The Validation Process

I-95 Corridor Coalition Vehicle Probe Project

ITS America Annual Meeting - 2009
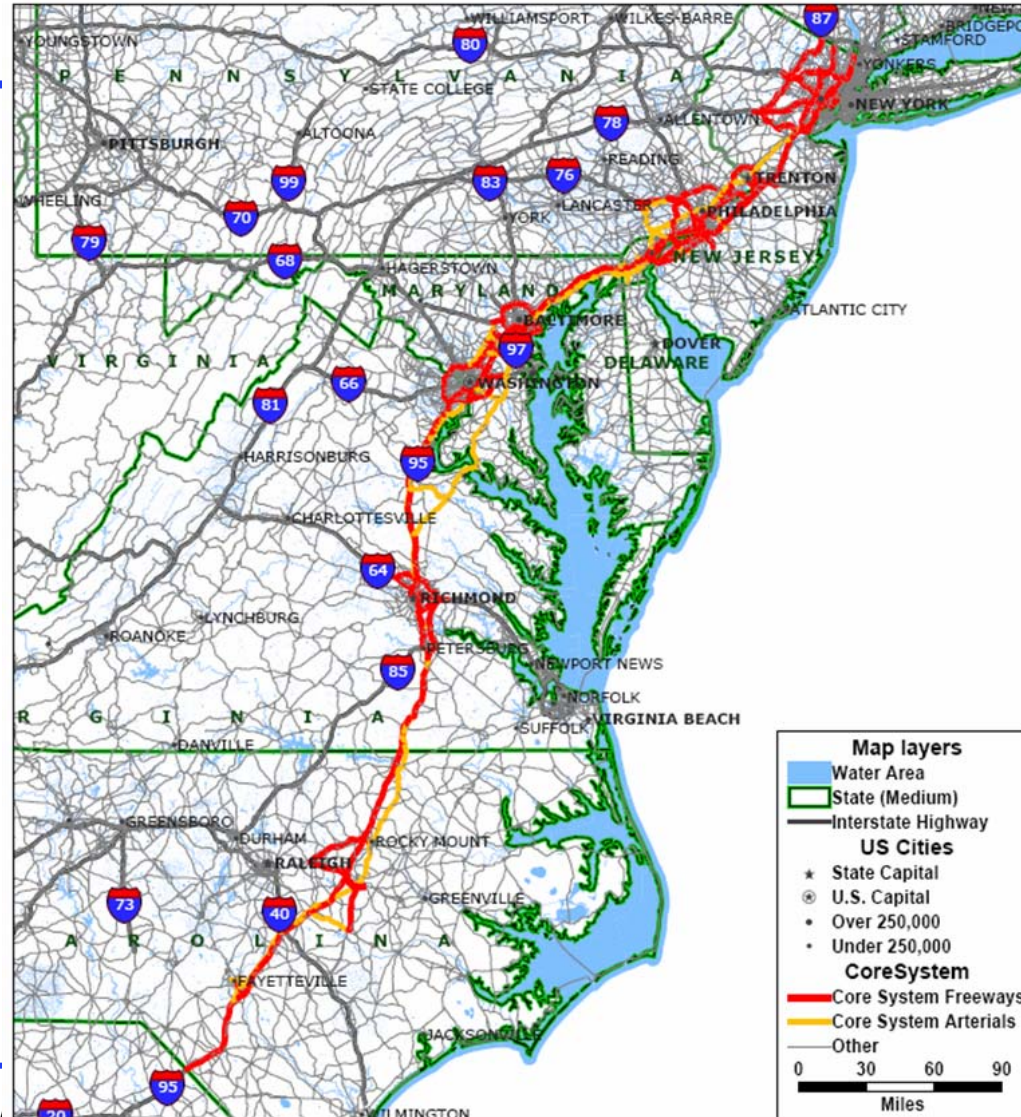### *Philip J. Tarnoff*

www.i95Coalition.org

Network Coverage

Core Coverage
- 1500 Freeway miles
- 1000 Arterial miles
- New Jersey to North Carolina

Expansions
- All NJ Freeways
- All NC Interstates
- All SC Freeways
  - in planning

Map layers
- Water Area
- State (Medium)
- Interstate Highway

US Cities
- ★ State Capital
- ⊛ U.S. Capital
- • Over 250,000
- · Under 250,000

CoreSystem
- Core System Freeways
- Core System Arterials
- Other

0   30   60   90
Miles

Data Quality Specifications

Specs are applied to freeways with flows/demand exceeding 500 vehicles per hour per direction

- Travel Time / Speed Data

  - Accuracy is assessed in four flow regimes
    - 0 - 30 MPH   30-45 MPH
    - 45-60 MPH   > 60 MPH

- In each range the following apply

  - Max average absolute speed error   10 MPH

  - Speed error bias   +/- 5 MPH Max

- Based on space mean speed - (distance/travel time)

The Challenge

- Validate the accuracy of the received data within the context of the data quality specifications

- Perform a three year validation for approximately 1,500 freeway miles

- Adjust contractor payments to reflect data quality

The Process

- Initial Validation (system acceptance)
  - July through September 2008
  - ~ 240 miles
- Ongoing Validation
  - Began October 2008
  - ~ 80 miles (one state) per month
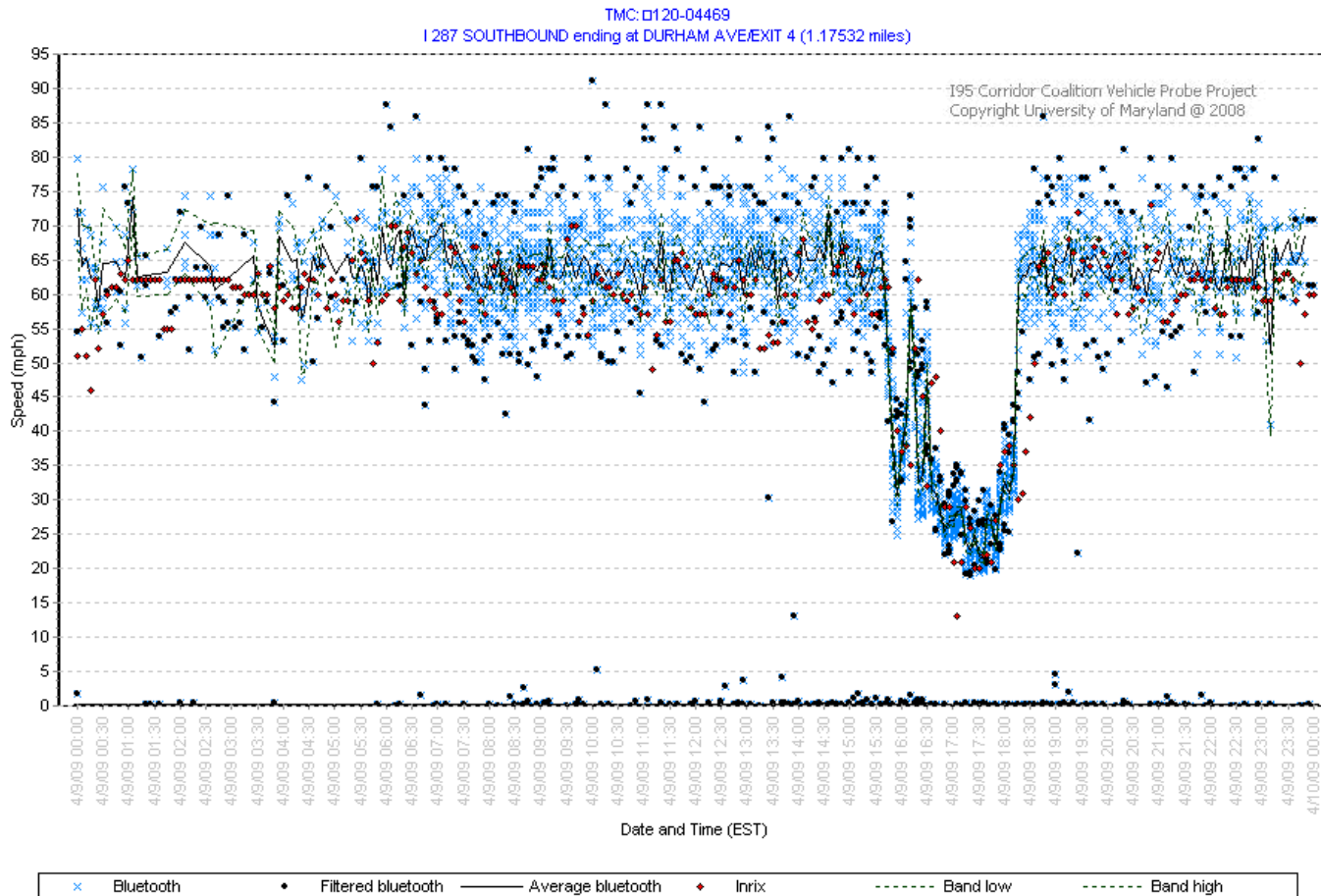- Bluetooth devices used for "ground truth"

Status

- Initial (240 mile) validation completed
- Continuing validation completed in six locations (five states)
- Payment criteria developed and implemented
- All contractual requirements have been satisfied
- Results available on the Coalition website

The Source of the Evaluation Results

TMC: ▯120-04469
I 287 SOUTHBOUND ending at DURHAM AVE/EXIT 4 (1.17532 miles)

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Summary of Overall Evaluation Results

Speed Bin (mph)	Speed Error Bias (mph)	Average Absolute Speed Error (mph)	Hours of Data Collection
0-30	3.2	6.3	84.0
30-45	1.7	6.0	120.7
45-60	0.0	1.9	1,002.3
60+	-1.3	2.2	4,389.8
All Bins	-1.0	2.3	5,596.8

Payment Considerations

- Payment adjusted downward if error thresholds exceeded in any speed bin
- Weighting factors:
  - Speed bins equally weighted (25% each)
  - AASE receives 2/3 weight
- Minimum sample size must be available for previous three months
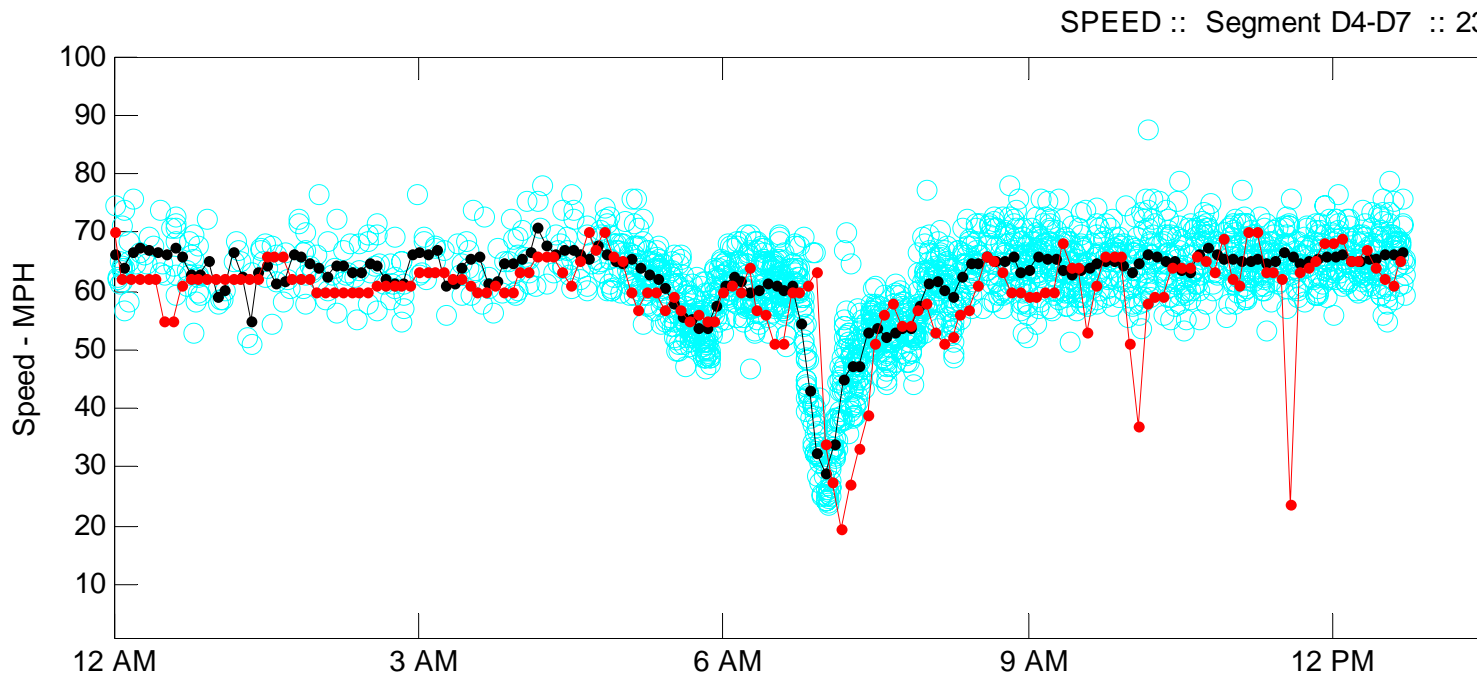- Offset credit provided for exceptional data quality

Issues for Continued Study

- False alarms and other short-duration, deviations of INRIX GPS data from the Bluetooth data.

- Appropriate outlier filtering of Bluetooth data.

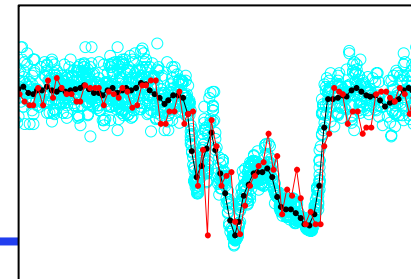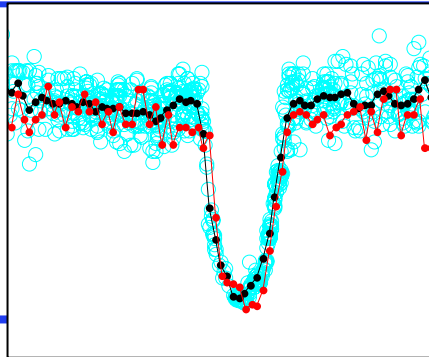- Special purpose lanes

- Data lag calculation

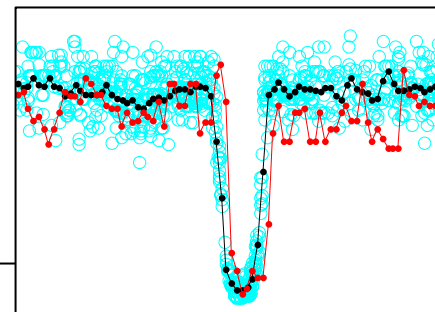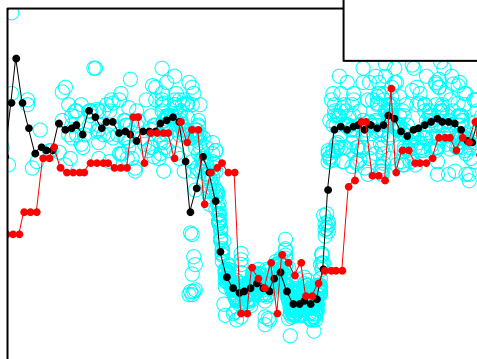# Example of False Alarm / Short Duration Spike
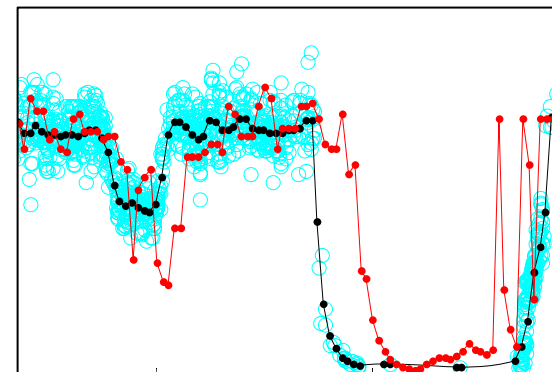

SPEED :: Segment D4-D7 :: 2?

Examples of Data Lag

Minimal

Moderate

Maximum

Concluding Thoughts

- Validation effort is unique in terms of its extent and data volume

- Automated data analysis tools have been developed to support the effort

- Ongoing efforts to mitigate the impact of short duration deviations

- Data quality continues to improve as process matures

More Information

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