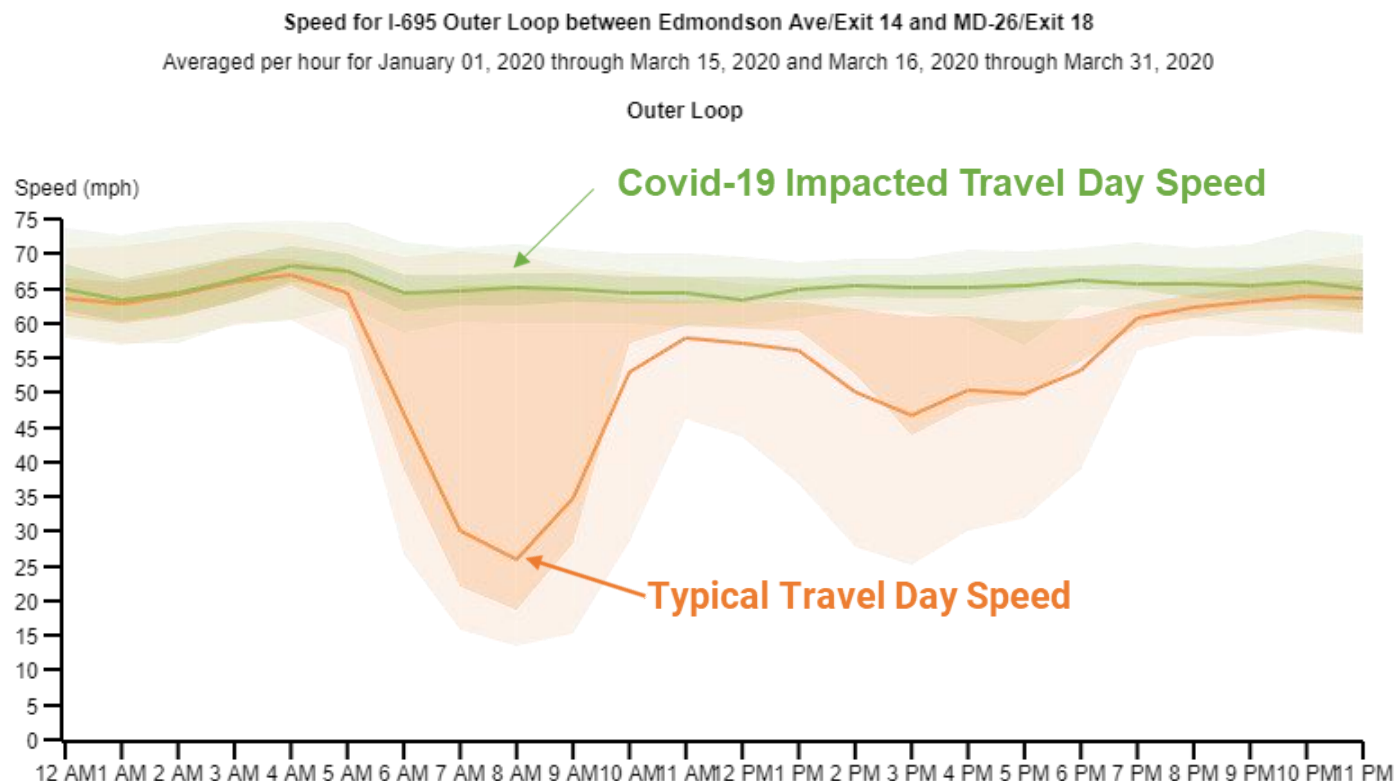
Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 OL @ EDMONDSON AVE/EXIT 14	4.67	24 m	249	101,946



Notes: See bottleneck #5. This is an overlapping bottleneck that starts in different places and is at times the #1 bottleneck in the region. Covid-19 conditions at the end of the quarter may have contributed to this split with the bottleneck head starting at different points..

#6 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 OL @ EDMONDSON AVE/EXIT 14	4.67	24 m	249	101,946

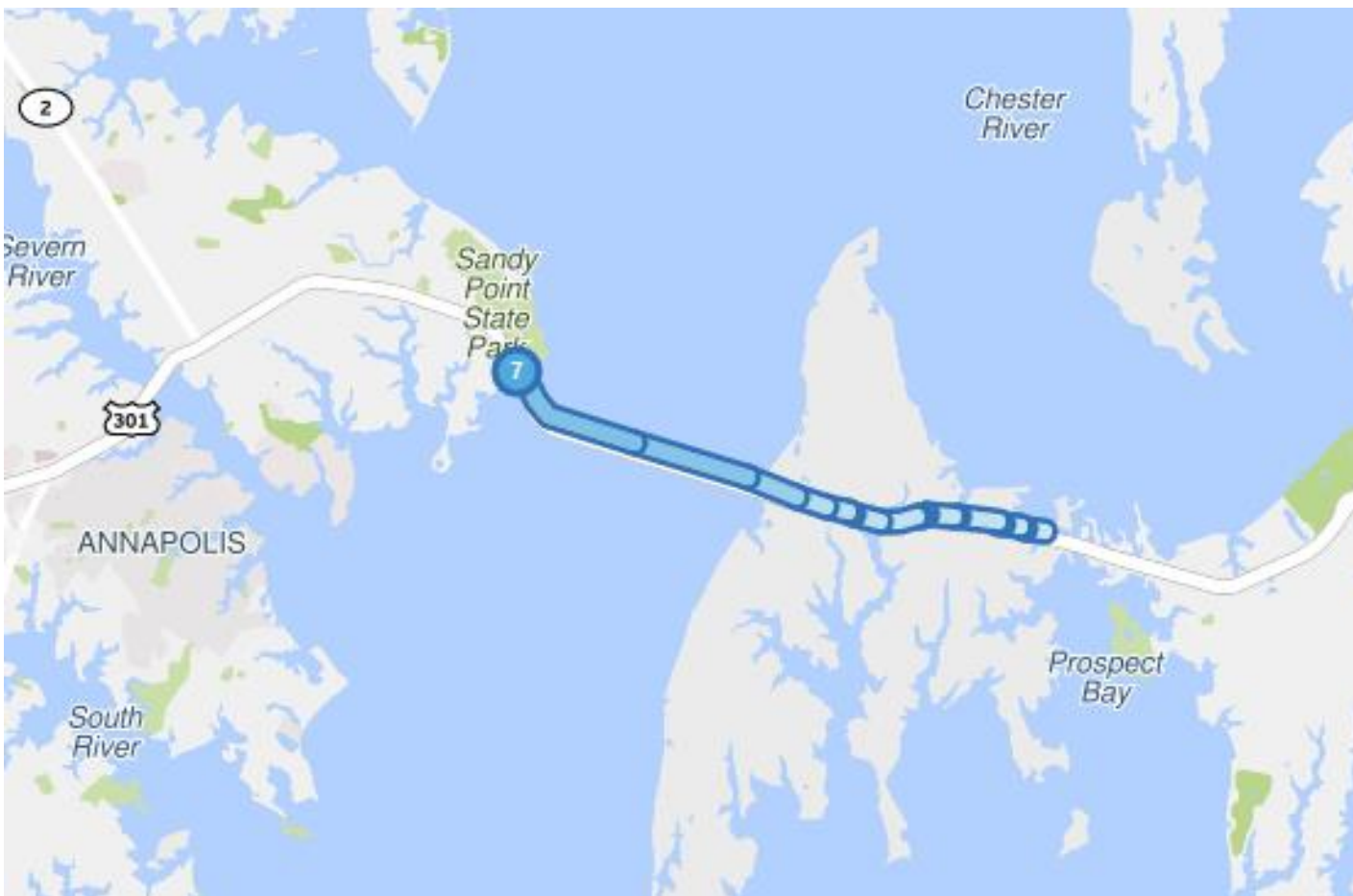


Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

#7 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
US-50 W @ BAY BRIDGE	4.30	54 m	260	36,526



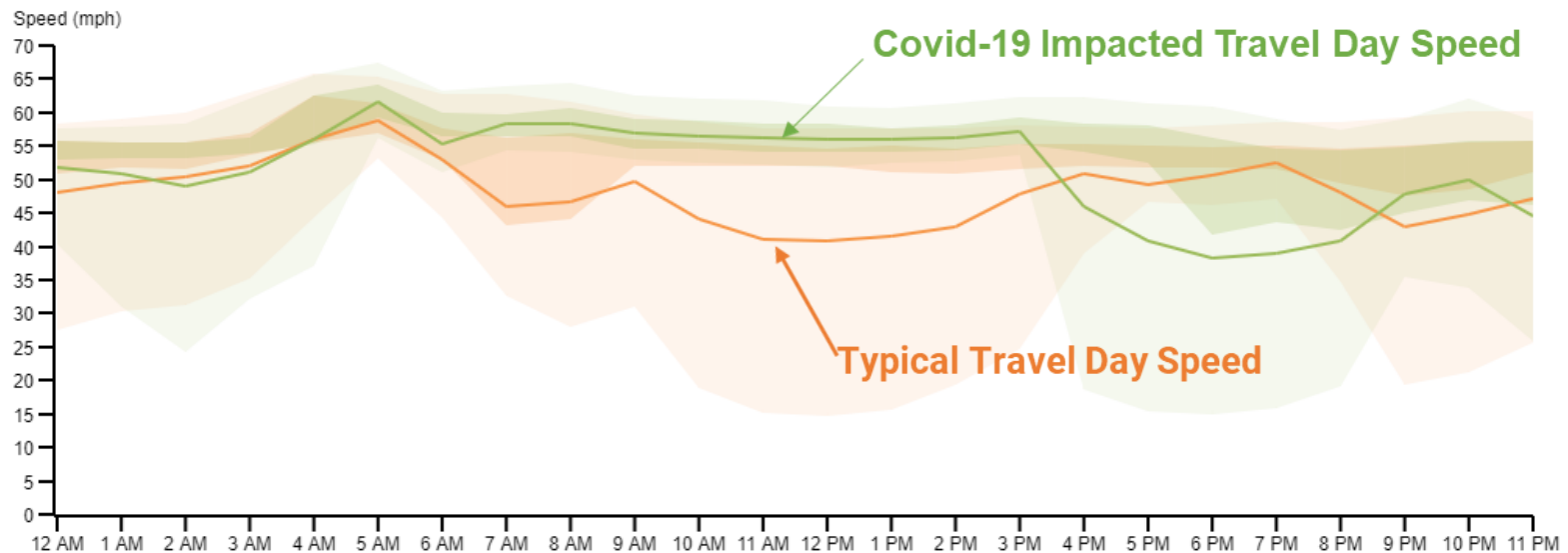
Notes: Westbound off peak shoulder and lane closures due to deck rehabilitation on the Bay Bridge. Project expected end date September 7, 2023

#7 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
US-50 W @ BAY BRIDGE	4.30	54 m	260	36,526

Speed for US-50 Westbound between MD-8/Exit 37 and William P Lane Brg Toll Plaza
Averaged per hour for January 01, 2020 through March 15, 2020 and March 16, 2020 through March 31, 2020

Westbound

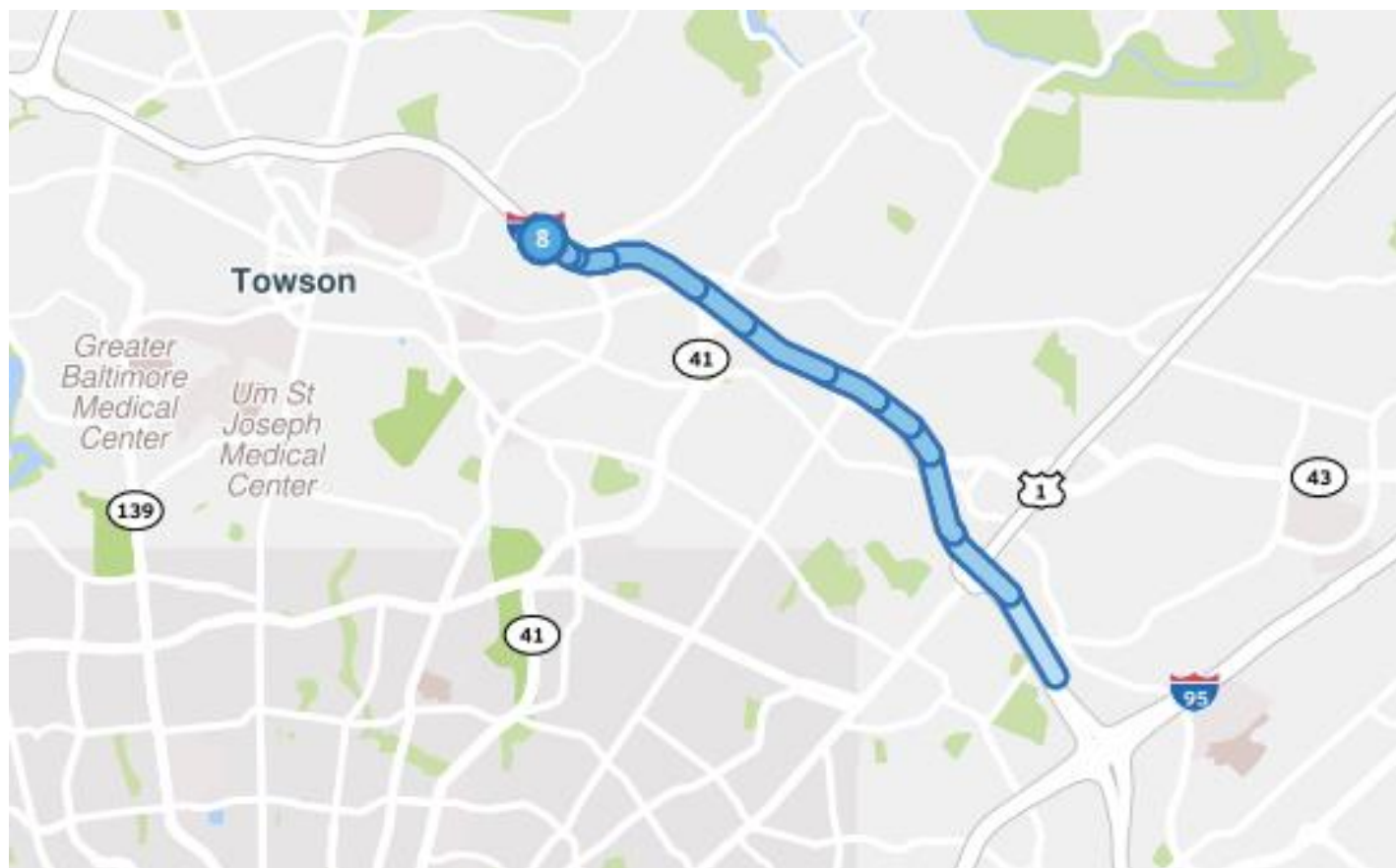


Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

#8 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 OL @ CROMWELL BRIDGE RD/EXIT 29	2.63	1 h 16 m	140	36576



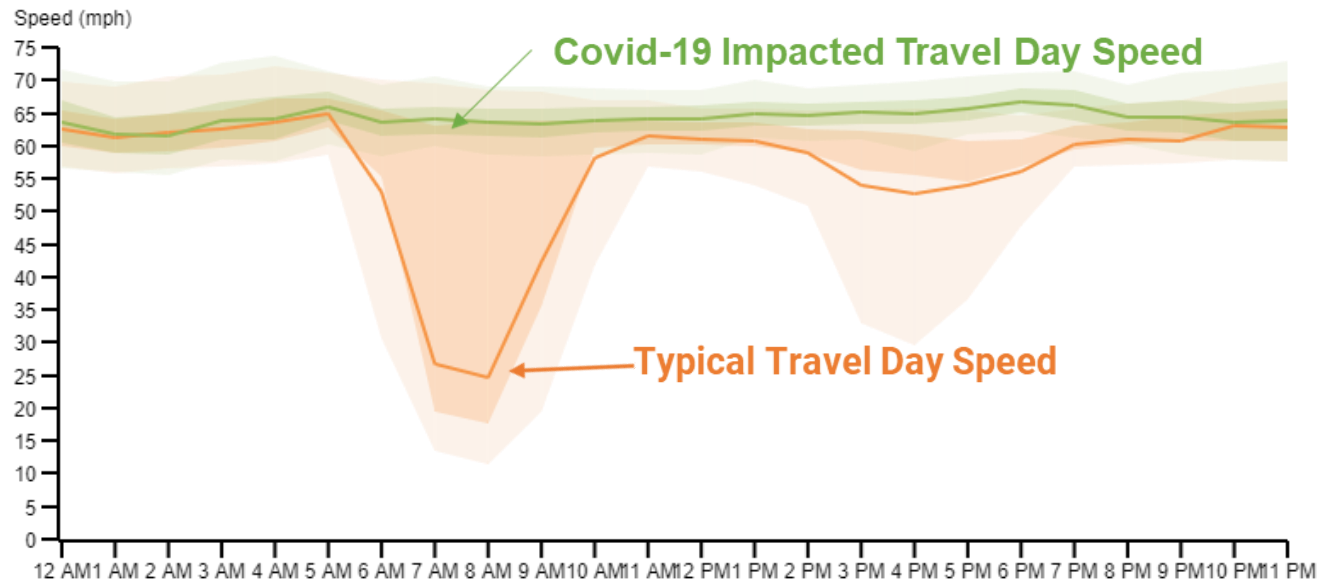
Note: Historically long term rush hour delays more severe in the AM peak period. Road geometry, traffic volume and the amount of exits and merges close together contribute to delays.

#8 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-695 OL @ CROMWELL BRIDGE RD/EXIT 29	2.63	1 h 16 m	140	36576

Speed for I-695 Outer Loop between Cromwell Bridge Rd/Exit 29 and MD-43/Whitemarsh Blvd/Exit 31
Averaged per hour for January 01, 2020 through March 15, 2020 and March 16, 2020 through March 31, 2020

Outer Loop

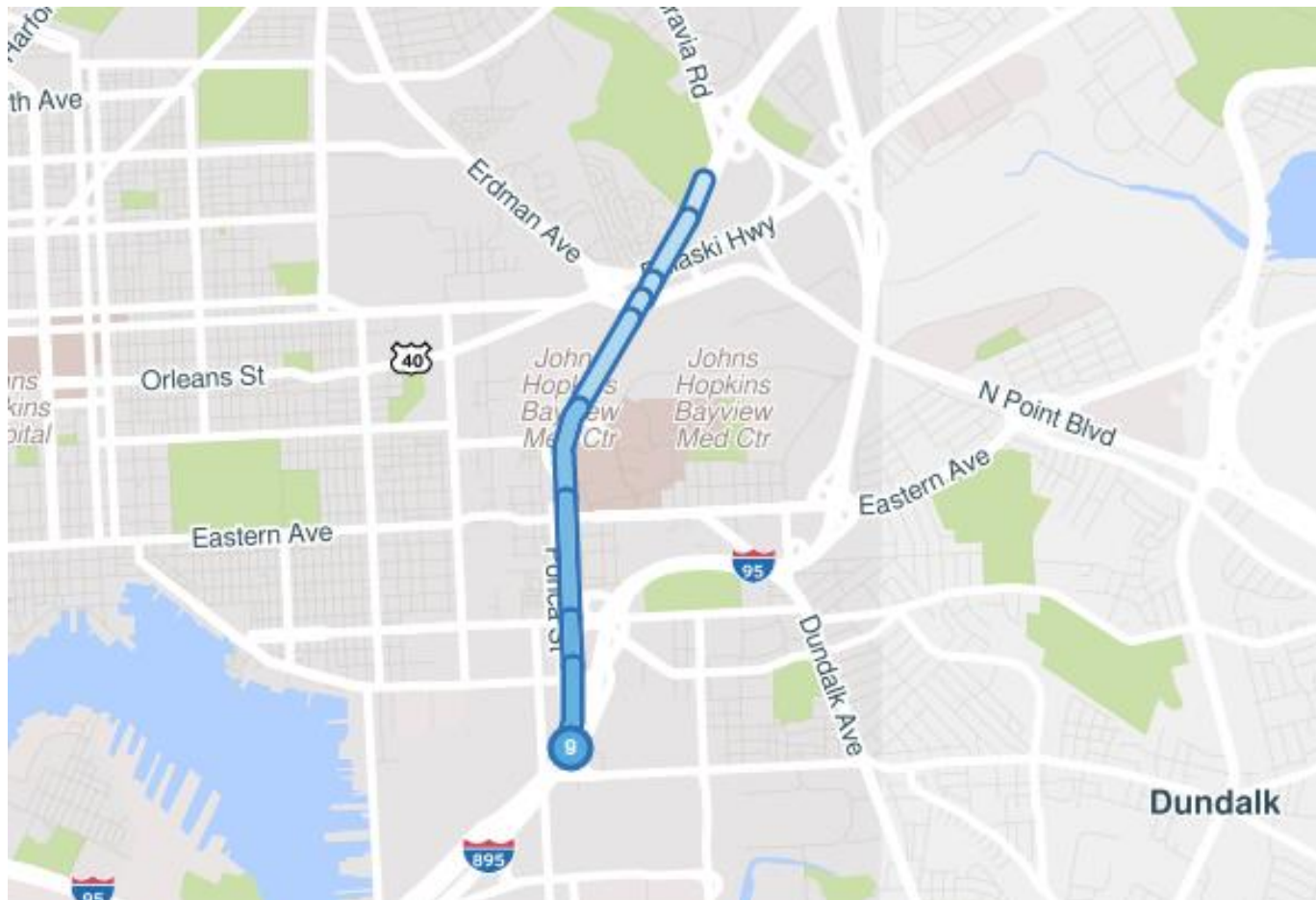


Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

#9 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-895 S @ HOLABIRD AVE/EXIT 10	1.10	2 h 4 m	59	27,914



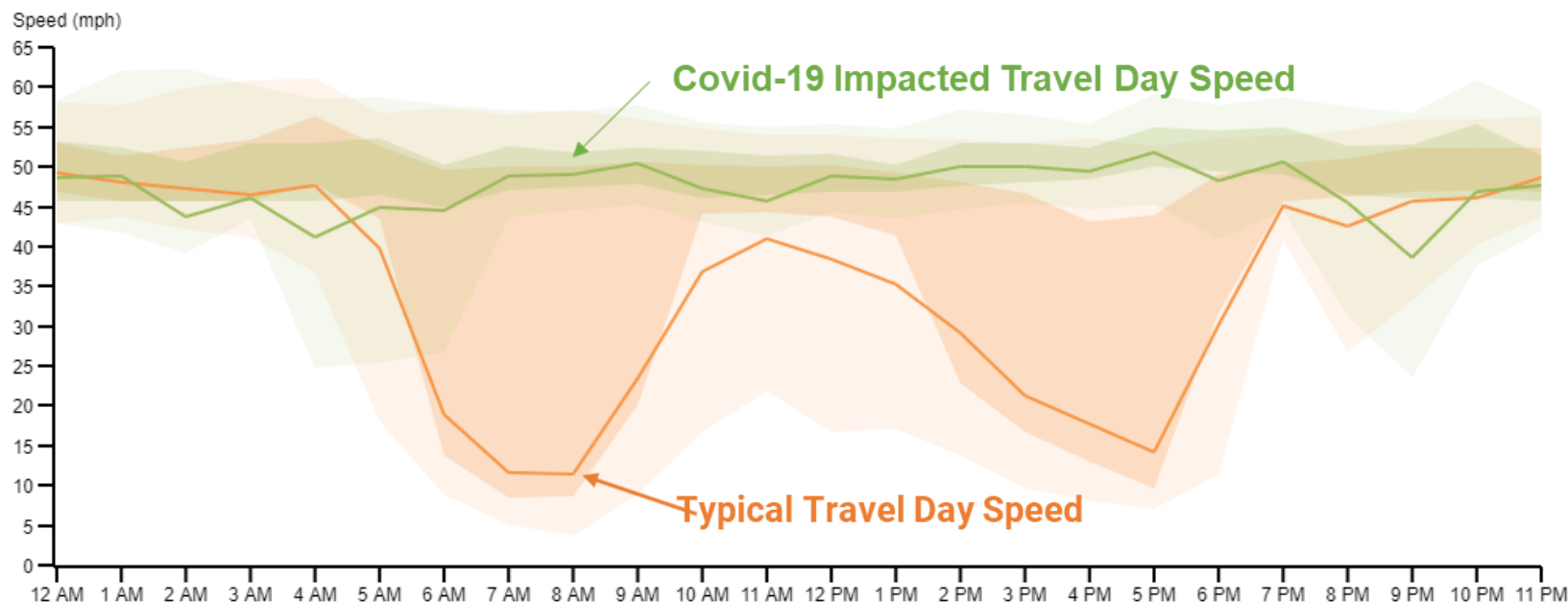
Notes: Major construction project impacting I-895 from November 2018 until summer 2021. The Northbound bore of the Harbor Tunnel is closed to traffic and the southbound bore is currently 2 way traffic. The I-895/Holabird Avenue exit ramp (Exit 10) will close completely during this time. For more information visit the MdTA at <https://mdta.maryland.gov/I-895BridgeProject/Home.html>

#9 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-895 S @ HOLABIRD AVE/EXIT 10	1.10	2 h 4 m	59	27,914

Speed for I-895 Southbound between O'donnell St/Exit 11 and Holabird Ave/Exit 10
Averaged per hour for January 01, 2020 through March 15, 2020 and March 16, 2020 through March 31, 2020

Southbound

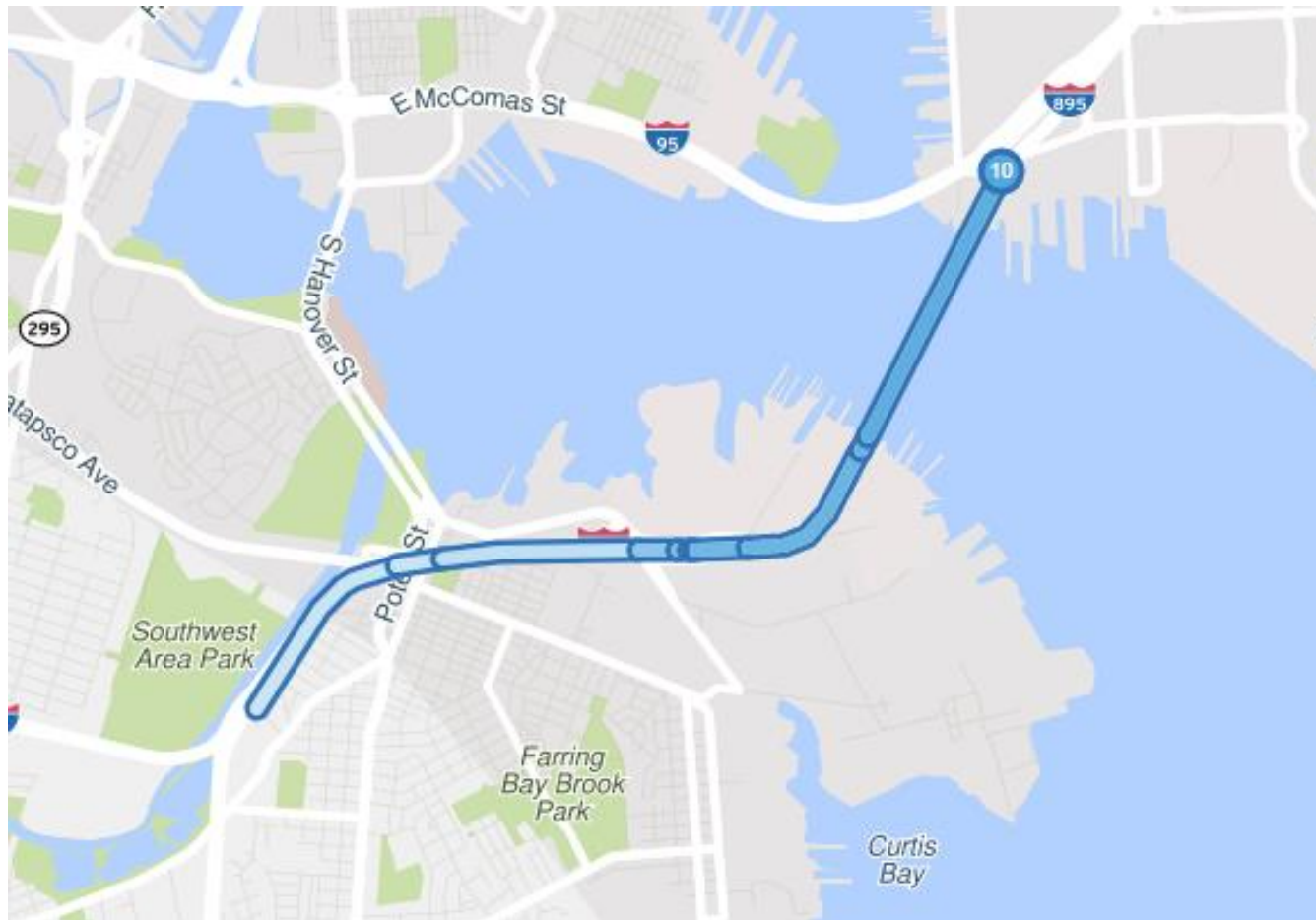


Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

#10 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-895 N @ HARBOR TUNNEL THWY (NORTH)	1.76	2 h 56 m	144	34,444



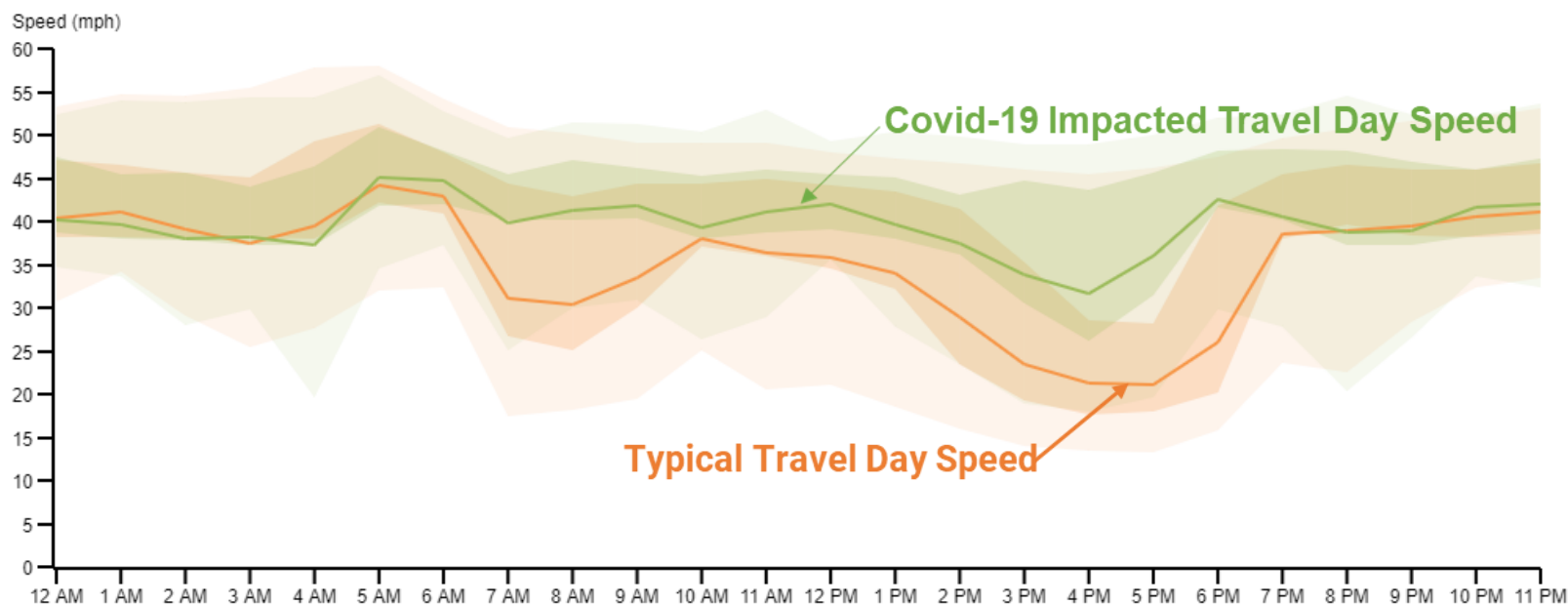
Notes: Major construction project impacting I-895 from November 2018 until summer 2021. The Northbound bore of the Harbor Tunnel is closed to traffic and the southbound bore is currently 2 way traffic. The I-895/Holabird Avenue exit ramp (Exit 10) will close completely during this time. For more information visit the MdTA at <https://mdta.maryland.gov/I-895BridgeProject/Home.html>

#10 Ranked Bottleneck in the Baltimore Region – 1st Quarter 2020

Location	Average max length (miles)	Average Daily Duration	All Events/ Incidents	Volume Estimate (AADT)
I-895 N @ HARBOR TUNNEL THWY (NORTH)	1.76	2 h 56 m	144	34,444

Speed for I-895 Northbound between Childs St/Exit 9 and Harbor Tunnel Thwy (North)
Averaged per hour for January 01, 2020 through March 15, 2020 and March 16, 2020 through March 31, 2020

Northbound



Speed: The current estimated harmonic mean speed for the roadway segment in miles per hour.

- January 01, 2020 through March 15, 2020 - INRIX
- January 01, 2020 through March 15, 2020 25th and 75th percentile - INRIX
- January 01, 2020 through March 15, 2020 5th and 95th percentile - INRIX
- March 16, 2020 through March 31, 2020 - INRIX
- March 16, 2020 through March 31, 2020 25th and 75th percentile - INRIX
- March 16, 2020 through March 31, 2020 5th and 95th percentile - INRIX

Covid-19 Special Report

Maryland Closure Dates

March 16 – Schools Closed

March 19 – Closure of Malls. Gatherings limited to 10

March 23 – All non essential businesses closed

March 30 – Stay at home directive

The March 16th date is where traffic went to free flow conditions on most roadways with the exception of US-50 at the Bay Bridge and I-895 at the Harbor Tunnel Thruway due to extensive construction projects.

COVID 19

Increase in Travel Speeds from INRIX

Below is a breakdown of the percentage increase in travel speeds amid COVID-19 pandemic vs. a typical day.

City	13-Mar		20-Mar	
	8:00 AM	5:30 PM	8:00 AM	5:30 PM
Baltimore	5%	20%	17%	35%
Washington DC	6%	32%	22%	54%

COVID 19

INRIX Simulated Passenger VMT in the Baltimore region vs a control week of Feb 22-28

Week 1 (March 14-20): 29.1% drop vs 19.8% for USA

Week 2 (March 21-27): 49.2% drop vs. 41.6% for USA

Week 3 (March 28 – Apr 3): 56.2% drop vs. 46.8% for USA (13th largest drop out of 98 metropolitan areas that INRIX analyzes)

COVID 19

Traffic Volumes

Volumes in the Baltimore region generally decreased by an estimated 22% between typical travel days (3/9-3/11) and after implementing Covid-19 travel restriction days (3/16-3/18).

A [very preliminary report](#) from the Maryland Department of the Environment finds that auto traffic was down about 50% on Interstate 95 since the outbreak of COVID-19, and that harmful emissions are significantly down at a sampling of Maryland power plants.

COVID 19

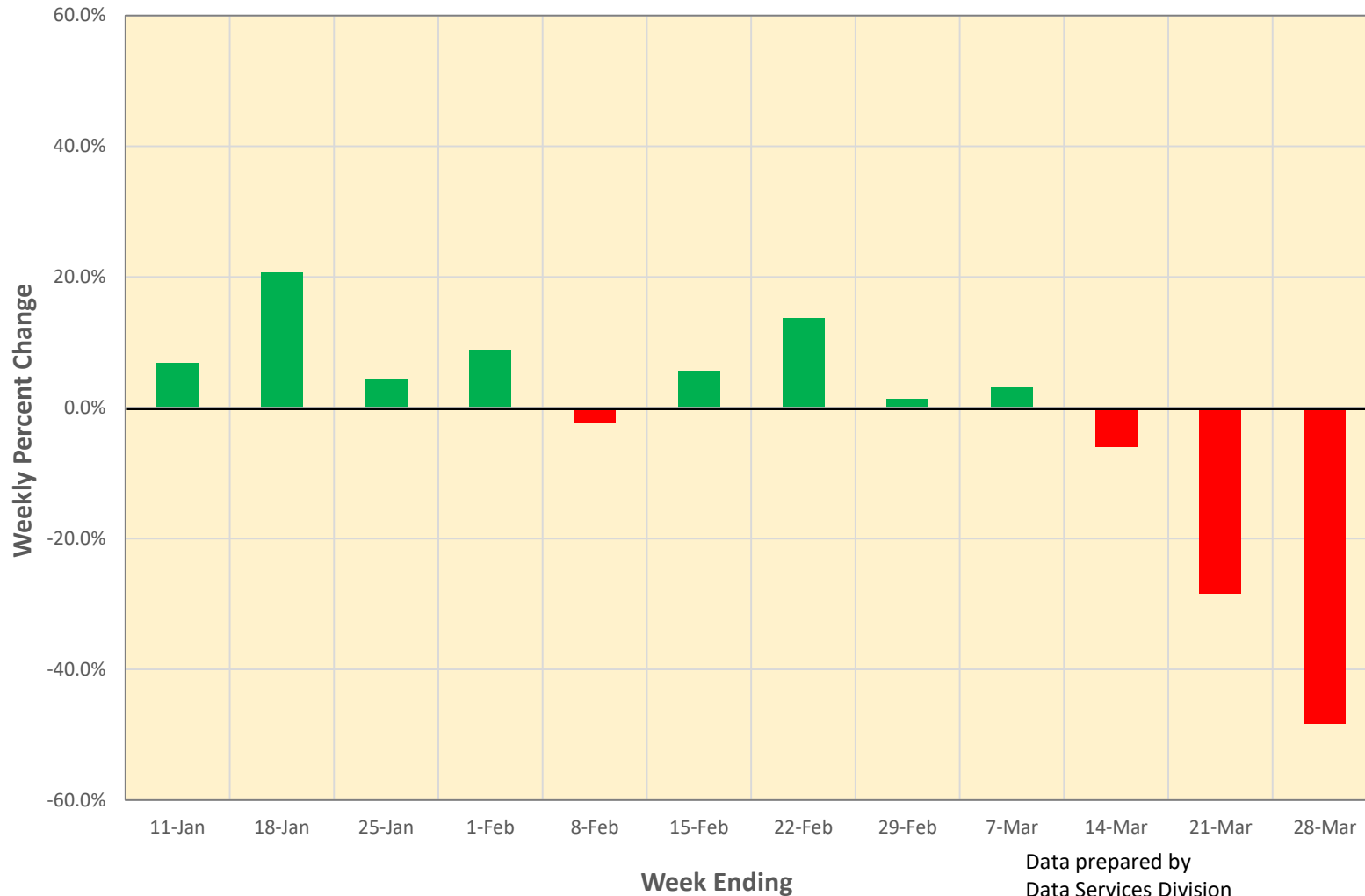
Traffic Volumes – Weekly Changes at Permanent Counters 2019 vs. 2020

Week Ending	Comparing weekly average ATR Volume 2019 to 2020 *
11-Jan	6.9%
18-Jan	20.7%
25-Jan	4.3%
1-Feb	8.8%
8-Feb	-2.2%
15-Feb	5.6%
22-Feb	13.7%
7-Mar	3.1%
14-Mar	-6.0%
21-Mar	-28.4%
28-Mar	-48.3%

COVID 19



Weekly Changes in the Baltimore Region at Permanent Counters (ATR) from 2019 to 2020



COVID 19

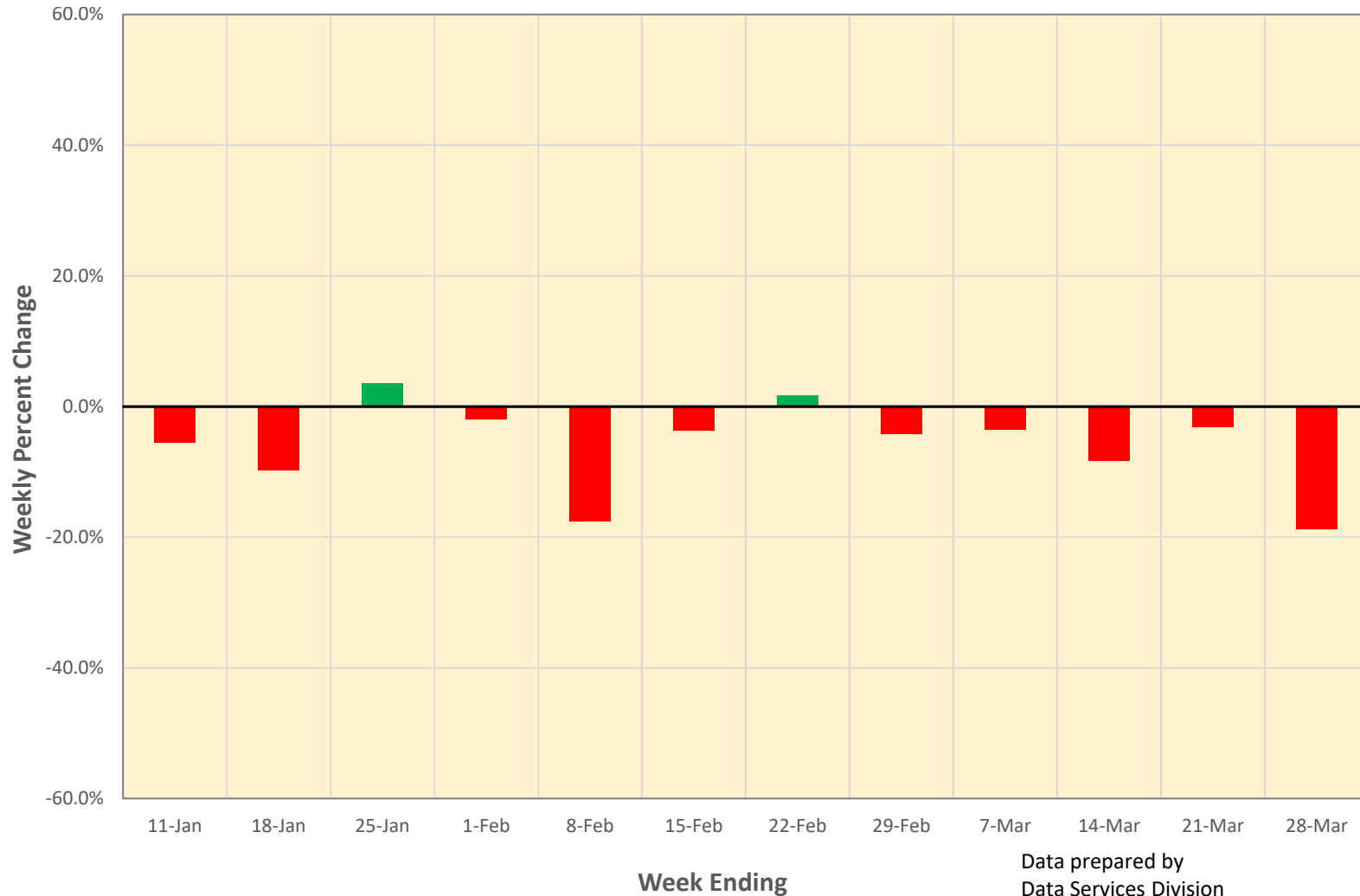
Truck Volumes – Weekly Changes at Permanent Counters 2019 vs. 2020

Week Ending	Comparing weekly average Truck ATR Volumes 2019 to 2020 *
11-Jan	6.9%
18-Jan	20.7%
25-Jan	4.3%
1-Feb	8.8%
8-Feb	-2.2%
15-Feb	5.6%
22-Feb	13.7%
7-Mar	3.1%
14-Mar	-6.0%
21-Mar	-28.4%
28-Mar	-48.3%

COVID 19



Weekly Changes in Truck Volumes in the Baltimore Region at Permanent Counters (ATR) from 2019 to 2020



Trucks are FHWA Class 5-13

COVID 19

Normal traffic conditions can be considered through March 15th. However a snapshot in figure 1 and 2 show the AM and PM peak conditions in the Baltimore Region from January 1st thru March 15th weekdays to give the best possible example of our rush hour conditions.

Figure 1 – AM Peak Period Rush Hour – pre Covid 19 shutdowns January 1 – March 15th

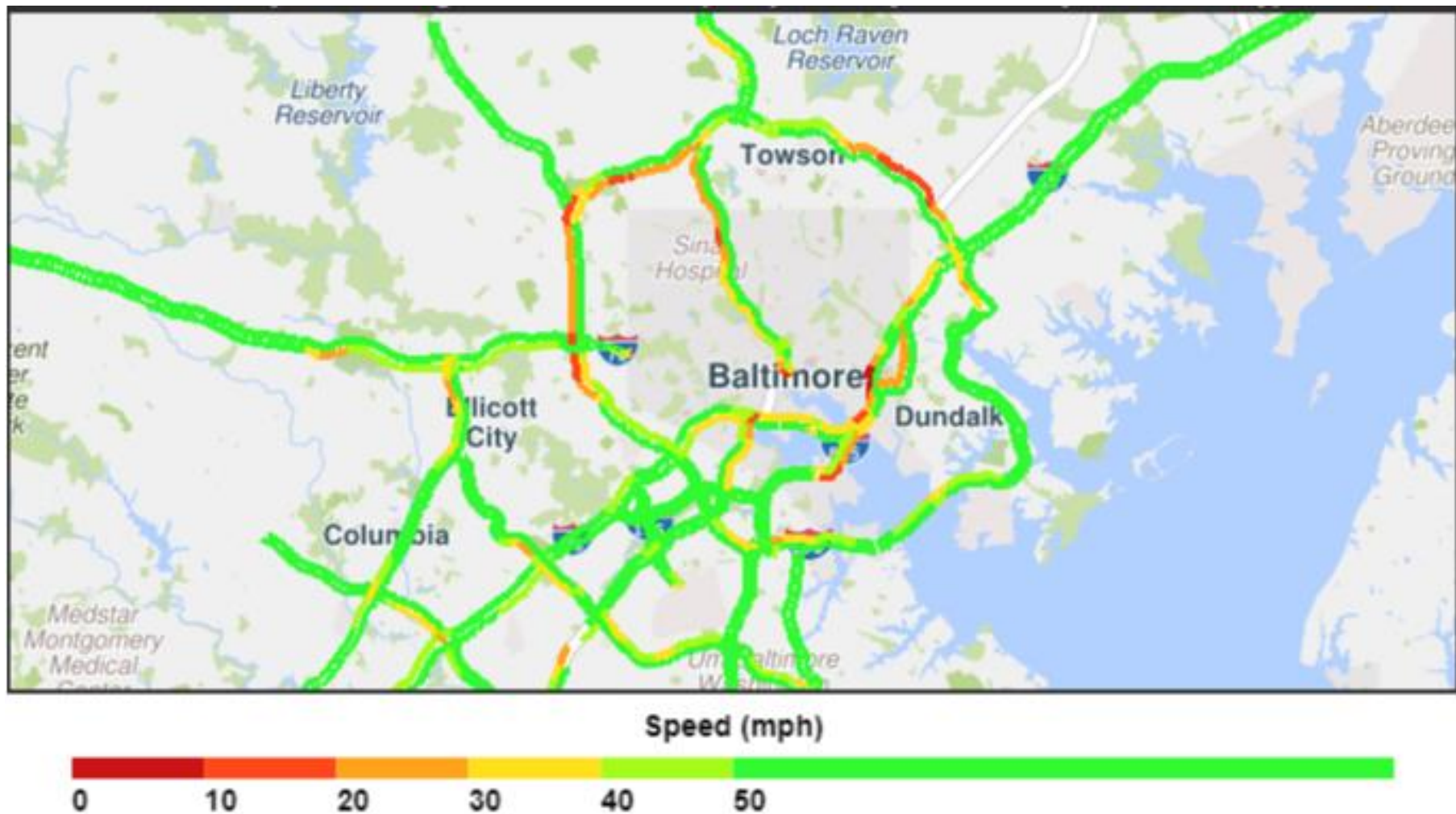
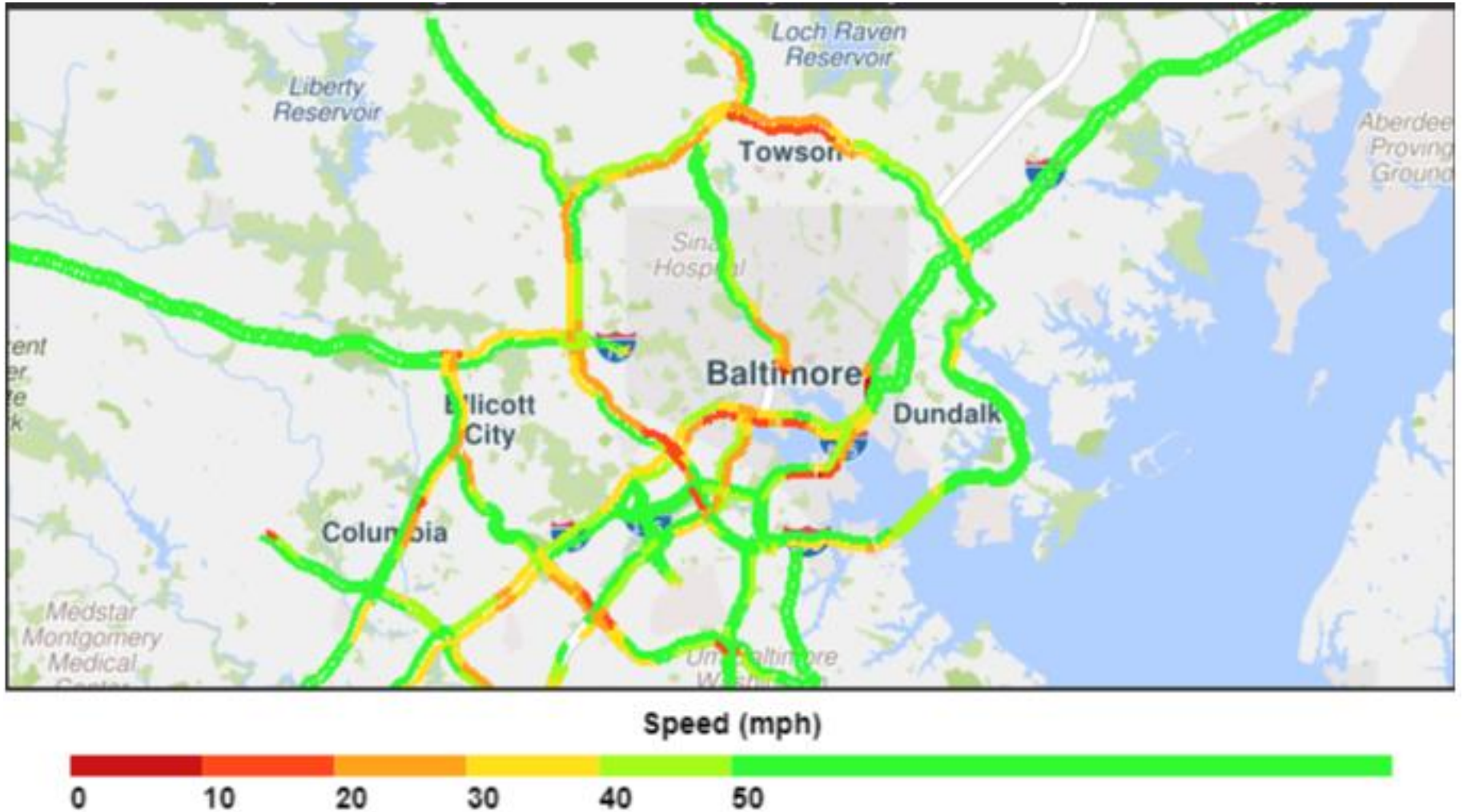


Figure 2 – PM Peak Period Rush Hour – pre Covid 19 shutdowns January 1 – March 15th



COVID 19

Due to the outbreak all Maryland schools were ordered closed by March 16th. Restaurants and bars were also ordered closed by the end of the week. Figures 3 and 4 will show the rush hour conditions after this action was taken.

Figure 3 – AM Peak Period Rush Hour – post Covid 19 shutdowns March 16th to end of month

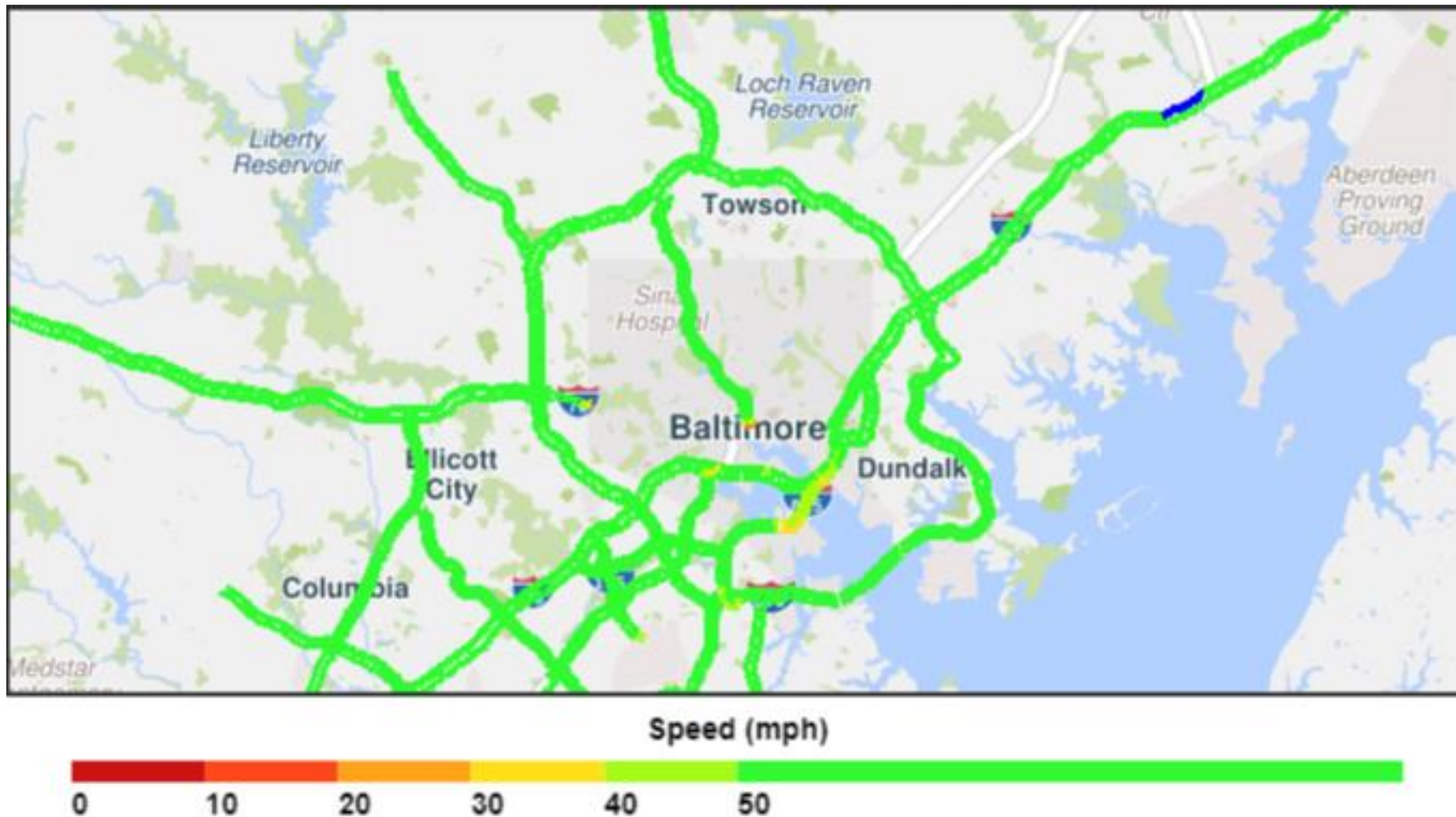
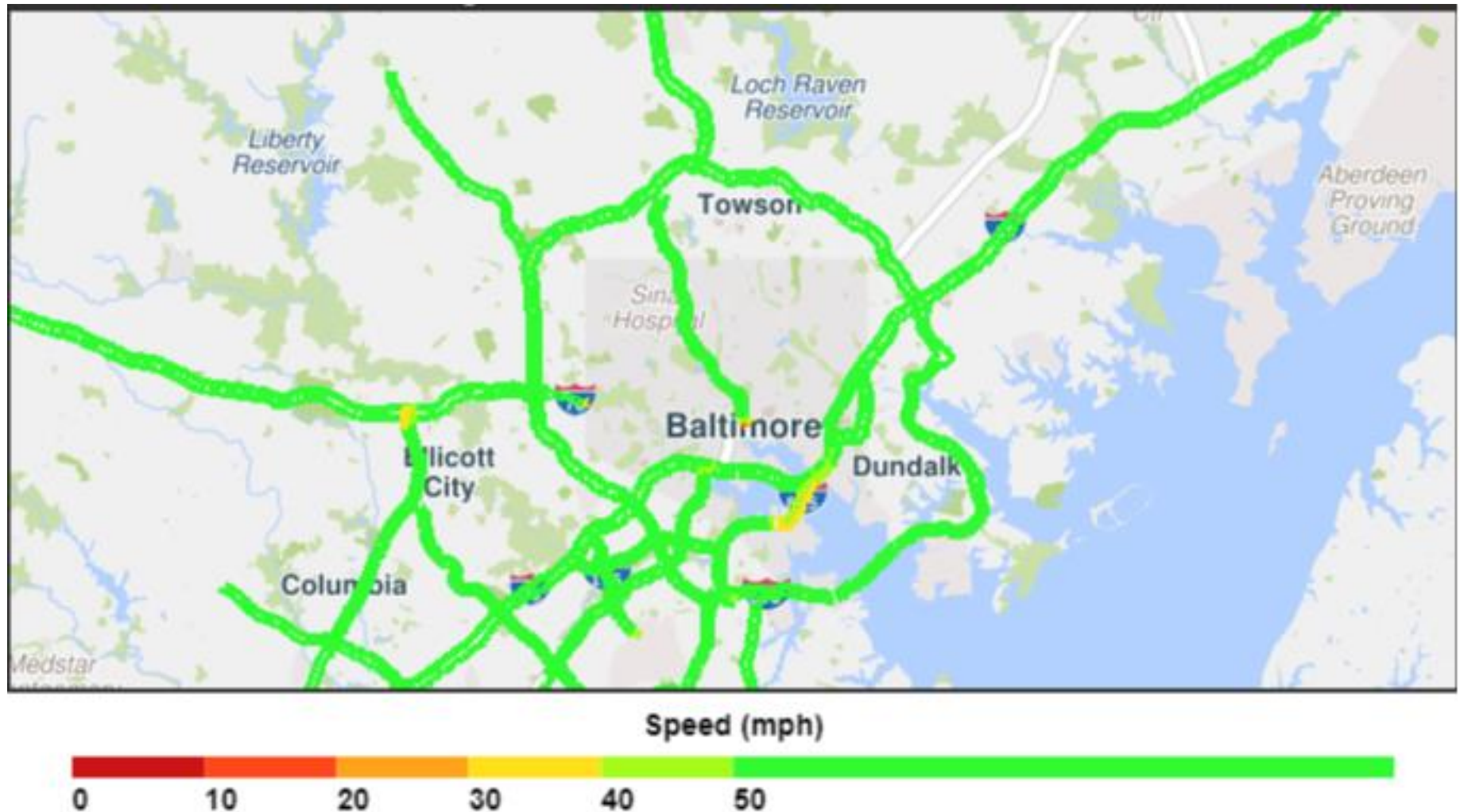


Figure 4 – PM Peak Period Rush Hour – post Covid 19 shutdowns March 16th to end of month



For More Information

Ed Stylec

Transportation Analyst

(410) 732-0500 x1031

estylec@baltometro.org

www.baltometro.org