Travel Forecasting Subcommittee Meeting Highlights

Friday November 20, 2009, 9:30 AM to 12:00 noon

Meeting attendees

- Walter Council (M-NCPPC, Prince George's Co.)
- Erik Dahlberg (WMATA)
- John (Jay) Evans (Cambridge Systematics, Inc.)
- Dan Goldfarb (Cambridge Systematics, Inc.)
- Eric Graye (M-NCPPC, Montgomery Co.)
- Elizabeth Harper (Parsons Brinckerhoff)
- Bahram Jamei (Virginia DOT)
- Eric Jenkins (M-NCPPC, Prince George's Co.)
- Wendy Jia (WMATA)
- Dial J. Keju (Frederick Co.)
- Bob Kuhns (Clark Nexsen)
- Yuanjun Li (M-NCPPC, Montgomery Co.)
- Feng Liu (Michael Baker Corp.)
- Subrat Mahapatra (MDSHA)
- Nick Schmidt (Parsons Brinckerhoff)
- John Thomas (Frederick Co.)
- Bassel Younan (AECOM)

COG/TPB staff in attendance

- William Bacon
- Tim Canan
- Mike Clifford
- Joe Davis
- Charles Grier
- Bob Griffiths
- Wanda Hamlin
- Charlene Howard
- Hamid Humeida
- Mary Martchouk
- Ron Milone
- Abdul Mohammed
- Mark Moran
- Jinchul (JC) Park
- Jane Posey
- Wenjing Pu
- Clara Reschovsky
- Meseret Seifu
- Robert Snead
- Daniel Son
- Dusan Vuksan
- Feng Xie
- Jim Yin

The meeting was chaired by Wendy Jia of WMATA.

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

The highlights from the September 18 meeting of the Travel Forecasting Subcommittee (TFS) were approved without any changes.

2. Scan of best practices in travel demand forecasting: Release of final FY 2009 report

This item was presented by Ron Milone. On September 17, TPB staff posted a PDF copy of the "FY 2009 Draft Final Report" from Cambridge Systematics, Inc. (CS) on the TFS web page (www.mwcog.org/transportation/committee/committee/default.asp?COMMITTEE_ID=43), under the

"Documents" heading. The CS report is a compilation of five technical memos written during FY 2009 for TPB: 1) Fuel Prices in Travel Models; 2) Recommended Approach to Near-Term Model Enhancements; 3) Framework for Before-and-After Study of HOV Network Effects Due to New HOT Lanes; 4) Improving the Model's Sensitivity to Land Use Policies and Non-Motorized Travel; and 5) Recommendations on Feedback Convergence Methods. At the September 18 TFS meeting, TPB staff suggested that members of the TFS review the document and get any comments back to TPB staff within 30 days. At the conclusion of the 30-day period, there were no comments offered, other than some minor comments about formatting and page numbering that TPB staff offered to CS. CS made the formatting changes and issued a final report that was uploaded by TPB staff on the TFS web page on November 23. This report will also be made available to the Association of Metropolitan Planning Organizations (AMPO) for posting on its web site. TPB staff will meet with CS in the near future to discuss future task orders.

3. 2007 Household Travel Survey

This item consisted of two parts, items 3a and 3b. Item 3b was presented first.

3b. Data validation and error checking

Mr. Milone presented this item and distributed a handout entitled "2007/08 Household Travel Survey: Initial Review." Mr. Milone discussed some background information about the HTS and some summary statistics from the survey. The survey included 11,436 households and 87,476 trips, which corresponds to factored values of 2,348,230 households and 20,284,206 trips in the Washington, D.C. area modeled region. The presentation included statistics, such as persons per household and trips per household, which were compared to other sources, such as the American Community Survey (ACS) and the Census Transportation Planning Package (CTPP), to check their reasonableness. Mr. Milone described the logic checks that were performed, such as making sure that the number of licensed drivers in a household was less than the total number of persons in a household, and the file consistency checks that were performed, e.g., between the household file and the person file. The number of trips, weighted and unweighted, by trip purpose was presented. Mr. Milone pointed out that the percent of trips that were home-based work (HBW) has gone from 30% in 1968, to 21% in 1994, to about 19% in 2007/2008. On a slide entitled, "Comparison of observed trips by mode: 1994 HTS vs. 2007/08 HTS," after Mr. Milone indicated that auto passenger trips showed a 41% increase from 1994 to 2007/2008, Bob Griffiths pointed out one of the reasons for this increase: In the 1994 survey, TPB collected trip information for only persons 5 years old and older. By contrast, in the 2007/2008 survey, it was all persons in the household, including children less than five years of age. So, one of the reasons for the large increase in auto passenger trips are the under-five-year-old children that are taken on many auto trips. On another slide, Mr. Milone pointed out that there has been a decline in daily trip rates, from 8.82 (total person trips per weekday) in 1994 to 8.31 in 2007/2008.

A member of the subcommittee had a comment about the decline in household trip rates. He suggested that TPB staff may want to consider the impact of the recent economic downturn. The member pointed out that the survey started in February 2007 and ended in May 2008, so, as the survey was ending, the economy was starting to get soft. Mr. Milone added that gas prices reached their peak value of $3.50 to

$4.00 during the spring and summer of 2008. On the subject of the decline in trip rates, both for motorized trips and total person trips, a member asked asked whether TPB staff had looked at results at the jurisdiction level, since this might show declines in trip rates in areas that had had increases in transit supply, such as Metrorail extensions. Mr. Milone responded that that tabulation has not yet been produced by his staff.

3a. Release of draft documentation

This item was presented by Bob Griffiths. Mr. Griffiths distributed two handouts: "Average Household Size (HH Pop/HH)" and "Change in Household Trip Rates, 1994 - 2007-2008." Mr. Griffiths indicated that he had been unable to finish the survey documentation, since he had been very busy over the last few weeks responding to questions from the models development unit regarding error checking and validation of the household travel survey. Consequently, there are still some cases in the survey data that need rectification. For example, there are about two dozen trips (out of the 88,000 trips) where the destination of one trip is not the origin of the subsequent trip. Many of these were loop trips, and there was sometimes an error in the way the respondent recorded the information. He added that there will also be some updates to the vehicle file, but he did not think that they would result in changes in any of the overall regional/jurisdiction/activity center percentages that have already been presented. Getting back to the question asked at the end of Mr. Milone's presentation, about declining trip rates stratified by jurisdiction, Mr. Griffiths indicated that he did have some tabulations that would address the question (in handout #2).

First, however, Mr. Griffiths began with the information in handout #1. He mentioned that one of the first concerns when looking at the 2007 HTS data was the apparent decrease in the average household size, when compared to the year-2000 census data. The first handout covered this topic. The handout included average household size, by jurisdiction, for the 1994 HTS, 2000 Census, 2007 ACS (both population-based and household based), and then the 2007/2008 HTS. He mentioned that when looking at the number of persons per household in the 2007 ACS, you really have to dig into the footnotes to understand what is going on with the ACS data. In the ACS, household-based estimates are derived from a household survey, but population-based estimates are ratioed or raked to independent population totals that are produced by the Census Bureau. When you put these two types of estimates together in the ACS, there are some logical inconsistencies. For example, if you look at the ACS estimates of household population and divide them by the household estimate, they show population per household *increasing*, between 2000 and 2007, going from 2.61 to 2.65. Mr. Griffiths mentioned that, for comparison purposes, he came up with his own estimate of household population by multiplying the number of one-person households by one, two-person households by two, etc., up to seven or more. At that point, you have to make an assumption about what is the average household size for households with 7+ persons. Based on the 2000 Census, this number should be about 8, which is a reasonable number. As a test case, he also did the calculation the other way, using the independent population estimate and the fact that you know the household population for household with one to six people, then the difference would have to be the average household size in households with 7+ people. In some jurisdictions, there would have to be an average of 60 persons per household for households with 7+ people. Thus, Mr. Griffiths said that TPB staff chose to use the household-based 2007 ACS

estimate for factoring the 2007 HTS. Consequently, on the second page of handout one, the HTS data is closely matching the ACS data (note that the ACS data shown in this table is not the 2007 ACS, but the 3-year average by jurisdiction -- 2005, 2006, 2007 – since the sample size is bigger). Mr. Griffiths added that it might not be until 2011 that one can fully answer this question.

Mr. Griffiths then discussed the second handout that addressed changes in household trip rates (for all trips, not just motorized trips). Mr. Griffiths mentioned that, in the past, we have never seen a decline in household trip rates in any survey – we have always seen an increase or no change – until now. He mentioned that his household trip rates would be a little different from those shown by Mr. Milone, since his (Mr. Griffiths') were based on the 12 jurisdictions in the air quality non-attainment region, which is the 1983 MSA (by contrast the 1994 HTS included Fauquier Co., VA). Mr. Griffiths pointed out, on page 1 of handout #2, that the decline in trip rates was across all household sizes – it's not just a case of decreasing household sizes leading to decreasing household trip rates. On page 3 of handout #2, change in per-person trip rates are shown by location (core jurisdictions, inner suburbs, outer suburbs) and age group. One explanation for why trip rates are decreasing has to do with the aging of the Baby Boom Generation, which is entering the 55- to 64-year-old age group, so more people are retiring and dropping out of the labor force, which leads to a decrease in trip rates. In 1994, the age group 55-64 had about 302,000 people. By 2007/2008, that age group now has about 605,000 people. Even if the trip rates had remained stable from 1994 to 2007/2008, because they are weighted by population, the trip rate would have gone down. On that same table (page 3 of handout #2), Mr. Griffiths pointed out that the largest decreases in trip rates were for the two age groups of 5-15 and 16-24, which he attributed to kids staying home and playing video games as opposed to going out and making a lot of trips. He indicated that TPB staff plans to look into this in more detail. Another finding is that the overall trip rates for the core-area jurisdictions (DC, Arlington, Alexandria) essentially remained the same. The inner suburban jurisdictions (Montgomery, Fairfax, Prince George's counties; Falls Church and Fairfax City) had the biggest decrease and this was generally true throughout the age groups. Mr. Griffiths said that, based on his initial normalized analysis, about 15% of the overall reduction in trip rates is due to the change in the age distribution. However, this also means that 85% of the reduction is still unexplained.

A member made a comment about the change in estimated/forecast VMT coming out of the various TPB travel models. He said that, according to the Version 2.1 travel model, the 2030 VMT was about 220 million. By contrast, the 2030 VMT from the Version 2.2 is about 198 million. He indicated that he had thought the justification given for the drop in VMT was because of the high level of congestion and the fact that the number of speed feedback iteration went from three to six in the Version 2.2 travel model. However, today, the member added, when TPB staff discussed the reasons for the drop in trip rates, he did not hear any mention of congestion as a possible cause. This member felt that congestion could be a possible cause of the drop in trip rates. Mr. Milone responded that we do not know for sure, regarding the household travel survey. As for the modeled results, however, Mr. Milone mentioned that a major cause of the decrease in VMT were the revised (lower) assumptions regarding travel and growth in travel at the external stations. Mr. Griffiths felt that the subcommittee member was probably correct -- that worsening congestion may be having a dampening effect on trip rates. According to Mr. Griffiths,

the fact that some of the biggest declines were seen in the inner suburbs, where you have some of the most congested travel, would indicate that if it takes you longer to make the same trips, not only do you shorted your trips, but you also may forgo some trips or do trip chaining, which can result in less VMT.

This same member mentioned that Virginia is part of the National Household Travel Survey (NHTS), as an "add on," and that the survey is almost finished. The member suggested that COG/TPB might want to release the 2007 HTS data so that agencies, such as VDOT, could take a look at it and compare it to the NHTS. The member indicated that it might be beneficial to allow some agency review of the COG/TPB HTS before it is released in final form.

Regarding the drop off in trip making from 1994 to 2007/2008, Mr. Clifford indicated that the last two pages of hand-out #2 showed some trends: 1) the change in per-person trip rates shows the largest decrease for the youngest age groups, 2) it shows a smaller decrease for the middle aged, and 3) it shows an increase for those at the upper age groups. He felt that this pointed to an income effect, since age and income are very correlated and higher income people tend to make more trips. He felt that it might be worth looking at VMT change from 2005 to 2008. Mr. Clifford added that, when his group looked at VIN (vehicle identification number) data between 2005 and 2008, the recession had started, gas prices were going up, and they found that the decline in new vehicle purchases was dramatic. He felt that older age groups might be a little more insulated from those effects. So, he suggested that there might be a correlation. Elizabeth Harper asked when the COG/TPB HTS data will be available to the public. Mr. Griffiths felt that more work was necessary before delivering the data.

4. Network development: Status of both TPBMAN and the year-2007 networks needed for model calibration

This item was presented by both Bobby Snead and Charlene Howard, who distributed a hand-out copy of their PowerPoint presentation. Mr. Snead went over the project objective and then gave a status report. Recently, work was completed to conflate the master highway network to the NAVTEQ street centerline database. The conflated links have also been merged with the TPBMAN geodatabase, which is the name for the new network geodatabase and its associated application, developed by DCI and COG/TPB staff. Rail links, which were not originally part of the master highway network, are now included in the TPBMAN geodatabase. That work was wrapped up in early November. Currently, TPB staff and DCI are working on refining the geodatabase and its application. Originally, the geodatabase had been populated with the 2008 CLRP. More recently, we have re-populated the database with 2009 CLRP and FY 2010-2015 TIP, which includes the Purple Line in Maryland. Networks have been generated, and are being reviewed, for the following years: 2002, 2007, 2009, 2010, 2020, and 2030. TPB staff is in the process of reviewing the new zone system (3,722 TAZ), including developing new centroid locations and centroid connectors. To date, this work has been done on paper maps. The next step is to put this information into electronic format (in the TPBMAN), so that it may be shared with the local jurisdictions and state DOTs for their review. One of the upcoming tasks for TPB staff is renumbering all the nodes in the networks with new node number ranges that will work with the new 3,722-TAZ system. Electronic or paper copies of the base-year networks, new centroids, and centroid connects will be made available for review by interested agencies by January 2010. Next steps include:

1) continue enhancement of the application, with a focus on developing the year-2007 networks needed for calibration work; and 2) deploy the TPBMAN application on a multi-user environment. Next, Ms. Howard presented a slide about future work to maintain and enhance both TPBMAN and COGTools (the editing toolbar within the application).

Ms. Jia asked how the timeline for the network development project will mesh with the timeline for the Version 2.3 travel model on the new zone system. TPB staff responded that the two work programs are designed to work together. The TPBMAN will be used to generate highway and transit networks that will be used for the upcoming calibration work of the Version 2.3 model. Yuanjun Li asked whether COG has networks representing the year 2040. TPB staff responded that the 2040 network has not yet been generated, since TPB staff have not yet gotten 2040 inputs from the stakeholders. This March, however, the 2040 inputs should start coming in to COG, allowing TPB staff the ability to develop a 2040 network.

5. Disposition and initial analysis of observed highway and transit data for 2007

This item was presented by Mary Martchouk, who is a new member of the TPB staff. Copies of her PowerPoint presentation were distributed to the subcommittee. She mentioned that the Version 2.3 travel model would be calibrated to the year 2007, since this was the primary year of the household travel survey. She mentioned that TPB staff is developing a database of year-2007 traffic counts and transit counts. Most of the traffic counts will come from COG/TPB's Regional Transportation Clearinghouse (RTDC). The transit counts will come from on-board transit surveys and transit counts conducted by the transit operators. Ms. Martchouk presented summaries of the year-2007 traffic count data, both daily and hourly counts. There were about 900 links with year-2007 traffic counts, which is only about 5% of the 20,000 links in a typical highway network. Mr. Milone pointed out that the 900 figure corresponds to only those links with a year-2007 count. If, however, we expanded the definition to include links with counts from other years that were factored to represent year-2007 values, which is a common practice, then the figure would be higher than 900. Ms. Martchouk also discussed the seasonal traffic patterns (March, April and October were the most representative of average conditions) and weekday traffic patterns (Wednesdays and Thursdays are the most typical days, with Fridays having the most travel). Her presentation also included a discussion about which transit ridership counts we have and she pointed out that we are looking for MARC boardings and alightings ("ons and offs") for 2007 and also the 2007 boardings an alightings from the Manassas Line of VRE (though we have the comparable 2006 and 2008 Manassas Line data, so we could interpolate, if necessary). Finally, she presented a table showing which survey data we have, and the status of each survey in terms of data collection, cleaning, and documentation.

Ms. Jia mentioned the 2008 WMATA rail survey that was conducted by the Maryland Transit Administration (MTA) and asked what additional information it would provide compared to the 2007 WMATA rail survey. Speaking on behalf of MTA, Ms. Harper said that the 2008 survey includes more data about household income. The data has been delivered by the vendor and is available. Parsons Brinckerhoff has been working on cleaning the data and factoring it, though the expansion factor work has not yet been documented. Ms. Harper added that, if there's an interest in using the data, let her

know. Ms. Jia asked whether there were differences in the travel patterns between the 2007 and 2008 rail surveys. Ms. Harper indicated that PB has not yet made such a check – they are mainly using it to update model coefficients. Ms. Harper also added that the MTA survey of Baltimore transit passengers (2007), which was mentioned in Ms. Martchouk's presentation, was not just a bus survey, but it also included MARC passengers as well, so there should be complete data there for MARC riders, too. TPB staff thought that the 2007 MTA survey included only MARC passengers who started their trip on a bus in the Baltimore region (thus, not all MARC commuter rail riders). TPB staff will look at the survey data more carefully to see what the survey data actually includes. Mr. Griffiths asked what the completed sample size was for the 2008 WMATA rail survey. Ms. Harper said that it was about 68,000 records (trip ends, or about 34,000 trips), with the caveat that the survey vendor, NuStats, typically removes records in cases where the respondent lists the boarding station and that station was not one of the stations where surveys were handed out (this represents around 20% of the records). However, PB keeps those records for the work it does, and the PB expansion factors account for this. Mr. Milone asked whether there were any changes to the Metrorail system from 2007 to 2008. Ms. Harper responded that the system was essentially the same in both years. Jay Evans mentioned that the Virginia Department of Rail and Public Transportation (VDRPT) funded a parking license plate survey in park-and-ride (PNR) lots in 2008 in the I-66 corridor of Fairfax Co., done by Cambridge Systematics, Inc. Also, under a VDOT study conducted by another vendor, a parking license plate survey was conducted for all PNR lots in Fairfax Co. last year. These data sets could be useful as a supplemental data set for PNR trip lengths, etc.

Subrat Mahapatra asked whether COG's RTDC contained special traffic counts (such as 48-hour counts and turning movement counts), or whether it simply contain the program counts and the permanent counts TPB staff said that the RTDC contains all the counts that were given to COG staff by the state DOTs. TPB staff thought that special counts were probably not included, adding that staff can check on that. Mr. Mahapatra added that 40% to 50% of MD SHA's traffic counts are special counts. Mr. Griffiths mentioned that COG/TPB has some special counts from DC, but they are not 24 hour – they are 11-hour or some subset of the day. Mr. Mahapatra mentioned that SHA has a lot of 13-hour, turning movement counts that get factored up to ADT. On the subject of traffic counts in Virginia, Mr. Griffiths suggested that TPB staff not restrict its analysis to counts that are pure year-2007 counts, since Virginia does its traffic counts by county on a three-year rotating basis, so there may be entire counties that have no year-2007 counts. In these cases, it would make sense to use the 2005 or 2006 counts for the county and factor the results up to year-2007 conditions. Bahram Jamei mentioned that VDOT, like MD SHA, has lots of special traffic counts. However, in the case of VDOT, it is very difficult to get your hands on all the special counts.

6. Developing the Ver. 2.3 travel model on the new zone system: Updated timeline

Mark Moran presented this item and distributed copies of his PowerPoint presentation to the subcommittee. The focus of this presentation was the timeline for completing the development of the Version 2.3 travel model on the new (3,722-TAZ) zone system. Since the last TFS meeting in September, there have been a number of updates to the schedule. Although not part of the project per se, there

has been a delay in the upcoming air quality conformity determination of the 2010 CLRP and FY 2011-2016 TIP, which was to have run from January to July 2010 – it is now scheduled to run from March to October 2010. As for the 2007/2008 Household Travel Survey (HTS), the date for completed documentation has slipped from September to November (As of today, the documentation is now expected by the January TFS meeting). Similarly, the schedule for the 2008 Bus Survey has slipped from Sept. 2009 to April 2010. As for network development (such as developing the new application to help manage highway and transit networks, TPBMAN), although there have been delays over the last year, within the last two months, there had been no further delays in the schedule. It is predicted that year-2007 networks on the new TAZ system will be available by the end of December (right now, the plan is to have the state and local governments review the new centroid locations and centroid connectors in January, which either means that there will be further slippage in the schedule for networks, or that some work will be conducted in parallel). Forecast-year networks (either 2030 or 2040) are planned for the end of February 2010. Due mainly to the aforementioned delays, the model calibration schedule is also likely to be delayed. Its original schedule (Oct. 2009 to April 2010) has now been moved to the period of Dec. 2009 to August 2010. Consequently, this means that the scheduled release of the Version 2.3 travel model on the new zone system has been moved from August 2010 to November 2010. Despite this delay, this would still be in time for use in the 2011 air quality conformity determination, which would likely start in January 2011.

A subcommittee member asked about when the Round 8.0 land use forecasts would be produced. TPB staff indicated that the Round 8.0 forecasts would be the first ones on the new TAZ system and should be ready by the end of January 2010. Another subcommittee member mentioned that, using previous travel models, WMATA had estimated there would be congestion problems on the Metrorail system beyond 2025. Now, according to this subcommittee member, with the newest work, which uses the Round 7.2 land use, the model is telling a slightly different story. The member indicated that she was unsure whether the change was due to the travel model or to the land use data. This member hopes that the new travel model, with new zones and more detailed transit submodes, will help WMATA better understand what is going on.

7. Status report on the 2009 Washington-Baltimore Regional Air Passenger Survey

Mr. Canan briefed the Subcommittee with a PowerPoint presentation, which was also distributed as a handout. The briefing provided an overview of the 2009 Washington-Baltimore Regional Air Passenger Survey, which is a bi-annual survey conducted as part of TPB's Continuous Airport System Planning (CASP) Program and managed by Abdul Mohammed on COG/TPB staff. Mr. Canan's presentation began with a description of the CASP Program and its three principal phases: (1) data collection/survey; (2) preparation of ground access forecasts; and (3) preparation of the ground access element of the regional transportation plan. He then briefed the Subcommittee on the background and history of the air passenger survey, noting it has been conducted nine times in nearly 30 years. The 2009 survey was conducted this past October at each of the region's three commercial airports: Baltimore-Washington International Thurgood Marshall Airport (BWI), Ronald Reagan Washington National Airport (DCA), and Washington-Dulles International Airport (IAD). The survey entailed distributing questionnaires to

checked-in air passengers waiting to board flights. Field data collection was supported by the firm WB&A Market Research, which had survey data collection experience at all three airports previously. Approximately 680 randomly-selected flights uniformly distributed at each airport were surveyed. More than 90 percent of the surveyed flights were domestic.

8. Metrorail line load application

This item was presented by Wendy Jia (WMATA) and Bassel Younan (AECOM). Back in 2003/2004, Metro established a centralized database that recorded real-time entries and exits in the Metrorail fare gates, summarized by 15-minute intervals, that can be used for operations and planning purposes. Because of the way the fare cards are encoded, this system can generate real-time origin-destination (OD) tables. The goals of this computer application were, first, to develop a desktop-based, user-friendly tool to estimate passenger loads across Metrorail lines, and, second, to integrate real-time OD fare gate transactions in the WMATA database with forecasts from a travel demand model.

9. Announcement of new chair of the TFS for 2010

Mr. Moran mentioned that the chair of the TFS rotates on an annual basis, each January, between DC, Maryland, Virginia, and WMATA. He said that, for 2010, it would be Maryland's turn and that Mr. Mahapatra had agreed to serve as TFS chair for 2010. Mr. Moran thanked Ms. Jia for her service to the subcommittee and the region over the past year, and presented her with certificate of appreciation.

10. Other business

There was no other business. The next proposed meeting of the TFS is Friday, January 22, 2010 from 9:30 AM to 12:00 noon. The meeting adjourned at about 12:15 PM.

These highlights were written by Mark Moran.