

# Vehicle Probe Project Web Conference



## *Status Update*

October 27, 2010



# 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 press \*0 to speak to an operator for questions regarding audio
- Please call 610-662-5569 for difficulties with the web application

# Agenda

	Topic	Speaker
1	Introductions and Welcome	Bill Stoeckert, I-95 Corridor Coalition
2	Communications Update	Karen Jehanian/Bill Stoeckert
3	INRIX Update	Rick Schuman, INRIX
4	Data Validation Update <ul style="list-style-type: none"> <li>•Status and Schedule, Pennsylvania Results (Aug 2010), Freeway Summary</li> <li>•Arterial Evaluation</li> <li>•Discussion Item: Use of Score and C-Value in Filtering</li> <li>•Arterial Data Quality Update</li> </ul>	Stan Young, University of Maryland
5	Vehicle Probe Project Year 19 Update	Bill Stoeckert
6	Request for Information: Using VPP data in Work Zones	Jawad Paracha, FHWA
7	Agency Questions and Updates	All
8	Contract Update	Kathy Frankle, University of Maryland
9	Participation in Meetings/Conferences	Karen Jehanian
10	Review of Action Items from this call	Karen Jehanian
11	Selection of Date for Next Webcast	All

# Introductions and Welcome

***Bill Stoeckert***  
***I-95 Corridor Coalition***

# Communications Update

*Karen Jehanian*

- Coalition Website Postings/  
Correspondence
- Meetings with Agencies
- Two-Year Validation Summary  
*(available on the home page of the Coalition website)*

# Project Team Correspondence

<b>Coalition Website Postings</b>		
<b>DOCUMENT</b>	<b>DATE POSTED</b>	<b>LOCATION ON WEBSITE</b>
October 7, 2010 TISPTC Meeting – Agenda and Presentation	October 14, 2010	On the TISPTC page
Validation of INRIX Data – Two Year Summary Report – (dated September 2010)	October 20, 2010	On the Main Coalition page and Highlights page under “Data Validation”
September 22, 2010 VP Team Webcast – Presentation and Meeting Minutes	October 21, 2010	On the Highlights page under “Project Presentations”
Coverage Maps from the Original RFP	October 25, 2010	On the Highlights page under “Technical Information”

# Project Team Correspondence

<b>Correspondence Sent to the VPP Team</b>		
<b>DOCUMENT</b>	<b>DATE SENT</b>	<b>METHOD</b>
TISPTC Year 19 Work Plan and Project Ranking Form	October 12, 2010	Via email
Validation of INRIX Data – Two Year Summary Report – (dated September 2010)	October 20, 2010	Via email
September 22, 2010 VP Team Webcast – Presentation and Meeting Minutes	October 20, 2010	Via email

# VP System Integration Meetings

State	2009 Meetings/Webcasts	2010 Meetings/Webcasts
Delaware	Nov. 9, 2009	
Georgia		Held on April 19, 2010
Maryland	Sept. 29, 2009	
New Jersey	May 11, 2009	
North Carolina	July 2, 2009	
Pennsylvania		Held on April 1, 2010
South Carolina	Nov. 18, 2009	
Virginia		Held on August 30, 2010

# INRIX Update

*Rick Schuman*

- Project Statistics
- Other Topics
  - i95.inrix.com users by agency

# Project Statistics

- Availability
  - 100% in September
    - 99.9%+ since launch (vs. 99% contract requirement)
- Users (as of 10/17/10)
  - Monitoring Site – 403
  - Data Feed – 43
  - Archive requests – 472 since launch

# I-95 Monitoring Site Accounts (by Agency)

Organization	# of Site Users/Accounts	Organization	# of Site Users/Accounts
<b>DUA Agencies</b>		<b>Others</b>	
DeIDOT	3	Coalition (staff, UMD, KMJ, etc.)	13
MdSHA	9	Telvent	8
NJDOT	43	CamSys	3
VDOT	10	Mixon/Hill	1
NCDOT	67	Protonix	0
PRTC	2	PBS&J	12
NYSDOT	1	INRIX	36
MTA	12	Enterinfo	1
FHWA/USDOT	8	Transurban (VA Beltway)	3
MdTA	11	VA UVA (Eval)	4
NJ TPKE	20	VA Redmon (Tyson's Display)	1
SCDOT	73	VA Open Roads (Integrator)	3
MWCOG	1	NJ TRANSCOM	2
DCDOT	4	NJ ICXT (Integrator)	2
PA NY/NJ-PATH	2	NJ AECOM (Planning study)	2
NHDOT	1	NC STATE (Course + Research)	14
Baltimore MC	2	Coogan (BWI Project)	1
FDOT	25	<b>Subtotal (Others)</b>	<b>106</b>
Philly PD	0	<b>Total (as of 10-18-10)</b>	<b>403</b>
DVRPC	2		
Richmond RPDC	1		
<b>Subtotal (Agencies)</b>	<b>297</b>		

# Data Validation Update

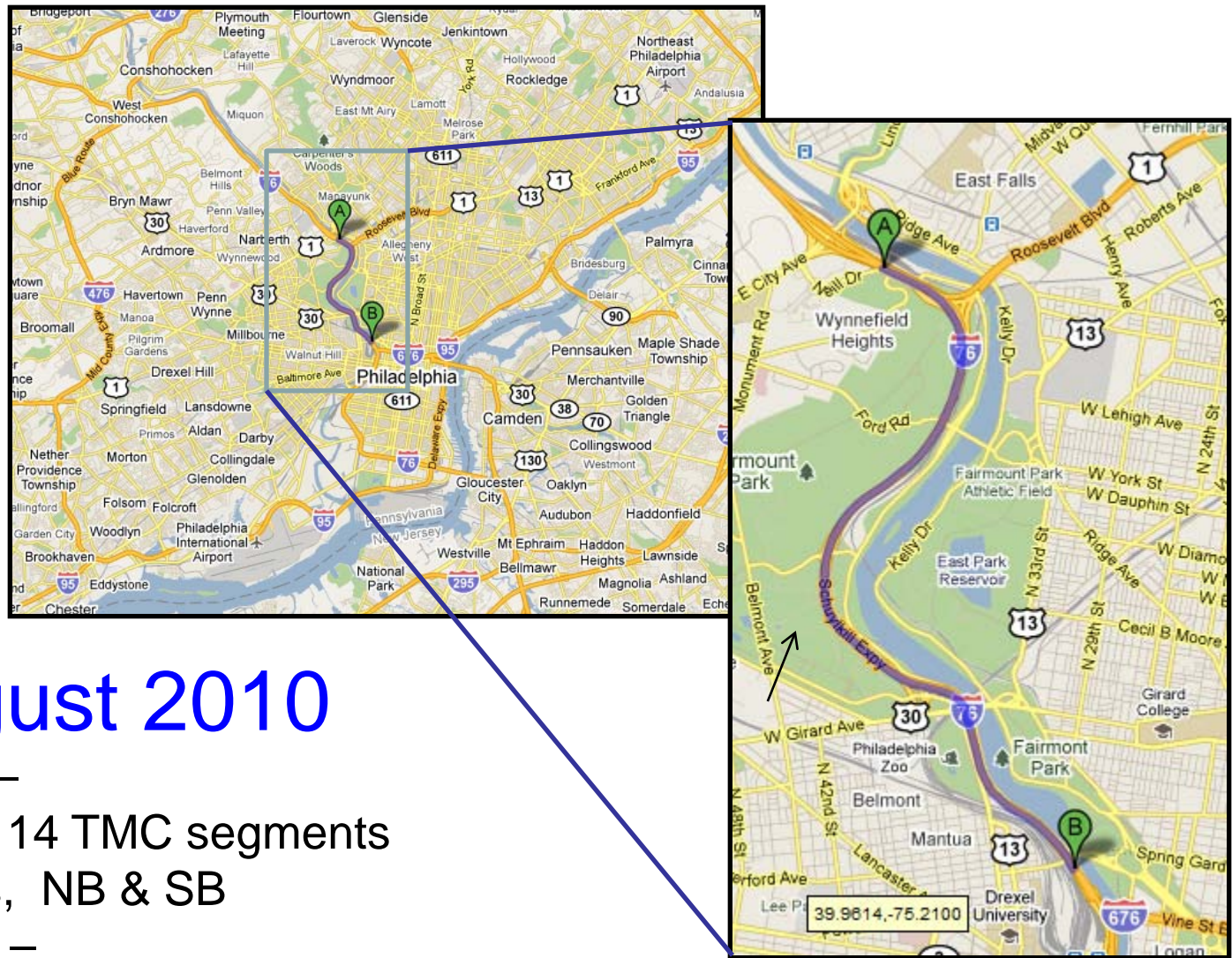
***Stan Young***  
***University of Maryland***

- Status and Schedule
- Pennsylvania Results – August 2010
- Freeway Summary
- Arterial Evaluation
- Discussion Item: Use of Score and C-Value in Filtering
- Arterial Data Quality Update

# Data Validation Status

Month and Year	State / Location	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]			
Apr-10	Delaware	<i>Apr 26 - May 4, 2010</i>	<i>15-Jun-10</i>	<i>26-Jun-10</i>	<i>29-Jun-10</i>	<i>13-Jul-10</i>	<i>31-Jul-10</i>
May-10	New Jersey	<i>May 25 - Jun 2, 2010</i>	<i>16-Jul-10</i>	<i>20-Jul-10</i>	<i>20-Jul-10</i>	<i>27-Jul-10</i>	<i>3-Aug-10</i>
Jun-10	New Jersey	<i>Jun 16 - Jun 30, 2010</i>	<i>8-Aug-10</i>	<i>17-Aug-10</i>	<i>17-Aug-10</i>	<i>22-Aug-10</i>	<i>25-Aug-10</i>
Aug-10	Pennsylvania	<i>Aug 19 - Aug 30, 2010</i>	<i>6-Oct-10</i>	<i>20-Oct-10</i>	<i>20-Oct-10</i>	30-Oct-10	10-Nov-10
Sep-10	Virginia	<i>Sep 8 - Sep 16, 2010</i>	<i>14-Oct-10</i>	28-Oct-10	28-Oct-10	15-Nov-10	29-Nov-10
Oct-10	Maryland	<i>Oct 8 - Oct 18, 2010</i>	1-Nov-10	15-Nov-10	15-Nov-10	1-Dec-10	15-Dec-10
Nov-10	Delaware	11/1/2010	1-Dec-10	15-Dec-10	15-Dec-10	31-Dec-10	14-Jan-11
Dec-10	-	-	-	-	-	-	-
Jan-11	North Carolina	1/1/2011	1-Feb-11	15-Feb-11	15-Feb-11	3-Mar-11	17-Mar-11

- PA reports being finalized, arterial issues
- VA deployment in Sep, report in Draft
- MD deployment completed in Oct
- DE targeted for Nov 2010
- NC in Jan 2011



# PA- August 2010

- Freeways –
- 5 paths, 14 TMC segments
- 8.2 Miles, NB & SB
- No Ramps –
- Arterials Separate

# Pennsylvania Validation

August 2010

- Freeway Summary
  - 5 Freeway segments on I-76
  - August 19, 2010 through August 30, 2010
  - 8.2 miles of Freeway validation
  - **201.2 hours** < 30 MPH
  - 77.2 hours 30-45 MPH
  - AASE in lower two bands
  - **4.7 / 4.2** (10 MPH is spec)

# Pennsylvania Validation Chart

## August 2010

PA Evaluation Summary						
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	<b>4.70</b>	5.70	<b>2.70</b>	3.00	2414	201.2
30-45 MPH	<b>4.20</b>	5.80	<b>1.40</b>	1.90	926	77.2
45-60 MPH	<b>2.30</b>	3.90	<b>-1.00</b>	-1.20	6947	578.9
> 60 MPH	<b>2.40</b>	5.30	<b>-2.20</b>	-4.90	1284	107.0
All Speeds	2.96	4.58	-0.17	-0.49	11571	964.3

Based upon data collected from August 19, 2010 through August 30, 2010 across 8.2 miles of roadway.

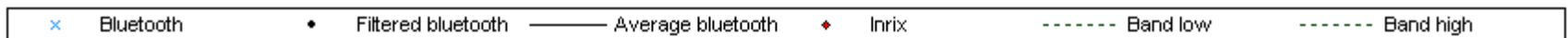
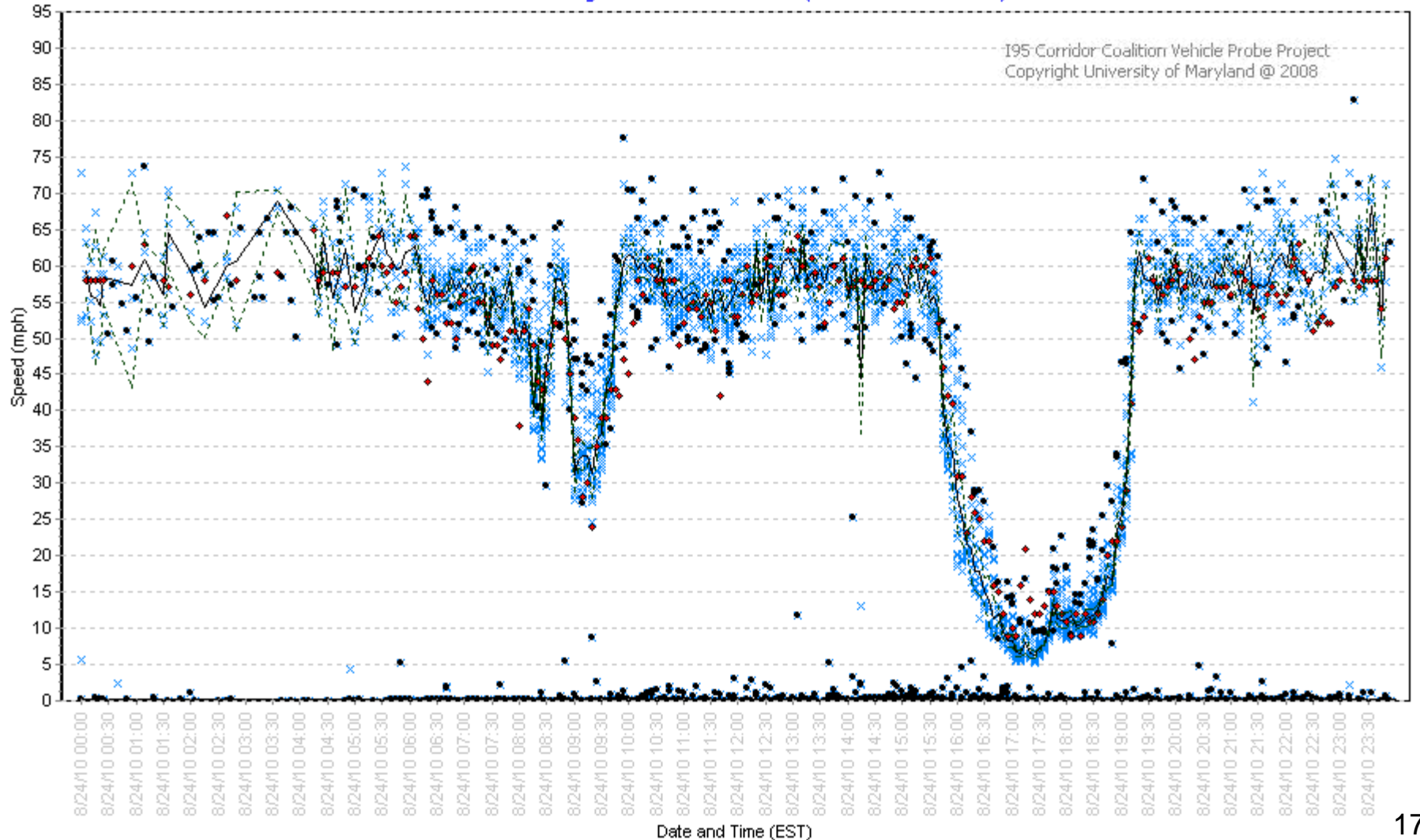
- Well within specifications
- More highly congested data (<30 MPH) than freeflow data (>60 MPH)

# Sample Data

## PA - Aug 24, 2010 at US1/Exit 340 to Exit 339

TMC: dPA02-0001

I-76 EASTBOUND ending at US-1/EXIT 340/EXIT 339 (1.71481549739838 miles)

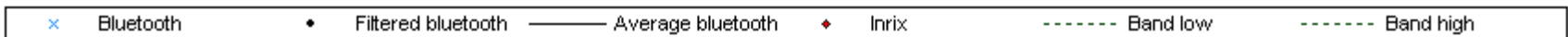
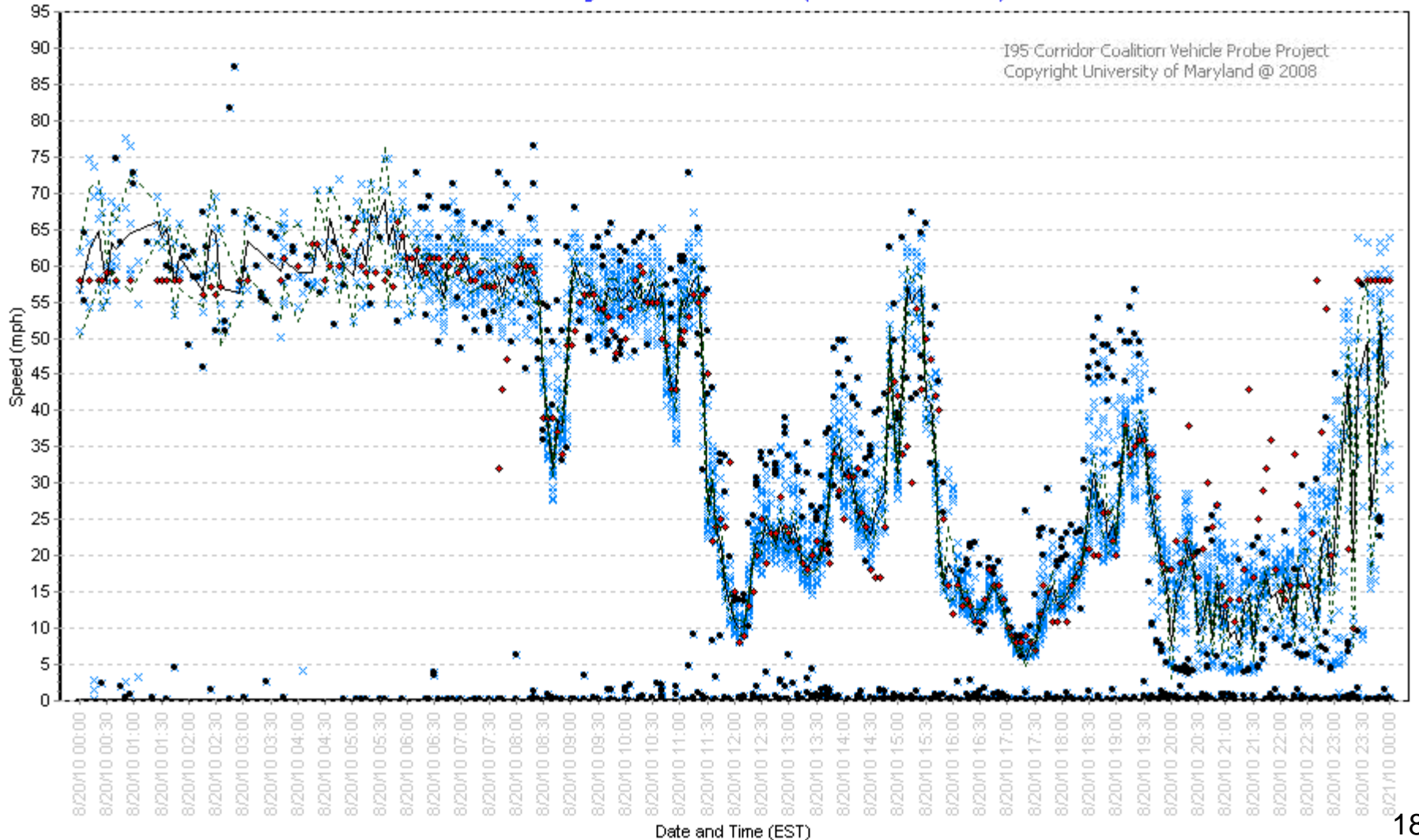


# Sample Data

PA - Aug 20, 2010 (Friday) at US1/Exit 340 to Exit 339

TMC: dPA02-0001

I-76 EASTBOUND ending at US-1/EXIT 340/EXIT 339 (1.71481549739838 miles)

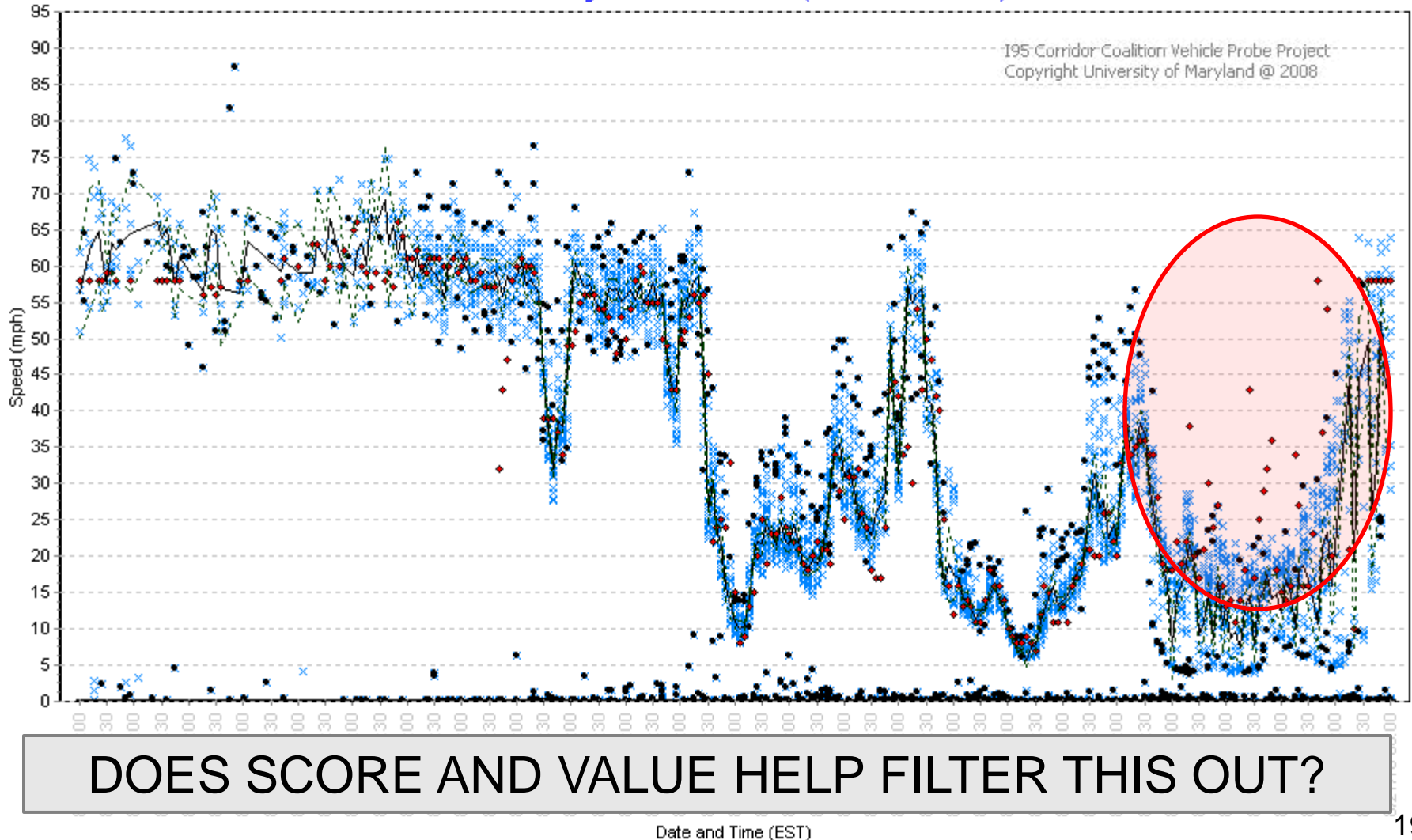


# Sample Data

PA - Aug 20, 2010 (Friday) at US1/Exit 340 to Exit 339

TMC: dPA02-0001

I-76 EASTBOUND ending at US-1/EXIT 340/EXIT 339 (1.71481549739838 miles)



× Bluetooth    • Filtered bluetooth    — Average bluetooth    ◆ Inrix    - - - - - Band low    . . . . . Band high

# Low Confidence Data (Score <30)

Speed Bin	ALL DATA		DATA with SCORE < 30		
	AASE - SEM Band	Number of 5 Minute Samples	AASE - SEM Band	Number of 5 Minute Samples	% of Data
0-30 MPH	<b>4.70</b>	2414	?		
30-45 MPH	<b>4.19</b>	926			
45-60 MPH	<b>2.33</b>	6947			
> 60 MPH	<b>2.35</b>	1284			
All Speeds	2.98	11571			

\* PA validation data collected from August 19, 2010 through August 30, 2010 across 8.2 miles of roadway.

# Low Confidence Data (Score <30)

Speed Bin	ALL DATA		DATA with SCORE < 30		
	AASE - SEM Band	Number of 5 Minute Samples	AASE - SEM Band	Number of 5 Minute Samples	% of Data
0-30 MPH	<b>4.70</b>	2414	<b>15.60</b>	244	10%
30-45 MPH	<b>4.19</b>	926	<b>5.56</b>	109	12%
45-60 MPH	<b>2.33</b>	6947	<b>2.21</b>	2319	33%
> 60 MPH	<b>2.35</b>	1284	<b>2.31</b>	652	51%
All Speeds	2.98	11571	5.28	3324	29%

- Averaged 15.6 AASE in 0-30 Band
- 10% of all data in the 0-30 Band

\* PA validation data collected from August 19, 2010 through August 30, 2010 across 8.2 miles of roadway.

# High Confidence Data

(Score = 30)

Speed Bin	ALL DATA		DATA with SCORE = 30		
	AASE - SEM Band	Number of 5 Minute Samples	AASE - SEM Band	Number of 5 Minute Samples	% of Data
0-30 MPH	<b>4.70</b>	2414	<b>3.47</b>	2170	90%
30-45 MPH	<b>4.19</b>	926	<b>4.00</b>	817	88%
45-60 MPH	<b>2.33</b>	6947	<b>2.40</b>	4628	67%
> 60 MPH	<b>2.35</b>	1284	<b>2.39</b>	632	49%
All Speeds	2.98	11571	2.75	8247	71%

- Reduced error in lower speed bands
- Slight increase in error in higher speed bands

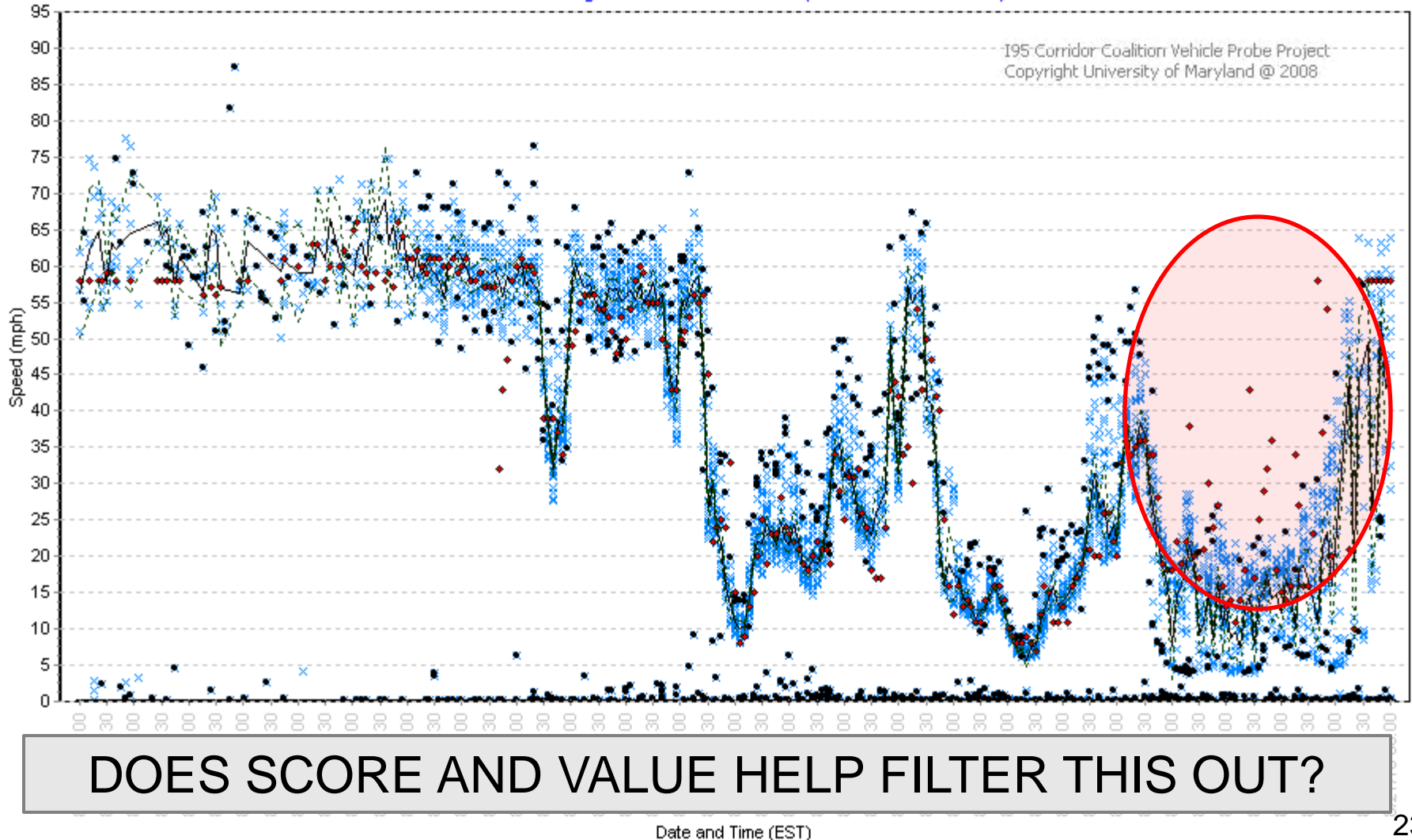
\* PA validation data collected from August 19, 2010 through August 30, 2010 across 8.2 miles of roadway.

# Sample Data

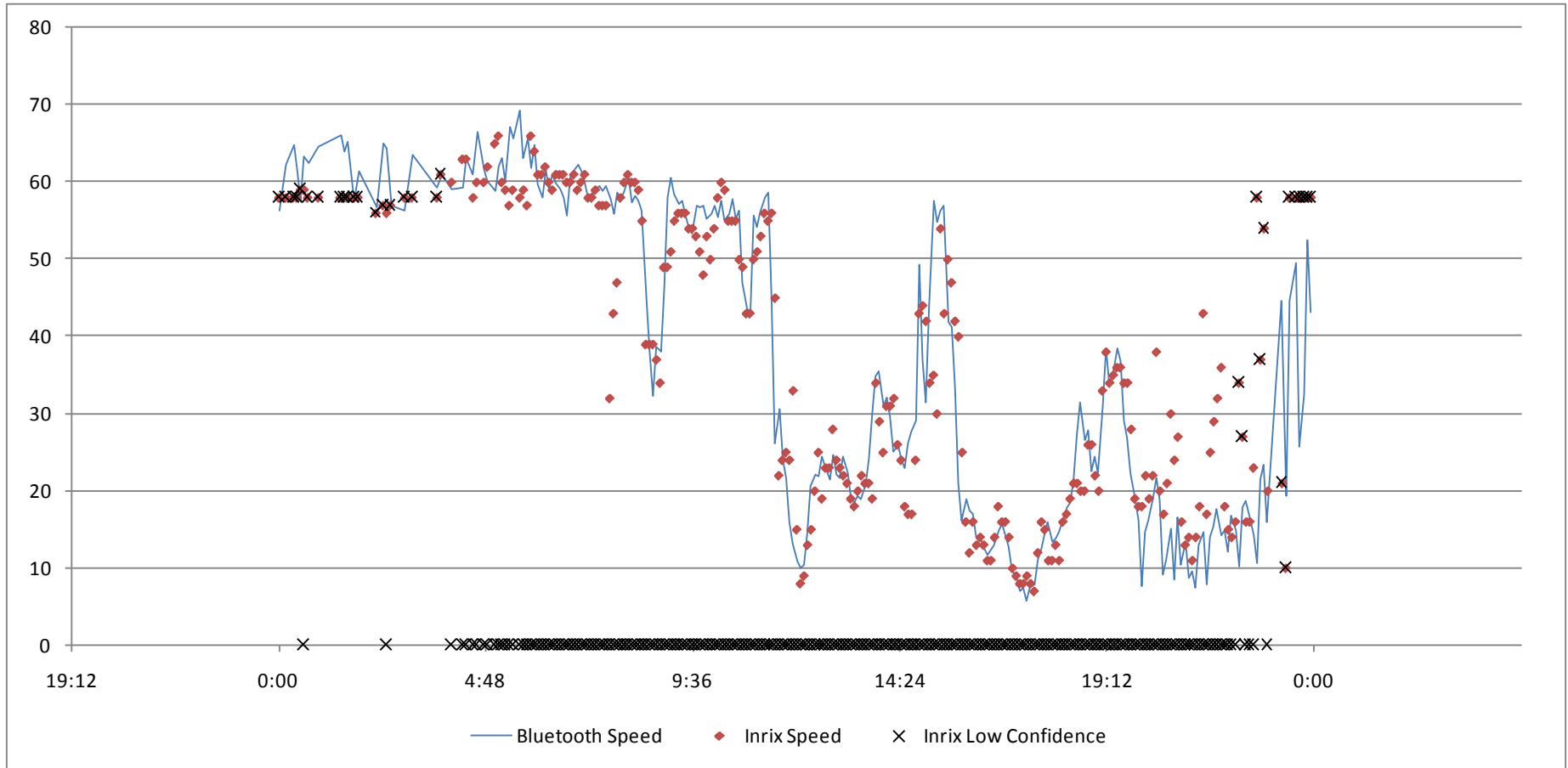
PA - Aug 20, 2010 (Friday) at US1/Exit 340 to Exit 339

TMC: dPA02-0001

I-76 EASTBOUND ending at US-1/EXIT 340/EXIT 339 (1.71481549739838 miles)



# Filtering based on Score > 25



# Pennsylvania Cumulative

Pennsylvania - 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	<b>4.90</b>	5.92	<b>2.68</b>	2.94	2714	226.2
30-45 MPH	<b>5.07</b>	6.67	<b>1.31</b>	1.75	1340	111.7
45-60 MPH	<b>2.30</b>	4.06	<b>-0.72</b>	-0.72	11523	960.3
> 60 MPH	<b>3.23</b>	5.85	<b>-3.12</b>	-5.45	15860	1321.7
All Speeds	3.11	5.24	-1.55	-2.69	31437	2619.8

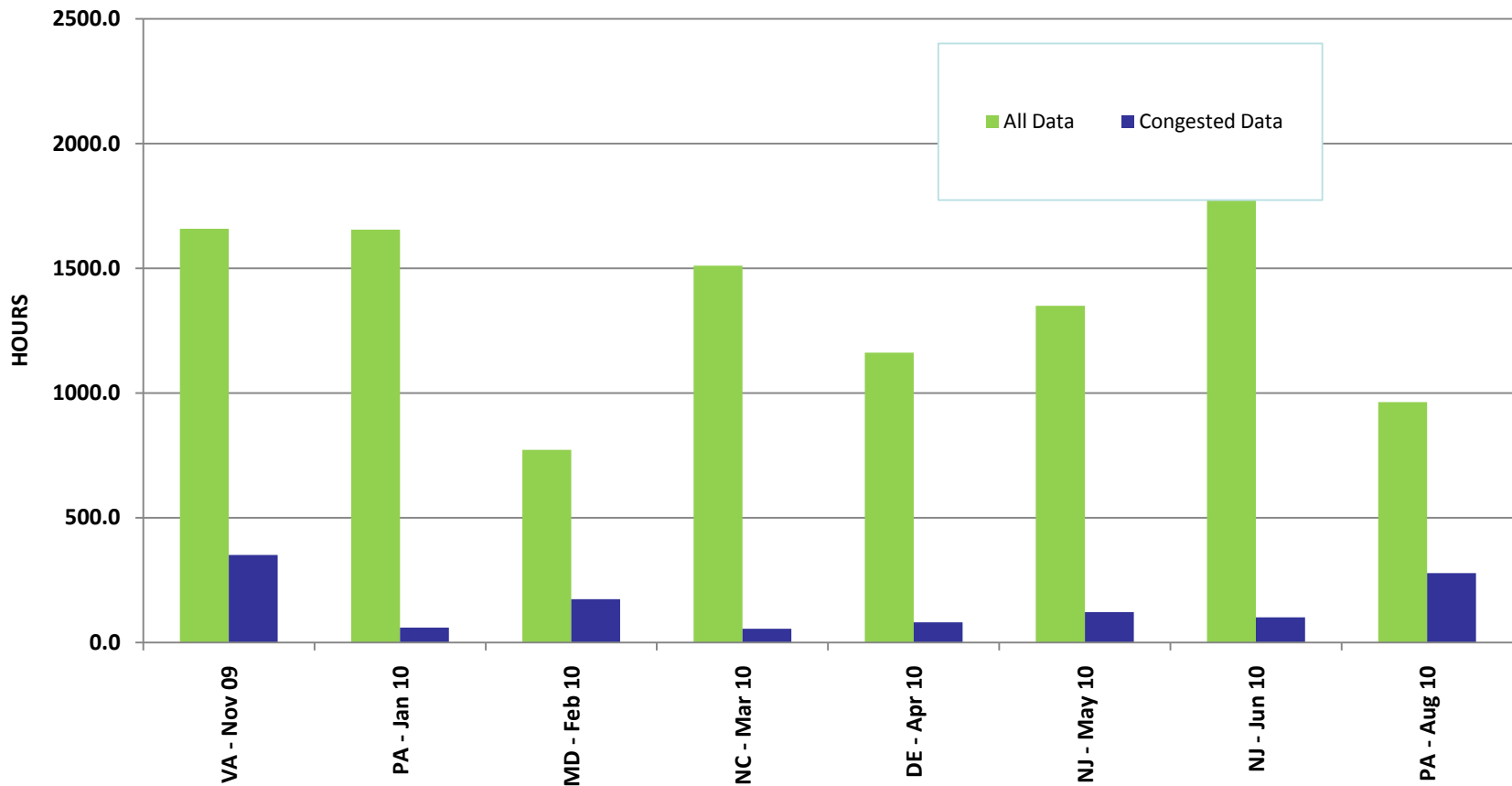
- Two Validations
  - Jan 10, Aug 10
- 18.2 miles
- > 300 hours of congestion data

# Summary - Payment Calculation

I95 VEHICLE PROBE CORE COVERAGE AREA - QUALITY ASSESSMENT				
Speed Range	Absolute Speed Error ( < 10 PMH )	Speed Error Bias ( +/- 5 MPH )	Hours of Data Collection	# Data Samples
	Comparison with SEM Band	Comparison with SEM Band		
<b>AGGREGATE QUALITY CALCULATION - Sep 2010</b>				
0-30 MPH	<b>4.56</b>	<b>2.85</b>	346.9	4163.0
30-45 MPH	<b>3.85</b>	<b>1.34</b>	234.3	2811.0
45-60 MPH	<b>2.10</b>	<b>-0.68</b>	1392.2	16706.0
> 60 MPH	<b>2.86</b>	<b>-2.46</b>	3496.8	41962.0
All Speeds	2.82	-1.51	5470.2	65642.0

- Based on data from PA, DE & NJ Apr – Aug 2010
- 100% Payment, 2.66% offset credit
- Same for NJ, similar for NC Expansion

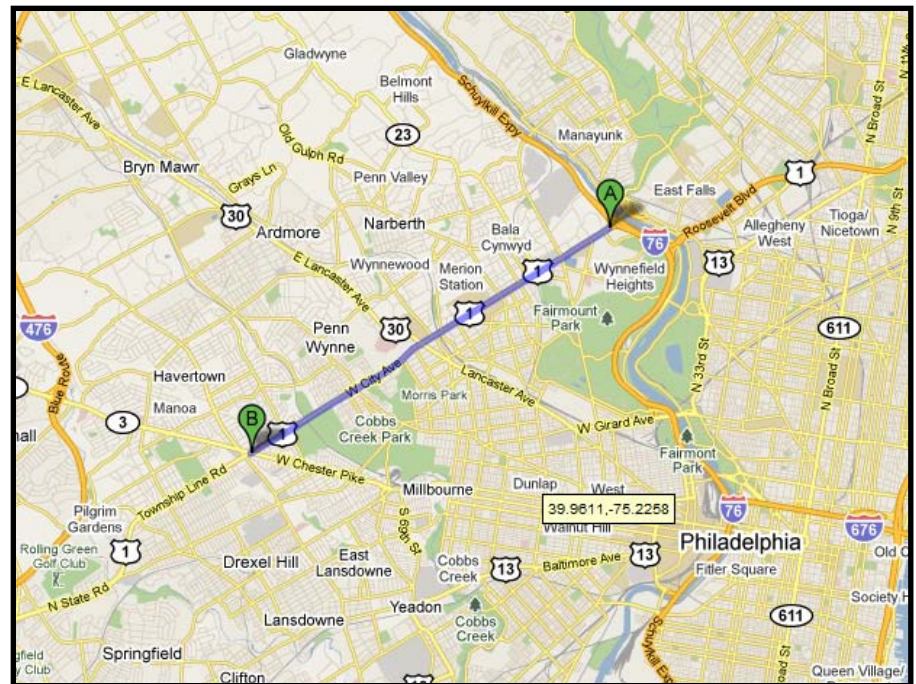
# State Comparison Hours of Validation Data



# Pennsylvania

## August 2010 - Arterials

- Arterials –
  - 6 paths, 15 TMC segments
  - 10.54 Miles, NB & SB
- Data under review



# Confidence Score & Value Update

- Score (10, 20, or 30)
- Value (also called C-Value)
  - 0 to 100, only when Score = 30
  - Initiated April 2010
- Analysis updated through Sept 2010
- First comprehensive look at C-Value
- Present at next monthly call

# Arterial Data Quality Update

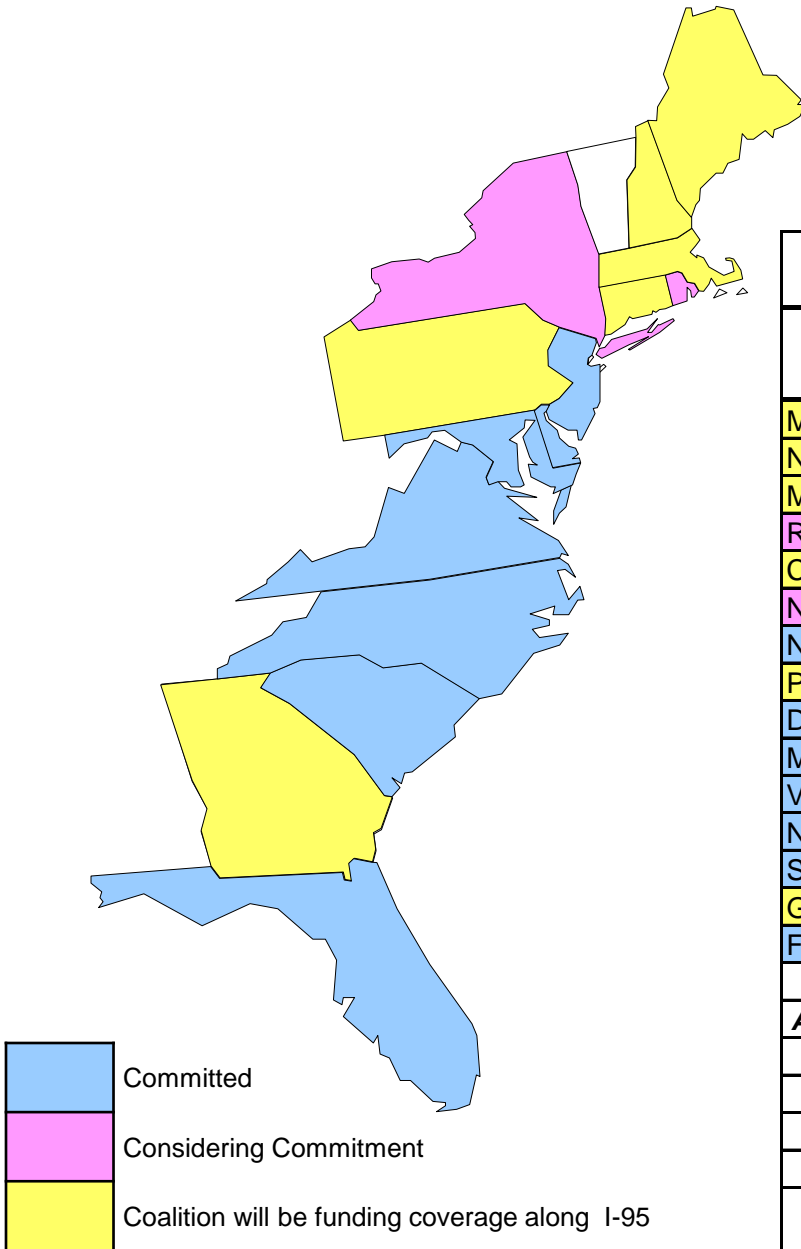
*Stan Young*

- Arterial Analysis
  - White paper summary - In Review
  - To be reviewed by committee
  - Setting Webinar Date

# Vehicle Probe Project Year 19 Update

***Bill Stoeckert***

# Year 19 VPP Commitment Status



Year 19 VPP Commitment Status				
State	Total Miles	Total Cost	State Participation	Coalition Cost
Maine	53	\$47,700	\$0	\$47,700
New Hampshire	16	\$14,400	\$0	\$14,400
Massachusetts	88	\$79,200	\$0	\$79,200
Rhode Island**	44	\$39,600	\$0	\$39,600
Connecticut	111	\$99,900	\$0	\$99,900
New York**	24	\$21,600	\$0	\$21,600
New Jersey*	470.5	\$365,375	\$188,938	\$176,438
Pennsylvania	51	\$38,250	\$0	\$38,250
Delaware	46	\$34,500	\$17,250	\$17,250
Maryland/DC*	297.2	\$235,400	\$123,950	\$111,450
Virginia	305.5	\$229,125	\$114,563	\$114,563
North Carolina*	261.8	\$208,850	\$110,675	\$98,175
South Carolina*	220	\$177,500	\$95,000	\$82,500
Georgia	112	\$100,800	\$0	\$100,800
Florida	728	\$655,200	\$327,600	\$327,600
<b>Subtotal</b>	<b>2828</b>	<b>\$2,347,400</b>	<b>\$977,975</b>	<b>\$1,369,425</b>
<b>Additional Costs:</b>				
Contingency		\$200,000	\$0	\$200,000
Validation		\$336,279	\$0	\$336,279
Management		\$148,099	\$0	\$148,099
Overhead		\$12,500	\$0	\$12,500
<b>Total</b>		<b>\$3,044,278</b>	<b>\$977,975</b>	<b>\$2,066,303</b>

\* Agency is contracted directly with UMD

\*\* Coverage along I-95

# **Request for Information:** Using VPP data in Work Zones

***Jawad Paracha***  
***Federal Highway Administration***

# VPP and WZ Applications

## Federal Rule (23 CFR Section 630 subpart J)

- Shall implement a policy for the systematic consideration and management of work zone impacts on all Federal-aid highway projects
- Shall address work zone impacts throughout the various stages of the project development and implementation process
- Shall use field observations, available work zone crash data, and operational information to manage work zone impacts for specific projects during implementation
- For significant projects, the state shall develop a TMP that consists of a TTC plan and addresses both TO and PI components

# VPP and WZ Applications

## Example Mobility Performance Measures:

- For queues greater than 1.0 mile and less than 1.5 miles, the work zone impacts are acceptable if the queue exceeds 1.0 mile for two hours or less.
- Travel delays of over 15 minutes beyond what are considered the normal travel delays for the affected roadway segment shall be considered unacceptable

# VPP and WZ Applications

## NCHRP Domestic Scan 08-04

### Best Practices in WZ Assessment, Data Collection, and Performance Measurement

- Safety/mobility performance specifications not widely used
- Data availability limits the performance measures used
- Access to real-time data is key to making improvements in current work zones
- Transportation management centers (TMCs) can play a key role

# VPP and WZ Applications

## Possible WZ applications:

- Real-time traveler information or traffic management
- Historic performance data such as TT for pre-trip planning applications (demand management)
- Monitoring WZ Performance (project and program)
- Before-after evaluation of Maintenance of Traffic (MOT) strategies
- Design of MOT alternatives (planning/design) considering link/network performance

# VPP and WZ Applications

## Possible WZ Applications:

- Project-based dashboard applications where project engineer defines the boundary of the project and monitors performance (real-time info, current vs. historic performance comparisons)
- Monitor evolution/dissipation of queues to make adjustments in lane closure schedules, advance warning signs, etc.
- Integrate mobility/crash data to review work zone project performance
- Monitor compliance with performance based specifications

# Agency Questions and Updates

# Contract Issues

*Kathy Frankle*

- DUA updates
- Expansion updates

# DUA Status

Core States	
DE DOT	9-May-2008
MD SHA	12-Jun-2008
NC DOT	15-Aug-2008
NJ DOT	19-Jun-2008
PA DOT	----
VDOT	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
MdTA	12-Dec-2008
MTA Bridges	23-Jul-2008
MWCOG	08-Jun-2009
New Hampshire DOT	03-Feb-2010
New Jersey Transit	In Process
North Jersey TPA	Inquired
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
Richmond, VA MPO	21-Sep-2010
SC DOT	22-Jan-2009

# Expansion Status

Coalition Members	DUA Status	Expansion
<b>Core States</b>		
Delaware DOT	9-May-2008	----
Maryland SHA	12-Jun-2008	9-1-2010 for MdSHA
MdTA	12-Dec-2008	
North Carolina DOT	15-Aug-2008	16-Apr-2010 (Mod)
New Jersey DOT	19-Jun-2008	8-Jul-2008
Penn DOT	----	----
VDOT	26-Jun-2008	going thru PBS& J contract
<b>Other Coalition Members</b>		
Florida DOT	7-Jun-2010	7-Jun-2010
New Jersey Turnpike	12-Jan-2009	covered by NJDOT
South Carolina DOT	22-Jan-2009	14-July-2010 (Mod)

# Participation in Meetings/Conferences

*Karen Jehanian*

# Participation in Meetings/Conferences

- Upcoming Meetings

- TRB Annual Meeting, Washington DC – January 23 – 27, 2011
- ITE Meetings – submitted three abstracts
  - (2011 Technical Conference & Exhibit, April 3–6, 2011, Lake Buena Vista, FL)
  - (2011 Annual Meeting & Exhibit, August 13-16, 2011, St. Louis, MO)
- 2011 ITS World Congress, Orlando, FL – October 16-20, 2011

# **Review of Action Items from this Webcast**

# Selection of Date for Next Project Team Meeting

*Wednesday, December 8, 2010*

*10:30 AM*

*(proposed)*

***All***

# Questions?

- Bill Stoeckert at 774-207-0367 or [wstoeckert@yahoo.com](mailto:wstoeckert@yahoo.com)
- Stan Young at 301-403-4593 or [seyoung@umd.edu](mailto:seyoung@umd.edu)
- Rick Schuman at 407-298-4346 or [rick@inrix.com](mailto:rick@inrix.com)
- For contract expansion issues Kathy Frankle at 410-414-2925 or [kfrankle@umd.edu](mailto:kfrankle@umd.edu)

# Thank You



**I-95 CORRIDOR  
COALITION**