Status Report on the NCR Congestion Report (Dashboard)

MOITS Policy Task Force and Technical Subcommittee Meeting

September 13, 2011

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National Capital Regional Transportation Planning Board (TPB)
Metropolitan Washington Council of Governments (MWCOG)

Updates from July Meeting

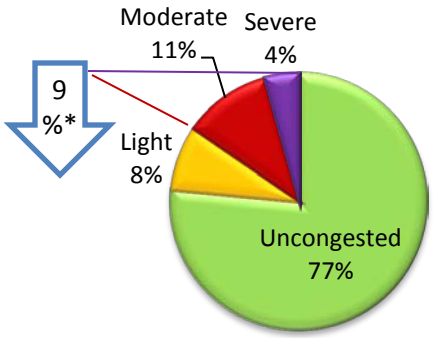
- Major changes
  - Page 1, **value of time**: $16.00/hour was changed to $18.49/hour, based on TPB model and Household Travel Survey
  - Page 10, number and duration of incidents
- Ongoing
  - Report for 2011Q2: in production (completion within two weeks)

National Capital Region Congestion Report (DRAFT) 4th Quarter 2010 *Snapshot*

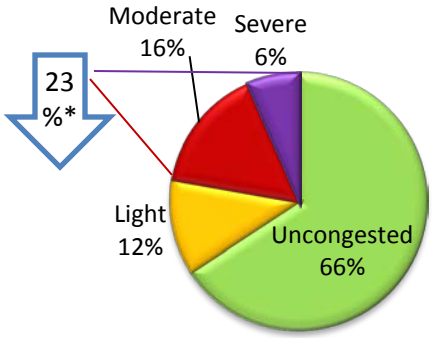
FREEWAY CONGESTION

Percentages of Freeway Lane-Miles by Congestion Level in 4th Quarter 2010

AM Peak (6 - 10 AM)



PM Peak (3 - 7 PM)



Congestion level	Ratio of experienced travel time to free flow travel time
Uncongested	< 1.15
Light	1.15 - 1.30
Moderate	1.30 - 2.00
Severe	> 2.00

* Q4/2010 vs. Q4/2009, see p. 2 & 11 for more information.

Freeway Delay per Freeway Traveler

7.6 Hours → $141*

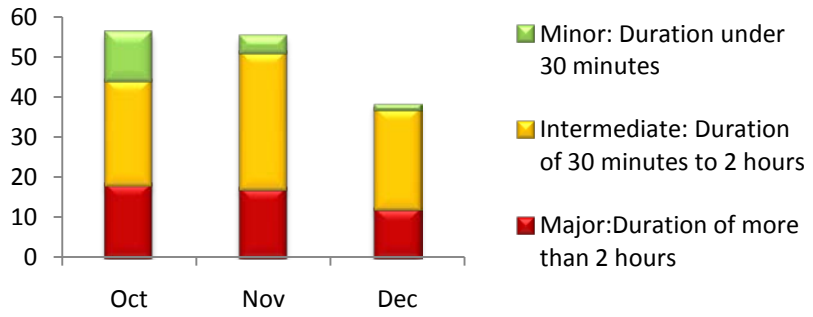
Per month during Q4/2010
*Cost of time $18.49/ hour
(Derived from TPB model & Household Travel Survey)

-45 %

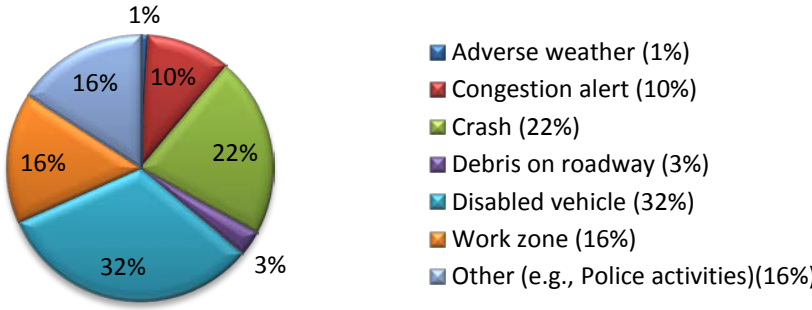
Q4/2010 vs. Q4/2009
Major factors: weather, fuel prices, economy
(see p. 3 & 11)

INCIDENTS

MATOC: Number of Notifications by Incident Severity in 4th Quarter 2010



RITIS: Percentages of Different Types of Recorded* Incidents in 4th Quarter 2010 (total 11,610 incidents)

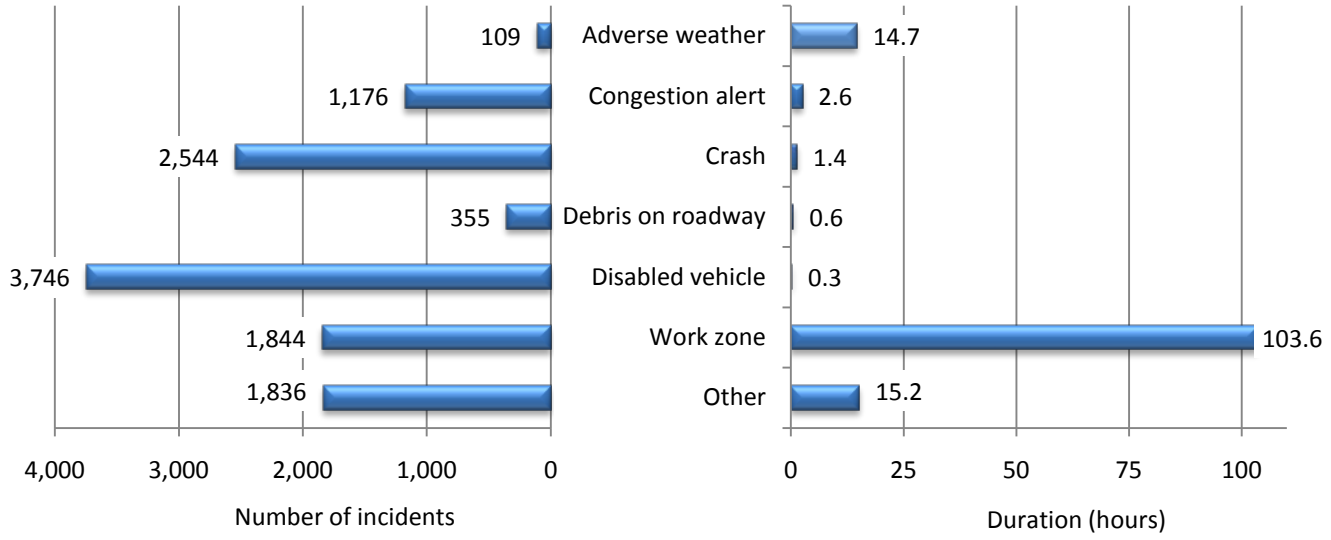


*Only RITIS-recorded incidents included . Data were not available for the District of Columbia.

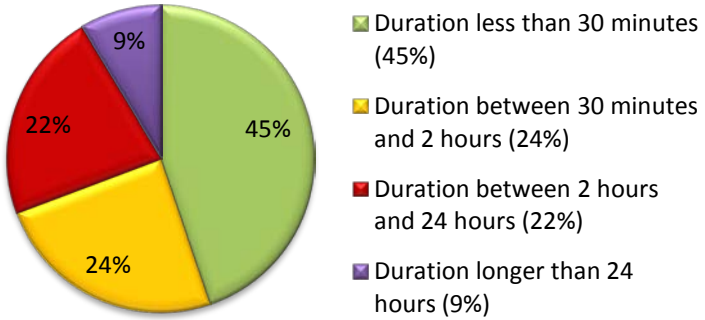
Powered by the I-95 Corridor Coalition Vehicle Probe Project and expansions made available by MDOT and VDOT, the Metropolitan Area Transportation Operations Coordination (MATOC) Program, the Regional Integrated Transportation Information System (RITIS) and the Transportation Technology Innovation and Demonstration (TTID) Program of FHWA.
 Released 7/22/2011. *For more information, contact: Wenjing Pu (wpu@mwcog.org)*

National Capital Region Congestion Report (DRAFT) 4th Quarter 2010 *Incidents**

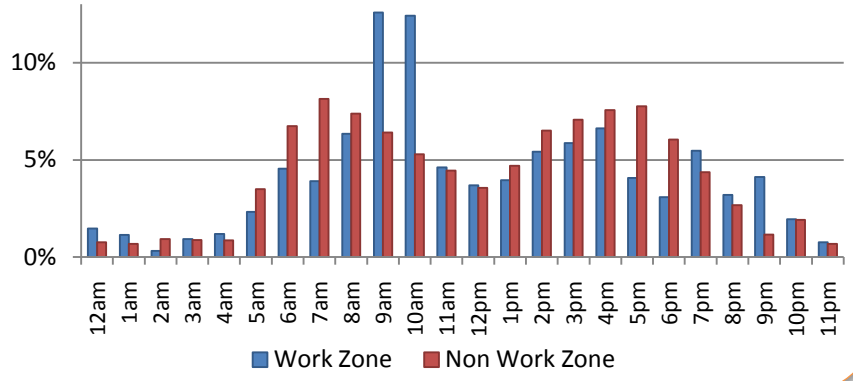
Number and Duration of RITIS-Recorded Incidents
in 4th Quarter 2010



Distribution of Duration of RITIS-Recorded Incidents
in 4th Quarter 2010 (total 11,610 Incidents)



Time of Day Distribution of RITIS-Recorded Incidents
in 4th Quarter 2010 (total 1844 work zone and 9766 non work zone Incidents)



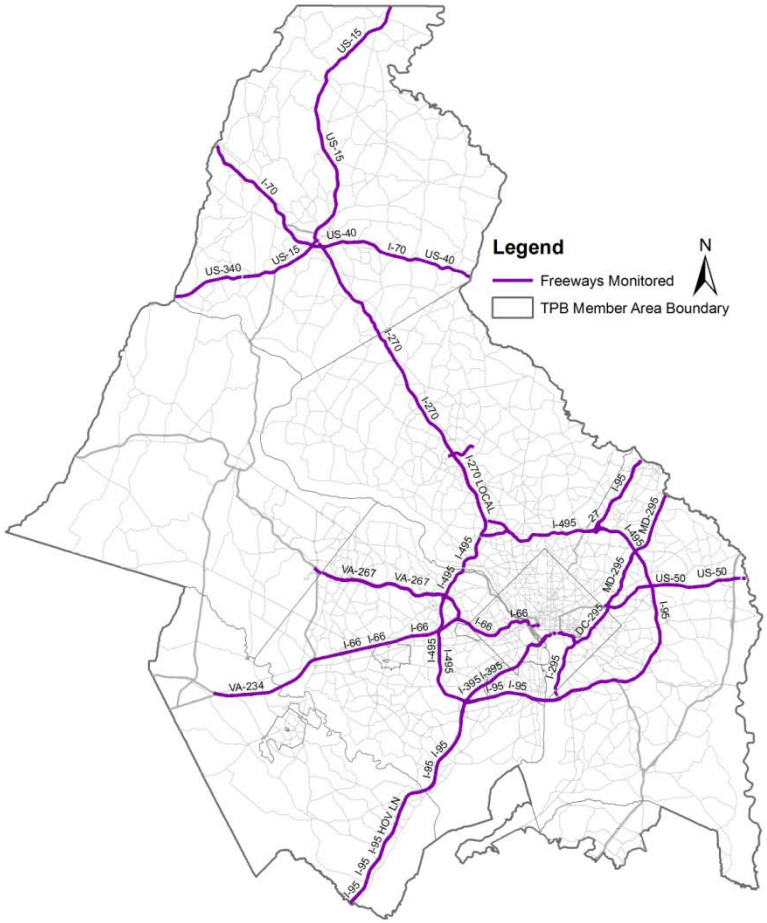
*Data sources: the Regional Integrated Transportation Information System (www.RITIS.org). Data were not available for the District of Columbia.

Data Sources

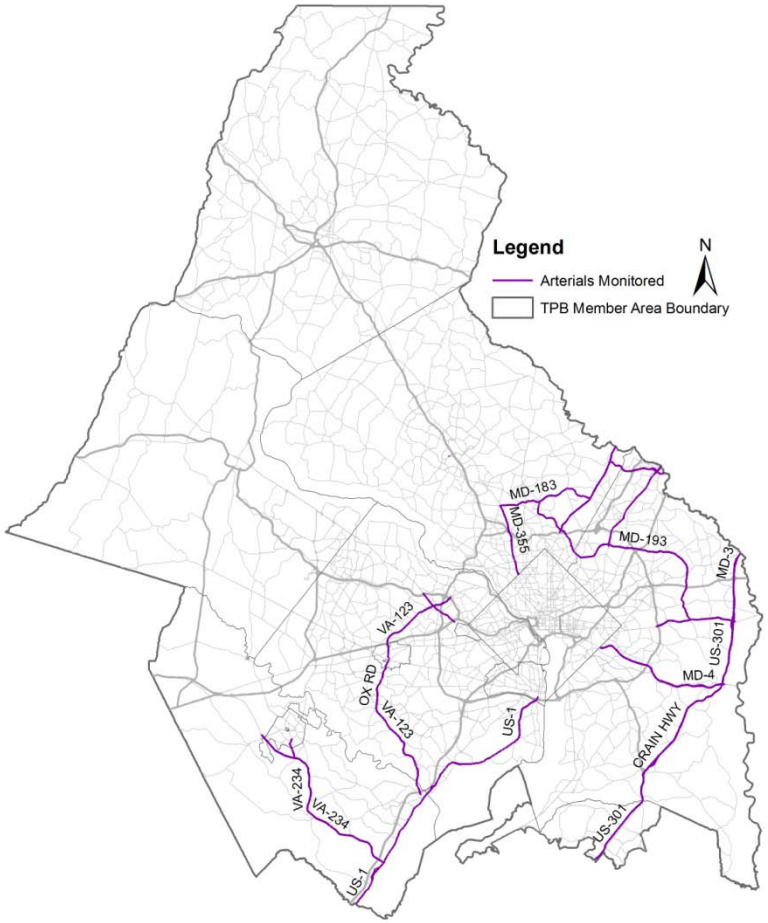
- Speed
  - I-95 Corridor Coalition/INRIX data
- Volume
  - FHWA Transportation Technology Innovation and Demonstration (TTID) Program
  - Maryland Traffic Monitoring System (TMS)
- Incidents
  - RITIS
  - MATOC

INRIX Speed Data Coverage in TPB

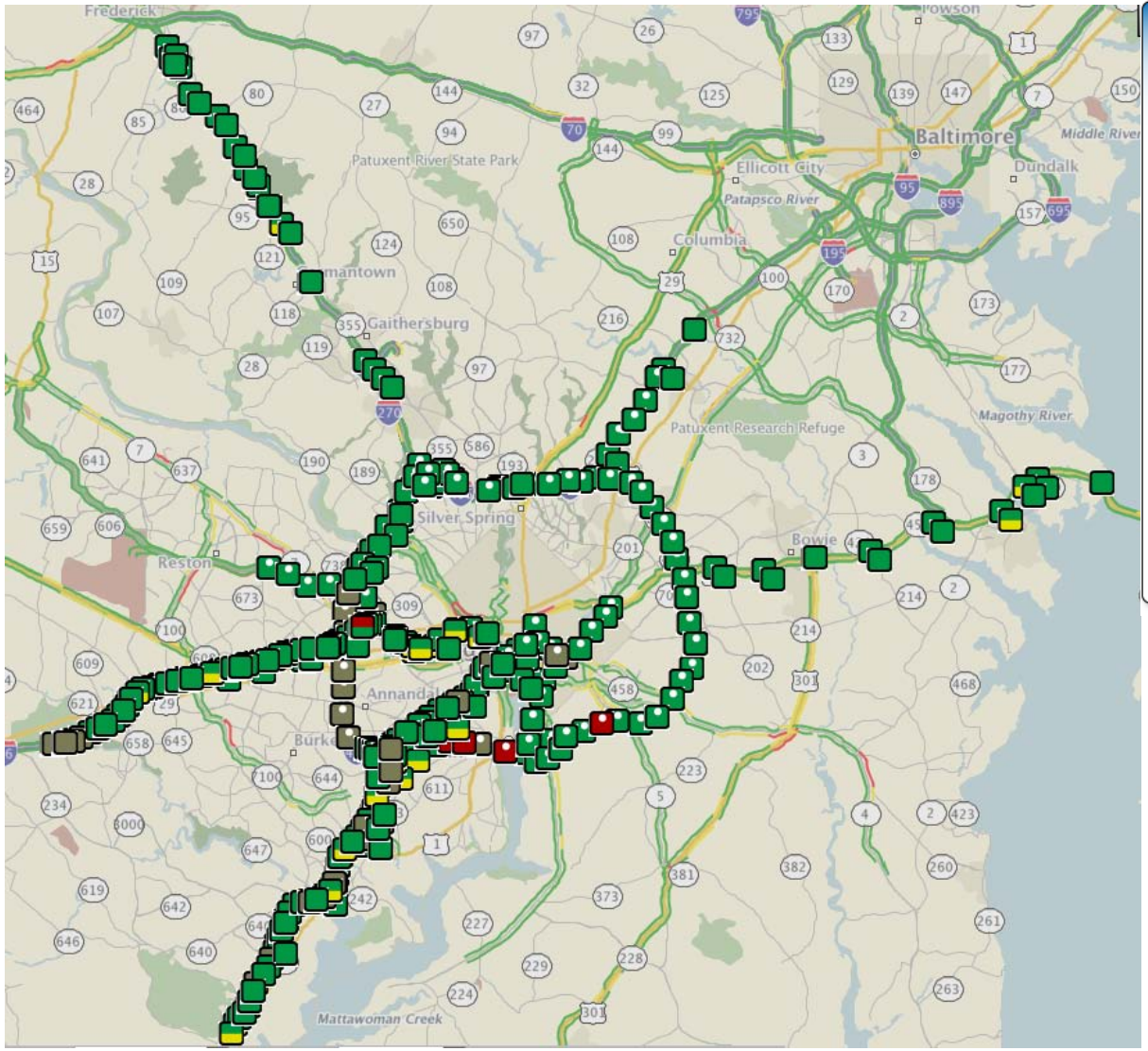
Freeways

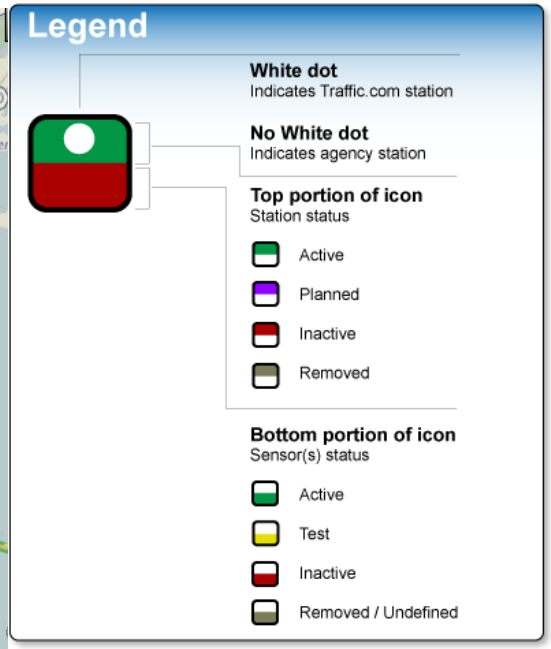


Arterials



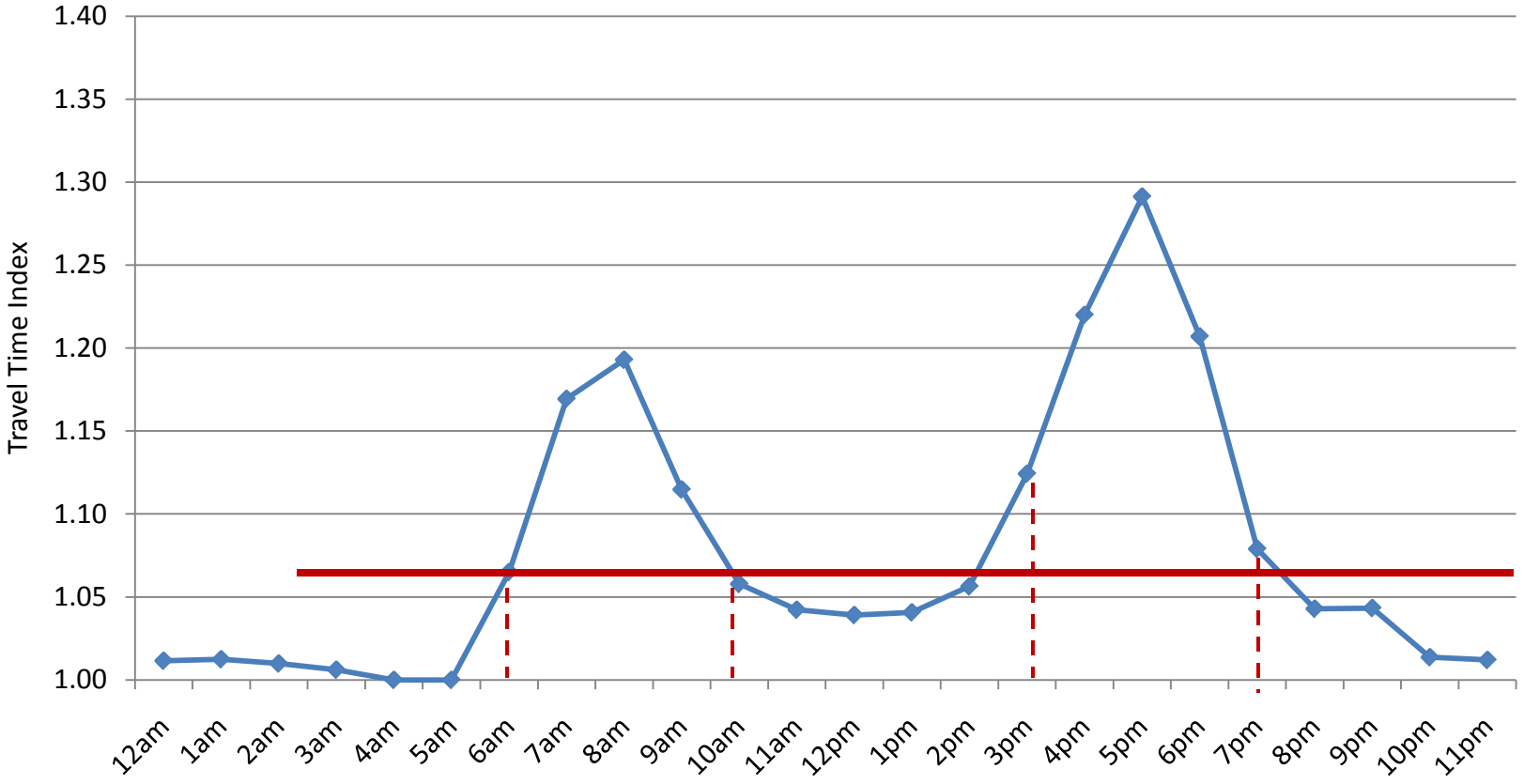
TTID Volume Data Coverage in TPB





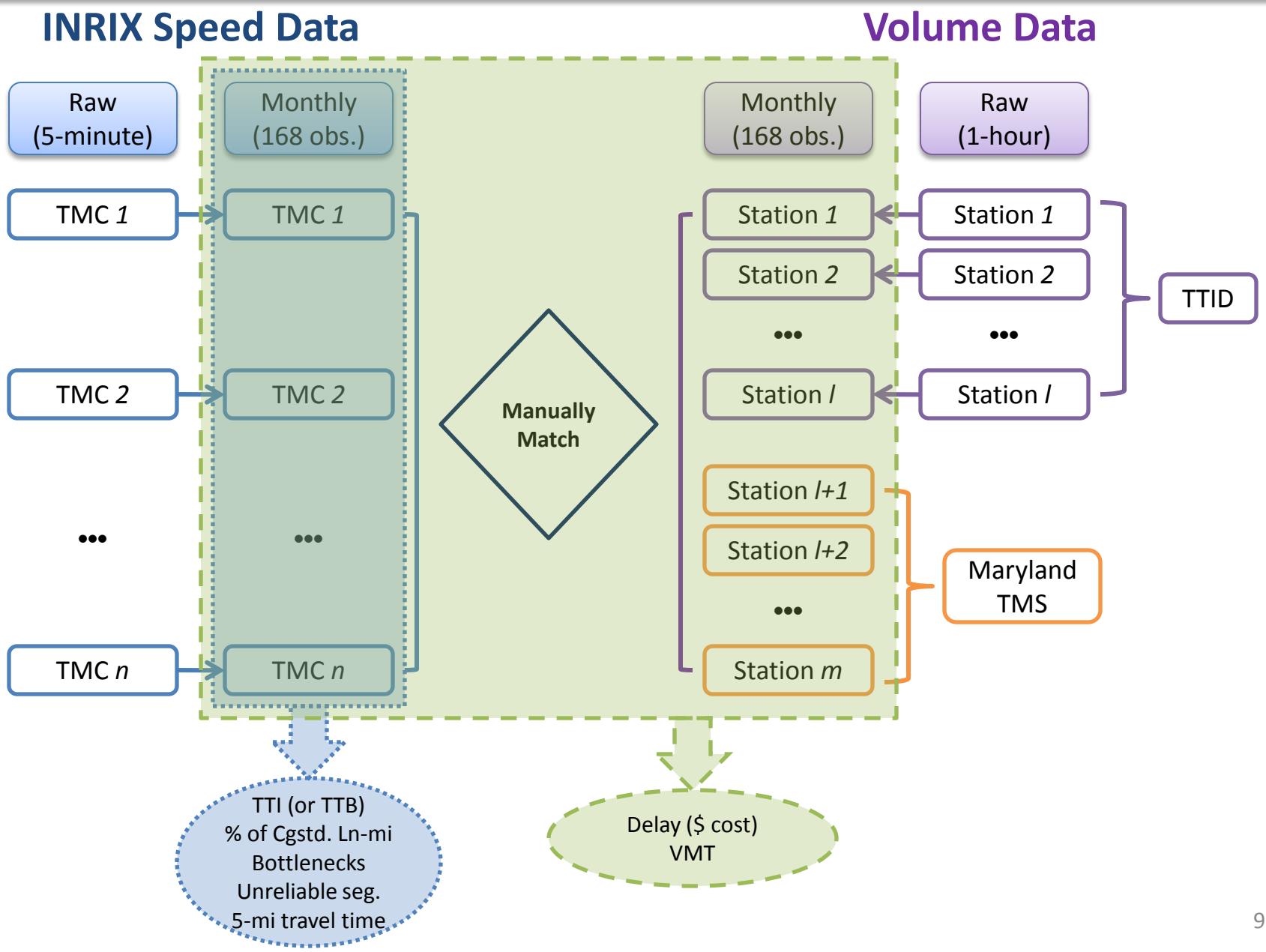
Source: Traffic.com, Inc.

Workday TTI by Time of Day (2010)



Travel time index (TTI) = experienced travel time / free flow travel time

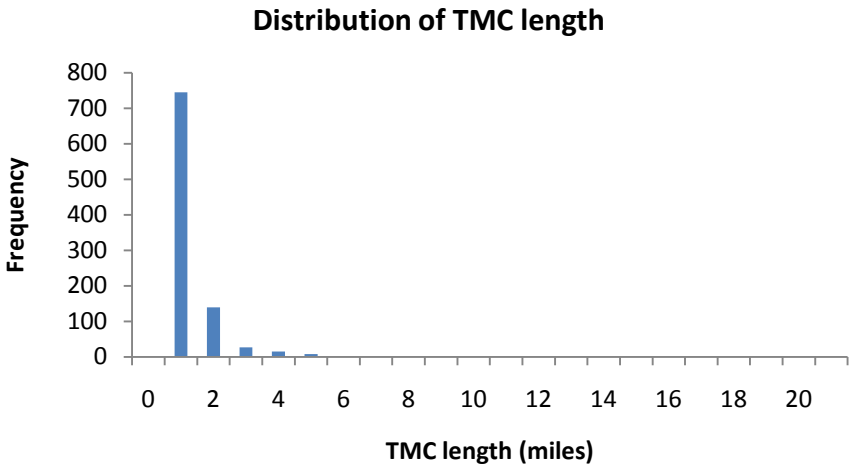
Data Flow

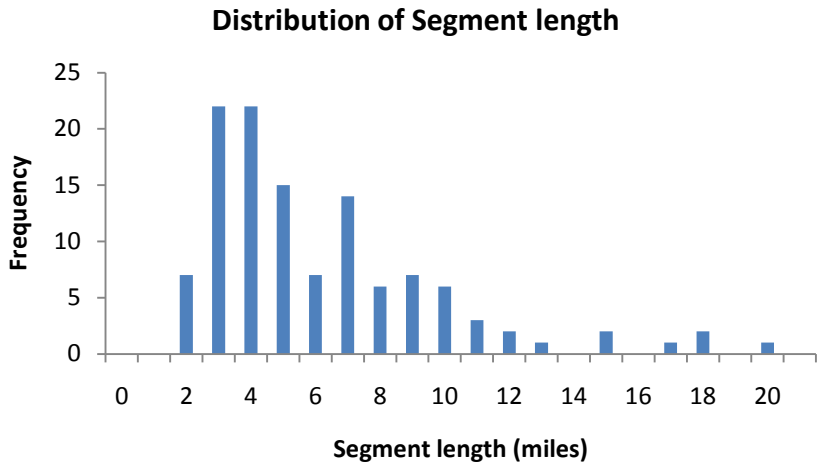

INRIX Speed Data
Volume Data
Raw (5-minute)
Monthly (168 obs.)
Monthly (168 obs.)
Raw (1-hour)
TMC 1
TMC 1
Station 1
Station 1
Station 2
Station 2
TTID
TMC 2
TMC 2
Station I
Station I
Manually Match
Station I+1
Station I+2
Maryland TMS
TMC n
TMC n
Station m
TTI (or TTB)
% of Cgstd. Ln-mi
Bottlenecks
Unreliable seg.
5-mi travel time
Delay ($ cost)
VMT

TMC and Station Match

Rules of thumb:

- Combine several TMCs (Traffic Message Channels – spatial unit of INRIX data) to form a "segment" that includes at least one station
- Segment should at least 1-mile long
- Segment ends/begins if
  - Number of lanes changes
  - At a major interchange or a point of interest
- If a segment has multiple stations, use average volume





Freeway Delay per Freeway Traveler

$$\sum_t \frac{\sum_i V_{it}\left(\frac{L_i}{S_{it}} - \frac{L_i}{FFS_i}\right)}{\sum_i V_{it}}$$

where,

L_i – Length of segment i,

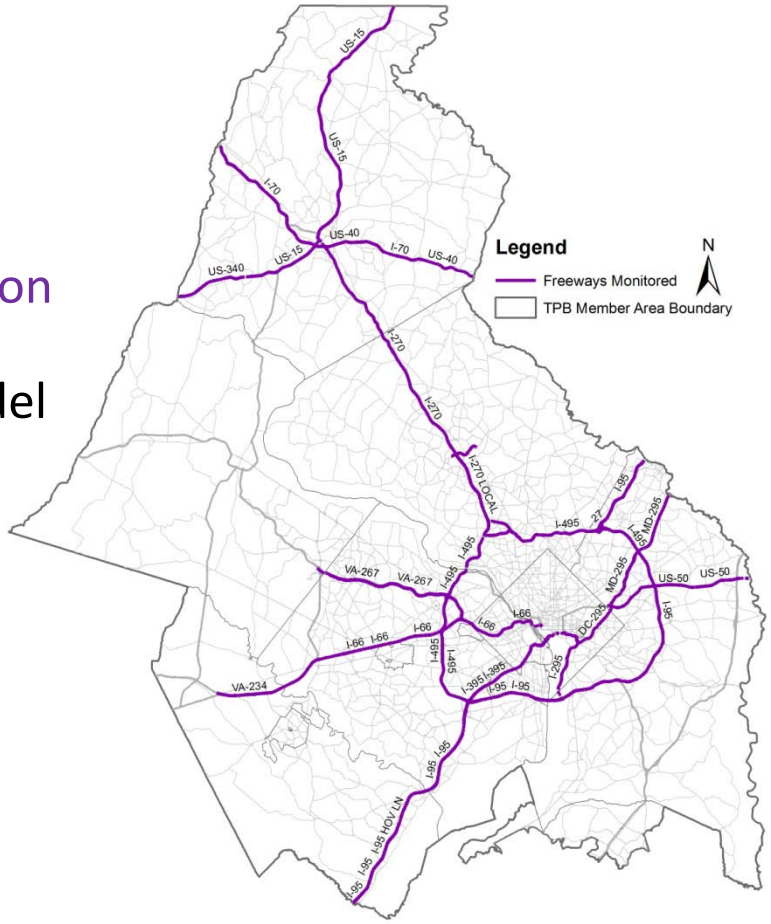
S_{it} – Speed of segment i during hour t,

FFS_i – Free flow speed of segment i,

V_{it} – Volume of segment i during hour t,

Vehicle-Miles Traveled

- Workday 24-hour freeway VMT of TPB member jurisdictions
  - TPB Model v2.3 output: 44 million vehicle-miles (2007)
  - NCR Congestion Report (draft): 35 million vehicle-miles (2008)
  - The report has 20% less VMT than model output
- Possible cause
  - The report does not cover
    - GW Parkway
    - Dulles Access Road (not tolled)
    - Dulles Greenway
    - Harry Byrd Highway
    - Clara Barton Parkway
    - Portions of I-66 and I-395



Freeway data coverage
of the NCR Congestion Report

Value of Time

V2.3 Calibration Report, 4/29/2011, Page 61

Table 39 Time Valuation (Minutes/2007$) by Purpose and Income Level

HH Income Quartile Range (1)	Mid-Point of HH Income Range	Hourly Rate per Worker (2)	2007 Time Valuation (Minutes per Dollar) Work Trips (75% V.O.T.)	Non-work (50% V.O.T.)
$ 0 - $ 50,000	$25,000	$9.23	8.7	13.0
$ 50,000 - $ 100,000	$75,000	$27.70	2.9	4.3
$100,000 - $150,000	$125,000	$46.17	1.7	2.6
$150,000 +	$175,000	$64.64	1.2	1.9

Notes:
(1) Income groups based on 2007 ACS-based quartiles
(2) Hourly rate based on 1,920 annual hours/worker * 1.41 workers/HH = 2,707 hrs/HH
(3) Median 2007 Annual Income for modeled area is $84,280

Value of time by trip purpose
(for median 2007 annual income $84,280)
- Work trips: $23.40/hr
- Non-work trips: $15.65/hr

V2.3 Calibration Report, 4/29/2011, Page 121

Table 74 Comparison of 2007 Estimated and Observed Trips by Purpose and Mode

% of non-transit, motorized trips by purpose
Work trips: 30%
Non-work trips: 70%

Value of time
$17.97 (2007 $)

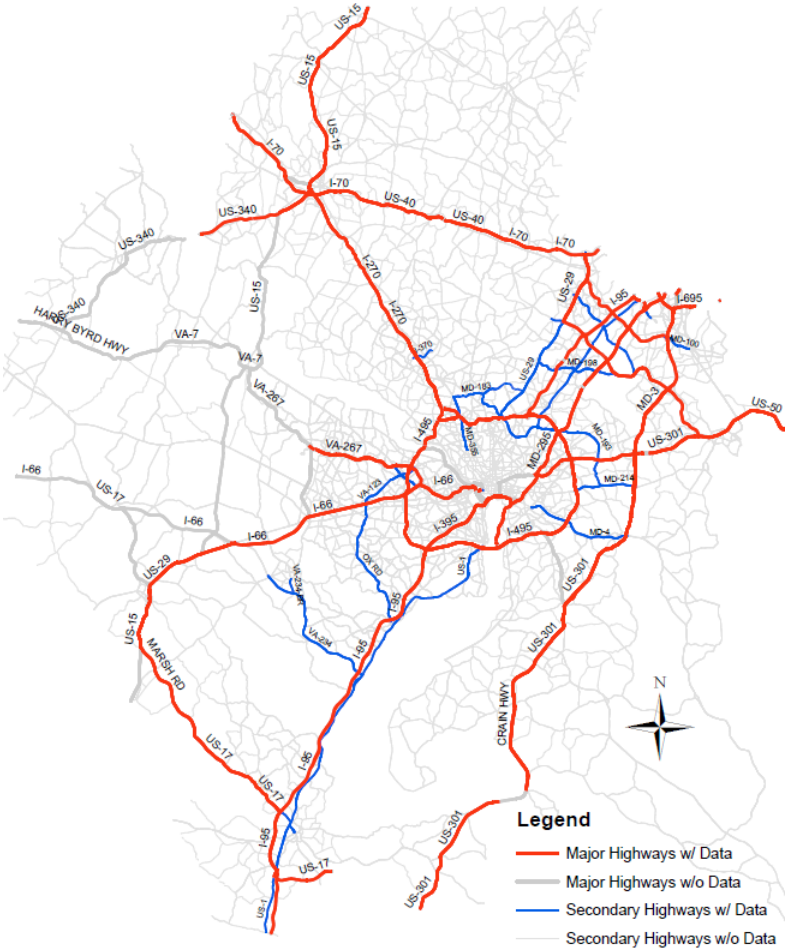
Value of time
$18.49 (2010 $)

FYI: INRIX Data – What We Have Now

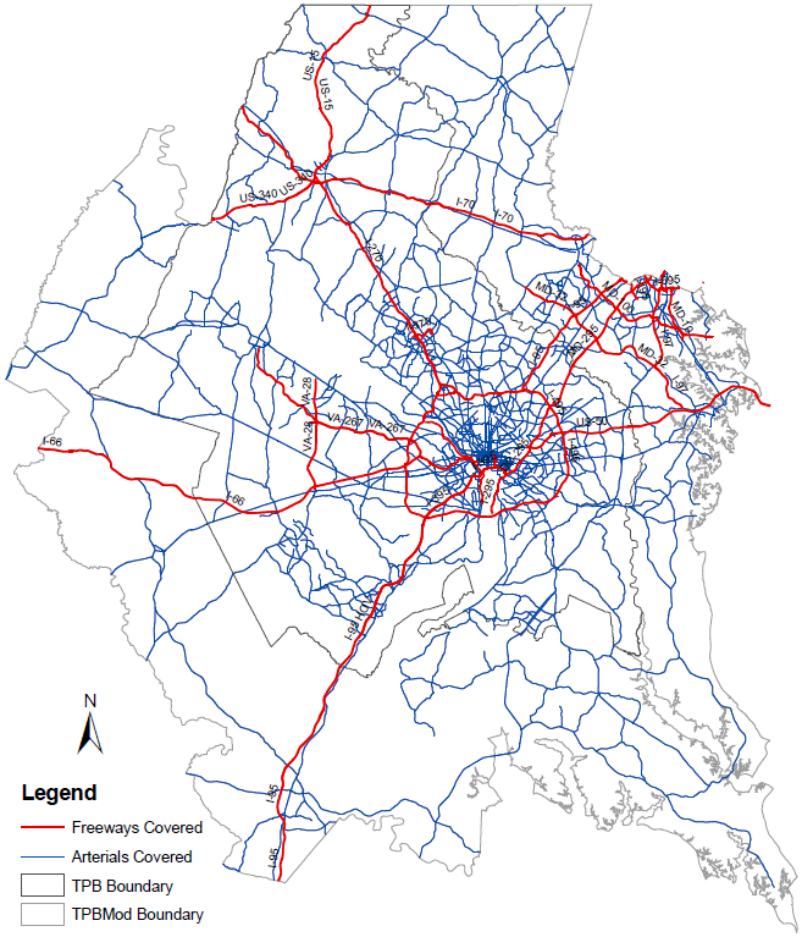
- I-95 Corridor Coalition Vehicle Probe Project (VPP) and its expansions
  - 5-minute archived data (since July 1, 2008)
    - Access via I-95 Traffic Monitoring website (INRIX): one snapshot every 5 minutes
    - Access via VPP suite of RITIS (UMD): one snapshot every 1 minute → can request aggregated data (5-, 10-, 15-, 30-, or 60-minutes intervals)
- FY 2011 Procurement (for 2010 plus Jan. 2011 data)
  - Average speed data
  - 5-minute archived data (one snapshot every 5 minutes)
  - TMC Shape File

Data Coverage: VPP vs. FY11 Procurement

I-95 VPP



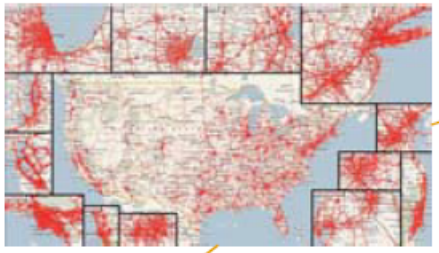
FY 2011 Procurement



Average Speed Data vs. 5-Min Archived Data

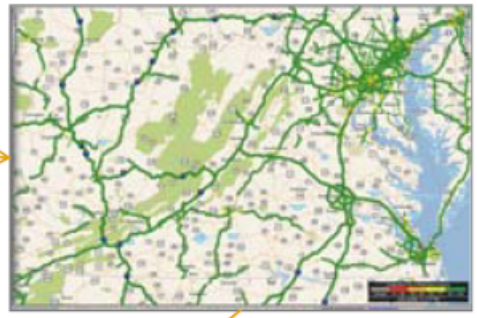
Average Speed vs. Archive Files

Incoming GPS Data Points
~4M vehicles, Billions points per month
(Each Red Dot = Real-Time GPS Data Point)



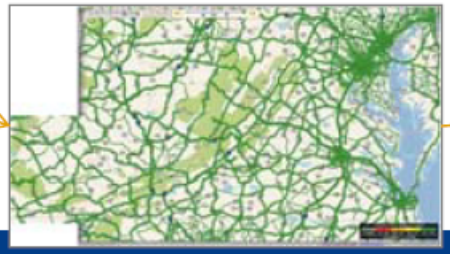
Real-Time Data Processing
"Fusion Engine"

Creates Real-Time Picture of Conditions
(INRIX "Core" Network)



GPS Data Archive
(Ten of Billions of "Red Dots") since 2005

Allows for Statistical Queries
(All TMC Covered Roads)



"Archive File"

TimeStampUTC	TMC9	Speed	Average Speed
2010-01-01 05:00:00.000	110+04122	59	60
2010-01-01 05:00:00.000	110+04121		58

"Average Speeds File"

TMC	DayOfWeek	StartTime_MinutesFromMidnight	SpeedRaw	SecondsRaw	PointCount	Stddev	Percentile10	Percentile25	Percentile50	Percentile85	FailureRate30	FailureRate50	FailureRate60
112N04199	5	900	60	67.771	1571	5.036	52	57	61	65	2	7	39
112N04199	5	915	59	68.92	1537	6.424	47	56	60	65	4	12	46
112N04199	5	930	57	71.338	1545	9.405	35	53	59	64	7	19	53
112N04199	5	945	54	75.301	1500	12.256	29	47	58	63	10	28	60
112N04199	5	960	50	81.325	1463	14.29	26	40	55	63	14	38	67
112N04199	5	975	47	86.516	1496	15.069	23	35	51	62	18	48	76
112N04199	5	990	42	96.816	1563	15.662	22	30	42	60	25	62	84
112N04199	5	1005	39	104.263	1704	15.904	17	27	38	57	31	70	89
112N04199	5	1020	38	107.007	1760	15.653	18	27	37	57	33	71	90

10 INRIX Confidential & P INRIX

Source: INRIX, Inc.

Thank You!

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