
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 July 18, 2014 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 of 9/19/14

Meeting attendees

- Melissa Chow (WMATA)
- Shweta Dixit (Loudoun Co. DTCL)
- Dan Goldfarb (VHB)
- Eric Jenkins (M-NCPPC, Prince George's Co.)
- Claudy Joinville (DelDOT)
- Robert Josef (VDOT)
- Jill Kaneff (Loudoun Co. Planning)
- Dial J. Keju (Frederick Co.)
- David Kline (Fairfax County DOT)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Cambridge Systematics)
- Subrat Mahapatra (MD SHA)
- Erin Murphy (Kimley-Horn and Assoc., Inc.)
- Bill Orleans
- Krishna Patnam (AECOM)
- Prasad Pulaguntla (Arlington Co. DES)
- Maggie Qi (CH2M HILL)
- Amit Sidhaye (Arlington Co. DES)
- Stuart Whitaker (Whitaker Associates)

COG/TPB staff in attendance

- William Bacon
- Anant Choudhary
- Joe Davis
- Robert Griffiths
- Wanda Hamlin
- Hamid Humeida
- Andrew Meese
- Ron Milone
- Mark Moran
- Dzung Ngo
- Jane Posey
- Clara Reschovsky
- Rich Roisman
- Jon Schermann
- Meseret Seifu
- Dusan Vuksan
- Feng Xie
- C. Patrick Zilliaccus

The meeting was chaired by Dial Keju.

1. Introductions and approval of meeting highlights from the May 23 meeting

The highlights from the May 23, 2014 meeting of the Travel Forecasting Subcommittee (TFS) were approved without change.

2. Status report on the consultant-assisted project for development of the COG/TPB travel demand model

The item was presented by Mark Moran who distributed a copy of his presentation. Mr. Moran provided some background about the consultant-assisted project for the development of the COG/TPB travel

demand model, whose rebidding typically happens every three years. Mr. Moran announced that Cambridge Systematics, Inc. had won the FY 2015 contract. Regarding the work in FY 2014, AECOM delivered COG/TPB staff the draft report and associated modeling files on June 30. Paper copies of the report were provided to meeting attendees and an electronic copy was uploaded to the COG TFS website. Mr. Moran invited the subcommittee to review and to give feedback on the report during a 30-day review and comment period ending on August 18. Next, Mr. Moran discussed the work in FY 2015, including the testing of model enhancements proposed by AECOM for possible inclusion in future model releases. Bob Josef asked whether the upcoming regional travel demand model (currently Version 2.3.57) would include the revised mode choice application program (ModeChoice). Mr. Moran responded that that the upcoming model would still use the existing AEMS mode choice program. He added that COG/TPB staff hopes to include the new ModeChoice program over the next year after the model has been tested by staff and hopefully recalibrated.

3. Status report on the air quality conformity analysis

Jane Posey presented this item and distributed handouts of her presentation. Her presentation was about the air quality conformity analysis of the 2014 Constrained Long-Range Plan (CLRP) and the FY 2015-2020 Transportation Improvement Program (TIP). She stated that the travel demand model results should be finished by September and might be approved by TPB in October. Ms. Posey said that the analysis used the new Round 8.3 land activity data, the Version 2.3.57 travel demand model, newly coded networks, and the MOVES 2010a mobile emissions model. She mentioned that, although the year 2020 is not a conformity year, it would be run nonetheless, since it is used as the base/binding year for the transit constraint through the regional core. Ms. Posey explained some of the minor updates made to the travel demand model and the significant changes made to the input networks, such as the new base transit service and additional D.C. streetcar lines. She highlighted that the WMATA July 2014 fare increases are not in this year's networks, but would be incorporated into the networks next year. No questions were asked.

4. Initial analysis of AirSage O-D cellular data for the TPB modeled area

The presentation was given by Ronald Milone and the copies of the presentation were distributed to the subcommittee. Mr. Milone opened his presentation by reviewing some information about exogenous travel demand inputs, including some of the shortcomings of the current data, which was one of the reasons why TPB staff chose to purchase AirSage (AS) data. The data, which has been developed from mobile devices and is increasingly being used for planning and marketing purposes, was delivered to TPB staff in June 2014. Mr. Milone explained the five-step methodology used by AS to develop their data sets, which are aggregate O-D trip matrices defined for a user-specified geography. He listed the specifications of the AS data that was purchased by COG and described the plan for using the data to examine external and through travel and to examine visitor/tourist travel. Mr. Milone pointed out some characteristics of AS data which will be a challenge for direct comparisons with modeled outputs. Mr. Josef asked whether the AS data included intra-zonal trips. Mr. Milone confirmed that intra-zonal trips are retained, at least those that occur within the study area (modeled area).

According to tabulations of the AS data, about 86% of internal-to-internal (I-I) trips were made by residents of the region, which Mr. Milone found to be reasonable. But the AS data also indicated that 28% of I-I trips were home-based work (HBW), which Mr. Milone thought was too high (the model shows about 19%). Robert Griffiths commented that the AS methodology identifies the habitual location for trips, which is imputed as being the work location (i.e., HBW). But, if someone goes to school for about eight hours a day, this could mistakenly be identified as a HBW trip, even though it is a HB non-work trip. So Mr. Griffiths was not surprised that the AS data seemed to over represent work trips. Mr. Milone also noted that the 2014 AS external and through trips accounted only 50% of the value from the travel model. He also discussed a zone-level comparison of AS data (home trip origins) with land activity data (households from Round 8.3). He noted that, when the data was aggregated to the TAZ level, the correlation was modest (R^2 of about 0.44), but when the data was aggregated to the district level, the correlation between the two data sets was higher (R^2 of about 0.89). Thus, locational noise in the data was reduced at higher levels of aggregation. Mr. Milone mentioned some other issues with the AS data, such as where home origin trips existed in locations that had zero households, such as on the National Mall. He also noted that the AS data appeared to underrepresent crossings at external stations (AS data was 40% of the count data). He said that further analysis will be conducted and thought that further consultation with AirSage might be needed to address some issues. Mr. Milone noted that the AS data could not be shared outside of COG, due to the contract's conditions. Mr. Griffiths added that the AS data could not completely replace the data from a household travel survey, but it may be the only practical way to get a handle on visitor/tourist trips.

Krishna Patnam pointed out an apparent contradiction: On the one hand, the AS data appeared to show home-based trips starting on the National Mall (which should have no households); on the other hand, the AS data was supposed to have been factored to the 2010 Census, which should not have included any household on the Mall. Prasad Pulaguntla asked whether AirSage did some of the analysis in today's presentation or whether it was all done by COG staff. Mr. Milone said that all the analysis was done by COG staff. Yuanjun Li asked how the AS data was expanded (factored) so that it would include the total population, including people who do not use a cell phone. Mr. Milone answered that the expansion factors were defined as the total population at the census tract level by the number of cell phone users in the tract. So, the factored numbers should include both cell phone users and non-users. Mr. Griffiths added that there is almost no income bias, since almost everyone has a cell phone. But other meeting participants mentioned that there could be some income bias, since the AS data relies on data from only two cell phone companies (Verizon and Sprint), and the other cell phone companies might have more of the low-income users. Jill Kaneff felt there might be some biases in the data due to the fact that some of the rural areas that feed into the modeled area might have lower cellphone usage. Mr. Griffiths agreed that that could be an issue and mentioned that the size of external zone catchment areas was taken into account to address the fact that there is a lower density of cell phone towers in these areas. According to Mr. Griffiths, some research recommended that the external catchment areas have a depth of 45 miles, but added that using such a large area could come with other problems. He added that it might be necessary to enlarge some of the external station catchment areas in Virginia. Mr. Zilliacus noted that, although Verizon is a dominant carrier in our region, in eastern West Virginia, the dominant carrier is U.S. Cellular. He suggested that COG/TPB staff might want to ask AirSage whether the U.S. Cellular

phones are included in the AirSage data (both Verizon and U.S. Cellular use the same technology: CDMA). Subrat Mahapatra asked if there is any way to infer the travel mode from the AS data. Mr. Griffiths said that there is some research being conducted in this area, where travel speed is being used to infer mode, but such techniques work better in rural areas than urban areas, since a person on a bus might travel slower than a person walking. He also noted that there are other problems with cell phone data, such as intermittent cellphone signals that result from tall buildings or using Metrorail underground. Dan Goldfarb asked whether it might make sense to use INRIX data to crosscheck the AS data. Mr. Milone commented that he would consider the idea, but Andrew Meese, COG/TPB, stated that INRIX data contains only speeds, not trip O-D information.

Mr. Meese then announced that he and his staff were planning to form a probe-data (INRIX) user's group, which might meet for the first time this fall. The user's group would be a forum for member agencies to discuss how to access and use the INRIX data. Access to the group would likely be limited to those who had signed data use agreements. Amit Sidhaye asked whether local jurisdictions could piggyback onto the contract that COG has with AirSage to a discount on future data. Mr. Milone responded that he would discuss the matter with the vendor. Ms. Li asked whether the AS data would include cell phones that have been turned on. Mr. Milone said that his understanding was that the devices must be powered on in order to be recorded. Lastly, Ms. Li asked if the AS data included the origin, destination, and the path traveled on the trip. Mr. Milone and Mr. Griffiths said that, due to the privacy reasons, AirSage data includes only the origin and destination of each trip, not the path.

5. Status report on the 2014 WMATA Bus Survey

Clara Reschovsky, COG/TPB staff, presented this item and also distributed copies of her presentation. After addressing the purpose of the 2014 WMATA Bus Survey, Ms. Reschovsky provided lists of the data items in the survey, and discussed the survey design for the spring and fall waves of the survey. Ms. Reschovsky mentioned that a pretest was done in February to test the methodology. She added that the spring wave of the survey, conducted from March 18 through the end of June, was now complete and had a good response rate. She said that the fall survey would start after Labor Day. She also noted that COG would make a comparison of using a tablet versus a self-administered paper questionnaire.

Mr. Moran asked whether the 2014 bus survey was as difficult to collect as previous surveys. Ms. Reschovsky replied that it was easier and the quality was higher, since this time, COG made use of a local consultant who knew the area and had had past experience conducting surveys in this region. Mr. Griffiths added that, in cases where bus lines did not have enough samples, the firm went back out and resurveyed the bus lines. Mr. Ziliacus asked if the survey data included the D.C. Circulator bus. Ms. Reschovsky said it was excluded since the bus survey was for only WMATA buses (Metrobus). Ms. Reschovsky also explained efforts to make the survey accessible to various populations, such as non-native English speakers and the visually impaired. Mr. Patnam asked which interview method was more efficient: electronic devices (tablets) or paper. Ms. Reschovsky said she could not answer that question until staff has the data file and has conducted some analysis of the issue. Mr. Sidhaye indicated that he was impressed by the high rate (87%) that was achieved for automatically geocoding home addresses in the survey. Ms. Reschovsky agreed that the geocoding went very well for this survey.

6. Suggested procedures for making data requests from COG/TPB staff and recent changes to the travel demand model

This item was presented by Mr. Moran, who also distributing copies of his presentation. He defined what is meant by “data requests” and described who makes these requests and how many are handled by COG/TPB staff each year (over 60). He described the protocol for making a data request, which is also available on the COG/TPB data request website. Mr. Patnam indicated that it is sometimes useful to know the assumptions behind the land activity forecasts, such as which development projects are included in given zone, and he wondered whether this was an appropriate question for COG staff. Staff indicated that users with such questions can start with COG staff, but added that COG staff may need to follow up with the local land use planners to answer the question.

The second part of Mr. Moran’s presentation was a discussion of recent changes to regional travel demand model (specifically between Ver. 2.3.52 and Ver. 2.3.57, which is currently being used in the air quality conformity assessment). Most of the changes were to enhance the usability of the model and would not have any major effect on modeled results. One exception was a bug fix for the walkacc.s script, which is used to develop zonal walk-access links to transit. Although neither this bug nor its fix had a major effect on total transit at the regional level, the bug could have resulted in errors in estimates of transit trips at the zonal level for some outer counties (Prince William Co. and beyond). Consequently, anyone who requests the production-use travel demand model (Ver. 2.3.52) will also be given the revised walkacc.s script. Eric Jenkins asked what process is used by COG staff for managing and building transportation networks used by the model. Mr. Moran responded that COG uses an Esri geodatabase to manage the transportation networks, along with custom-built software, called COGTools, for interacting with the geodatabase. In the case of the highway networks, a user may specify any years between the base year and the horizon year (2040) and the system will produce the year-specific network. In the case of transit networks, only specific year networks are coded, so there is a more limited choice of which years/scenarios are available.

7. Ashburn-Sterling Traffic Study

The item was presented by Ms. Kaneff and Shweta Dixit. Ms. Dixit described some key information about the Loudoun County travel demand model (LCTM), which is applied using Cube Application Manager of CUBE platform, and was derived from the COG/TPB model. She said the study was approved in 2012 and was completed by URS Corporation in April 2014 using the updated LCTM. Ms. Kaneff provided background about the existing conditions, including changes of population and employment from 2010 to 2040 in the study area. Mr. Milone noted that, based on the numbers in Table 17 on slide 10, it appears that employment is forecast to grow at a higher rate than population, which means that the county will have to increasingly import workers from outside the county to fill the new jobs. Ms. Kaneff agreed, but also indicated that since 50% of county residents leave the county to fill jobs in other jurisdictions, there is an interest to have more of those residents fill jobs within the county. Ms. Dixit discussed the use of the model to analyze the adequacy of the future network by running three scenarios 1) 2010 “existing,” 2) 2040 “No build,” and 3) 2040 “Build,” which incorporates the 2030

Countywide Transportation Plan. Ms. Dixit highlighted that the “No build” scenario was deficient while the “Build” scenario was deemed adequate to address the forecasted demand in the study area in 2040. Lastly, she discussed some project-specific recommendations.

Mr. Liu said that he understood that the Loudoun Co. model used a different tolling procedure than the COG model and wondered whether a comparison had been made between the two models. Ms. Dixit said that she believed that such a comparison had not been conducted. Ms. Kaneff noted that the Loudoun model has many more local roads than the COG model, so it would be difficult to compare the two models. Eric Jenkins asked for more specific information about model running times and about traffic assignment closure criteria, such as the number of user equilibrium iterations and the relative gap. Ms. Dixit answered that a run took 3.5 hours, but she would have to investigate to find the answers to the other questions.¹ Mr. Milone asked whether the volume-to-capacity (V/C) ratios were daily or peak period. Ms. Dixit stated that they are peak-period V/Cs. Rich Roisman asked if a validation report had been written. Ms. Dixit stated that a validation report is available. Stuart Whitaker asked whether the mode choice modeling step was incorporated in the LCTM. Ms. Kaneff and Ms. Dixit confirmed that it was, adding that the model used a simplified version of the COG/TPB mode choice process. Mr. Patnam asked if there was documentation about what network changes were made, compared to COG’s CLRP. Ms. Dixit said there was. Dusan Vuksan asked whether LCTM’s modeled area was the same as the one used in the COG model. According to Ms. Dixit, the TAZs within Loudon County are at a finer grain than those of the other counties (though the modeled area should be the same as COG’s). Mr. Griffiths asked whether Loudoun Co. provided land use data for the 667 TAZs within Loudon County. Ms. Kaneff explained that Loudoun Co. did the forecasts at the 667-TAZ level, and then aggregated the data to the COG TAZ level for input to the COG process.

8. Round-table discussion about current projects and activities in the region

Chair Dial Keju invited subcommittee members to share current projects or activities that might be of interesting to the subcommittee or TPB staff.

Ms. Li announced that Montgomery County had hired VHB for a six-month project to develop a new version of the county’s travel demand model. The model, which will be named Travel 4, is based on COG’s Ver. 2.3.52 model. It has more detailed networks including all local roads within the county. She noted that the previous model, Travel 3, was built derived from COG’s Ver. 2.1D #50 Travel Model.

Mr. Kline informed the subcommittee that Fairfax County, with the help of Cambridge Systematics, was updating the county’s model by adding more subzones in the county and realigning the county’s zone system to make sure that it is consistent with COG’s Ver. 2.3 model. The project is expected to take two to three more months to complete.

¹ After the meeting, Ms. Dixit was able to determine that the Loudoun County model was set up for 20 UE iterations and achieved a convergence between 0.002 to 0.0007 based on scenario/year and time of day.

Mr. Pulaguntla, a new representative of Arlington County, said that they started gathering the data to build a county model, with the focus on the high-growth areas, such as Columbia Pike, Crystal City, and Glebe Road.

Mr. Jenkins shared that Prince George's County was updating, with the help of AECOM, the county's travel model to version 1.5 which uses TransCAD platform and uses a finer grained TAZ system in the county. Next, the plan is to migrate to a hybrid system using both TRANSIMS and TransCAD.

Mr. Keju said that the Frederick County had just finished developing its Round 8.3 land use submission to COG. This latest update included the City of Frederick.

Mr. Mahapatra from Maryland SHA listed some state's ongoing project planning studies. For example, in Montgomery County, SHA is doing the following: updating the functional master plan, US 29 bus rapid transit (BRT) study, and the Maryland 355 BRT study. He added that COG staff will be helping SHA with those projects. He also added that there are other projects in Prince George's Co.

Robert Josef, a representative of VDOT, discussed the traffic study for I-66 (outside the Beltway). VDOT is testing different scenarios, such as various lane configurations and access locations. He said that the model for the study was built by CH2M HILL, based on COG's model, but with finer-grained zones along the I-66 corridor and a more detailed network from Fairfax's model. Additionally, the Richmond planning office is making runs for toll optimization and revenue sharing. Mr. Josef highlighted that the O-D trip table of the model would be validated using AirSage data bought by Kimley-Horn and Associates, Inc. Mr. Milone asked what the schedule for the study was. Mr. Josef and Maggie Qi said the Tier 1 study, including 14-15 alternatives, has been completed. Now, they are refining network data. It is expected that the study will finish in 2016. Mr. Milone asked if the study was analyzing multi-modal or highway alternatives. Ms. Qi said it was the former.

9. Next meeting date and other business

The next scheduled meeting of the TFS is Friday, September 19, 2014 from 9:30 AM to 12:00 noon.

*** The meeting highlights were prepared by Dzung Ngo and Mark Moran ***