2016 CONGESTION MANAGEMENT PROCESS (CMP) TECHNICAL REPORT

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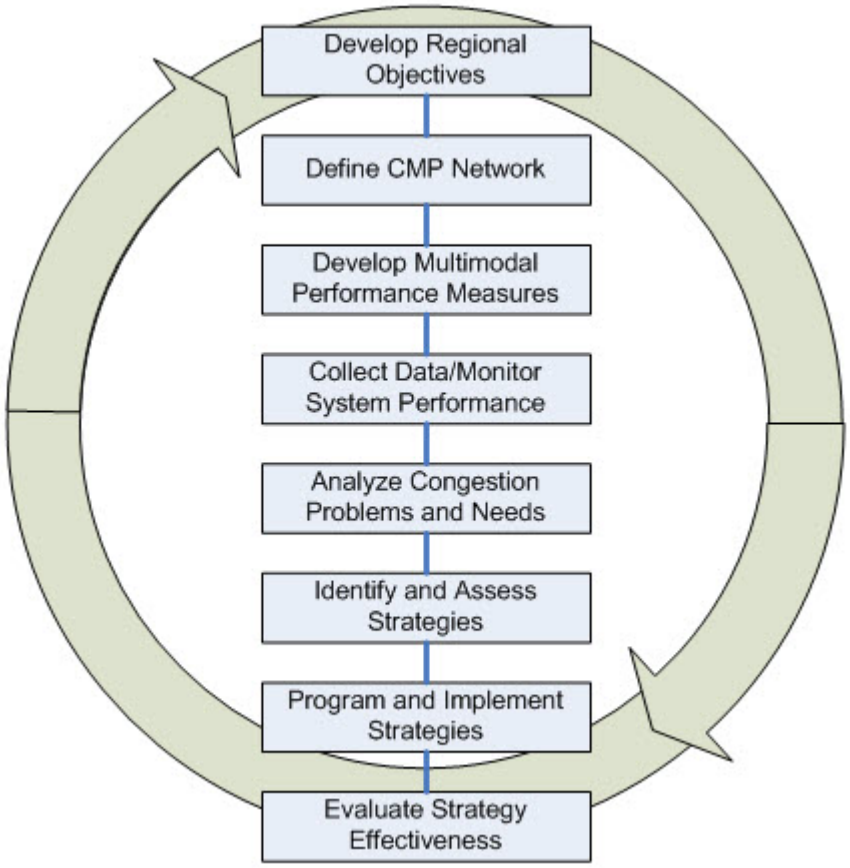
Commuter Connections Subcommittee

September 20, 2016

What is CMP?

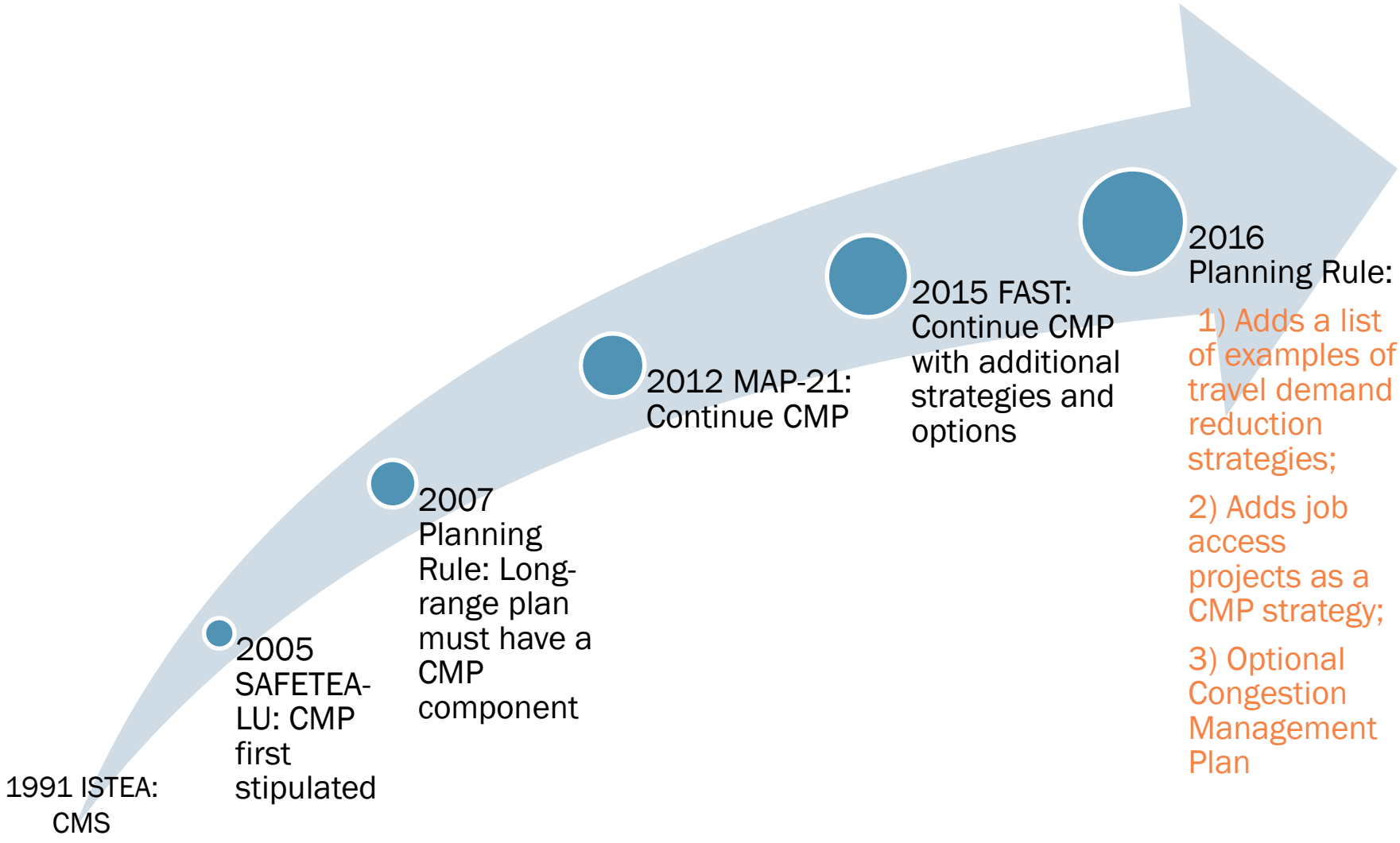
The transportation planning process in a TMA shall **address congestion management through a process** that provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53 **through the use of travel demand reduction** (including intercity bus operators, employer-based commuting programs such as a carpool program, vanpool program, transit benefit program, parking cash-out program, shuttle program, or telework program), **job access projects, and operational management strategies**.

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



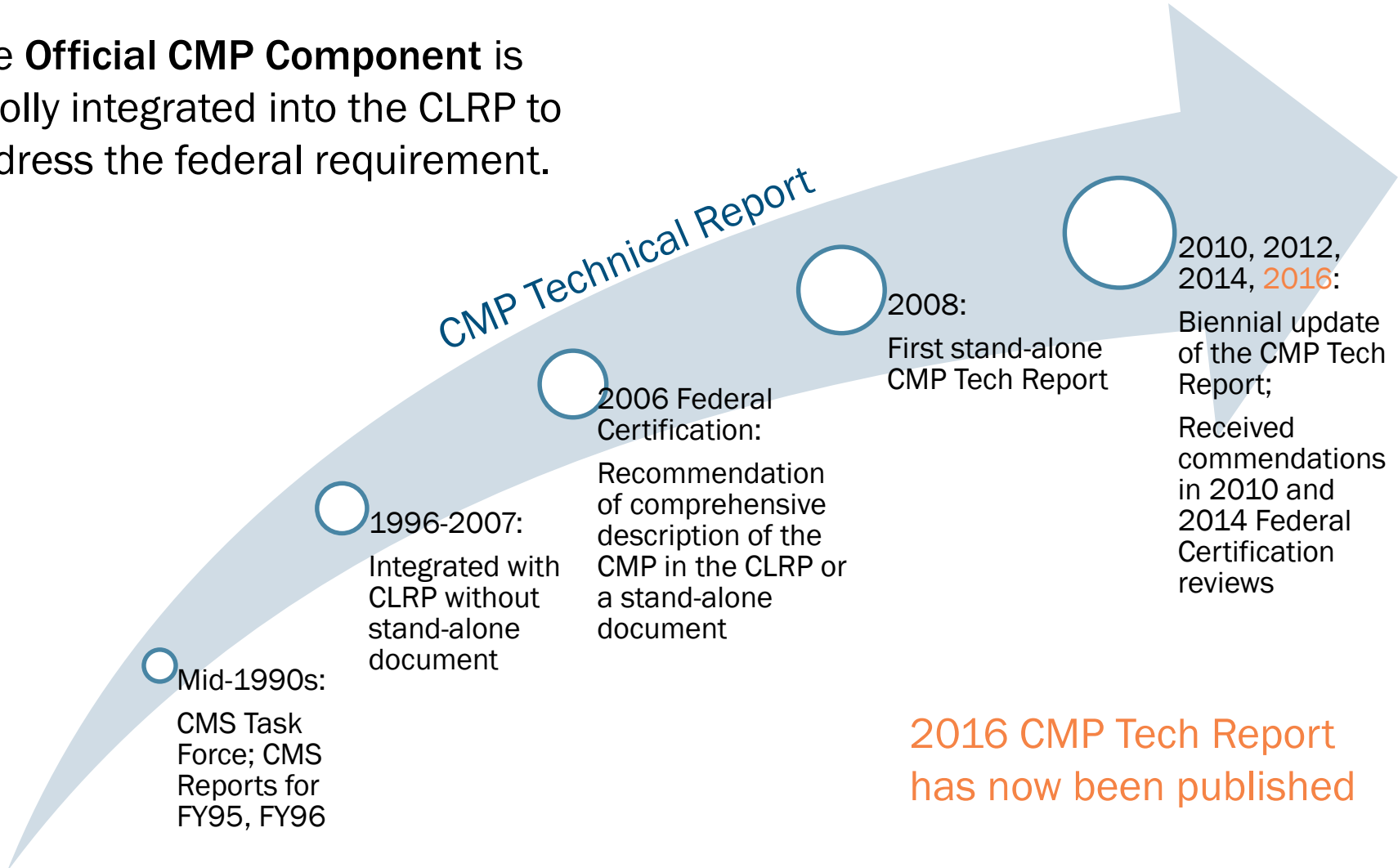
Source: FHWA, CMP Guidebook

Evolution of CMP



CMP in the National Capital Region

The **Official CMP Component** is wholly integrated into the CLRP to address the federal requirement.



2016 CMP Tech Report has now been published

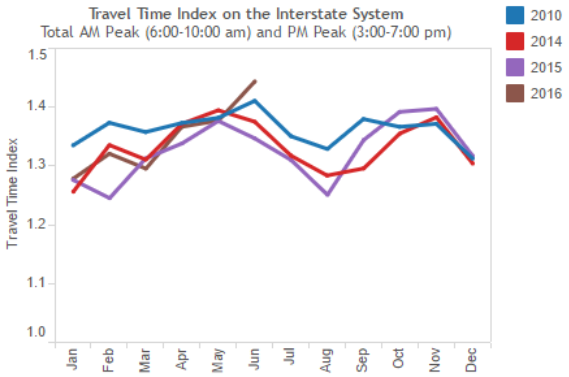
Online Congestion Dashboard

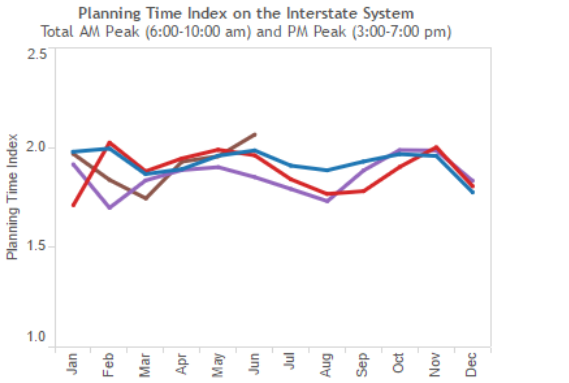
Home > Transportation > Data & Tools > Congestion Dashboard

TRANSPORTATION

Congestion Dashboard

Regional Trends

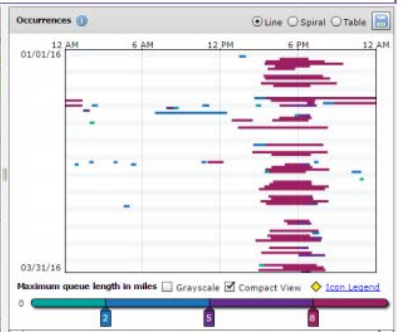


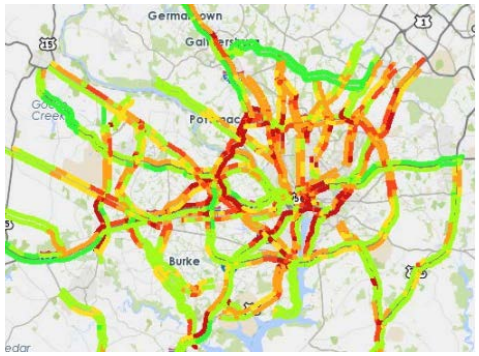


Quarterly updated NCR Congestion Report at:

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

Rank	Location	Average duration	Average max length (miles)	Occurrences	Impact factor*
1	I-66 W @ VA-234/EXIT 47	2 h 36 m	11.23	109	190,919





CMP Technical Report

CMP Technical Report serves as a background document to the official CLRP/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 I-95 Corridor Coalition Vehicle Probe Project data-based analyses

Structure of the 2016 CMP Technical Report

Contents	Number of Pages
Executive Summary	19
1. Introduction	6
2. State of Congestion	83
3. Consideration and Implementation of Congestion Management Strategies	53
4. Study of Congestion Management Strategies	14
5. How Results of the CMP Are Integrated into the CLRP	8
6. Conclusions	4
Appendix A through G	83

Use of the CMP Technical Report

- One-stop shop for:

Congestion & Related Data
Probe data monitoring results
Freeway aerial survey
HOV facility survey
Airport ground access
Freight movement
Traffic signal and congestion
Safety and congestion
Transit congestion
Cordon counts
Trans. data clearinghouse
…

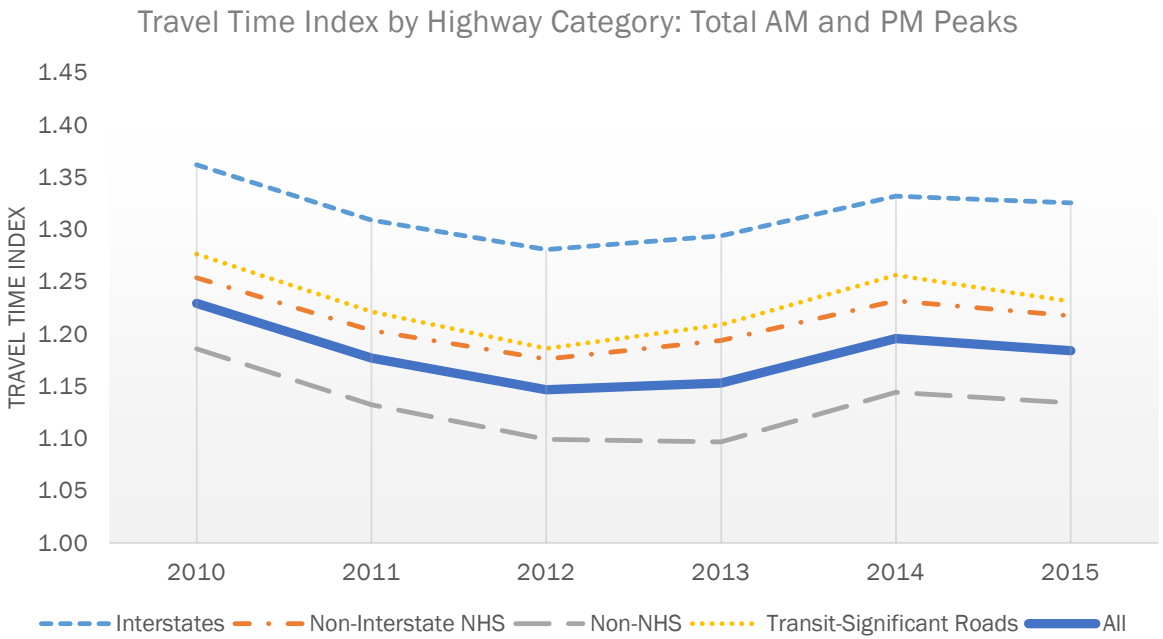
Congestion Mgmt. Strategies
Demand strategies
• Commuter Connections
• Local TDM strategies
• Land use, …
Operational strategies
• HOV/HOT
• Active Traffic Mgmt.
• MATOC, …
Integrative/Multimodal Strategies
• Bus priority
• ICM, …

Regional Travel Trends

- From 2010 to 2015 in the TPB Planning Area
  - Population, up 7.7%; Employment, up 5.6%
  - Weekday VMT, up 1.0%; Transit ridership, up 0.1%
  - Peak period congestion, down 3.7%

Peak Period Congestion – Travel Time Index

- Peak period congestion decreased between 2010 and 2012, but more recently has increased moderately
  - Travel Time Index* (TTI) decreased 6.7% between 2010 and 2012 and increased by 3.3% from 2012 to 2015; TTI in 2015 was still 3.7% below the 2010 level.
  - Interstates remained the most congested highway category, followed by Transit-Significant roads**, non-Interstate NHS, and non-NHS.

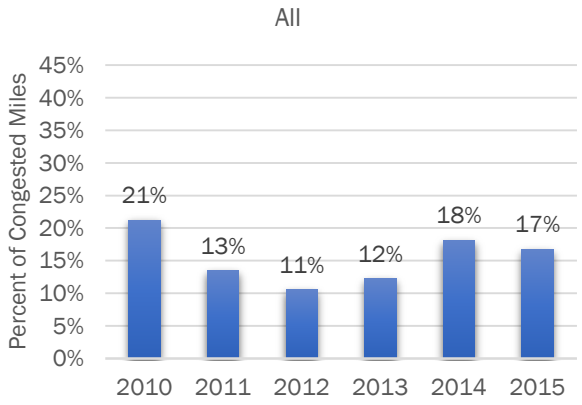


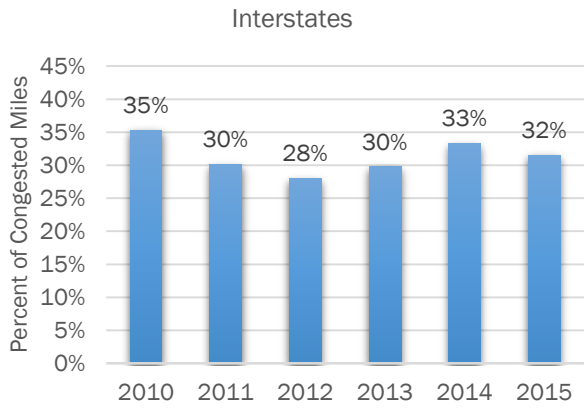
*Travel Time Index = Actual travel time / Free flow travel time.

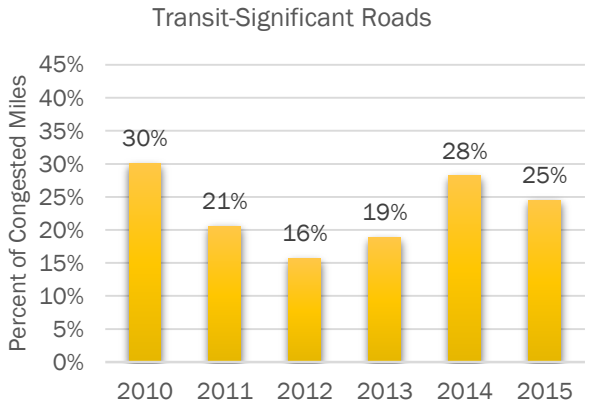
** Transit-Significant Roads: Directional toad segments with at least 6 buses running in the AM peak hour.

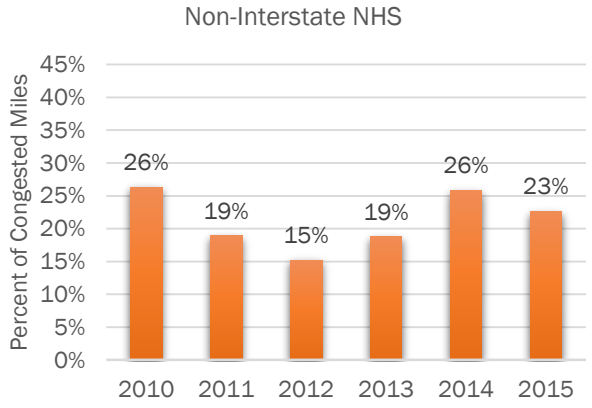
Peak Period Congestion – Percent of Congested Miles

- Overall, the percentage of congested* directional road miles was 21% in 2010, 11% in 2012 and 17% in 2015





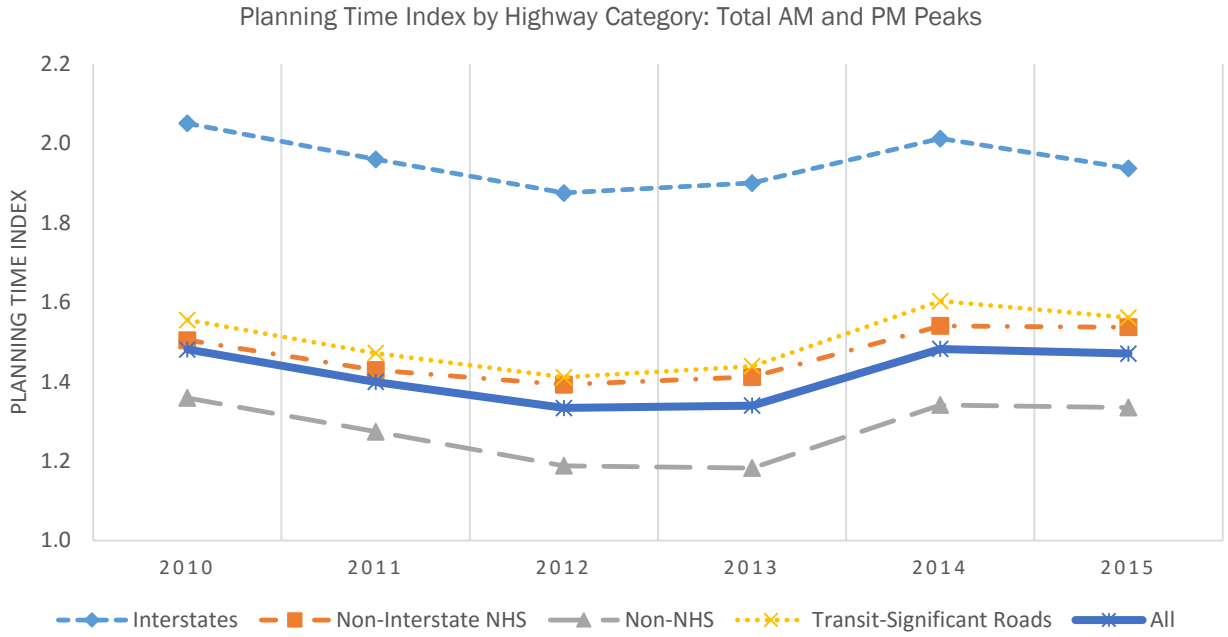




*Congestion is considered when Travel Time Index > 1.30.

Peak Period Travel Time Reliability

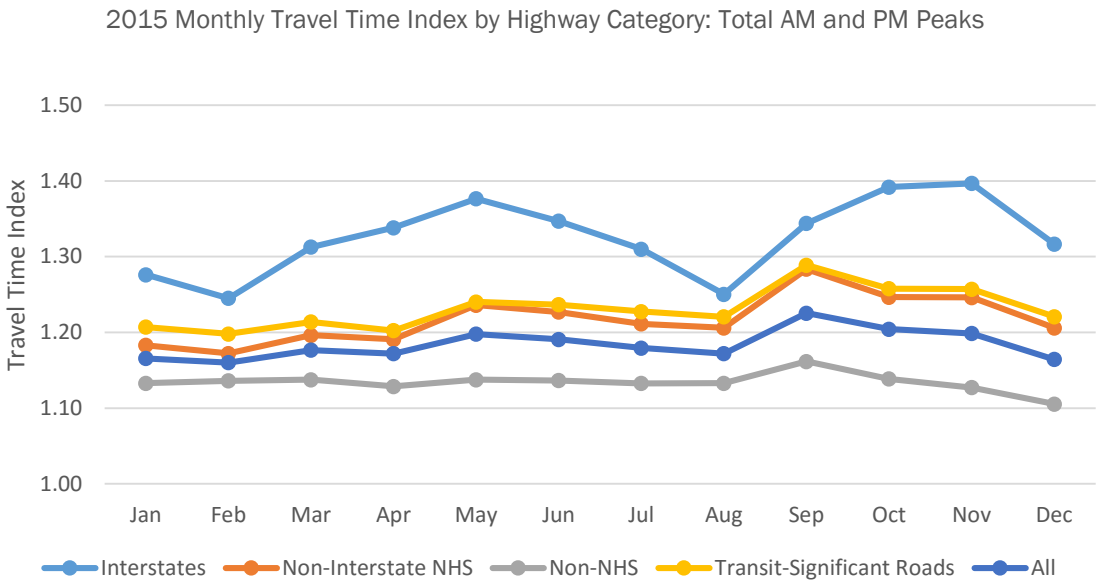
- Peak period travel time reliability improved between 2010 and 2012, but more recently has decreased moderately, almost to the 2010 level
  - Planning Time Index* (PTI) improved 9.5% between 2010 and 2012 but worsened 9.8% from 2012 to 2015. PTI in 2015 was 0.7% better than the 2010 level.
  - Most unreliable category is Interstates, followed by Transit-Significant Roads, non-Interstate NHS, and non-NHS.



*Planning Time Index = 95th percentile travel time / Free flow travel time

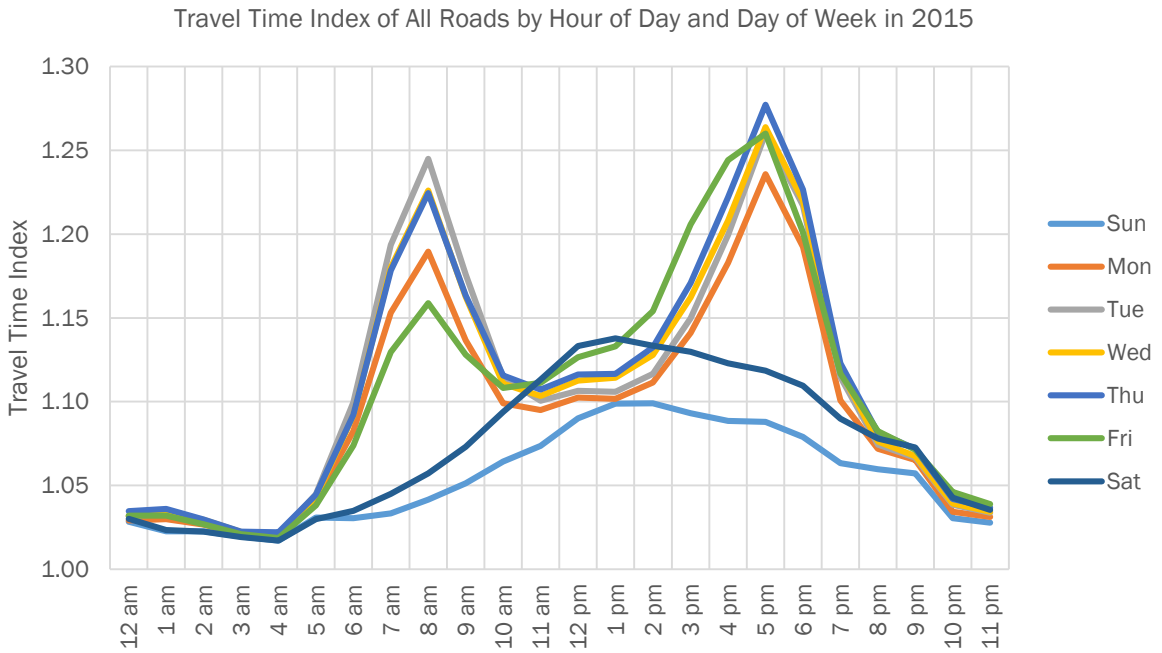
Monthly Variation of Congestion in 2015

- Monthly variations of congestion were most noticeable on the Interstate System, followed by the Transit-Significant Roads, the Non-Interstate NHS, and the Non-NHS
- The region overall had increasing congestion from January to May, then decreasing congestion through August. September had the highest level of congestion, after that, congestion kept decreasing for the rest of year (Interstates congestion peaked in Nov.)

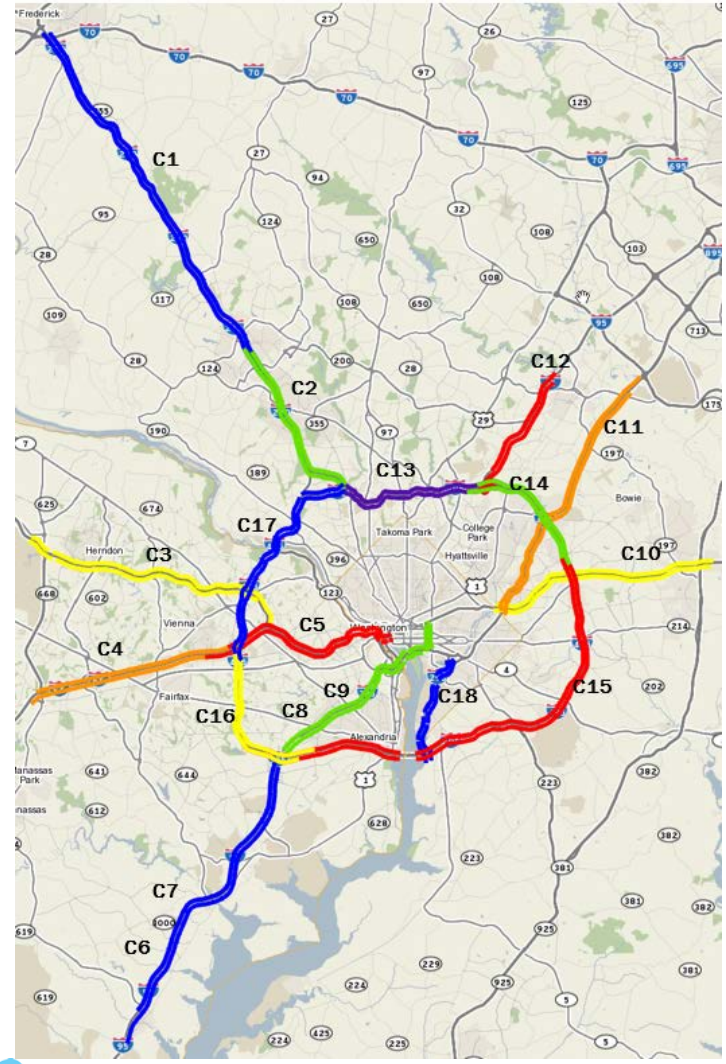


Day of Week Variation of Congestion in 2015

- The middle weekdays were the most congested days of a week with Thursday PM peak the worst and Friday PM peak one hour earlier than other weekdays
- Monday and Friday had unique traffic patterns
- Weekend days had the lowest traffic in a week and Sunday was even lower than Saturday



Major Freeway Commute Routes



Route Code	Description
C1	I-270 between I-370/Sam Eig Hwy/Exit 9 and I-70/US-40
C2	I-270 between I-370/Sam Eig Hwy/Exit 9 and I-495/MD-355
C3	VA-267 between VA-28/Exit 9a and VA-123/Exit 19
C4	I-66 between VA-28/Exit 53 and I-495/Exit 64
C5	I-66 between I-495/Exit 64 and Theodore Roosevelt Memorial Bridge
C6	I-95 between VA-234/Exit 152 and Franconia Rd/Exit 169
C7	I-95 HOV between VA-234/Exit 152 and Franconia Rd/Exit 169
C8	I-395 between I-95 and H St
C9	I-395 HOV between I-95 and US-1
C10	US-50 between MD-295/Kenilworth Ave and US-301/Exit 13
C11	MD-295 between US-50/MD-201/Kenilworth Ave and MD-198
C12	I-95 between I-495/Exit 27-25 and MD-198/Exit 33
C13	I-495 between I-270/Exit 35 and I-95/Exit 27
C14	I-495 between I-95/Exit 27 and US-50/Exit 19
C15	I-495 between US-50/Exit 19 and I-95/I-395/Exit 57
C16	I-495 between I-95/I-395/Exit 57 and I-66/Exit 9
C17	I-495 between I-66/Exit 9 and I-270/Exit 35
C18	I-295 between I-495 and 11th St. Bridge

Travel Time on Major Freeway Commute Routes, 8:00-9:00 AM

Route	Length (miles)	Average Travel Time in AM Peak Hour 8:00-9:00 am (min)				Reliable (95th) Travel Time* in AM Peak Hour 8:00-9:00 am (min)				2015 Changes in Average Travel Time in AM Peak Hour (min)			2015 Changes in 95th Travel Time in AM Peak Hour (min)		
		2010	2013	2014	2015	2010	2013	2014	2015	vs. 2010	vs. 2013	vs. 2014	vs. 2010	vs. 2013	vs. 2014
C1: I-270 SB from I-70 to I-370	24	42	34	36	38	84	63	64	69	-3	4	3	-15	7	5
C2: I-270 SB from I-370 to I-495	10	22	17	18	20	41	32	35	42	-2	3	2	1	10	7
C3: VA-267 EB from VA-28 to VA-123	14	29	21	21	23	65	40	38	39	-5	2	2	-26	-1	1
C4: I-66 EB from VA-28 to I-495	12	29	21	23	22	61	36	41	36	-7	1	-1	-24	1	-5
C5: I-66 EB from I-495 to TR Bridge	13	18	16	16	16	32	32	32	28	-3	-1	-1	-4	-4	-4
C6: I-95 NB from VA-234 to Exit 169	20	28	28	32	23	67	63	69	40	-5	-5	-9	-26	-23	-29
C7: I-95 NB HOV from VA-234 to Exit 169	18	20	17	17	16	26	21	22	17	-4	-1	-1	-9	-3	-5
C8: I-395 NB from I-95 to H St.	13	41	42	41	45	89	94	90	96	3	3	3	7	2	6
C9: I-395 NB HOV from I-495 to US-1	11	16	13	14	15	31	24	26	27	-1	2	1	-3	3	2
C10: US-50 WB from US-301 to MD-295	14	23	21	21	22	40	34	35	37	-1	1	1	-3	3	2
C11: MD-295 SB from MD-198 to US-50	16	29	25	26	29	65	49	47	49	0	3	3	-16	0	2
C12: I-95 SB from MD-198 to I-495	8	13	9	10	13	28	19	20	24	0	4	3	-4	5	4
C13: I-495 IL from I-270 to I-95	10	15	12	13	14	23	19	20	21	-1	1	1	-2	2	2
C14: I-495 IL from I-95 to US-50	9	11	11	11	11	14	13	15	15	0	0	0	1	1	0
C15: I-495 IL from US-50 to I-95	28	31	35	37	42	50	60	68	79	11	7	5	29	19	11
C16: I-495 IL from I-95 to I-66	10	29	13	17	18	49	19	35	31	-11	6	2	-18	11	-4
C17: I-495 IL from I-66 to I-270	14	19	19	26	26	31	35	52	48	7	7	1	17	13	-4
C13: I-495 OL from I-95 to I-270	10	33	30	30	34	53	50	49	56	1	4	3	3	6	6
C14: I-495 OL from US-50 to I-95	10	17	15	15	16	30	25	25	26	-2	1	0	-4	2	2
C15: I-495 OL from I-95 to US-50	29	36	32	36	39	57	50	58	60	2	6	2	3	10	2
C16: I-495 OL from I-66 to I-95	11	11	10	10	11	12	10	12	13	0	1	1	1	3	2
C17: I-495 OL from I-270 to I-66	14	17	14	15	16	26	19	19	21	-2	1	1	-4	3	2
C18: I-295 NB from I-495 to 11th St. Brdg.	6	14	16	13	15	35	33	36	37	1	-1	2	2	3	1

Travel Time on Major Freeway Commute Routes, 5:00-6:00 PM

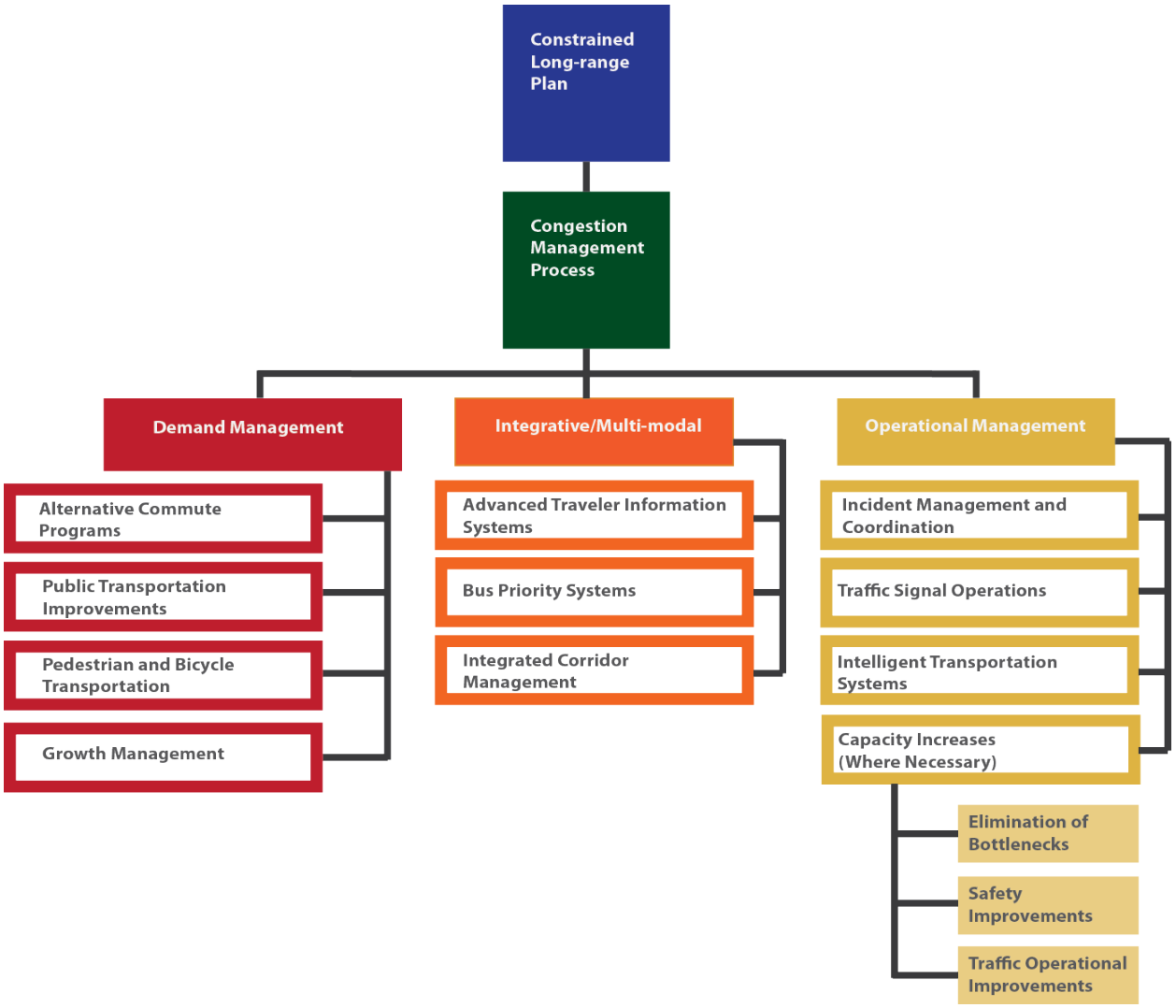
Route	Length (miles)	Average Travel Time in PM Peak Hour 5:00-6:00 pm (min)				Reliable (95th) Travel Time* in PM Peak Hour 5:00-6:00 pm (min)				2015 Changes in Average Travel Time in PM Peak Hour (min)			2015 Changes in 95th Travel Time in PM Peak Hour (min)		
		2010	2013	2014	2015	2010	2013	2014	2015	vs. 2010	vs. 2013	vs. 2014	vs. 2010	vs. 2013	vs. 2014
C1: I-270 NB from I-370 to I-70	24	38	35	36	38	77	60	64	64	0	3	2	-13	4	0
C2: I-270 NB from I-495 to I-370	9	16	14	13	14	28	26	24	25	-2	0	1	-3	-2	1
C3: VA-267 WB from I-66 to VA-28	15	20	18	19	21	33	27	30	33	1	3	2	0	5	3
C4: I-66 WB from I-495 to VA-28	13	26	31	32	31	46	56	59	58	5	0	-1	12	2	-1
C5: I-66 WB from TR Bridge to I-495	11	11	9	9	10	17	13	12	12	-1	0	0	-5	-1	0
C6: I-95 SB from Exit 169 to VA-234	18	49	46	43	29	110	99	89	50	-20	-17	-14	-61	-50	-40
C7: I-95 SB HOV from Exit 169 to VA-234	17	18	18	18	15	27	27	30	17	-3	-3	-3	-10	-10	-13
C8: I-395 SB from H St. to I-95	14	28	29	32	34	48	52	64	63	7	5	3	14	11	-1
C9: I-395 SB HOV from US-1 to I-495	11	11	10	11	11	18	12	16	14	-1	1	0	-3	3	-2
C10: US-50 EB from MD-295 to US-301	13	18	16	16	16	26	22	21	22	-1	0	1	-4	0	1
C11: MD-295 NB from US-50 to MD-198	15	33	30	29	29	59	59	54	54	-4	-1	1	-5	-4	0
C12: I-95 NB from I-495 to MD-198	7	8	9	8	10	14	18	17	20	2	1	2	5	1	3
C13: I-495 IL from I-270 to I-95	10	26	19	22	22	50	45	49	44	-4	3	0	-6	-1	-5
C14: I-495 IL from I-95 to US-50	9	17	17	19	23	31	32	34	38	6	5	3	7	6	4
C15: I-495 IL from US-50 to I-95	28	33	29	32	37	48	37	43	56	4	8	5	8	19	13
C16: I-495 IL from I-95 to I-66	10	13	10	10	10	26	12	12	11	-4	0	-1	-14	-1	-1
C17: I-495 IL from I-66 to I-270	14	43	40	47	44	96	81	107	88	1	4	-3	-8	8	-19
C13: I-495 OL from I-95 to I-270	10	21	14	16	14	50	28	38	27	-7	0	-2	-23	-1	-11
C14: I-495 OL from US-50 to I-95	10	16	15	15	15	30	28	26	25	0	0	0	-5	-2	0
C15: I-495 OL from I-95 to US-50	29	36	39	47	51	64	77	95	96	15	12	4	32	20	1
C16: I-495 OL from I-66 to I-95	11	16	12	15	16	24	18	24	25	0	4	2	1	7	1
C17: I-495 OL from I-270 to I-66	14	35	20	23	31	71	35	46	58	-4	12	8	-13	22	11
C18: I-295 SB from 11th St. Brdg. to I-495	6	14	15	17	20	25	27	30	33	5	5	2	8	6	3

National Comparison of the Washington Region's Congestion

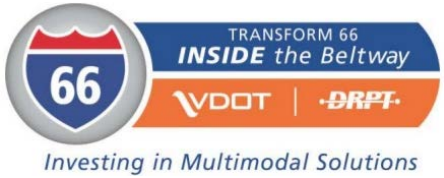
Texas A&M Transportation Institute (2014 data)			INRIX Traffic Scorecard (2015 data)			TomTom Traffic Index (2015 data)		
Annual Hours of Delay per Auto Commuter			Average Hours Wasted in Traffic			Extra Travel Time compared to Free Flow Conditions		
Metro Area	Value	Rank	Metro Area	Value	Rank	Metro Area	Value	Rank
Washington	82	1	Los Angeles	81	1	Los Angeles	41%	1
Los Angeles	80	2	Washington	75	2	San Francisco	36%	2
San Francisco	78	3	San Francisco	75	3	New York	33%	3
New York	74	4	Houston	74	4	Seattle	31%	4
San Jose	67	5	New York	73	5	San Jose	30%	5
Boston	64	6	Seattle	66	6	Honolulu	29%	6
Seattle	63	7	Boston	64	7	Miami	28%	7
Chicago	61	8	Chicago	60	8	Washington	26%	8
Houston	61	8	Atlanta	59	9	Portland	26%	9
Riverside	59	10	Honolulu	49	10	Chicago	26%	10

Source: Texas A&M Transportation Institute, 2015 Urban Mobility Scorecard; INRIX, Traffic Scorecard; TomTom, Traffic Index.

Congestion Management Strategies



Selected Congestion Management Strategies

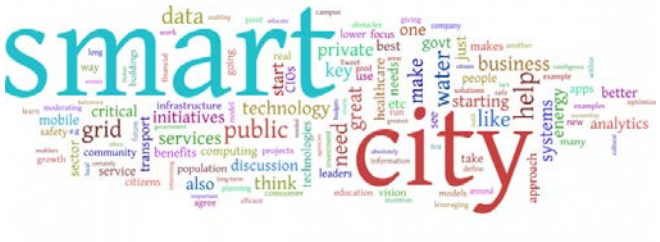


Smart DC
Information Session

#SmartDC

Congestion Management Strategies to Watch

- Advances in technology and data
- Traveler choices
- Coordination and collaboration



Key Findings (1/2)

1. **Congestion** – Peak period congestion in the Washington region decreased between 2010 and 2012, and then increased moderately in 2014 and 2015, but still remaining lower than that of 2010.
2. **Reliability** – Travel time reliability in the region improved between 2010 and 2012, and then worsened in 2014 and 2015, almost back to the 2010 level.
3. **Bottlenecks** – Both peak period and 24/7/365 roadway bottlenecks were identified using an updated methodology, with some shifting of bottleneck locations versus the 2014 report, but mostly consistent with historical bottleneck locations.

Key Findings (2/2)

4. **Travel demand management** continues to be an important tool for day-to-day congestion management and played a key role in congestion management during special events.
5. **Operations coordination** - The Metropolitan Washington Area Transportation Operations Coordination (MATOC) continues to play an important role.
6. **Real-time information** benefits both travelers and transportation agencies.
7. **Variably priced lanes** provide additional options to travelers.
8. **Walking and bicycling** continue to grow in the region.

Recommendations (1/4)

1. Continue the Commuter Connections Program
2. Continue and enhance the MATOC program and support agency/jurisdictional transportation management activities
3. Consider the development of a regional Congestion Management Plan (CMPL) or certain form of it to enhance the integration of CMP and CLRP/TIP
4. Incorporate performance measures to be finalized in the final rule on System Performance, Freight Movement, and CMAQ

Recommendations (2/4)

5. Continue to encourage integration of operations management and travel demand management components of congestion management for more efficient use of the existing transportation network
6. Pursue sufficient investment in the existing transportation system, which is important for addressing congestion
7. Consider variable pricing and other management strategies in conjunction with capacity increasing projects
8. Continue to encourage transit in the Washington region and explore transit priority strategies

Recommendations (3/4)

9. Encourage implementation of congestion management for major construction projects
10. Continue to encourage access to non-auto travel modes.
11. Continue and enhance providing real-time, historical, and multimodal traveler information
12. Continue to look for ways to safely interface with the public through new technology such as mobile devices and social media

Recommendations (4/4)

13. Encourage connectivity within and between Regional Activity Centers
14. Continue and enhance the regional congestion monitoring program with multiple data sources
15. Monitor trends in freight, specifically truck travel, in anticipation of the Panama Canal expansion
16. Participate in collaborative planning connected and autonomous vehicle readiness
17. Continue to coordinate with providers of shared mobility services

Review and Finalization

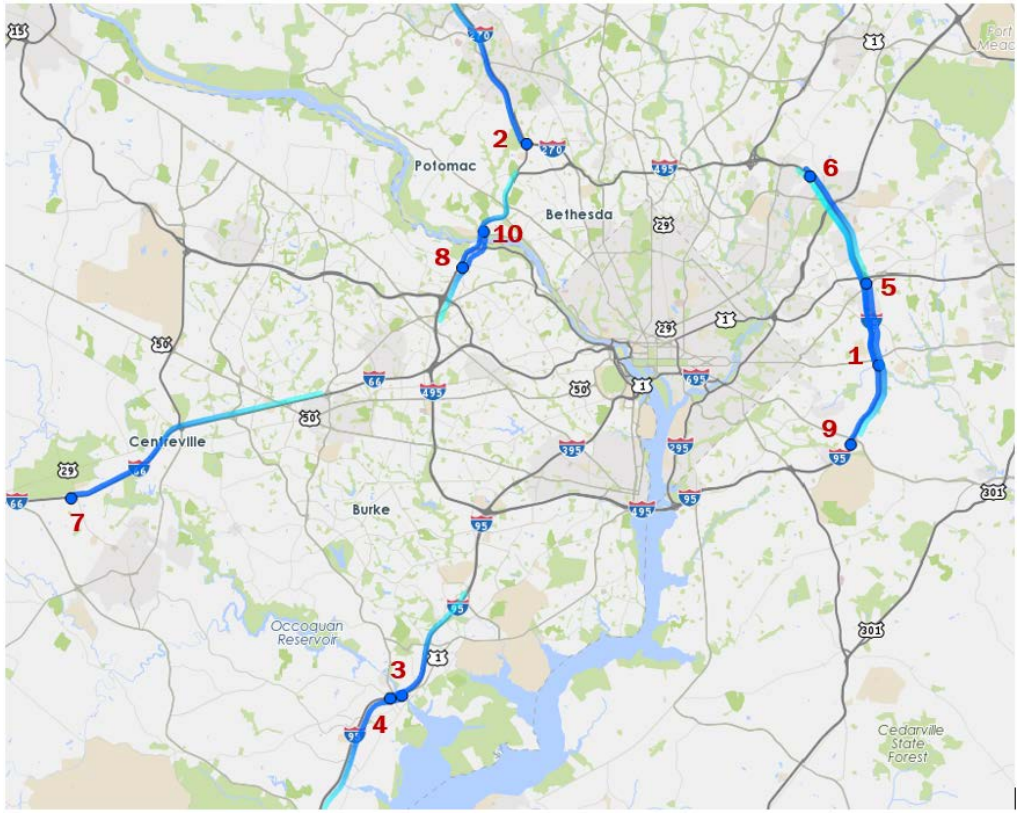
- MOITS Technical Subcommittee review, June 8, 2016
- TPB Technical Committee review, July 8, 2016
  - Received five comments
  - Revised top bottleneck ranking methodology
- **TPB Technical Committee finalization, September 9, 2016**
- SPOTS/VPDUG joint meeting, September 14, 2016
- *Commuter Connections,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

Comments and Responses

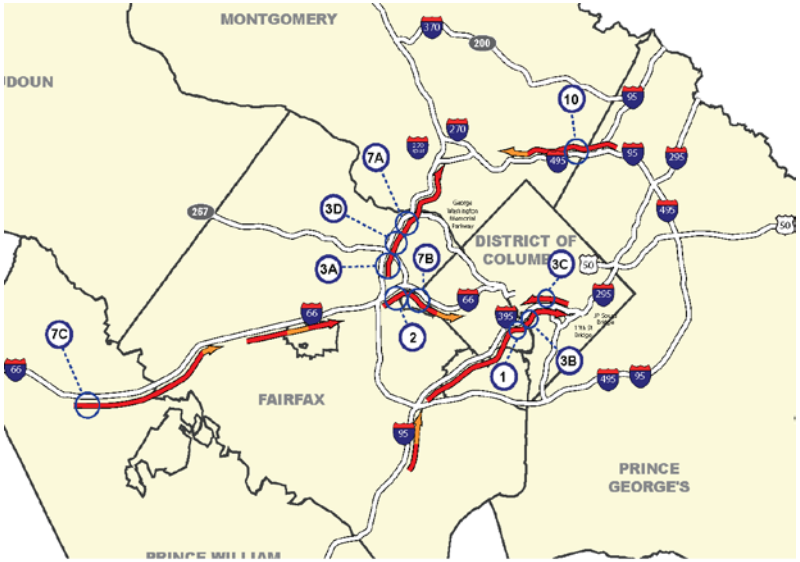
No.	Comments	Responses
1	Consider measuring “bottleneck for transit”, especially for bus services	The CMP incudes a Transit-Significant Road Network and monitors its congestion and reliability; “Bottleneck for transit” could be pursued in future CMP activities.
2	Expand the “bottleneck for transit” to 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

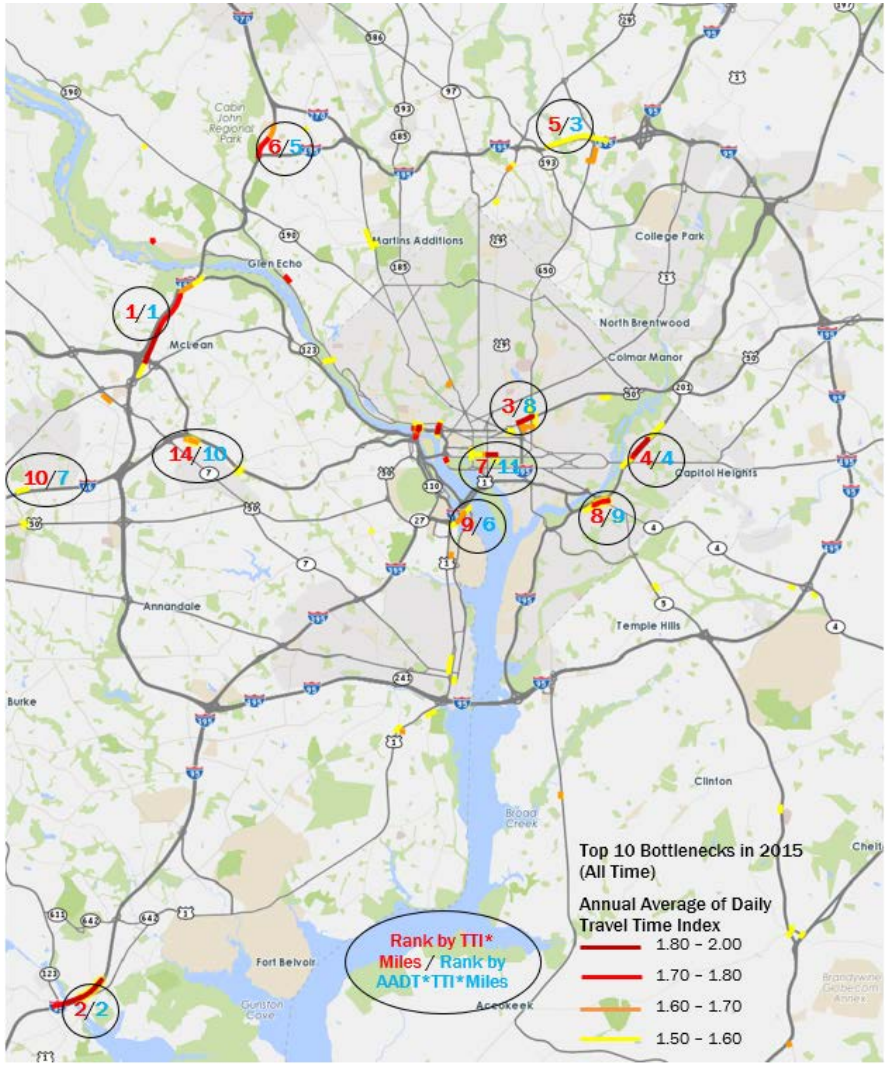
1. Download 2015 hourly data for the entire TPB Planning Area (5,500 directional miles) from the VPP Suite
2. For each TMC, calculate annual average TTI for:
   - "All Time": including every hour in 2015 (24/7/365)
   - "Peak Periods": non-federal holiday weekday 6:00-9:00 am and 4:00-7:00 pm (consistent 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

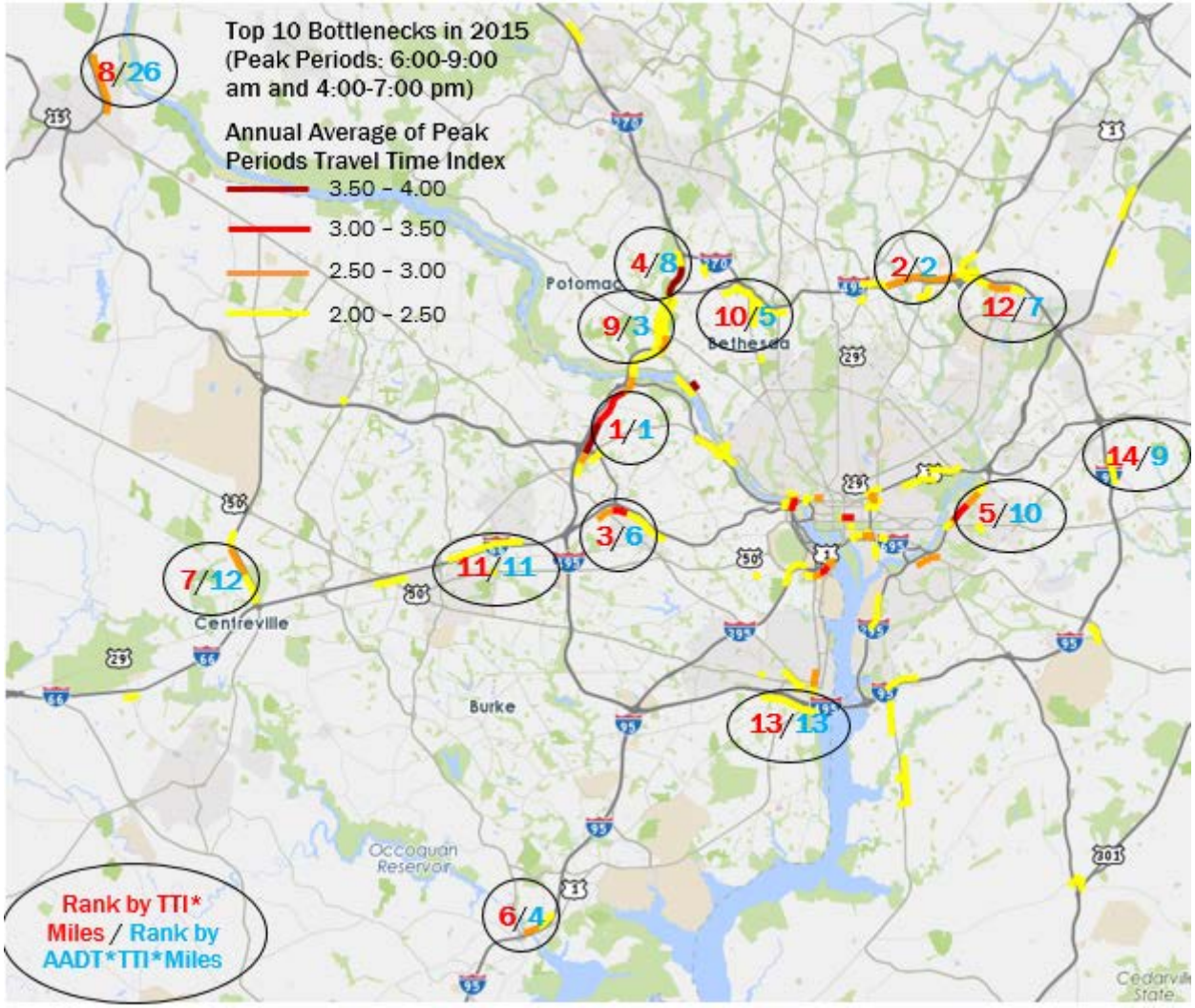
Top Bottlenecks – All Time (Map)



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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