
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, April 29, 2011, 9:30 AM to 11:00

Meeting attendees

- Jamie Henson (DDOT)
- Bahram Jamei (Virginia DOT)
- Wendy Jia (WMATA)
- David Kline (Fairfax County DOT)
- Dalia Leven (Cambridge Systematics)
- Li Li (Whitman, Requardt & Associates)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Cambridge Systematics)
- Jaak Pedak (Fairfax Co. DOT)
- Maggie Qi (CH2M HILL)
- Dan Stevens (Fairfax County DOT)

COG/TPB staff in attendance

- William Bacon
- Elena Constantine
- Joe Davis
- Bob Griffiths
- Wanda Hamlin
- Hamid Humeida
- Mary Martchouk
- Ron Milone
- Mark Moran
- Jinchul Park
- Wenjing Pu
- Clara Reschovsky
- Rich Roisman
- 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.

1. Introductions and approval of highlights from the previous meeting

The highlights from the February 28, 2011 meeting of the Travel Forecasting Subcommittee (TFS) were approved without any changes.

2. TPB 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 to the attendees. Mr. Milone informed the TFS that the Version 2.3 Travel Model had not been released following the previous TFS meeting because the year-2040 run had not yet been completed. Now, however, the year-2040 run has been completed. Additionally, after the February TFS meeting, TPB staff has found and corrected some errors in the transportation networks and travel model. Thus, travel model and its two networks (2007 and 2040) can now be released to interested parties and TPB staff intends to transmit the model and networks within the next week. However, the model is likely to

undergo further updates between now and November 2011, when it is expected to be adopted as the official TPB model, which occurs when the TPB approves the findings of the 2011 CLRP/ FY 2012-2017 TIP Air Quality Conformity Determination. For this reason, for those interested in obtaining the new travel model, TPB staff recommends that those who can wait until November 2011 should do so. For those who cannot wait, TPB staff indicated that interested parties can go to the COG website (<http://www.mwcog.org/transportation/activities/models/documentation.asp>) to find details on how to request a copy of the model.

Mr. Milone then discussed some of the updates made to the model including:

- Adjusting k-factors to refine trip distribution
- Recalibrating the mode choice model to incorporate trip distribution updates and a correction to the development of the drive-access-to-transit links
- Modifying time-of-day model to achieve a better match with HPMS volumes by time period.
- Refining free-flow speeds and capacities to better match observed VMT by facility type
- Implementing Cube Cluster (distributed processing) in traffic assignment in order to decrease model run times
- Modifying traffic assignment algorithm from bi-conjugate Frank-Wolfe (BC FW) to Frank-Wolfe (FW), since BC FW combined with and without Cube Cluster resulted in slightly different modeled results
- Adding traffic counts on links which intersect screenlines, such that, now, 58% of links which intersect a screenline have an observed, year-2007 traffic count

Next, Mr. Milone addressed the issue of the long model run times. Model run times on a two-year-old travel model server require about 80-90 hours without Cube Cluster (distributed processing) and about 50 hours with Cube Cluster. Model run times are a function of the computer hardware, the number of cores used to run the model, the convergence criteria, and the model year (future-year runs have more congestion and take longer to run). This, unfortunately, is a dramatic increase from the run times in the Version 2.2 travel model (ca. 15 to 18 hours). TPB staff is working with Citilabs to find a solution that will allow staff to use the bi-conjugate Frank-Wolfe algorithm with distributed processing (such that modeled results will not change).

Mr. Milone then discussed trip distribution and mode choice results, showing trip tables by purpose and jurisdiction/market segment. He pointed out that year-2007 model results match the targets reasonably well. For example, there are 1,099,715 estimated transit trips compared to 1,124,587 observed transit trips. He also showed the resulting 2007 and 2040 traffic assignment convergence graphs, noting that unlike the bi-conjugate Frank-Wolfe assignment that was presented previously, the regular Frank-Wolfe assignment converges slower and the relative gap convergence criteria (relative gap of 10^{-3}) is not attained by the AM Non-HOV3+, PM Non-HOV3+, and night time assignments, which run to the user-imposed limit of 200 user equilibrium iterations.

Next, Mr. Milone discussed the traffic assignment results, such as VMT by state, jurisdiction, facility type, and area type, pointing out that the overall estimated VMT is only 1% higher than the observed

VMT. The estimated VMT is also within 10% of the observed VMT for most facility and area types. Then, he discussed the percent root mean square error (RMSE) of the volumes calculated by facility type and time of day. The overall %RMSE for all facility types was calculated to be 41%, with the lowest %RMSE of 21% obtained for freeways. Mr. Milone pointed out that these model results are better than those achieved using previous versions of the regional travel model. He also showed scatterplots of daily and period volumes, which indicated strong agreement between estimated and observed results. In addition to evaluating volumes on all the facilities where counts were available, estimated and observed volumes on only links that intersected screenlines were compared. Overall, the estimated volumes were 4% higher than observed, which is acceptable.

The next part of the presentation focused on transit assignment completed for year 2007. Mr. Milone provided some details regarding how the assignment is run and briefly discussed the resulting Metrorail productions and attractions by Metrorail station groups (segments).

Lastly, Mr. Milone discussed the year-2040 scenario. He showed how the land use and area types logically changed from 2007 to 2040. Then, he presented changes in the VMT and volumes between the two years. He concluded with a comparison of the latest Version 2.3 run to the conformity run of the Version 2.2 Travel Model. The Version 2.3 Travel Model yielded lower trip rates for both base and future years, but higher trip lengths. As a result, the total VMT was projected to grow by 40%, from 2007 to 2040, which is higher than the growth estimated by the Version 2.2 model (31%). VMT per capita is predicted to decline, from 2007 to 2040, in both Version 2.2 and Version 2.3 models. Mr. Milone concluded his presentation by stating that the model and documentation continue to be updated and tested. He encouraged the TFS attendees to provide input with regard to additional sensitivity tests that should be performed on the model.

One of the subcommittee members raised the issue of performing subarea studies near Metrorail stations with large parking lots. Since PNR and KNR trips use special auto-access links to travel from their origin to the parking lot, the VMT from these trips is not explicitly assigned to the network, thus making it difficult to predict road congestion around Metrorail parking lots. Mr. Milone responded that it may be possible to assign auto-access trips explicitly to the network; however, this type of change to the model could not be accomplished in the short term.

Another subcommittee member inquired about what types of sensitivity tests are being considered. Mr. Milone responded that sensitivity tests that he had in mind are system and policy tests, including removing a bridge, adding travel lanes, doubling the transit fares, as well changing the land use inputs. However, before these could be completed, TPB staff intends to conduct sensitivity tests related to the effects of Cube Cluster on modeled results. The subcommittee member proposed testing the model with a parking capacity constraint. She said that she would like to see whether the model is sensitive to increased parking capacity. Mr. Milone responded that the current model theoretically includes a mechanism for constraining parking capacity at transit PNR lots (shadow pricing), but this capability has not been calibrated or validated yet, so it is not ready to be used at this time. He added that, at the current time, the model's response to increasing parking lot size could actually be a slight decrease in demand, since the model assumes that the walk time from the PNR lot to the station is a function of the

parking lot size (larger lots imply longer walk times between the lot and the station). The subcommittee member then asked whether the bus Priority Corridor Network (PCN) coding has been completed and whether it is possible to test its impact on diversion of Metrorail trips to bus. Mr. Milone responded that staff intends to use the Version 2.3 model for the TPB's Aspirations Scenario work, after the air quality conformity determination is completed in November (and after the 2011 CLRP baseline network is adopted). TPB staff has no plans to study the PCN, but WMATA might consider using technical assistance funds for supporting this project.

3. Other business

Bob Griffiths of TPB provided a status report on the development of the Census Transportation Planning Products (CTPP) TAZ system. He mentioned that his team is currently developing an initial set of zones based on the existing TPB TAZ system. He mentioned that the TPB modeled area will include only 1,000-1,500 CTPP zones because each zone must meet the minimum population or employment size requirements. The zones will be combined in an intelligent aggregation manner, considering the type of land use within each zone as well as density. Mr. Griffiths stated that the draft set of the zones should be available in May and he expected that one of his staff would make a presentation on the topic at the next TFS meeting.

Wendy Jia of WMATA mentioned that they are currently developing a Metrorail trip forecast for the Dulles line to get a better understanding of demand at stations opened during phases I and II. WMATA staff is also modeling how passenger behavior will change in response to shifting some of the Blue Line trains to the Yellow Line Bridge (near the 14th Street Bridge).

The next proposed meeting of the TFS is Friday, May 20 2011 from 9:30 AM to 12:00 noon. The meeting adjourned at about 11:05 AM.

The highlights were written by Mary Martchouk.