

Vehicle Probe Project Web Conference



Status Update

June 23, 2011



Call Courtesies

- Please give your name and agency before asking your question (at least the first time)
- Please keep your phone muted until asking a question or speaking (press *6 to mute/unmute individual phone lines)
- Please do not place call “on hold” as your hold music may be heard by the group
- Please call 610-662-5569 for difficulties with the web application

Agenda

Topic		Speaker
1	Introductions and Welcome	George Schoener
2	Review of Action Items from previous webcasts	Karen Jehanian
3	Communications Update	Karen Jehanian
4	INRIX Update	Rick Schuman
5	Data Validation	Stan Young
6	Spotlight Presentation: Learn more about your data	Stan Young
7	Update on Funding	George Schoener
8	Contract Issues and Year 19 Update	Kathy Frankle
9	Vehicle Probe Project Suite (PM Tool) Update	Stan Young for Michael L. Pack
10	Agency Questions and Updates	All
11	Participation in Meetings/Conferences	Karen Jehanian
12	Review of Action Items from this call	Karen Jehanian
13	Selection of Date for Next Webcast	All

Introductions and Welcome

George Schoener
I-95 Corridor Coalition

Review of Action Items from previous webcasts

Karen Jehanian

Review of Action Items

from previous VP Webcasts

#	Responsible Party	Action Items	Due Date	Status
Previous VPP Team Webcasts				
1	Rhode Island, Delaware, Virginia, Georgia	Go online and commit funds as soon as possible, preferably by May 30, 2011.		GA , VA & RI committed to project via Pooled Fund study
2	VPP Mgmt Team (Stan Young)	Make a presentation on the Score & C-Value Analysis, Filtering Based on Score and C-Value, and Volume Analysis research conducted by University of Maryland at the next VPP Team webcast in June.		At June 23 rd webcast
3	Kathy Frankle/ Member Agencies	Finalize paperwork with agencies committed to Year 19 whether through a direct contract with UMD or the Pooled Fund Study.		Ongoing
4	VPP Mgmt Team (Atkins)	Monitor usage and benefit of the Long Distance Trip Planner website.		Ongoing

Communications Update

Karen Jehanian

- Coalition Website Postings/
Correspondence

Project Team Correspondence

Coalition Website Postings		
DOCUMENT	DATE POSTED	LOCATION ON WEBSITE
May 24, 2011 VP Team Webcast – Presentation and Meeting Minutes	June 7, 2011	On the Highlights page under “Project Presentations”
Validation of INRIX Data – Monthly Report – South Carolina (dated April 2010)	June 14, 2011	On the Highlights page under “Data Validation”
Correspondence Sent to the VPP Team		
DOCUMENT	DATE SENT	METHOD
May 24, 2011 VP Team Webcast – Presentation and Meeting Minutes	June 7, 2011	Via email
Validation of INRIX Data – Monthly Report – South Carolina (dated April 2010)	June 14, 2011	Via email

INRIX Update

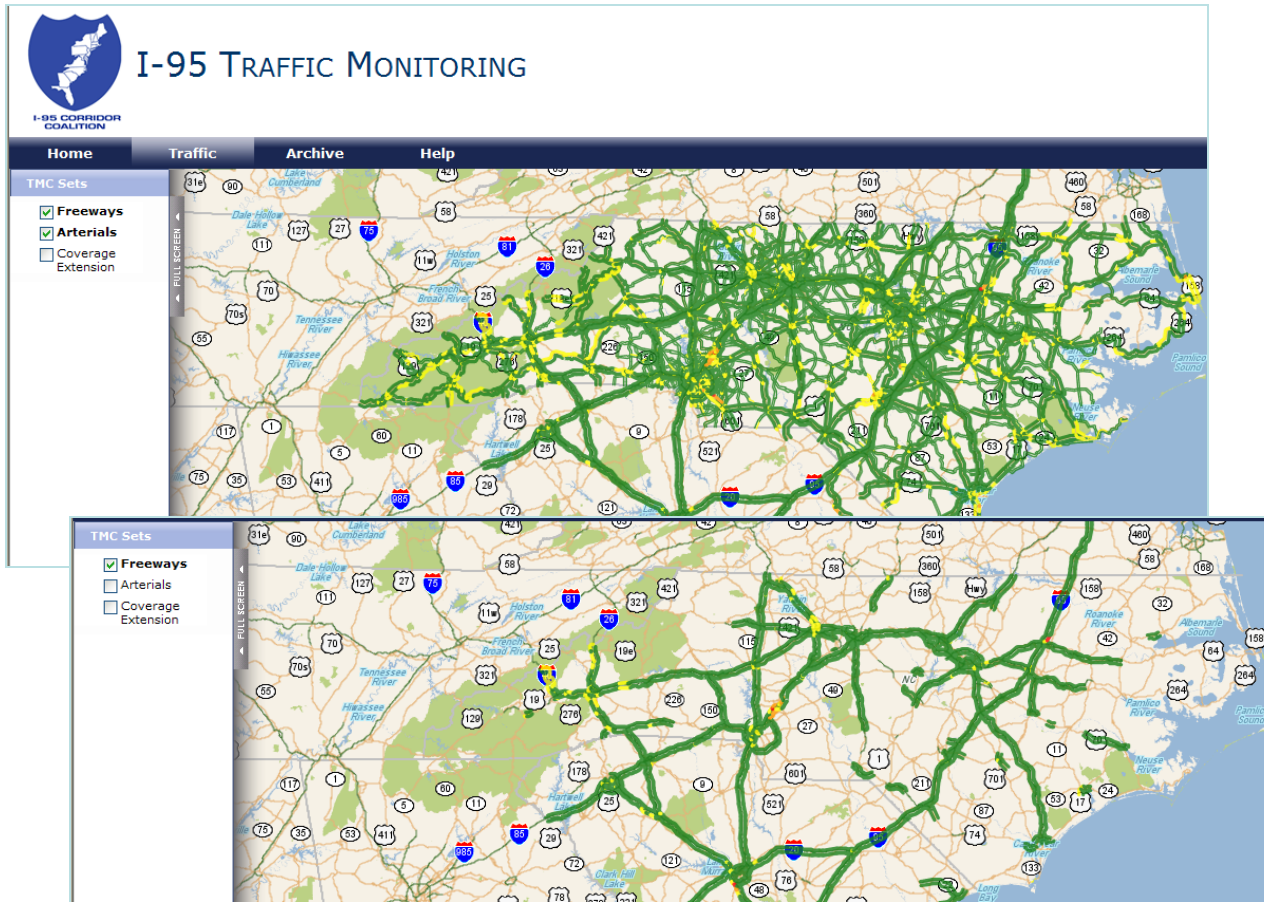
Rick Schuman

- Project Statistics
- Other Topics
 - NC Expansion
 - Donated Arterials Clean-up
 - TMC Set Preparation for July 1

Project Statistics

- Availability
 - 99.99% in May
 - 99% contract requirement
 - 99.88% in 2009; 99.94% in 2010; 99.92% YTD in 2011
- Users (as of 6/10/11)
 - Monitoring Site – 441
 - Data Feed – 43
 - Archive requests – 619 since launch
 - Only 16 in last month – due to VPP suite?

North Carolina Expansion



- Full Coverage now live
- 1500+ freeway miles
- ~15,000 total miles
- Ramps coming in CLT, RDU and GBO
- Included in Monthly PM files from June 1
- Will work with CATT Lab to ingest and backload data

Donated Arterials Clean-up

- After recent map update
 - Added 118 miles to donated arterials
 - Now in appropriate state “arterial” data feed
- ~15 miles remain to reach full “1001” donated miles in contract
 - 3 segments in VA – no TMC codes at present
 - Requested codes from Tele Atlas



TMC Set Modifications

Progress for/by July 1, 2011

✓ = TMC Set Prepared and Ready to Go

TMC Set	ME	NH	MA	RI	CT	NY	NJ	PA	DE	MD	VA	NC	SC	GA	FL
All	NEW ✓	NEW ✓	NEW ✓	NEW ✓	NEW ✓	NEW ✓	ADD ✓	ADD ✓	ADD ✓	ADD ✓	ADD ✓	ADD ✓	ADD ✓	NEW ✓	ADD ✓
Freeways	NEW ✓	NEW ✓	NEW ✓	NEW ✓	NEW ✓	NEW ✓	EXISTING	EXISTING	EXISTING	EXISTING	ADD ✓	ADD ✓	ADD?	NEW ✓	ADD ✓
Arterials							EXISTING	EXISTING	EXISTING	EXISTING	ADD ✓	ADD ✓	ADD?		
Ramps				NEW ✓		?	NEW ✓	NEW ✓	NEW ✓	NEW ✓	NEW ✓	NEW ✓	NEW ✓		ADD ✓



= Existing TMC Set

NEW = Creating a new TMC Set

ADD = Adding TMCs to existing TMC Set

Note – MD includes DC TMCs

Data Validation Update

Stan Young
University of Maryland

- Status and Schedule
- March 2011 – North Carolina

Data Validation Status

Month and Year	State	Ground Truth Data Collection [By mid-month]	Data Processed and Preliminary Results Ready for Review [By end of Month]	UMD Review	INRIX Review	State Review & Briefing [+ 2 weeks]	Publish [+ 2 weeks]
				[+ 2 weeks]			
Mar-11	NC	<i>Mar 10 - 24, 2011</i>	<i>5-May-11</i>	<i>15-Jun-11</i>	15-Jun-11	1-Jul-11	15-Jul-11
Apr-11	NJ	<i>1-Apr-11</i>	15-Jun-11	29-Jun-11	29-Jun-11	15-Jul-11	29-Jul-11
May-11	NJ	<i>1-May-11</i>	15-Jun-11	29-Jun-11	29-Jun-11	15-Jul-11	29-Jul-11
Jun-11	DE	6/14/2011	1-Jul-11	15-Jul-11	15-Jul-11	31-Jul-11	14-Aug-11
Jul-11	?MD?	7/1/2011	1-Aug-11	15-Aug-11	15-Aug-11	31-Aug-11	14-Sep-11
Aug-11	?VA?	8/1/2011	1-Sep-11	15-Sep-11	15-Sep-11	1-Oct-11	15-Oct-11

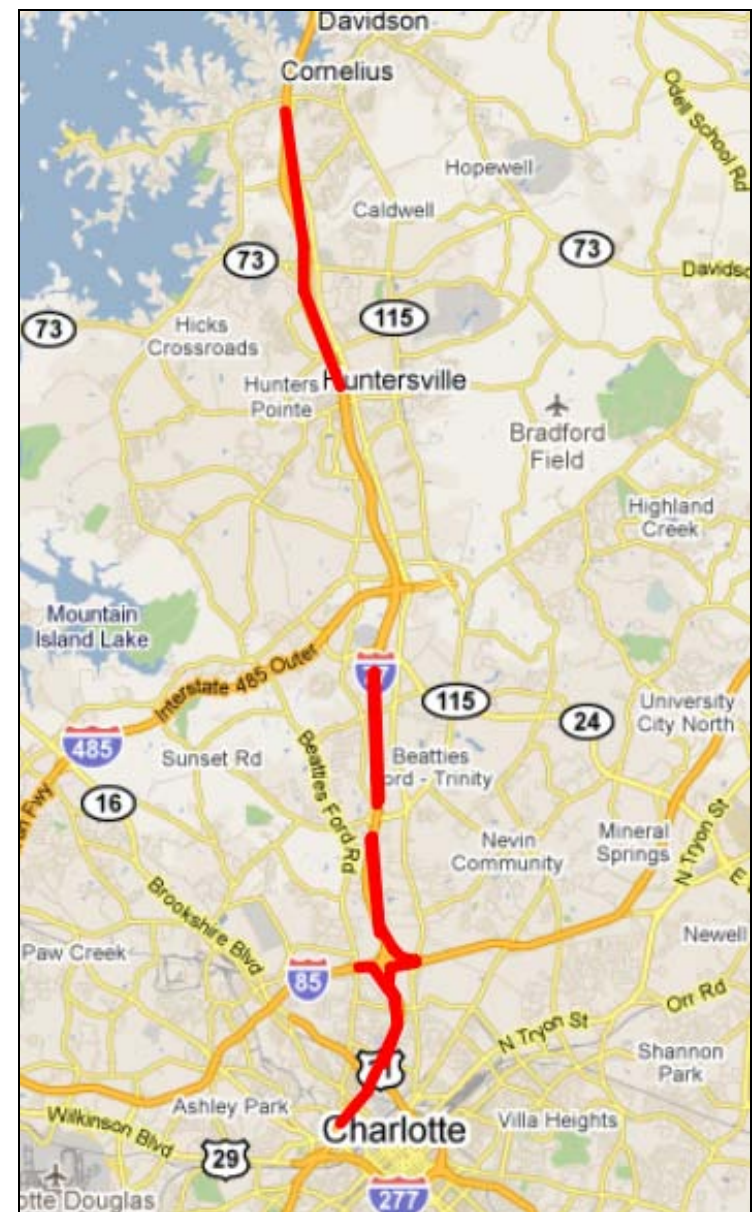
- **Mar 2011:** NC – Report being Finalized
- **April 2011:** NJ – Ramps at Lincoln Tunnel, Unusual results
- **May 2011:** NJ – Targeted Arterials
- **June 2011:** DE – Traditional Validation
- **July 2011:** MD – Tentative (Possible Use of I-95 PA Data)

North Carolina Validation

March 2011

Freeway Summary

- 9 paths, 14 TMCs on I77
- March 10 - 24, 2011
- 16.1 miles
- >1200 hrs of data
- 43.6 hrs of congestion
 - 25.4 hours < 30 MPH**
 - 18.2 hours 30- 45 MPH**
- AASE in lower two bands
 - 2.3 / 5.7 (10 MPH is spec)**



North Carolina Validation for Freeways

March 2011

North Carolina Evaluation Summary for Freeways

Speed Bin	Absolute Speed Error (<10mph)		Speed Error Bias (<5mph)		Number of 5 Minute Samples	Hours of Data Collection
	Comparison with SEM Band	Comparison with Mean	Comparison with SEM Band	Comparison with Mean		
0-30 MPH	2.30	3.20	1.30	1.70	305	25.4
30-45 MPH	5.70	8.30	4.90	6.60	218	18.2
45-60 MPH	1.00	2.90	0.70	1.70	1971	164.3
> 60 MPH	1.50	3.80	-1.20	-2.60	11974	997.8
All Speeds	1.51	3.73	-0.80	-1.78	14468	1205.7

Based upon data collected from March 10, 2011 through March 24, 2011 across 16 miles of roadway. For more information please visit i95coalition.org.

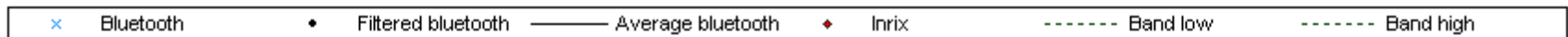
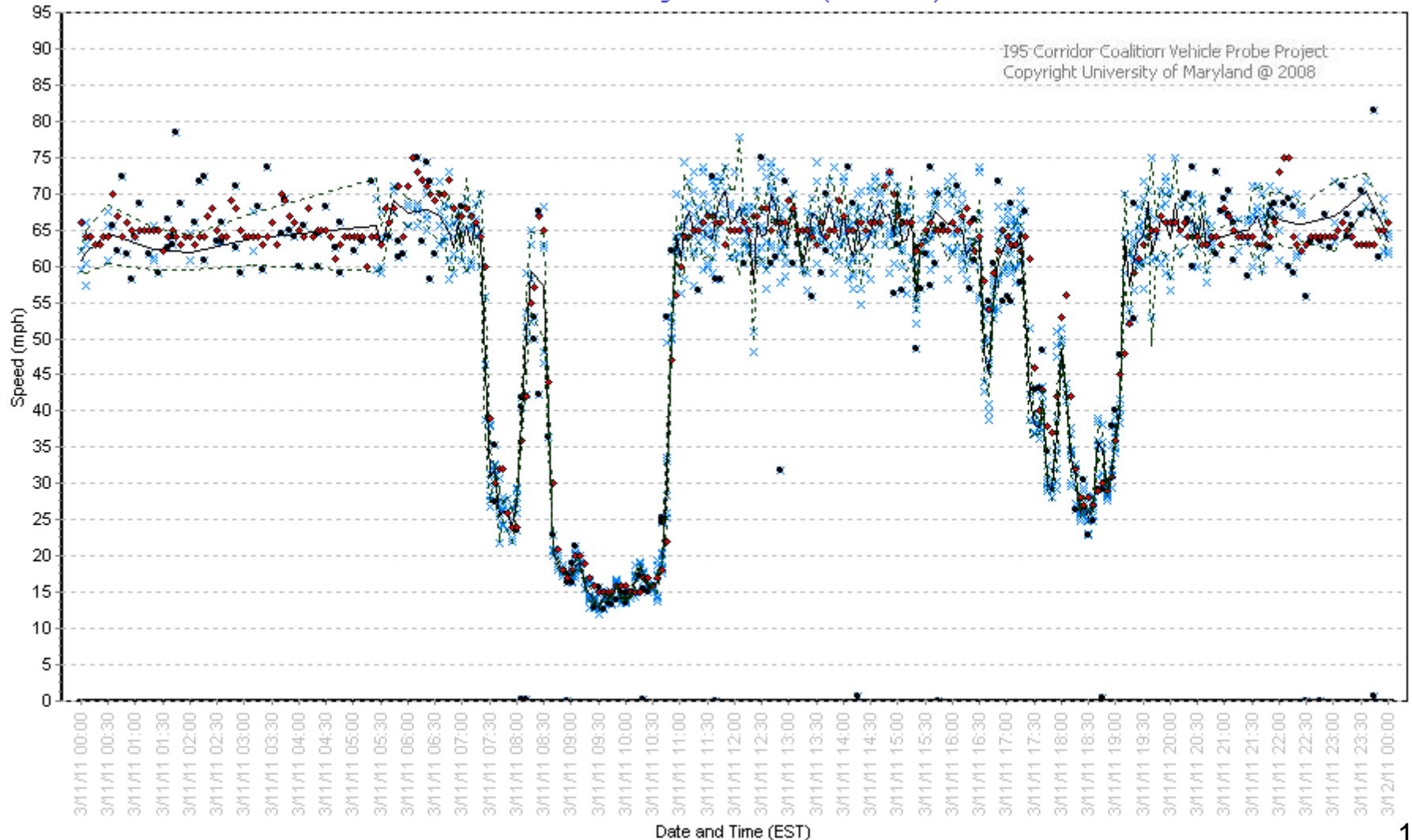
- AASE and SEB within specifications
- Fair amount of congested data

Sample Freeway Data

North Carolina - Mar 11, 2011 on I-77 SB at Exit 25

TMC:125-04793

I-77 SOUTHBOUND ending at HWY 73/EXIT 25 (2.36741 miles)

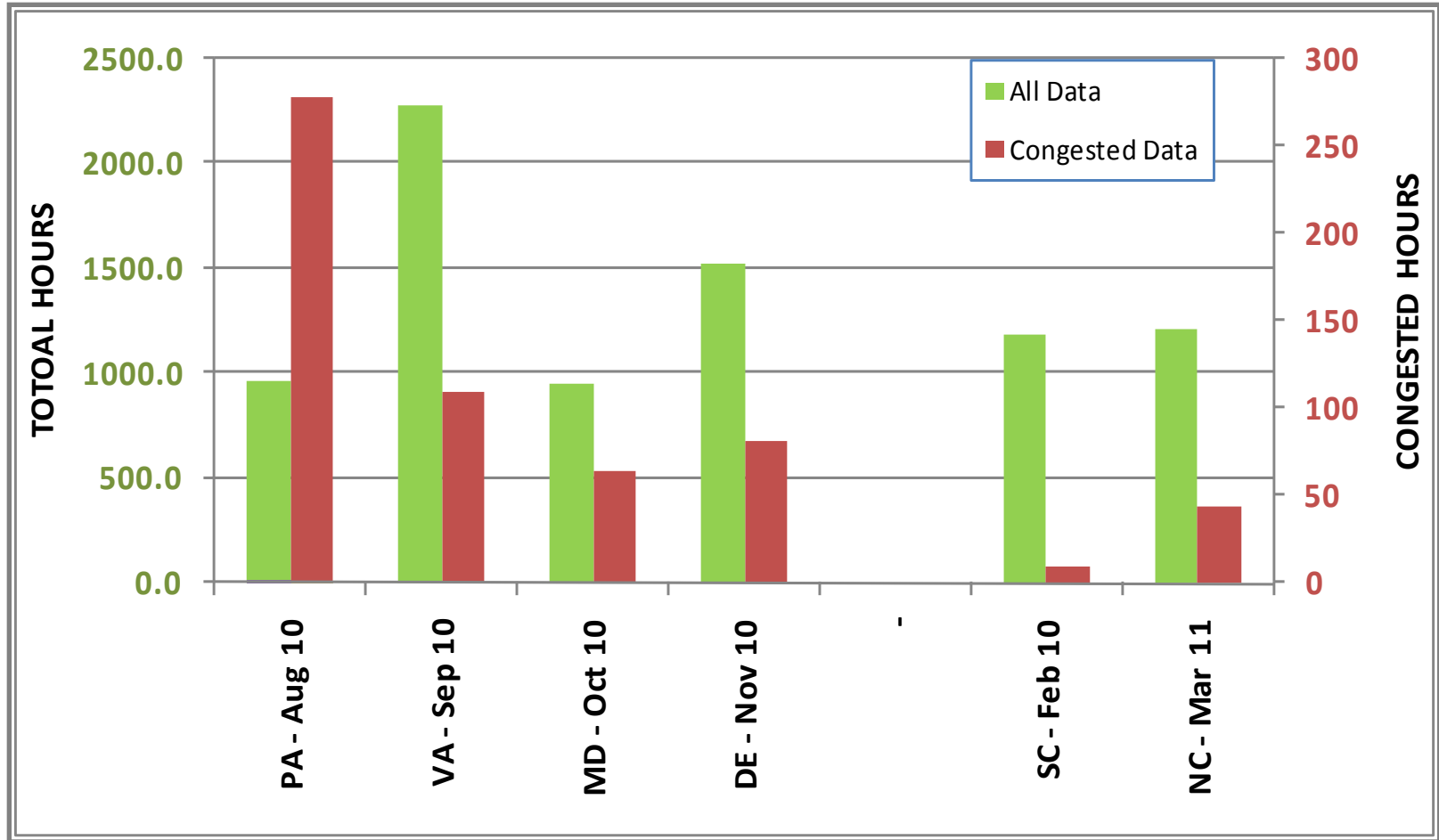


North Carolina Cumulative

North Carolina - Cumulative to Date						
Speed Bin	Absolute Speed Error		Speed Error Bias		Number of 5 Minute Samples	Hours of Data Collection
	Comparison with SEM Band	Comparison with Mean	Comparison with SEM Band	Comparison with Mean		
0-30 MPH	3.50	4.48	1.99	2.27	1068	89.0
30-45 MPH	7.33	9.59	2.24	3.18	657	54.8
45-60 MPH	2.04	4.38	0.81	2.15	3261	271.8
> 60 MPH	2.02	4.43	-1.67	-3.24	42155	3512.9
All Speeds	2.13	4.50	-1.36	-2.65	47141	3928.4

- Four Validations
 - Oct 2008, July 2009, March 2010, March 2011
- 113 miles, > 143 hrs of congestion
- **AASE of 3.5 / 7.3 in lower speed bins**

State Comparison Hours of Validation Data

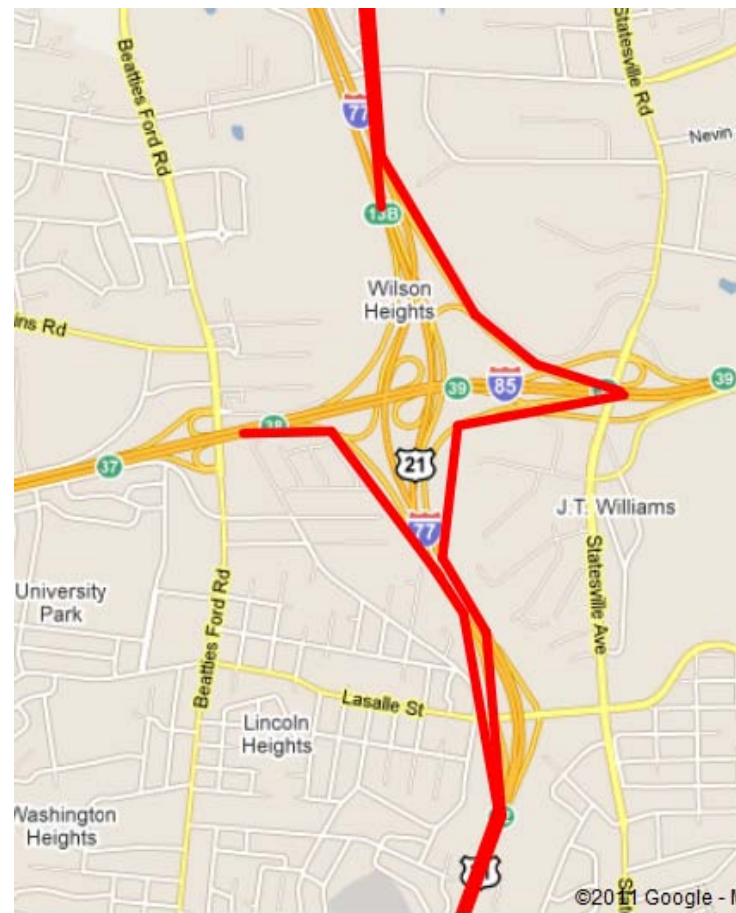


North Carolina RAMPS

March 2011

Ramp Summary

- 3 paths, 9 TMCs
- I77 & I85 Interchange
- March 10 - 24, 2011
- 2.7 miles
- >71 hrs of data
- 6.2 hrs of congestion
 - 4.6 hours < 30 MPH**
 - 1.7 hours 30- 45 MPH**
- AASE in lower two bands
 - 4.6 / 6.3 (No Spec on Ramps)**



North Carolina Validation for Ramps

March 2011

North Carolina Evaluation Summary for Ramps						
Speed Bin	Absolute Speed Error (<10mph)		Speed Error Bias (<5mph)		Number of 5 Minute Samples	Hours of Data Collection
	Comparison with SEM Band	Comparison with Mean	Comparison with SEM Band	Comparison with Mean		
0-30 MPH	4.60	6.60	3.10	3.80	55	4.6
30-45 MPH	6.30	12.20	4.00	8.60	20	1.7
45-60 MPH	1.90	4.50	1.80	4.00	761	63.4
> 60 MPH	1.20	3.40	-1.00	-3.20	18	1.5
All Speeds	2.16	4.79	1.88	3.94	854	71.2

Based upon data collected from March 10, 2011 through March 24, 2011 across 2.7 miles spanning three interchange ramps. For more information please visit i95coalition.org.

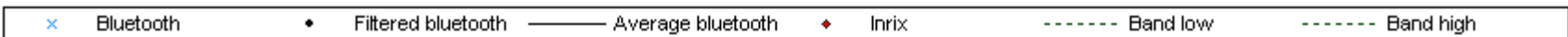
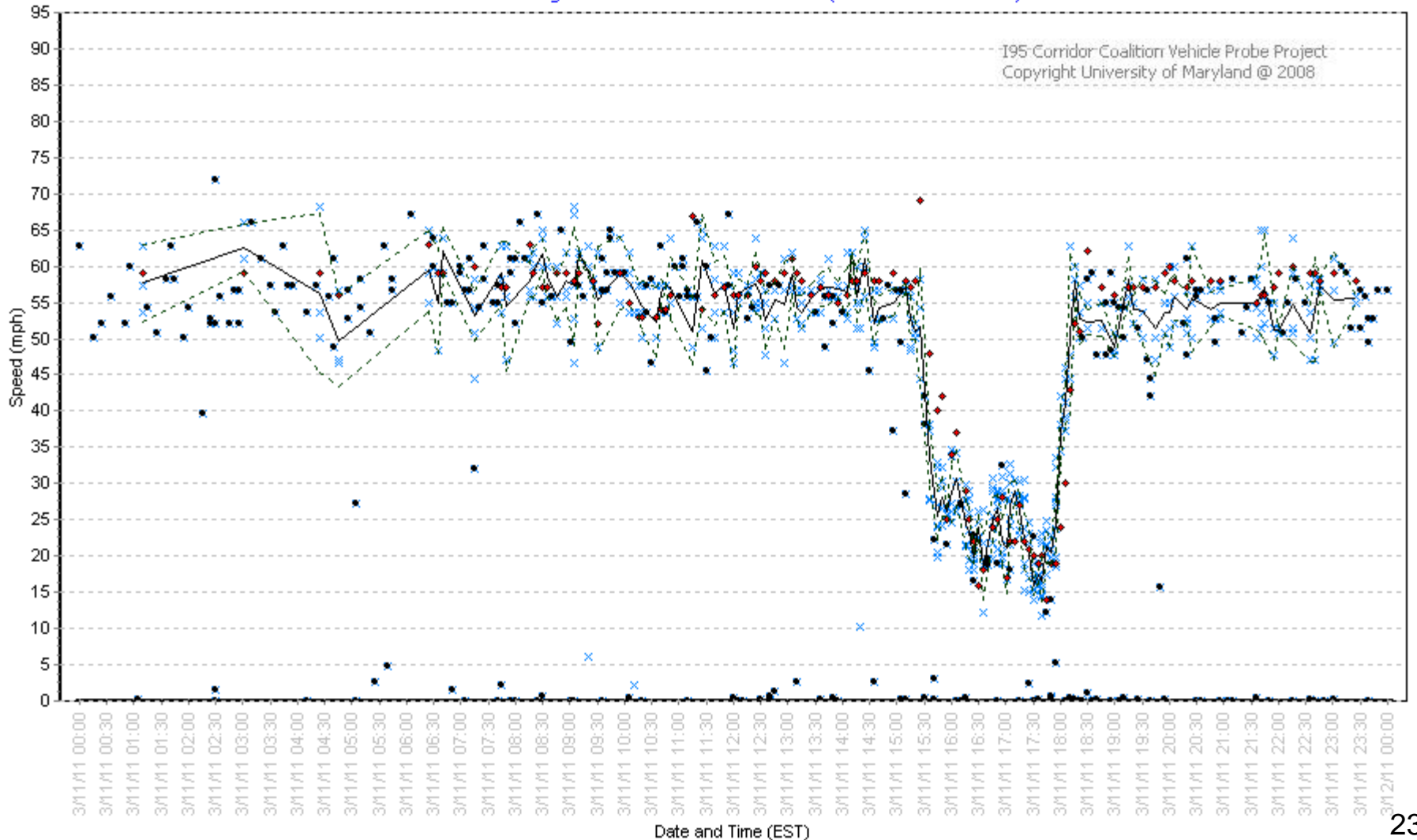
- Most data came from one ramp

Sample Ramp Data

North Carolina - Mar 11, 2011 I-77 & I-85 NB77 to EB85

TMC:NC04-0006

NORTHBOUND ending at I 85/STATESVILLE AVE/EXIT 13 (1.0551381111145 miles)



Spotlight Presentation: Learn more about your data

Score & Volume Analysis

- When is VP data live, not historical?
- At what volume is VP live, not historical?
- Can we filter to receive only live data?

Stan Young
University of Maryland

Background

- Contract Required Quality Indicators
 - SCORE
 - 30 - Real-Time Data
 - 20 - Reverts to historical (for time of day/day of wk)
 - 10 - Reverts to reference speed
- Specifications in effect > 500 VPH

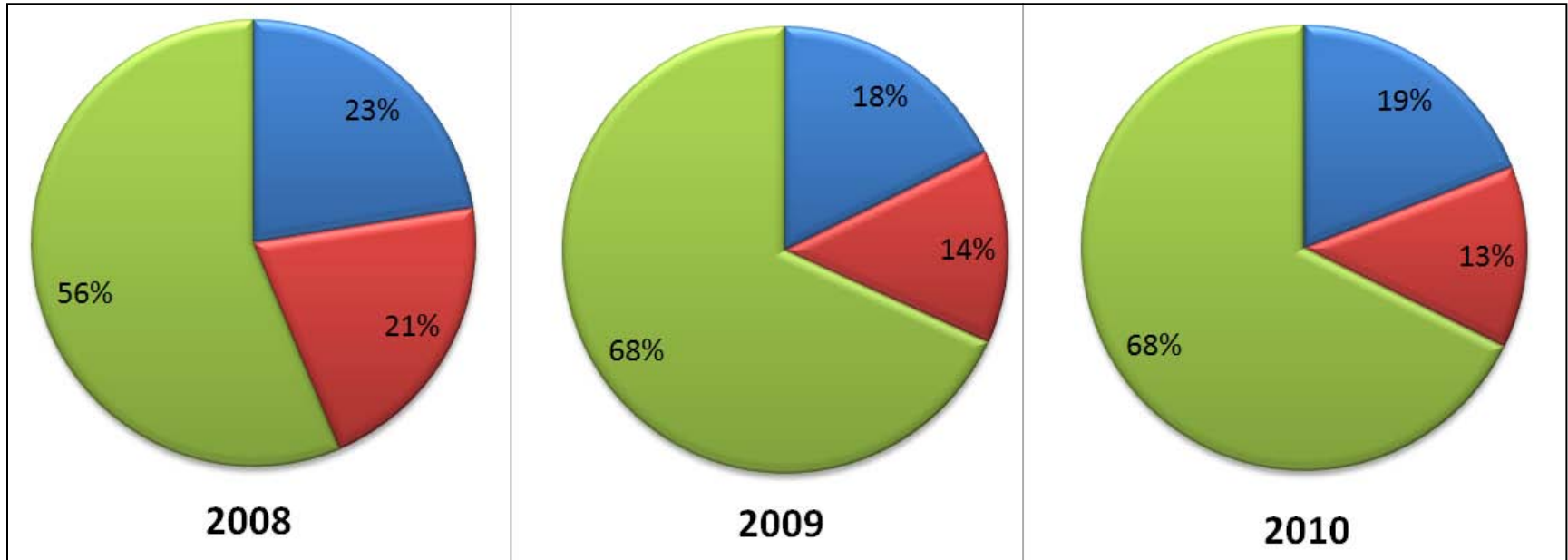
Performance of Historical & Reference Data

Meeting AASE Quality Specifications

	Speed Bin - MPH				
	0-30	30-45	45-60	>60	Combined
Live Data (Score = 30)	OK	OK	OK	OK	OK
Historical (Score = 20)	X	OK	OK	OK	OK
Reference (Score = 10)	X	X	OK	OK	OK

Based on analysis of 2010 Delaware Validation data set

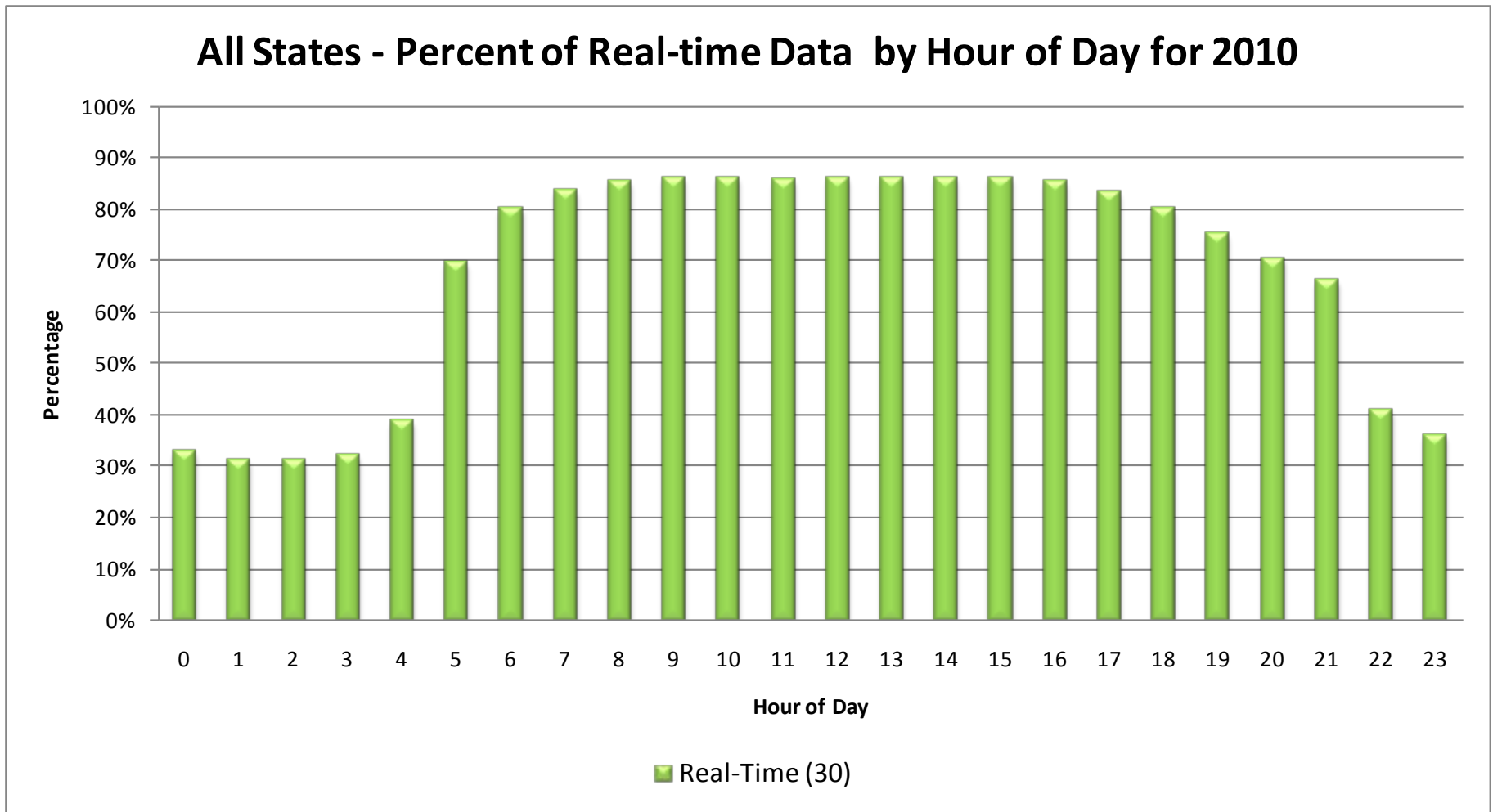
Increase in Real-Time Data from 2008 to 2010



■ Real-Time (30) ■ Historical (20) ■ Reference (10)

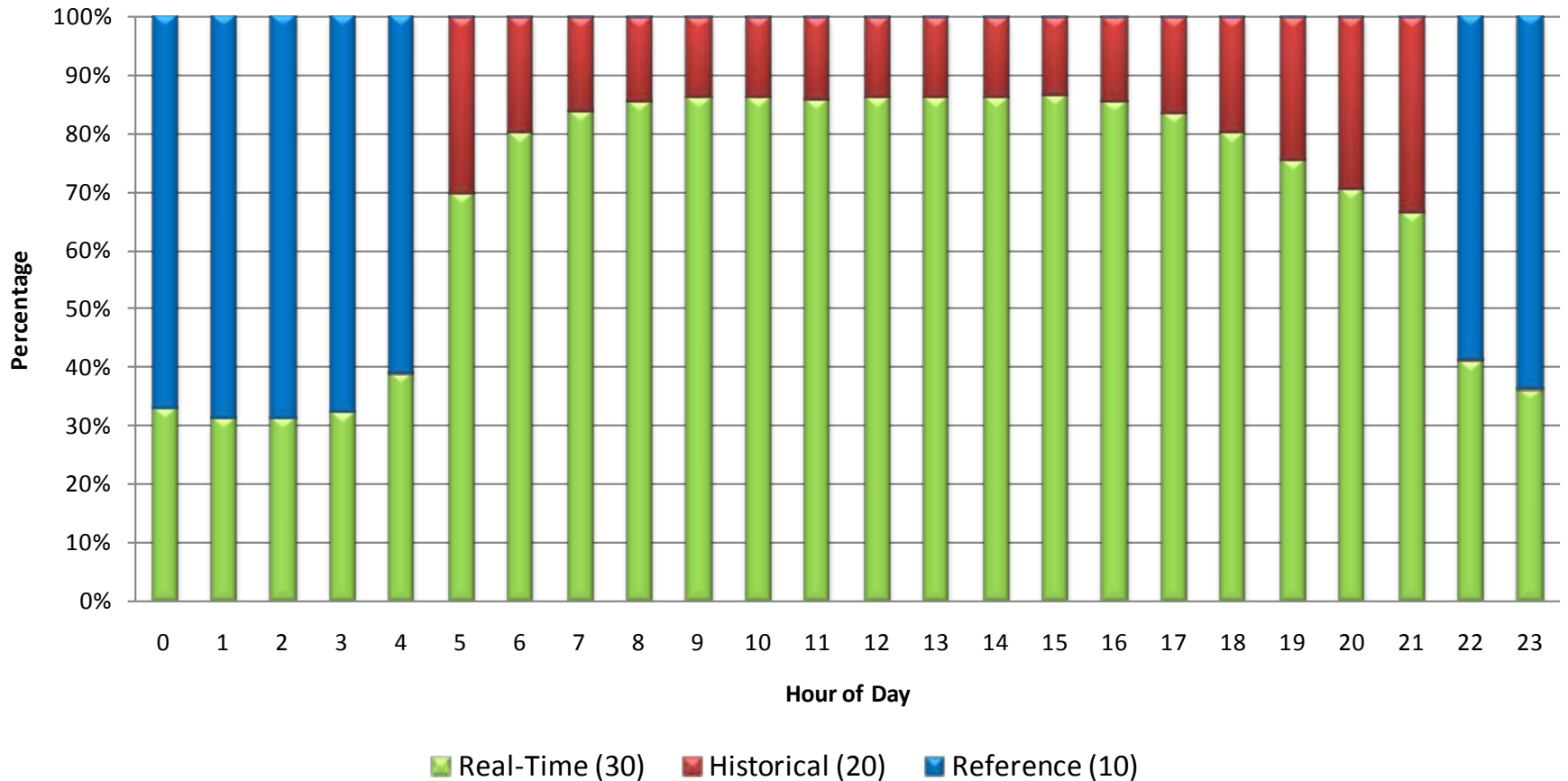
- Real-time data has increased from 55% in 2008 to 70% in 2010

Variation in Score throughout the Day



Variation in Score throughout the Day

All States - Percent Score by Hour of Day for 2010



At what volume is data live?

Analysis from State of MD - 2009

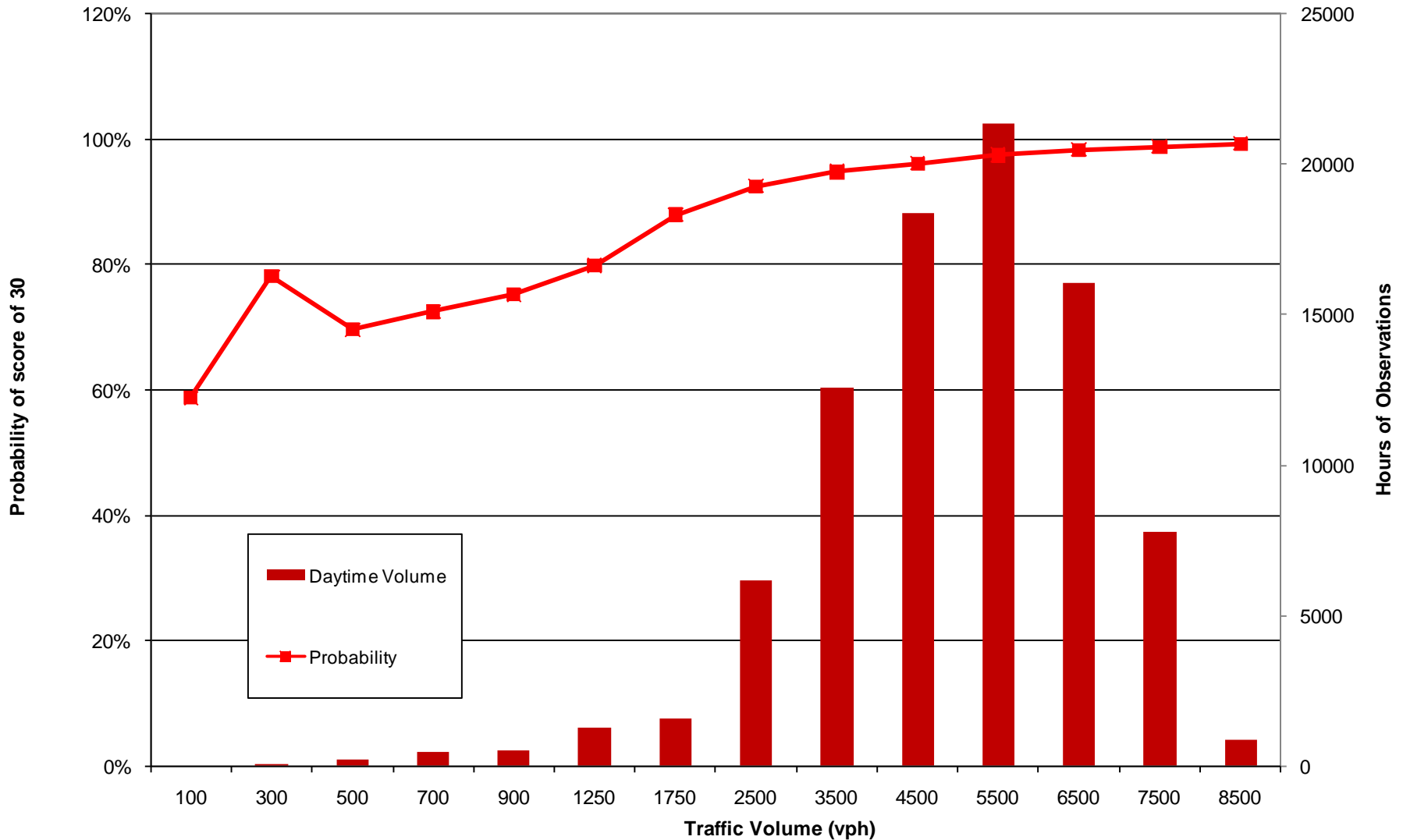
Sensitivity to Traffic Volume

- Contract spec - 500 VPH
- What is probability of Score = 30 at 500 / 1000 / 2000 VPH?
- Do different facility types have different thresholds?
- Is there a difference between daytime and nighttime? Weekday vs. Weekend?

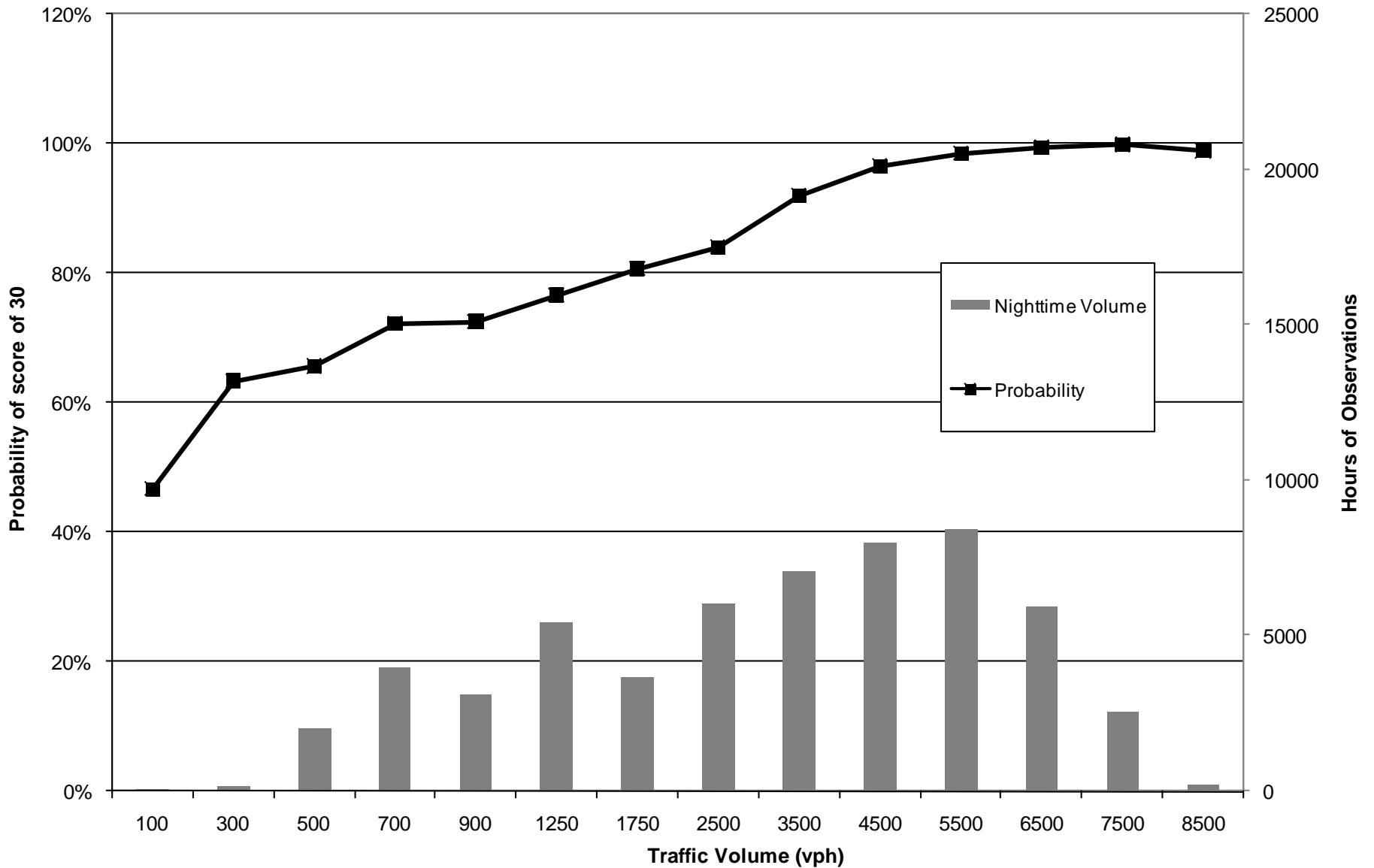
MD Freeway Analysis

- MD permanent count data
 - 18 segment on I-95 / I-495, 4 lanes
 - 10 segment on other freeways, 2-3 lanes
 - 2009 volume data from HPMS
- For each hour on each segment
 - Determined the probability of Score = 30
 - Analyzed against hourly volume

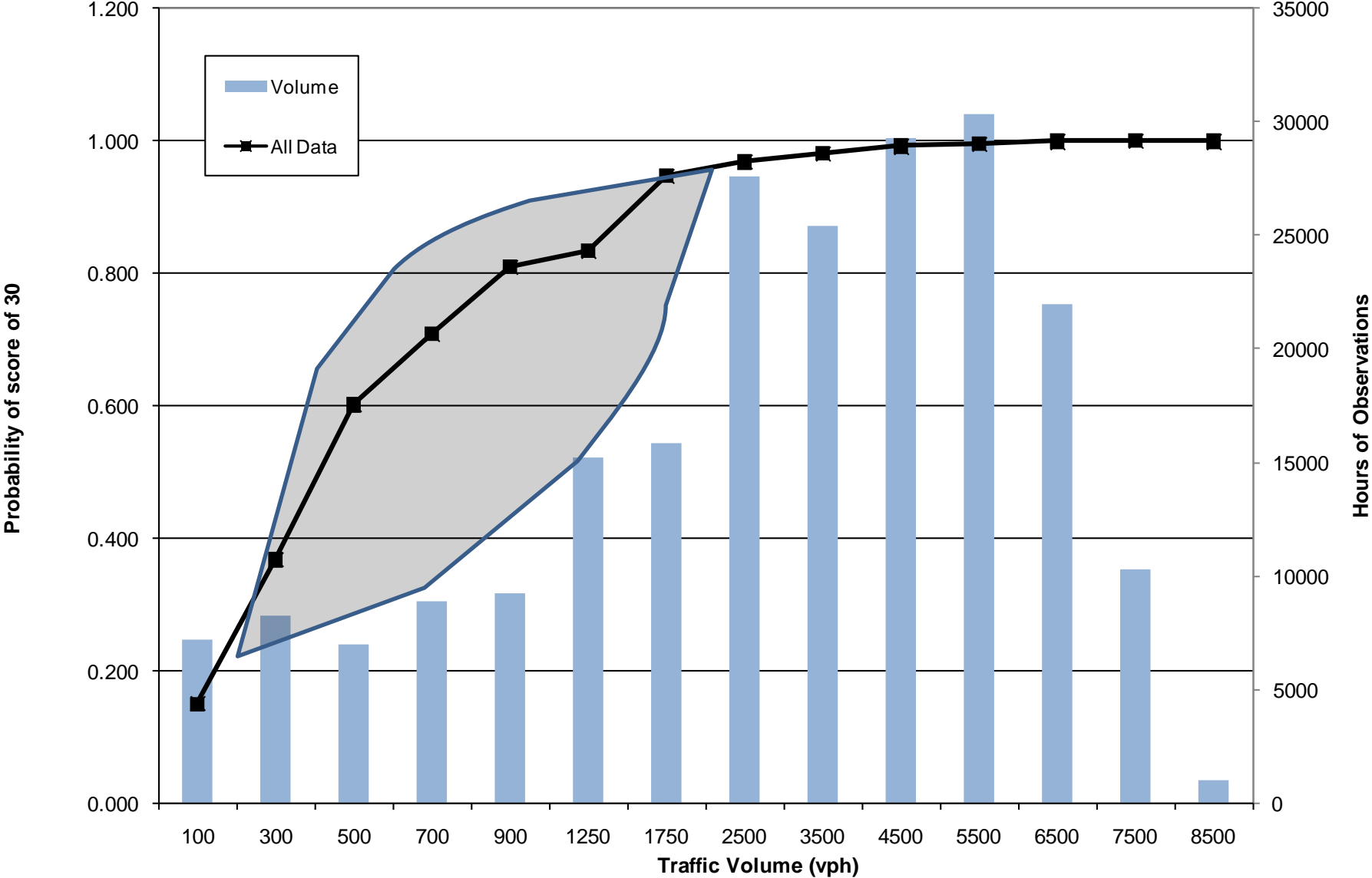
I95 / I495 Vehicle Probe Daytime Hours (5am to 10pm) MD 2009



I95 / I495 Vehicle Probe Nighttime Data (10pm to 5am) MD 2009



All Data Combined Maryland 2009



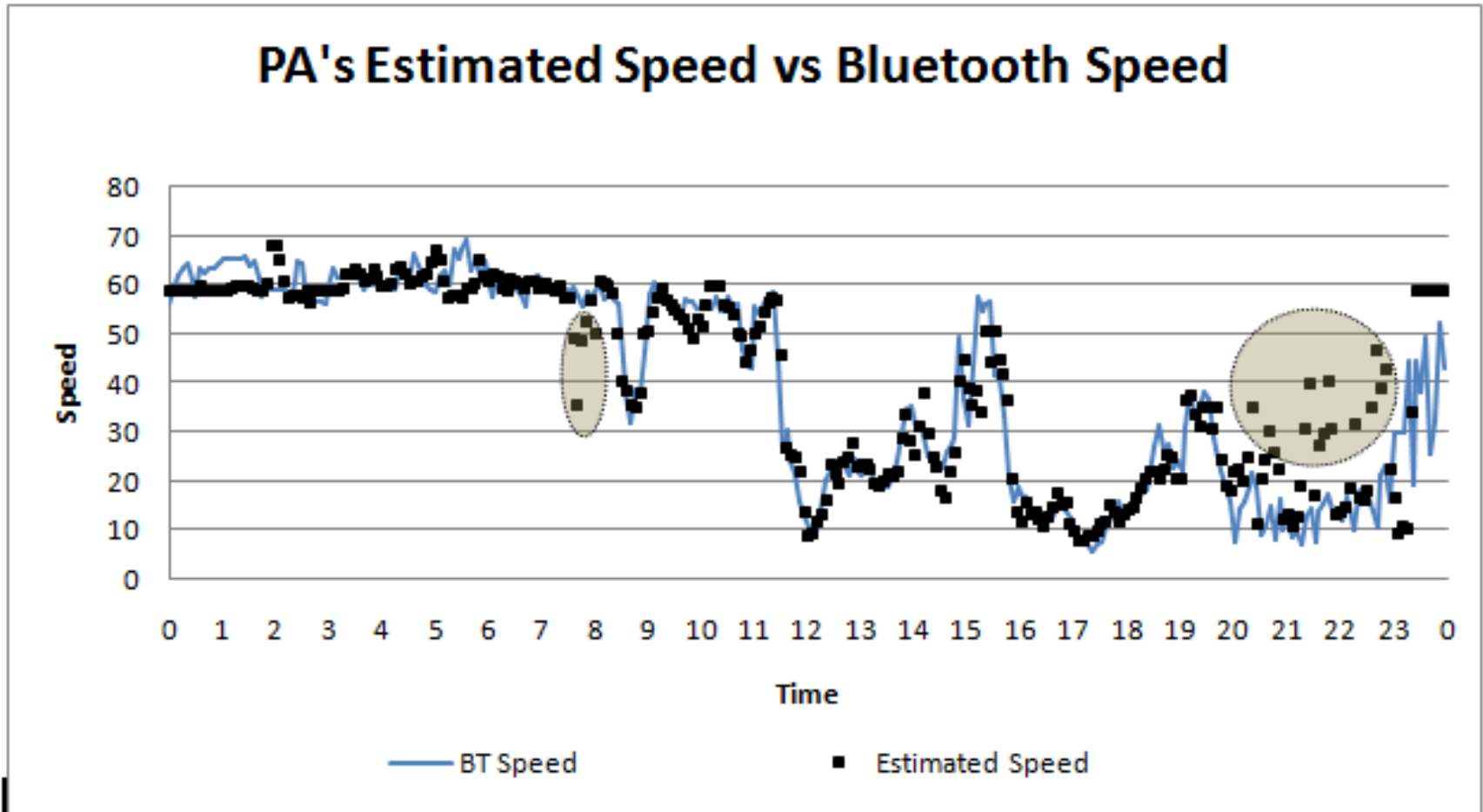
Score vs. Volume Analysis

- As volume increases, Score increases
 - At 500 vph, live data ~ 60%
 - At 900 vph, live data ~ 80%
 - At 1750 vph, live data ~ 95%
- Factors contributing to variation in the data
 - Number lanes
 - Time of day
 - Weekday vs. Weekend

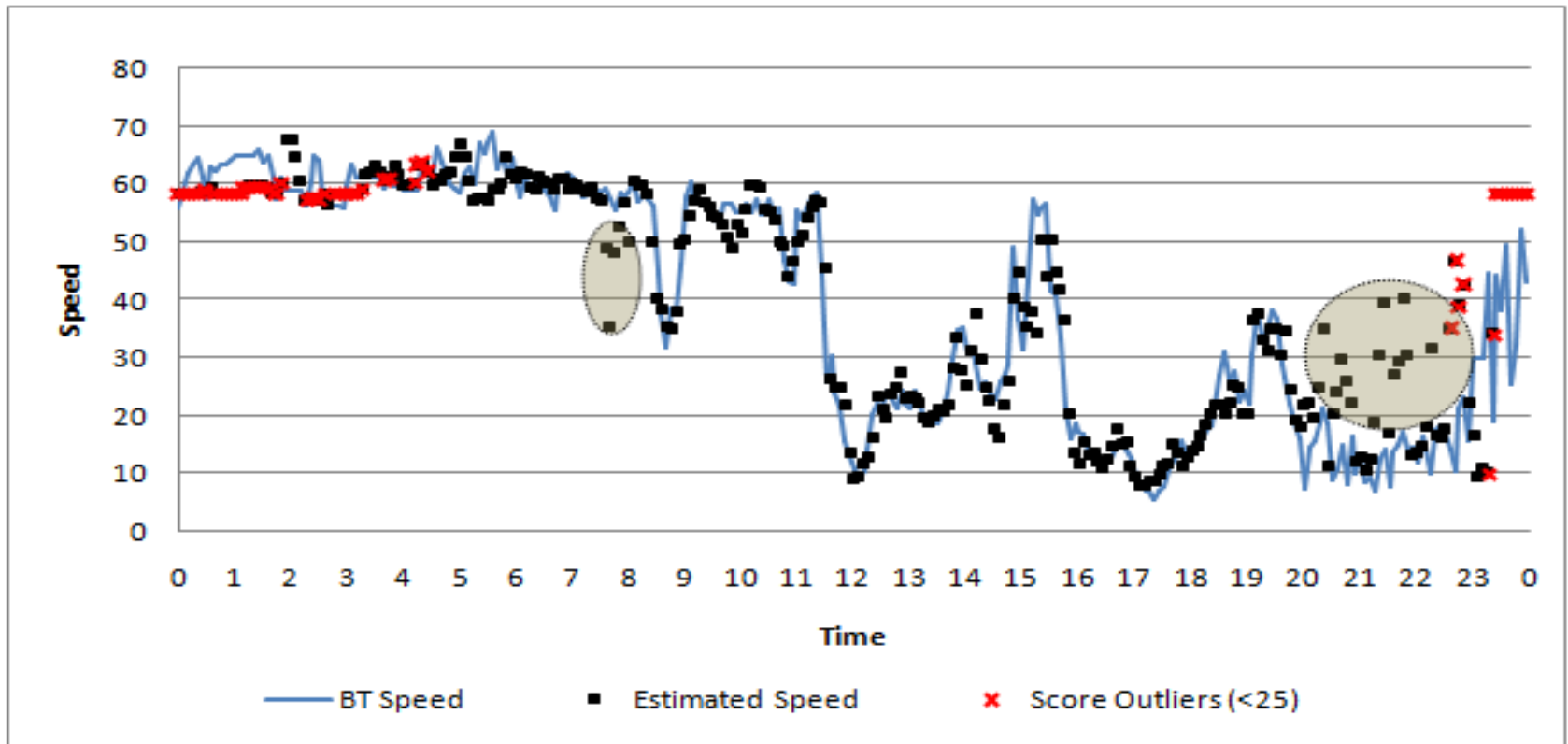
What is the impact of using
data only when Score = 30?

Analysis from
PA Validation - 2010

From PA Validation



From PA Validation Filtering based on Score <25



Results of Filtering

Applied to the Entire PA Data Set

Speed Bin	Data Set	Complete Dataset			Daytime			Night-time		
		AASE	# Observ.	%	AASE	# Observ.	%	AASE	# Observ.	%
0-30	Complete	4.70	2414	100%	4.49	2378	100%	18.49	36	100%
	>25 Only	3.80	2302	95.4%	3.79	2288	96.2%	5.55	14	38.9%
	< 25 Only	23.12	112	4.6%	22.24	90	3.8%	26.72	22	61.1%
30-45	Complete	4.19	926	100%	4.07	899	100%	7.95	27	100%
	>25 Only	4.05	857	92.5%	4.04	851	94.7%	5.70	6	22.2%
	< 25 Only	5.85	69	7.5%	4.65	48	5.3%	8.59	21	77.8%
45-60	Complete	2.33	6947	100%	2.70	5380	100%	1.07	1567	100%
	>25 Only	2.52	5087	73.2%	2.56	4742	88.1%	1.88	345	22.0%
	< 25 Only	1.83	1860	26.8%	3.73	638	11.9%	0.84	1222	78.0%
>60	Complete	2.35	1284	100%	2.62	676	100%	2.06	608	100%
	>25 Only	2.40	719	56.0%	2.55	584	86.4%	1.74	135	22.2%
	< 25 Only	2.29	565	44.0%	3.03	92	13.6%	2.15	473	77.8%
TOTAL	Complete		11571	100%		9333	100%		2238	100%
	>25 Only		8965	77.5%		8465	90.7%		500	22.3%
	< 25 Only		2606	22.5%		868	9.3%		1738	77.7%

Results of Filtering

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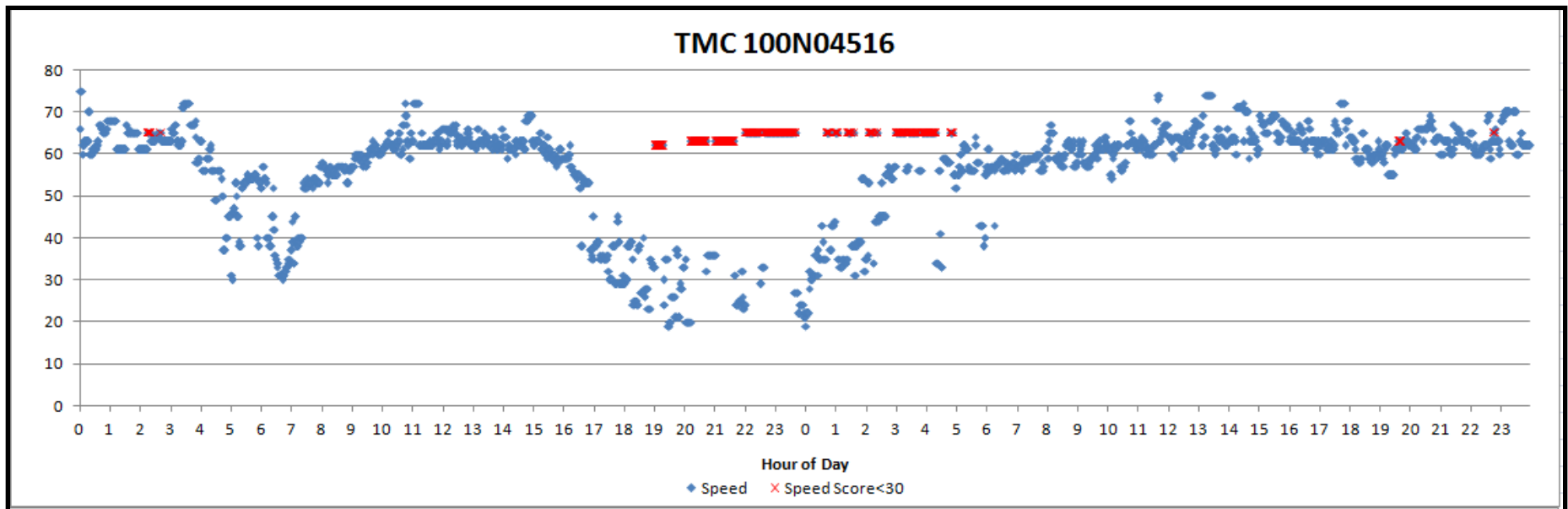
Summary of Filtering by Score

- All Data (Day and Night)
 - 22.5% of data is eliminated
 - AASE in lowest speed bin
 - 4.7 before / 3.7 after / 4.6% of data eliminated
- Just Nighttime Data
 - 77% of data is eliminated
 - AASE in lowest speed bin
 - 18.5 before / 5.5 after / 61% of data eliminated
- Conclusions – **FILTER BY SCORE!**

Example from Jan 26-27, 2011

Maryland Snow Storm

Portion of I-695 Beltway on SW side of Baltimore



Conclusions

- Quality of data continues to increase
- Score = 30 indicates live data
- Live data depends on volume
 - At 500 VPH, live data is 60%
- Use Score >25 for real-time applications

Update on Funding

George Schoener

Contract Issues & Year 19 Update

Kathy Frankle

- DUA Status
- Year 19 VPP Commitment Status
 - Contract through UMD
 - Pooled Fund Study Status

DUA Status

Core States	
Delaware DOT	9-May-2008
Maryland SHA	12-Jun-2008
North Carolina DOT	15-Aug-2008
New Jersey DOT	19-Jun-2008
Pennsylvania DOT	----
Virginia DOT	26-Jun-2008

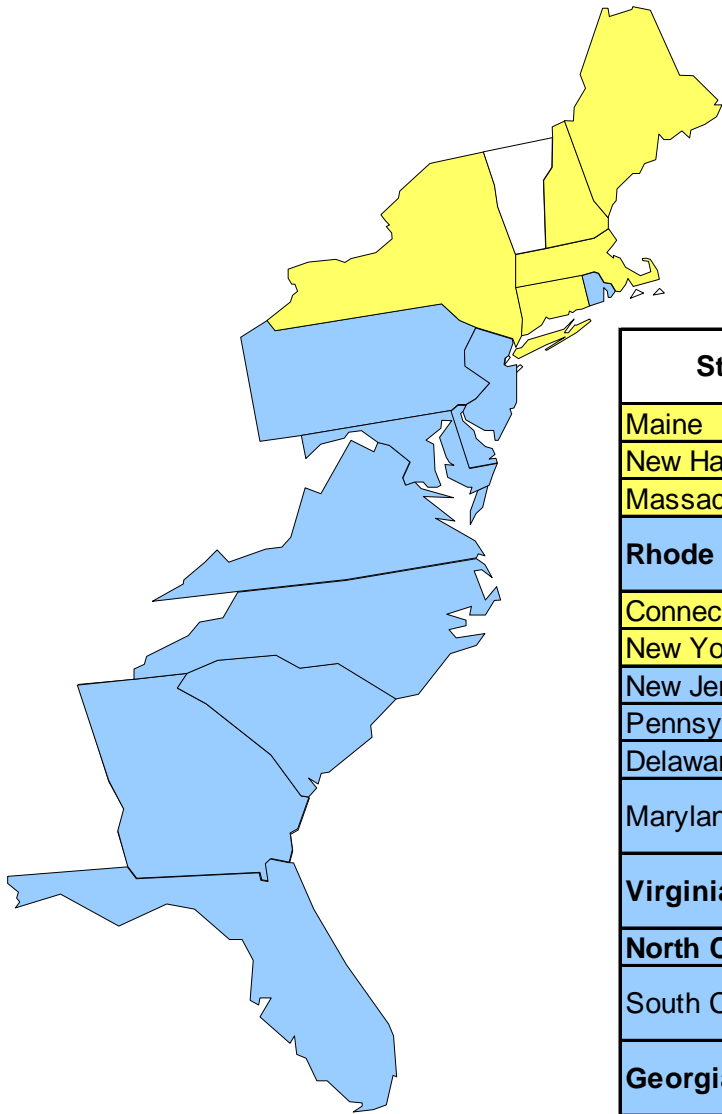
Other Coalition Members	
Baltimore MPO	17-May-2010
Delaware Valley Reg. Planning Comm.	22-Jul-2010
District of Col	22-Oct-2009
FHWA	3-Sep-2008
Florida DOT	7-Jun-2010
Georgia DOT	Inquired
Ft. Meade Reg. Growth Mgmt Committee	4-Feb-2011
MdTA	12-Dec-2008

Other Coalition Members (continued)	
MTA Bridges	23-Jul-2008
MWCOG	08-Jun-2009
New Hampshire DOT	03-Feb-2010
New Jersey Transit	In process
North Jersey TPA	17-Mar-2011
NJ Turnpike	12-Jan-2009
NY State DOT	25-May-2008
Philadelphia Police	15-Jul-2010
Port Authority NJ/NY	22-Oct-2009
PRTC	26-Nov-2008
Rhode Island DOT	11-Feb-2011
Richmond, VA MPO	21-Sep-2010
Rutgers Univ. (for NJDOT)	30-Nov-2010
South Carolina DOT	22-Jan-2009
South Jersey Transp. Auth.	08-Feb-2011
Wilmington Area Planning Council	13-May-2011

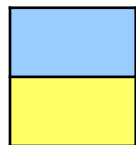
DUA Status (continued)

Consultants		
Company	On Behalf of	Date
AECOM	NJDOT, NJ Transit	20-Jul-2010
CSI	I-95 Coalition	12-Nov-2008
IBI Group	Virginia DOT	26-Jan-2011
IBM	NJ Turnpike	11-Mar-2011
Mixon-Hill	I-95 Coalition	12-Nov-2008
North Carolina State Univ/ ITRE	North Carolina DOT	02-Sep-2009
Parsons Brinckerhoff	New Jersey DOT	07-Apr-2011
Protronix	North Carolina DOT	28-Jan-2010
Telvent	I-95 Coalition	13-Feb-2009
Telvent USA	Maryland SHA	25-Jan-2011
Transurban	VDOT	13-Jul-2009

Year 19 VPP Participation Status



State	Core Miles	Expansion Miles	Funding	Status
Maine	53	N/A	N/A	
New Hampshire	16	N/A	N/A	
Massachusetts	88	N/A	N/A	
Rhode Island	78	0	Pooled Fund	Committed to Pooled Fund Study!!!!
Connecticut	111	N/A	N/A	
New York	24	N/A	N/A	Transcom is reviewing vendors
New Jersey	471.7	423.6	UMD Contract	UMD sent revised contract mod 6/9
Pennsylvania	148.7	488	State Contract	State contract not yet complete
Delaware	46	0	Pooled Fund	Needs to commit to project on-line
Maryland/DC	301.1	420.1	UMD Contract	UMD sent contract modification 6-10-2011
Virginia	309.5	198	Pooled Fund	Committed to Pooled Fund Study!!!!
North Carolina	261.8	1,291.2	UMD Contract	Contract modification completed
South Carolina	220	980	UMD Contract	UMD will need to process a contract mod before 8/1
Georgia	139.1	0	Pooled Fund	Committed to Pooled Fund Study!!!!
Florida	728	533	UMD Contract	Contract signed 6-16-2011



Participating in Year 19

Coalition will be funding coverage along I-95

NOTE: **Bold Text** denotes that all paperwork is complete

June 23, 2011

Pooled Fund Study Status

- Vehicle Probe Project Pooled Fund has been posted
- Solicitation #1304
- <http://www.pooledfund.org/projectdetails.asp?id=1304&status=1>
- States using the pooled fund need to use SPR funds
- **Delaware still needs to commit to the project on-line**
- The match waiver was approved

Vehicle Probe Project Suite Update

***Stan Young for Michael L. Pack
University of Maryland***

VPP Suite Usage

- As of June 22, 2011:
 - 735 Million Records Downloaded
- 300 Unique/Individual Users from 37 Organizations
 - 5 MPOs
 - 3 Universities
 - 13 DOTs
 - FHWA & US DOT
 - 9 Private Sector Consultants (on behalf of an organization)
 - 2 Transit Agencies

VPP Suite Update

- **June 21, 2011** – Fixes for a few bugs were rolled and the following new functionality was added:
 - New user interface that is "less cluttered"
 - Fixes to the "Congestion Scan" graphing application to help reduce issues with TMC linkings/ordering on beltways or roads that do not move in the traditional North/South, East/West direction only
 - Ability to download aggregated data at 5, 10, 15, 30, and 1-hour intervals (this was high on the user request)
 - Ability to download C-value & confidence score
 - Better logging of user interaction (for our own bug-checking purposes)
- **June 23, 2011 (anticipated)** – Release of updated video tutorial explaining the new features.

VPP Suite – Important Notice

- **June 21, 2011** – UMD CATT Lab experienced a server failure rendering some of the VPP tools temporarily unavailable
 - The failure impacted the VPP suite, but **did not impact the actual collection of the VPP data, the processing of the data, the storage of the data, or the real-time viewing within RITIS.**

VPP Suite Access

- **Training Videos & Overview:**

<http://vpp.ritis.org/suite/screencast/>

- **To Gain Access:**

Step 1: Make sure your agency has signed the VPP DUA by visiting:
<http://vpp.ritis.org/suite/dua/>

Step 2: Once your agency has signed, send individual user requests to:
accounts@ritis.org with the following:

- ✓ First & Last Name
- ✓ Agency Affiliation
- ✓ Address
- ✓ Phone Number
- ✓ Email

Step 3: Receive an email with your login credentials & instructions

Agency Updates and/or Questions for the Project Team

All

Participation in Meetings/Conferences

Karen Jehanian

Meetings of Interest

UPCOMING:

- 2011 ITE Annual Meeting & Exhibit
 - August 13-16, 2011, St. Louis, MO

- 2011 ITS World Congress, Orlando, FL
 - October 16 – 20, 2011

ITS World Congress Participation

	Title	Conference/ Meeting	Paper	Presentation	Primary Author/contact	Additional Authors	Notes
1	An Interactive, Web-based, Mobility Performance Measures Application Utilizing Probe Data	ITS World Congress	x	x	Michael Pack		Accepted – Oct 18, 2011 Session Time: 8:30 AM-10:00 AM
2	Probability of Real-Time Data as a Function of Hourly Volume, Assessment of the I-95 Vehicle Probe Project Data	ITS World Congress	x	x	Stan Young	Hadi Sadrsadat, UMD	Accepted - Presentation in Vehicle Probe for Travel Time Analysis Session - Oct 18, 2011, 4:00 PM-5:30 PM
3	Analysis of Level of Confidence Score within the I-95 Vehicle Probe Project	ITS World Congress	x	x	Stan Young	Nayel R. J. Urena Serulle, UMD	Accepted - Presentation in Vehicle Probe for Travel Time Analysis Session - Oct 18, 2011, 4:00 PM-5:30 PM
4	Validation of the Historical Vehicle Probe Project Speed by Using Bluetooth Speed as the Ground Truth	ITS World Congress	x	x	Stan Young	Elham Sharifi, UMD	Accepted - Presentation in Data Collection Using Bluetooth Session - Oct 19, 2011, 1:30 PM-3:00 PM
5	Challenges to Effective Arterial Traffic Monitoring: Lessons from the I-95 Corridor Coalition's Vehicle Probe Project	ITS World Congress	x	x	Stan Young	George Schoener, I-95 Corridor Coalition, Karen Jehanian, KMJ Consulting, Inc., Nayel R. J. Urena Serulle, UMD	Accepted - Presentation in Traffic Management Case Studies Using Vehicle Probe Data Session - Oct 20, 2011, 1:30 PM-3:00 PM
6	Data Use for Operations Performance and Planning	ITS World Congress		x	Karen Jehanian	George Schoener, I-95 Corridor Coalition, Executive Director - Project overview and Regional benefit from probe data for operations and planning Michael Pack, UMD CATT Lab –Using data for Operations (RITIS) Andrew Meese, MWCOG – Metropolitan Area Transportation Operations Coordination (MATOC) – A Practical application	Session to be conducted - Wednesday, Oct. 19, 2011, 1:30 – 3:00 p.m. This is an ICS session sponsored by FHWA. Other speakers include: Alex Estrella, San Diego Association of Governments and Koorosh Olyai, Dallas Area Rapid Transit. Brain Cronin for RITA will be the moderator.

Review of Action Items from this Webcast

Selection of Date for Next Project Team Meeting

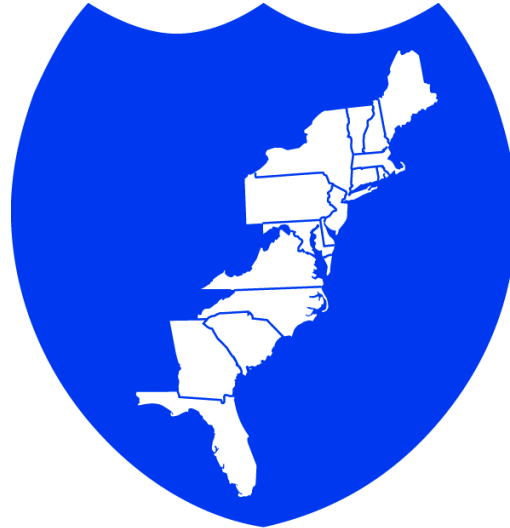
***Thursday, September 15, 2011
10:30 AM
(proposed)***

All

Questions?

- Stan Young at 301-403-4593 or seyoung@umd.edu
- Rick Schuman at 407-298-4346 or rick@inrix.com
- Karen Jehanian at 610-228-0211 or kjehanian@kmjinc.com
- For contract expansion issues Kathy Frankle at 410-414-2925 or kfrankle@umd.edu

Thank You



**I-95 CORRIDOR
COALITION**