



## TPB TRAVEL FORECASTING SUBCOMMITTEE

### HIGHLIGHTS OF THE MAY 20, 2016 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

- Melissa Chow (WMATA)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Eric Jenkins (M-NCPPC, Prince George's Co.)
- Bob Josef (VDOT)
- Dial J. Keju (Frederick Co.)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Cambridge Systematics)
- Lou Mosurak (Loudoun Co. DTCI)
- Krishna Patnam (AECOM) \*
- Russell Provost (M-NCPPC, Montgomery Co.)
- Matthew Ridgway (Fehr & Peers DC)
- Alex Rixey (Fehr & Peers DC)
- Tom Rossi (Cambridge Systematics)
- Debbie Spielberg (Montgomery Co. Council staff)
- Jiaxin Tong (Kimley-Horn & Assoc.)
- Steve Weller (CH2M HILL)
- Ryan Westrom (DDOT)
- Jongsun Won (PTV Group)

#### COG STAFF

- William Bacon
- Anant Choudhary
- Yu Gao
- Robert Griffiths
- Charlene Howard
- Hamid Humeida
- Martha Kile
- Nicole McCall
- Ron Milone
- Jessica Mirr
- Mark Moran
- Dzung Ngo
- Jinchul (JC) Park
- Wenjing Pu
- Rich Roisman
- Meseret Seifu
- Daniel Son
- Feng Xie
- Jim Yin
- C. Patrick Zilliagus

\* Attended the meeting remotely via WebEx/teleconference

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This meeting of the Travel Forecasting Subcommittee (TFS) was chaired by Mr. Josef.

## **1. INTRODUCTIONS AND APPROVAL OF MEETING HIGHLIGHTS FROM THE MARCH 18 MEETING**

After introductions, the highlights from the March 18, 2016 meeting of the TFS were approved without change.

## **2. STATUS REPORT ON COG/TPB'S TRAVEL DEMAND MODELING IMPROVEMENT EFFORTS**

The presentation comprised two parts: 1) Mr. Milone gave a status report on the work being done by COG/TPB staff as part of Task Order 16.2, "Advice and Testing." 2) Mr. Liu and Mr. Rossi gave a status report on work being done by consultant staff as part of Task Order 16.2, as well as describing the status of the other three task orders (16.3, 16.4, and 16.5). Mr. Milone noted that we are currently in Phase 1 of the strategic plan: updates to the trip-based model. This two-year phase will end next fiscal year (2017).

Before beginning his presentation, Mr. Milone announced that Mr. Griffiths would be retiring from COG next month, after more than 40 years of dedicated service to the region. Mr. Milone also mentioned that Mr. Griffiths would release a request for proposal (RFP) for the household survey in the following week. The survey, which will be conducted by a consultant starting the next fiscal year, will be used for Phase 3 of the strategic plan, development of an activity-based model using new data.

- Mr. Milone asked about the difference between two household surveys, the 2007/2008 and the upcoming survey. Mr. Griffiths said that the former used mail, phone, and computer-assisted telephone interviewing (CATI) to retrieve the diary information. This time, however, the plan is to have a mail recruitment, but an automated web retrieval, with a telephone option. We also plan to look at using either GPS loggers or a smartphone app. Then, staff will do a comparison between the GPS data from smartphone app and the data from the web retrieval. He noted that the key contents of both surveys are mostly the same, except for a few additional questions to measure the use of a ridesharing service, such as Uber or Lyft; parcel delivery to home or office; and E-ZPass availability.
- Regarding the task to update non-resident trips (slides 6 to 10), Mr. Pu asked how non-resident trips are defined. Staff said that non-resident trips are made by people who live outside of the TPB modeled area, but are moving within the modeled area. AirSage imputes a person's home location based on the location where the cellphone normally "sleeps" at night.
- Regarding transit coding enhancements (slide 15), Mr. Milone noted that staff is considering adding the ground-to-mezzanine elevator length as a station attribute. Mr. Westrom asked whether that variable could be made available to external parties. Mr. Milone said it could.
- On slide 15, Ms. Li commented that local Ride-On bus should have a mode code of 6, not 5, as was indicated on the slide. Mr. Milone agreed, noting that it was a typo (the typo was corrected before the presentation was uploaded to the TFS webpage).

Next, Mr. Liu presented the status of the work being conducted by Cambridge Systematics (CS). Mr. Liu discussed task #4 (speed/travel time validation improvement) and task #9 (Revise bus speed linkage to highway speeds) of Task Order 16.2. He stated that modified BPR functions were

recommended for testing to replace the current conical functions used for freeways/expressways and major arterials. He noted that the task to revise bus speeds was still in progress.

- Regarding slide 9 (“Task Order 16.2 Advice and Testing”), Mr. Milone asked how on-time performance should be understood. Mr. Liu responded that he was not sure and noted that the measurement came from WMATA.
- Regarding the conical and BPR functions in slide 7 (“Task Order 16.2 Advice and Testing”), Mr. Milone asked what the basis was for choosing BPR functions over conical functions or vice versa. Mr. Liu said that the initial idea was to fit volume-delay function (VDF) function to the Highway Capacity Manual. Later, when more observed speed data became available, the observed speed data were used to modify the VDF function. Mr. Milone noted that, given that the estimated speeds in our model tend to be too low, is the cause the functional form of the VDF or the definition of capacity that we use. Mr. Liu said that the underestimation of speeds could be due to both issues, but cautioned that we cannot easily observe cases where the volume exceeds capacity. Mr. Liu noted that the Federal Transit Administration (FTA) has emphasized the importance of having accurate travel speeds in travel demand models.

Next, Mr. Rossi updated the subcommittee on the progress of Task Order 16.3, Managed Lane Modeling. He reported that CS reviewed the state of the practice and the firm was working on reviewing the current toll modeling practice in the COG/TPB travel model. Mr. Rossi presented a new approach to modeling managed lane facilities, which was based on work done for the Baltimore Metropolitan Council (BMC), even though, in the BMC case, it applies to an activity-based model (ABM).

- Regarding the proposed managed lane modeling approach, Mr. Milone asked how trip purposes would be considered in relation with the value of time (VOT) distributions. Mr. Rossi responded that the VOT distributions would be segmented by trip purpose.
- Mr. Josef asked whether the VOT perception is incorporated into the modeling work. Mr. Rossi said that perception is not included, thus, the model just uses the skims from the network. He noted that the transferred VOT distributions used some information developed from a stated preference survey in San Francisco.
- Mr. Bunch asked whether the proposed toll modeling considers the availability of E-ZPass devices, since a vehicle is required to have an E-ZPass device to use the HOT lane system in Virginia. Mr. Rossi said that the ABM model in BMC has a binary model to simulate the availability of an E-ZPass transponder in households. The trip-based model, which is an aggregate model, cannot simulate transponder availability by segment. He noted that CS does not recommend modeling E-ZPass ownership, since we do not have the observed data to do so.

Next, Mr. Liu presented the status of Task Order 16.4, Non-Motorized Model Enhancement.

- Mr. Westrom shared that Montgomery County had recently done a study of bicycle-level traffic stress, which is an indicator of how easy it is to bike in an area. He noted that a similar effort is being conducted by the District of Columbia. When the work is done at the District, possibly in a month and a half, he could share the report with interested parties.

Finally, Mr. Rossi presented the status of Task Order 16.5, Mode Choice Model Enhancement. He reported that CS had finished the review of mode choice structures in several MPOs and proposed a “draft” approach for making enhancements to the mode choice step.

- Regarding the transit attribute differentiation in slide 33 (“Proposed Approach”), Mr. Westrom asked whether speed and frequency are considered. Mr. Rossi said that frequency and wait time are related, but not the same, noting that sometimes a cap is placed on wait time. Mr. Rossi said that it probably is worth considering using frequency as a separate variable, but, because it is so correlated with wait time, which needs to be in the model, it may be difficult to obtain a separate parameter.

### **3. 2015 REGIONAL AIRPORT GROUND ACCESS – TRAVEL TIME STUDY**

Mr. Zilliacus presented the findings of a study of highway and transit travel times to the three commercial airports (DCA, BWI, and BWI). He said that the draft report is available on the COG website. He welcomed feedback on the draft report within a 30-day review and comment period. He said that staff would be possibly present some findings of the report to a committee of the Baltimore Regional Transportation Board.

- A member asked which vehicle probe data was used to calculate highway travel times. Mr. Zilliacus responded that it was INRIX vehicle probe data downloaded from the CATT lab of the University of Maryland (UMD).

### **4. UPDATES TO THE TPB REGIONAL TRANSPORTATION DATA CLEARINGHOUSE (RTDC)**

Ms. Howard gave a brief demonstration of the RTDC Project webpage, a data portal, and the RTDC Data Viewer, a quick and simple way to explore many of the datasets in the RTDC. She welcomed any feedback on the RTDC.

- Mr. Milone asked what was the most recent years for traffic counts. She said the latest are 2014 for hourly traffic, 2014 for bike counts, and 2015 for average transit ridership counts by transit provider.
- Mr. Milone asked about the data quality control since some permanent count stations are not operating all the time. Ms. Kile said that are no internal checks on the quality of the permanent count stations, so it is up to the user to make sure that the data is complete.
- Mr. Bunch asked whether registration is required to access the RTDC webpage. Ms. Howard replied that it is not required anymore.

### **5. TRAVEL FORECASTING METHODS COMPARISON – EVALUATING THE FUTURE THROUGH SIX DIFFERENT LENSES**

The presentation was conducted by Mr. Graye and Mr. Rixey.

First, Mr. Graye provided the rationale for evaluating the various methods of travel forecasting (slides 1-3).

- Mr. Milone asked for more information about how the county uses modeling to support the Subdivision Staging Policy (slide 3). Mr. Graye said that the Staging Policy is used to manage growth, so, for example, whether a new development results in new traffic that exceeds certain standards. This relates to both the county’s Adequate Public Facilities Ordinance (APFO) and also to long-range subarea master plans, where one seeks to ensure a balance between land use and transportation.

Next, Mr. Rixey discussed six travel forecasting methods, including the COG/TPB travel model, Montgomery County's Travel/4 model, and the UMD mesoscopic model (slides 4-15).

- Mr. Moran asked whether the UMD mesoscopic model uses DTALite. Mr. Rixey thought that it did (though one report suggests that it uses TransModeler).<sup>1</sup> Lei Zhang of the University of Maryland is involved in developing multiple mesoscopic models, including BMC InSITE-DTALite and SILK AgBM-DTALite, both of which incorporate elements of the open source DTALite platform.<sup>2</sup>
- Regarding the Agent-Based Model used by UMD, Mr. Bunch asked which platform was used. Mr. Rixey was not sure.
- Regarding simplified tour based modeling, Mr. Milone asked which data was used to calibrate the model and whether the model is used in this region. Mr. Rixey thought that household travel surveys were used. He added that CDM Smith and Bill Allen developed the model, first in Brunswick, Georgia in 2010, and applied it in Atlanta, Charlotte, and Birmingham, but not yet in the D.C. region.

Finally, Mr. Graye discussed the evaluation criteria, including resources needed, to apply these forecasting techniques. He said that the next steps would be identifying the “pros” and “cons” of each component in the evaluation, and developing a strategic plan that takes into account MWCOC's models development work program (slides 16-17).

- Slide 11 notes that the UMD mesoscopic model can perform auto routing at the arterial or corridor level. Ms. Spielberg asked whether that represents a strength or a limitation (i.e., that is all that the model can do). Mr. Rixey said that the strength of the model is the fact that it can model roads at the collector level (as opposed to just the arterial level). However, he felt that, given the performance metrics needed for the county, the ability to accurately model collector level or local streets was probably not necessary.
- Ms. Spielberg asked whether Fehr & Peers or the county might perform a more detailed models comparison of these six methods in the future, focusing on the strengths and weakness of each method. Mr. Graye said the intent was to perform such a comparison, but not in the context of critiquing one tool or another. The goal is to identify how those tools can better serve the county's modeling needs.
- Ms. Spielberg asked which of the six methods include transit. Mr. Rixey said that the COG/TPB travel model, Travel/4 model, and the Tour-Based Model do include transit. The UMD mesoscopic model does not currently include transit, though based on conversations with UMD's Fred Ducca, he understands that the mesoscopic model framework could incorporate transit with additional data collection and modeling effort.
- Ms. Spielberg asked which methods have been developed for the Washington, D.C. area. Mr. Graye said that the COG/TPB model and Travel/4 cover the entire TPB modeled area (22 jurisdictions). The UMD model covers only two jurisdictions. Also, Mr. Graye thought that

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<sup>1</sup> University of Maryland, Lei Zhang, and Gang-Len Chang, “Developing Mesoscopic Models for the Before and After Study of the Inter-County Connector: Phase One” (Baltimore, Maryland: Maryland State Highway Administration, March 2013), 13, [http://ntl.bts.gov/lib/47000/47200/47250/MD-13-SP109B4P\\_ICC-Before-After-Study\\_Report.pdf](http://ntl.bts.gov/lib/47000/47200/47250/MD-13-SP109B4P_ICC-Before-After-Study_Report.pdf).

<sup>2</sup> The Maryland Integrated Travel Analysis Modeling System (MITAMS). ][http://mitams.org/Main\\_Page](http://mitams.org/Main_Page)

DTALite and the Agent Based Model had been applied within Montgomery County by the Maryland State Highway Administration (MD SHA).

- Mr. Bunch noted that other regions that had developed a county-wide have added micro-coding of traffic interchanges and turn penalties. He asked whether Montgomery Co. was considering adding such detail, which might be needed to move to mesoscopic traffic assignment. Mr. Graye said that that option would be considered, but he noted that an increase in network detail would also require adding more traffic analysis zones, which will lengthen run times.
- Mr. Bunch asked whether Montgomery Co. had reviewed all the modeling enhancements that had been done by other local jurisdictions in the region. Not yet, according to Mr. Graye, but it could be considered in the future if the budget permits it.
- Mr. Jenkins asked if Montgomery Co. had looked at TRANSIMS, an open-source travel demand modeling package that can perform traffic microsimulation. Mr. Graye said that TRANSIMS was not one of the packages reviewed. Mr. Jenkins noted that the Prince George's Co. Planning Department is moving in the direction of using TRANSIMS.
- The subcommittee members discussed the importance of model maintenance, irrespective of the modeling method chosen.
- Mr. Kline asked how many resources were spent on the model summary. Mr. Graye responded that the budget for the project was \$90,000. The model summary is a portion of the overall project scope.

## **6. OVERVIEW OF INTEGRATING MWCOC DEMAND MODEL INTO NEPA PROJECTS**

Mr. Berger briefed the subcommittee on how model outputs were used for a number of local, high-profile NEPA projects. He discussed the benefits of using the model, project requirements when using the model, and made three suggestions about future model improvements.

- Mr. Berger's first suggested model improvement (slide 13) was that the COG transportation network should be coded at a finer level of detail ("at least 1:5000 scale"). Mr. Milone noted that the COG/TPB travel model is a planning model, which tends to be at a higher level of resolution than the project level.
- Mr. Berger's second suggestion was to create a direct connection between the model and GIS-based roadway networks published by the local DOTs. Other useful data is stored in the DOT centerline files that could be combined with the model.
- Mr. Berger's third suggestion was that COG should create a tool to extract data, such as trip tables and modal split without requiring the expertise to use Cube Voyager. This could benefit all parties interested in researching the model output data.

## **7. NEXT MEETING DATE AND ADJOURNMENT**

The next scheduled meeting of the TFS is Friday, July 22, 2016 from 9:30 AM to 12:00 noon. The meeting adjourned around noon.

\*\*\* The meeting highlights were prepared by Dzung Ngo, Mark Moran, and Ron Milone \*\*\*

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