
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 November 30, 2012 meeting of the Travel Forecasting Subcommittee

Held at the Metropolitan Washington Council of Governments, from 9:30 AM to 12:00 PM

Status of highlights: Approved on 1/25/13

Meeting attendees

- Michael Eichler (WMATA)
- Dan Goldfarb (VHB)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Anthony Hofmann (Baker)
- Bahram Jamei (Virginia DOT)
- Eric Jenkins (M-NCPPC, Prince George's Co.)
- Dial J. Keju (Frederick Co.)
- Rick Kiegel (Maryland Transit Administration)
- David Kline (Fairfax County DOT)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Cambridge Systematics)
- Xuemei Liu (Cambridge Systematics)
- Krishna Patnam (AECOM)
- Jaak Pedak (Fairfax Co. DOT)
- David Roden (AECOM)
- Phil Shapiro (STC)
- Steve Weller (CH2M HILL)
- Shanjiang Zhu (George Mason University)

COG/TPB staff in attendance

- Joe Davis
- Bob Griffiths
- Wanda Hamlin
- Hamid Humeida
- John Kent
- Martha Kile
- Mary Martchouk
- Nicole McCall
- Ron Milone
- Mark Moran
- Jane Posey
- Wenjing Pu
- Clara Reschovsky
- Rich Roisman
- Meseret Seifu
- Dusan Vuksan
- Feng Xie
- Jim Yin

The meeting was chaired by Bahram Jamei of VDOT.

1. Introduction and approval of meeting highlights

The highlights from the September 21 meeting of the Travel Forecasting Subcommittee (TFS) were approved without change.

2. Status report on the Version 2.3 Travel Model updates and application schedule

This item was presented by Mark Moran of TPB staff. Mr. Moran first gave an overview of recent model updates, which include:

- Software version updates: Cube Voyager Version 6.0.2 is now being used. Previous air quality conformity work used Version 5.1.3 (and later 6.0.1). The LineSum program used to summarize transit assignment results has also been updated.
- Additional parallelization of model steps: The model application has been reconfigured so that some modeling steps that were previously executed in sequence are now executed in parallel. The reconfiguration saves computation time. Additional parallelization was recently added to the transit skimming, mode choice, highway assignment, and transit assignment steps.
- Update in the development of light-rail transit (LRT) walksheds and their resultant zonal percent-walk-to-transit values: The model has always differentiated between Metrorail walksheds and walksheds for “all transit” (including Metrorail). Staff has recently determined that, due to the assumptions used in path-building, LRT (Mode 5) walksheds should be included with Metrorail walksheds, not simply in the “all transit” walksheds.
- The stability of model applications has been refined: Input files have been moved and script changes have been made to minimize model application disruptions.

Next, Mr. Moran discussed the application schedule for the air quality conformity (AQC) assessment of the 2013 CLRP and FY 2013-2018 TIP. The process is currently underway and the travel demand modeling work will be done in the spring and summer of 2013. Staff currently anticipates that air quality conformity work will be completed by July 2013, at which time the draft CLRP/TIP and air quality emission results will be presented to the TPB for adoption. Mr. Moran concluded his presentation by mentioning the next steps, including preparing a version of the model for use in the AQC analysis; updating the model documentation; and developing a batch file that would facilitate the removal of unnecessary temporary files from the model run subdirectories.

A TPB staff member inquired whether migrating to Cube Voyager 6.0.2 has affected the model results. Mr. Moran responded that it has not. The staff member also asked whether the new model will run to completion if the user does not turn off distributed processing and the platform used to run the model does not have 8 cores. Mr. Moran responded that the number of cores available must be specified in the batch file used to launch a run. The run will fail if the actual number of cores available is less than that specified in the batch file.

3. Status report on the Version 2.3 Travel Model year-2010 validation

This item was presented by Ron Milone of TPB staff. Mr. Milone mentioned that the TPB staff has spent several months compiling observed 2010 data at the jurisdiction level, including Census household data, ACS demographic data and HPMS VMT data. Staff has also collected daily and hourly traffic counts at the network link level, Metrorail station ridership counts and daily Metrobus line ridership counts. He added that the 2010 highway network has undergone recent revision relating to facility type coding and centroid connector coding.

Mr. Milone reviewed several model performance tables with the subcommittee and offered the following observations:

- The 2010 Round 8.1 households compared very well with the 2010 Census households at jurisdiction level.
- The modeled 2010 household size, income, and vehicles available distributions at regional and state level compared very well with ACS-based distributions.
- 2010 modeled estimates of rail and bus demand compared well at the system level with WMATA counts at the system level, although substantial differences were noted at finer levels of disaggregation.
- While regional 2010 modeled VMT was found to match HPMS figures well, staff noted substantial VMT over-estimation in the District, Loudoun County and the City of Alexandria.
- Staff noted a substantial over-estimation of highway crossings over the Potomac River

In the staff's estimation, additional work is warranted to address the highway over-estimation issues noted above.

A subcommittee member inquired about how non-motorized trips were validated. Mr. Milone responded that this travel market has been calibrated using the 2007/08 Household Travel Survey. Non-motorized trips have not yet been validated against more recent data. A subcommittee attendee suggested that screenlines be created for both transit and highway. Mr. Milone agreed and stated that staff is working on it. A subcommittee member asked how well the model performs at the corridor level and suggested using a relative gap of 10^{-4} to produce better convergence. Mr. Milone responded that the traffic assignment RMSE performance for 2010 is comparable that of the last 2007 analysis.

4. Status report on the consultant-assisted project for development of the TPB travel model: Computational alternatives for traffic assignment

David Roden of AECOM focused his presentation on traffic assignment refinements that are being explored as an alternative to the TPB's existing assignment practices (Task Order 8). Mr. Roden then provided some background on the High-Occupancy Vehicle (HOV) and High-Occupancy Toll (HOT) lanes and the existing TPB traffic assignment process. The current HOV assignment model first assigns the non-HOV3+ trips to the LOV network for the AM and PM peak periods, calculates loaded speeds, and then assigns the HOV3+ trips to the loaded network. The reason for the two-step process is the underestimation of HOV3+ trips if a simple multiclass assignment is performed. Some of the concerns regarding this process include:

- Additional run time and complexity;
- The inability of the LOV trips to consider the impact of HOV3+ traffic on travel speeds; and
- Inconsistent treatment of HOV2 and HOV3+ facilities.

AECOM suggested separating the HOV choice from the shared household travel in the mode choice step by splitting person trips into independent person trips and joint travel. The independent person trip would consider the full mode choice options, but will limit the HOV choice to zone pairs with a travel time difference, while the joint travel will be based on group mode choice options. There was a discussion regarding the difficulty of splitting trips into independent person and joint travel, particularly when it comes to pick up or drop off trips.

Mr. Roden next discussed the existing HOT-lane process, which involves first running the model with HOT-lanes treated as HOV-lanes, then setting a toll and iteratively adjusting the toll until the V/C ratio falls between 0.95 and 1.01. Once the toll that results in the desired V/C ratio is calculated, the entire model is rerun with fixed tolls. Some of the concerns regarding the existing process include:

- Excessive computation times;
- Toll rates being set outside of the standard modeling process; and
- Link-based tolls using peak hour V/C ratio and possibly not replicating actual conditions.

AECOM proposed splitting trips into those willing to pay the toll and those not willing to pay the toll, prior to traffic assignment, using a toll choice probability curve (diversion curve). Mr. Roden then mentioned that the next steps for AECOM will be 1) to get INRIX data (or information about the INRIX data) and to call other MPOs to determine how they use such data; 2) identify potential sources of data for joint trips; and 3) test computationally efficient methods of setting HOT lane toll rates.

There was a discussion regarding how the HOT lanes affect the mode choice and regional mobility distribution. Mr. Roden pointed out that the feedback of generalized cost to other model steps is one of the reasons why toll setting should be done as an integral part of the model run.

5. A review of the regional transportation networks supporting the Version 2.3 Travel Model

This item was presented by Ron Milone and Jim Yin of TPB staff. Mr. Milone first gave a brief overview of TPB Cube Voyager highway and transit networks, which are designed to reflect the evolving TIP and CLRP. Mr. Milone reviewed the Cube Voyager network inputs and described attributes of the various network files used in the Version 2.3 travel model. He also reviewed the TAZ and highway network node numbering schemes.

Mr. Yin next described the development and management of the regional transportation network database. This is the GIS-based file system with which the TIP and CLRP networks are prepared each year. Mr. Yin explained that all the elements of the transportation networks are stored in a personal geodatabase, which uses Microsoft Access data files to store both spatial and non-spatial data. It includes multi-year data where highway and transit network elements are dynamically linked. Custom ArcGIS-based software is used for editing and exporting elements. Using a personal geodatabase approach for network development has several benefits, including greater consistency across network years, transit line coding is dynamically linked to highway editing, and the ability to link external geo-referenced files to the highway network.

Next, Mr. Yin reviewed the structure of the geodatabase, the elements that are included, and how they are linked. Mr. Yin also discussed the network editing application (COGTool), which is used to edit highway and transit networks and to export files. Some of the challenges associated with using COGTool include the need to add it to the ArcGIS platform and the need to understand some concepts of relational databases. In conclusion, Mr. Yin stated that TPB staff is currently working on documenting

the currently adopted 2012 CLRP networks and converting existing TRNBUILD-based network files into a format that is compliant with a newer transit network program, Public Transport (PT).

A subcommittee attendee asked whether COGTool will be made available to the public. Mr. Milone responded that it is not a finished product and has not yet been documented. However, TPB staff can make a beta version available to those who are interested. An attendee inquired whether a standalone version of ArcGIS is necessary to use the network database. Mr. Milone responded that it is (TPB staff currently employs ArcGIS Version 9.3.1).

6. Update of the Regional Transportation Data Clearinghouse

This item was presented by Martha Kile of TPB staff. Ms. Kile explained that the RTDC is a collection of transportation-related data obtained from member agencies. RTDC was first released a decade ago and has been continually expanded and improved and is now available as a web map application. The application consists of “widgets” that enable the user to query and download data. The available data layers include the average annual daily traffic counts from 2005 through 2011, hourly traffic counts from 2008 through 2011, transit counts by route, Round 8.1 Cooperative Forecast data, Version 2.3 model screenlines, activity centers, and jurisdictional boundaries. Next, Ms. Kile demonstrated some of the widgets in the web map application, including the query tool and the export tool. Following the demonstration, Ms. Kile mentioned that, in the short term, the development team will continue to work to address any data inconsistencies and re-organize some of the datasets. In the longer term, TPB staff will continue to add new data to RTDC and will consider how else the data can be accessed through the interface.

A subcommittee member inquired whether one can download shapefiles instead of CSV files. Ms. Kile responded that the shapefiles may be obtained with the application. A meeting attendee asked whether turning movement counts are available through RTDC. Ms. Kile responded that they are not. Another attendee asked what transit data is available in the RTDC. Ms. Kile responded that average weekday transit ridership, by month, may be obtained.

7. Round-table discussion

This item was deferred until the next meeting of the subcommittee.

8. Announcement of new chair for 2013

Mr. Moran informed the subcommittee that the chair of the TFS rotates on an annual basis, each January, between DC, Maryland, Virginia, and WMATA. Since this was the last meeting of the subcommittee in 2012, it was now time to announce the new chair and thank the outgoing chair. He then thanked Bahram Jamei for serving as the chair of the subcommittee for 2012 and presented him with a certificate of appreciation. Mr. Moran then announced that Wendy Jia from WMATA will be the new chair for calendar year 2013.

9. Other business

The next proposed meeting of the TFS is Friday, January 25, 2012 from 9:30 AM to 12:00 noon.

-- The meeting highlights were prepared by Mary Martchouk --