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National Capital Region
Transportation Planning Board

TPB TRAVEL FORECASTING SUBCOMMITTEE

HIGHLIGHTS OF THE MAY 19, 2023 MEETING, HELD 9:30 AM TO 11:30 AM

Meeting was held virtually via web conferencing software. There was no on-site meeting.

MEETING ATTENDEES

MEMBERS, ALTERNATES, AND PARTICIPANTS

- Jonathan Avner (Whitman, Requardt & Assoc.)
- Kelvin Belcher (MDOT-SHA-TFAD)
- James Bunch (Mead & Hunt)
- Kevin Chai (Fairfax Co. DOT)
- Joel Freedman (RSG, Inc.)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Ramgiridhar (Giri) Kilim (VDOT)
- Li Li (Whitman, Requardt & Assoc.)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Cambridge Systematics)
- Srikanth Neelisetty (Transurban)
- Krishna Patnam (AECOM)
- Marie Pham (Loudoun Co.)
- Mark Radovic (Gannet Fleming)
- Mushtaqur (Mushtaq) Rahman (Baseline Mobility Group)
- Harun Rashid (NVTA)
- Andrew Rohne (RSG, Inc.)
- Rana Shams (MDOT)
- Elham Shayanfar (MDOT)
- Gaurav Vyas (Bentley Systems, Inc.)
- Malcolm Watson (Fairfax County DOT)
- Chris Wichman (AirSage)
- Jim Yang (M-NCPPC, Prince George's Co.)
- Yi Zhao (DDOT)

COG STAFF

- William Bacon
- Anant Choudhary
- Joe Davis
- Nazneen Ferdous
- Cristina Finch
- James Li
- Mark Moran
- Ray Ngo
- Wanda Owens
- Jinchul (JC) Park
- Jane Posey
- Meseret Seifu
- Dusan Vuksan
- Feng Xie
- Zhuo Yang
- Jim Yin

This meeting of the Travel Forecasting Subcommittee (TFS) was chaired by Dr. Zhao

1.   OPENING: MEETING ROLES, MEETING RULES, ROLL CALL OF PARTICIPANTS

Mr. Moran discussed roles of the meeting participants (e.g., chair, host, technical host, and note taking), meeting rules, and then performed a roll call of participants.

2. APPROVAL OF MEETING HIGHLIGHTS FROM THE MARCH 24 MEETING

Dr. Zhao began chairing the meeting. The highlights of the March 24, 2023, meeting of the TFS were approved without any changes.

3. LEVERAGING DIFFERENT DATA SOURCES FOR AUTOMATED CALIBRATION OF TRAVEL DEMAND MODELS IN AGENT SOFTWARE

This item was presented by Mr. Vyas from Bentley Systems, who spoke from a set of presentation slides. Mr. Vyas discussed that mobility is undergoing a generational change with new technology (e.g., automated vehicles, electric vehicles, mobility as a service) and changing travel patterns (e.g., the pandemic, work-from-home, telecommuting) having a profound effect on forecasting travel. At the same time, re-calibrating travel models can be laborious and time-consuming. Mr. Vyas discussed how to take advantage of passively collected big data sources like cellphone, GPS, and transit smart card data with conventional data sources like household travel surveys, traffic counts in Bentley's AGENT automated calibration procedure, which is designed to help agencies to provide meaningful, efficient, and frequently updated planning decision support. AGENT is a software platform for creating a variety of travel demand forecasting models, either trip-based or activity-based.

Mr. Patnam noted that there have been recent TFS presentations from several travel demand modeling software vendors and he asked whether COG/TPB staff is considering a software migration. Mr. Moran stated that, for the production-use travel model (Gen2 Model), Bentley Cube is the current software platform. He also noted that the upcoming activity-based model (Gen3 Model) will use both Bentley Cube (for transportation supply) and ActivitySim (for transportation demand). Nonetheless, he noted that it is important to keep abreast of what is happening in the industry and with competing software vendors. He also noted that Citilabs Cube and INRO EMME Software are now both part of Bentley Systems, Inc.

Regarding slide 14 ("MTC 1.5 calibration: Comparison at zone level"), Mr. Freedman asked what had been calibrated in the plot to the right? For example, were the size terms adjusted or was it just applying TAZ-specific constants? Mr. Vyas answered, no, the automated calibration did not add any TAZ-specific calibration constants. If we had done that, then the problem would have become over-specified. In this case, we changed the coefficient on distance and changed the attraction terms.

Regarding model calibration with multiple targets (e.g., slides 20-23), Mr. Xie asked, in the chat window, how does one determine the relative importance factor of each target? Mr. Vyas said the importance factor reflects the reliability of a data source. In the case of data with multiple calibration targets, the importance should be set based on the reliability of each data source. If the targets are equally reliable then a user can set equal importance to all the targets. Typically, we set higher importance factors for traffic counts since we have a high degree of confidence in them.

Mr. Vyas paused at slide 27 for any questions. In the chat window, Mr. Li asked how tighter privacy regulations would affect the way that LBS and Big Data are used for model calibration. Mr. Vyas said the automated calibration procedure in AGENT is not tied to just one source of Big Data. The process of data fusion allows one to use multiple datasets together for model calibration. Although some new privacy regulations may, in fact, limit the availability of LBS/Big Data, in such a scenario, we can leverage other data sources (traffic counts, transit counts, etc.) for model calibration.

Dr. Zhao asked how the multi-target calibration process will lead to reduced model calibration time. Mr. Vyas said that data fusion and use of multiple data sources for model calibration actually expedites your model calibration process. In most cases, the Big Data and the traffic counts will complement each other. In some cases, however, it could be that the Big Data contradicts some of

the traffic count data. In these cases, there will be a back-and-forth process to the calibration effort. But, in general, it is viewed that we do not need to rely simply on sequential calibration of models, as was the most common practice in the past.

In the chat window, Mr. Patnam asked what versions of Cube are compatible with AGENT? Mr. Vyas said that, at this point, AGENT is an add-on to EMME, but it is also available to Cube users. So, if you are a Cube user and you are using Cube 6 or Cube 7 (via the early access program), Bentley can work with you to make AGENT work with Cube. Future versions, such as Cube 2023, should have a tighter integration of AGENT and Cube.

Mr. Rahman asked how long it took to calibrate the Maricopa Association of Governments (MAG) model using AGENT? Mr. Vyas said that run time is dependent on which computer you are running on, but it took about 10 iterations of the demand model, run in calibration mode, to calibrate the MAG model.

4. PLANNED UPDATES TO THE COG/TPB PRODUCTION-USE, AGGREGATE, TRIP-BASED TRAVEL DEMAND FORECASTING MODEL, KNOWN AS THE GEN2/VER.2.4.6 TRAVEL MODEL

This Item was presented by Mr. Ngo who spoke from a set of presentation slides. Mr. Ngo's presentation focused on the six updates in the Gen2/Ver. 2.4.6 Model, highlighting its compatibility with on-premises servers (Windows Server 2012, Cube 6.5 or Cube 6.4.1) and cloud servers (Windows Server 2019, Cube 6.5). He shared that the model outputs closely matched those of the predecessor model, the Gen2/Ver. 2.4 Model. Staff plans to release the Ver. 2.4.6 Model as the production-use model this summer, and it is planned that it will be used for the upcoming air quality conformity analysis of the 2025 Long-Range Transportation Plan (LRTP), known as Visualize 2050. He said that if Visualize 2050 is approved by the TPB (scheduled in June 2025), the Ver. 2.4.6 Model or its successor will become the adopted, production-use regional travel model.

Mr. Avner asked what round of the Cooperative Forecasts of land activity will be included with the production-use model and the adopted, production-use model. Mr. Ngo said that Round 9.2 will be included in the former and Round 10 will be included in the latter. Mr. Patnam asked about the cloud setup used by COG/TPB staff for testing the Ver. 2.4.6 Model. Mr. Ngo said that staff tested the model on Amazon's m6a.4xlarge and t3.2xlarge instances. The m6a.4xlarge instance has 16 threads and 64 GB RAM, and costs $1.43 per hour, while t3.2xlarge instance has 8 threads, 32 GB, and costs $0.48 per hour.

5. STATUS REPORT ON THE COG/TPB DEVELOPMENTAL, DISAGGREGATE, ACTIVITY-BASED TRAVEL DEMAND FORECASTING MODEL, KNOWN AS THE GEN3 TRAVEL MODEL

This item was presented by Mr. Freedman of RSG, who spoke from a set of presentation slides. Mr. Freedman provided updates on Gen3 Phase 2 model development. Mr. Freedman first described work completed since the last Gen3 TFS update presentation. These include model functionality updates such as improved error checking, some bug fixes, and enhancements for modeling autonomous vehicles. Next Mr. Freedman described the one-and-one-half-day, on-site training recently conducted by RSG for MWCOG staff on how to set up and use the Gen3 Model. Mr. Freedman then described the plan for sensitivity testing for the Gen3 Phase 2 model. Mr. Freedman spent the bulk of the presentation on the Gen3 Phase 2 model calibration and validation results achieved to date and concluded by describing next steps for completion of the project.

Mr. Graye asked whether COG/TPB staff plan to provide training on the Gen3 Model for member jurisdictions. Mr. Moran said, yes, after we receive the final, calibrated model from RSG this summer,

we plans to do usability testing. When that is done, we plan to decide whether the Gen3 Model is production-use ready. Presuming that it is, COG/TPB staff plan to offer training in using the Gen3 Model.

6. ROUNDTABLE DISCUSSION OF CURRENT MODELING EFFORTS AROUND THE REGION

There were no reports offered on modeling efforts around the region.

7. OTHER BUSINESS

a. Next planned TFS meeting

The next meeting of the TFS is scheduled for Friday, July 21, 2023, at 9:30 AM. After that, our next two meetings are scheduled for Friday, September 22 and Friday, November 17. Until the Gen3 Model project is completed, we plan to have a status report at each TFS meeting about the development of the Gen3 Model.

b. Planned presentations at upcoming TFS meetings

TPB staff strives to have at least one external/non-COG presenter at each TFS meeting. At the July 21 TFS meeting, in addition to a status report on the Gen3 Model, the following topics are planned on the agenda:

- Household travel survey state-of-the-practice recommendations (Ken Joh)
- Regional coordination of transit on-board surveys (Tim Canan)
- Presentations from the Transportation Research Board Innovations in Travel Analysis and Planning Conference, Indianapolis, Indiana, June 2023: "Sensitivity Testing of Activity-Based Models" (Andrew Rohne)

For the September 22 TFS meeting, we have the following planned guest presentation:

- Presentations from the Transportation Research Board Innovations in Travel Analysis and Planning Conference, Indianapolis, Indiana, June 2023: "Measuring Racial Equity Geographically: What Works and What Needs Work" (Brian Lee and Stefan Coe, Puget Sound Regional Council)

Mr. Moran requested that people interested in making presentations to the TFS please contact him, so that he can schedule the presentation.

8. ITEM 7: OTHER BUSINESS

Ms. Li announced that Eric Graye (M-NCPPC, Montgomery Co) will be retiring, effective July 1, 2023. Several TFS members congratulated Eric on his successful career and his efforts to advance regional planning and travel demand modeling.

9. ADJOURN

The meeting adjourned at 11:19 A.M.