National Capital Region
Transportation Planning Board

TPB TRAVEL FORECASTING SUBCOMMITTEE

HIGHLIGHTS OF THE NOVEMBER 15, 2019 MEETING

Meeting time & location: 9:30 AM to 12:00 noon, Metropolitan Washington Council of Governments

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MEETING ATTENDEES

MEMBERS, ALTERNATES, AND PARTICIPANTS

- Kevin Chai (Fairfax County DOT)
- Zuxuan Deng (DDOT)
- Michael Eichler (WMATA)
- Nazneen Ferdous (Jacobs) *
- Dan Goldfarb (NVTC)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Kyeongsu Kim (Connetics Transportation) *
- David Kline (Fairfax County DOT)
- Jaesup Lee (M-NCPPC, Montgomery Co.)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Xuemei Liu (Cambridge Systematics) *

- Atabak Mardan (C&M Associates)
- Melissa McMahon (Arlington County, ACCS)
- Srikanth Neelisetty (Transurban) *
- Mark Radovic (Consultant for MD-SHA) *
- Harun Rashid (NVTA) *
- Alex Rixey (Fehr & Peers DC)
- Amir Shahpar (VDOT)
- Howard Slavin (Caliper) *
- Aichong Sun (AECOM)
- Jiaxin Tong (Kimley-Horn & Assoc.)
- Malcolm Watson (Fairfax County DOT) *

COG STAFF

- William Bacon
- Tim Canan *
- Anant Choudhary
- Joe Davis
- Charlene Howard
- Ken Joh

- Sanghyeon Ko
- James Li *
- Nicole McCall
- Mark Moran
- Ray Ngo
- Wanda Owens

- Meseret Seifu
- Dusan Vuksan
- Feng Xie
- Jim Yin

* An asterisk indicates that the person attended the meeting remotely via WebEx.

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

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

The highlights of the September 20, 2019 meeting of the TFS were approved without changes.

2. STATUS REPORT ON TPB'S TRAVEL DEMAND FORECASTING MODEL DEVELOPMENT ACTIVITIES

This item was presented by Mr. Moran, who spoke from a set of presentation slides, which were distributed to the subcommittee. Mr. Moran first discussed the TPB's production-use travel demand models, e.g., Gen2/Ver. 2.3.75 and Ver. 2.3.78. Regarding slide 4, Mr. Deng asked the meaning of the third index number in the model version number. Mr. Moran noted that the third index number indicates the number of minor changes that have been made to the model, such as bug fixes or feature enhancements. He noted that only some model updates result in a change in modeled results.

Next, Mr. Moran discussed the status of the strategic plan for model improvement and the developmental travel demand models, including Gen2/Ver. 2.3.82 through Ver. 2.3.84. In the Ver. 2.3.82 Model, updates were made to the way that external-to-internal (X-I) and internal-to-external (I-X) trips were handled in trip distribution, since it was found that trip lengths of the modeled trips were too long compared to the observed origin-destination data obtained from cellular devices (AirSage). A parallel effort was undertaken to improve the model's ability to replicate commuter rail travel, which, in previous model versions, was underestimated by 40%. Updates were made to path-building and transit assignment parameters used to convert actual travel and wait times to perceived times used in path-building to reflect the fact that commuter rail has unobserved attributes, such as comfort and convenience, that are hard to pick up in the travel model. This work resulted in a developmental model named Ver. 2.3.83. Then, a re-calibration of the mode choice model resulted in the Ver. 2.3.84 Model. With the revised model, commuter rail ridership is still underestimated, but it is much closer to observed data than before. For example, in the re-calibration of the model to year-2007 conditions, commuter rail travel is underestimated by 6%. When the model was run to simulate year-2014 conditions, commuter rail ridership was 24% underestimated, which is larger than what staff would like, but still an improvement over the 40% underestimation for the Ver. 2.3.75 Model. Mr. Moran reminded the subcommittee that commuter rail represents about 4% of transit travel in the region. He said that a model containing all of these updates would likely be called the Ver. 2.4 Model.

Mr. Moran stated that development of the Gen2/Ver. 2.5 Model is currently on hold. He reminded the subcommittee of previous presentation last year, which showed that the Ver. 2.5 Model was not performing up to expectations. First, of four sought model enhancements, only one (updating the transit path-building and assignment software) had been definitively achieved. For the three others, it was unclear whether the desired enhancements had been achieved (slide 19 of 11/30/18 presentation). Second, the model run time is almost twice that of the Ver. 2.3 Model. Third, when looking at five regional modeling metrics, such as daily VMT by jurisdiction and transit ridership by sub-mode, three were comparable to (but not better than) the Ver. 2.3 Model and two were worse than the Ver. 2.3 Model (slide 20 of the 11/30/18 presentation). Given the TPB staff inclination to pause development of the Ver. 2.5 Model, Mr. Moran encouraged travel modeling stakeholders who feel otherwise to come talk to him. Absent such dialog, the development of the Ver. 2.5 Model is likely to remain in a paused state.

He concluded with a discussion about the TPB's planned, next-generation travel demand model, known as the Generation-3 or Gen3 Model. He noted that a vendor/consultant had been selected to develop the Gen3 Model -- Resource Systems Group (RSG) -- adding that the contract had not yet been finalized. Mr. Moran hoped that the contract would begin in Nov. or Dec., with a kick-off meeting between TPB staff and the consultant likely to occur in Dec.

Mr. Goldfarb noted that it is important to update the model so that it can accurately estimate and predict commuter rail travel, especially given the fact that Virginia is about to make a major investment in updating the Long Bridge, which carries VRE trains over the Potomac River. Mr. Moran agreed, but he also noted that there could be limits to how far the regional model can be adjusted. He noted that anyone doing a sub-area study focused on commuter rail, would likely perform a sub-area validation to further refine the model.

Mr. Graye asked what were the factors that caused the longer model run times for the Ver. 2.5 Model, compared to the Ver. 2.5 Model. Mr. Moran said that the principal cause was that traffic assignment has been segmented to have three value-of-time (VOT) segments. Mr. Rashid asked what land use versions were being used for these updates to the Ver. 2.3 Model and when does COG expect to have the next major update of land use forecasts, i.e., Round 10. TPB staff noted that Round 9.1 land use was being used for the Ver. 2.3 Model updates, though Round 9.1a is being used for the current air quality conformity analysis of the 2020 Amendment to Visualize 2045 and the FY 2021-2024 TIP. Mr. Canan noted that COG's Planning Directors have been focusing on the issue of adding more housing to the region. He thought that there may be a Round 9.2 at some point that would include the updated housing forecast. He thought that a Round 10 would likely not occur until data from the 2020 Census is available, but that assumption would have to be verified with Paul DesJardin.

3. 2017-2018 REGIONAL TRAVEL SURVEY BRIEFING: ALTERNATIVE TRAVEL OPTIONS

This item was presented by Dr. Joh, who spoke from a set of presentation slides, which were distributed to the subcommittee. He provided an update on the 2017-2018 Regional Travel Survey (RTS), a once-in-a-decade household travel survey for the National Capital Region. As part of its ongoing presentations on the findings from the RTS, Dr. Joh's presentation shared results from a series of new questions from the recruitment survey that focus on the use of alternative travel options that reduce reliance on solo driving throughout the region.

Mr. Zuxuan asked whether the jurisdictions shown on the chart represent the resident's jurisdiction (Slide 8). Dr. Joh responded yes; it is based on the address of the household.

Mr. Eichler noted that the chart does not show those who took public transit more than 5 days a week, i.e. daily transit riders (Slide 10). Dr. Joh responded that the survey focused on weekday trips because weekday travel data is used to develop the regional travel demand model.

An attendee asked whether the chart represented one-way or two-way traffic, and whether it represents a production trip from home or an attraction trip from the workplace (Slide 10). Dr. Joh responded that it could include either; he also noted that these questions are part of the recruitment survey and not based on actual observed trips from the trip file.

An attendee asked how it is possible for the share of Prince William County residents who took public transit a few days per month be lower than the share of those who took transit a few days per year (Slide 10). Dr. Joh responded that the largest share of Prince William County residents take transit only a few days per year.

An attendee asked if the trips represent all trip purposes or only commuting trips. Dr. Joh responded that it includes all trips, taken on weekdays, including commute and non-work trips.

Mr. Shahpar noted that there is not much demand for TNC trips in the suburbs. He also noted the high share of transit use in the District of Columbia and asked whether the data could be normalized by population to allow for comparison with other jurisdictions (Slide 10). Dr. Joh responded that the tabulations are based on data collected from the person file which is weighted, and that these are not based on actual observed trips.

An attendee asked whether there was a question on the survey that captured the complementing or conflicting nature between TNC users and transit users. Dr. Joh responded that this was not captured in these series of questions but could be examined more closely with data on actual observed trips from the trip file.

An attendee asked if it is possible to estimate the number of vehicles who use the HOT lane and pay the toll (Slide 21). Dr. Joh responded that the question only asked whether a HOT lane was used and did not ask whether a toll was paid or how much.

An attendee asked if the HOV question includes passengers who rode in a vehicle who used the HOV lane, or if it only included drivers. Dr. Joh responded that the question was asked for all persons who used the HOV lane, whether they were drivers or passengers.

Mr. Rixey asked for clarification on the "at least once" category for bicycle use (Slide 23). Dr. Joh responded that "at least once" means at least once ever.

4. POTENTIAL APPLICATION OF GOOGLE-BASED TRAVEL TIME DATA IN TRANSPORTATION PLANNING ANALYSES

This item was presented by Mr. Xie and Mr. Vuksan, who spoke from a set of presentation slides, which were distributed to the subcommittee. They introduced TPB staff's recent exploration of the potential application of Google-based travel time data in transportation planning analyses. Mr. Xie introduced the motive of this study. He also explained why the exploration focused on travel time data from Google's Application Programming Interface (API), instead of from the travel demand model or other non-model-related data sources available in house. Mr. Xie described the procedure to request travel time data from the Google Distance Matrix API, as well as the subsequent QA/QC analyses conducted to verify the reasonableness of this data. Mr. Vuksan then introduced the case studies TPB staff conducted using the travel time data requested from Google API, focusing on a comparison between Google and modeled travel times and 45-minute travel sheds.

Mr. Shahpar raised a question regarding a scatter plot that illustrates the correlation between Google and modeled travel times (slide 9), asking why so many data points in the plot have travel times more than 45 minutes, if 45-minute travel sheds were studied. Mr. Xie provided the clarification that although the travel shed analysis looked at TAZs that were within 45 minutes from the origin TAZ, the travel time correlation analysis looked at travel times between the origin TAZ and all other TAZs in the modeled area.

Mr. Xie went on to summarize key findings from preliminary analyses and case studies and concluded the presentation with next steps. Mr. Sun from AECOM provided two comments on Google API travel times: he stated that Google driving times are historical averages that represent best possible times; he also indicated that while travel demand model aggregates transit scheduling information from the GTFS data, Google transit times are developed strictly based on "continuous" GTFS schedules. Mr. Xie responded that Google transit times may be developed using more sophisticated methods, but based on the analysis, Google and modeled transit times are comparable. Mr. Xie also pointed out that Google driving times are "observed" data based on historical travel time information which seem to be more realistic than simulated data based on TPB staff's limited testing and professional judgment. Mr. Tong asked about the cost-effectiveness of using the Google API data to validate the regional travel model. Mr. Xie explained Google's pricing policies and indicated that the cost would increase exponentially if requesting travel times for a 3722 by 3722 matrix. Mr. Vuksan added that staff considered negotiating a discounted price with Google for this kind of task, which involves an extremely large quantity of travel time requests.

5.   REGIONAL TRANSPORTATION DATA CLEARINGHOUSE (RTDC)

Ms. Mirr and Ms. Howard presented this item and spoke from a set of presentation slides. They provided a brief overview of the updates made to the Regional Transportation Data Clearinghouse OpenData page and Viewer. Ms. Mirr and Ms. Howard presented several different traffic count related datasets to the subcommittee, including monthly average weekday transit ridership dataset (FY2019) updates and ridership data, which was provided by transit operators in the TPB planning area. Not all transit operators within the TPB planning area provided data for this update. TPB staff also presented updates for hourly traffic volumes for the years 2016 and 2017, which includes the permanent and short-term, count-station feature classes with related tabular data of detailed hourly traffic counts for DC, Maryland and Virginia. They also presented 2017 Historic AADT data, which include the annual average daily traffic estimates reported at permanent and short-term counting stations in the TPB modeled region. 2016 and 2017 External Stations traffic count data was also presented, which includes the traffic counts at "external stations," i.e., locations where major roads cross the TPB modeled area boundary. The 2016 and 2017 vehicle classification data were also presented by Ms. Mirr and Ms. Howard. These datasets include an updated set of feature classes of the 2017 weekday counts by time-of-day and tables of weekday and weekend vehicle classification volumes for 2016 and 2017. Next, 2016 and 2017 Highway Performance Monitoring System (HPMS) updates were also presented. Finally, Ms. Howard and Ms. Mirr presented updates to the RTDC Viewer, transit summary charts, hourly counts, and vehicle classification.

6.   MIXED-USE TRIP GENERATION TOOLS

This item was presented by Mr. Rixey who spoke from a set of presentation slides. His presentation covered three main topics: 1) An overview of mixed-use trip generation tools; 2) Montgomery County's site-level analysis tools; 3) Insights from Arlington and Alexandria. Regarding mixed-use trip generation tools, he discussed the Institute of Transportation Engineers (ITE) trip generation manuals, both the 9th and 10th editions. He discussed M-NCPPC's Local Area Transportation Review (LATR) tool (slides 5-6), a tool called MXD+ (slides 7-9), and a tool called TRIPSDC (slides 9-13), which provides both trip generation and mode choice analyses, and has a web-based app. On slide 14, he provided a comparison table for all these tools. Then those tools were applied for Washington D.C., Montgomery Co., Arlington Co., and the City of Alexandria.

Mr. Graye commented that Montgomery Co. evaluated these tools for mixed land use areas in Montgomery County. A further step will be data collection and customization to develop a regional trip generation tools for suburban areas. Ms. Li noted that Mr. Graye is the supervisor for this project, with funding from Montgomery Co., although this project is for the M-NCPPC, which covers both Montgomery and Prince George's counties.

Mr. Moran noted that the trip generation rates that come out of the ITE trip generation manual are different from the trip generation rates used by the regional travel demand model. The ITE rates are for a small site, but the travel model trip generation are at the TAZ level and are estimated from a Household Travel Survey.

Mr. Shahpar asked if TRIPSDC is an open source application. Mr. Rixey answered that TRIPSDC is not open source, but it is a web-based application, available for public use at www.tripsdc.org.

7.   ANNOUNCEMENT OF NEW CHAIR FOR 2020

Mr. Moran stated that the chair of the TFS generally rotates on a calendar-year basis between Maryland, the District of Columbia, Virginia, and the Washington Metropolitan Area Transit Authority (WMATA). Since the November TFS meeting is the last scheduled meeting of the TFS for the year, this is typically the meeting where the new chair is announced, and the outgoing chair is thanked. The current chair, Zuxuan Deng, represents the District, since he works for the District of Columbia

Department of Transportation (DDOT). Based on the rotation schedule, next year's chair should be someone working for a Virginia agency. Before announcing next year's chair, however, Mr. Moran thanked Mr. Deng for his service to the TFS, the TPB, and the region. Mr. Moran presented Mr. Deng with framed certificate of appreciation, signed by the current TPB chair, Mr. Martin Nohe. Next, Mr. Moran announced that the CY 2020 chair would be Mr. Amir Shahpar, who works for the Virginia Department of Transportation (VDOT). Mr. Shahpar has been attending the TFS for many years. He is a Modeling Manager for VDOT with 16 years' experience in transportation planning. He currently oversees travel demand modeling and traffic forecasting for most projects across VDOT's Northern Virginia District, including Arlington, Fairfax, Loudoun, and Prince William counties.

Mr. Shahpar's tenure will begin at the January TFS meeting. Mr. Moran thanked Mr. Shahpar for agreeing to serve as next year's TFS chair.

8. ROUNDTABLE DISCUSSION OF CURRENT MODELING EFFORTS AROUND THE REGION

There was no roundtable discussion for this meeting.

9. OTHER BUSINESS

There was no discussion about other business for this meeting.

10. ADJOURN

The meeting adjourned around 12:00 noon. The next meeting is scheduled for Friday, January 24, 2020 at 9:30 A.M.