2016 CONGESTION MANAGEMENT PROCESS (CMP) TECHNICAL REPORT

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System Performance, Operations and Technology Subcommittee (SPOTS) &
Vehicle Probe Data Users Group (VPDUG) Joint Meeting

September 14, 2016

Review and Finalization

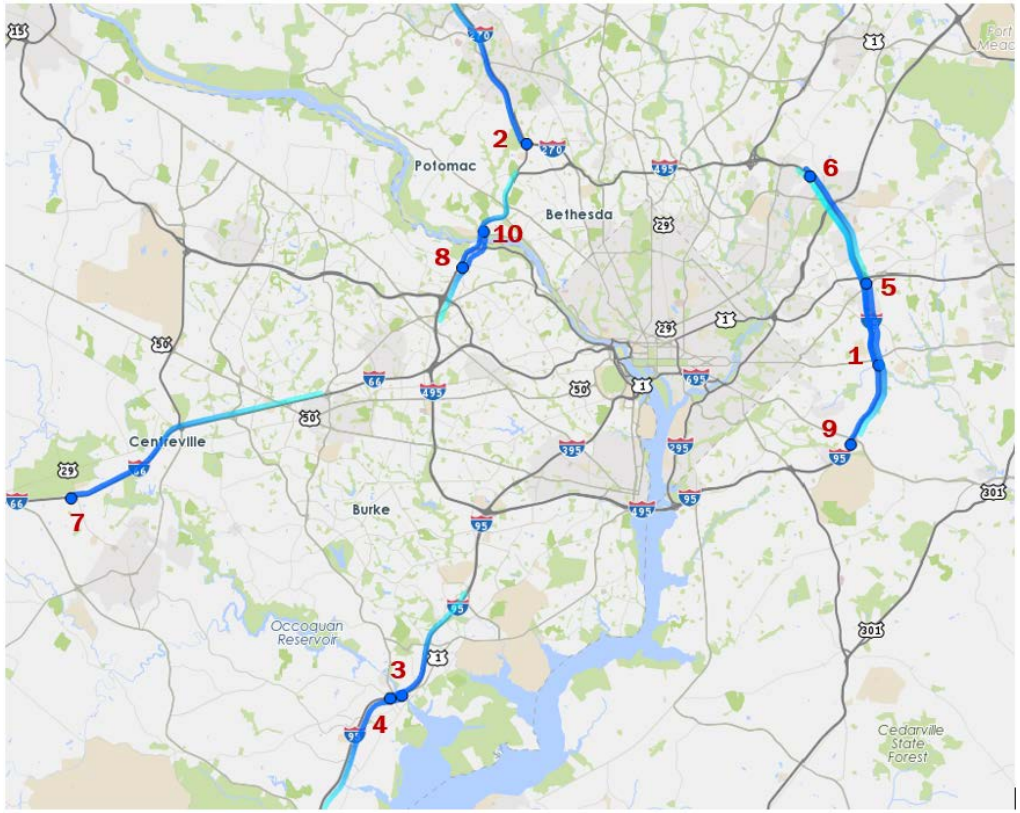
- MOITS Technical Subcommittee review, June 8, 2016
- TPB Technical Committee review, July 8, 2016
  - Received five comments
  - Revised top bottleneck ranking methodology
- TPB Technical Committee finalization, September 9, 2016
- *SPOTS/VPDUG joint meeting, September 14, 2016*
- Commuter Connections, September 20, 2016

Comments and Responses

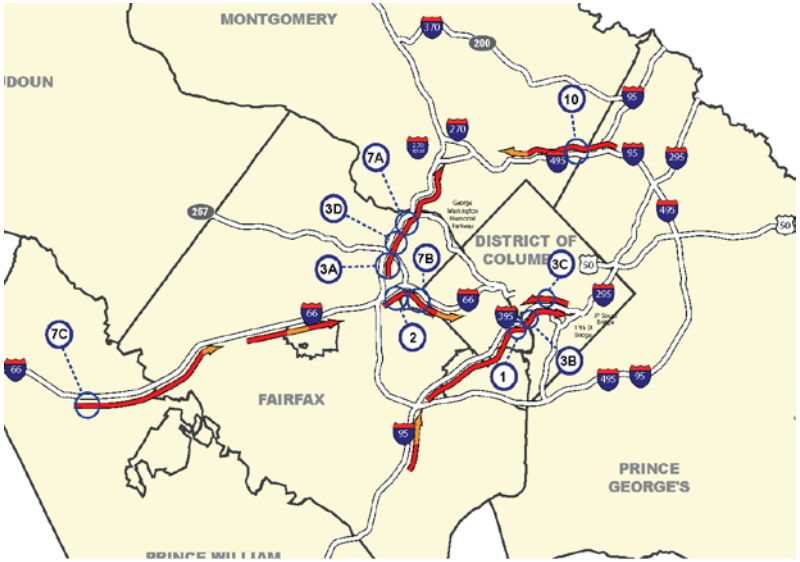
No.	Comments	Responses
1	Consider measuring “bottleneck for transit”, especially for bus services	The CMP incudes a Transit-Significant Road Network and monitors its congestion and reliability; “Bottleneck for transit” could be pursued in future CMP activities.
2	Expand the “bottleneck for transit” to include fare gates, vertical movements, platforms, etc.	The CMP relies on transit agencies to provide such data. When it became available, the CMP could provide summaries.
3	Investigate P&R supply/demand at more finer temporal scale (e.g. 30-minute to start with)	The CMP relies on P&R facility owners to provide such data.
4	Include person throughput in congestion measuring	The updated bottleneck ranking method includes AADT; The proposed new congestion measure under the MAP-21 NPRM is Annual Hours of Excessive Delay Per Capita; Future CMP could investigate.
5	Top bottlenecks seem counter-intuitive	A new method is adopted.

Top Bottlenecks (Old)

Vehicle Probe Project (VPP) Suite Methodology and AADT, 2015



Skycomp, Spring 2014



Top Ten Congested Segments on the Freeway System (2014)

Rank	Route	From	To	Density	Speed Range
1	NB I-395 (8:30-9:30 AM)	VA 27 (Washinton Blvd)	VA 110 (Jefferson Davis Hwy)	150	5 MPH
2	EB I-66 (6:00-7:00 PM)	VA 7 (Leesburgh Pike)	VA 267	140	5 MPH
3A	Inner Loop I-495 (4:30-5:30 PM)	VA 123 (Chain Bridge Rd)	VA 267	120	5-10 MPH
3B	NB I-395 (8:30-9:30 AM)	VA 110 (Jefferson Davis Hwy)	George Washington Memorial Pkwy	120	5-10 MPH
3C	SB I-395 (5:00-6:00 PM)	4th St	12th St	120	5-10 MPH
3D	Inner Loop I-495 (4:30-5:30 PM)	VA 267	VA 193 (Georgetown Pike)	120	5-10 MPH
7A	Inner Loop I-495 (5:30-6:30 PM)	VA 193 (Georgetown Pike)	George Washington Memorial Pkwy	110	10-15 MPH
7B	EB I-66 (6:00-7:00 PM)	VA 267	Westmoreland St	110	10-15 MPH
7C	EB I-66 (6:00-7:00 AM)	VA 234 Bypass	VA 234 (Sudley Rd)	110	10-15 MPH
10	Outer Loop I-495 (7:00-8:00 AM)	MD 650 (New Hampshire Ave)	MD 193 (University Ave)	105	10-15 MPH

Note: Due to construction at the terminus of the Southeast Freeway, eastbound densities along this corridor were not included in the Top Ten list above.

New Method – Overview

- Based on Travel Time Index – in line with Density-based method – and added length (traveler perspective) and AADT (system perspective)
- All time, and peak periods only
- Regardless of roadway function class

	Travel Time Index * Length	Travel Time Index * Length * AADT
All Time (24/7/365)	√	√
Peak Periods (Non-holiday weekday 6-9 am & 4-7 pm)	√	√

New Method – Steps

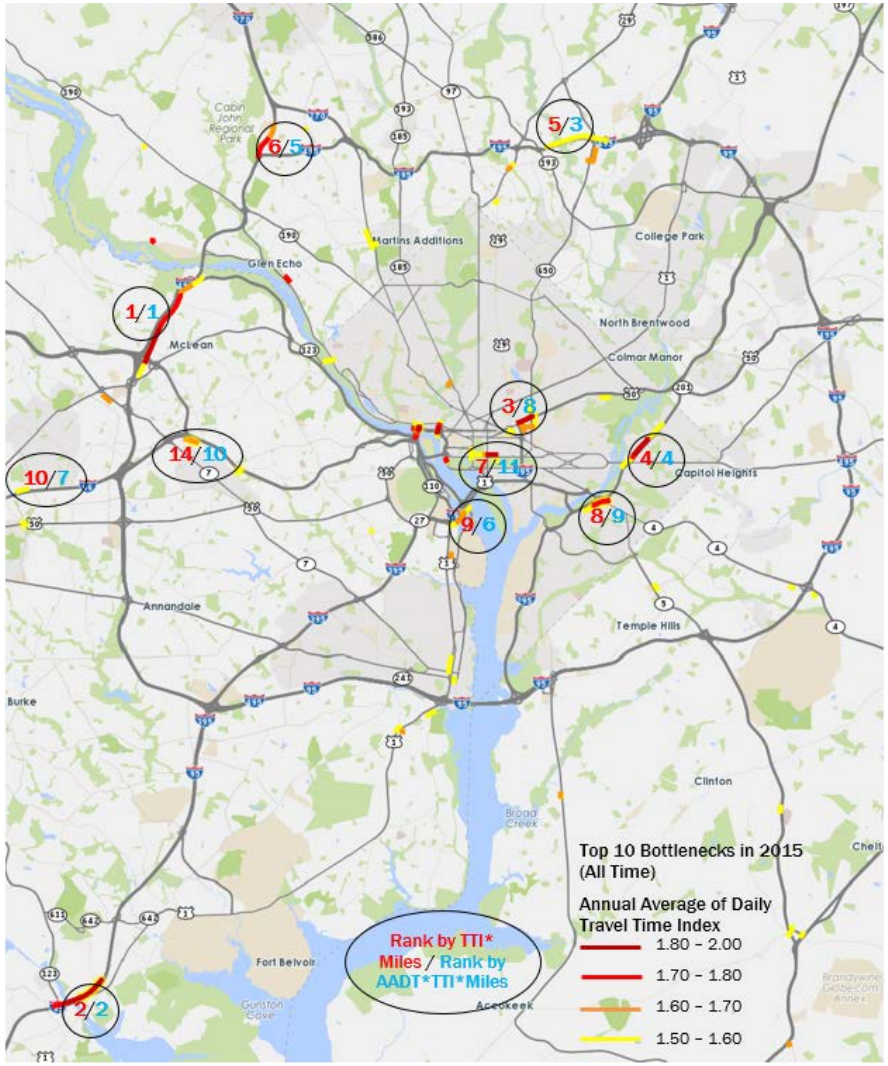
1. Download 2015 hourly data for the entire TPB Planning Area (5,500 directional miles) from the VPP Suite
2. For each TMC, calculate annual average TTI for:
   - "All Time": including every hour in 2015 (24/7/365)
   - "Peak Periods": non-federal holiday weekday 6:00-9:00 am and 4:00-7:00 pm (consistent with previous Aerial Photography Surveys)
3. Sort the TMCs by TTI for "All Time" and "Peak Periods", respectively
4. For "All Time", there are 108 TMCs with TTI >= 1.50; visualize the 108 TMCs in VPP Suite using "List of TMC codes" selection method
   - Four colors: 1.50-1.60, 1.60-1.70, 1.70-1.80, 1.80-2.00
   - Identify TMC clusters and calculate Average TTI (weighted by TMC length) and Total Length for each cluster
   - Find AADT in http://rtdc.mwcog.opendata.arcgis.com/

New Method – Steps

5. For “Peak Periods”, there are 174 TMCs with TTI >= 2.00; visualize the 174 TMCs in VPP Suite using “List of TMC codes” selection method
    - Four colors: 2.00-2.50, 2.50-3.00, 3.00-3.50, 3.50-4.00
    - Identify TMC clusters and calculate Average TTI (weighted by TMC length) and Total Length for each cluster
    - Find AADT in http://rtdc.mwcog.opendata.arcgis.com/

- Rank by “Ave. TTI * Length” or “Ave. TTI*Length*AADT” for “All Time” or “Peak Periods”, respectively

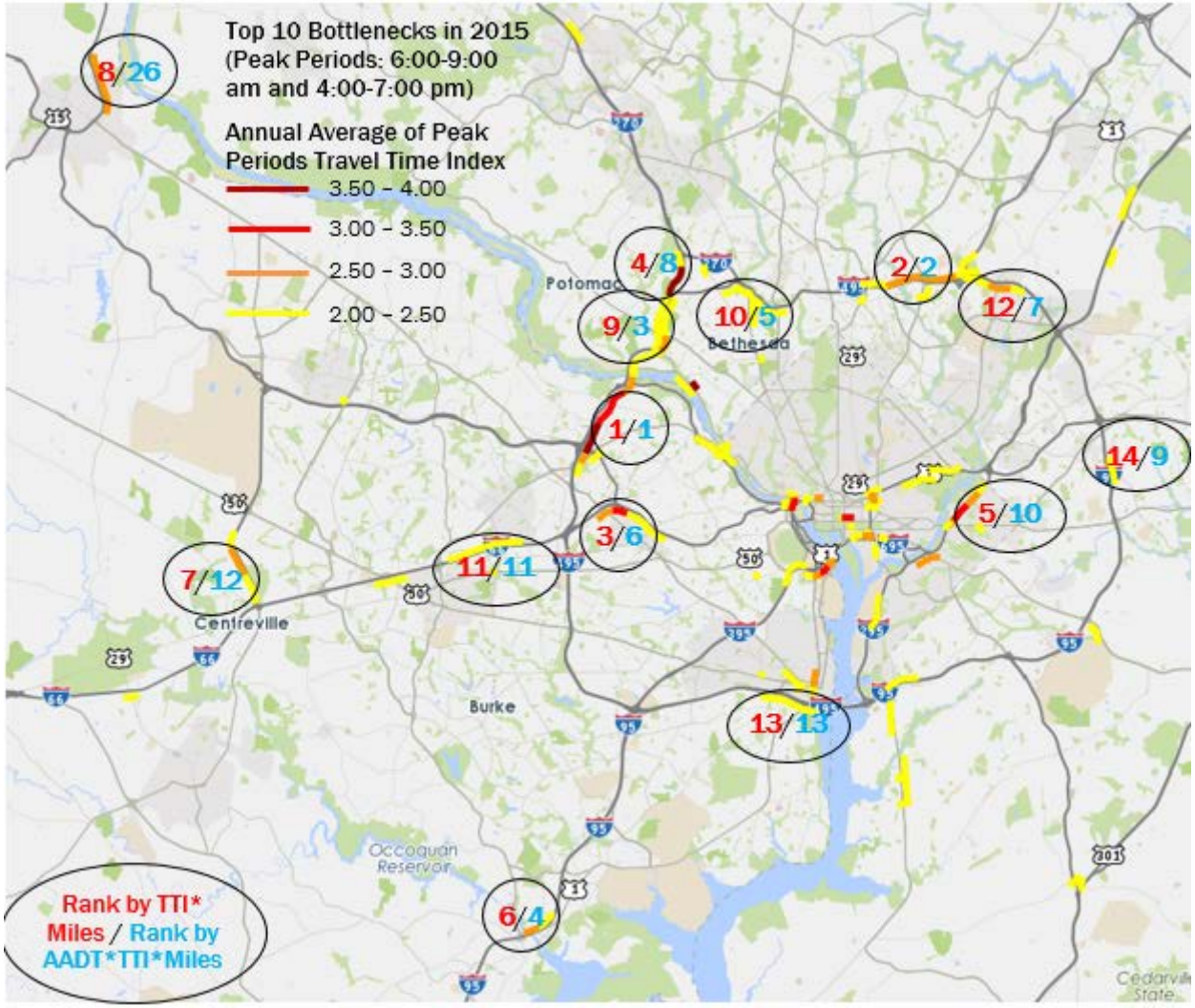
Top Bottlenecks – All Time (Map)



Top Bottlenecks – All Time (Table)

Location	State	Ave. TTI	Length (miles)	TTI*Miles	Rank by TTI*Miles	AADT	AADT*TTI* Miles	Rank by AADT*TTI* Miles
I-495 IL between VA-267 and GW Pkwy	VA	1.75	3.40	5.94	1	94,500	561,509	1
I-95 SB at VA-123	VA	1.88	1.61	3.01	2	104,000	313,445	2
New York Ave. between N. Capitol St. and I-395	DC	1.65	1.61	2.65	3	25,400	67,423	8
DC-295 SB at Benning Rd.	DC	1.71	1.55	2.64	4	60,632	160,142	4
I-495 OL between MD-193 and MD-650	MD	1.52	1.71	2.61	5	104,670	273,222	3
I-270 SPUR SB between Democracy Blvd. and I-495	MD	1.70	1.31	2.23	6	65,406	145,651	5
Constitution Ave WB between 12th St. and 17th St.	DC	1.74	0.91	1.59	7	16,024	25,448	11
DC-295 NB at Pennsylvania Ave	DC	1.68	0.75	1.26	8	49,349	62,225	9
I-395 NB between US-1 and GW Pkwy	VA	1.59	0.74	1.17	9	91,000	106,545	6
I-66 WB at Vaden Dr./Exit 62	VA	1.52	0.64	0.98	10	79,500	77,815	7
I-66 EB at VA-267	VA	1.66	0.25	0.42	14	65,500	27,247	10

Top Bottlenecks – Peak Periods (Map)



Top Bottlenecks – Peak Periods (Table)

Location	State	Ave. TTI	Length (miles)	TTI*Miles	Rank by TTI*Miles	AADT	AADT*TTI*Miles	Rank by AADT*TTI*Miles
I-495 IL between VA-267 and I-270 Spur	VA, MD	2.69	8.36	22.47	1	110,376	2,480,129	1
I-495 OL between I-95 and MD-193	MD	2.57	4.35	11.17	2	104,670	1,168,848	2
I-66 EB at VA-267	VA	2.47	2.83	6.99	3	65,500	458,043	6
I-270 SPUR SB	MD	3.21	2.04	6.56	4	65,406	429,242	8
DC-295 SB at Benning Rd.	DC	2.59	2.28	5.89	5	59,376	349,827	10
I-95 SB at VA-123	VA	2.34	2.46	5.75	6	104,000	597,810	4
VA-28 SB between US-50 and I-66	VA	2.32	2.30	5.33	7	50,000	266,469	12
US-15 NB between VA-7 and N. King St.	VA	2.56	2.02	5.19	8	8,800	45,656	26
I-495 OL between I-270 and MD-190	MD	2.26	2.22	5.01	9	122,010	611,335	3
I-495 IL between MD-355 and MD-185	MD	2.23	1.96	4.38	10	110,876	485,635	5
I-66 WB at Vaden Dr./Exit 62	VA	2.17	1.87	4.05	11	79,500	322,083	11
I-495 IL bw. I-95 and US-1	MD	2.32	1.68	3.91	12	111,740	437,336	7
I-495 OL at Telegraph Rd.	VA	2.33	1.48	3.43	13	76,500	262,657	13
I-495 OL at MD-202/Landover Rd.	MD	2.09	1.54	3.22	14	113,390	364,755	9

Report Publication

- SPOTS Subcommittee Web: https://www.mwcog.org/events/2016/9/14/spots/
- CMP Web: https://www.mwcog.org/documents/2016/09/09/congestion-management-process-technical-report-congestion-management-process/

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