National Capital Region
Transportation Planning Board

TPB TRAVEL FORECASTING SUBCOMMITTEE

HIGHLIGHTS OF THE JANUARY 19, 2018 MEETING

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

MEETING ATTENDEES

MEMBERS, ALTERNATES, AND PARTICIPANTS

- Kael Anderson (NCPC)
- Robert Berger (BMC)
- Jim Bunch (Sabra, Wang & Assoc.)
- Nazneen Ferdous (CH2M)
- Dan Goldfarb (NVTC)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Robert Griffiths (COG staff consultant)
- Jennifer Hirsch (NCPC)
- Kyeongsu Kim (Connetics Transportation Group)
- David Kline (Fairfax DOT)
- Yuanjun Li (M-NCPPC, Montgomery Co.)

- Feng Liu (Cambridge Systematics)
- Krishna Patnam (AECOM)
- George Phillips (Prince William Co.)
- Harun Rashid (NVTA)
- Alex Rixey (Fehr & Peers DC)
- Amir Shahpar (VDOT)
- Christine Sherman (Arlington Co. DES)
- Iftin Thompson (M-NCPPC, Prince George's Co.)
- Michael Weil (NCPC)
- Jongsun Won (PTV Group)

COG STAFF

- Bill Bacon
- Tim Canan
- Joe Davis
- Wanda Hamlin
- Charlene Howard
- Hamid Humeida
- Ken Joh

- Rick Konrad
- Arianna Koudounas
- James Li
- Ron Milone
- Mark Moran
- Ray Ngo
- Jinchul (JC) Park

- Rich Roisman
- Meseret Seifu
- Daniel Son
- Dusan Vuksan
- Feng Xie
- Jim Yin

* An asterisk indicates that the person attended the meeting remotely via WebEx. We are not aware of anyone attending this meeting remotely.

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

1. INTRODUCTIONS AND APPROVAL OF MEETING HIGHLIGHTS FROM THE NOV. 17 MEETING

The highlights of the November 17, 2017 meeting of the TFS were approved without change.

2. TESTING OF CONSULTANT-PROPOSED UPDATES TO THE TRIP-BASED TRAVEL DEMAND FORCASTING MODEL (VEL. 2.5)

Mr. Milone informed the subcommittee that the Ver. 2.3.70 travel demand model and planning inputs used in the recently approved out-of-cycle air quality conformity analysis are now available upon request. He encouraged TFS members to use the latest methods and planning assumptions for local planning activities. He mentioned that the current air quality cycle involving the analysis of the "Visualize 2045" Plan is now underway. The Visualize 2045 analysis will be supported by a new set of land use forecasts (Round 9.1) and will include six analysis years, including a 2045 horizon year. Staff anticipates that the analysis will be completed and submitted for approval by the TPB in October 2018.

TPB staff is continuing its evaluation and testing of the Ver. 2.5 model, which features several refinements to the existing Ver. 2.3 model. These include the use of updated transit network and path-building software (PT), a refined non-motorized sub-model within the trip generation process, a simplified mode choice model and enhanced highway and transit assignment methods. Mr. Milone reviewed a checklist of desired features and objectives that staff will strive to attain before bringing the Ver. 2.5 model into production. One of these objectives is to reduce the Ver. 2.5 running time as much as possible (the Ver. 2.5 model running time is currently almost twice that of the Ver. 2.3 model). One considered approach for reducing running times is to revisit the current practice of running "base" and "final" scenarios, which is currently used to model HOT lanes. Staff is currently testing the Ver. 2.3 model to ascertain whether the assignment results of a "final" scenario, in isolation, are substantially different from those obtained when using both a "base" and "final" run. At this point, staff is optimistic that the single, "final" model approach may be acceptable for both the Ver. 2.3 model as well as the Ver. 2.5 model.

Mr. Milone finally mentioned that staff plans to use the Ver. 2.3 model in the upcoming air quality conformity analysis of the Visualize 2045 Plan. The Ver. 2.5 model will be executed in parallel with the 2.3 model to allow for testing and evaluation. Staff anticipates that the 2.5 model will be brought into production in calendar year 2019. Mr. Vuksan underscored that the proposed approach to apply a single "final" scenario, instead of dual "base" and "final" scenarios, will mean that the currently adopted Ver. 2.3.70 model will be updated prior to the upcoming air quality conformity analysis.

3. PLANS FOR THE DEVELOPMENT OF TPB'S NEXT-GENERATION REGIONAL TRAVEL DEMAND FORECASTING MODEL

This item was presented by Mr. Moran, who distributed paper copies of his presentation slides. Mr. Moran presented the current TPB staff plans for developing the next-generation (NextGen) TPB regional travel demand forecasting model. Mr. Moran's presentation included the following topics:

- Background
    - Strategic plan for improving the TPB travel model
    - Model naming conventions

- Phase 2 of Strategic Plan: Development of NextGen model
  - Contracting issues
  - Plan for consultant procurement
- Modeling approaches to be considered
  - Trip-based, tour-based, activity-based, hybrid models
- Timeline, expected budget, and Next steps

Whereas Mr. Milone's presentation focused on Phase 1 of the Strategic Plan ("Update the existing, trip-based model"), Mr. Moran's presentation focused on Phase 2 of the Strategic Plan ("Develop a next-generation model with existing data"). The current plan is to use a Request for Information (RFI) followed by a Request for Proposals (RFP) to solicit consultant assistance in developing the next-generation (NextGen) TPB travel demand forecasting model. Details about proposed plans, timelines, and budgets can be found in Mr. Moran's presentation slides.

Mr. Milone noted that TPB staff has looked at the experiences of peer Metropolitan Planning Organizations (MPOs), and we have found these MPOs have taken a variety of approaches to moving to a next-generation travel demand forecasting model. He noted that the approach of using both an RFI and an RFP should help us tailor a solution that meets the unique modeling needs of our region.

Regarding slide 11, which covered the RFI, Mr. Patnam asked whether TPB staff would make it clear the priorities of the various desired model updates. Mr. Moran said, yes, noting that priority setting should be part of the upcoming Product Requirements Document (PRD).

Regarding slide 18 ("Current proposed timeline: Overview"), Mr. Patnam asked whether, following the completion of the RFP and the selection of a consultant, it is possible that there could be a potential deviation from what was specified in the RFP and what gets implemented by the consultant, following the initial period of investigations. Mr. Moran said that, yes, that could be the case. He noted that the RFI should set the broad direction for the model improvements being sought, and then the RFP would narrow options down to a preferred model structure. But, he noted that there could still be updates during the contract which result from the initial investigations conducted by the consultant.

Following the presentation, Mr. Bunch asked whether the PRD will define the data upon which the model should be built. For example, some statewide models are moving to multi-tiered networks, which include detailed network coding that allows the user to choose what level of network aggregation to use for a given analysis. Mr. Moran noted the work done by the Metropolitan Transportation Commission (MTC), the MPO for the San Francisco Bay area, has done for its Travel Model Two, its second-generation activity-based travel demand model (ABM). In that case, MTC developed micro-analysis zones (MAZs), which are smaller than the traditional transportation analysis zone (TAZ), but larger than land ownership parcels. MTC, and three other MPOs noted in a recent report,[1] plan to use MAZs for modeling non-motorized travel and access to transit, but would use TAZ-to-TAZ (or similar scale) travel time matrices for modeling transit and auto travel. Mr. Moran noted that TPB staff is considering the benefits of a similar approach, though no firm decisions have been made yet. Mr. Patnam asked whether TPB staff expects that the PRD would specify a maximum model run time. Mr. Moran responded that, yes, we do expect that to be in the PRD.

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[1] Metropolitan Transportation Commission and Parsons Brinckerhoff, Inc., "Travel Model Two: Strategic Supply Design," Technical Paper (Metropolitan Transportation Commission, August 24, 2012), 2.

4. STATUS REPORT ON 2017 COG/TPB REGIONAL TRAVEL SURVEY

Dr. Joh 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 presented a brief recap of the main survey effort and provided an update on the recruitment and completion rates to date. Dr. Joh also gave a review of the sampling plan for the second quarter of the survey and described survey outreach and media activities.

Mr. Rixey asked how the survey is addressing transportation network companies (TNCs) and carshare vehicles. Dr. Joh responded that the survey includes questions on TNCs and carshare use.

Mr. Bunch asked how the survey is accounting for seasonal differences in travel. Dr. Joh responded that the survey is collecting data for a 12-month period to capture variations in travel patterns throughout the year and travel days are only on weekdays; additionally, travel days exclude federal holidays and the week between Christmas and New Year's Day.

Mr. Milone commented that there is a $20 incentive for participation, and given that 15,000 households are expected to complete the survey, the cost for incentives would be $300,000. He asked what the estimated cost per completed household would be. Dr. Joh responded that the cost per completed household would be $120-150.

5. TRAVEL MONITORING PROGRAM CONTRACTOR PROCUREMENT

Mr. Roisman presented his materials on the subject procurement, which was the subject of an active Request for Proposals (RFP) at the time of the subcommittee meeting. Before proceeding, Mr. Roisman introduced to the subcommittee Mr. Rick Konrad, COG's Director Contracts and Procurement. Mr. Roisman noted that Mr. Konrad was present to observe this presentation because it is regarding an active COG procurement. Mr. Roisman informed the subcommittee that because the procurement was active, he would not take any questions on the presented material.

Mr. Roisman's presentation covered a brief history of the TPB's travel monitoring program, which became part of the subcommittee's oversight on July 1, 2004, and provided some examples of studies previously completed under the program, such as the Metro Core Cordon Count and intercity bus patronage counts at Union Station and other major regional stops. It also noted how the program has evolved over time from being based on field data collection (with count personnel) to non-intrusive collection and the use of archived, continuously-collected data sources (i.e., "Big Data"), citing the Regional Airport Ground Access Travel Time Study as an example.

Mr. Roisman then explained staff's reasons for seeking to procure a contractor for the travel monitoring program and provided basic information about the RFP, with a link to the full RFP on the COG website. RFP 18-007: On-Call Travel Monitoring Support was issued on January 12. A pre-proposal conference will be held on January 22 at 10 AM in COG Conference Room 3 (first floor). Prior to the conference, technical and procedural questions must be submitted in writing to Alieu Turay at aturay@mwcog.org no later than 12:00 PM on Friday, January 19 (shortly after the conclusion of the subcommittee meeting). Proposals are due on Friday, February 2, 2018 at 2:00 PM EST. Mr. Roisman noted that the RFP references the planned model development procurement presented to the subcommittee earlier in the meeting by Mr. Moran, and that data collection required as part of the model development are anticipated to be issued as task orders under the travel monitoring contract. Finally, Mr. Roisman covered the anticipated spring 2018 travel monitoring activities at the time of RFP publication. The next steps in the process are the submittal of proposals, review and scoring of proposals by a technical selection committee (TSC), award and

contracting, issuance of task orders, and spring 2018 travel monitoring work. Mr. Roisman did not take any questions.

6. ECONOMIC BENEFIT OF METRORAIL AND VRE TO THE STATE OF VIRGINIA

Mr. Goldfarb began with a brief overview of the Northern Virginia Transportation Commission (NVTC). He then described the goal of this study: to quantify the economic benefit of Metrorail and VRE commuter rail to the state of Virginia. The study made use of the TPB regional travel demand model in the following manner. First, the model was used to determine existing levels of roadway congestion. Second, Metrorail and VRE were removed and the model was re-run. Third, land use was redistributed until the network reached existing congestion levels. Finally, an estimate was made of state revenue losses due to the land user redistribution that was made.

Regarding slides 17 and 20, a meeting participant asked if parking rate information was available and if households moved due to the lack of transit. Mr. Goldfarb noted that WMATA has an on-board survey that used geocoding to indicate where riders came from. The reduction in households was based on information from the on-board survey. A regression analysis helped to guide the reduction in households in Northern Virginia.

After Metrorail and VRE were removed, there were dramatic drops in average trip length. If VRE had been left in the network, everyone would have taken VRE, which shows the importance of Metrorail to the network. Jobs were also reduced based on the WMATA passenger survey. Economic impacts, such as income tax, sales tax, etc. were calculated at TAZ level.

Regarding slide 25, Mr. Roisman asked whether, after looking at household income data from the American Community Survey (ACS), did the study compare this with income from the WMATA rail survey. Mr. Goldfarb stated that we did do some comparison with the rail survey data, noting that the details can be found in the report.

There were about 85,000 households, 27,000 retail jobs and 103,000 office jobs removed, due to the removal of Metrorail and VRE. The final report showed 600 million dollars (4% of Virginia's entire budget) was generated by households and jobs supported by rail. This is about a 250% return on investment (slide 35).

Mr. Milone asked how well the presentation was received in other places. Mr. Goldfarb noted that the study had been presented to both the NVTC and its executive committee. Those who, in general, favor transit, liked the presentation. He has also presented the study to the Federal Transit Administration (FTA), which provided some good comments. The leadership at COG seems happy with the results. The Washington Board of Trade is interested in having the study re-done, but for the entire region, not just Northern Virginia. There was, however, a critique of the study on a website called Bacon's Rebellion.

Ms. Li asked how long it took to conduct the study. Mr. Goldfarb replied that the scoping took a while, but the actual study took several months.

Mr. Bunch asked how much the study increased the tax revenues for the counties that received the new households. Mr. Goldfarb stated that that was not part of the study. It was documented how much revenue was lost to Northern Virginia, but they did not estimate how much was gained in the recipient counties outside of Northern Virginia.

Mr. Vuksan pointed out the difficulties of conducting this study for the entire region (not just Northern Virginia), since it would get much trickier to decide where to move jobs and households,

given that the assumptions for such as study would be that there would be no Metrorail or commuter rail in the entire DC area. Mr. Goldfarb admitted that that would be a lot more challenging to model.

Mr. Milone noted that the underlying assumption of the entire study is driven by the idea that location choices are driven by transportation accessibility. However, Mr. Milone noted, people determine where to live based on many factors, and transportation is only one of these factors. Mr. Goldfarb agreed, but noted every study has limitations, and that was one of the limitations of this study. Nonetheless, transportation accessibility is still considered one of the major determinants in where people choose to live and work.

Mr. Shahpar asked if the study considered the I-66 express lanes, which would be a travel option for someone who could no longer use the Orange and Silver Metrorail lines. Mr. Goldfarb stated that the study did take this into consideration.

7. NATIONAL CAPITAL REGIONAL FEDERAL PARKING STUDY: AN ACCESSIBILITY-BASED APPROACH FOR FEDERAL FACILITIES PARKING POLICIES

Mr. Anderson presented this item and distributed copies of his presentation. As the central planning agency for the federal government in the National Capital Region, NCPC is charged with planning for the appropriate and orderly development of the region, and conservation of its important natural and historical features. The current effort concerns parking standards at federal facilities. NCPC would like to get feedback from the TFS members on the proposed parking ratios and technical methodology. The general idea is that there are four types of locations and each type of location has an associated parking ratio threshold. For example, the central employment area has a ratio of low ratio of 1:5, which means one parking space for every five employees. There were three parts to the study: literature review, local parking comparison, and modelling analysis. The study partner was the Volpe National Transportation Systems Center.

One of the assumptions of the work was that parking ratios should be a function of transit accessibility. Thus, an area with a high degree of transit accessibility should have a low parking ratio (the lowest ratio was 1:5). Transit accessibility was found to be very high in the DC core and around Metrorail stations.

Mr. Milone pointed out that the TPB's accessibly analyses for the long-range transportation plan (LRTP) focus on how many jobs were accessible by household. By contrast, this study focuses on how many households were accessible by jobs.

The study recommended three areas for improving NCPC parking policies: 1) Make them more data driven; 2) Standardize the modification process; and 3) Increase the amount of performance-based monitoring. The study also included a proposed future analysis tool. This tool would estimate and chart accessibility for all federal facilities.

Ms. Li asked if the NCPC policy covered federal facilities only. Mr. Anderson agreed. Noting that many parking lots in Norther Virginia were already at or near capacity, Mr. Shahpar asked if there were plans to expand parking facilities. Mr. Anderson noted there were no such plans thus far. He noted that one of the policy goals of the NCPC is to balance parking facilities and encourage people to live close to transit accessible areas, which should reduce the need to build more parking facilities.

Mr. Milone asked if NCPC also considers the possible availability of off-site parking that may be used in addition to the parking on the federal facility? Mr. Weil stated that NCPC tries to encourage federal facilities to consider what parking might already be available off-site, including encouraging federal facilities to work with local jurisdictions to figure out what was available off-site.

8. TRANSPORTATION RESEARCH BOARD 97ᵀᴴ ANNUAL MEETING: POST-MEETING DISCUSSION

The Transportation Research Board (TRB) held its 97th Annual Meeting from January 7-11, 2018 in Washington, D.C. The meeting attracted about 13,000 transportation professionals from around the world, including many from this region and from TFS participants. This item provided an opportunity for TFS participants to discuss and share what was learned at the annual meeting.

Ms. Yuanjun Li mentioned USDOT's Bureau of Transportation Statistics' (BTS) National Transportation Atlas Database (NTAD) which is a set of nationwide geographic databases of transportation facilities, transportation networks, and associated infrastructure (https://www.bts.gov/geospatial/national-transportation-atlas-database). There are over 60 datasets in the database. Ms. Li mentioned if the TFS has interest, a representative from BTS could give a presentation at an upcoming TFS meeting. She also mentioned that the 2020 Census Transportation Planning Products (CTPP), will no longer report at TAZ level. Instead the Census and the American Association of State Highway Transportation Officials (AASHTO) will provide block-group level data. It will be up to individual agencies to develop their own TAZ-level data. Like Mr. Moran, Ms. Li also attended the session that discussed hybrid trip-based/activity-based models.[2] She noted that all three of the example hybrid models had been developed outside of the U.S. [At the TRB session, Mr. Moran asked the presenter, Gaurav Vyas, WSP, why the hybrid approach had not been seen much in the U.S. The presenter did not know exactly why this was the case, but he noted that Vince Bernardin had done some work in this area.[3] Additionally, Bill Allen has done some work with aggregate, tour-based models,[4] and PTV has also done some work with hybrid models.[5]] Ms. Li noted that, although many large urban areas in the U.S. have started using ABMs, her impression is that many of these continue to use the trip-based model for many analyses.

Ms. Howard mentioned an interesting session that she attended about traffic effects caused by the Solar Eclipse on August 21, 2017. The study made use of INRIX data and traffic counts from automatic traffic recorders (ATRs). Ms. Li also mentioned the Metropolitan Travel Survey Archive (http://www.surveyarchive.org/), which contains household travel survey data from cities across the U.S. for multiple points in time. Mr. Moran also noted that the 2017 National Household Travel Survey (NHTS) will be released soon. Mr. Rixey mentioned a poster he saw at TRB. It featured researchers from Portland State University (Singleton, Totten, Orrego, Schneider, and Clifton), who did a survey on the state of non-motorized modeling in regional travel demand models used in the U.S. The researchers categorized about 50 models based on the level of inclusion of non-motorized travel in the model ("Making Strides: State of the Practice of Pedestrian Forecasting in Regional Travel Models," paper #18-00963).

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[2] Gaurav Vyas, "Comparison of Hybrid 4-Step and Activity-Based Models" (Transportation Research Board 97th Annual Meeting, January 7-11, 2018, Washington, D.C., January 10, 2018).

[3] See, for example, Vincent Bernardin and Michael Conger, "From Academia to Application: Results from Calibration and Validation of First Hybrid Accessibility-Based Model," *Transportation Research Record: Journal of the Transportation Research Board*, no. 2176 (2010): 50–58, https://doi.org/10.3141/2176-06.

[4] See, for example, TMIP Webinar: William G. Allen Jr., "Simplified Tour-Based Model," July 26, 2017.

[5] See, for example, Chetan Joshi and Klaus Noekel, "Aggregate, Tour-Based Modeling: A Pragmatic Step-up from the 4-Step Model" (5th TRB Conference on Innovations in Travel Modeling, April 27-30, 2014, Baltimore, Maryland, April 28, 2014).

9. NEXT MEETING DATE AND OTHER BUSINESS

The next scheduled meeting of the TFS is Friday, March 23, 2018 from 9:30 AM to 12:00 noon. There was no other business. The meeting adjourned around noon.

*** The meeting highlights were prepared by Jim Yin, Wanda Owens, Mark Moran, and Ron Milone ***