The Validation Process
I-95 Corridor Coalition Vehicle Probe Project

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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
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

www.i95Coalition.org
The Source of the Evaluation Results
# Summary of Overall Evaluation Results

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