



NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD

Meeting Highlights

Vehicle Probe Data Users Group

Date: Thursday, February 12, 2015
Time: 1:00 PM – 3:00 PM
Place: Meeting Room 4&5, First Floor, MWCOG

Meeting Attendees (20)

Benito O. Pérez	District Department of Transportation
Daniel Stevens	Fairfax County Department of Transportation
Drew Lund	University of Maryland CATT Lab
Ed Azimi	Virginia Department of Transportation
Edward Stylc	Baltimore Metropolitan Council
John Thomas	Montgomery County Department of Transportation
Keith Jasper	Northern Virginia Transportation Authority
Lulu Mao	VDOT Northern Region Operations
Masoud Hamed	University of Maryland CATT (remote)
Matt Wolniak	JMT; Representing Maryland SHA
Mena Lockwood	Virginia Department of Transportation (remote)
Michael Digafe	IBM (remote)
Michael VanDaniker	University of Maryland CATT Lab
Noah Goodall	Virginia Center for Transportation Innovation and Research
Reuben Juster	University of Maryland CATT
Robert Winick	Motion Maps, LLC
Sanhita Lahiri	Virginia Department of Transportation
Stanley Young	University of Maryland CATT
Subrat Mahapatra	Maryland State Highway Administration
Terri Tabesh	Maryland State Highway Administration (remote)

COG/TPB Staff in Attendance (8)

Andrew Meese
C. Patrick Zilliacus
Dusan Vuksan
Feng Xie
Jon Schermann
Marco Trigueros
Martha Kile
Wenjing Pu

1. Introductions and Review of 10/9/2014 Meeting Summary

Participants introduced themselves and [highlights](#) from the October 9, 2014 meeting were reviewed and finalized.

2. Arterial Probe Data Quality of the Vehicle Probe Project

Dr. Stanley Young of the University of Maryland has been leading the on-going, independent data validation studies for the I-95 Corridor Coalition Vehicle Probe Project (both VPPI & VPPII) since the project inception. From July 2009 to July 2014, monthly data validation results for freeways were released on the [VPP website](#) (click “Highlights” tab and look for “Data Validation” section). Around 2012, Dr. Young and his team started to investigate probe data quality on arterials and some initial findings were presented on the [NATMEC 2014 Arterial Probe Data Quality Workshop](#) (slides 119-167).

During this meeting’s [presentation](#), Dr. Young introduced the latest validation results of freeway data obtained from all three vendors of the VPP II – INRIX, HERE and TomTom. It was noticed that the speed data come from TomTom was capped at the speed limit while the other two vendors showed actual fluctuations of speeds especially during non-rush hours. The impact, if any, of TomTom’s speed limit cap on performance measures needs to be investigated in the future.

Dr. Young compared the different characteristics of freeway and arterial traffic flows and showed examples of arterial data quality against Bluetooth samples. He summarized the arterial validation results by using a phrase, “A Tale of Three arterials”, more specifically:

- Arterials likely to have usable probe data. Such arterials may have the following characteristics: AADT > 40,000, 2+ lanes, <= 1 signal per mile, classified as HPMS principle arterials, and with limited curb cuts.
- Arterials with possibly usable probe data: AADT within 20,000 – 40,000, 2+ lanes, <= 2 signals per mile, classified as HPMS minor arterials. Use of probe data on such arterials should be tested.
- Arterials unlikely to have usable probe data: low volume such as AADT < 20,000, >= 2 signals per mile, classified as HPMS major collectors. Use of probe data on such arterials is not recommended.

TMC (Traffic Message Channel, the most widely used location referencing system of vehicle probe data to date) has been identified as an issue for arterial data, including 1) TMC segments are often too long for arterials, 2) TMC coding may not be available on roads that warrant coverage, and 3) alternative segmentation methods are often proprietary such as INRIX XD segments. Mr. Pu said that both the Transportation Research Board (through the Urban Data and Information System Committee – ABJ30) and the FHWA have intention to come up with more standardized approaches to process probe data and he was hopeful that some national guidelines would become available in a few years especially after the MAP-21 Congestion and

System Performance rulemaking process. Mr. Mahapatra added that SHA created a TMC linear reference system in its statewide highway GIS database that would enable structure-to-structure segmentation of the highway network.

Mr. Azimi asked how the probe data could reflect the HOV lane operations such as those along I-66. Dr. Young replied that probe data vendors usually provide HOV lane data only if there is a physical separation between the HOV lane(s) and the general purpose (GP) lanes. Ms. Lockwood added that she was aware of that I-66 does not have separate TMCs for the HOV lane but I-95/I-395 does have separate TMCs for the reversible HOV lanes. She suggested Mr. Azimi to contact Ms. Amy McElwain for more information along the I-495 Express Lanes as there are some detectors installed to capture the operations of both Express Lanes and GP lanes.

3. Maryland SHA's Use of Probe Data and Lessons Learned

Maryland is one of the leading states that have been effectively utilizing vehicle probe data for performance management and decision making. Mr. Subrat Mahapatra of Maryland State Highway Administration (SHA) and Mr. Matthew Wolniak of JMT [presented](#) a number of examples of probe data utilization, including:

- Maryland State Highway Annual Mobility Report (2014 data)
- Project planning and design
- Mobility & Economy Dashboard (online)
- Before and after studies
- Applications in advanced travel analysis tools

Vehicle probe data has helped SHA to make data-driven decisions. For example, multiple low cost short term improvements have been identified and implemented, and multiple Mid-term/Long-term corridor studies have been re-evaluated and initiated. Some challenges and opportunities of using probe data include:

- Trip and tour based congestion and reliability metrics (Origin to Destination) for people and goods movement;
- Lane based performance metrics (HOV lane or, ETL running next to a general travel lane);
- Lane based usage (disproportional use of some lanes over others) to understand operations better;
- Fusing datasets with other data sources like land use, traffic counts, detectors etc. - Interfacing of navigation networks with state LRS;
- Insights on markets and trip O/Ds; and
- Multi-modal and multi-resolution networks that can meet performance management, travel modeling and analysis needs.

In response to Mr. Pu's question regarding the methodology behind the Top 30 most congested locations in Maryland, Messrs. Mahapatra and Wolniak clarified that their own post-processing

method was used to identify the Top 30 locations after extracting data from the Bottleneck Ranking tool of the VPP Suite.

4. VDOT's Use and Evaluation of Probe Data

Speaking from a [presentation](#), Ms. Mena Lockwood introduced VDOT's use and evaluation of vehicle probe data. The uses included traveler information, holiday travel trends, and congestion management.

Currently, VDOT provides travel time obtained from INRIX on major Interstate commuting routes by a number of means such as Variable Message Signs, 511 website, and mobile apps. Travel time business rules were established to ensure the quality of data. Such rules include: 1) average bias could not exceed ± 5 mph, 2) average absolute error could not exceed 10 mph, and 3) signs would be blanked if $< 85\%$ of TMCs reported real time information.

VDOT built a [Holiday Travel Trends website](#) in house. Since this was one of the major topics of a recent I-95 Corridor Coalition webcast held on December 11, 2014 ([Using VPP Suite Trend Maps for Holiday/Event Travel Planning](#)), only highlights were mentioned in this presentation.

Some challenges in the use of probe data included definition of congestion, data quality on arterials, and TMC issues. VDOT and the Virginia Center for Transportation Innovation and Research (VCTIR) at the University of Virginia were conducting data validations for all three vendors' data in VPP II (INRIX, HERE and TomTom) along 10 routes in Virginia (five freeways and five arterials), which would be one of the major topics of the next Vehicle Probe Data Users Group meeting.

5. Round-Table Discussion on Other Probe Data-Related Topics

Mr. Pu mentioned to the group that he will start drafting some preliminary recommendations on probe data processing and performance measures calculation. The draft will be discussed on the next meeting.

6. Adjourn and Discussion of the Next Meeting Date

The date for the next meeting was to be determined based on the progress of VDOT/VCTIR's data validation studies and other factors.

The meeting was adjourned at 3:00 PM.