Probe Data Analytics User Group Web meeting
February 9, 2017

Agenda:

#	Topic	Speaker
1	Agenda/Meeting Overview & Introductions Coalition Update	Jesse Buerk, DVRPC Denise Markow, I-95 Corridor Coalition
2	Agency Spotlight Presentation: Florida Turnpike's use of PDA apps for Bottleneck Identification	Enock Mtoi, Florida Turnpike/Florida DOT
3	Probe Data Analytics Improvements	John Allen, UMD CATT Lab
4	Spotlight Presentation: Visual Exploration of GPS Traces	Nikola Marković, UMD CATT
5	Agency Input Session	All Agencies
6	Wrap Up - Next Meeting & Thank You	Denise Markow

Next User Group Meeting: Thursday, May 10, 2017 - 10:30a.m. - 12:00p.m. (EDT)

Meeting Highlights:

- **Introductions & Coalition Update**:
  - ➢ Jesse Buerk welcomed the group, introduced the speakers for the meeting and reviewed the agenda.
  - ➢ Denise Markow reviewed some of the recent TSMO related activities within the Coalition including the first RITIS User Group meeting (12/15/2016), RITIS User Group survey (conducted in January 2017) and the Travel Information Services meeting (1/19/2017) held in-person and via web with presentations from Florida 511, MassDOT's Real-time Travel Info, New England 511 and other agencies.

- **User Group Member Spotlight: Florida Turnpike Enterprise – Use of Probe Data Applications for Bottleneck Identification** –
  - ➢ Enock Mtoi of the Florida Turnpike Enterprise (FTE) explained the operations of the FTE (part of Florida DOT) noting that they own and operate 483 miles of toll facilities which are funded through their toll revenue.
  - ➢ Previously FTE identified bottleneck locations using aerial photography but this method was expensive and limited the number of locations that could be observed.
  - ➢ FTE uses the TMC reports from their SunGuide software and added the use of Probe Data Analytics tools to identify congestion along their facilities.
  - ➢ The current process FTE uses to identify and rank the bottlenecks in their system along with their causes was described.
  - ➢ Enock stated that the Probe Data Analytics Tools allows them to scan their roadways and other parallel systems quicker than before.
  - ➢ They have found that the metrics from the Probe Data Analytics are consistent with their understanding of their system and the data enables them to validate the information received from their TMC without visiting the actual sites.
  - ➢ Enock also noted that their modeling and simulations methods have improved through the use of PDA for calibration and validation.

- **Probe Data Analytics Improvements** – John Allen (CATT Lab) provided an update on each of the following:
  - ➢ Recent Updates – The implementation of the Hadoop computing platform and the removal of the Flash Player were the major recent updates that have enabled many other features and functionality to move forward.
  - ➢ Deployment Roadmap – The current and planned feature deployment schedule for 2017 was reviewed.
  - ➢ Q1 2017 Updates:
    - ▪ FLASH Player Migration – enables high value features including: Advanced time selection and Map-based TMC selections
    - ▪ My History – organizes user's downloads, queries and reports
    - ▪ MAP-21 Widgets – updated to reflect the Final Rule (UPDATE: CATT Lab is working with our partners, including other universities and AASHTO, to produce written step-by-step procedures (and suggested strategies) to guide agencies through the process of setting appropriate targets for each required metric; and designing report layouts for all of the required submissions to FHWA.)
    - ▪ Removal of all date range, granularity and number of TMC restrictions
  - ➢ Q2 2017 Updates:
    - ▪ FLASH Migration (Results pages) – no Flash Player for results pages
    - ▪ Custom Coloring for UDC Tables
    - ▪ Map Selections – create and customize TMC sets using a map function
    - ▪ Advanced Time Selection – allows full control of analysis times (include/exclude holidays, certain dates, certain times, etc.)
    - ▪ Custom graph formatting/exports – currently under development and will be funded through PennDOT
    - ▪ Basic O-D Data Analytics (Phase I)* - currently under development and being built from a use case perspective (such as Traffic Impact Studies, Transit Routing, Detour Analysis, Evacuation Planning). This will be a standalone app (not part of the PDA Suite). **The CATT Lab is looking to form a Focus Group to help refine development and prioritization of additional use-cases and features – interested Users should contact John Allen (**jallen35@umd.edu**).**
  - ➢ Following the presentation/updates, the following questions were discussed:
    - ▪ Mena Lockwood (VDOT) asked about the data set being used for the O-D Analytics. INRIX and HERE data is being looked at. John noted that the data sets are separate from the speed data.
    - ▪ Mena asked if data that VDOT purchased through Streetlight will be able to be ingested into the O-D Analytics tool. John noted that it has not been looked into at this point but is something that may be considered.
    - ▪ Daivamani Sivasailam (MWCOG) asked what the smallest level of geography that will be available for use within the O-D Analytics. It was noted that the smallest geography is at the road level, but the tool is still in the early stages of development and that has yet to be finalized.
    - ▪ Wenjing Pu (FHWA) as about the anticipated cost of the O-D Analytics tool. It was noted that there will be a cost for agencies to procure data from a vendor. However, it is too early in the development process to determine what cost, if any, will be assessed for the O-D Analytics tool.

- **Spotlight Presentation: Visual Exploration of GPS Traces** –
  - ➤ Nikola Marković, UMD CATT provided a presentation on the use of GPS trace data.
  - ➤ He noted that the work is based on an INRIX data set covering four months.
  - ➤ MdSHA asked UMD CATT to investigate this data set and identify potential applications of the GPS Trace data, as this was the first time they had purchased this type of data.
  - ➤ The visualizations showed the endpoints (beginning and end) of each trip as well as waypoints.
  - ➤ All of the trips had either a beginning, end or waypoint within Maryland.
  - ➤ Seventy-five percent of the trips were totally within Maryland and had a median trip duration is of 18 minutes.
  - ➤ State based O-D trips (for trips between Maryland and other states) were shown using a chord diagram (approximately 5 million trips) – most trips were from neighboring states.
  - ➤ Another chord diagram provided data on trips within the state of Maryland (by County) – most trips originated and ended within the same county. T
  - ➤ Trajectories were shown for trips along I-95.
  - ➤ Heat maps were used to visualize trip generators and activity zones.
  - ➤ The application of unsupervised learning such that the algorithms can find groups of trips with the same origins and destinations was shown.
  - ➤ When overlaid with the transit network, it can show if the network can handle major origin-destination pairs or if modifications to the system may be needed.
  - ➤ How GPS traces can be compared to other data sources such as EPA pollution data (emissions) was also shown.
  - ➤ Nikola noted that the CATT Lab is currently developing a suite of tools for the analysis of trajectory data.

Please note that the audio and visual presentation of this GPS Trace demonstration is available at https://vimeo.com/204254492.

- Following the presentation/updates, the following questions were discussed:
  - o Mena Lockwood asked about the return on investment for Maryland. Nikola stated that the had not spoken with MdSHA but the most promising application appears to be the Volume and Turning Movement project.
  - o Daivamani Sivasailam noted the potential for activity-based modeling. Nikola agreed that it is a great resource for model calibration and that it may replace models. Penetration rate is about 1/2 % and it is expected to increase in the future. Combining data from multiple vendors would also help on that end.
  - o Keith Miller (NJTPA) asked if any bias has been found in the data. Nikola noted the data is naturally biased towards heavy vehicles but it can be corrected for since they have vehicle weight class information.
  - o Keith Miller asked about income and if where the traces are coming from is known. Nikola stated that the provider type is known (fleet, cell, integrated GPS).
  - o Wenjing Pu noted that FHWA is interested in this type of data for travel behavior at the national level.
  - o David Heller (SJTPO) asked about the availability of the graphics. John noted that they are not yet available but it will be part of a separate tool.
  - o Wenjing Pu asked if Nikola had collaborated with Lei Zhang, Director of the National Transportation Center at UMD who is doing a project for FHWA with GPS

traces within a metropolitan area. Nikola has not collaborated with Lei Zhang, but John will follow up to see if someone else has done so
- o Denise Markow noted that freight may need to be included in this effort/discussion.
- o Wenjing asked if the INRIX O-D data includes freight and passenger vehicles. Nikola noted that information on vehicle weight classes is available.
- o Patrick Zilliacus (MWCOG) asked if intercity buses are separated from the other large vehicles. Nikola stated that they are not but the GPS traces could be overlaid with other data in the future (e.g., weigh-in-motion systems) to potentially extract this information.
- o Wenjing Pu shared a link for bus data:
    - o https://www.fhwa.dot.gov/policyinformation/analysisframework/03.cfm

Agency Input Session – Jesse Buerk asked participants for any questions or issues. Greg Jordan noted that Skycomp is doing a validation of the INRIX O-D product and asked that anyone interested contact him (gjordan1@umd.edu).

Wrap Up – Denise Markow thanked the users for participating and noted that O-D data is coming! She also asked users to complete an on-line survey regarding this Probe Data Analytics User Group meeting and plans for subsequent meetings (link to be provided in the follow-up email). She noted that the next Probe Data Analytics User Group meeting is scheduled for Thursday, May 11, 2017 (10:30am – 12:00pm).

ACTION ITEMS:

#	Action Item	Whom	Status
1	O-D Data Analytics - The CATT Lab is looking to form a Focus Group to help refine development and prioritization of additional use-cases and features. Interested Users should contact John Allen (jallen35@umd.edu).	PDA Users	
2	Complete on-line survey regarding this Probe Data Analytics User Group meeting and plans for subsequent meetings.	Participants and Invitees	To be conducted in February 2017
3	Check with Lei Zhang, Director of the NTC at UMD to see if there has been any collaboration with their FHWA project on GPS traces within a metropolitan area.	John Allen	

Participants:

User Group Participants:	
Ed Stylc	Baltimore Metropolitan Council
Mike Bruff	City of Durham MPO
Jesse Buerk	DVRPC
Wenjing Pu	FHWA
Enock Mtoi	Florida DOT/Turnpike
Patrick Zilliacus, Daivamani Sivasailam	MWCOG/NCRTPB
Kitae Kim, Rima Abi Saad	NJIT
Kelly Wells	North Carolina DOT
Tom Chase	NCSU/ITRE
Keith Miller	North Jersey TPA
Scott Benedict, Mike Crowley, Ted Lucas	Pennsylvania DOT
Greta Ryan	Richmond Regional MPO
David Heller	South Jersey TPO
Mena Lockwood	Virginia DOT
Denise Markow	I-95 Corridor Coalition
Nikola Marković	UMD CATT
John Allen, Drew Lund, Greg Jordan	UMD CATT Lab
Joanna Reagle	KMJ Consulting (Coalition Support)