



## TPB TRAVEL FORECASTING SUBCOMMITTEE

### HIGHLIGHTS OF THE SEPTEMBER 21, 2018 MEETING

Meeting time & location: 9:00 AM to 11:30 AM, Metropolitan Washington Council of Governments

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### MEETING ATTENDEES

#### MEMBERS, ALTERNATES, AND PARTICIPANTS

- Jim Bunch (Sabra & Associates)
- Robert Berger (BMC)
- Yohan Chang (Connetics Transportation Group)
- Zuxuan Deng (DDOT)
- Kwasi Donkor (Fehr & Peers)
- Charles Freeman (Frederick County) \*
- Dan Goldfarb (NVTC)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Adam Groves (PTV Group)
- Manish Jain (Transurban) \*
- Naveen Juvva (Streetlight Data) \*
- Navid Kalantari (AECOM)
- Kyeongsu Kim (Connetics Transportation Group)
- David Kline (Fairfax DOT)
- Jaesup Lee (M-NCPPC, Montgomery Co.)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Cambridge Systematics)
- Srikanth Neelisetty (Transurban) \*
- Tim Padgett (Kimley-Horn)
- Krishna Patnam (AECOM)
- Harun Rashid (NVTA)
- Amir Shahpar (VDOT)
- Christine Sherman (Arlington Co. DES)
- Ed Strocko (Bureau of Transp. Statistics)
- Aichong Sun (AECOM)
- Jiaxin Tong (Kimley-Horn)
- Catherine Vanderwaart (WMATA)
- Jongsun Won (PTV Group)

#### COG STAFF

- William Bacon
- Tim Canan
- Anant Choudhary
- Joe Davis
- Yu Gao
- Charlene Howard
- Ken Joh
- Arianna Koudounas
- James Li \*
- Ron Milone
- Mark Moran
- Jessica Mirr
- Ray Ngo
- Wanda Owens
- Jinchul Park
- Dusan Vuksan
- Feng Xie
- Jim Yin
- C. Patrick Zilliaccus

This meeting of the Travel Forecasting Subcommittee (TFS) was chaired by Ms. Yuanjun Li.

## 1. INTRODUCTIONS AND APPROVAL OF MEETING HIGHLIGHTS

The highlights of the July 20, 2018 meeting of the TFS were approved without change.

## 2. STATUS REPORT ON THE VER 2.5 TRAVEL MODEL DEVELOPMENT AND EVALUATION

Mr. Milone presented this item and spoke from a set of presentation slides, which were distributed to the subcommittee. Mr. Milone refreshed the subcommittee on the background of the Ver. 2.5 model and he reminded the group that the Ver. 2.5 travel model has been under evaluation by TPB staff for about one year. The effort to bring the model into production use has clearly taken longer than expected. Staff has nonetheless made substantial progress getting comfortable with the model and continuing its refinement. He also reminded the group that the Ver. 2.5 model will be considered “ready” for production when:

- It validates to observed (2014) data as well as the existing Ver. 2.3 model;
- The running time is deemed acceptable;
- The model’s demonstrated response to system, land use and policy changes is deemed to be reasonable; and
- The model is adequately documented.

The Ver 2.5 model application has undergone several revisions since its delivery at the end of FY 2017. The most recent application, known as Ver. 2.5.9, is the best performing version of the Ver. 2.5 family of models from a validation-performance perspective. It includes the basic features implemented by Cambridge Systematics, Inc. (CS) along with an improved treatment of external trips (a feature that was implemented by TPB staff in recent months). Mr. Milone reviewed the most recently prepared validation results of the Ver. 2.5.9 model with respect to year-2014 observed data. He also shared, for the first time, forecast-year results of the 2.5.9 model with comparisons to similar forecasts produced by the Ver. 2.3.75 model, which was used in the most recent air quality conformity (AQC) analysis and is likely to become the adopted, production-use model on Oct. 17 if the TPB approves the AQC analysis. Mr. Milone underscored the following key findings to the subcommittee:

- The VMT validation performance of the Ver. 2.5 model at the jurisdictional level was found to be quite reasonable. All estimated-to-observed (E/O) ratios at the jurisdiction level (jurisdictions within the TPB-member area) were within the range of 0.9 to 1.1 (i.e., +/-10%), except for Frederick County (1.12 E/O ratio).
- The percent RMSE performance of the Ver. 2.5 model was slightly inferior to that of the Ver. 2.3 model. The Ver. 2.5 freeway %RMSE was 29%, compared to 21% for the Ver. 2.3 model. The overall %RMSE for the Ver. 2.5 model was 45%, compared to 41% for the Ver. 2.3 model.
- The E/O daily screenline crossing performance was found to be generally acceptable and comparable to that of the Ver. 2.3 model. Staff noted, however, that the Ver. 2.5 model yielded an 11% under-estimation for Potomac River crossings.
- Staff’s most recent analysis of E/O transit boardings has indicated that the Ver. 2.5 model under-predicts regional transit boardings by 15% (the existing Ver. 2.3 model over-predicts

transit boardings by 5%). While the Ver. 2.5 model matches Metrorail boardings reasonably well (1.05 E/O ratio), the non-Metrorail sub-mode boardings appear to be under-estimated.

- Staff noted that the Vehicle-Hours-of-Delay (VHD) metric forecasted by the Ver. 2.5 model is substantially less than that forecasted by the Ver. 2.3 model (about 40% less in 2014 and about 30% less in 2045). Further, the *rate* of growth in VHD between 2014 and 2045 is shown to be larger for the Ver. 2.5 model (100% growth) than the V2.3 model (85% growth). Staff informed the group that the VHD differences noted were attributed to updated Volume-Delay functions (freeway and expressway facilities) that are now used in the V2.5 traffic assignment process. The updated function is less sensitive to congested conditions than the function used in the Ver. 2.3 process. The update was prompted to address previous research that suggested that the congested speeds produced by the Ver 2.3 model were less than observed speeds.<sup>1</sup>

Mr. Milone also mentioned that staff is attempting to shorten the rather excessive running time requirements of the Ver. 2.5 process (27-33 hours, depending on the computation environment). Staff will continue work on the Ver. 2.5 model and a determination will be made at the end of the calendar year about its readiness for production use.

Mr. Bunch suggested that, given the updated Volume-Delay functions, mobile emissions derived from the Ver. 2.5 model should be evaluated to assess potential impacts. Staff agrees. Ms. Li inquired about which Cooperative Forecast version was used for the Ver. 2.5 model evaluation. Staff informed her that Round 9.1 was used (Round 9.1 land activity is anticipated to be adopted at the upcoming Oct. 17 TPB meeting). Mr. Goldfarb inquired about which version of Cube was used for the Ver. 2.5 model evaluation. Staff informed him that Cube Voyager Version 6.4.2 is currently being used. Mr. Freeman commented that the VMT performance for Frederick Co. (which is over-estimated by 12%) should be investigated. Staff concurs that the over-estimation requires examination.

### **3. STATUS REPORT ON DEVELOPING THE TPB'S GENERATION-3 (GEN3) TRAVEL DEMAND FORECASTING MODEL**

Mr. Moran presented this item and spoke from a set of presentation slides, which were distributed to the subcommittee. He first discussed updates to the project timeline for the Gen3 model development (slide 3). Staff has finished the Request for Information (RFI) stage and is now starting the Request for Proposals (RFP) stage. Compared to the status in July,

- The duration of RFI phase had been extended to allow more review time.
- The RFP advertisement period has shifted from Sept./Oct. to Nov./Dec.
- The likely start date of the contract has shifted from Nov. 2018 to Mar. 2019.

Mr. Moran also discussed updates to the strategic plan for model improvement (slide 4). Mr. Moran then presented some aggregated, anonymized findings (slides 7-15) based on the seven formal responses that were received regarding the Gen3 model RFI. He noted that the purpose of the summaries was to show general tendencies in the responses, but he cautioned that the summaries should not be construed to imply a preferred approach by TPB staff. The modeling approach preferred by TPB staff will be specified in the future, as part of the scope of work (SOW) of the upcoming RFP. Mr. Moran concluded with some next steps, including approximate dates:

- RFP advertisement period: Nov. to Dec. 2018
- Vendor selection: Jan. to Feb. 2019

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<sup>1</sup> AECOM and Stump/Hausman Partnership, "Draft FY 2013 Final Report, COG Contract 12-006: Assistance with Development and Application of the National Capital Region Transportation Planning Board Travel Demand Model" (National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments, July 1, 2013), 6-21, <http://www.mwcog.org/transportation/activities/models/review.asp>.

- Start of contact: Mar. 2019

Regarding the summaries of modeling features proposed by the seven responding vendors, Mr. Graye noted that a regional travel demand forecasting model is not going to be able to do everything for everyone. He added that, in some cases, instead of including a certain feature in the regional model, it might make more sense to develop a post processor that would implement that feature. Mr. Moran agreed that TPB staff views its primary role as developing a regional model, which others might then take and customize for sub-regional analyses. Mr. Milone added that the important question is how much detail is needed in the regional model to address a policy or phenomenon. Mr. Bunch asked if any of the seven responding vendors had any insight into peak-period spreading or modeling time-of-day phenomena. Mr. Moran said that, to maintain the anonymity of the respondents, he was not prepared to offer any information about vendor responses regarding those two areas.

Ms. Vanderwaart asked whether the TFS would be able to provide review of the RFP SOW and/or a revised Product Requirements Document (PRD). Mr. Moran said that the intent was that the TFS would be able to provide oversight of both the SOW and the PRD. He noted that, given that the TFS meets only every two months, some of this review might be conducted via email between meetings. Mr. Donkor asked if any of the RFI respondents discussed inclusion of adding other, newer modes of travel to the model, such as ride-hailing services/transportation network companies (TNCs), like Uber and Lyft. Mr. Moran noted that the PRD did address the fact that staff would like to add TNC's to the Gen3 model. Inclusion of connected/autonomous vehicles (CAVs) is yet more challenging, since, unlike TNCs, the technology is not yet widely deployed, so incorporation of CAVs in regional travel models is, at this point, still very speculative. Nonetheless, many consultants are working on finding the best ways to include CAVs into regional travel models.

Ms. Li mentioned the challenge of adding non-motorized travel modes (bike and walk) to the regional model. Ms. Vanderwaart noted that we may need to come up with a new term, since non-motorized travel would not, in a strict sense, cover electric bikes (e-bikes) and electric scooters (e-scooters), which have motors. Mr. Kline echoed the earlier comments of Mr. Graye: No matter how much detail you add to the regional travel model, counties will likely still find the need to add additional detail to their county-focused models. Mr. Patnam asked whether the 2017/2018 Regional Travel Survey (RTS) would be ready for use in developing the Gen3 model. Mr. Moran noted that RTS data was likely to be ready for model development use in the year 2020 (i.e., late FY 2020 or early FY 2021), which would fall in the middle of the developmental period of the Gen3 model. The availability of the survey data will depend on the time it takes to geocode, clean, and factor the data, which, in turn, is dependent on the staffing resources that can be assigned to do the work.

#### **4. STATUS REPORT ON THE 2017-18 COG/TPB REGIONAL TRAVEL SURVEY**

Dr. Joh presented this item and distributed presentation slides to the subcommittee. He provided an update on the 2017-2018 Regional Travel Survey, a once-in-a-decade household travel survey for the National Capital Region that launched on October 3, 2017. He provided an update on the recruitment and completion rates to date. Dr. Joh also gave an update of the Hispanic and Latino outreach for the survey and the survey schedule. Post-survey processing will begin January 2019 and continue into FY 2020. Public release dataset is anticipated in FY 2020.

No questions were asked by attendees.

## **5. RON'S RUMINATIONS ON TRANSPORTATION PLANNING**

Mr. Milone reflected on his experiences in the transportation planning profession after 30+ years of work in the metropolitan Washington, D.C. area. He offered his personal observations on getting into the transportation planning field and on how the region has (and has not) changed since the 1982 Plan Evaluation. He also reviewed historical/projected land activity use trends in the Washington region. Ron will retire from COG at the end of October.

## **6. REGIONAL TRANSPORTATION DATA CLEARINGHOUSE (RTDC): RECENT UPDATES**

Ms. Howard presented this item and spoke from a set of presentation slides, which were distributed to the subcommittee. She provided a brief overview of the updates made to the Regional Transportation Data Clearinghouse OpenData page and Viewer. She also presented the updates now available for Performance Based Planning and Programming (PBPP) datasets, Bridge Condition performance (2017) and Pavement Condition performance (2016). These datasets are available for download as feature classes and include data for the TPB region. Updates to the Vehicle Classification data were also presented and the 2015 weekday and weekend counts are now available. A 2012 Metrorail Passenger Survey station summary document was added. Two Visualize 2045 online products have also been added to the clearinghouse library: The Aspirational Element and the Financially Constrained Element. Then, Ms. Howard discussed the next updates, which include transit ridership data for FY18 and the PBPP Bridge and Pavement Condition Dashboard.

Ms. Li asked what kind of data the team is requesting to be included in the clearinghouse library. TPB staff indicated that it is constantly looking for data to add that would be of interest to regional planners, and staff encouraged agencies to contact us if they have data sets that should be added to the RTDC. A participant asked about the date of the latest traffic counts in the RTDC and whether counts are in units of AADT or AAWT. Staff noted that both 2014 and 2015 hourly-vehicle classification data are available for download on the clearinghouse website (<https://gis.mwcog.org/rtdc>). Counts can be found in both AADT and AAWT. 2016 AADT/AAWDT counts are also available, but hourly-vehicle classification data for the year 2016 are not yet available.

## **7. USDOT'S BUREAU OF TRANSPORTATION STATISTICS' (BTS) NATIONAL TRANSPORTATION ATLAS DATABASE (NTAD) AND OTHER STATISTICAL PRODUCTS**

Mr. Strocko, who spoke from a series of presentation slides, began by informing the subcommittee about the history and mission of the Bureau of Transportation Statistics (BTS). The agency was created in 1991 as part of the Intermodal Surface Transportation Efficiency Act (ISTEA). BTS was created to administer transportation data collection, analysis and reporting; and to ensure a cost-effective use of resources. Mr. Strocko stated that BTS also provides timely, accurate, and credible information about the U.S. transportation system, the movement of people and goods, and the consequences of transportation for the economy, society and the environment.

Mr. Strocko then presented the seven major components of the BTS mandate:

- Intermodal Transportation Data
- National Transportation Atlas Database (NTAD)
- Transportation Performance and Impacts
- Airline Information (one of the most requested BTS data streams)
- Safety Data Program
- National Transportation Library (NTL)
- Statistical Coordination

Mr. Moran asked whether there is a physical library that can be visited by the public. Mr. Strocko said that there is a small library, but he noted that the emphasis is on providing digital information via the Web. Mr. Strocko then discussed the NTAD, noting that information comes from a variety of sources, such as the U.S. Department of Transportation (USDOT), the U.S. Geological Survey (USGS), and the U.S. Army Corps of Engineers. Mr. Strocko indicated that all maps and data are in ESRI format and are stored in the cloud. Mr. Moran asked whether the BTS can provide Amtrak passenger data. Mr. Strocko said that it did. Mr. Strocko noted that BTS strives to have both national and state-level transportation statistics for all modes of travel. There are 70 geospatial layers stored in the cloud server (NTAD website: <https://www.bts.gov/geospatial/national-transportation-atlas-database>).

Regarding a map showing road and aviation noise (slide 16), Mr. Moran asked whether the noise data came from sound monitoring stations or from noise models. Mr. Strocko indicated that BTS produces the map using a combination of the two. Mr. Moran also stated that AMPO used to produce a U.S. map showing the boundaries of all MPOs in the U.S., and he wondered whether the BTS now produces anything like this. Mr. Strocko was uncertain, but he thought that BTS did, in fact, have some boundary information for MPOs. Ms. Howard said that FHWA now produces a series of MPO boundary maps.

Mr. Strocko noted that BTS collects and distributes GTFS data (static data only, not real-time data), but only for agencies that have signed a waiver. For example, the map in slide 17 omitted Ride-On GTFS data for the Washington, D.C. area. Mr. Moran commented that in our region, we estimate 50% of the transit providers provide GTFS data. Since this is dominated by the larger transit agencies, the result is that about 80-85% of the transit route miles are represented by GTFS data. Even though BTS does not have GTFS data for every transit agency, Mr. Strocko noted that BTS would like to encourage more transit agencies to provide GTFS data and to sign the waiver allowing its release.

Mr. Yin asked for more detail about when BTS updates to their GTFS data occur. Mr. Strocko said that BTS updates its GTFS feed twice a year: In the spring and fall (April and October), and will try to do an update on a quarterly basis in the future. A subcommittee member asked whether BTS is storing travel models used by MPOs across the U.S. Mr. Strocko noted that BTS is looking into that. BTS welcomes feedback from users on what data are needed for future improvement.

## **8. ROUNDTABLE DISCUSSION OF CURRENT MODELING EFFORTS AROUND THE REGION**

No current modeling efforts or projects were discussed for this item on the agenda.

## **9. NEXT MEETING DATE AND OTHER BUSINESS**

The next meeting of the TFS Friday, November 30, 2018 from 9:30 AM to 12:00 noon.

The highlights were drafted by Joe Davis and the meeting presenters, compiled by Joe Davis, and edited by Mark Moran and Ron Milone.