

Highlights of the TPB Travel Forecasting Subcommittee Meeting Held September 22, 2006

Bill Mann chaired this meeting in Ms. Sutton's absence.

Item 1: Approval of July 21, 2006 Meeting Highlights

The highlights were approved as written.

Item 2: Results of FY2006 Travel Forecasting Research

Jim Hogan distributed a memo entitled "Task Order Assistance on TPB Travel Demand Model Development and Application" along with a draft copy of the "Results of FY2006 Travel Forecasting Research". Mr. Hogan stated that the TPB travel demand models have received increased scrutiny in recent years by environmental groups and other stakeholders. In 2003, the TPB commissioned the National Academy of Sciences Transportation Research Board (TRB) to conduct a review of the TPB models to comment on how well they measure up to the state of modeling practice. In a final letter report to the TPB, dated May 10, 2004, the TRB panel, comprised of members from academia, consulting firms, and other MPOs, made the following observation:

"As we noted in our first letter, despite some four decades of experience with the use of travel demand models in transportation planning, there are few universally accepted guidelines or standards of practice for these models or their application. Any assessment of these models, their performance, and the current state of transportation demand modeling practice relies primarily on professional experience and judgment."

The TRB is presently engaged in a nationwide assessment of modeling practices by MPOs, and it is scheduled to report its findings shortly. These findings, together with the earlier TRB panel recommendations regarding the TPB travel demand models, will offer insight and guidance for the direction of the TPB models development program.

In September 2005 TPB announced that it was seeking to contract for the services of an individual or firm that would be able to provide technical assistance on a task order basis for an ongoing assessment of the performance of the TPB travel demand models. The task orders might include the following activities:

- Attending all meetings of the TPB Travel Forecasting Subcommittee and other committees as appropriate;
- Providing written guidance to TPB staff on specific models development issues raised at either the TPB Travel Forecasting Subcommittee meetings or other forums, drawing upon knowledge of travel demand modeling practice in other MPOs; and
- Conducting research focused on specific modeling issues raised by the TPB staff.

A competitive bidding process was conducted, involving several transportation consulting firms. The firm of Vanasse Hangen Brustlin, Inc. (VHB) was selected by a review committee comprised of staff from the three state DOTs, WMATA, and TPB.

For FY2006 VHB was given the following five task orders under this contract:

Task 1 – Attend meetings and assess TPB work program in models development and data collection;

Task 2 – Review managed lanes modeling in other MPOs;

Task 3 – External trip forecasts (both here at TPB and elsewhere);

Task 4 – Review experience with equilibrium assignment; and

Task 5 – Review current use of activity-based modeling.

Phil Shapiro, Dan Goldfarb and Rich Roisman from Vanasee Hangen Brustlin, Inc. (VHB) distributed a copy of their presentation entitled “Results of FY06 COG/TPB Travel Forecasting Research”. The four research topics were modeling toll facilities, external trip forecasts, equilibrium assignment, and activity-based models. The general approach to the research was to define TPB’s problem statement, review literature, contact other MPOs if applicable, synthesize data into information, prepare a technical memorandum and make recommendations to the TPB.

The research for modeling toll facilities involved reviewing work done by other MPOs to analyze HOT lane and managed lane proposals and assess travel demand modeling techniques employed by these analyses. TPB is currently employing an approach similar to Atlanta in modeling managed lanes, and VHB feels this is the best strategy for TPB at this time. Both MPOs employ an automated assignment post-processor to update tolls such that acceptable levels of service are maintained on HOT or electronic toll lanes.

The research for modeling external trips involved reviewing how high-growth MPOs forecast productions and attractions at external stations in order for TPB to consider alternative approaches for forecasting external trips. Several of the larger MPOs were surveyed, and results obtained indicate that external trips are not a “hot” issue, as most MPOs are focused on getting internal travel modeling accomplished. Many of these MPOs lack access to a statewide model and are growth factoring travel at their external stations. The use of statewide models is not possible for TPB at this time, particularly with regard to Maryland. It is recommended that TPB consider development of a “super-region” model that would include super-district level data, stretching as far as 150 miles from Washington, DC. Networks for these external areas would need to be developed, and external counts could be supplemented by data from super-regional jurisdictions which is similar to current coordination with BMC, FAMPO, VDOT and MDOT.

The research task investigating equilibrium assignment involved evaluation of the equilibrium algorithm and a review of applications issues. Comparison was made between applications using equilibrium assignment and incremental capacity restraint (ICR). While equilibrium assignment is theoretically superior to ICR, the latter was found to have more stability in that results did not yield large changes in volumes at locations far removed from changes made to a network. While new methods of reaching convergence with equilibrium algorithms are being developed for macro-level assignments, there will likely be a move to more meso-level and micro-level traffic assignments in the future. TPB is encouraged to keep abreast of these evolving methods and how they can be applied.

The activity-based model research task involved a review of the current use of activity-based models in the U.S. and abroad. It also involved an assessment of their effectiveness and potential use by TPB. The term activity-based and tour-based are sometimes used interchangeably. All activity-based models are tour-based, but not all tour-based models are activity-based. Activity-

based models presently are in use in New York City (NYMTC), Columbus (MORPC), and San Francisco County (SFCTA). Sacramento and Denver have activity-based models under development. Other MPOs have identified activity-based models as a long term goal in their models development programs, and some have implemented advanced model elements instead of committing to a full activity-based model.

The VHB recommendation to TPB was that a full-scale adoption of an activity-based model not be undertaken at this time. TPB should ensure that the upcoming home interview survey includes an activity diary, since this could then be used in future to estimate, calibrate, and validate an activity-based model. Following the completion of the home interview survey, TPB could convert the results into tours, which could then be used to develop a tour-based model. TPB might also develop a detailed network assignment procedure similar to those in use at NYMTC and MORPC. TPB could also develop a population synthesizer module, an effort being undertaken by ARC in Atlanta. Formalizing closer relationships with area universities to begin research into the development and application of an activity-based model for the region is another possibility, as is a joint effort with other MPOs (through AMPO) to participate in a program to assess how an activity-based model can be cost-effectively developed and applied.

Questions and Comments

Mr. Milone commented that the equilibrium assignment path for the toll vs. non toll option does not control how well a given auto path may or may not use a toll facility which is a cause for concern for modelers.

Mr. Shapiro responded that what is more important is whether or not people are thinking about using the toll facilities rather than if they are actually using it or not. Nothing is proven on this subject, but I think we are going to find that people do not use HOT or toll lanes everyday. So the fact that they may use a different road in part of the assignment is part of the process of how people may use the toll facility one day and not use it the next.

Mr. Kirby agreed that this is new for everybody, but the notion of having toll facilities be a separate mode in the mode choice decision is questionable. He also questioned whether models should prevent people from getting onto a toll facility for a short segment and then getting off. If people have an opportunity to essentially queue jump and there is no impedance from doing it, then they will not be deterred from getting into a lane and traveling maybe two miles and then getting off. Does this make it another mode and should we discourage people from doing this in the model? That is the big question.

Mr. Shapiro stated that we should not discourage it; however, we should not put it into the mode split model.

Mr. Milone asked what drives growth with the super-regional model. Mr. Shapiro replied that households and employment drive growth with this model, just as in the existing internal model.

Mr. Kirby commented that the super-regional model is essentially a commuting model. It makes a lot of sense, although it will be very sensitive to forecasts regarding where employment growth and residential growth will occur. Those forecasts are difficult to obtain at times. We have Census data which shows that the commuting share is getting larger from these outer areas.

Mr. Evans commented that he didn't know if there are a lot of agencies doing the full blown four step modeling process for external purposes.

Mr. Griffiths asked if capacity restraining growth at external stations was reviewed. Mr. Shapiro replied that this process would look at the same type of restraint as employed in the internal model.

Mr. Mann commented that trip purposes are hard to model with statewide models.

Mr. Jamei asked if there was a middle ground to the number of iterations completed for equilibrium convergence. Mr. Goldfarb replied that there were over 100 to 500 iterations completed in the Hampton Roads area before convergence. AECOM had been trying to incorporate highway benefits into user benefits, but the instability in the assignment was presenting problems. That's when this issue started coming up. In the survey that VHB had done for TRB, no one was aware of these issues.

Mr. Harrington questioned if the results would have been different if minor arterials were included. With low-level networks equilibrium may have been better because it appears to spread trips a little better than all-or-nothing (AON). Mr. Goldfarb replied that the results could have been better but with no real assurance.

Item 3: Update on Household Travel Survey

Bob Griffiths distributed a handout entitled "2006 Washington DC Household Travel Behavior Survey Interviewer Training Manual" and an advance letter incentive that will be sent out to every household to explain the purpose of the Household Travel Survey. He explained that the pilot test will assess address list versus RDD as the sampling frame. It will also determine the impact of interview method and large incentive on the number of trips reported. The pilot test will offer a \$100 completion incentive to 200 address-list households and 40% of mail-only households. The GPS augment for the pilot test will better estimate vehicle trip rates and VMT for non-home trips and collect route choice data. GPS households will be randomly selected from 800 pilot households. Equipment will be delivered and picked up in-person. The GPS equipment plugs into the cigarette lighter with an antenna on the dash. It has power splitters for other devices. The GPS will capture trip start and end times, origin and destination coordinates, travel distances, paths, and speed. There will be a comparison between the GPS and trip diary. Aggregate household statistics, total trips and VMT, will also be calculated. There will be a non-respondent follow-up survey that will measure size and likely impacts of non-response bias.

The pilot test began at the end of August and will conclude in the middle of October. The evaluation and finalization of the survey design will be done in October. The main survey will begin in November with interim deliveries in January 2007 through October 2007. The final delivery will be January 2008.

Mr. Griffiths stated that there is a new capability to process geographic information in conducting the HTS. As interviewers collect geographic information from a respondent, Mapquest will pop up on the screen so the interviewer can verify the address in real time. Staff had the opportunity to listen in remotely on interviews as they were being conducted, and there were some cases of long pauses because the interviews are being conducted from San Marcos, Texas. Although the interviewers are experienced, they are unfamiliar with the Washington area, even when Mapquest is available. Staff plans to look at this issue very closely to see how accurate the information is and how the information is being processed. Staff traveled to Texas and conducted a geography lesson on the Washington region. The interviewers had plenty of questions, but they quickly

became familiar with the area. If this process is successful, information will be geo-coded more rapidly.

Questions and Comments

Mr. Chinyere questioned how non-English speaking households will be handled. Mr. Griffiths replied that there are a limited number of Spanish speaking diaries. Right now, we have the capability of conducting interviews in English and Spanish.

Mr. Milton asked if public announcements were used to advertise the survey. Mr. Griffiths replied that public announcements were not used for the pretest although it is a valid option for the main survey. It may be more effective to advertise in smaller neighborhood or community papers than the Washington Post.

Mr. Kirby suggested contacting “Dr. Gridlock” to advertise the survey. He said that he wouldn’t discount using the Washington Post.

The next TFS meeting is scheduled for November 17, 2006.