National Capital Region
Transportation Planning Board

Draft

As of 1/19/2023

TPB TRAVEL FORECASTING SUBCOMMITTEE

HIGHLIGHTS OF THE NOVEMBER 18, 2022, MEETING

9:30 AM to 12:00 noon. Meeting was held virtually via web conferencing software. There was no on-site meeting.

MEETING ATTENDEES

MEMBERS, ALTERNATES, AND PARTICIPANTS

- Charles Baber (BMC)
- Keith Belcher (MDOT-SHA-TFAD)
- Kevin Chai (Fairfax Co. DOT)
- Yucong Du (Jacobs)
- Joel Freedman (RSG, Inc.)
- Dan Goldfarb (MITRE Corporation)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Anthony Hofmann (Baker)
- Erik Jenkins (Loudoun Co. DTCI)
- Jaesup Lee (M-NCPPC-Montgomery Co.)
- Li Li (Whitman, Requardt & Assoc.)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Cambridge Systematics)
- Roberto Miquel (Whitman, Requardt & Assoc.)
- Vahid Moshtagh (VDOT)
- Srikanth Neelisetty (Transurban)
- Krishna Patnam (AECOM)
- Caroline Pecker (MDOT-SHA)
- Mark Radovic (Gannet Fleming)
- Tom Rossi (Cambridge Systematics)
- Brian Ryder (BMC)
- Rana Shams (MDOT)
- Elham Shayanfar (MDOT)
- Lisa Shemer (MDOT-SHA)
- Malcolm Watson (Fairfax County DOT)
- Jim Yang (M-NCPPC, Prince George's Co.)
- Yi Zhao (DDOT)

COG STAFF

- William Bacon
- Mackenzie Bosco
- Tim Canan
- Anant Choudhary
- Joe Davis
- Nazneen Ferdous
- Yu Gao
- Ken Joh
- James Li
- Martha Kile
- Sanghyeon Ko
- Nicole McCall
- Mark Moran
- Erin Morrow
- Ray Ngo
- Wanda Owens
- Jinchul (JC) Park
- Jane Posey
- Meseret Seifu
- Daniel Son
- Dusan Vuksan
- Feng Xie
- Zhuo Yang
- Yue Zhang

* All meeting participants attended the meeting remotely via WebEx.

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

1. INTRODUCTIONS AND APPROVAL OF MEETING HIGHLIGHTS FROM THE PREVIOUS MEETING

First, a roll call was conducted. Next, the highlights of the September 23, 2022, meeting of the TFS were approved.

2. TESTING THE TPB'S TRAVEL MODELS AND MOVES MODELS ON AWS CLOUD SERVERS

This item was presented by Mr. Ngo and Mr. Park, who spoke from a set of presentation slides. Mr. Ngo reported that COG has been migrating many of its on-premises servers to Amazon Web Services (AWS). He noted that many considerations should be considered in the migration decision, including cost and performance. Regarding performance of the cloud for the Gen2 and Gen3 models, the testing results showed faster model runtimes on the selected AWS servers than the current on-premises computers. He said that concurrent runs by more than one user on the cloud are feasible. Based on the tests, staff chose three cloud server specifications (high, medium, and low) for the Gen3 Model, Gen2 Model, and other computer usage, for the next phase of modeling work. COG plans to set up some AWS on-demand servers for a full trial, and possibly move the modeling data to AWS by the end of December.

Mr. Moshtagh asked whether COG is simply exploring the cloud or actively planning to migrate the on-premises modeling servers to the cloud after the testing phase. Mr. Ngo responded that COG staff plans to make the move if the cloud solution meets both the cost and performance requirements. Mr. Moshtaugh asked whether it is necessary for external agencies to follow the migration lead by COG. Mr. Ngo said that the decision for the external agencies to stick with the on-premises computers or move to the cloud is up to each agency. He highlighted some factors, including the needs of each agency and the cost analysis, that may influence the decision. Mr. Patnam asked whether the Cube software license works with the AWS servers. Mr. Ngo said that COG's current software contract with Bentley allows COG staff to use Cube, including Cube 6.5, on the cloud. Ms. Yuanjun Li asked whether COG could share the AWS servers with local agencies. Mr. Moran responded that the sharing option is not available now because COG staff are still in a testing phase. Moreover, the current Cube license contract with Bentley permits software use by only COG staff.

Ms. Yuanjun Li followed up with several questions in the WebEx chat Box: 1) Is the server usage sharable with local jurisdictions? 2) Will the fee schedule be a yearly subscription? and 3) How much work is this for IT to support? Mr. Moran stated that, regarding the first question, not at this time,

since we are still in a testing stage and the software license does not allow external users. But other agencies are welcome to follow our lead. Regarding the other questions, Mr. Moran suggested that Ms. Yuanjun Li follow up with us after the meeting via email.

Mr. Park stated that COG is conducting mobile emissions modeling, using the EPA's MOVES model, in the cloud (AWS) for two main reasons: first, to ensure that the model can be run in an acceptable amount of time; and, second, to shorten the model run time, which could allow for conducting more model runs in a given period of time. Staff expected that MOVES modeling on AWS would save staff time and effort, especially in production or scenario planning where multiple MOVES runs might need to be executed and evaluated. Currently staff set up five workstations in the cloud (known as "instances") for three versions of the MOVES model (two for MOVES2014B, two for MOVES304 and one for MOVES303). COG staff have been conducting performance tests on these "on-demand" instances. MOVES modeling on AWS shortened model run times by almost a half for all MOVES model versions, while producing identical emissions results as those produced by an on-premises workstation. Based on the MOVES modeling experience on AWS, staff have the following comments: 1) Sharing/isolating disk and software among instances is necessary; 2) Users should control software versions for each MOVES model; 3) Simultaneous access to AWS instances by multiple users will enhance work efficiency; 4) Users need to develop a file management system to manage files on AWS and AWS usage time; and 5) A handbook would be useful for AWS users which includes a log-in procedure, usage time, budget limits, and troubleshooting.

3. RECENT UPDATES TO THE TRAVEL BALTIMORE METROPOLITAN COUNCIL INSITE ACTIVITY-BASED TRAVEL MODEL

This item was presented by Mr. Baber and Mr. Rossi, who spoke from a set of presentation slides. Mr. Baber introduced the topic and then Mr. Rossi presented a summary of BMC's InSite activity-based model and the recent update to a 2019 base year, which included adding three counties to the model region, use of additional data for model application and validation, and structural changes made to a few models. He presented two run-time enhancements, population sampling and TourCast multi-processing, which reduced run times by 32%. In total, due to the runtime reductions in both population sampling and TourCast multi-processing, the total runtime was reduced about 60%. He also presented the model validation process for the new base year, including demand component validation, assignment validation, and the use of LOCUS location-based-services (LBS) data.

Ms. Yuanjun Li asked whether the BMC/consultant team used COG's 2017/2018 Regional Travel Survey (RTS) when validating Montgomery, Prince George's, and Frederick counties. For example, did the BMC/consultant team have separate validation numbers for each of the three counties that are outside of BMC region? Mr. Rossi stated that they did not separate these three non-BMC counties in their validation segmentation. He noted that he did believe that the team did use the 2017/2018 COG survey data in validation, but he wanted to confirm that.

Ms. Yuanjun Li asked whether the validation was done by time of day or daily only. She was also curious how school trips were validated. Mr. Rossi stated that we do validate the various demand mode components for each activity purpose, including school. These include location, mode, and time-of-day choice at the tour and shop/trip levels. Daily activity patterns are validated by person type, including children by age group, i.e., preschool, elementary, and driving age.

Ms. Yuanjun Li asked why Queen Anne's Co. was added into the BMC modeled area. Mr. Baber stated that Queen Anne's Co. is now a member of the Baltimore Regional Transportation Board (BRTB, the MPO) and BMC.

Mr. Baber continued presenting on work visualizing InSite inputs/outputs using a Tableau dashboard (starting on slide 13). The InSite dashboard contains a tab allowing users to summarize and tabulate InSite horizon-year trips and another tab that displays trends from two or more horizon years. Users can interact with the dashboard using socioeconomic and demographic and trip attribute filters. In addition, users can choose chart and table summary variables of either trips, person miles/hours, or vehicle miles/hours. Summary variable charts and table totals can be segmented using household variables of poverty status, household size, auto ownership, household income, and household type.

The dashboards will be made available on BMC's website. Dashboard design will allow public agencies and the public to initiate a basic analysis of travel patterns and trends. The dashboard chart and table completed analysis can be downloaded and incorporated into reports and presentations. Mr. Xie asked whether the InSite Model been used for Long-Range Planning Analyses for BMC. He also asked whether BMC has engaged local jurisdictions about using the InSite Model. Mr. Baber stated that, for the last air quality conformity determination, they adopted InSite as BMC's official modeling tool. Additionally, InSite was used in the last TIP air quality conformity analysis, completed last July. Round 10.0 Cooperate Forecasts were used along with a new transportation analysis zone (TAZ) structure. Mr. Baber noted that InSite has been used for some of BMC's technical analyses in preparing for the Long-Range Transportation Plan and project selection. As far as local jurisdictions using InSite, local governments stopped modeling support many years ago. Thus, in the Baltimore region, it is just BMC and MDOT SHA which are using InSite currently. SHA has installed and ran the previous model of InSite, but we still need to send SHA the latest version (2019 validation) to SHA for their use.

4. EVALUATION OF THE 7-DAY PANEL COMPONENT OF THE 2017-2018 REGIONAL TRAVEL SURVEY

Dr. Joh presented this item to the subcommittee and spoke from a set of presentation slides. The presentation focused on an evaluation of the 7-day panel survey to assess the effectiveness of the smartphone app-based survey methodology. Dr. Joh discussed the key findings from this project which included data editing and imputation, trip logic and consistency checks, and a review of user comments on the survey experience.

No questions were asked by the subcommittee.

5. COG/TPB GEN3 TRAVEL MODEL: STATUS REPORT

This item was presented by Mr. Freedman of RSG, who spoke from a set of presentation slides. Mr. Freedman provided updates on the estimation, implementation, and calibration of the Gen3 Phase 2 Model. Mr. Freedman noted that the development schedule is about two months behind schedule, but he added that the consultant team expects to catch up soon. Mr. Freedman stated that all the model components that we had planned to implement in Phase 2 have now been implemented, including:

- Vehicle Type Model
- Extension to Vehicle Type Model that considers autonomous vehicles
- Transit Subsidy Model
- Telecommute Frequency Model
- Auto Ownership Model (done by COG staff)
- Trip Mode Choice Model
- Coordinated Daily Activity Patter (CDAP) Model (done by COG staff)

- Mandatory Tour Frequency Model (done by COG staff)

Mr. Freedman stated that the Non-Mandatory Tour Frequency Model cannot be estimated at this time due to a software issue. So, the model will be just calibrated. Mr. Freedman also indicated that the documentation is in progress. He noted that the estimated models have been implemented and now being used in calibration. Mr. Freedman also discussed how "shadow pricing" is used in activity-based models to ensure that total workers who choose to work in a zone is proportional to the total input employment in the zone. He noted that this process can be slow, and it is not guaranteed to converge. Consequently, he said that RSG is working on a revised mechanism: a simulation-based constraint mechanism.

Ms. Yuanjun Li noted, in the chat window, that the auto ownership results for zero-car households, post calibration, did not seem to improve for Montgomery Co., Prince George's Co., and Frederick Co. in Maryland. She wondered whether that was because no jurisdiction-level adjustments were made. Mr. Freedman said that that was correct – we added jurisdictional adjustments for only DC, Arlington, and Alexandria.

6. THANK OUTGOING CHAIR AND ANNOUNCEMENT OF NEW CHAIR FOR 2023

Mr. Moran noted that the chair of the TFS rotates on a calendar-year basis between four entities: the District of Columbia, Maryland (state or local agency), Virginia (state or local agency), and a transit or regional agency. Based on the recent rotation order, the upcoming chair should be a representative from the District of Columbia. Mr Moran noted that the term of the chair ends at the end of the calendar year, but, because the TFS meets only in odd-numbered months, this is our last scheduled meeting of this calendar year, so the November meeting is typically when we thank our outgoing chair and introduce our in-coming chair.

First, Mr. Moran thanked the outgoing chair, Ms. Shemer, for her service to the subcommittee. He presented her with a digital copy of a certificate of appreciation, which had been signed by the chair of the TPB, Ms. Pamela Sebesky. Mr. Moran read the contents of the certificate to the subcommittee and offered that he could send her a framed, hard copy of the certificate in the mail, if she would like to have one.

Next, Mr. Moran announced the new TFS chair for 2023. The new chair will represent the District of Columbia and works for the District of Columbia Department of Transportation (DDOT). His name is Dr. Yi Zhao. Dr. Zhao is the Traffic Engineering Branch Manager at DDOT. He oversees the traffic engineering and traffic signal teams, which develop and review multimodal transportation models and analysis, traffic engineering studies, design plans for transportation improvement projects, and work zone traffic management plans in DDOT. Prior to joining DDOT, he held positions as a Senior Research Associate at FHWA's Turner-Fairbank Highway Research Center, an Assistant Professor at Beijing Jiaotong University, and a postdoctoral researcher at the University of Nevada, Reno. Dr. Zhao's term will begin on January 1, 2023, and the first TFS meeting of the year is scheduled for January 20.

7. ROUNDTABLE DISCUSSION OF CURRENT MODELING EFFORTS AROUND THE REGION

There were no updates provided by the meeting attendees.

8. OTHER BUSINESS

8a. Snapshots of effects of COVID-19 on travel, available on COG website

Martha Kile reported that COG/TPB staff continue to develop snapshots to illustrate how the COVID-19 pandemic is impacting travel in the metropolitan Washington region. We are currently analyzing

roadway data for October. Our preliminary results show that traffic in the inner core jurisdictions is at about 93 percent of 2019 levels. While levels in the outer jurisdictions are about 98 percent of the 2019 levels. Enplanements through April 2022 are available at the three major airports, combine. The levels are about 90 percent of 2019 levels. Enplanements at DCA has been higher than the 2019 levels every month beginning in April. We're also going to be looking at some-day week analysis. Although, there has been a decrease in the amount and quality traffic data available from the continuous counting stations. So we have to see if there's enough data to perform the analysis. The charts show changes in roadway traffic and enplanements link: https://www.mwcog.org/documents/2022/05/10/covid-19-travel-monitoring-snapshot-covid19-featured-publications-traffic-monitoring/

8b. AMPO Annual Conference, Oct. 25-28

Mr. Moran noted that the Association of Metropolitan Planning Organizations (AMPO) Annual Conference was held on October 25 to 28, 2022 in Minneapolis, Minnesota. The conference had about 400 attendees, including TPB staff. Here were some examples of TPB staff participation:

- Feng Xie presented on the TPB's ongoing efforts to develop a next-generation, activity-based regional travel model for transportation forecasting, to be known as the Gen3 Model, which will make use of the open-source ActivitySim software. ActivitySim development is being managed by a consortium of 11 agencies (including MWCOG), under the auspices of the AMPO Research Foundation.
- Ken Joh presented about a review of transportation surveys measuring impacts to travel behavior from COVID-19 that inform regional transportation planning.
- Tim Canan, Nicole McCall, Stacy Cook, and Lyn Erickson moderated sessions on various topics.

8c. Planned meeting dates for 2023

The planned meeting dates for 2023 are

- Friday, Jan. 27 (4th Fri.), 9:30 A.M. to 12 noon
- Friday, Mar. 24 (4th Fri.), 9:30 A.M. to 12 noon
- Friday, May 19 (3rd Fri.), 9:30 A.M. to 12 noon
- Friday, Jul. 21 (3rd Fri.), 9:30 A.M. to 12 noon
- Friday, Sep. 22 (4th Fri.), 9:30 A.M. to 12 noon
- Friday, Nov. 17 (3rd Fri.), 9:30 A.M. to 12 noon

8d. Planned presentations at upcoming TFS meetings

Mr. Moran provided an update on planned presentations at upcoming TFS meetings:

- Jan. 27 TFS meeting
    - "Using Location-Based Services and Metro Data to Understand Our Market" (Kayleigh Campbell, WMATA)
    - Gen3 Model, status update (RSG staff)

TPB staff strives to have at least one external/non-COG presenter at each TFS meeting. At the current time, there are no scheduled non-COG presenters for the March, May, July, September, and November meetings. Mr. Moran requested that people interested in making presentations to the TFS

please contact him, so that he can schedule the presentation. (Update: As of January 2023, PTV plans to make a presentation about integration of ActivitySim and PTV Visum software at the March 24 TFS meeting.)

8d. Next meeting scheduled for Friday, January 27, 2023

9. ADJOURN

The meeting adjourned at about 12:00 noon.