

CONGESTION MANAGEMENT PROCESS (CMP) UPDATE

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Systems Performance, Operations, and Technology Subcommittee
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Preface

- SPOTS has been briefed regularly on the regional Congestion Management Process (CMP), most recently in May 2022 regarding the 2022 CMP Technical Report
- The TPB Technical Committee accepted the 2022 CMP Technical Report as final in July 2022 – the TPB was notified, but no briefing
- Now recommended that a CMP briefing to TPB would be opportune
 - Today’s presentation to SPOTS is a preview of what is anticipated to be presented to TPB at its April 17 meeting
 - Slated to include general information about:
 - The overall need for a CMP plus the 2022 report, and
 - The recent 12-year bottlenecks analysis



Introduction

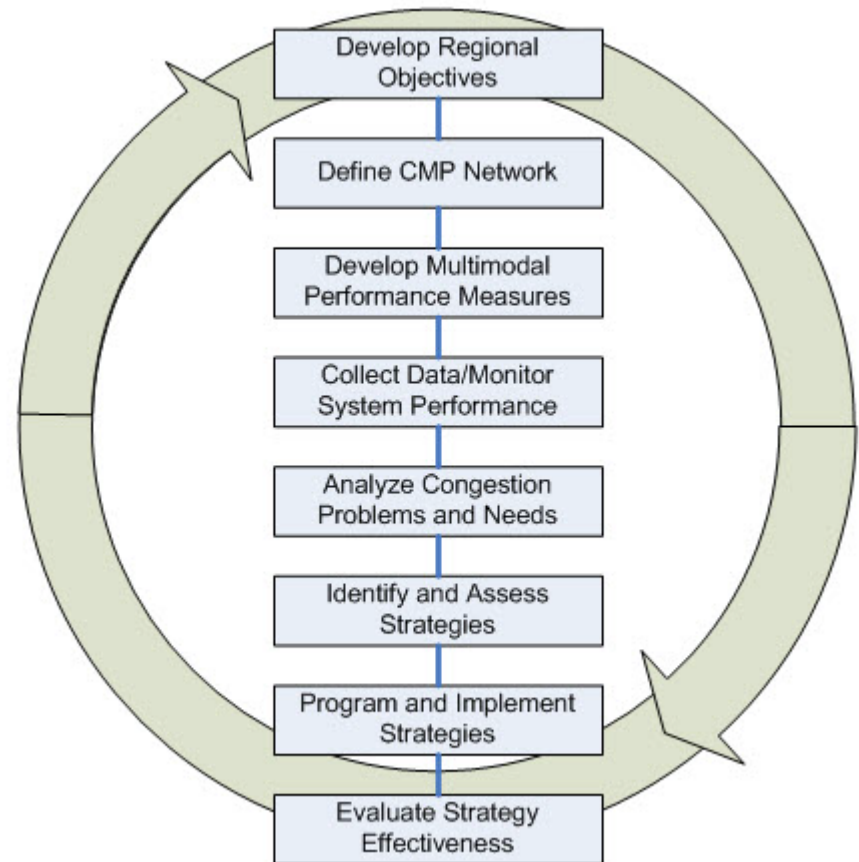
- A Congestion Management Process (CMP) is a requirement in metropolitan transportation planning
 - Many generations of federal regulations for metropolitan planning (including IJA/BIL) have maintained a CMP requirement
- Our official regional CMP component is wholly integrated into the overall long-range transportation plan (Visualize 2045)
- In addition, a CMP Technical Report has been developed as a supporting document biennially since 2008
- As an update briefing, today's presentation will look at:
 - The overall need for a CMP
 - The 2022 CMP Technical Report
 - An associated recent 12-year regional bottlenecks analysis



What Is a CMP?

The transportation planning process in a TMA shall **address congestion management through a process** that provides for safe and effective integrated management and operation of the multimodal transportation system...**through the use of travel demand reduction...job access projects, and operational management strategies.**

- Federal Register Vol. 81, No.103, pp.34152, May 27, 2016.

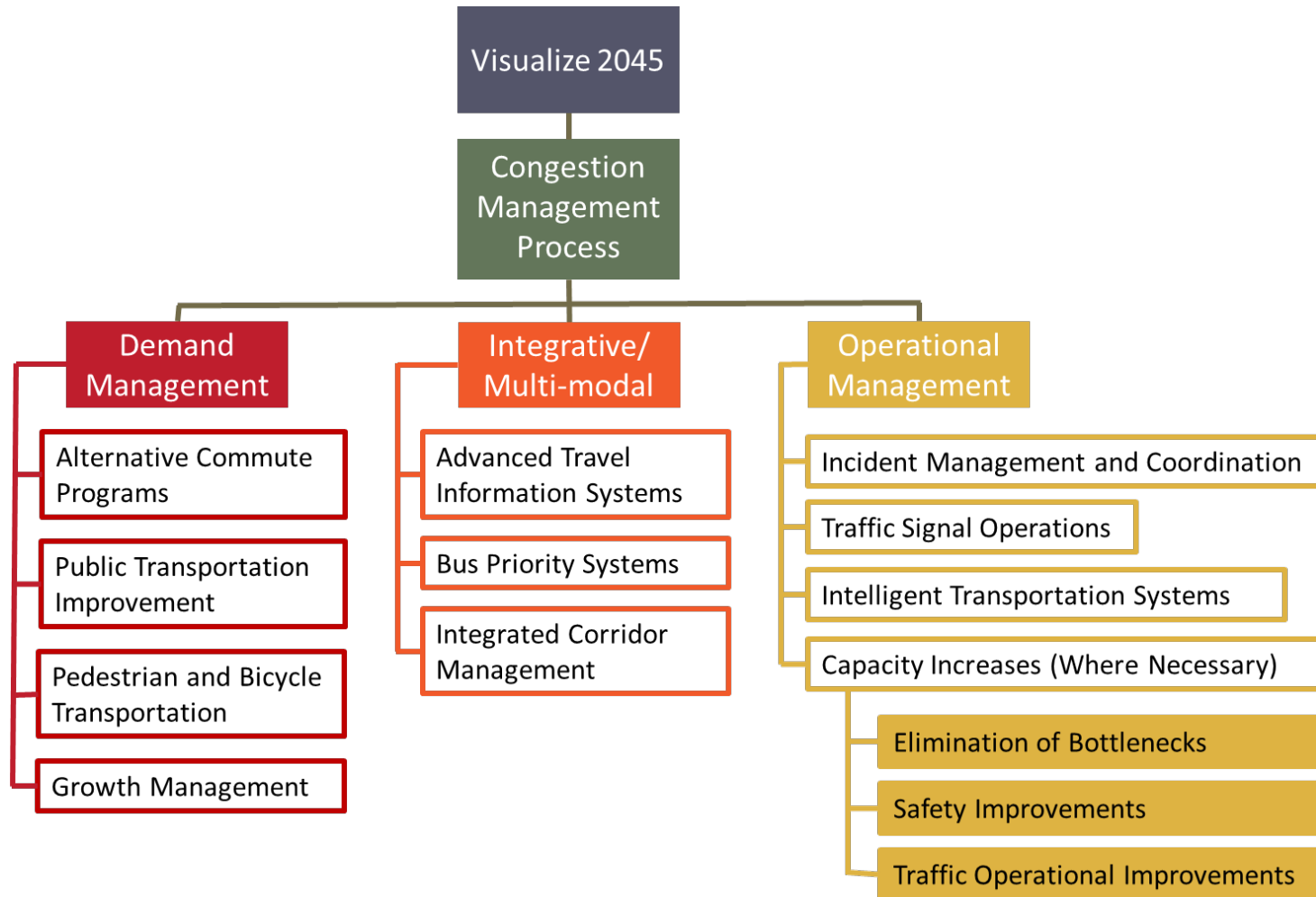


Components of the Region's CMP

1. Visualize 2045 comprises the official regional CMP
 - Chapter 8 – Planning for Performance (pp. 193-195)
 - TPB ensures that the plan includes alternatives to SOVs
 - Appendix E – Federal Compliance and Impact on Plan Development
 - The CMP informs the project selection process for the plan and TIP
2. Project-specific CMP addressed in Technical Inputs Solicitation
3. National Capital Region Congestion Reports (quarterly dashboard)
4. Biennial CMP Technical Reports



Congestion Management Strategies



Congestion Management Strategies

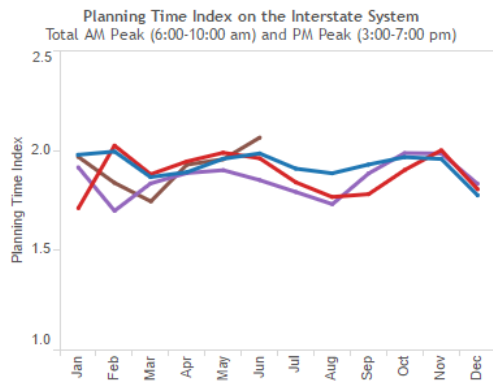
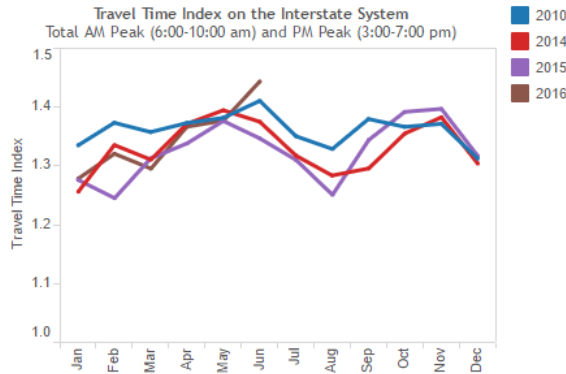


Dashboard

[Home](#) > [Transportation](#) > [Data & Tools](#) > [Congestion Dashboard](#)

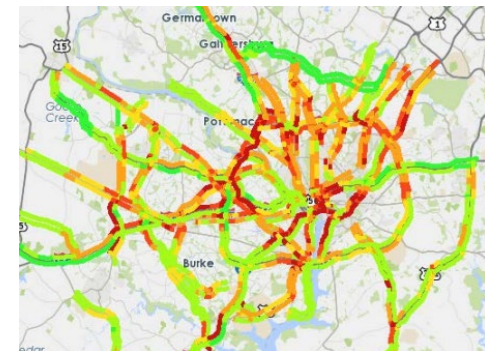
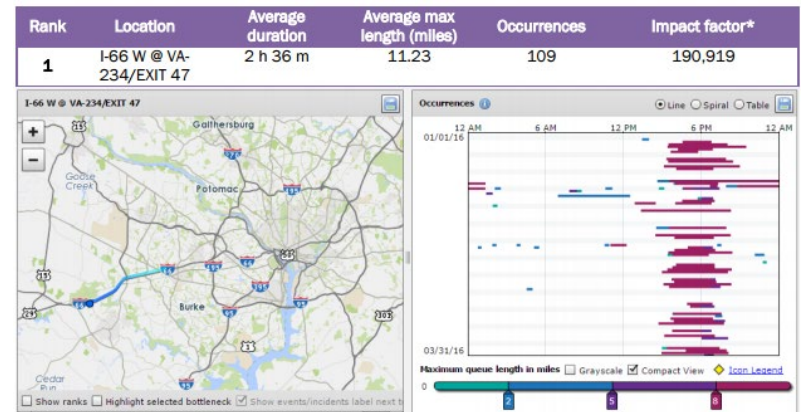
TRANSPORTATION Congestion Dashboard

Regional Trends



Quarterly updated NCR
Congestion Report at:

<https://www.mwcog.org/congestion/>



CMP Technical Report (June 2022)

CMP Technical Report serves as a background document to the official LRP/CMP, providing detailed information on data, strategies, and regional programs involved in congestion management:

Compiles information from a wide range of metropolitan transportation planning activities

Provides some additional CMP-specific analyses, particularly Vehicle Probe Project data-based analyses



CMP Technical Report Key Findings

1. Congestion analysis
2. Reliability analysis
3. Bottlenecks
4. Travel demand management continues its importance
5. Walking/biking continue to grow
6. Variably priced lanes offer travel options
7. Regional Transportation Operations Coordination (e.g. MATOC)
8. Real-time travel information
9. COVID-19 Pandemic Impacts



Report Recommendations (1 of 2)

1. Continue the Commuter Connections program
2. Continue the MATOC program
3. Continue to coordinate PBPP with the CMP
4. Encourage integration of operations and travel demand management components of congestion management
5. Pursue sufficient investment in the existing transportation system
6. Consider variable pricing and other management strategies
7. Encourage transit and explore transit priority strategies
8. Encourage congestion management during major construction projects
9. Encourage access to non-auto travel modes



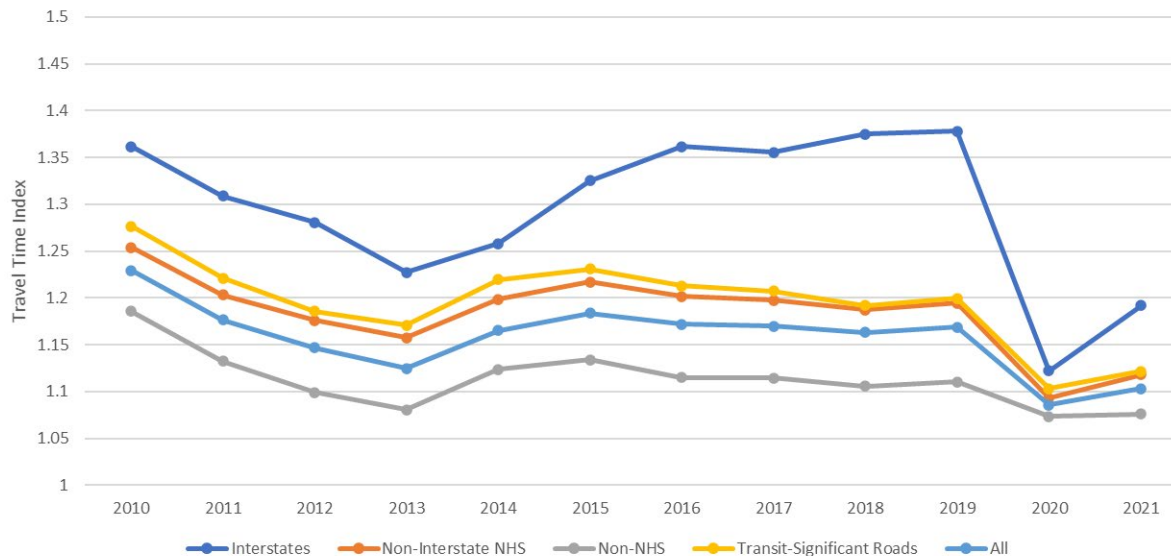
Report Recommendations (2 of 2)

10. Continue and enhance traveler information
11. Encourage implementation of projects, programs, and processes that support the TPB Aspirational Initiatives
12. Encourage connectivity within and between Regional Activity Centers
13. Continue and enhance the regional congestion monitoring program with multiple data sources
14. Monitor trends in freight, specifically truck travel
15. Participate in collaborative planning connected and autonomous vehicle readiness
16. Monitor impacts of and interactions with shared mobility services
17. Encourage Traffic Incident Management (TIM)



Peak Period Congestion

- Measured by Travel Time Index (TTI)*
- Impact of COVID-19 pandemic measures on congestion
- Even with COVID-19 impacts, Interstates remained the most congested highway category, followed by Transit-Significant roads**, non-Interstate NHS, and non-NHS.



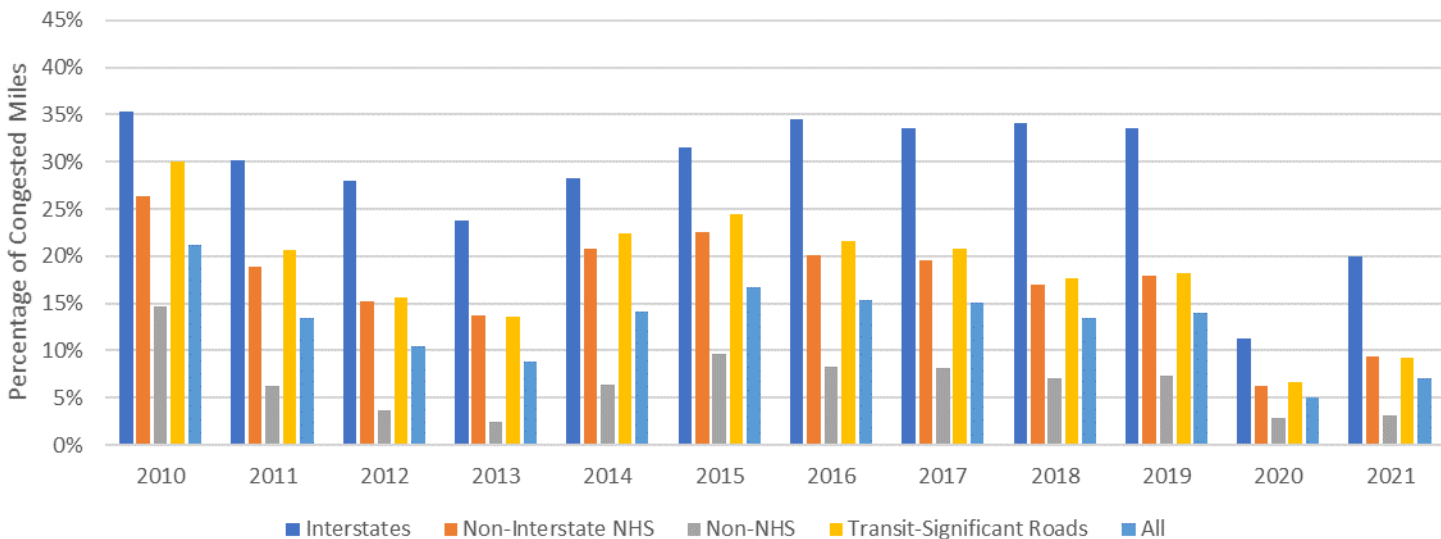
*Travel Time Index =
Actual travel time / Free flow travel time.

** Transit-Significant Roads:
Directional road segments with at least 6 buses running in the AM peak hour.



Peak Period Congestion – Percent of Congested Miles

- To capture the spatial extent of congestion*
- On average, this region observed about 7% of all monitored roads congested during peak periods in 2021, and that was a slight increase from 5% in 2020



*Congestion is considered when Travel Time Index > 1.30.



National Comparison

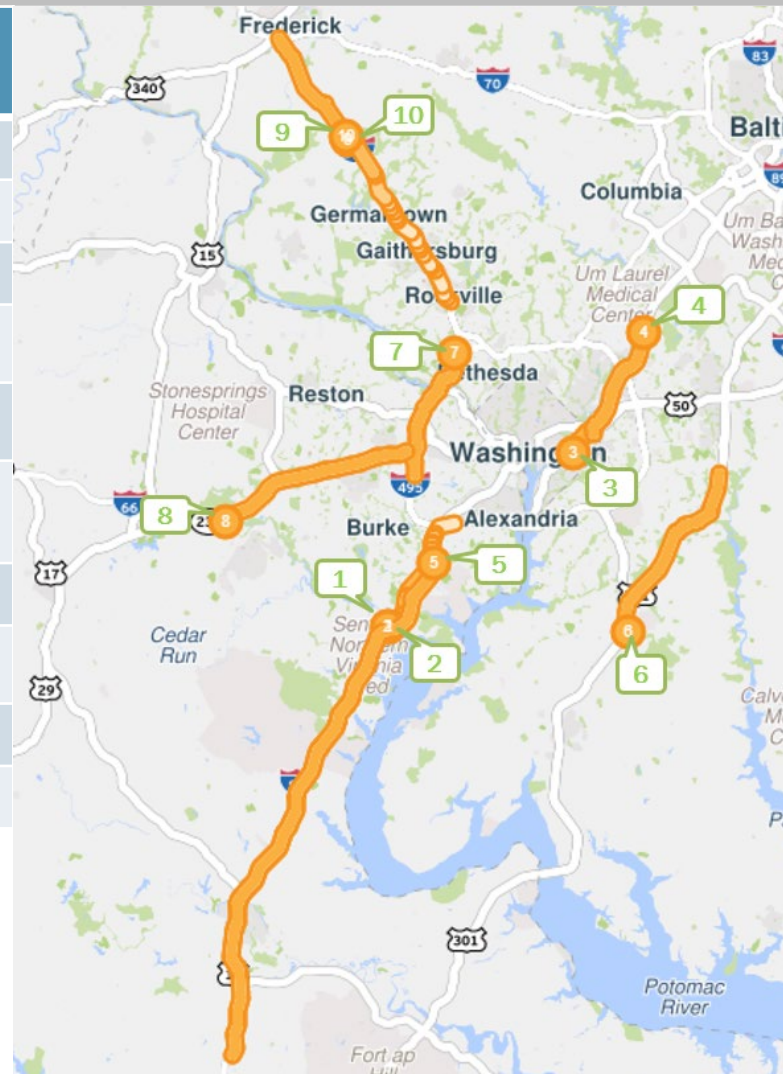
Texas A&M Transportation Institute (2020 data)			INRIX Traffic Scorecard (2021 data)			TomTom Traffic Index (2021 data)		
Annual Person-Hours of Delay per Auto Commuter			Hours Lost in Congestion			Extra Travel Time compared to Free Flow Conditions		
Metro Area	Value	Rank	Metro Area	Value	Rank	Metro Area	Value	Rank
New York	56	1	Chicago	104	1	New York	35%	1
Boston	50	2	New York	102	2	Los Angeles	33%	2
Houston	49	3	Philadelphia	90	3	Miami	28%	3
Los Angeles	46	4	Boston	78	4	Baton Rouge	27%	4
San Francisco	46	4	Miami	66	5	San Francisco	26%	5
Washington	42	5	San Francisco	64	6	Chicago	24%	6
Dallas	40	6	New Orleans	63	7	Honolulu	23%	7
Chicago	39	7	Los Angeles	62	8	Seattle	23%	7
Atlanta	37	8	Houston	58	9	Riverside	23%	7
Philadelphia	37	8	Washington	44	13	Washington	21%	8



Location of Top 10 Bottlenecks in 2021

Location	Impact factor*
I-95 S @ VA-123/EXIT 160	530,457
I-95 N @ VA-123/EXIT 160	386,481
DC-295 S @ E CAPITOL ST	278,813
B/W PKWY N @ POWDER MILL RD	255,314
I-95 N @ VA-617/BACKLICK RD/EXIT 167	216,574
US-301 S @ MCKENDREE RD/CEDARVILLE RD	196,300
I-495 IL @ I-270-SPUR	176,892
I-66 W @ VA-234/VA-234-BR/EXIT 47	159,189
I-270 S @ MD-109/EXIT 22	153,541
I-270 N @ MD-109/EXIT 22	146,933

*Base impact - the sum of queue lengths over the duration



12-Year Bottlenecks Analysis Initiation

- In July 2022, the TPB Technical Committee finalized the biennial 2022 Congestion Management Process (CMP) Technical Report
- The committee asked about one aspect of the report, the top ten bottleneck analysis for calendar year 2021
 - Staff shifted in 2022 from an in-house methodology used for previous reports to the PDA Suite Bottleneck Ranking tool, leading to questions about changed rankings
- Redoing the analysis with the previous methodology was not feasible, so staff agreed to do a multi-year analysis with the current tool to examine long-term trends
- Draft results in read-ahead materials for the December 2022 Technical Committee meeting
 - We did not anticipate it going viral...



The 12-Year Analysis

- Vehicle probe speed data (from Inrix) available in the PDA Suite back to the year 2010
- Staff performed one-year bottleneck ranking analyses for each of the twelve years of 2010 to 2021
- Looked for persistent versus short-lived bottleneck locations, comparative severity, and trends
- Examined options within the bottleneck tool for weighting by different factors (“Base Impact” confirmed as the chosen option)



History of 2021 Bottlenecks

Rankings for each individual year 2010-2021

2021 Rank	Location	Highest Rank 2010-2021	Lowest Rank 2010-2021	Number of Times in Annual Top Ten 2010-2021
1	I-95 S @ VA-123/EXIT 160	1	1	12
2	I-95 N @ VA-123/EXIT 160	2	>100*	8
3	DC-295 S @ EAST CAPITOL ST	2	>100*	7
4	BALT-WASH PKWY N @ POWDER MILL RD	2	6	10
5	I-95 N @ VA-617/BACKLICK RD/EXIT 167	5	>100*	1
6	US-301 S @ MCKENDREE RD/CEDARVILLE RD	3	31	10
7	I-495 INNER LOOP @ I-270-SPUR	2	>100*	8
8	I-66 W @ VA-234/VA-234-BR/EXIT 47	3	66	3
9	I-270 S @ MD-109/EXIT 22	9	35	2
10	I-270 N @ MD-109/EXIT 22	10	>100*	1

*Anomalously high values may indicate data glitches for a given year rather than actual conditions.

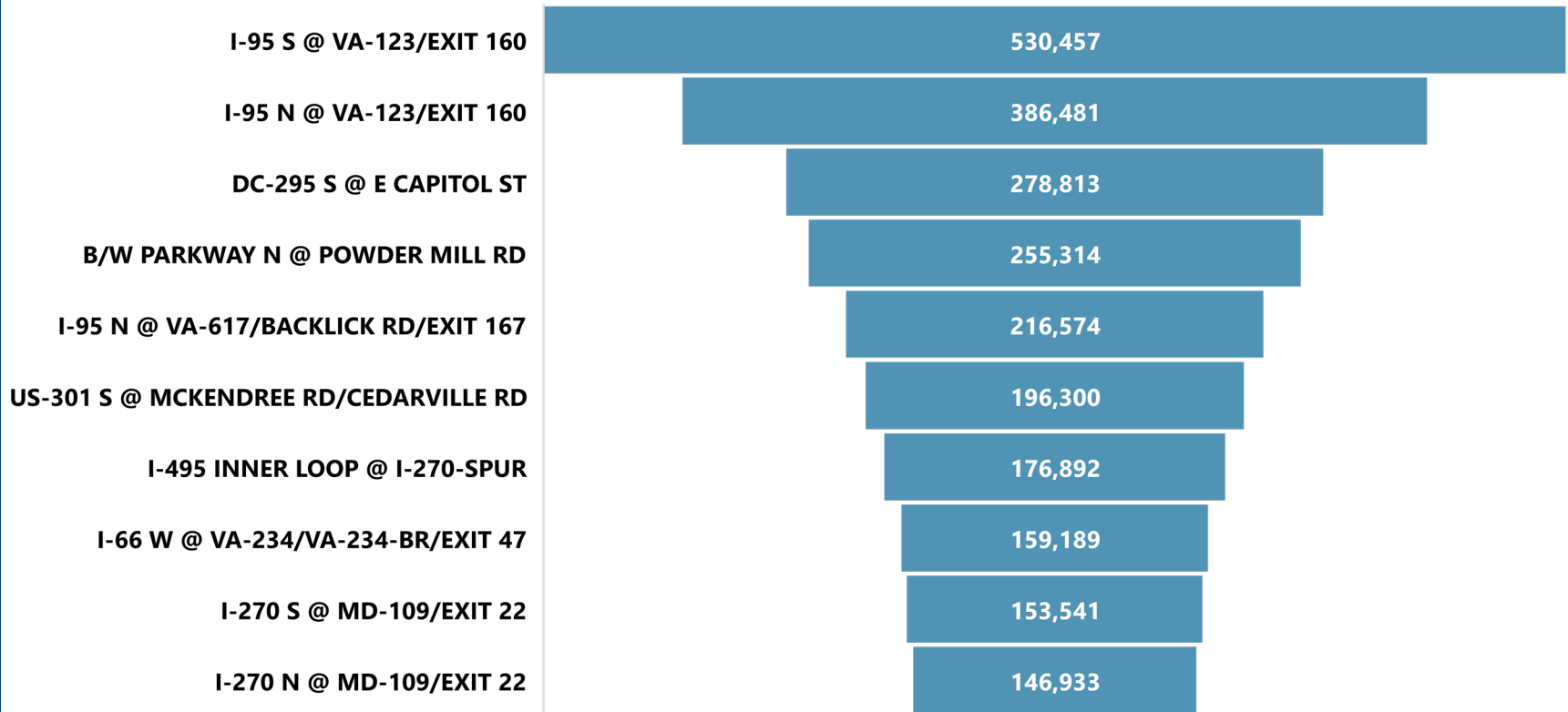


Persistent & Past Bottlenecks

Persistent Bottleneck Locations	Highest Rank 2010-2021	2021 Rank	Number of Times in Annual Top Ten 2010-2021
I-95 S @ VA-123/EXIT 160	1	1	12
BALT-WASH PKWY N @ POWDER MILL RD	2	4	10
US-301 S @ MCKENDREE RD/CEDARVILLE RD	3	6	10
I-95 N @ VA-123/EXIT 160	2	2	8
I-495 INNER LOOP @ I-270-SPUR	2	7	8
Past Bottleneck Locations	Highest Rank 2010-2021	2021 Rank	Number of Times in Annual Top Ten 2010-2021
I-66 E @ SYCAMORE ST/EXIT 69	2	>100	10
I-495 OUTER LOOP @ MD-97/GEORGIA AVE/EXIT 31	4	44	10
I-95 S @ MCB QUANTICO/EXIT 148	2	>100	5
I-66 W @ VADEN DR/EXIT 62	3	>100	4
I-66 E @ VADEN DR/EXIT 62	8	>100	4



Bottleneck Magnitudes (2021)



2021's top bottleneck (measured in "Base Impact" [integrating queue length and bottleneck duration]) was 37% more impactful than the second-ranked bottleneck, and more than three times as impactful as the 10th-ranked bottleneck



Why Bottlenecks May Change Over Time

- Temporary impacts of construction zones
- Long-term impacts after construction projects
- Regional and national population and business growth
- Regional and national economic ups and downs
- Year-to-year variations in the impacts of storms and major incidents
- Still-evolving long-term travel demand impacts of the pandemic
- Changes within the PDA Suite tool and its underlying databases

Some Major Projects 2010-2021

- 2011: MD-200 (InterCounty Connector) (east end connection to US-1 completed 2014); included I-95 interchange
- 2012: 495Express lanes between VA-620 and north of VA-267
- 2012/2013: Woodrow Wilson Bridge approaches (main bridge was completed 2009)
- 2013: 11th Street Bridge
- 2014: Silver Line Metro to Wiehle–Reston East
- 2014: 95Express reversible lanes from VA-294 to VA-610
- 2017: I-66 inside the Beltway converted from HOV to HOV/toll lanes
- 2019: 395Express reversible lanes from Turkeycock Run to Potomac River



Unanticipated Media Attention

- A presentation with DRAFT results was posted on our website as part of read-ahead materials a week ahead of an upcoming December 2, 2022 Technical Committee meeting
- Shortly afterward, staff was notified that a local television station had already done both an on-line story and a television news segment about the bottleneck ranking!
 - Months before this was slated to go to the TPB
- Followed by echoing coverage by other media outlets
- Showed that the media loves rankings (even if we would prefer to tell a more complex story about congestion and congestion management strategies)



Bottlenecks Context: Range of the CMP

- The context of this bottleneck analysis is the 2022 Congestion Management Process Technical Report (see mwcog.org/cmp)
- Bottlenecks analysis is not the only way that the CMP Technical Report examines the extent of congestion; also reported, based on vehicle probe data speeds, are:
 - Congestion, reported as Travel Time Index (see mwcog.org/congestion for definition)
 - Reliability, reported as Planning Time Index
 - Travel time along defined major commute routes and designated arterial roadways
- The CMP Technical Report also describes the many congestion management strategies pursued in the region, featuring Commuter Connections programs



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