

Congestion on Freeways Delay per Traveler in Q3/2011

All time in Q3/2011

11.4 Hours
→ **\$219***

Per month
during Q3/2011



*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 Q3/2011

AM Peak (6 – 10 AM)

189%

of free flow travel time

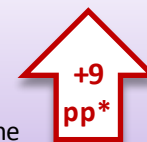


vs. Q3/2010

PM Peak (3 – 7 PM)

235%

of free flow travel time



vs. Q3/2010

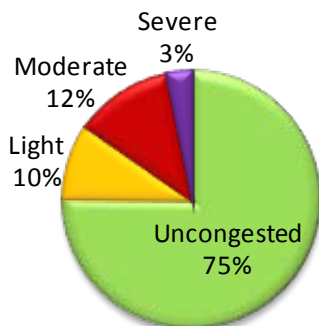
*pp: percentage points.

**This is comparing to free flow travel time. For example, if free flow travel time is 30 minutes, then one has to budget 30*189% = 57 minutes to ensure on-time arrival in the AM peak (this measure essentially is Planning Time Index).

(see p. 4)

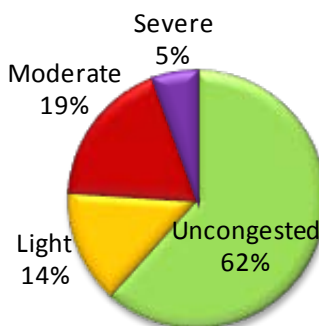
Percentages of Freeway Lane-Miles by Congestion Level in Q3/2011

AM Peak (6 – 10 AM)



The change of moderate & severe congested lane-miles in Q3/2011 vs. Q3/2010.

PM Peak (3 – 7 PM)



The change of moderate & severe congested lane-miles in Q3/2011 vs. Q3/2010.

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 impacts of the magnitude 5.8 earthquake on August 23, 2011 and the Metropolitan Area Transportation Operations Coordination (MATOC) Program

(see p. 15)

Q3/2011 Congestion One Pager

In the first 9 months of 2011, freeway traffic conditions were better than 2010 and 2009. The 9-month total delay per traveler (or cost of time) was:

- Q1-Q3/2011: 96 hours (or \$1,847)
- Q1-Q3/2010: 123 hours (or \$2,364)
- Q1-Q3/2009: 140 hours (or \$2,683)

One possible reason for this change could be less vehicle-miles of travel (VMT) and vehicle-hours of travel (VHT) on freeways in 2011 so far (the causes of less travel is yet to be determined):

- Q1-Q3/2011: 6% less VMT than Q1-Q3/2010; 8% less VMT than Q1-Q3/2009
- Q1-Q3/2011: 12% less VHT than Q1-Q3/2010; 15% less VHT than Q1-Q3/2009

... but, **the travel time savings diminished in Q3/2011.** The 3rd quarter total delay per traveler (or cost of time) was:

- Q3/2011: 34 hours (or \$656)
- Q3/2010: 36 hours (or \$683)
- Q3/2009: 48 hours (or \$915)

... and, **travel time reliability became slightly better in the AM peak and a little worse in the PM peak** in Q3/2011 compared to Q3/2010. The extra time for on time arrival was (as a % of free flow travel time):

- Q3/2011: 189% for AM peak, 235% for PM peak
- Q3/2010: 195% for AM peak, 226% for PM peak

No significant changes were observed on sampled arterials: traffic conditions were about the same as 2010 and worse than 2009.

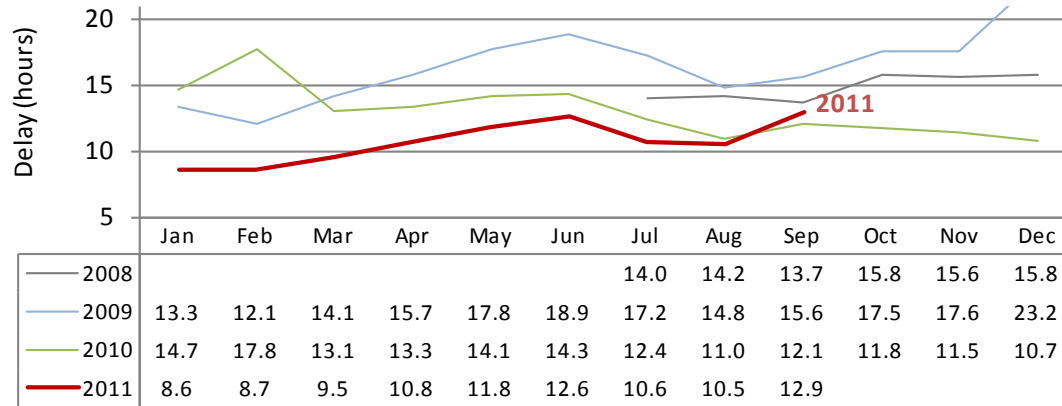
The I-95/I-395, I-66 and the north and west sections of the Beltway remained the most congested and unreliable corridors.

This region experienced a number of unusual events in the past quarter, including earthquake, hurricane Irene and a week-long rain and flooding. The Metropolitan Area Transportation Operations Coordination (MATOC) Program and local transportation agencies acted diligently to respond to these events.

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

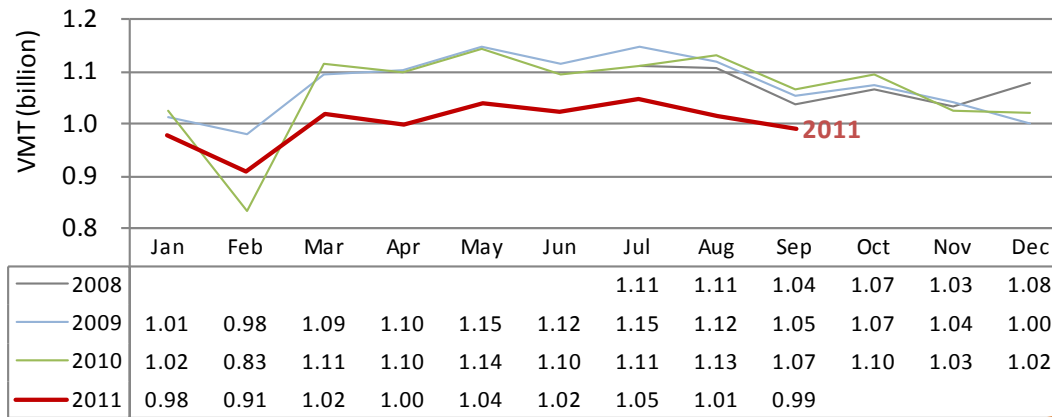
- Special events such as earthquake and hurricane that were unique to Q3/2011
- Lower VMT and VHT in total

Freeway Delay Per Traveler



22% less delay per traveler in Q1-Q3/2011 compared to the same time last year. Sep. 2011 delay exceeded that of Sep. 2010 by 48 minutes. This region experienced an unusual week-long rain that caused flooding in early Sep. 2011.

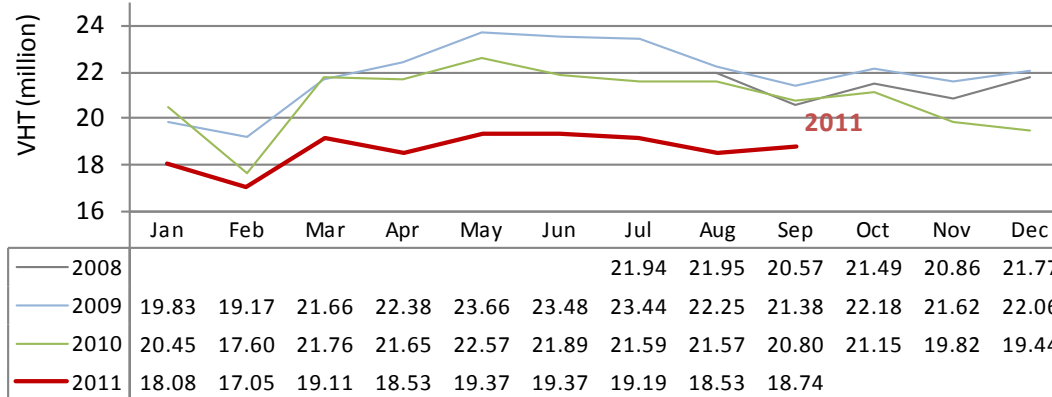
Freeway Vehicle-Miles of Travel (VMT)



6% less VMT in Q1-Q3/2011 compared to the same time last year.

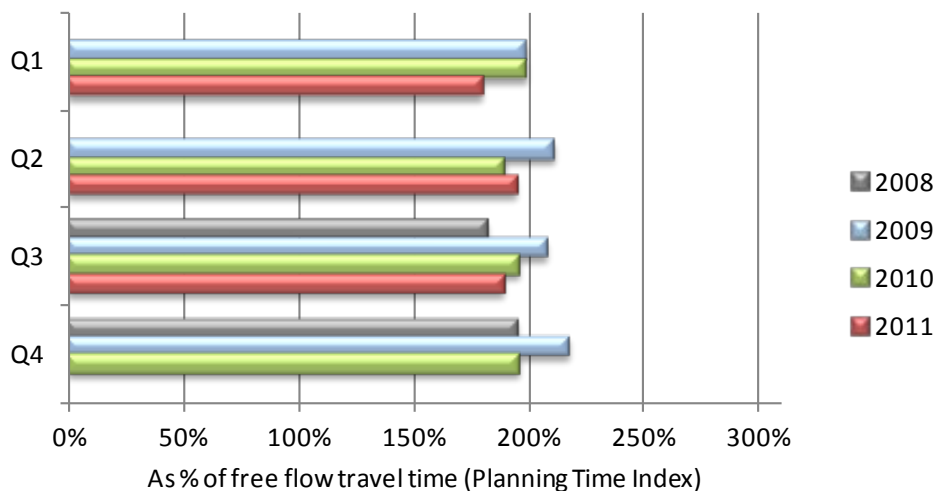
In Feb. there were more VMT in 2011 than in 2010. This region experienced several winter storms in Feb. 2010.

Freeway Vehicle-Hours of Travel (VHT)



12% less VHT in 2011 so far compared to the same time last year.

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

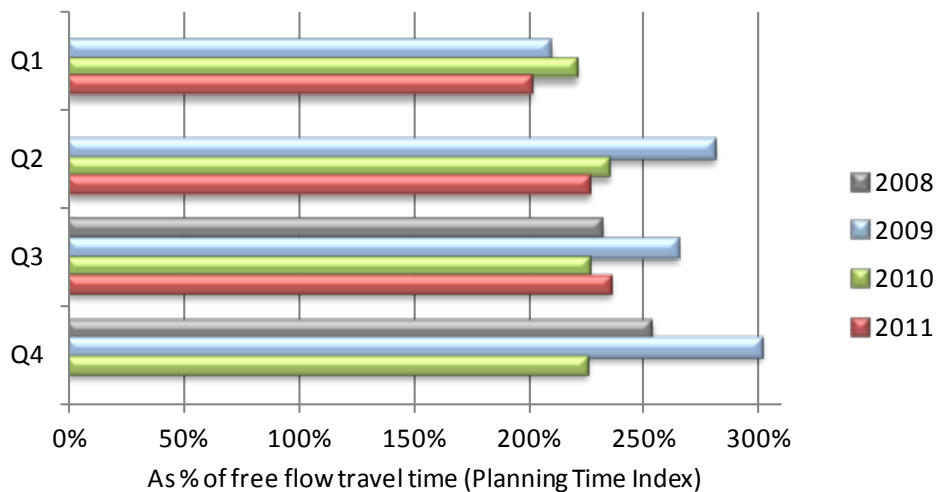


AM peak in the 3rd quarter of the year became more and more reliable in the past three years.

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

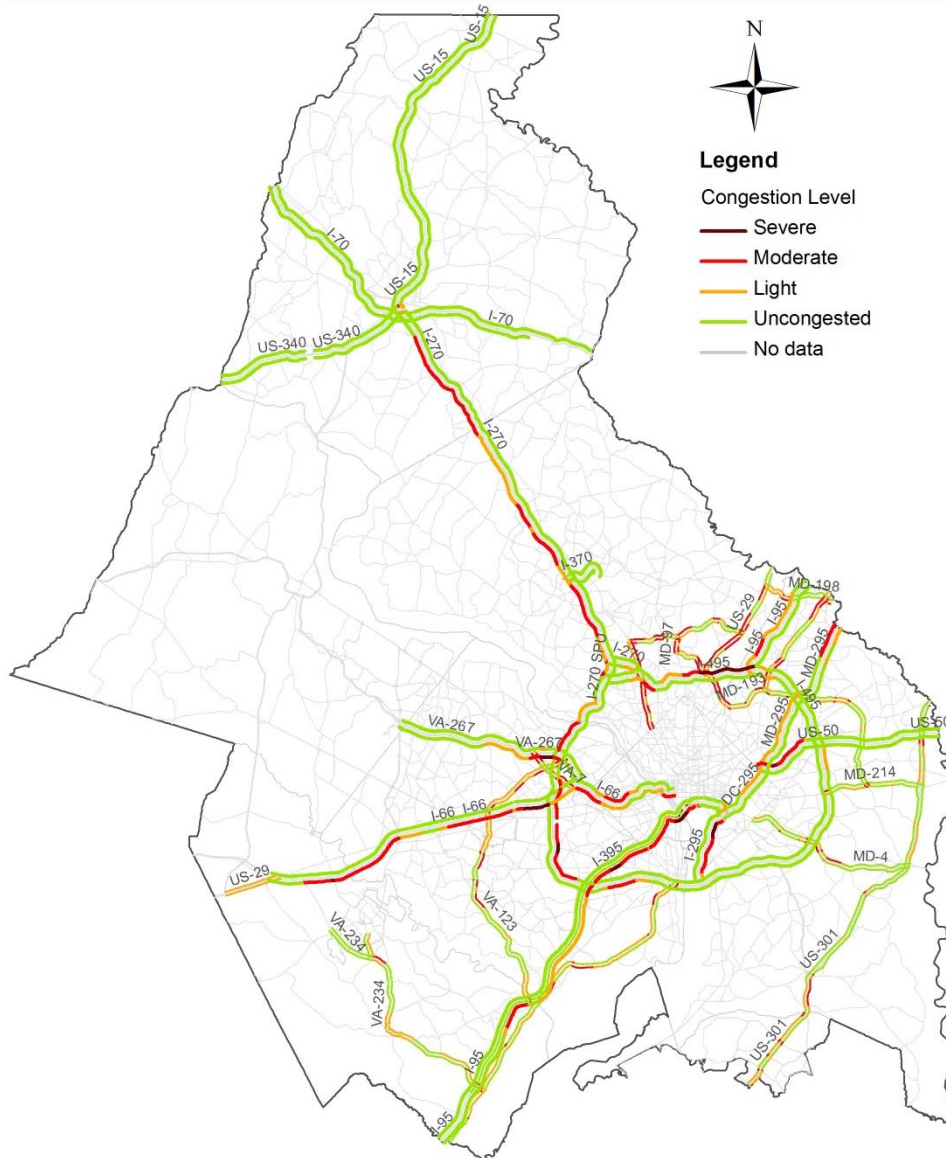
If free flow travel time is 30 minutes, then one has to budget $30 \times 189\% = 57$ minutes to ensure on-time arrival in the AM peak.

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

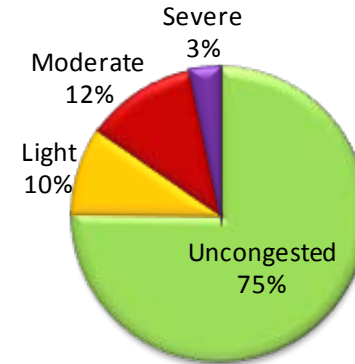


PM Peak in Q3/2011 was less reliable than Q3/2010, but more reliable than Q3/2009.

Highway Congestion in Q3/2011: AM Peak (6 – 10 AM)



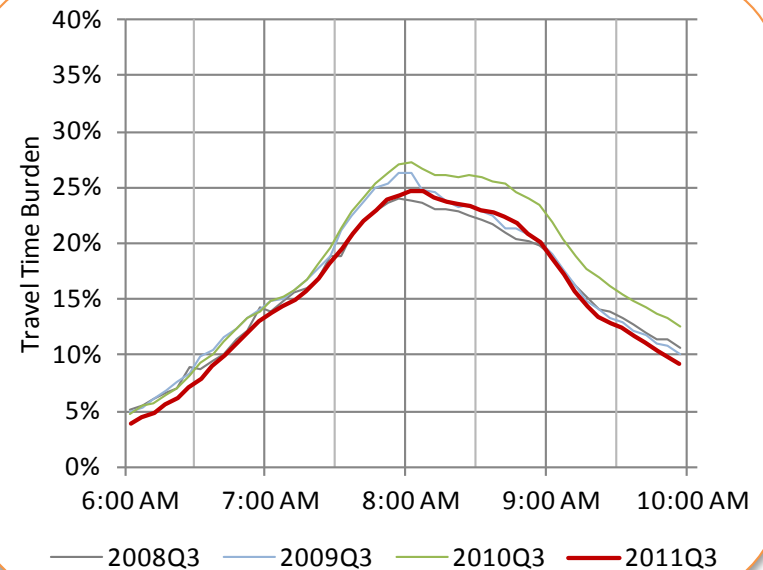
% of Freeway Lane-Miles by Congestion Level in AM Peak



The decrease (in %) of moderate and severe congested freeway lane-miles in Q3/2011 compared to Q3/2010. (see p. 7)

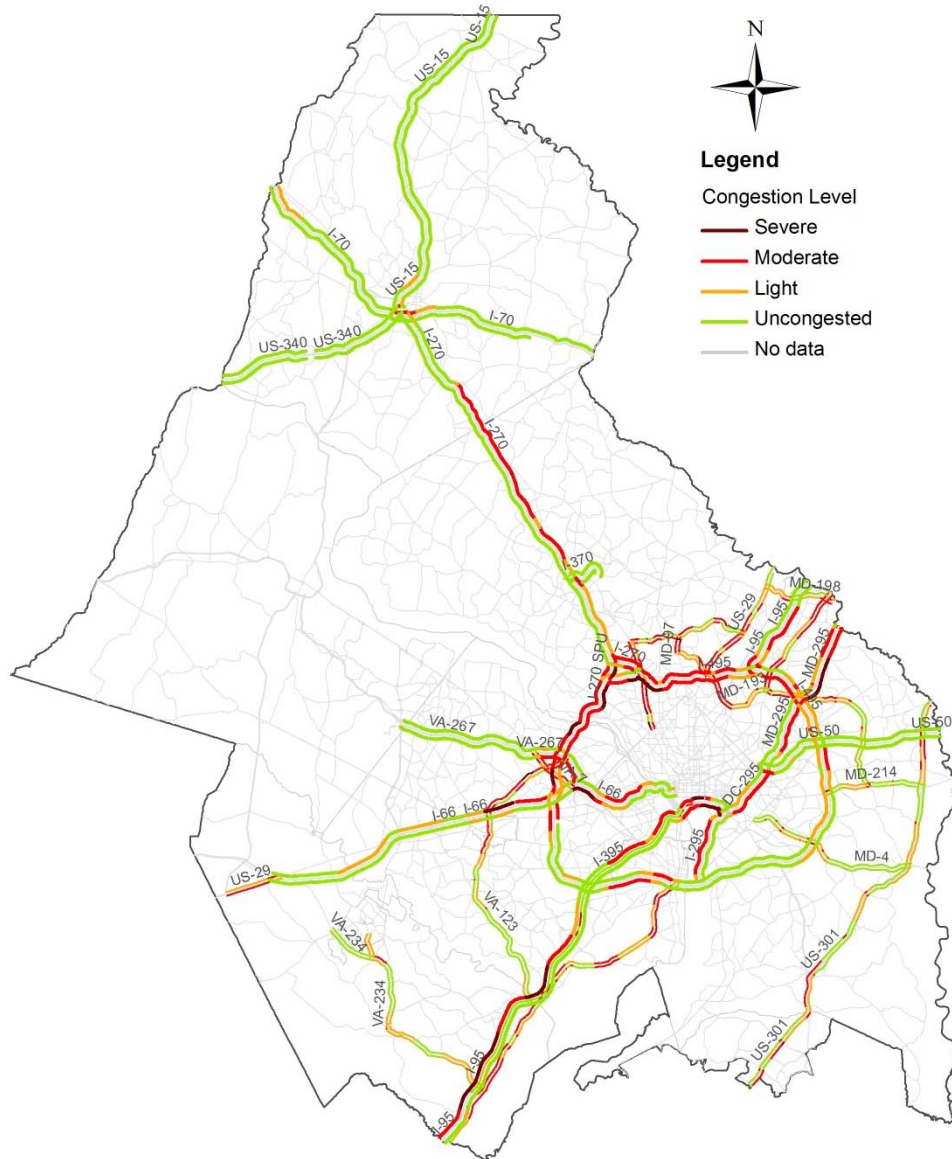
Total monitored freeway lane-miles: 2,000.

Congestion Variation in AM Peak & Historical Comparison

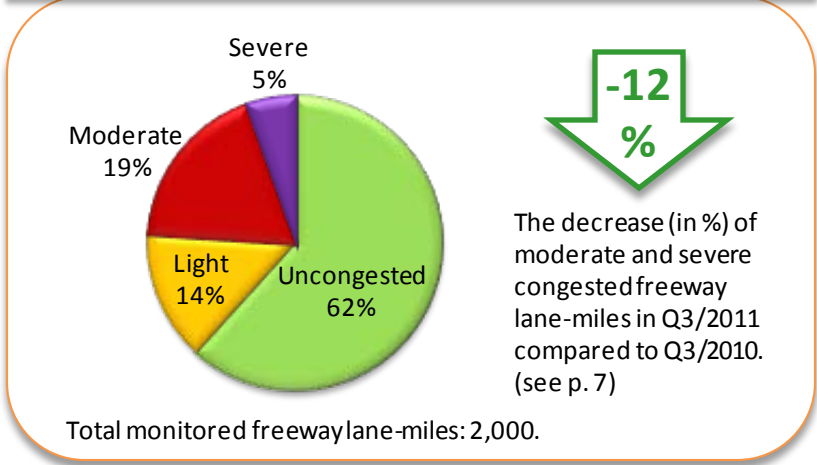


Congestion level is determined by Travel Time Index (TTI): severe: $TTI \geq 2.00$, moderate: $1.30 \leq TTI < 2.00$, light: $1.15 \leq TTI < 1.30$, and uncongested: $TTI < 1.15$. Travel time burden is the percentage of additional travel time over and above free flow travel time, i.e., $\text{travel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

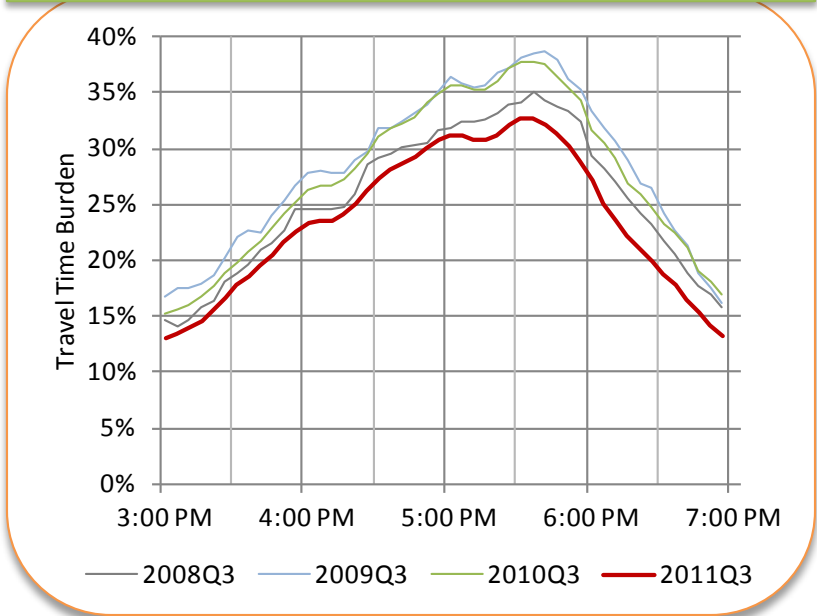
Highway Congestion in Q3/2011: PM Peak (3 – 7 PM)



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

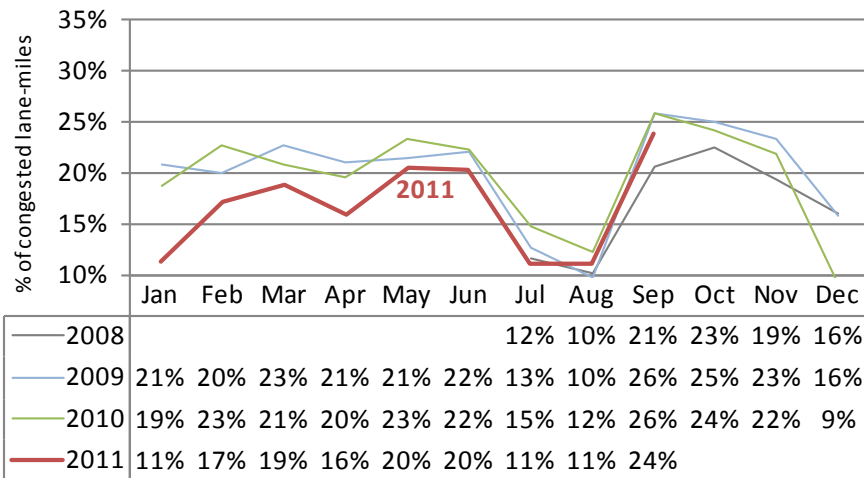


Congestion Variation in PM Peak & Historical Comparison



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)



Until Aug. in 2011, this region had the least freeway congestion in both AM and PM peak periods in the past three years.

It remains to be seen if congestion really came back in Sep. 2011, or just a result of adverse weather (rain and flooding) in that month.

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

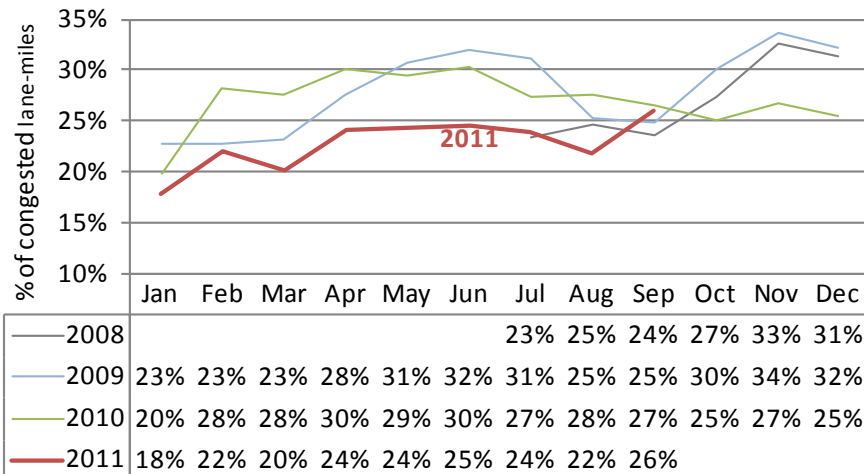
Severe:
TTI >= 2.00

Moderate:
1.30 <= TTI < 2.00

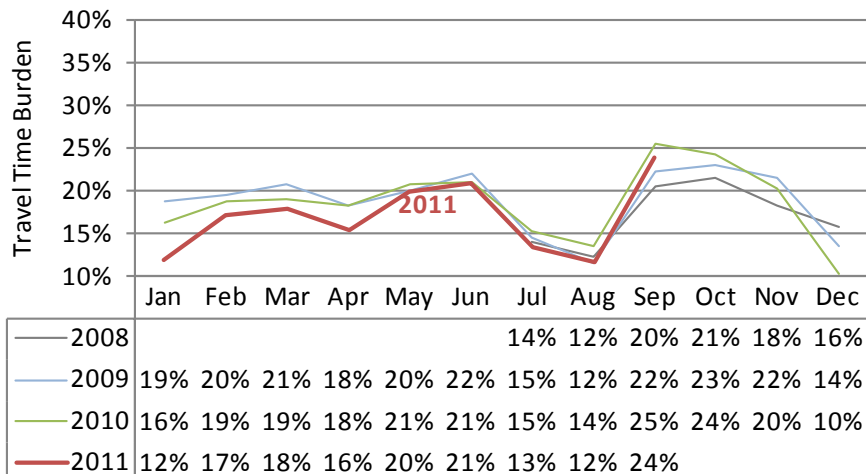
Light:
1.15 <= TTI < 1.30

Uncongested:
TTI < 1.15

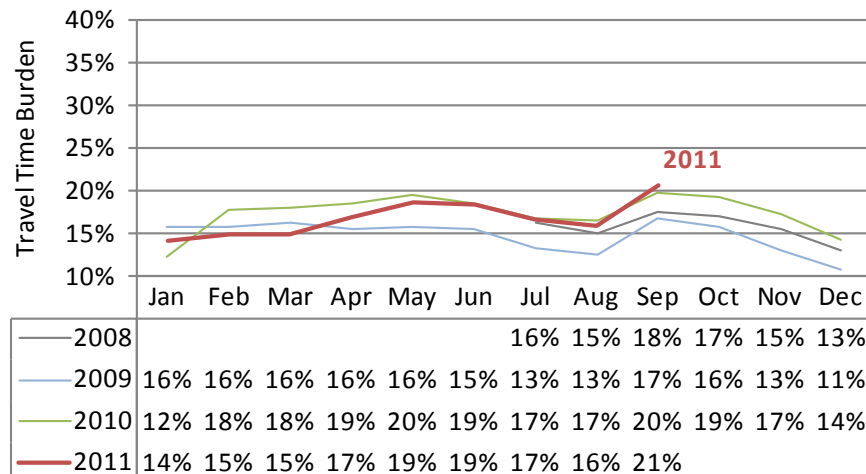
Percentages of Moderate and Severe Congested Freeway Lane-Miles PM Peak (3 – 7 PM)



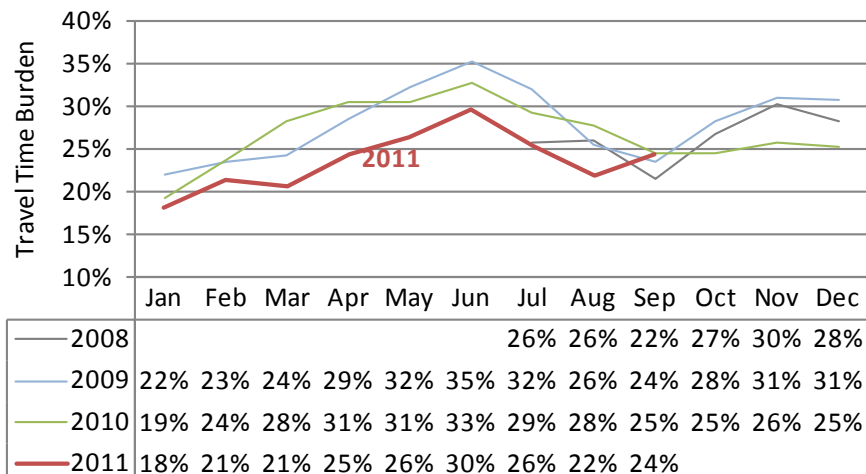
Freeway Travel Time Burden: AM Peak (6 – 10 AM)



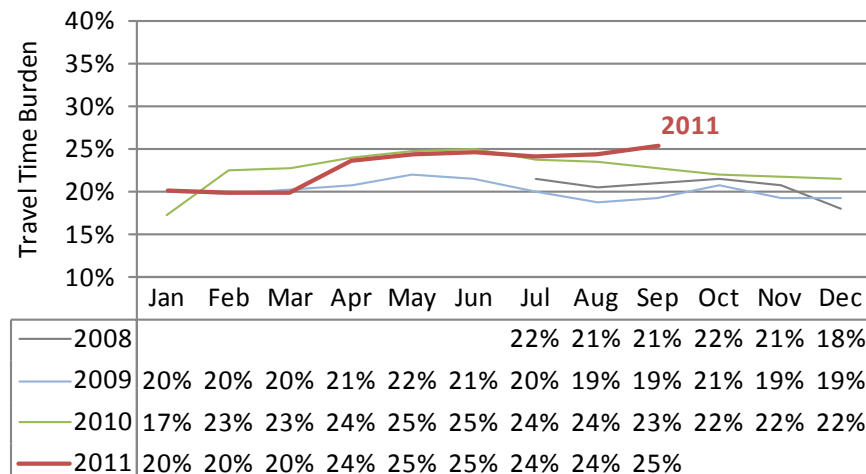
Arterial Travel Time Burden: AM Peak (6 – 10 AM)



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



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



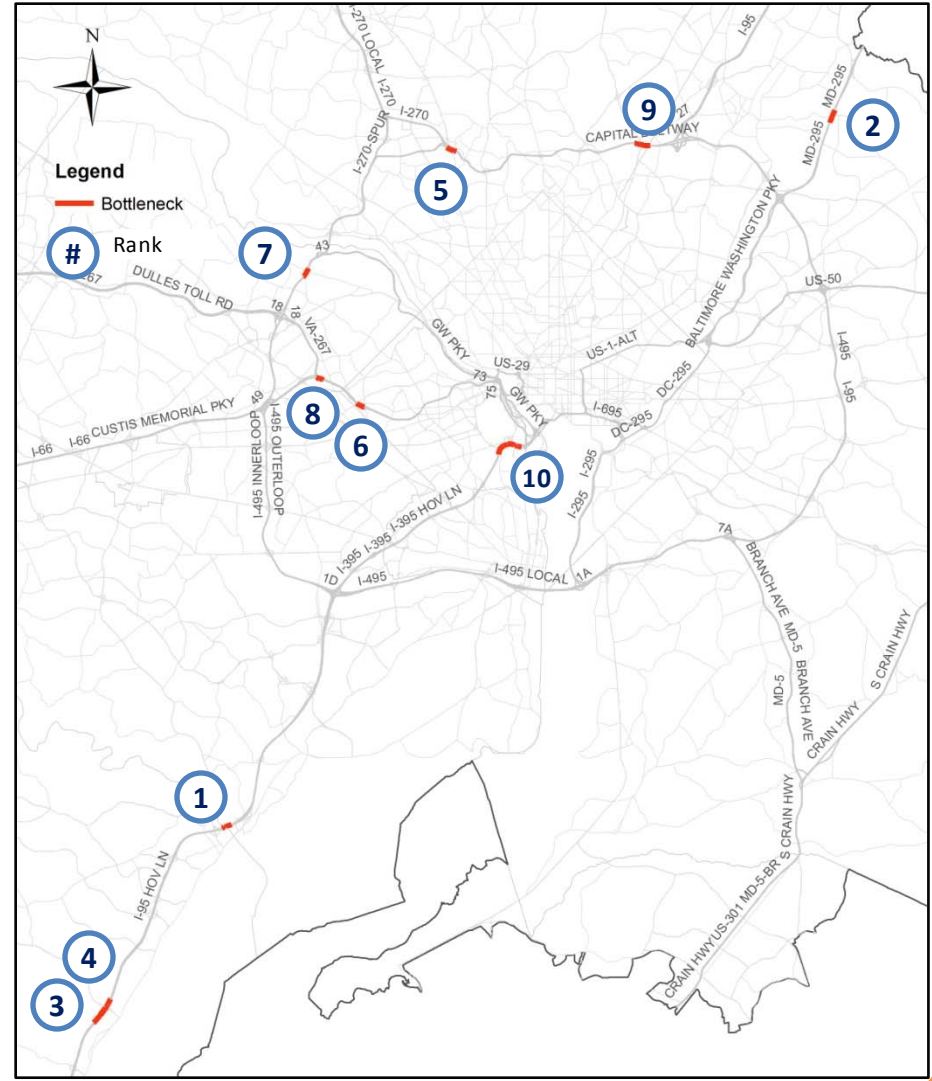
*Travel time burden is the percentage of additional travel time over and above free flow travel time, i.e., travel time burden = (actual travel time – free flow travel time)/free flow travel time * 100%.

Most Severe Freeway Bottlenecks

Road/ Direction	Location	Weekly Hours of Congestion*	Average Speed when Congested (mph)	Rank		
				Q3/ 2011	Q2/ 2011	Q3/ 2010
I-95 SB	VA-123/EXIT 160	43	29	1	2	> 10
MD-295 NB	POWDER MILL RD	44	31	2	5	6
I-95 HOV SB	End of HOV	45	33	3	10	5
I-95 SB	VA-234/EXIT 152	33	26	4	> 10	7
I-495 IL	MD-355/EXIT 34	32	28	5	3	9
I-66 EB	SYCAMORE ST/EXIT 69	47	35	6	9	> 10
I-495 OL	VA-193/EXIT 44	40	31	7	6	8
I-66 EB	VA-267/EXIT 67	38	31	8	4	> 10
I-495 OL	MD-650/EXIT 28	33	30	9	7	> 10
I-395 NB	10TH ST/EXIT 10	41	30	10	1	1

*Weekly Hours of Congestion is the total number of congested hours in a typical week (total 168 hours) of a quarter.

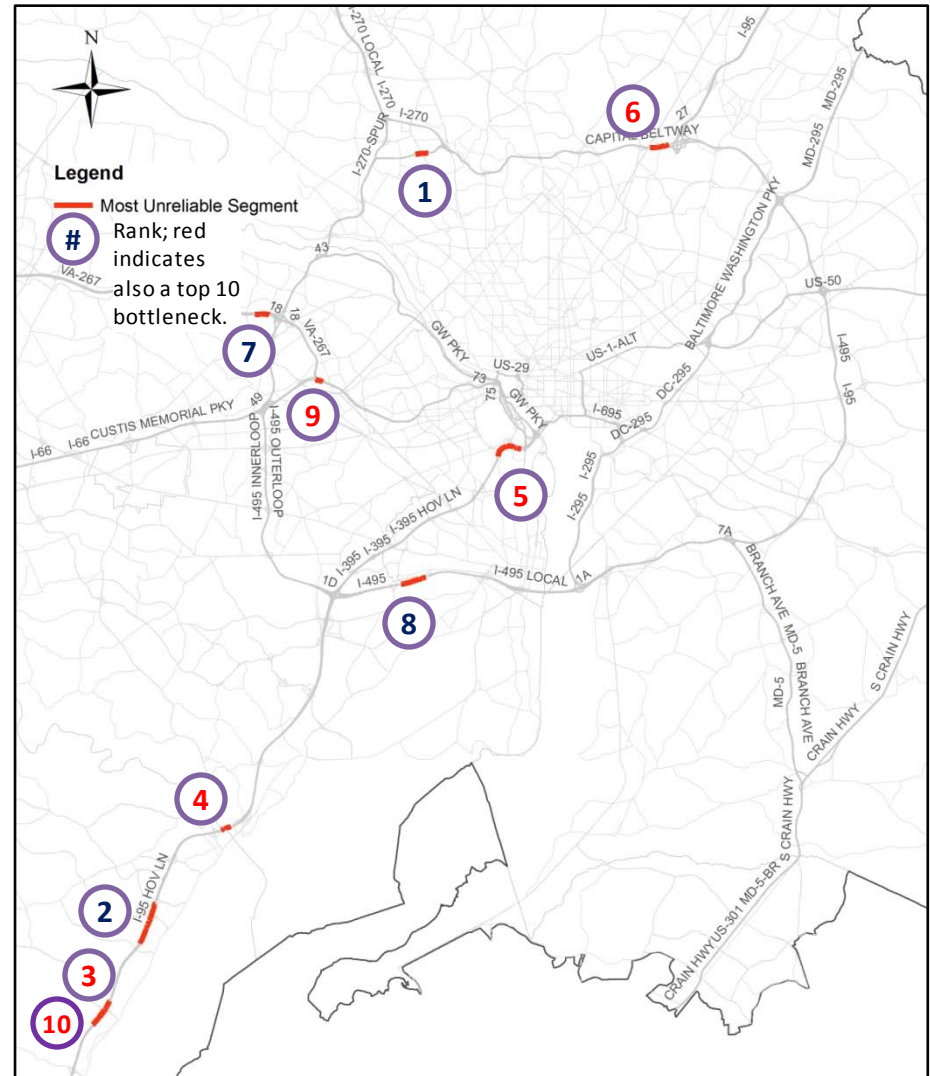
Congestion is defined if travel time is longer than 1.3 times of free flow travel time (National Transportation Operations Coalition, 2005).



Most Unreliable Freeway Segments

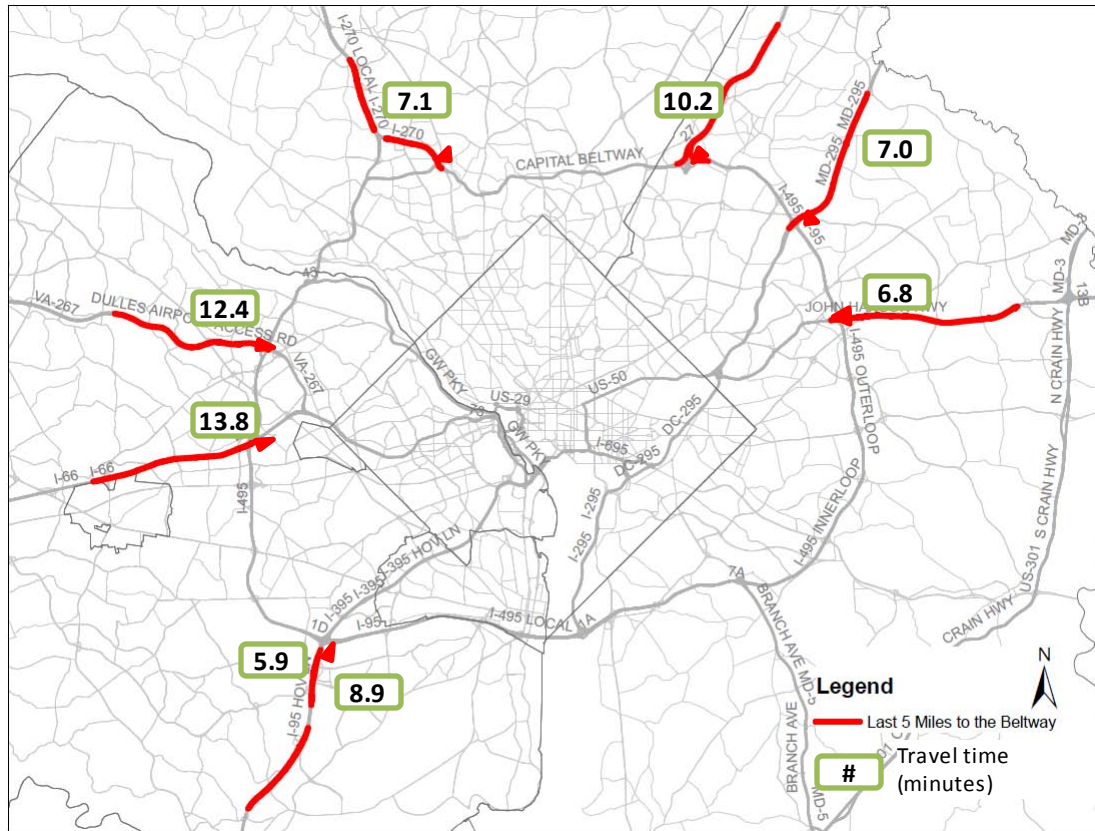
Road/Direction	Location	Ratio of 95th Travel Time to Free Flow Travel Time*	Also a Top 10 Bottleneck?	Rank		
				Q3/2011	Q2/2011	Q3/2010
I-495 IL	MD-187/EXIT 36	7.2	No	1	1	1
I-95 SB	DALE BLVD/EXIT 156	7.0	No	2	7	3
I-95 SB	VA-234/EXIT 152	6.2	Yes	3	5	4
I-95 SB	VA-123/EXIT 160	5.1	Yes	4	3	>10
I-395 NB	10TH ST/EXIT 10	5.0	Yes	5	6	2
I-495 OL	MD-650/EXIT 28	4.9	Yes	6	4	8
VA-267 EB	I-495/EXIT 18	4.7	No	7	>10	>10
I-495 OL	EISENHOWER AVE/EXIT 3	4.4	No	8	>10	>10
I-66 EB	VA-267/EXIT 67	4.4	Yes	9	9	10
I-95 HOV SB	End of HOV	4.3	Yes	10	>10	7

* 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	Travel Time (min)	Extra Time for On-Time Arrival	Rank		
					Q3/2011	Q2/2011	Q3/2011
I-66 EB	VA-123/EXIT 60	Beltway	13.8	355%	1	1	1
VA-267 EB	HUNTER MILL RD/EXIT 14	Beltway	12.4	312%	2	4	4
I-95 SB	MD-198/EXIT 33	Beltway	10.2	352%	3	3	3
I-95 NB	LORTON RD/EXIT 163	Beltway	8.9	273%	4	2	2
I-270 SB	FALLS RD/EXIT 5	Beltway	7.1	250%	5	5	5
MD-295 SB	MD-197/EXIT 11	Beltway	7.0	245%	6	7	8
US-50 WB	MD-197/EXIT 11	Beltway	6.8	197%	7	6	6
I-95 HOV NB	LORTON RD/EXIT 163	Beltway	5.9	138%	8	8	7

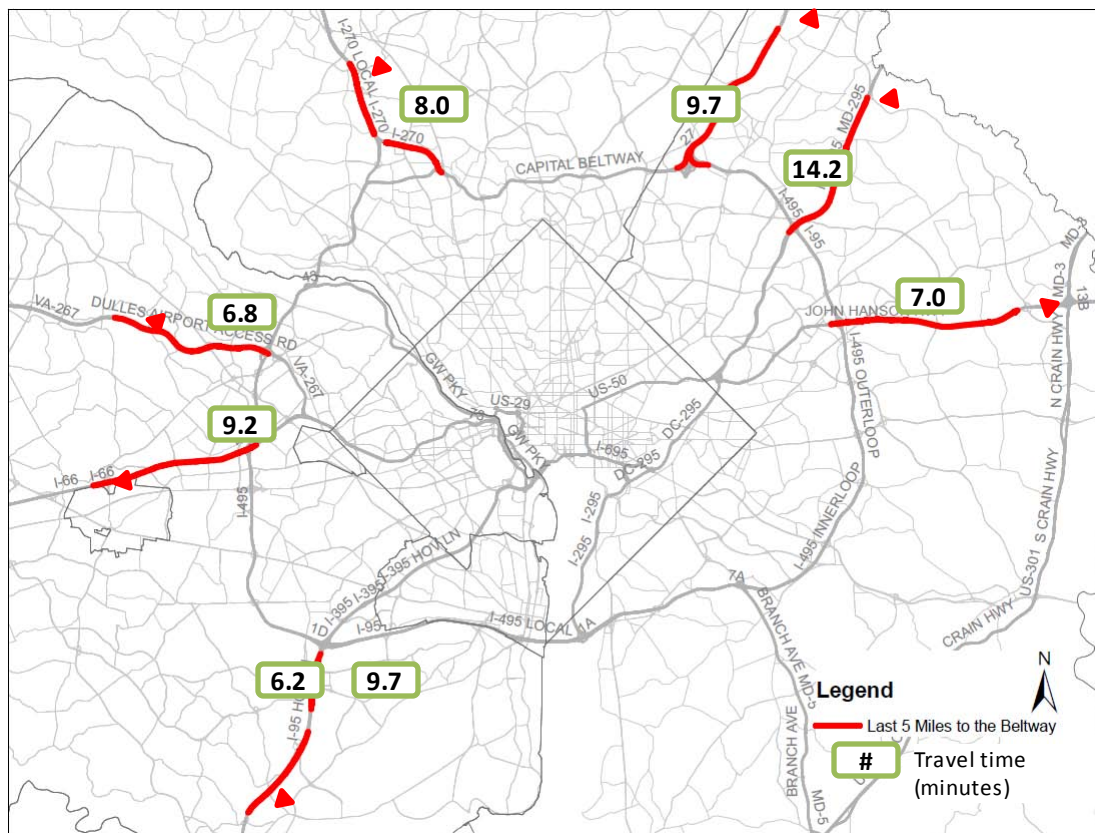


One example of *Extra Time for On-Time Arrival* (Planning Time Index):

If free flow travel time is 30 minutes, then one has to budget $30 \times 189\% = 57$ minutes to ensure on-time arrival in the AM peak.

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

Route	From	To	Travel Time (min)	Extra Time for On-Time Arrival	Rank		
					Q3/2011	Q2/2011	Q3/2011
MD-295 NB	Beltway	MD-197/EXIT 11	14.2	381%	1	2	2
I-95 NB	Beltway	MD-198/EXIT 33	9.7	262%	2	3	5
I-95 SB	Beltway	LORTON RD/EXIT 163	9.7	401%	3	1	1
I-66 WB	Beltway	VA-123/EXIT 60	9.2	317%	4	4	3
I-270 NB	Beltway	FALLS RD/EXIT 5	8.0	277%	5	6	4
US-50 EB	Beltway	MD-197/EXIT 11	7.0	182%	6	5	6
VA-267 WB	Beltway	HUNTER MILL RD/EXIT 14	6.8	193%	7	7	7
I-95 HOVSB	Beltway	LORTON RD/EXIT 163	6.2	151%	8	8	8



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

If free flow travel time is 30 minutes, then one has to budget $30 \times 189\% = 57$ minutes to ensure on-time arrival in the AM peak.

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

Route	Length (miles)	Free Flow Travel Time (min)	Peak of the Peak	Average Travel Time in Peak Period (min)			Reliable (95th) Travel Time* in Peak Period (min)			Q3/2011 Change in Average Travel Time (min)		Q3/2011 Change in 95th Travel Time (min)	
				Q3/2011	Q3/2010	Q3/2009	Q3/2011	Q3/2010	Q3/2009	vs. Q3/2010	vs. Q3/2009	vs. Q3/2010	vs. Q3/2009
I-270 SB from I-70 to I-370	23	21	7:50	31	35	34	53	59	61	-4	-4	-6	-8
I-270 SB from I-370 to I-495	10	9	8:40	14	17	17	25	31	29	-3	-3	-6	-5
VA-267 EB from VA-28 to I-66	15	14	8:10	20	22	23	33	38	51	-2	-3	-5	-18
I-66 EB from VA-28 to I-495	11	11	7:35	19	21	26	27	39	49	-3	-8	-13	-22
I-66 EB from I-495 to TR Bridge	10	9	9:35	14	14	14	23	21	26	0	1	2	-3
I-95 NB from VA-234 to I-495	19	18	6:35	23	28	36	44	51	65	-5	-13	-7	-22
I-95 NB HOV from VA-234 to I-495	18	16	7:30	17	19	23	20	22	34	-1	-5	-2	-14
I-395 NB from I-495 to Ohio Dr	10	10	7:55	24	25	26	48	48	52	-1	-2	-1	-4
I-395 NB HOV from I-495 to Ohio Dr	11	10	7:45	14	17	20	21	25	36	-3	-6	-4	-16
US-50 WB from US-301 to MD-295	14	13	7:50	18	18	19	29	29	28	0	-1	0	0
MD-295 SB from MD-198 to US-50	15	14	7:55	17	20	22	28	33	37	-4	-5	-5	-9
I-95 SB from MD-198 to I-495	8	8	7:45	11	12	11	24	24	22	-1	0	0	2
I-495 IL from I-270 to I-95	9	8	8:05	9	10	10	11	13	12	-1	-1	-2	-2
I-495 IL from I-95 to US-50	8	8	8:55	9	9	9	11	10	10	1	1	1	2
I-495 IL from US-50 to I-95	26	24	8:05	29	28	29	40	37	38	1	0	2	1
I-495 IL from I-95 to I-66	7	7	8:25	13	16	16	23	28	29	-3	-3	-4	-5
I-495 IL from I-66 to I-270	13	13	8:40	15	17	17	21	26	28	-2	-2	-4	-7
I-495 OL from I-270 to I-66	13	13	8:50	16	17	16	23	25	21	-1	0	-3	1
I-495 OL from I-66 to I-95	9	8	7:55	9	9	9	10	9	13	0	0	0	-3
I-495 OL from I-95 to US-50	24	23	8:00	28	28	29	45	39	38	0	-1	6	7
I-495 OL from US-50 to I-95	8	7	8:05	8	9	8	14	13	13	0	0	1	1
I-495 OL from I-95 to I-270	10	10	8:05	21	23	22	37	37	37	-2	-1	0	0

* 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	Free Flow Length (miles)	Free Flow Travel Time (min)	Peak of the Peak	Average Travel Time in Peak Period (min)			Reliable (95th) Travel Time* in Peak Period (min)			Q3/2011 Change in Average Travel Time (min)		Q3/2011 Change in 95th Travel Time (min)	
				Q3/2011	Q3/2010	Q3/2009	Q3/2011	Q3/2010	Q3/2009	vs. Q3/2010	vs. Q3/2009	vs. Q3/2010	vs. Q3/2009
I-270 NB from I-495 to I-370	9	9	17:30	12	13	13	20	19	19	-1	-1	1	1
I-270 NB from I-370 to I-70	24	22	17:30	34	33	34	51	50	53	0	-1	1	-1
VA-267 WB from I-66 to VA-28	15	14	17:55	16	17	17	18	21	22	-1	-1	-3	-4
I-66 WB from TR Bridge to I-495	10	10	15:30	15	15	15	26	23	27	0	0	3	-1
I-66 WB from I-495 to VA-28	12	11	17:35	17	22	18	28	33	30	-4	-1	-4	-1
I-95 SB from I-495 to VA-234	19	18	17:30	40	50	50	90	119	127	-10	-10	-28	-36
I-95 SB HOV from I-495 to VA-234	18	16	15:20	21	23	28	34	36	59	-2	-7	-1	-25
I-395 SB from Ohio Dr to I-495	11	11	17:40	17	20	20	26	30	29	-3	-3	-4	-3
I-395 SB HOV from Ohio Dr to I-495	11	10	18:25	11	13	15	13	16	21	-2	-4	-3	-8
US-50 EB from MD-295 to US-301	14	13	17:25	15	16	16	20	20	20	-1	-1	-1	-1
MD-295 NB from US-50 to MD-198	12	12	16:45	24	25	31	42	36	53	-1	-7	7	-10
I-95 NB from I-495 to MD-198	8	7	17:25	10	10	12	17	16	19	0	-2	1	-3
I-495 IL from I-270 to I-95	9	8	17:35	15	16	16	24	26	27	-1	-2	-2	-3
I-495 IL from I-95 to US-50	8	8	17:30	13	12	12	23	20	22	1	2	3	1
I-495 IL from US-50 to I-95	26	24	17:35	29	31	29	37	40	36	-2	0	-3	0
I-495 IL from I-95 to I-66	7	7	15:00	9	10	10	24	20	26	-1	-2	3	-3
I-495 IL from I-66 to I-270	13	13	16:55	36	39	44	71	70	85	-3	-8	1	-14
I-495 OL from I-270 to I-66	13	13	17:00	28	31	30	56	59	51	-3	-2	-2	6
I-495 OL from I-66 to I-95	9	8	17:45	11	12	11	19	16	14	-1	0	2	4
I-495 OL from I-95 to US-50	24	23	17:25	31	29	30	52	44	46	2	1	8	6
I-495 OL from US-50 to I-95	8	7	17:35	9	10	11	17	15	17	0	-1	2	0
I-495 OL from I-95 to I-270	10	10	17:35	15	16	16	31	32	32	-1	-1	-1	-1

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

Quarterly Spotlight: Earthquake and MATOC

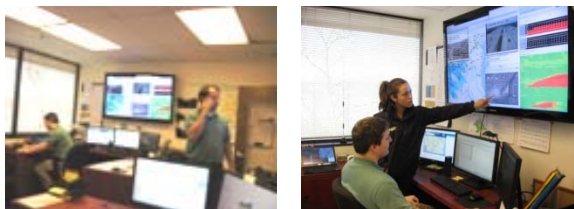


The Metropolitan Area Transportation Operations Coordination (MATOC) Program is a coordinated partnership between transportation agencies in D.C., Maryland, and Virginia that aims to improve safety and mobility in the region through information sharing, planning, and coordination

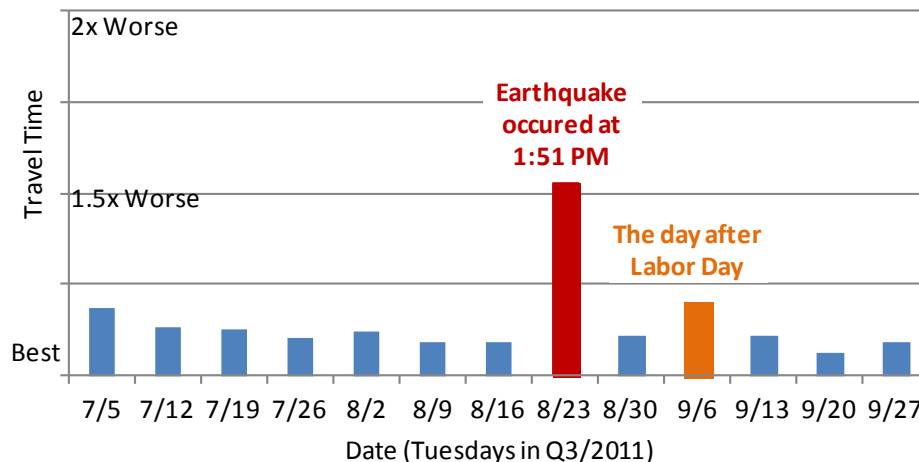
In an incident such as the August 23 earthquake, MATOC responded the unusual traffic situations (the charts on the left illustrates the traffic spikes) in the following ways:

1. timely added “earthquake activity” in its information sharing package and set up the alarm for the unusual traffic patterns: earlier and intense PM peak period;
2. Switched from individual incident-based information sharing to hourly and semi-hourly updates of all incidents and earthquake-related activities;
3. Conducted after action reviews and drew lessons for future improvements.

For more information about the MATOC, visit www.matoc.org



Traffic between 3:00 PM - 4:00 PM on all Tuesdays in Q3/2011



Traffic on the Earthquake Day (1:00 PM - 8:00 PM)

