Item #4

Regional Congestion Update

Freight Subcommittee
July 12, 2012

Wenjing Pu
COG/TPB Staff

National Capital Region Transportation Planning Board (TPB)
Metropolitan Washington Council of Governments (COG)

MAP-21 Requirements

- MAP-21 was signed into law on July 6, 2012
- Establishment of the *National Highway Performance Program*
- *Congestion Reduction* and *System Reliability* are two of the seven "National Goals"
- Monitoring (data sources)
- Reporting (performance measures)
- Target (progress)

Congestion and Reliability Monitoring in the Washington Region (1/2)

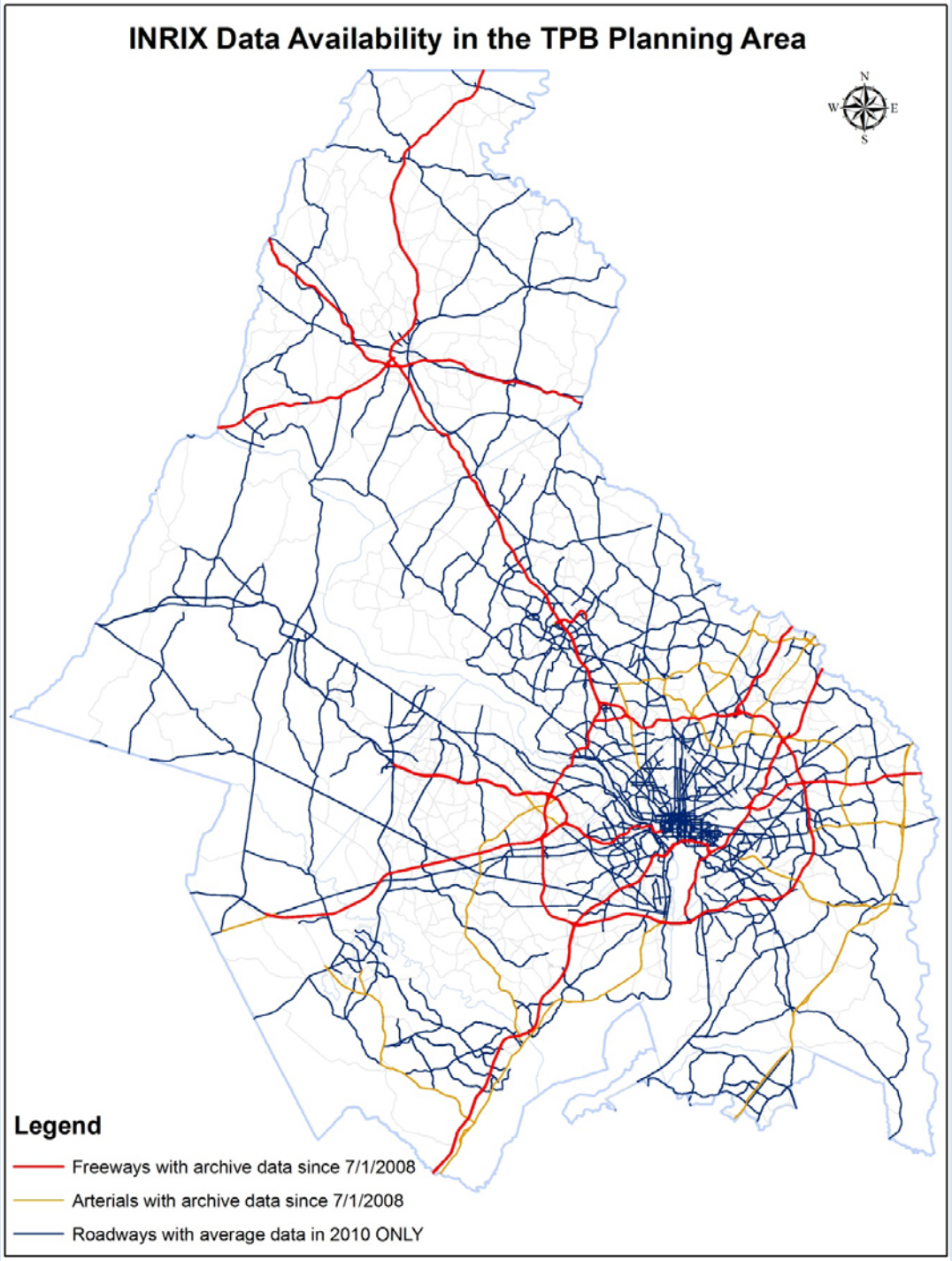
- Major periodical surveys
  - Freeways: Aerial photography survey
    - Conducted by Skycomp, Inc.
    - Cycle: 3 years
    - Does not monitor reliability
    - The latest survey was conducted in Spring 2011 (http://www.mwcog.org/store/item.asp?PUBLICATION_ID=436)
  - Arterials: GPS-equipped floating car travel time study
    - Conducted by TPB staff
    - Cycle: 3 years
    - Does not monitor reliability
    - Terminated in 2012 in view of emerging private sector probe-based traffic data
- Other surveys (e.g., HOV surveys, Airport Ground Access Surveys)

Congestion and Reliability Monitoring in the Washington Region (2/2)

- Use of Third-Party Data
  - Private sector probe-based speed data
    - Continuous real-time monitoring (24/7/365)
    - Monitor both congestion and reliability
    - Unprecedented spatial coverage, especially on arterials
  - TTID Program*
    - Vehicle volume information

* Transportation Technology Innovation and Demonstration (TTID) program, a Public/Private Partnership (PPP) between FHWA, state DOTs and Traffic.com®. http://ops.fhwa.dot.gov/travelinfo/ttidprogram/ttidprogram.htm

INRIX Data Availability as of 12/31/2011



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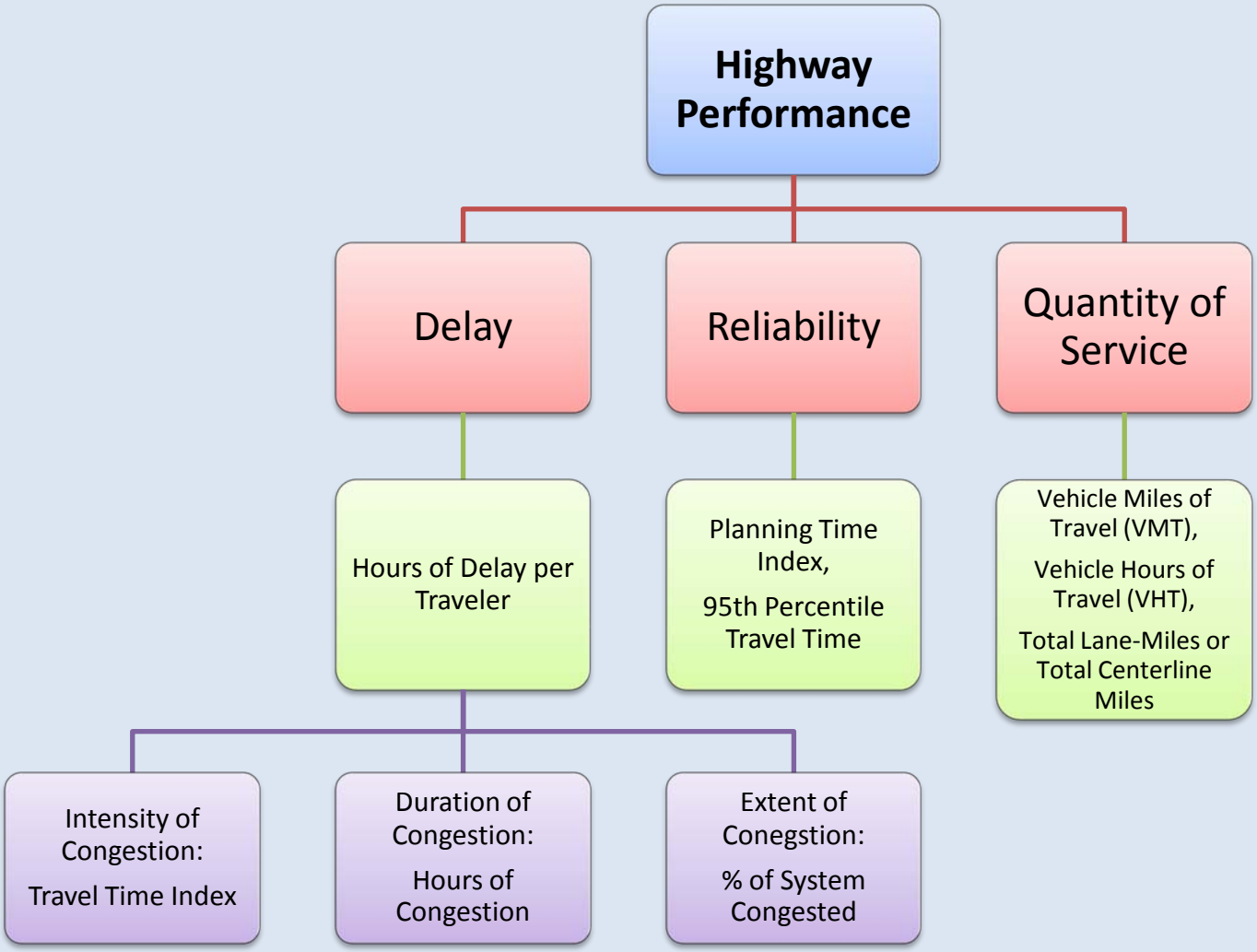
Hierarchical Highway Performance Measures



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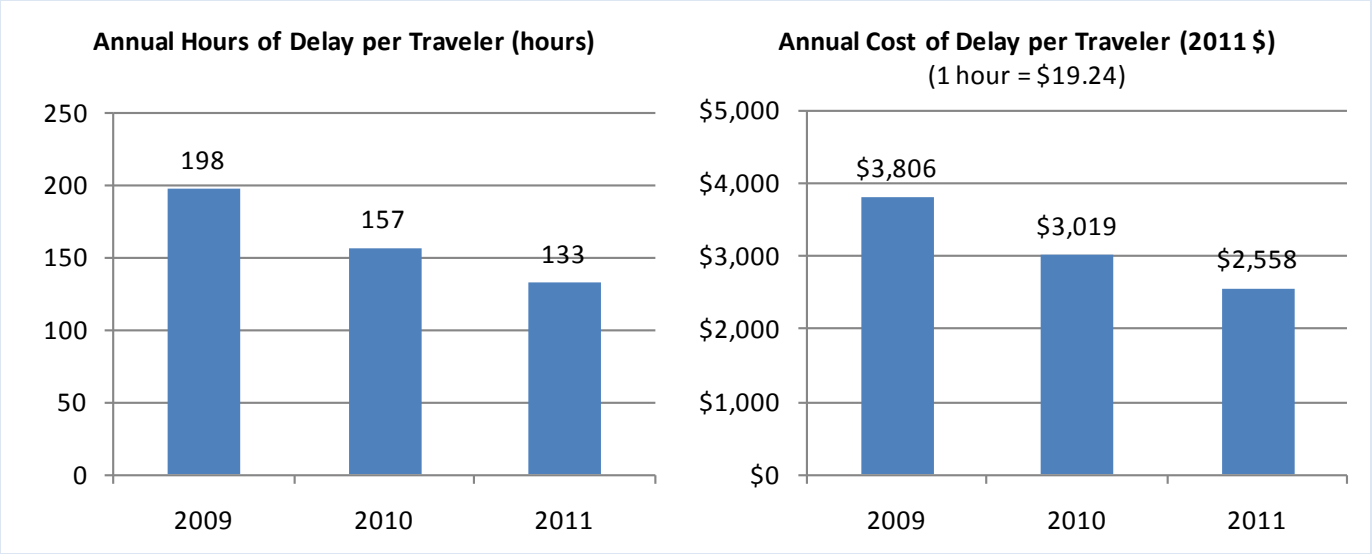
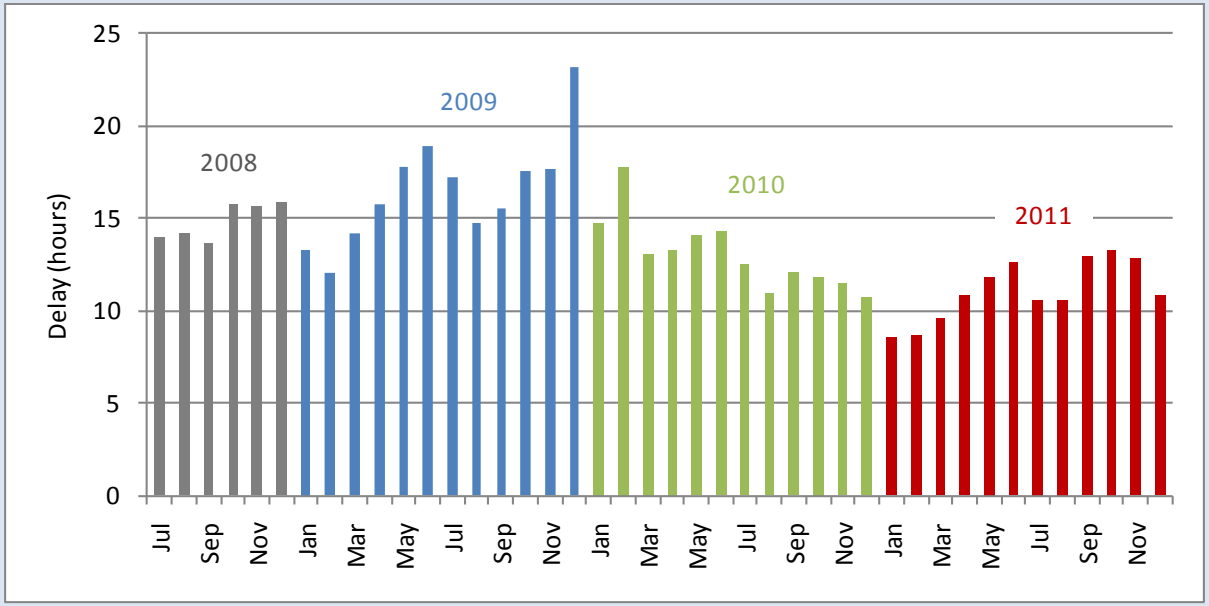
Main Products of Third-Party Data Analysis

- CMP* Technical Report
  - Biennial report to document the state of congestion and congestion management strategies
  - Latest draft report released on July 10, 2012
    http://www.mwcog.org/uploads/committee-documents/kV1dWlxd20120709134722.pdf
- National Capital Region Congestion Report (Dashboard)
  - Quarterly updated report to provide a brief view of congestion and a highlighted strategy in that quarter
  - www.mwcog.org/congestion

*Congestion Management Process (CMP), a federal mandate for MPOs with population 200,000+.

2012 CMP Tech Report: Delay





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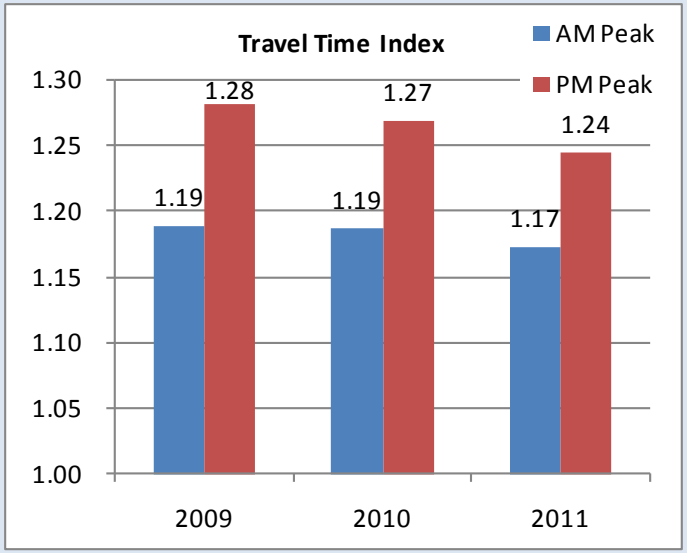
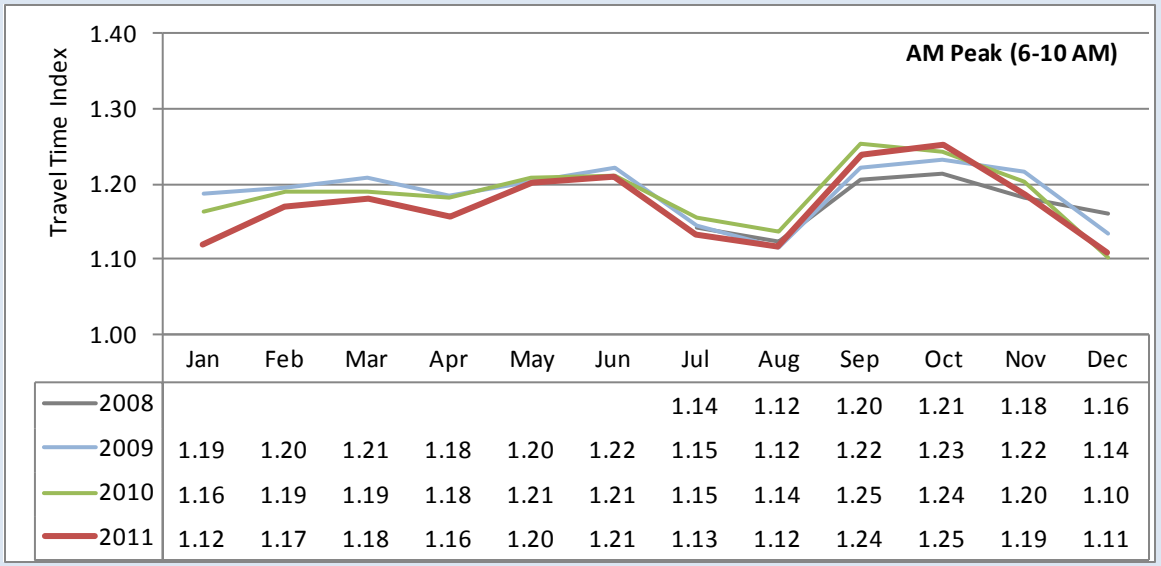
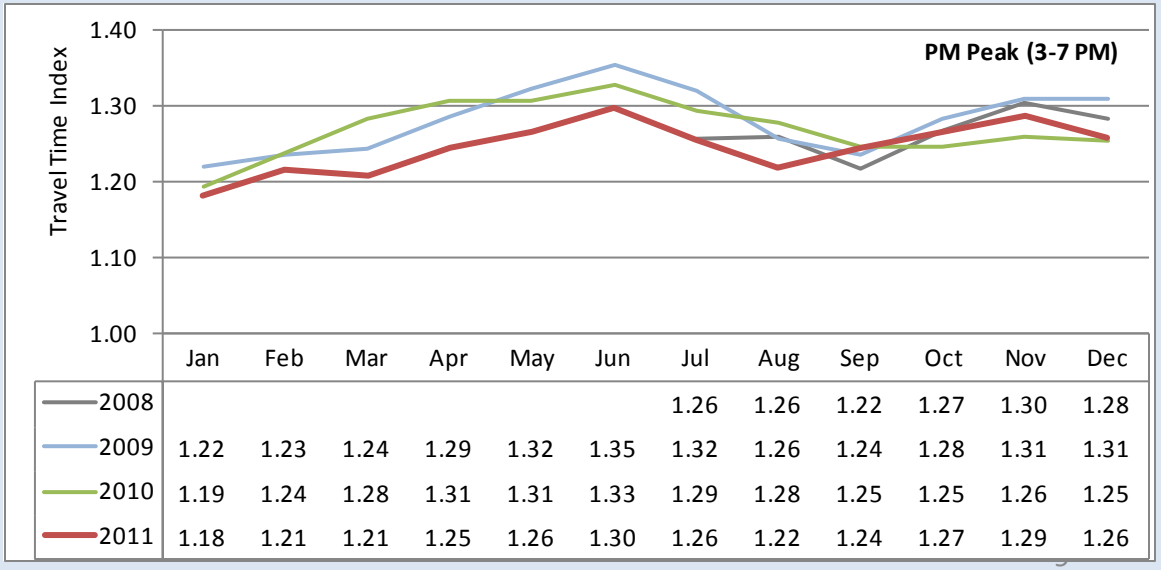
2012 CMP Tech Report: Travel Time Index





	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							1.14	1.12	1.20	1.21	1.18	1.16
2009	1.19	1.20	1.21	1.18	1.20	1.22	1.15	1.12	1.22	1.23	1.22	1.14
2010	1.16	1.19	1.19	1.18	1.21	1.21	1.15	1.14	1.25	1.24	1.20	1.10
2011	1.12	1.17	1.18	1.16	1.20	1.21	1.13	1.12	1.24	1.25	1.19	1.11



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							1.26	1.26	1.22	1.27	1.30	1.28
2009	1.22	1.23	1.24	1.29	1.32	1.35	1.32	1.26	1.24	1.28	1.31	1.31
2010	1.19	1.24	1.28	1.31	1.31	1.33	1.29	1.28	1.25	1.25	1.26	1.25
2011	1.18	1.21	1.21	1.25	1.26	1.30	1.26	1.22	1.24	1.27	1.29	1.26

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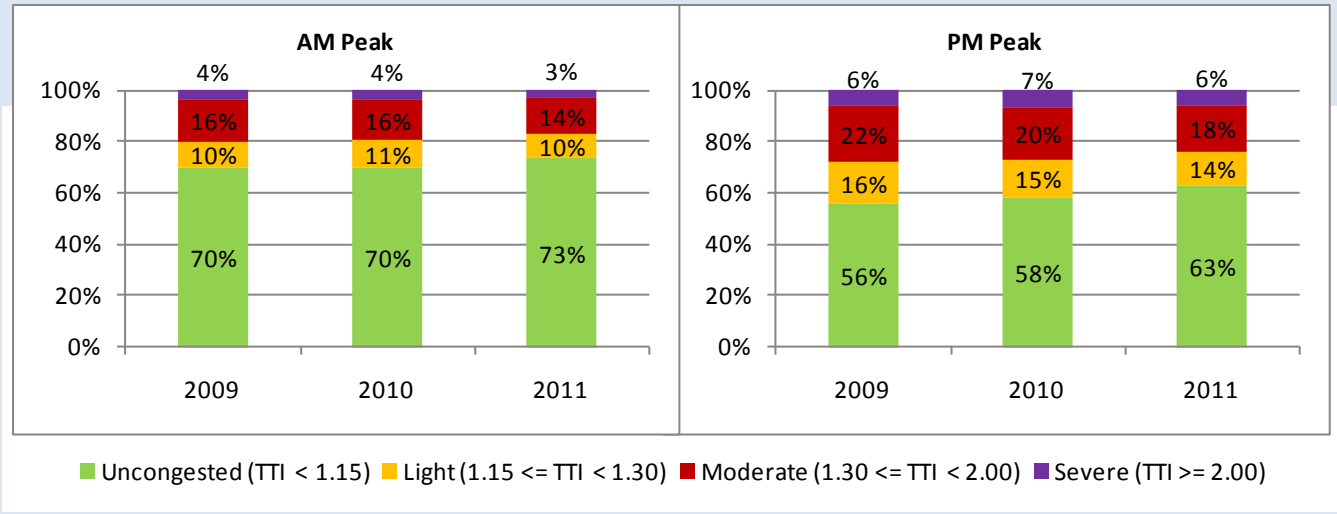
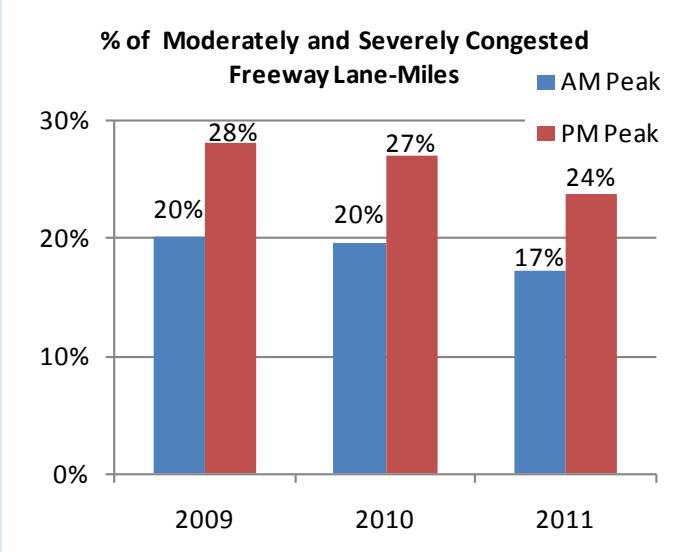
2012 CMP Tech Report: % Freeway Lane-Miles by Congestion Level





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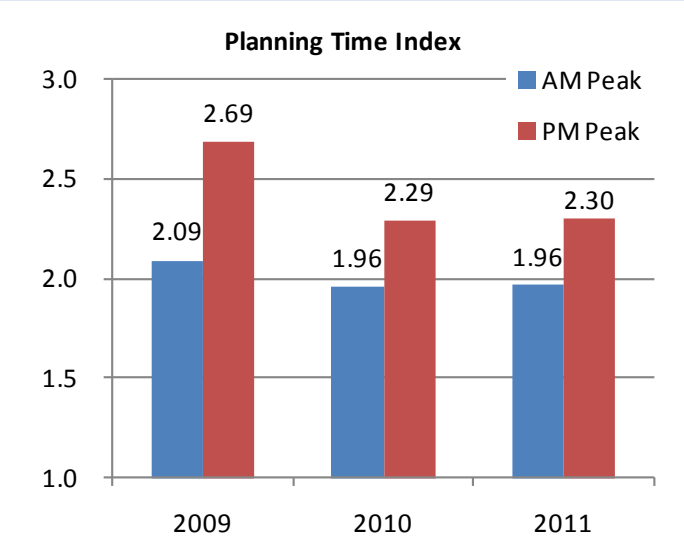
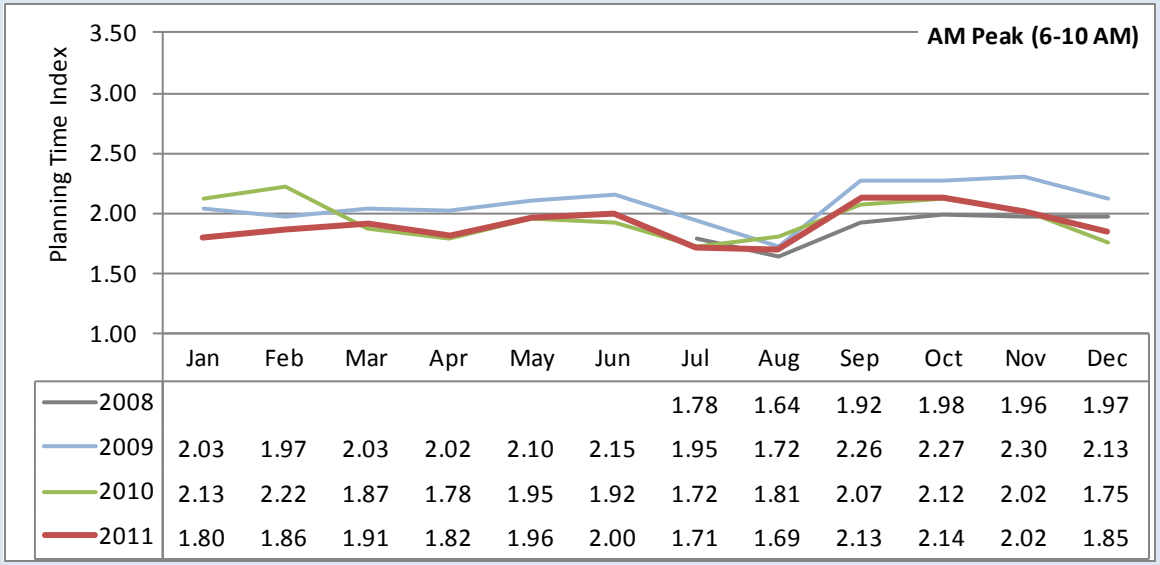
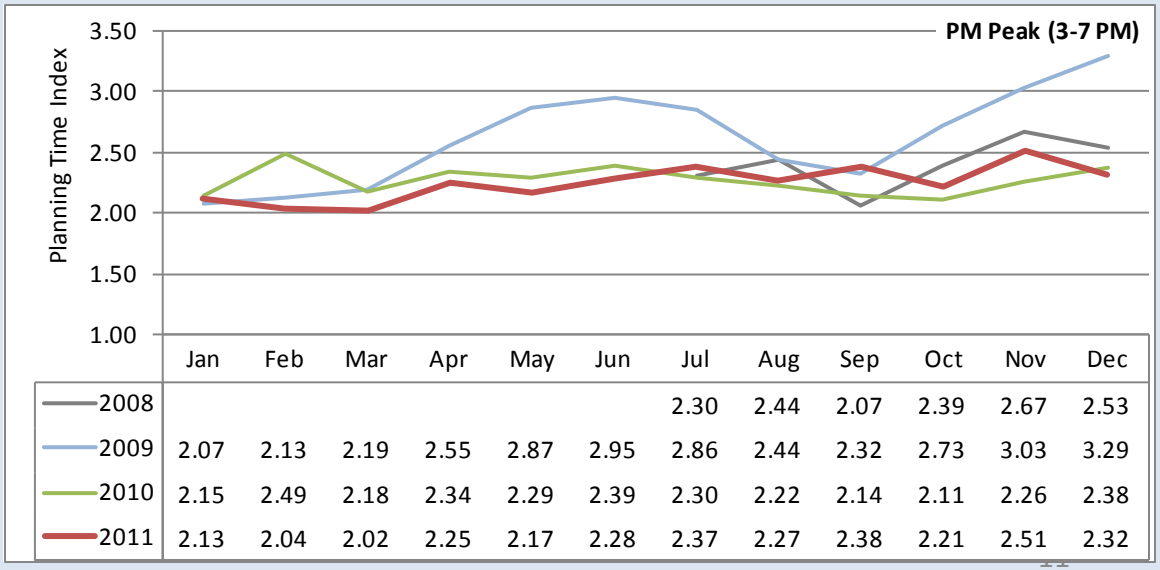
2012 CMP Tech Report: Planning Time Index





	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							1.78	1.64	1.92	1.98	1.96	1.97
2009	2.03	1.97	2.03	2.02	2.10	2.15	1.95	1.72	2.26	2.27	2.30	2.13
2010	2.13	2.22	1.87	1.78	1.95	1.92	1.72	1.81	2.07	2.12	2.02	1.75
2011	1.80	1.86	1.91	1.82	1.96	2.00	1.71	1.69	2.13	2.14	2.02	1.85



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							2.30	2.44	2.07	2.39	2.67	2.53
2009	2.07	2.13	2.19	2.55	2.87	2.95	2.86	2.44	2.32	2.73	3.03	3.29
2010	2.15	2.49	2.18	2.34	2.29	2.39	2.30	2.22	2.14	2.11	2.26	2.38
2011	2.13	2.04	2.02	2.25	2.17	2.28	2.37	2.27	2.38	2.21	2.51	2.32

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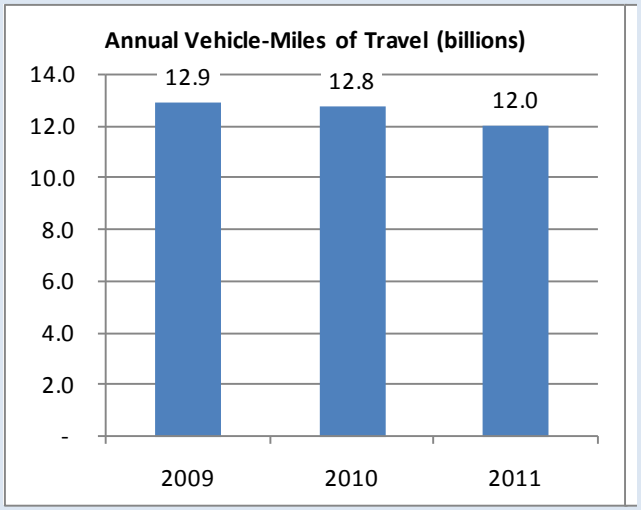
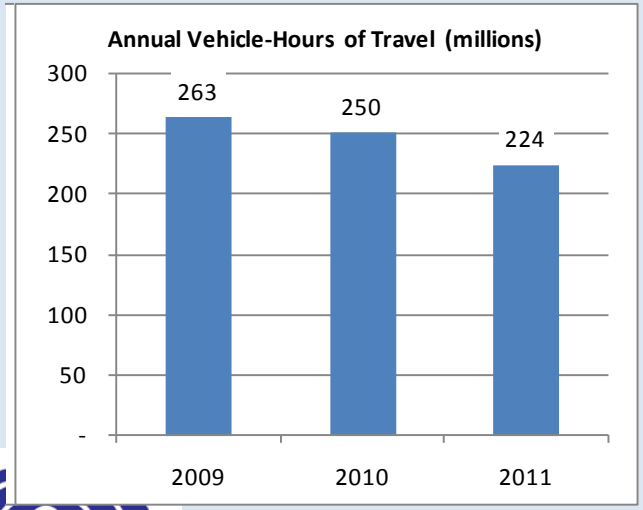
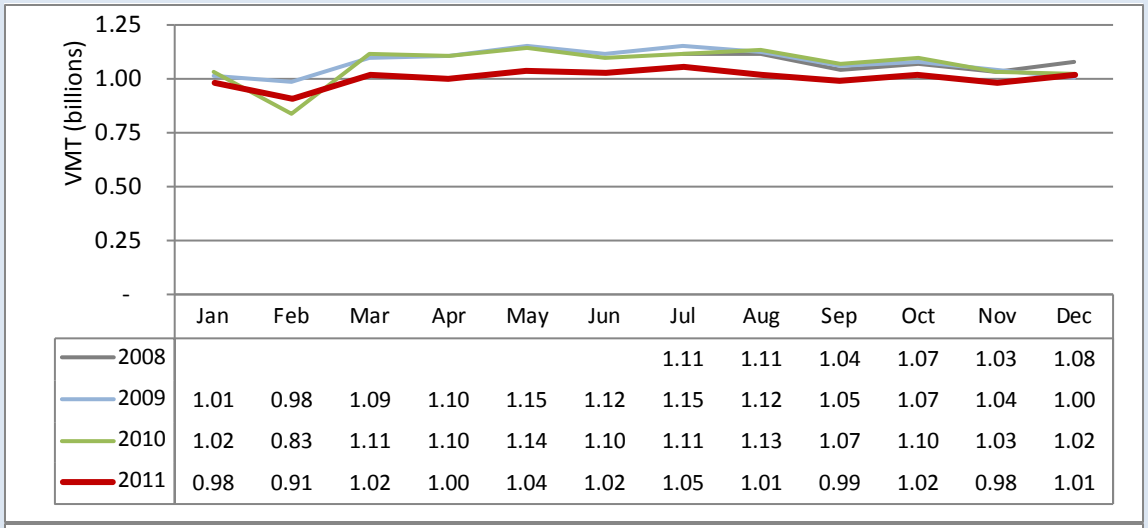
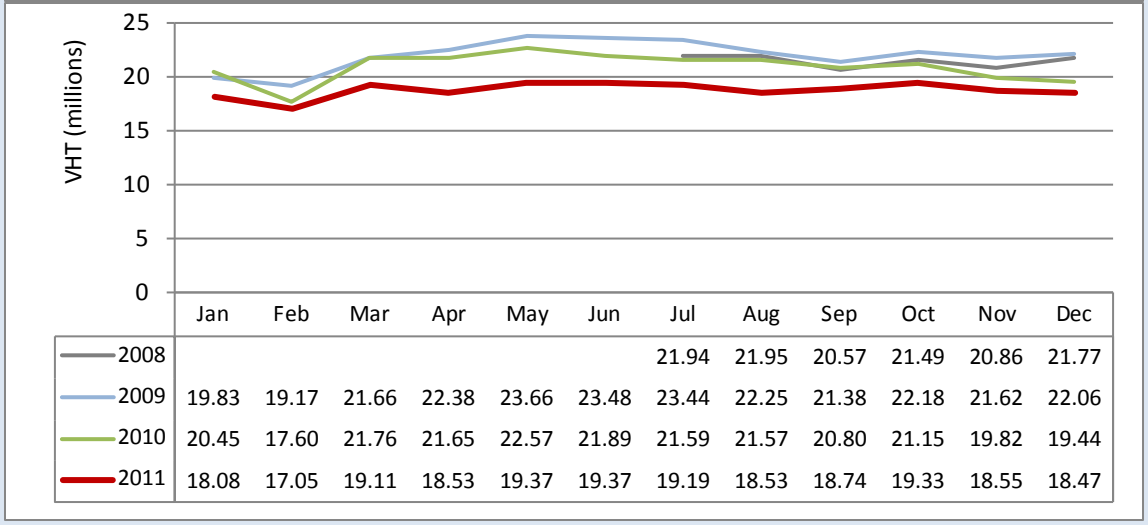
2012 CMP Tech Report: VMT and VHT







	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							1.11	1.11	1.04	1.07	1.03	1.08
2009	1.01	0.98	1.09	1.10	1.15	1.12	1.15	1.12	1.05	1.07	1.04	1.00
2010	1.02	0.83	1.11	1.10	1.14	1.10	1.11	1.13	1.07	1.10	1.03	1.02
2011	0.98	0.91	1.02	1.00	1.04	1.02	1.05	1.01	0.99	1.02	0.98	1.01



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							21.94	21.95	20.57	21.49	20.86	21.77
2009	19.83	19.17	21.66	22.38	23.66	23.48	23.44	22.25	21.38	22.18	21.62	22.06
2010	20.45	17.60	21.76	21.65	22.57	21.89	21.59	21.57	20.80	21.15	19.82	19.44
2011	18.08	17.05	19.11	18.53	19.37	19.37	19.19	18.53	18.74	19.33	18.55	18.47

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2012 CMP Tech Report: Major Commute Routes (AM Peak)

Route	Length (miles)	Free Flow Travel Time (min)	Beginning of Most Congested 5 Minutes			Average Travel Time in Peak Period (min)			Reliable (95th) Travel Time* in Peak Period (min)			2011 Change in Average Travel Time (min)		2011 Change in 95th Travel Time (min)	
			2009	2010	2011	2009	2010	2011	2009	2010	2011	vs. 2009	vs. 2010	vs. 2009	vs. 2010
I-270 SB from I-70 to I-370	23	21	7:35	6:50	6:45	36	34	31	60	56	50	-5	-3	-9	-5
I-270 SB from I-370 to I-495	10	9	8:30	8:05	7:50	17	17	15	32	31	27	-2	-2	-5	-3
VA-267 EB from VA-28 to I-66	15	14	7:55	7:50	8:00	24	22	21	43	37	34	-3	-2	-9	-3
I-66 EB from VA-28 to I-495	11	11	7:45	7:35	7:40	28	23	21	47	38	33	-7	-2	-15	-5
I-66 EB from I-495 to TR Bridge	10	9	9:25	9:25	9:30	15	15	15	24	23	23	0	0	-1	0
I-95 NB from VA-234 to I-495	19	18	6:45	6:35	6:35	41	32	27	76	56	54	-14	-4	-22	-1
I-95 NB HOV from VA-234 to I-495	18	16	7:55	7:45	7:35	25	19	18	39	23	22	-7	-1	-16	-1
I-395 NB from I-495 to Ohio Dr	10	10	7:55	7:50	7:55	26	26	25	49	50	49	-1	-2	0	-1
I-395 NB HOV from I-495 to Ohio Dr	11	10	7:55	7:50	7:45	21	18	15	39	26	23	-6	-3	-16	-4
US-50 WB from US-301 to MD-295	14	13	7:55	7:55	7:55	20	19	18	32	29	29	-1	0	-3	0
MD-295 SB from MD-198 to US-50	15	14	7:55	7:50	7:55	22	21	18	38	37	31	-4	-4	-7	-6
I-95 SB from MD-198 to I-495	8	8	7:55	7:50	7:50	12	12	12	24	24	24	0	-1	0	0
I-495 IL from I-270 to I-95	9	8	8:00	8:45	8:00	10	10	9	12	13	11	-1	-1	-1	-1
I-495 IL from I-95 to US-50	8	8	8:00	8:50	8:40	9	9	9	11	10	11	0	1	0	1
I-495 IL from US-50 to I-95	26	24	8:10	8:05	8:05	29	29	29	42	40	38	-1	-1	-4	-2
I-495 IL from I-95 to I-66	7	7	8:40	8:45	8:40	16	16	14	28	27	25	-1	-2	-3	-2
I-495 IL from I-66 to I-270	13	13	8:45	8:40	8:40	16	16	15	26	25	21	-2	-2	-5	-4
I-495 OL from I-270 to I-66	13	13	9:05	8:55	8:55	16	16	16	21	24	25	1	0	4	1
I-495 OL from I-66 to I-95	9	8	8:15	8:25	7:55	9	9	9	11	10	10	0	0	-1	0
I-495 OL from I-95 to US-50	24	23	8:30	8:30	8:20	28	28	28	37	39	40	-1	0	3	1
I-495 OL from US-50 to I-95	8	7	8:30	8:30	8:25	9	9	8	13	12	13	0	0	0	1
I-495 OL from I-95 to I-270	10	10	8:20	8:30	7:55	23	23	22	39	39	38	-1	-1	-1	-1

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2012 CMP Tech Report: Major Commute Routes (PM Peak)

Route	Length (miles)	Free Flow Travel Time (min)	Beginning of Most Congested 5 Minutes			Average Travel Time in Peak Period (min)			Reliable (95th) Travel Time* in Peak Period (min)			2011 Change in Average Travel Time (min)		2011 Change in 95th Travel Time (min)	
			2009	2010	2011	2009	2010	2011	2009	2010	2011	vs. 2009	vs. 2010	vs. 2009	vs. 2010
I-270 NB from I-495 to I-370	9	9	17:50	17:40	17:50	14	14	12	25	22	20	-2	-2	-4	-2
I-270 NB from I-370 to I-70	24	22	17:30	17:35	17:30	36	33	32	56	51	49	-3	-1	-7	-2
VA-267 WB from I-66 to VA-28	15	14	17:55	17:55	17:50	18	17	16	26	23	20	-2	-1	-5	-2
I-66 WB from TR Bridge to I-495	10	10	15:50	15:00	15:45	16	15	16	26	25	27	0	1	1	2
I-66 WB from I-495 to VA-28	12	11	17:50	17:40	17:35	20	22	19	31	34	33	-1	-3	2	-1
I-95 SB from I-495 to VA-234	19	18	17:30	17:35	17:30	53	49	41	120	107	87	-11	-8	-34	-20
I-95 SB HOV from I-495 to VA-234	18	16	16:40	18:40	18:45	29	23	21	56	33	33	-8	-1	-22	0
I-395 SB from Ohio Dr to I-495	11	11	17:35	17:30	17:35	23	21	19	38	32	29	-4	-2	-9	-2
I-395 SB HOV from Ohio Dr to I-495	11	10	18:25	18:25	18:25	17	14	12	27	17	16	-4	-2	-11	-1
US-50 EB from MD-295 to US-301	14	13	17:30	17:30	17:25	16	16	15	20	20	19	-1	-1	-1	-1
MD-295 NB from US-50 to MD-198	12	12	17:35	17:45	17:35	31	26	24	52	39	39	-7	-2	-13	0
I-95 NB from I-495 to MD-198	8	7	17:25	17:30	17:25	12	11	10	18	16	17	-1	0	-1	1
I-495 IL from I-270 to I-95	9	8	17:35	17:40	17:40	17	16	15	28	27	24	-2	-1	-3	-3
I-495 IL from I-95 to US-50	8	8	17:40	17:40	17:40	12	12	13	20	19	23	1	1	3	4
I-495 IL from US-50 to I-95	26	24	17:40	17:30	17:35	31	31	29	44	38	37	-2	-2	-7	-2
I-495 IL from I-95 to I-66	7	7	17:50	15:35	15:00	11	10	9	23	19	15	-2	-1	-8	-4
I-495 IL from I-66 to I-270	13	13	17:50	17:40	17:05	45	39	36	90	70	67	-9	-3	-23	-3
I-495 OL from I-270 to I-66	13	13	17:50	17:40	17:05	29	29	29	53	51	53	0	0	0	1
I-495 OL from I-66 to I-95	9	8	17:45	17:55	17:45	11	11	11	14	16	16	0	0	2	-1
I-495 OL from I-95 to US-50	24	23	17:00	17:30	17:30	30	30	29	46	45	46	-1	0	0	1
I-495 OL from US-50 to I-95	8	7	17:45	17:50	17:50	11	10	10	19	17	17	-1	0	-2	0
I-495 OL from I-95 to I-270	10	10	17:55	17:35	17:40	17	17	15	38	33	31	-3	-2	-7	-2

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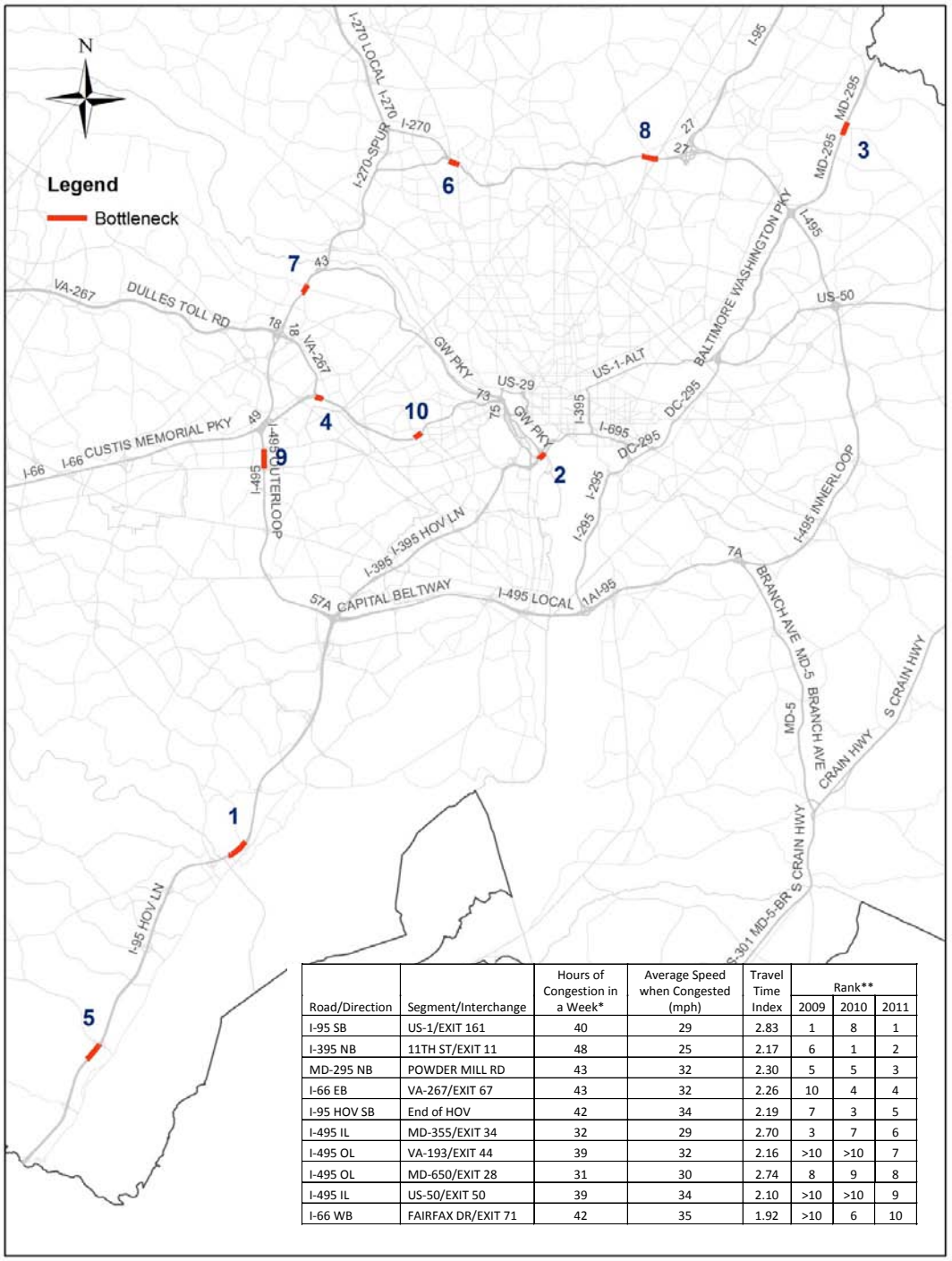
Top 10 Bottlenecks in 2011



Road/Direction	Segment/Interchange	Hours of Congestion in a Week*	Average Speed when Congested (mph)	Travel Time Index	Rank**		
					2009	2010	2011
I-95 SB	US-1/EXIT 161	40	29	2.83	1	8	1
I-395 NB	11TH ST/EXIT 11	48	25	2.17	6	1	2
MD-295 NB	POWDER MILL RD	43	32	2.30	5	5	3
I-66 EB	VA-267/EXIT 67	43	32	2.26	10	4	4
I-95 HOV SB	End of HOV	42	34	2.19	7	3	5
I-495 IL	MD-355/EXIT 34	32	29	2.70	3	7	6
I-495 OL	VA-193/EXIT 44	39	32	2.16	>10	>10	7
I-495 OL	MD-650/EXIT 28	31	30	2.74	8	9	8
I-495 IL	US-50/EXIT 50	39	34	2.10	>10	>10	9
I-66 WB	FAIRFAX DR/EXIT 71	42	35	1.92	>10	6	10

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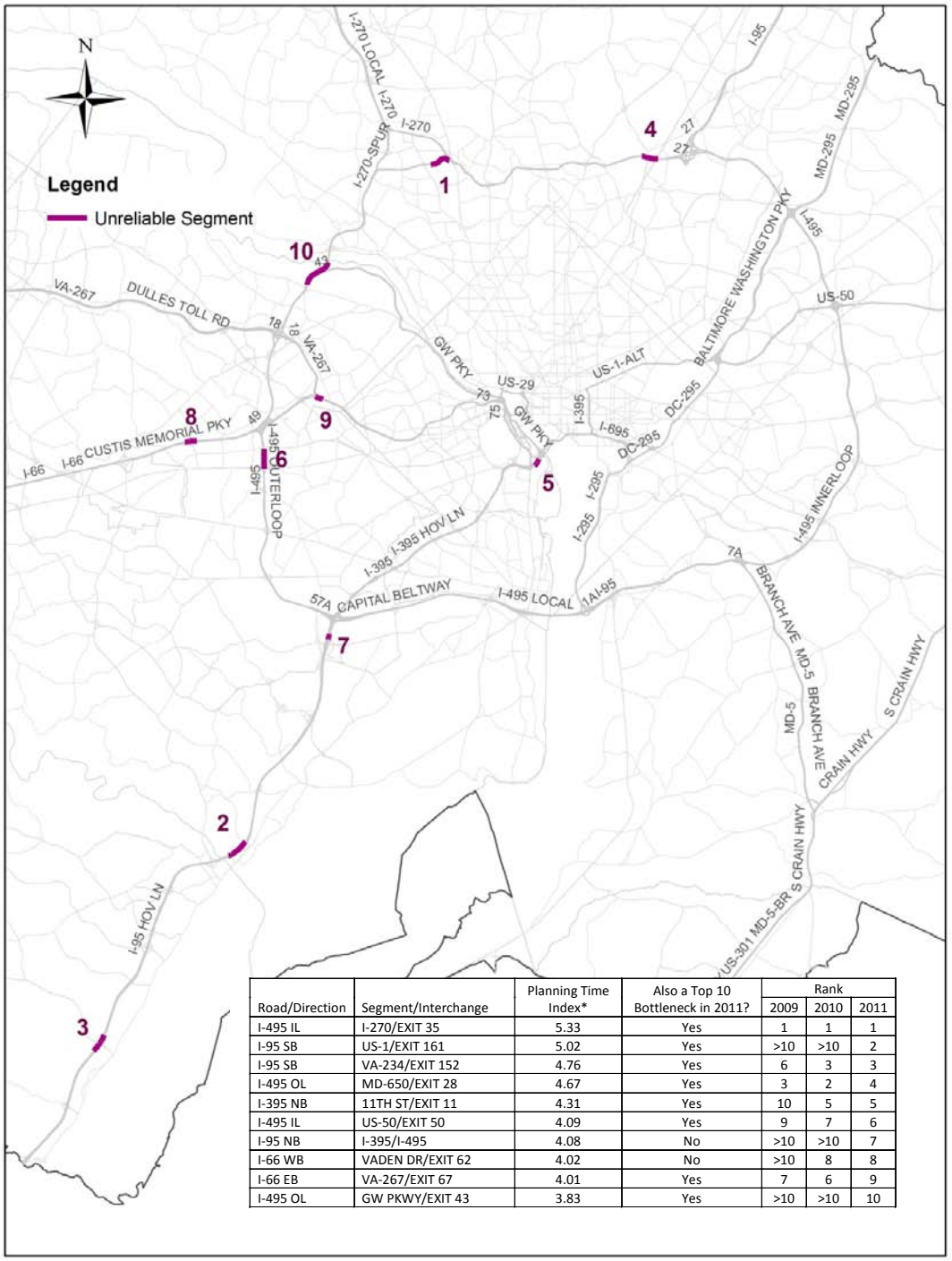
Top 10 Most Unreliable Segments in 2011



Road/Direction	Segment/Interchange	Planning Time Index*	Also a Top 10 Bottleneck in 2011?	Rank		
				2009	2010	2011
I-495 IL	I-270/EXIT 35	5.33	Yes	1	1	1
I-95 SB	US-1/EXIT 161	5.02	Yes	>10	>10	2
I-95 SB	VA-234/EXIT 152	4.76	Yes	6	3	3
I-495 OL	MD-650/EXIT 28	4.67	Yes	3	2	4
I-395 NB	11TH ST/EXIT 11	4.31	Yes	10	5	5
I-495 IL	US-50/EXIT 50	4.09	Yes	9	7	6
I-95 NB	I-395/I-495	4.08	No	>10	>10	7
I-66 WB	VADEN DR/EXIT 62	4.02	No	>10	8	8
I-66 EB	VA-267/EXIT 67	4.01	Yes	7	6	9
I-495 OL	GW PKWY/EXIT 43	3.83	Yes	>10	>10	10

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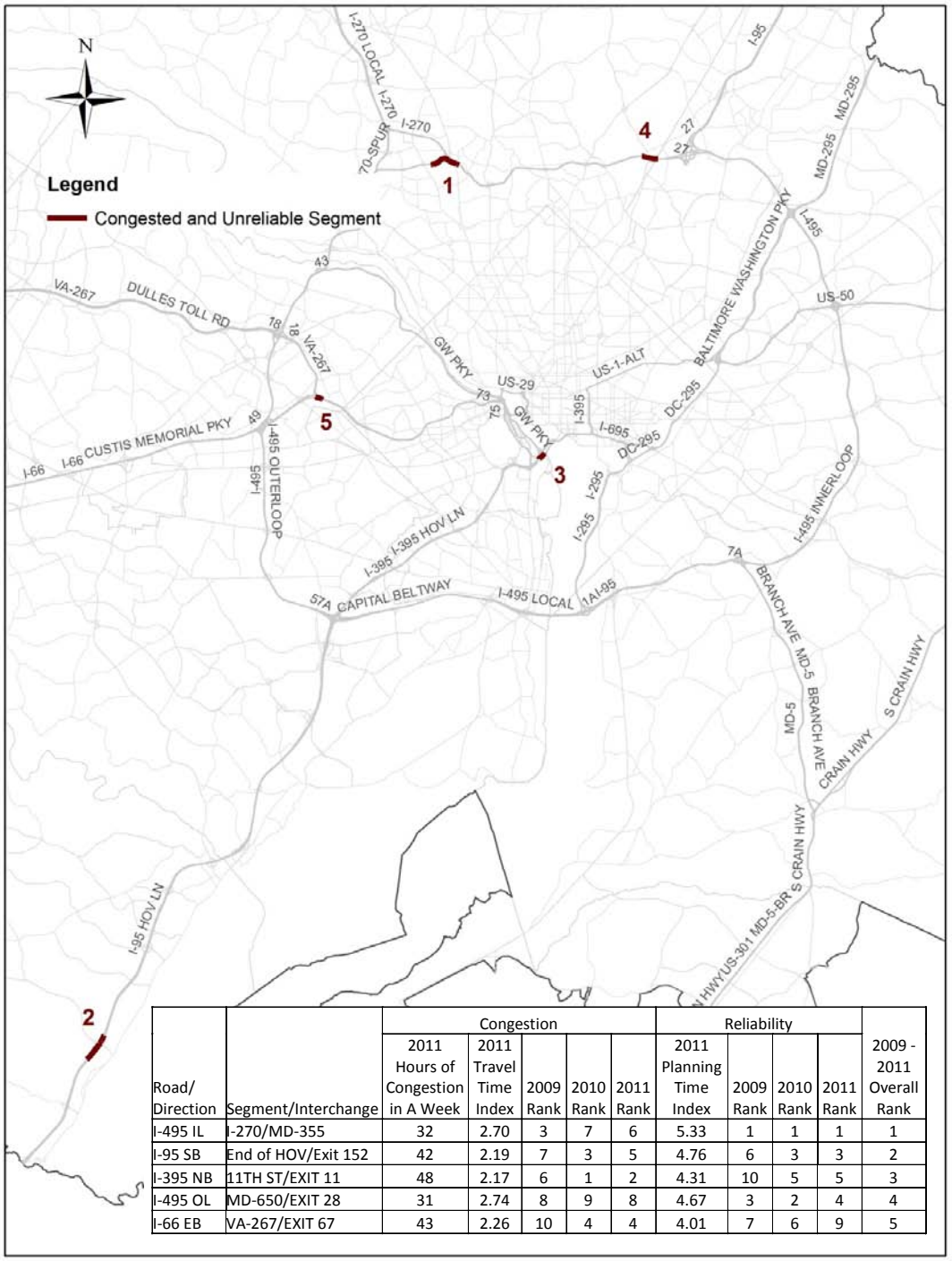
Top congested and unreliable locations 2009-2011



Road/ Direction	Segment/Interchange	Congestion: 2011 Hours of Congestion in A Week	Congestion: 2011 Travel Time Index	Congestion: 2009 Rank	Congestion: 2010 Rank	Congestion: 2011 Rank	Reliability: 2011 Planning Time Index	Reliability: 2009 Rank	Reliability: 2010 Rank	Reliability: 2011 Rank	2009 - 2011 Overall Rank
I-495 IL	I-270/MD-355	32	2.70	3	7	6	5.33	1	1	1	1
I-95 SB	End of HOV/Exit 152	42	2.19	7	3	5	4.76	6	3	3	2
I-395 NB	11TH ST/EXIT 11	48	2.17	6	1	2	4.31	10	5	5	3
I-495 OL	MD-650/EXIT 28	31	2.74	8	9	8	4.67	3	2	4	4
I-66 EB	VA-267/EXIT 67	43	2.26	10	4	4	4.01	7	6	9	5

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Developing a Regional Congestion "Dashboard"

- Inspired by various agency / jurisdictional dashboard efforts around the country, e.g., Virginia DOT
- Desire to bring the CMP "alive"
  - Relevant to the activities our MPO board is discussing or encouraging
- Timely –updated quarterly
- Simple and easy-to-communicate performance measures
- Take advantage of available data
- Availability: www.mwcog.org/congestion

Metropolitan Washington Council of Governments

National Capital Region Congestion Report (Beta) 4th Quarter 2011 *Snapshot*

Congestion on Freeways
Delay in Q4/2011

All time in Q4/2011

12.3 Hours → $237*
per traveler per month during Q4/2011

+9 %
vs. Q4/2010

*Cost of time = $19.24/ hour (Derived from TPB model & Travel Survey)

(see p. 3)

Reliability on Freeways
Extra Time for On-Time Arrival** in Q4/2011

AM Peak (6 – 10 AM)

202% of free flow travel time

+6 pp*
vs. Q4/2010

PM Peak (3 – 7 PM)

236% of free flow travel time

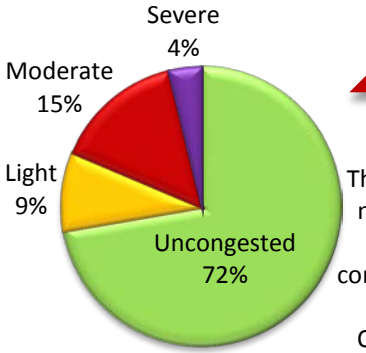
+11 pp*
vs. Q4/2010

*pp: percentage points.
**This is compared to free flow travel time. For example, a 20-minute free flow travel with 200% extra time for on-time arrival indicates one has to budget a total of 20 * 200% = 40 minutes to arrive on time (this measure essentially is Planning Time Index).

(see p. 4)

Percentages of Freeway Lane-Miles by Congestion Level in Q4/2011

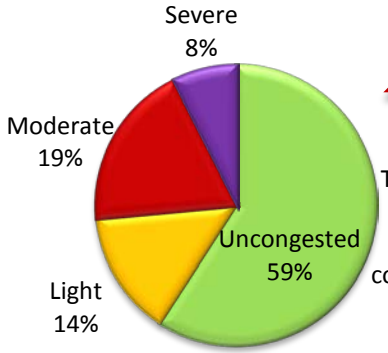
AM Peak (6 – 10 AM)



+1 %

The change of moderate & severe congested lane-miles in Q4/2011 vs. Q4/2010.

PM Peak (3 – 7 PM)



+3 %

The change of moderate & severe congested lane-miles in Q4/2011 vs. Q4/2010.

Congestion level	Ratio of experienced travel time to free flow travel time
Uncongested	< 1.15
Light	1.15 - 1.3
Moderate	1.3 - 2
Severe	> 2

(see p. 5, 6 & 7)

Spotlight

Traffic on "Black Friday"

The region's overall freeway traffic was examined for the day after Thanksgiving in the past 4 years and the results revealed significant changes in 2011.

(see p.15)

Powered by the I-95 Corridor Coalition Vehicle Probe Project and expansions made available by MDOT and VDOT, and the Transportation Technology Innovation and Demonstration (TTID) Program of FHWA.

Q4/2011 Congestion One Pager

In the last quarter of 2011, **total freeway delay was up 9% (or 3 hours) compared to the same quarter last year**. The total delay per traveler (or cost of time):

- Q4/2011: 37 hours (or $711 per traveler per month)
- Q4/2010: 34 hours (or $654)

Travel time reliability became slightly worse in both AM and PM peak periods compared to Q4/2010. The extra time for on time arrival was (as a % of free flow travel time):

- AM Peak: 202% (%195 in Q4/2010)
- PM Peak: 236% (%225 in Q4/2010)

The percentage of moderate and severe congested freeway lane-miles and the travel time burden slightly increased during both AM and PM peak periods, compared to the same quarter last year.

No significant changes were observed on sampled arterials: traffic conditions were a little better compared to Q4/2010 and a little worse compared to Q4/2009.

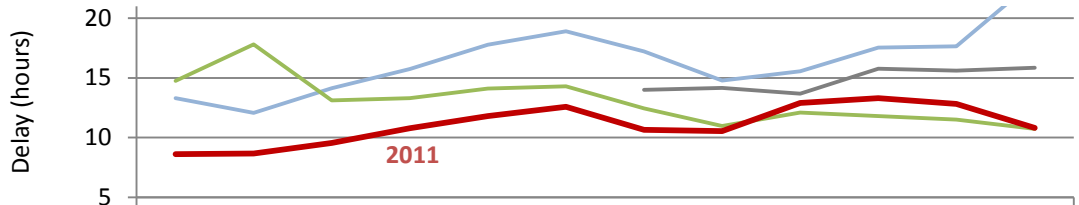
5 out of the 10 most congested freeway bottlenecks were in the vicinity of Tysons Corner. The 11th Street Bridge became the most congested bottleneck, largely due to the impacts of construction activities.

There was no major winter storm during Q4/2011, similar to Q4/2010, and unlike Q4/2009, during which a snow storm hit this region on Dec. 19 and the impacts lasted about a week.

The causal factors influencing congestion levels this quarter compared to the same quarter last year cannot be definitively determined. However, known notable factors included:

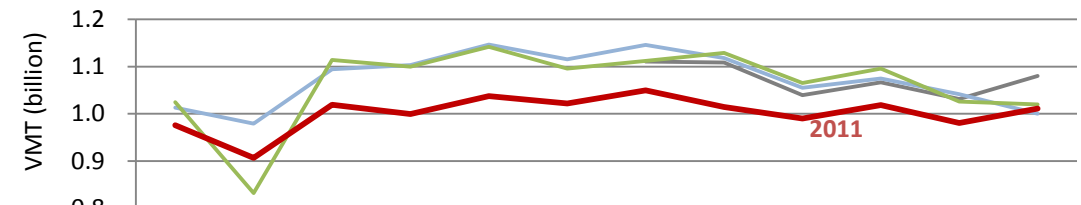
- Stronger holiday retail sales compared to the last several years
- Unemployment rate in the region has slightly dropped compared to Q4/2010

Freeway Delay Per Traveler



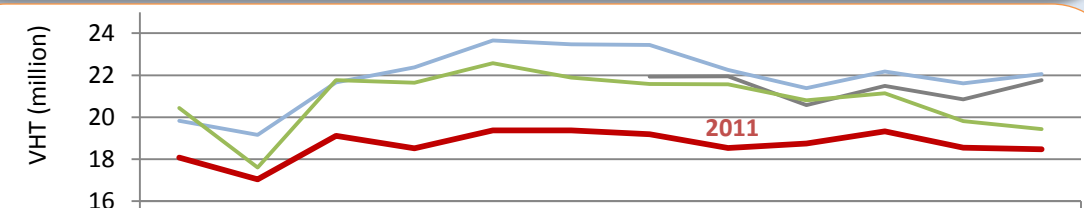
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							14.0	14.2	13.7	15.8	15.6	15.8
2009	13.3	12.1	14.1	15.7	17.8	18.9	17.2	14.8	15.6	17.5	17.6	23.2
2010	14.7	17.8	13.1	13.3	14.1	14.3	12.4	11.0	12.1	11.8	11.5	10.7
2011	8.6	8.7	9.5	10.8	11.8	12.6	10.6	10.5	12.9	13.3	12.8	10.8

Freeway Vehicle-Miles of Travel (VMT)



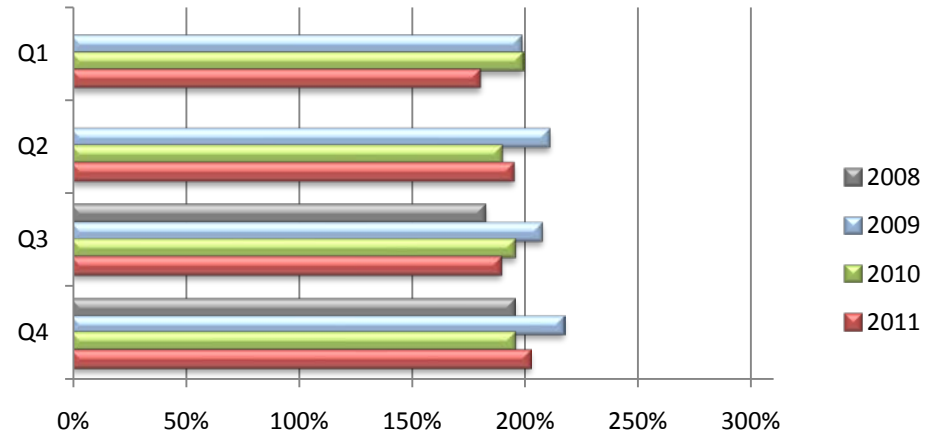
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							1.11	1.11	1.04	1.07	1.03	1.08
2009	1.01	0.98	1.09	1.10	1.15	1.12	1.15	1.12	1.05	1.07	1.04	1.00
2010	1.02	0.83	1.11	1.10	1.14	1.10	1.11	1.13	1.07	1.10	1.03	1.02
2011	0.98	0.91	1.02	1.00	1.04	1.02	1.05	1.01	0.99	1.02	0.98	1.01

Freeway Vehicle-Hours of Travel (VHT)

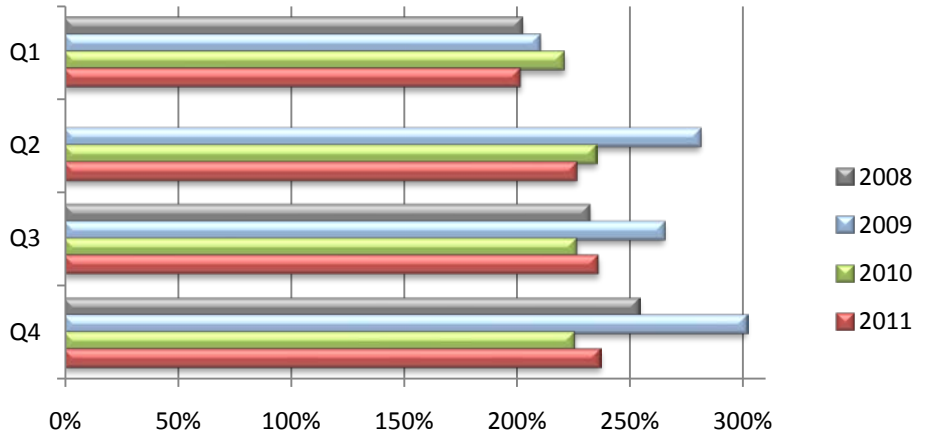


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							21.94	21.95	20.57	21.49	20.86	21.77
2009	19.83	19.17	21.66	22.38	23.66	23.48	23.44	22.25	21.38	22.18	21.62	22.06
2010	20.45	17.60	21.76	21.65	22.57	21.89	21.59	21.57	20.80	21.15	19.82	19.44
2011	18.08	17.05	19.11	18.53	19.37	19.37	19.19	18.53	18.74	19.33	18.55	18.47

Extra Time for On-Time Arrival: AM Peak (6 – 10 AM)



Extra Time for On-Time Arrival: PM Peak (3 – 7 PM)

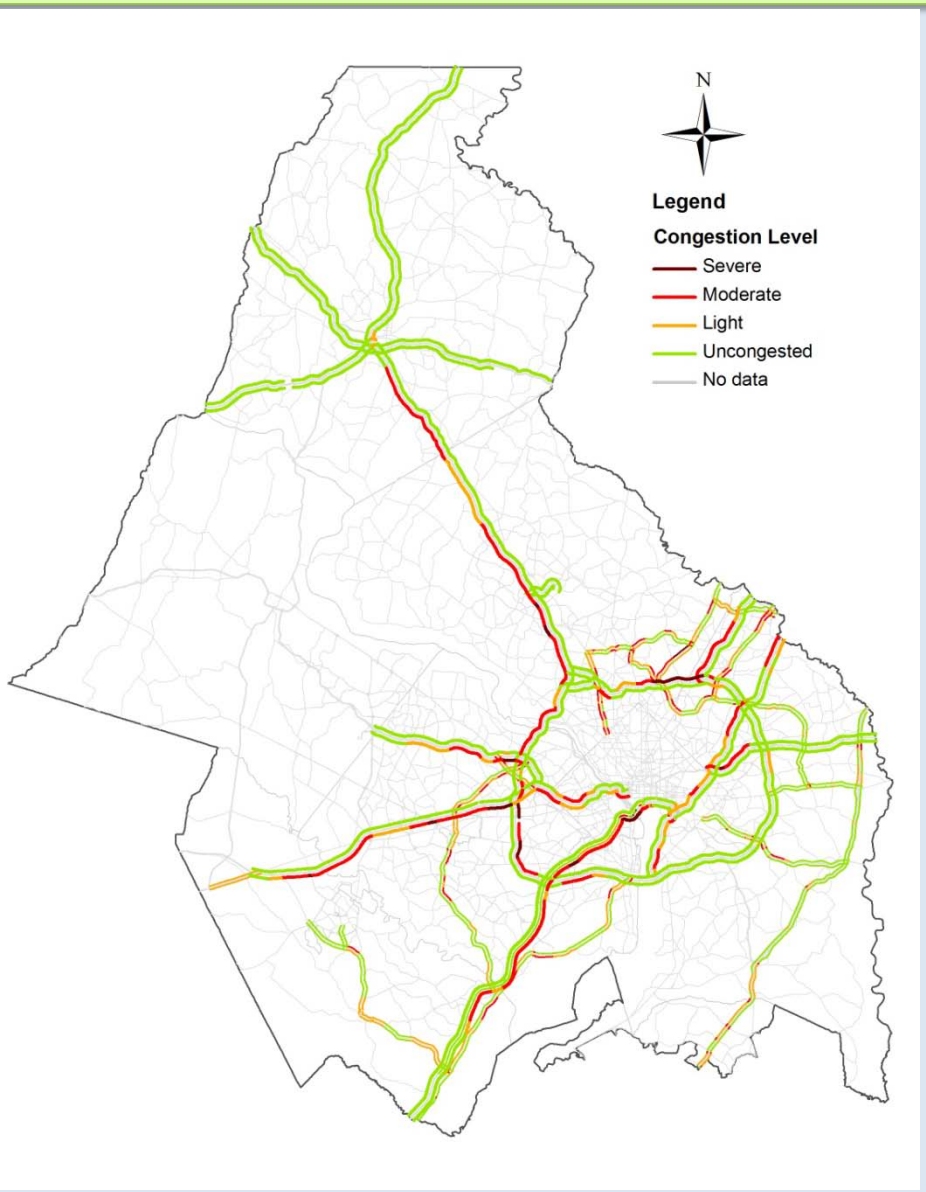


One example of *Extra Time for On-Time Arrival (Planning Time Index)*:

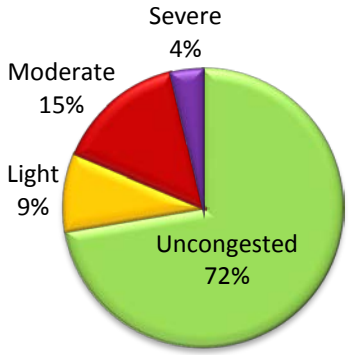
A 20-minute free flow travel with 200% extra time for on-time arrival indicates one has to budget a total of 20 * 200% = 40 minutes to arrive on time.

National Capital Region Congestion Report (Beta) 4th Quarter 2011 *AM Peak (6 – 10 AM)*

Highway Congestion in Q4/2011: AM Peak (6 – 10 AM)



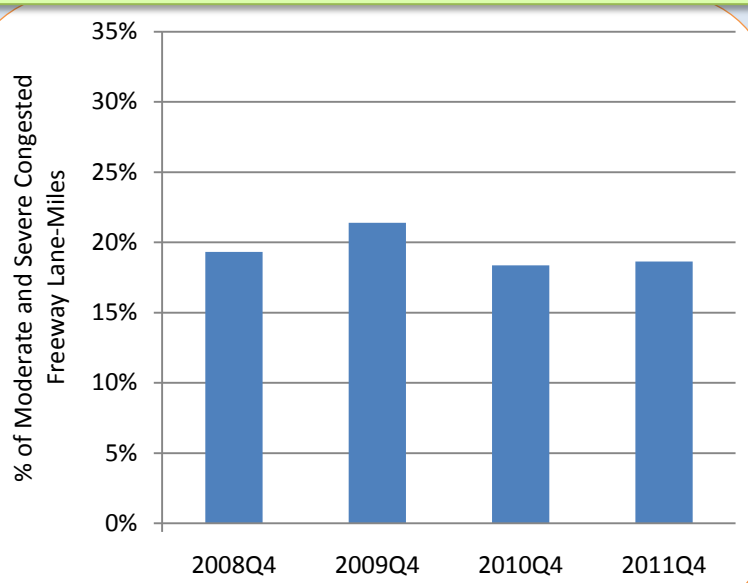
% of Freeway Lane-Miles by Congestion Level in AM Peak



The change (in %) of moderate and severe congested freeway lane-miles in Q4/2011 compared to Q4/2010. (see p. 7)

Total monitored freeway lane-miles: 2,000.

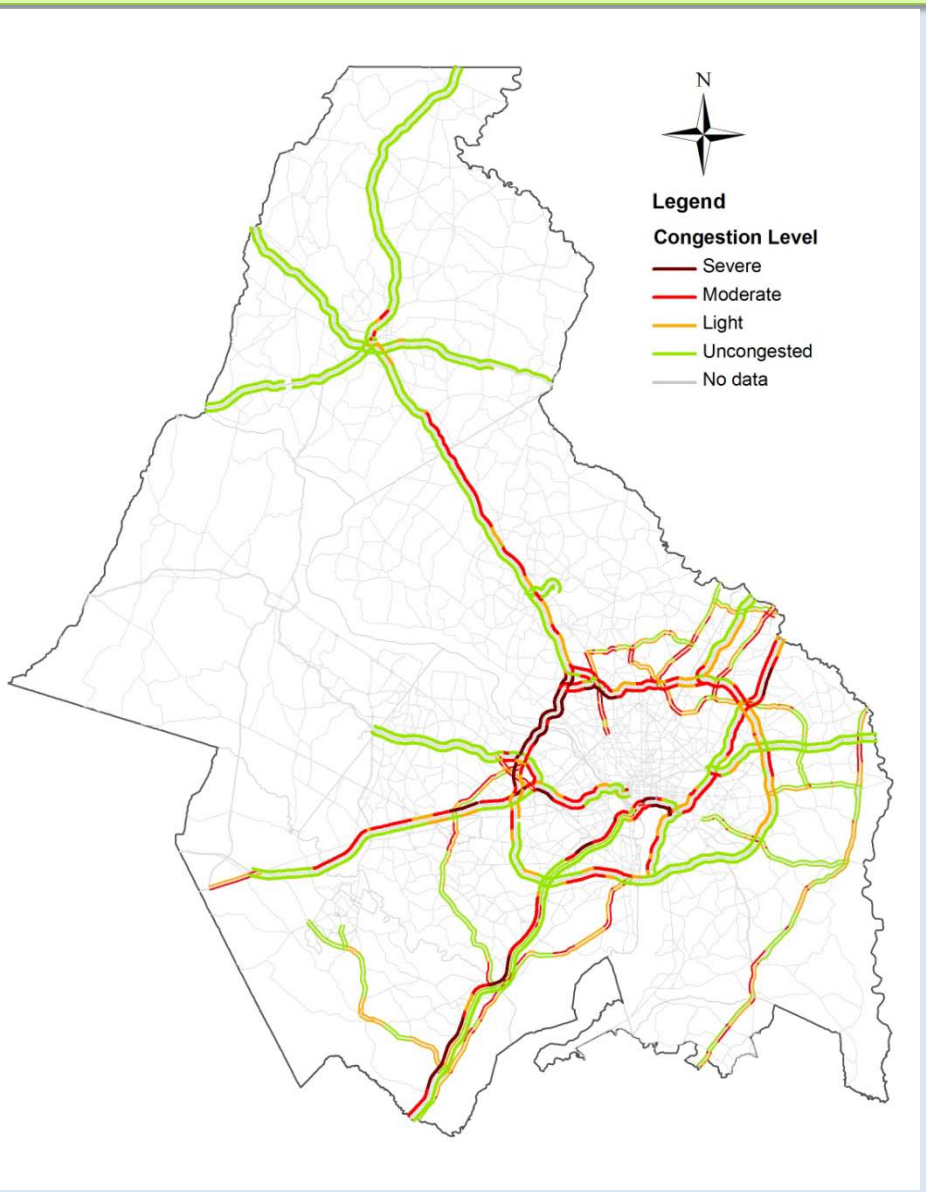
Congestion Variation in AM Peak & Historical Comparison



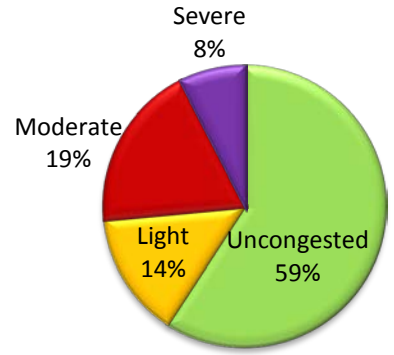
Congestion level is determined by Travel Time Index (TTI): severe: TTI >= 2.00, moderate: 1.30 <= TTI < 2.00, light: 1.15 <= TTI < 1.30, and uncongested: TTI < 1.15. *Travel time burden* is the percentage of additional travel time over and above free flow travel time, i.e., travel time burden = (actual travel time – free flow travel time)/free flow travel time * 100%.

National Capital Region Congestion Report (Beta) 4th Quarter 2011 *PM Peak (3 – 7 PM)*

Highway Congestion in Q4/2011: PM Peak (3 – 7 PM)



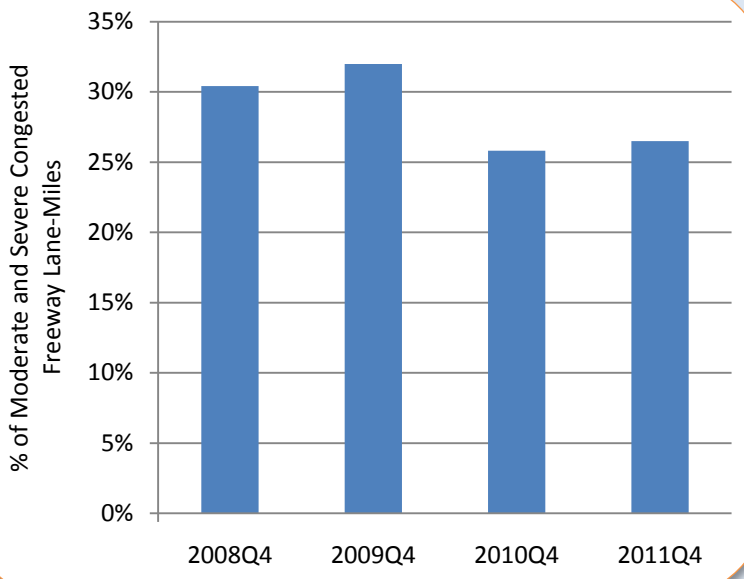
% of Freeway Lane-Miles by Congestion Level in PM Peak



The change (in %) of moderate and severe congested freeway lane-miles in Q4/2011 compared to Q4/2010. (see p. 7)

Total monitored freeway lane-miles: 2,000.

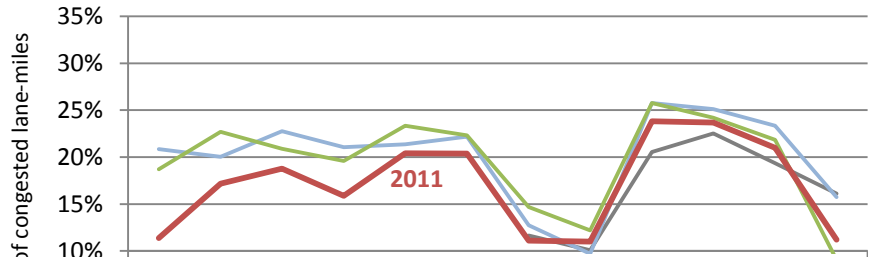
Congestion Variation in PM Peak & Historical Comparison



Congestion level is determined by Travel Time Index (TTI): severe: TTI >= 2.00, moderate: 1.30 <= TTI < 2.00, light: 1.15 <= TTI < 1.30, and uncongested: TTI < 1.15. *Travel time burden* is the percentage of additional travel time over and above free flow travel time, i.e., travel time burden = (actual travel time – free flow travel time)/free flow travel time * 100%.

Percentages of Moderate and Severe Congested Freeway Lane-Miles

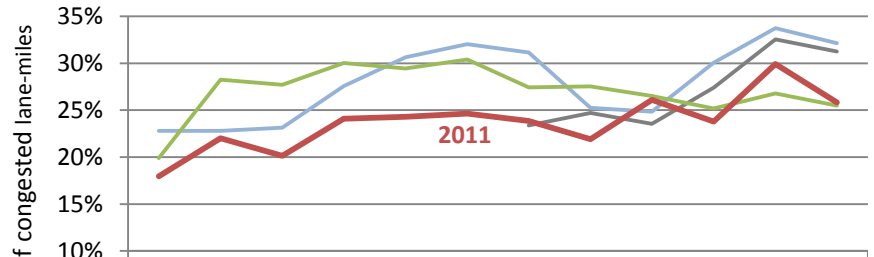
AM Peak (6 – 10 AM)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							12%	10%	21%	23%	19%	16%
2009	21%	20%	23%	21%	21%	22%	13%	10%	26%	25%	23%	16%
2010	19%	23%	21%	20%	23%	22%	15%	12%	26%	24%	22%	9%
2011	11%	17%	19%	16%	20%	20%	11%	11%	24%	24%	21%	11%

Percentages of Moderate and Severe Congested Freeway Lane-Miles

PM Peak (3 – 7 PM)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							23%	25%	24%	27%	33%	31%
2009	23%	23%	23%	28%	31%	32%	31%	25%	25%	30%	34%	32%
2010	20%	28%	28%	30%	29%	30%	27%	28%	27%	25%	27%	25%
2011	18%	22%	20%	24%	24%	25%	24%	22%	26%	24%	30%	26%

Congestion level is determined by Travel Time Index (TTI), the ratio of actual travel time to free flow travel time:

Severe:
TTI >= 2.00

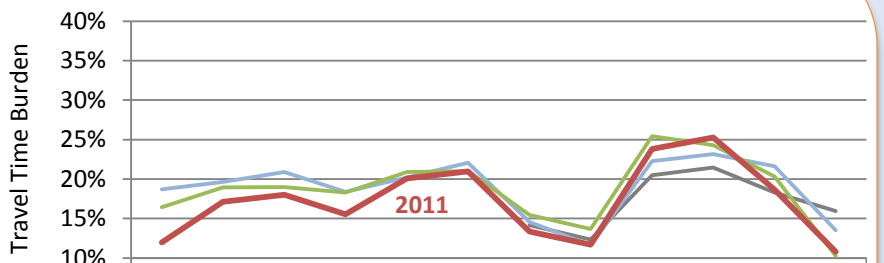
Moderate:
1.30 <= TTI < 2.00

Light:
1.15 <= TTI < 1.30

Uncongested:
TTI < 1.15

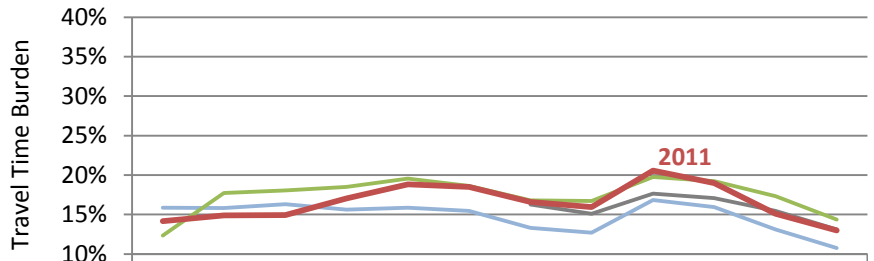
National Capital Region Congestion Report (Beta) 4th Quarter 2011 *Travel Time Burden**

Freeway Travel Time Burden: AM Peak (6 – 10 AM)



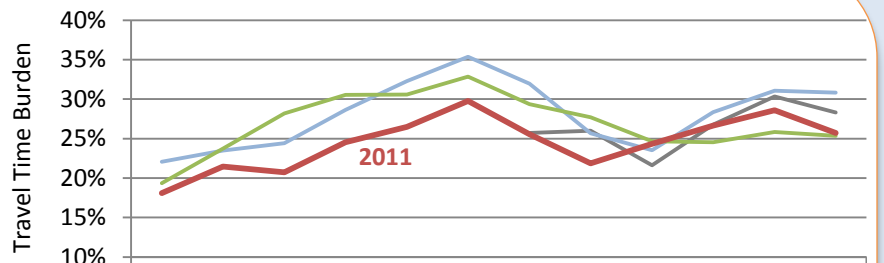
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							14%	12%	20%	21%	18%	16%
2009	19%	20%	21%	18%	20%	22%	15%	12%	22%	23%	22%	14%
2010	16%	19%	19%	18%	21%	21%	15%	14%	25%	24%	20%	10%
2011	12%	17%	18%	16%	20%	21%	13%	12%	24%	25%	19%	11%

Arterial Travel Time Burden: AM Peak (6 – 10 AM)



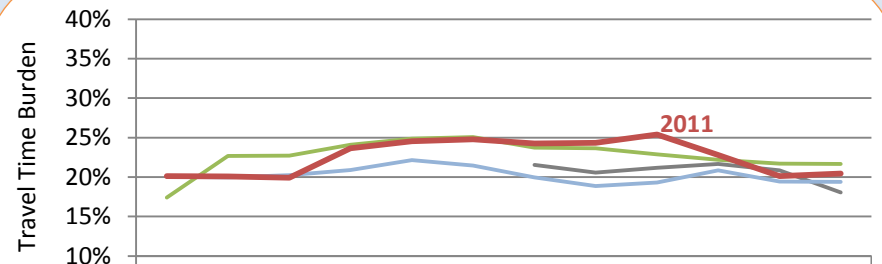
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							16%	15%	18%	17%	15%	13%
2009	16%	16%	16%	16%	16%	15%	13%	13%	17%	16%	13%	11%
2010	12%	18%	18%	19%	20%	19%	17%	17%	20%	19%	17%	14%
2011	14%	15%	15%	17%	19%	19%	17%	16%	21%	19%	15%	13%

Freeway Travel Time Burden: PM Peak (3 – 7 PM)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							26%	26%	22%	27%	30%	28%
2009	22%	23%	24%	29%	32%	35%	32%	26%	24%	28%	31%	31%
2010	19%	24%	28%	31%	31%	33%	29%	28%	25%	25%	26%	25%
2011	18%	21%	21%	25%	26%	30%	26%	22%	24%	27%	29%	26%

Arterial Travel Time Burden: PM Peak (3 – 7 PM)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008							22%	21%	21%	22%	21%	18%
2009	20%	20%	20%	21%	22%	21%	20%	19%	19%	21%	19%	19%
2010	17%	23%	23%	24%	25%	25%	24%	24%	23%	22%	22%	22%
2011	20%	20%	20%	24%	25%	25%	24%	24%	25%	23%	20%	20%

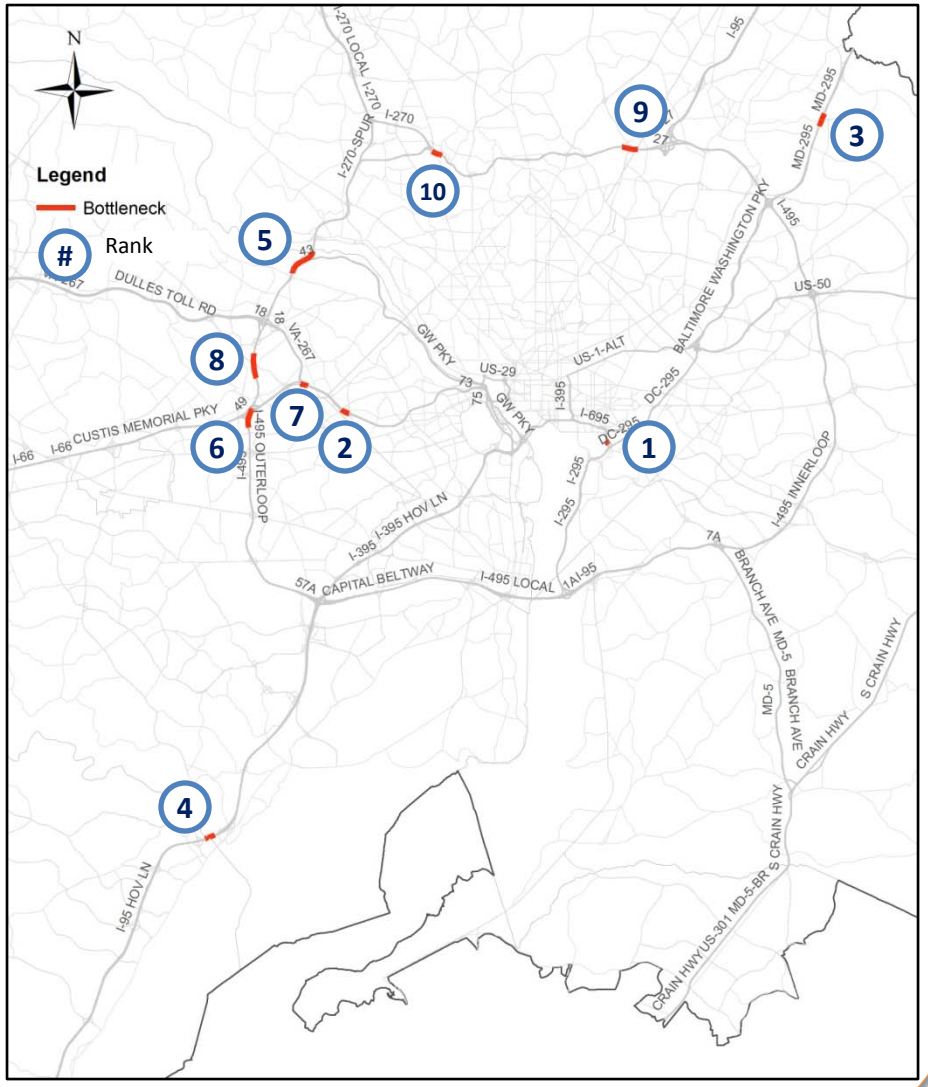
*Travel time burden is the percentage of additional travel time over and above free flow travel time, i.e., travel time burden = (actual travel time – free flow travel time)/free flow travel time * 100%.

Most Severe Freeway Bottlenecks

Road/ Direction	Location	Weekly Hours of Conge-stion*	Average Speed when Congested (mph)	Rank			In Const-ruction Zone?
				Q4/ 2011	Q3/ 2011	Q4/ 2010	
I-295 SB	11TH ST BRIDGE	39	20	1	>10	>10	Yes
I-66 EB	SYCAMORE ST/EXIT 69	57	36	2	6	>10	No
MD-295 NB	POWDER MILL RD	48	34	3	2	3	No
I-95 SB	VA-123/EXIT 160	36	28	4	1	10	No
I-495 OL	GW PKWY/EXIT 44	41	29	5	7	>10	No
I-495 IL	I-66/EXIT 49	44	33	6	>10	>10	Yes
I-66 EB	VA-267/EXIT 67	42	33	7	8	2	Yes
I-495 OL	VA-7/EXIT 47	41	33	8	>10	>10	Yes
I-495 OL	MD-650/EXIT 28	35	32	9	9	>10	Yes
I-495 IL	MD-355/EXIT 34	36	30	10	5	6	No

*Weekly Hours of Congestion is the total number of congested hours in a typical week (total168 hours) of a quarter.

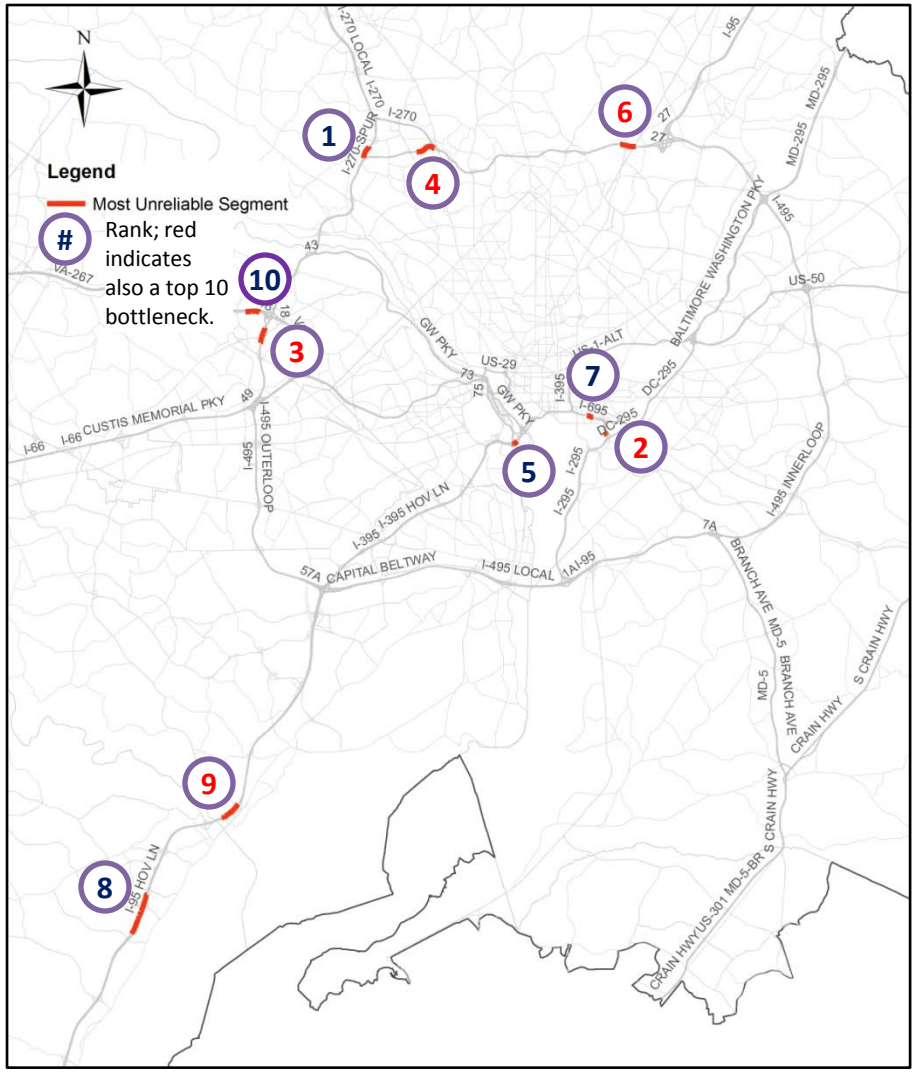
Congestion is defined if travel time is longer than 1.3 times of free flow travel time (National Transportation Operations Coalition, 2005).



Most Unreliable Freeway Segments

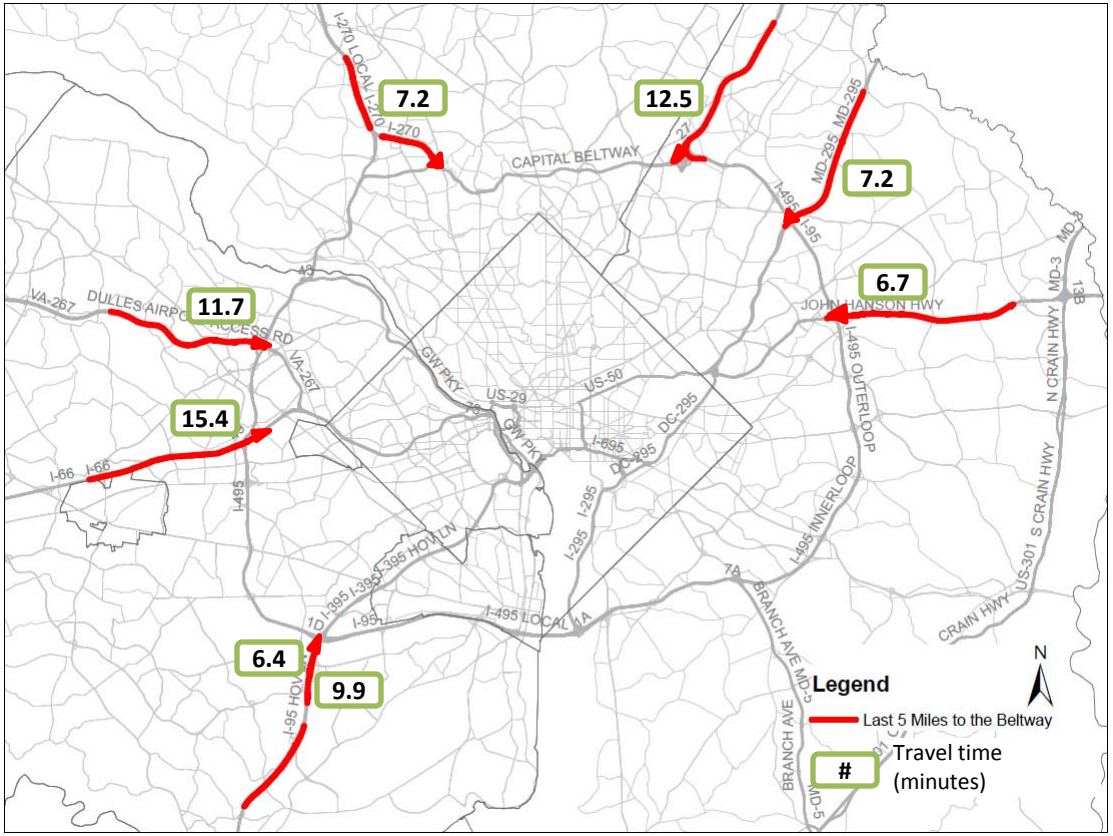
Road/ Direction	Location	Ratio of 95th Travel Time to Free Flow Travel Time*	Rank			Also a Top 10 Bottle-neck?	In Const-ruction Zone?
			Q4/ 2011	Q3/ 2011	Q4/ 2010		
I-270 Spur SB	I-495	6.2	1	>10	6	No	No
I-295 SB	11TH ST BRIDGE	6.1	2	>10	>10	Yes	Yes
I-495 OL	VA-123/EXIT 46	6.0	3	>10	>10	Yes	Yes
I-495 IL	I-270/EXIT 35	5.6	4	1	1	Yes	No
I-395 NB	VA-110/EXIT 9	5.6	5	5	3	No	No
I-495 OL	MD-650/EXIT 28	5.5	6	6	2	Yes	Yes
I-295 SB	6TH ST	5.3	7	>10	>10	No	Yes
I-95 SB	DALE BLVD/ EXIT 156	5.2	8	2	>10	No	No
I-95 SB	US-1/EXIT 161	5.2	9	4	7	Yes	No
VA-267 EB	I-495/EXIT 18	5.1	10	7	10	No	Yes

* This ratio is also called Planning Time Index.



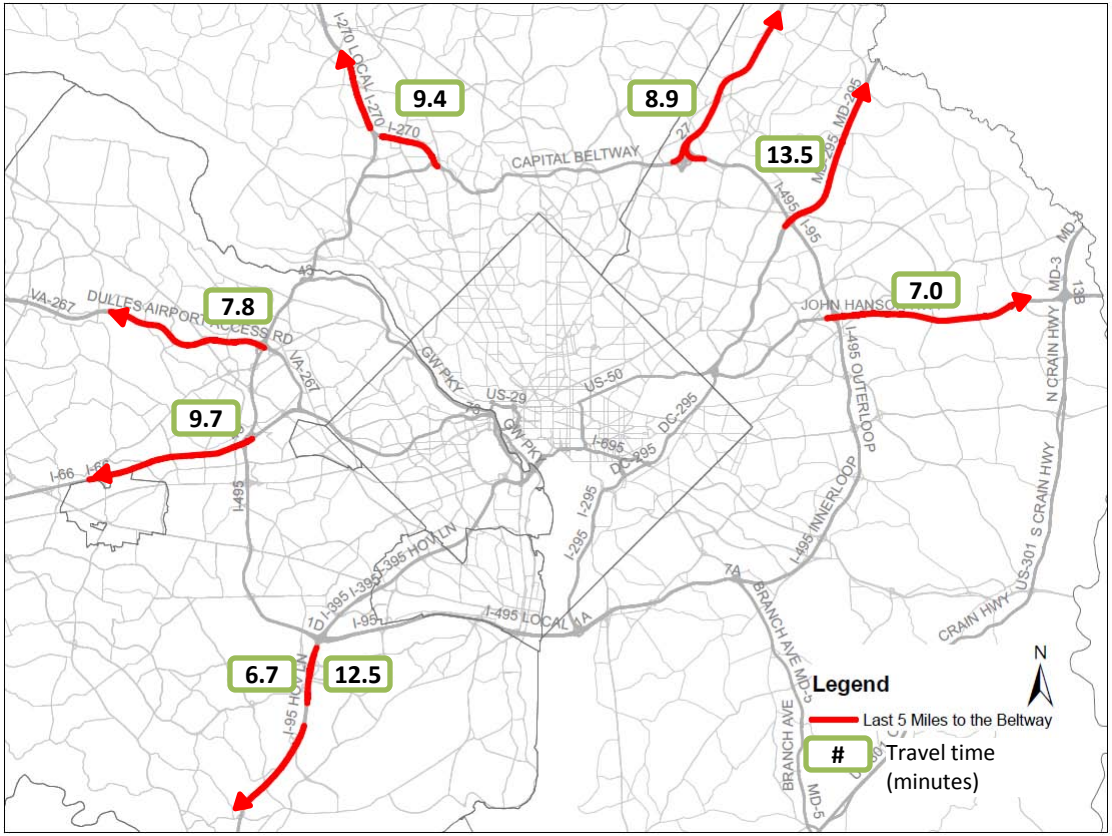
Travel Time of the Last 5 Miles to the Beltway (Freeways Only) in AM Peak Hour (8 – 9 AM)

Route	From	To	Average Travel Time (min)			Reliable (95th) Travel Time (min)		
			Q4/2011	Q4/2010	Q4/2009	**Q4/2011**	Q4/2010	Q4/2009
I-66 EB	VA-123/EXIT 60	Beltway	**15.4**	16.0	22.5	**22.0**	23.8	31.8
I-95 SB	MD-198/EXIT 33	Beltway	**12.5**	12.1	11.4	**20.2**	22.5	18.5
VA-267 EB	HUNTER MILL RD/EXIT 14	Beltway	**11.7**	11.0	10.7	**15.8**	14.7	15.4
I-95 NB	LORTON RD/EXIT 163	Beltway	**9.9**	14.9	13.3	**17.5**	28.9	22.6
I-270 SB	FALLS RD/EXIT 5	Beltway	**7.2**	9.6	10.2	**10.2**	14.6	12.9
MD-295 SB	MD-197	Beltway	**7.2**	7.0	8.5	**12.9**	11.5	12.4
US-50 WB	MD-197/EXIT 11	Beltway	**6.7**	7.3	7.6	**12.6**	12.4	12.5
I-95 HOV NB	LORTON RD/EXIT 163	Beltway	**6.4**	6.7	8.9	**8.9**	8.9	19.8



Travel Time of the First 5 Miles from the Beltway (Freeways Only) in PM Peak Hour (5 – 6 PM)

Route	From	To	Average Travel Time (min)			Reliable (95th) Travel Time (min)		
			Q4/2011	Q4/2010	Q4/2009	**Q4/2011**	Q4/2010	Q4/2009
MD-295 NB	Beltway	MD-197	**13.5**	15.1	20.0	**17.2**	17.7	28.5
I-95 SB	Beltway	LORTON RD/EXIT 163	**12.5**	18.3	27.0	**18.1**	27.3	45.4
I-66 WB	Beltway	VA-123/EXIT 60	**9.7**	14.3	12.2	**11.7**	19.8	17.8
I-270 NB	Beltway	FALLS RD/EXIT 5	**9.4**	11.3	13.3	**12.4**	13.8	17.7
I-95 NB	Beltway	MD-198/EXIT 33	**8.9**	8.9	10.6	**13.7**	13.8	14.1
VA-267 WB	Beltway	HUNTER MILL RD/EXIT 14	**7.8**	8.4	9.8	**10.5**	11.7	13.5
US-50 EB	Beltway	MD-197/EXIT 11	**7.0**	7.3	8.1	**8.4**	10.2	10.1
I-95 HOV SB	Beltway	LORTON RD/EXIT 163	**6.7**	6.8	9.3	**8.2**	7.3	13.5



Travel Time of Major Commute Routes in AM Peak (6 – 10 AM)

Route	Length (miles)	Free Flow Travel Time (min)	Beginning of most congested 5 minutes	Average Travel Time in Peak Period (min)			Reliable (95th) Travel Time* in Peak Period (min)			Q4/2011 Change in Average Travel Time (min)		Q4/2011 Change in 95th Travel Time (min)	
				Q4/ 2011	Q4/ 2010	Q4/ 2009	Q4/ 2011	Q4/ 2010	Q4/ 2009	vs. Q4/2010	vs. Q4/2009	vs. Q4/2010	vs. Q4/2009
I-270 SB from I-70 to I-370	23	21	6:45	33	34	36	54	62	59	-2	-3	-8	-5
I-270 SB from I-370 to I-495	10	9	7:50	16	17	19	31	32	36	-1	-3	-1	-5
VA-267 EB from VA-28 to I-66	15	14	7:45	21	22	25	35	35	45	-1	-4	0	-10
I-66 EB from VA-28 to I-495	11	11	7:40	21	22	29	34	33	47	0	-8	1	-13
I-66 EB from I-495 to TR Bridge	10	9	9:35	15	15	15	24	24	24	0	0	0	0
I-95 NB from VA-234 to I-495	19	18	6:30	27	32	43	58	60	84	-5	-15	-2	-26
I-95 NB HOV from VA-234 to I-495	18	16	7:35	18	19	26	25	22	44	-1	-7	3	-19
I-395 NB from I-495 to Ohio Dr	10	10	7:55	24	24	26	50	46	52	-1	-3	4	-2
I-395 NB HOV from I-495 to Ohio Dr	11	10	7:45	15	17	21	24	26	39	-3	-6	-3	-16
US-50 WB from US-301 to MD-295	14	13	7:45	18	19	20	32	32	38	0	-2	0	-6
MD-295 SB from MD-198 to US-50	15	14	7:45	18	22	24	32	37	47	-4	-7	-5	-15
I-95 SB from MD-198 to I-495	8	8	7:55	13	13	12	29	26	25	0	1	2	3
I-495 IL from I-270 to I-95	9	8	8:05	9	10	10	10	12	12	-1	-1	-2	-1
I-495 IL from I-95 to US-50	8	8	8:40	10	9	9	12	10	11	1	1	3	2
I-495 IL from US-50 to I-95	26	24	8:00	29	29	29	40	41	43	0	0	0	-3
I-495 IL from I-95 to I-66	7	7	8:50	15	16	14	25	28	27	-1	0	-4	-2
I-495 IL from I-66 to I-270	13	13	8:35	15	16	17	19	25	26	-2	-3	-6	-7
I-495 OL from I-270 to I-66	13	13	9:05	17	16	16	27	25	20	1	1	2	7
I-495 OL from I-66 to I-95	9	8	7:55	9	9	9	10	9	11	0	0	1	-1
I-495 OL from I-95 to US-50	24	23	8:20	27	28	27	38	40	35	-1	0	-2	3
I-495 OL from US-50 to I-95	8	7	7:45	8	8	9	14	12	14	0	-1	1	-1
I-495 OL from I-95 to I-270	10	10	7:45	22	23	23	40	41	43	-1	-1	-1	-3

* The reliable (95th) travel time is the travel time that will ensure a traveler finish the specified route travel.

Travel Time of Major Commute Routes in PM Peak (3 – 7 PM)

Route	Length (miles)	Free Flow Travel Time (min)	Beginning of most congested 5 minutes	Average Travel Time in Peak Period (min)			Reliable (95th) Travel Time* in Peak Period (min)			Q4/2011 Change in Average Travel Time (min)		Q4/2011 Change in 95th Travel Time (min)	
				Q4/ 2011	Q4/ 2010	Q4/ 2009	Q4/ 2011	Q4/ 2010	Q4/ 2009	vs. Q4/2010	vs. Q4/2009	vs. Q4/2010	vs. Q4/2009
I-270 NB from I-495 to I-370	9	9	17:45	13	14	16	21	23	28	-2	-4	-1	-7
I-270 NB from I-370 to I-70	24	22	17:30	33	34	38	49	51	61	-1	-4	-3	-12
VA-267 WB from I-66 to VA-28	15	14	17:50	16	17	19	22	21	28	-1	-3	1	-6
I-66 WB from TR Bridge to I-495	10	10	15:45	19	15	16	33	26	29	4	3	7	4
I-66 WB from I-495 to VA-28	12	11	17:40	19	23	21	35	36	33	-3	-1	-1	1
I-95 SB from I-495 to VA-234	19	18	17:05	40	49	61	82	102	143	-9	-21	-19	-61
I-95 SB HOV from I-495 to VA-234	18	16	18:45	22	22	27	39	33	51	0	-5	6	-12
I-395 SB from Ohio Dr to I-495	11	11	17:40	20	22	26	32	32	45	-2	-6	0	-13
I-395 SB HOV from Ohio Dr to I-495	11	10	18:35	12	14	16	17	17	26	-1	-3	0	-9
US-50 EB from MD-295 to US-301	14	13	17:25	15	15	16	19	19	20	0	-1	0	-1
MD-295 NB from US-50 to MD-198	12	12	17:50	24	26	32	41	39	58	-2	-8	2	-17
I-95 NB from I-495 to MD-198	8	7	17:25	10	10	12	20	17	20	0	-1	3	0
I-495 IL from I-270 to I-95	9	8	17:40	14	15	17	23	25	29	-1	-3	-2	-6
I-495 IL from I-95 to US-50	8	8	17:40	14	11	12	23	19	21	2	2	4	3
I-495 IL from US-50 to I-95	26	24	17:30	30	30	34	39	35	53	1	-4	4	-14
I-495 IL from I-95 to I-66	7	7	15:00	8	10	12	14	19	30	-2	-4	-5	-15
I-495 IL from I-66 to I-270	13	13	17:45	35	37	51	65	70	105	-1	-16	-5	-41
I-495 OL from I-270 to I-66	13	13	17:00	34	29	31	51	47	61	5	3	4	-9
I-495 OL from I-66 to I-95	9	8	17:45	10	11	12	14	15	16	-1	-2	-1	-2
I-495 OL from I-95 to US-50	24	23	17:30	31	29	31	48	45	47	2	-1	3	1
I-495 OL from US-50 to I-95	8	7	17:50	10	10	11	20	18	21	0	-1	2	-1
I-495 OL from I-95 to I-270	10	10	18:00	14	17	22	27	31	47	-3	-8	-4	-20

* The reliable (95th) travel time is the travel time that will ensure a traveler finish the specified route travel.

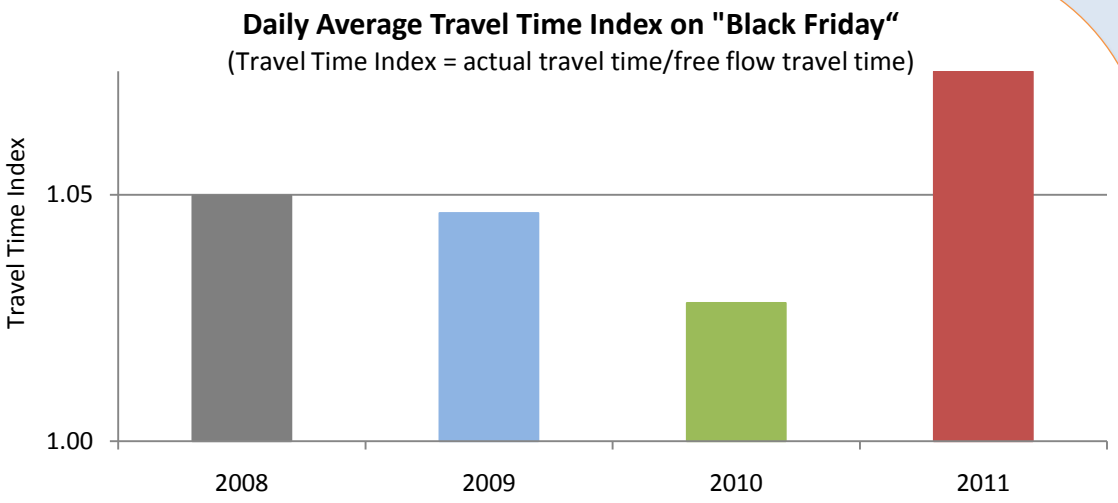
Quarterly Spotlight: Traffic on "Black Friday"

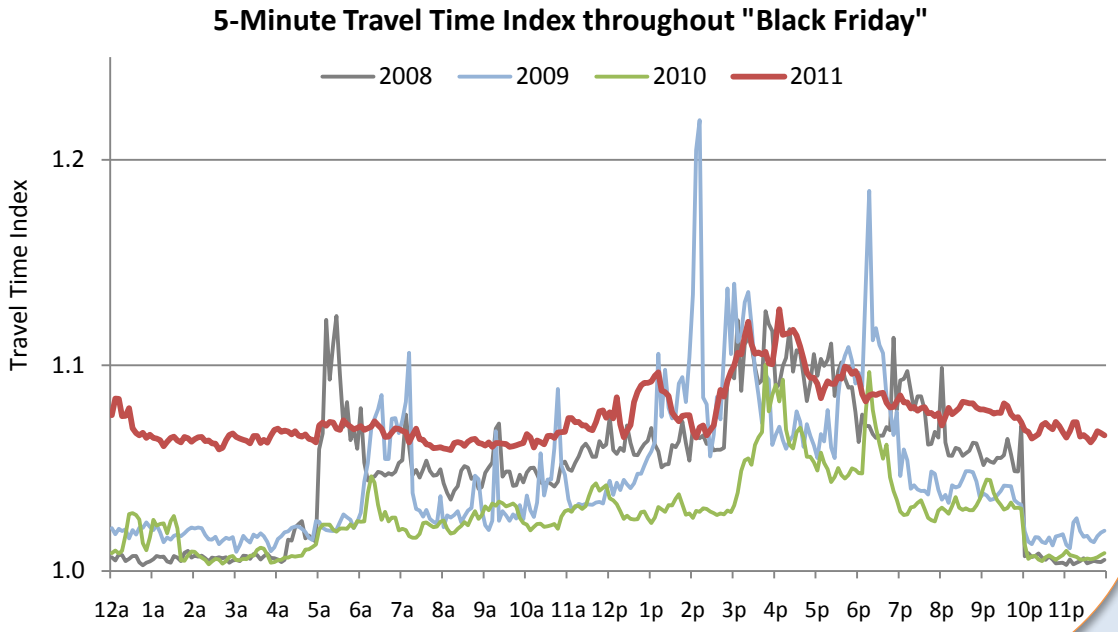
November 25, 2011, the past Black Friday, showed continued evidence of being one of the biggest shopping days of the year, although it remained a work day for many.

As the National Retail Federation recorded the highest Thanksgiving weekend sales since 2008, this region also experienced the heaviest daily average traffic (upper right chart).

Looked closely, the traffic pattern throughout the past Black Friday also changed significantly from previous years (lower right chart):

- Overnight traffic was much higher than previous years, perhaps because many retailers kicked off the Black Friday sales before or at midnight.
- Traffic levels were generally higher throughout the day.
- Traffic was more evenly spread throughout the day, in comparison to pronounced peaks and valleys observed in years past.





Performance Measures for Events

- Case 1: Earthquake
- Case 2: Snow/ice event
- Case 3: Shopping Black Friday

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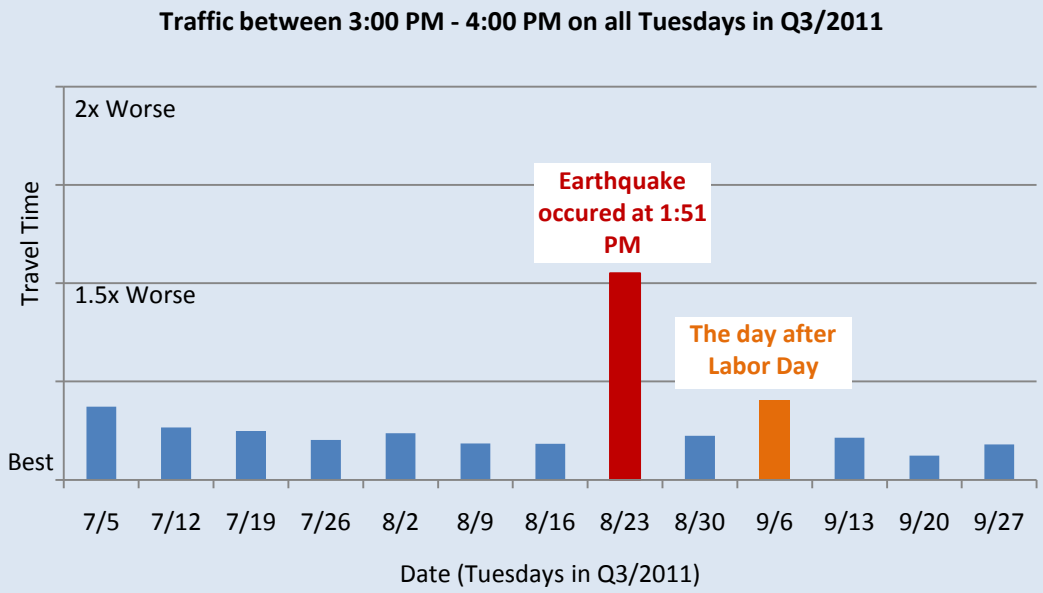
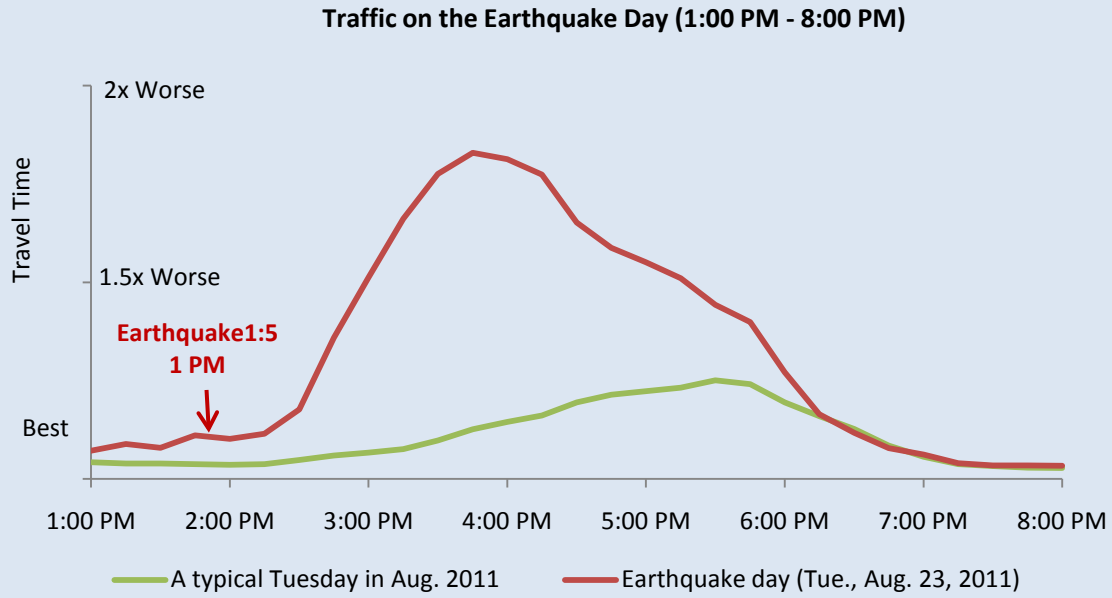
Magnitude 5.8 Earthquake, August 23, 2011





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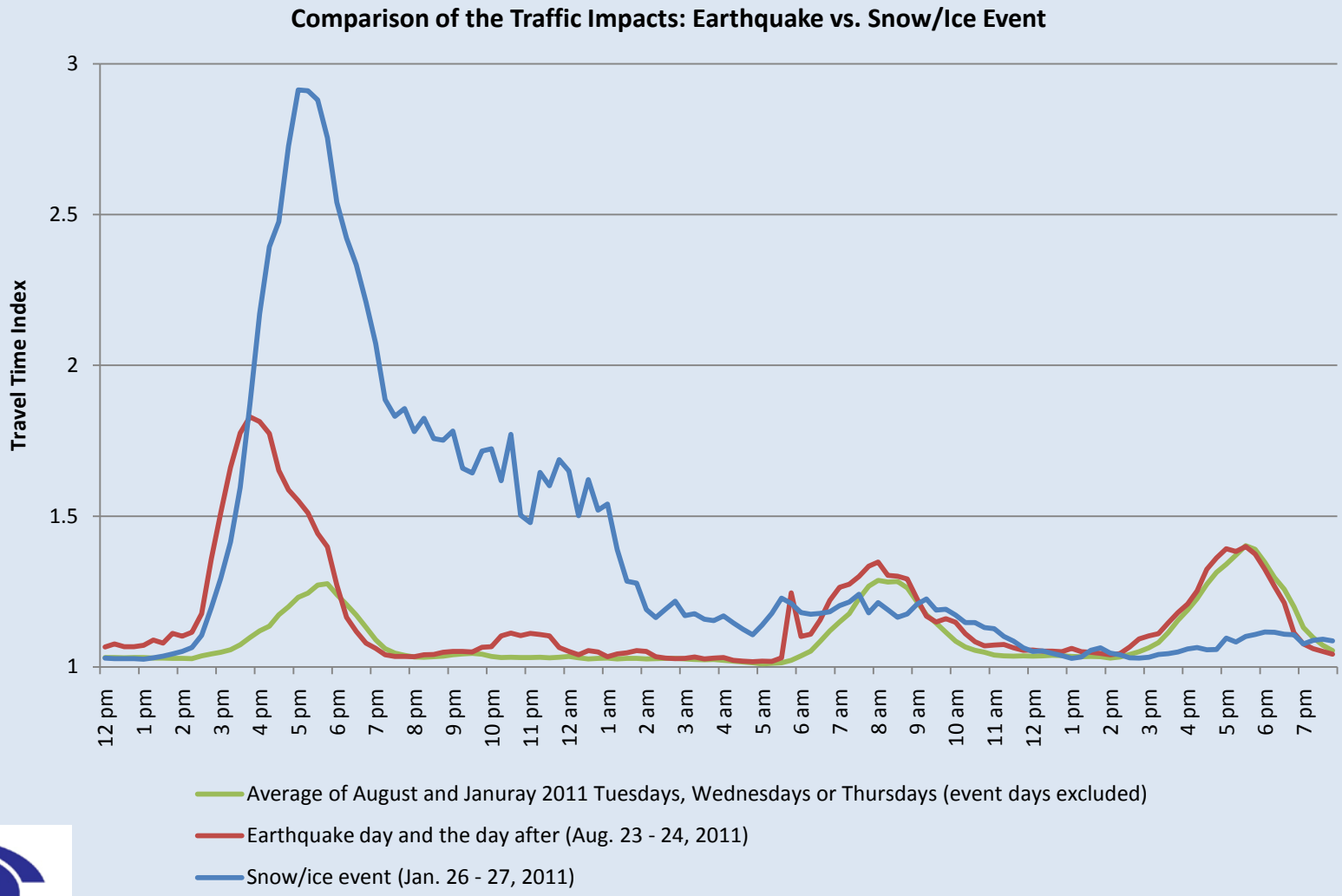
Jan.26, 2011 Snow/Ice Event vs. Earthquake



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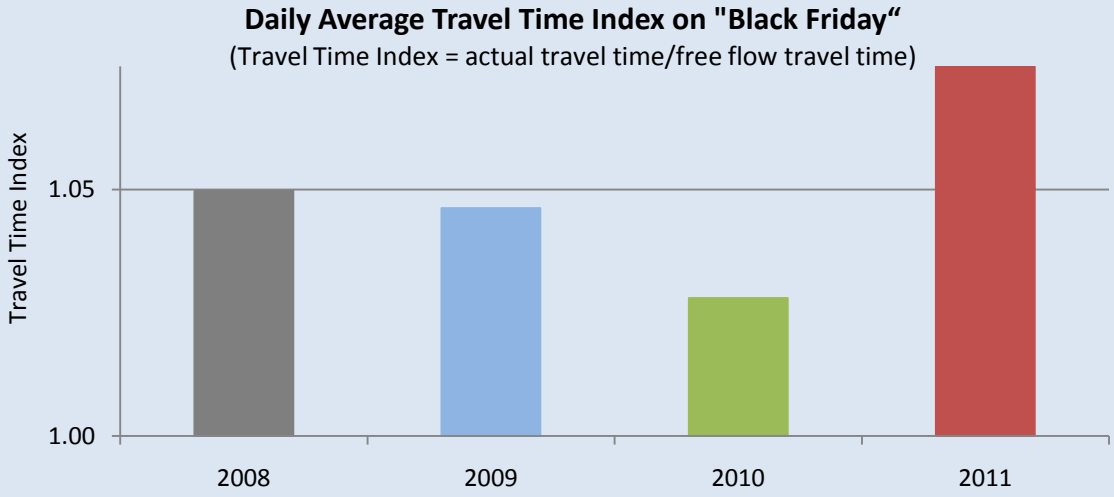
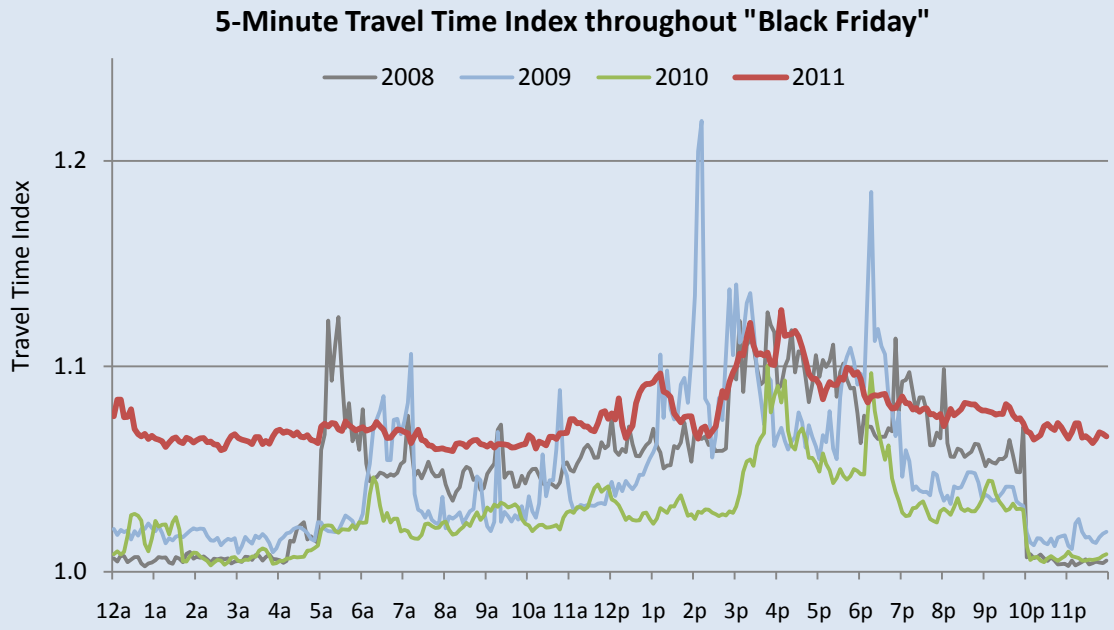
Traffic on Black Friday (Shopping)





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Support Member Jurisdictions' Planning Efforts

- Example 1: ICC Before and After Study
- Example 2: I-66 Inside Beltway Bus Operations Analysis

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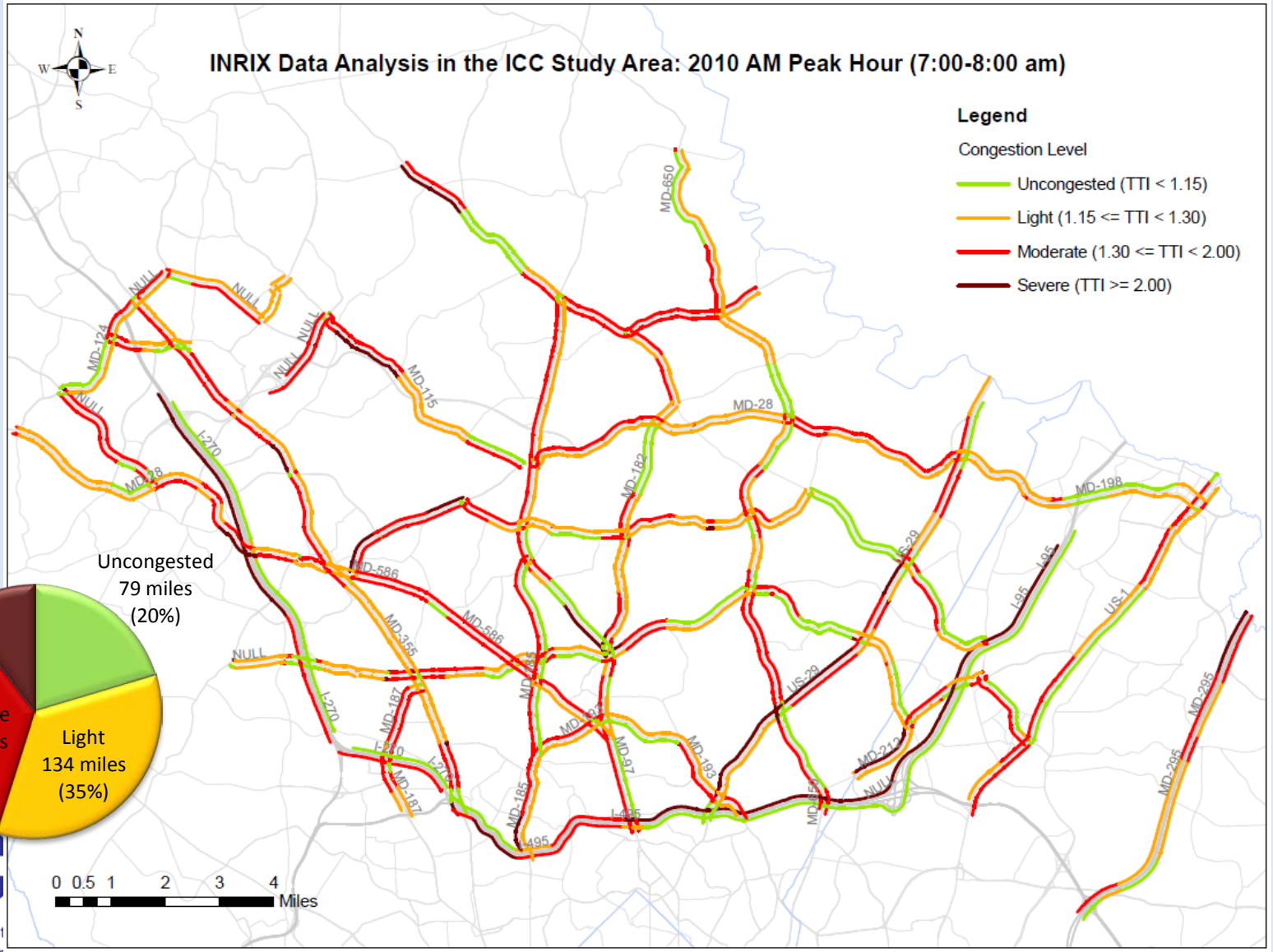
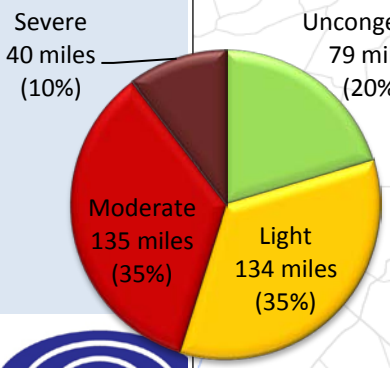
ICC Before and After Study





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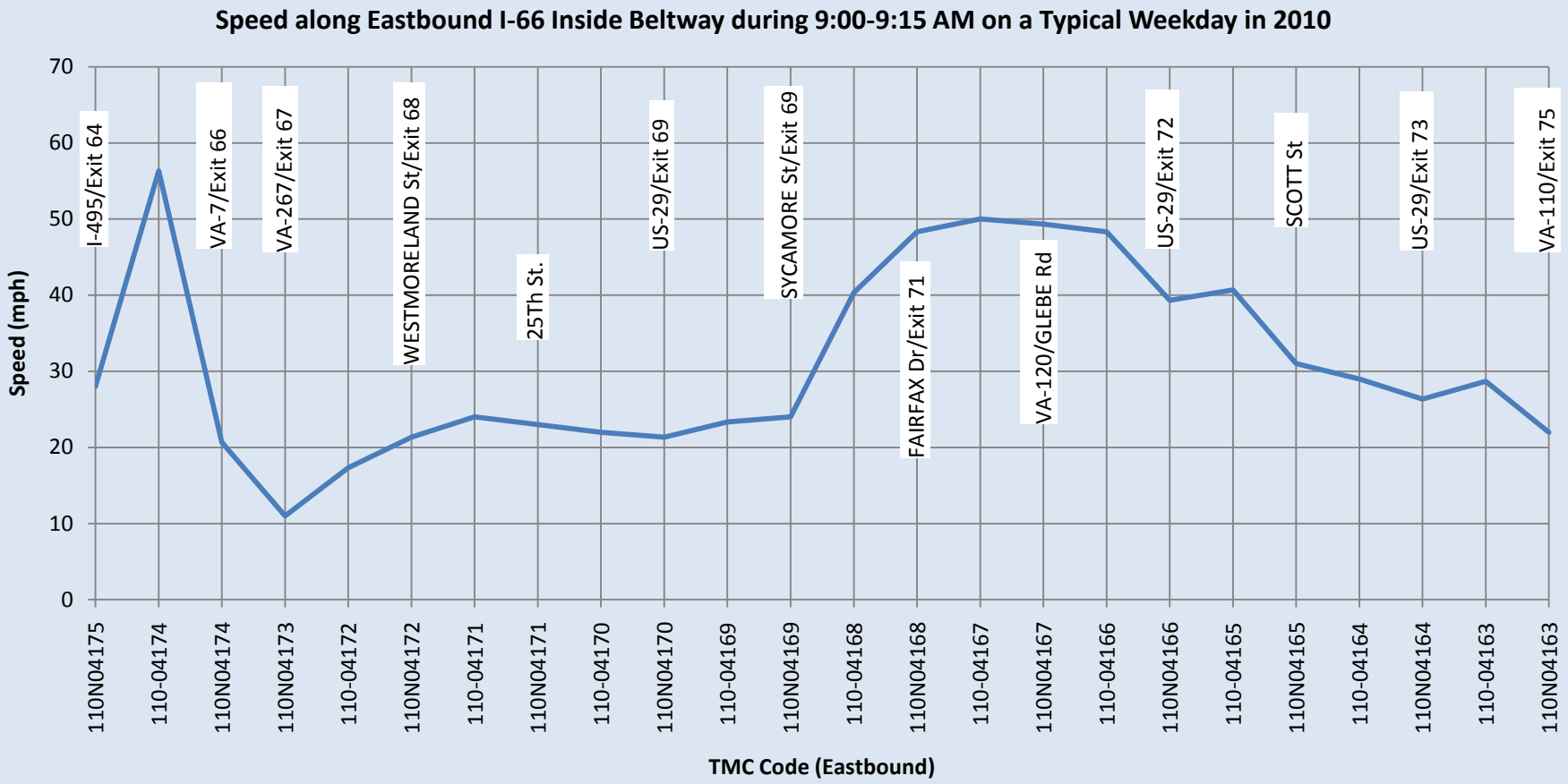
I-66 Inside Beltway Bus Operations Anslysis



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