

---

## National Capital Region Transportation Planning Board

Metropolitan Washington Council of Governments  
777 North Capitol Street, N.E., Suite 300, Washington, D.C. 20002-4290

---

# Highlights of the special meeting of the Travel Forecasting Subcommittee

---

*Friday, February 28, 2011, 9:30 AM to 11:00*

## Meeting attendees

- Erik Dahlberg (WMATA)
- Chris Dickersin (DDOT)
- John (Jay) Evans (Cambridge Systematics)
- Harold Foster (M-NCPPC, Prince George's Co.)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Jamie Henson (DDOT)
- Manish Jain (AECOM Consult, Inc.)
- Bahram Jamei (Virginia DOT)
- Eric Jenkins (M-NCPPC, Prince George's Co.)
- Dial J. Keju (Frederick Co.)
- David Kline (Fairfax County DOT)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Dante Perez-Bravo (CH2M HILL)
- Maggie Qi (VHB)
- Rich Roisman (VHB)
- Conor Semler (Kittelson & Associates, Inc.)
- Phil Shapiro (STC)
- Dan Stevens (Fairfax County DOT)
- John Thomas (Frederick Co.)
- Shanjiang Zhu (University of Maryland)

## COG/TPB staff in attendance

- William Bacon
- Elena Constantine
- Joe Davis
- Bob Griffiths
- Charlene Howard
- Hamid Humeida
- Mary Martchouk
- Ron Milone
- Mark Moran
- Jinchul Park
- Clara Reschovsky
- Meseret Seifu
- Daniel Son
- Dusan Vuksan
- Feng Xie
- Jim Yin

The meeting was chaired by Jamie Henson of DDOT. This was a special meeting of the Travel Forecasting Subcommittee held for the purpose of releasing the year-2007 calibration and validation of the TPB Version 2.3 travel model on the 3,722-TAZ area system.

### **1. Introductions and approval of highlights from the previous meeting**

The highlights from the January 21, 2011 meeting of the Travel Forecasting Subcommittee (TFS) were approved without any changes.

## **2. Release of the Version 2.3 travel model on the 3,722-TAZ area system**

This item was presented by Ron Milone of TPB staff, who distributed a copy of his slides, the draft Calibration Report, and the draft User's Guide to the attendees. Both reports were dated February 28, 2011. Mr. Milone first pointed out two items that have not been completed and, hence, would not be presented today: transit assignment and a year-2040 run of the model. Then he described the history of development of the Version 2.3 travel model. This model version was initially released two years ago on the existing 2,191-TAZ system. At that time, the main changes from Version 2.2 model included the nested-logit mode choice model and new truck models. By contrast, the updated Version 2.3 model, which is being released today, is based on the new 3,722-TAZ system and is calibrated with 2007/2008 Household Travel Survey data and recent transit on-board surveys. Mr. Milone reviewed several additional technical refinements in the Version 2.3 model which are detailed in the documentation.

Mr. Milone briefly described the contents of the distributed documentation for the Version 2.3 travel model. He pointed out that during model validation work, staff saw fit to implement some additional modeling adjustments (production/attraction modification factors in trip generation and K-factors in trip distribution). The adjustments have been found to be necessary in previous models and have been implemented with economy. The adjustments are detailed and explained in Appendix A of the calibration report. As further testing is performed, TPB staff is willing to revisit and possibly remove some of these adjustments, where appropriate.

Mr. Milone offered the following observations and concerns with regard to the documented validation findings:

- The 2007 simulated area-wide VMT matched observed Highway Performance Monitoring System (HPMS) targets very well. The simulated VMT was one percent higher than the observed for the modeled area and two percent higher for the MSA. However, VMT was underestimated in the District of Columbia by about 6%. Mr. Milone observed that this was the first time in recent memory that VMT in the District has been underestimated by the model.
- VMT performance statistics by time of day were shared based on a 1,700-count sample for which hourly counts existed. The summary indicated that both (AM and PM) peak periods shown to be overestimated by about 25%, while the nighttime period was underestimated by about 25%. He observed that the time-of-day model may require some adjustments, but cautioned that the limited hourly count sample may be subject to geographic bias.
- A meaningful comparison of estimated and observed screenline crossings has been difficult to prepare because observed ground counts are coded on a very low percentage of links crossing screenlines, about 23% coverage overall. He added that he is working with Bob Griffiths and Martha Kile to increase the ground count coverage.
- In showing RMSE statistics by facility type, he pointed out that freeways are over-simulated by about 23% for freeways and under-simulated on the lower facilities. He suggested that additional adjustments are in order for capacities or free-flow speed assumptions. The overall percent RMSE statistic of 43% is consistent with earlier model versions.

- Mr. Milone pointed out that differences were noted between two sources of observed transit trips by mode, namely the 2007/2008 Household Travel Survey (HTS) and the transit on-board surveys. While the total transit trips from each data source are reasonably consistent (about one million linked transit trips per day), the proportions of transit trips by purpose are different. For example, the on-board transit surveys reflect a 67% HBW share of transit trips, while the 2007/08 HTS reflects a 54% share. The mode choice model is currently calibrated to the transit shares based on the on-board data.
- The comparison of Version 2.2 and the Version 2.3 travel models outputs<sup>1</sup> metrics indicated that the Version 2.3 modeled motorized trip rates are substantially lower than those in the Version 2.2 model (7.35 versus 10.28). This was due largely to the fact that the Version 2.2 travel model used a trip generation adjustment factor for non-work trips of about 1.5 in order for estimated VMT to match observed VMT, but the Version 2.3 model did not require such an adjustment. Mr. Milone suggested that the difference in the trip rates is a result of longer trip lengths obtained from the HTS, which targeted all 22 jurisdictions in the modeled study area in contrast to the 13 “core” jurisdictions targeted in the 1994 HTS. He added that this is the first time that the regional model has not needed such an adjustment factor to match observed VMT.

To conclude his presentation Mr. Milone discussed the next steps, which include:

- Prepare a transmittal package of draft Version 2.3 model
- Run transit assignment
- Prepare and run a future-year analysis (2040)
- Consider refinements to k-factors, capacities and speeds, and time-of-day split
- Check “outlier” ground counts, enhance count coverage
- Revisit the application process to reduce model adjustments, optimize run times with distributed processing , and streamline code and application steps
- Complete the user’s guide
- Test the model by running it with inputs for the air quality conformity determination of the 2011 CLRP

A subcommittee member inquired whether the transit constraint for the year 2020 will remain the same as it was in the Version 2.2 travel model. (The Version 2.2 travel model, when run for future-year networks, uses a procedure known as the “transit constraint,” which accounts for the fact that there is a capacity limit to the number of Metrorail trains that can traverse the regional core area). Mr. Milone responded that it would be used in the Version 2.3 travel model, once staff runs it with the future-year (2040) network. The same subcommittee member asked whether high-occupancy toll (HOT) lane analyses would still require the double (i.e., “base” and “conformity”) model run procedure. Mr. Milone responded that the double run of the travel model to address VDOT requirements that HOV vehicle travel unimpeded will continue to be used in the Version 2.3 travel model, though there have

---

<sup>1</sup> Note there was a typo on the table on slide 21 of Mr. Milone’s presentation. The two columns titled “2011 CLRP” should have read “2010 CLRP.”

also been discussions with Cambridge Systematics (CS) on ways to address VDOT policy without requiring the second run. The subcommittee attendee then asked whether the toll selection process for the HOT lanes will remain as an offline iterative routine that is run by TPB staff or whether outside users might be able to run the process. Mr. Milone responded that, due to the complicated nature of the procedure, up to now, the toll-setting procedure has been run by only TPB staff. However, he added that TPB staff will consider the pros and cons of releasing this procedure. Another subcommittee member asked whether there is a capability to manually override the area type variable. Mr. Milone responded that this capability, implemented in the Version 2.2 travel model, has not yet been implemented in the Version 2.3 travel model, but it will be.

A subcommittee attendee asked how the 2007 “Pseudo” Round 8.0 land use forecast was developed. Mr. Griffiths stated that instead of simply interpolating the Round 8.0 land activity data between 2005 and 2010, which would overestimate land activity for 2007 (due to the recent recession), he used the ACS control totals and independent employment data for 2007 to develop the land use file. The Pseudo Round 8.0 land use reflects a lower household size relative to the existing Round 8.0 land use recently released (from about 2.6 in 2007 to about 2.5). Future land use forecasts coming out of the Cooperative Forecasting process will reflect lower household sizes, which is evident from the latest Census data.

A subcommittee member inquired whether all the trip targets were developed based on linked trips. Mr. Griffiths replied that the Bus Survey was linked by Clara, but he was not sure how the Metrorail targets were developed.

There was a discussion about why the trip-purpose-specific transit targets from the HTS were so dramatically different from those obtained from the on-board surveys. Some of the reasons that were discussed included the possibility of inconsistent survey methodologies and purpose definitions across different surveys, seasonality effects because on-board transit surveys are conducted during the summer months, and the low sample size in the HTS (in terms of transit trips). A subcommittee attendee made a suggestion that since the transit targets were dramatically different between the HTS and the on-board surveys, the 2007 and 2008 Metrorail surveys should be compared. He also mentioned that once the transit assignment is done it may be necessary to revisit the calibration targets.

Another subcommittee member suggested that the 2010 HCM should be consulted to identify appropriate free-flow speeds and capacities. Mr. Milone agreed that this is a reasonable suggestion. He added that he would like to consider reducing freeway capacities and speeds, because, as of now, the model seems to be overestimating freeway VMT. A consultant mentioned that, in past efforts, when he had encountered difficulties matching VMT by facility type, there was often an issue with the area type classification for some zones.

There was another discussion regarding the low trip rates produced by the Version 2.3 travel model as compared to the previous models. Similar to prior model versions, the 2001 National Household Travel

Survey (NHTS) also had higher trip rates (about 10 trips per household).<sup>2</sup> A subcommittee attendee pointed out that Washington D.C. metropolitan area is more urban, has a lower household size, and more non-motorized trips than the average American city, which should result in lower motorized trip rates. A consultant mentioned that they have found that the NHTS rates were much higher than those observed in the state of Virginia. Another consultant also confirmed that, based on their work in Philadelphia, a trip rate of about 7 trips per household is not unreasonable.

### **3. Other business**

There was no other business. The next proposed meeting of the TFS is Friday, March 18 2011 from 9:30 AM to 12:00 noon. The meeting adjourned at about 11:00 AM.

-----

The highlights were written by Mary Martchouk.

---

<sup>2</sup> Cambridge Systematics, Inc., *Travel Model Validation and Reasonability Checking Manual, Second Edition* (Washington, D.C.: Travel Model Improvement Program, Federal Highway Administration, September 24, 2010), 5-10.