Highlights of the TPB Travel Forecasting Subcommittee Meeting
Held on September 23, 2005

Item 1: Approval of the July 22, 2005 Meeting Highlights

The highlights were not approved as written. The I-270 corridor in Maryland was overlooked in the Regional HOV Monitoring Report. The amended highlights will reflect this change.

Item 2: Arterial Highway System Performance in the Metropolitan Washington Region

Daivamani Sivasailam distributed a handout entitled "Arterial Highway Travel Time/Speed Monitoring Study". The purpose of the study was to identify the location, severity and extent of congestion on the major arterial highway routes in the Washington metropolitan region. Forty-two major arterial highway routes totaling 363 miles in Maryland, Virginia and the District of Columbia were monitored. Three cars per route equipped with global positioning systems (GPS) were used to record travel time and speed data during the PM peak and off-peak periods. A minimum of three runs were performed during each hour. Speed and travel time monitoring occurred between 1 p.m. and 8 p.m. on weekdays with good weather and no major incidents.

Mr. Sivasailam discussed in detail the report findings. Average conditions on many of the roadways surveyed were at an acceptable LOS (A-D), but there are many instances when congested conditions were encountered during the travel runs. The level of service (LOS) is determined by using speed data and the 2000 Highway Capacity Manual (HCM) procedure. LOS was determined at the segment level during the PM peak hour, peak period and off-peak period and is based on the average travel conditions during the time period for which it was reported. LOS E and F are congested conditions. Of the 228 bi-directional miles surveyed during FY 2005, 86% of the system operated at LOS D or better during the PM peak hour in Maryland, Virginia and the District of Columbia. All the routes surveyed experienced LOS E and F conditions except MD 5 (Branch Avenue) and Military Road/Nebraska Avenue in the District of Columbia during the PM peak hour or peak period. The District of Columbia had the highest percentage of miles experiencing LOS E and F during the PM peak hour and peak period. This more than doubled the percentage of miles under LOS E and F conditions in 2002. Maryland and Virginia had lower percentages of miles under LOS E and F conditions compared to 2002 during the peak hour. Various locations had failing LOS conditions. They include:

District of Columbia – Southbound 14th Street, Eastbound K Street, Eastbound Pennsylvania Avenue

Maryland – Northbound MD 97, Southbound MD 28

Virginia – Southbound US 1, Eastbound US 29, Westbound US 29

In conclusion, Mr. Sivasailam commented that after collecting data for six consecutive years, there is an overall picture of traffic congestion on the roads surveyed, including problem intersections during the survey period. Advanced GPS technology has automated data collection with improved reliability. This translates into more efficient data analysis and time savings. Staff will continue

to investigate new technologies and methods of data collection along with adding new routes to increase the scope of the study in new and changing locations in the Washington metropolitan region.

Questions and Comments

Mr. Goldfarb asked if the segments were defined using predetermined Anode-Bnode pairs. He also asked if there was a relationship between segment length and poor LOS. Mr. Sivasailam replied no. A segment is defined as a roadway between major intersections. Ms. Vega commented that the LOS is based on the design of the roadway. All segments in the District of Columbia are classified as urban roadways because of high density and low speeds.

Mr. Mann asked if the output speeds from the travel model have been compared to the observed speeds in this study. Mr. Milone replied that in the air quality post processor model results, refined speeds and volumes are looked at on an hour by hour basis. This study provides great information for establishing a range of arterial speeds for a given time period.

Ms. Howard suggested that segments for future studies be defined by Anode–Bnode pairs to ensure better data processing for the Regional Data Clearinghouse.

Item 3: Status Report on Traffic Quality in the Metropolitan Washington Area Freeway System

Mr. Sivasailam distributed a copy of a report entitled "Traffic Quality on the Metropolitan Washington Area Freeway System – Preliminary Materials Spring 2005". The report details congested conditions along various routes in Maryland, Virginia and the District of Columbia. Some of the findings include:

- US 50 (Morning) – Throughout the morning survey period, a three to four mile zone of westbound congestion was found between the vicinity of East-West Highway and MD 295; average estimated speeds ranged from 15 to 25 mph.
- US 50 (Evening) – During most observations, eastbound congestion was found between South Dakota Avenue and MD 202; average estimated speeds ranged from 30 to 59 mph.
- I-66 Inside (Morning) – During most observations after 7:30 a.m., a four to five mile zone of westbound congestion was found between Lee Highway and Westmoreland Street (VA 693); average estimated speeds ranged from 15 to 50 mph.
- I-66 Inside (Evening) – During most observations after 6:30 p.m. (HOV restrictions end), westbound congestion was found between Lee Highway and Sycamore Street; average estimated speeds ranged from 35 to 45 mph.
- I-66 Outside (Morning) – Throughout the morning survey period, a seven to eight mile zone of eastbound congestion was found between the vicinity of US 15 and VA 234; average estimated speeds ranged from 10 to 40 mph.
- I-66 Outside (Evening) – During most observations before 7:00 p.m., a six to seven mile zone of westbound congestion was found between VA 28 and VA 234; average estimated speeds ranged from 10 to 30 mph.

- I-66 HOV (Morning) – After 6:30 a.m., eastbound congestion was typically found between Fairfax County Parkway and VA 123; average estimated speeds ranged from 15 to 45 mph.
- I-66 HOV (Evening) – During most observations before 6:00 p.m., westbound congestion was found on the I-66 HOV facility between US 29 in Centreville and VA 234 (HOV terminus); when congested, average estimated speeds ranged from 30 to 50 mph.
- I-70 (Morning) – Between 7:30 and 8:30 a.m., a short zone of eastbound congestion was found between US 15 and MD 355; average estimated speeds ranged from 30 to 50 mph.
- I-70 (Evening) – During most observations before 6:00 p.m., a short zone of westbound congestion was found on I-70 between I-270 and US 15 (southbound); average estimated speeds ranged from 30 to 50 mph.
- I-95 Maryland (Morning) – On some days but not others, a two to four-mile zone of southbound congestion was found approaching the Beltway; when congested, average estimated speeds ranged from 30 to 50 mph.
- I-95 Maryland (Evening) – During most observations before 6:30 p.m., northbound congestion was found between the Beltway and MD 198; average estimated speeds ranged from 35 to 50 mph.
- I-95 Virginia (Morning) – During most observations, an extended zone of northbound congestion was typically found approaching the Capitol Beltway; average estimated speeds ranged from 10 to 30 mph.
- I-95 Virginia (Evening) – During most observations before 6:00 p.m., an extended zone of southbound congestion was found between Franconia Road and the Occoquan River; average estimated speeds ranged from 20 to 40 mph.
- US 267 Toll (Morning) – During most observations after 7:00 a.m., an extended zone of eastbound congestion was found between VA 28 and the Beltway; average estimated speeds ranged from 10 to 40 mph.
- US 267 Toll (Evening) – On some days but not others, a short zone of westbound congestion was found approaching VA 28.
- I-270 (Morning) – Throughout most of the morning survey period, southbound congestion was found between I-70 and MD 109; average estimated speeds ranged from 20 to 50 mph.
- I-270 (Evening) – During most observations before 6:30 p.m., northbound congestion was found between the vicinity of Falls Road and MD 109; average estimated speeds ranged from 15 to 50 mph.
- I-395 (Morning) – During most observations, westbound congestion was found between the vicinity of 11th Street and the 14th Street Bridge; during the peak period, average estimated speeds ranged from 15 to 30 mph. Throughout the morning survey period, northbound congestion was found between the 14th Street Bridge and the exit to the mall (I-395 terminus); average estimated speeds ranged from 25 to 45 mph. During most observations, a one to two mile zone of northbound congestion was found between VA 27 and the Potomac River; average estimated speeds ranged from 5 to 30 mph. During most observations before 8:30 a.m., a seven to eight mile zone of northbound congestion was found between the vicinity of the Capitol Beltway and VA 7; average estimated speeds ranged from 15 to 45 mph.
- I-395 (Evening) – During most observations before 6:30 p.m., a four to five mile zone of north-eastbound congestion was found between VA 110 and the Southeast Freeway

terminus (signal at the Sousa Bridge); average estimated speeds ranged from 5 to 30 mph. Throughout the morning survey period, a two to three mile zone of south-westbound congestion was found between South Capitol Street and the George Washington Memorial Parkway; average estimated speeds ranged from 10 t0 25 mph. During most observations before 6:30 p.m., a three to five mile zone of southbound congestion was found between VA 27 and Little River Turnpike (VA 236); when congested, average estimated speeds ranged from 15 to 45 mph.

- I-495 Inner Loop (Morning) – Prior to 6:30 a.m., no congestion was found on the inner loop of the Beltway between I-95 and I-66. After 7:30 a.m., a three to six-mile zone of northbound congestion was found between I-95/I-395 and I-66; average estimated speeds ranged from 15 to 35 mph. Throughout the morning survey period, a three to four mile zone of westbound congestion was found between St. Barnabas Road and the Woodrow Wilson Bridge; average estimated speeds ranged from 5 to 15 mph.
- I-495 Outer Loop (Morning) – During most observations, an extended zone of westbound congestion was found between I-95 and I-270; average estimated speeds ranged from 10 to 40 mph. During most observations after 7:00 a.m., an extended zone of southbound congestion was found between I-270 western spur and VA 267; average estimated speeds along this corridor ranged from 15 to 45 mph. On some days but not others, northbound congestion was found between US 50 and MD 450; when congested, average estimated speeds ranged from 40 to 50 mph. On some days but not others, a short zone of eastbound congestion was found between US 1 and I-295.
- I-495 Inner Loop (Evening) – During most observations, a seven to nine mile zone of northbound congestion was found between the vicinity of VA 123 and the I-270 Spur; average estimated speeds ranged from 20 to 40 mph. During most observations, eastbound congestion was found between the vicinity of the I-270 western spur and New Hampshire Avenue. During most observations before 6:30 p.m., a five to seven mile zone of southbound congestion was found between I-95 and US 50; average estimated speeds ranged from 30 to 50 mph.
- I-495 Outer Loop (Evening) – During most observations before 6:30 p.m., westbound congestion was found between New Hampshire Avenue and I-270; when congested, average estimated speeds ranged from 20 to 40 mph. Throughout the evening survey period, a five to seven mile zone of southbound congestion was found between I-270 Spur and VA 267; average estimated speeds ranged from 15 to 20 mph. During most observations, southbound congestion was found between VA 123 and VA 236; average estimated speeds ranged from 25 to 45 mph. During most observations, eastbound congestion was found between Telegraph Road and the Woodrow Wilson Bridge; average estimated speeds ranged from 10 to 30 mph.

Questions and Comments

Mr. Mann asked if it would be feasible to pinpoint problem areas and recommend inexpensive solutions. Mr. Kirby commented that the Texas Transportation Institute study is based on aggregate VMT and capacities. Those aggregate numbers do not include “choke point” issues. The first clear observation is that congestion is not spread uniformly throughout the entire system; it is very location, time and direction specific. Mr. Kirby suggested that in some locations localized remedies could be put into place to deal with “choke points” before they become major problems.

Item 4: Preparing a Design for a New Household Travel Survey and a Regional HPMS

Mr. Griffiths stated that Bill Mann had requested at the last TFS meeting a discussion of the CTPP final adjustments file of Part 3 data. As a result, discussion of the new Household Travel Survey and a Regional HPMS may need to be rescheduled. In terms of background, Part 3 Journey to Work Census data addresses workers, not work trips. To convert it to HBW trips to check distribution and modal shares in the travel models, you have to go through a number of adjustment factors to account for every worker that does not go to work every day, that don't always use their usual mode, that in some cases have multiple jobs, and that engage in trip chaining, i.e., people making intermediate stops to and from work. It makes a commuting trip different from a HBW trip that we use in our models.

Examining the changes in trip purposes over time the HBW trip is becoming a declining share of total daily travel, 20% of all daily travel. Adjustments need to be made by mode because there are some modal differences. Absenteeism is another issue in the adjustment process. Much of the adjustment factors were calculated with NHTS looking at trip records for the Washington PMSA, a combined CMSA Baltimore and Washington and then for metropolitan areas with populations greater than 3 million with a rail system. Looking at absenteeism by mode for those major groups, they were all pretty close to a 25% absenteeism rate, consistent with what was observed in the 1994 HTS, but a big change from the 1990 Census. The change in rate may be due to more alternate flexible work schedules. Telecommuting would be part of that, but it is also due to people working alternate schedules, and with composition of the work force.

The next factor is usual travel day modes. Census asks what you usually do the week before Census; with the HTS we wanted to know on a given weekday, what was the person's mode on that particular day. One of the advantages of using the NHTS was the survey asked what people did as their usual mode as well as what they actually did on a particular day. We could derive a conversion factor from these data. We may want to include this feature in the upcoming HTS. Examining the data, it did seem there were drive alone and carpool shifts. Surprisingly, there were a lot of normal transit riders on a particular travel day using another mode.

Multiple HBW trip factor – workers that have more than one job. Some workers go from home to work, go back home, and later go to another job. Some workers may go home for lunch, but this is a very small percentage.

Regarding trip chaining, the data suggest that people are more likely in total to make an intermediate stop on the way home from work than to work. Breaking that out really helps. It seems to be consistent with 1994 HTS, but would imply there was greater trip chaining in 2000.

There is another adjustment that may or may not need to be made regarding out of town workers. It is in the part 3 data where they say the destination of the trip is Capitol Hill, and the origin is Alabama. What that says is the Census form went to Alabama to be filled out, but the week before the Census the respondent was in Washington. In total there were 30,000 of these workers, $1/10^{th}$ of a percent. Also there were 20,000 Washington region workers that were somewhere else during that period. It would reflect that work travel needs to be factored down in converting the census data to HBW trips.

Mr. Harrington commented that in terms of using it, he felt that too much emphasis was being placed on HBW trips, particularly in trip chaining. We may want to back up and not use these

factors if they use transit. We don't necessarily care if they stop off en route. He asked if a rule of stopping less than five minutes was applied.

Mr. Griffiths acknowledged that trip linking is influenced by the dwell time at an activity. It's tricky; where does one draw the line. In the 1994 HTS we reported school trips were really drop offs. We put a dwell time that was less than 5 minutes. Take out intermediate stops for stopping at gas stations. What about drive through banks - is that an incidental trip?

Mr. Milone said that we thought about this back with the 1994 survey. He recalled that we were not liberal in coming up with rules.

Mr. Mann asked if these adjusted Census data will directly match HTS trip tables? Bob replied that we don't have an updated large scale HTS to compare. For now, this would be best we can do in terms of looking at HBW trips.

Mr. Hogan asked if the Census suppression would cause problems with jurisdiction to jurisdiction tables. Bob replied that he did not feel that suppression would be a problem.

With the passage of the SAFETEA-LU, Bob stated that we are going to have a substantial increase in funding, the same as occurred in the original ISTEA. The last time we were able to afford a real large-scale HTS with 5,000 households regionwide was when we got that big bump in budget. We would propose that in the development of the work program for FY2007 we look at putting significant resources into a large-scale travel survey to look at 10,000 households regionwide. He plans to have discussions with BMC to encourage them to conduct a similar survey because our model regions overlap.

Mr. Griffiths listed out several issues concerning the methods to be employed in conducting the next survey. He expressed concern with the declining response rate of telephone interviews. Failing to get at least a 25% response rate suggests that the sample is no longer representative of the population. Further, many young households don't have land line phones, they are not showing up on anybody's telephone sample, and they make a lot of trips. He is recommending that we go to some type of address-based sampling plan, to get some of those households you wouldn't pick up with traditional telephone surveys. Also we should give people multiple ways of responding - telephone, mail, internet.

Mr. Milone asked if there is any consensus among people who are conducting large scale surveys about doing things in multiple waves. Bob responded that large scale surveys are now being conducted year round. The other thing to manage is non-response. If you have a short survey window, you cannot adequately follow up on households that did not initially respond. This is one of the advantages of doing a year round sample.

Item 5: Status Report on Review of State of Practice in Metropolitan Area Travel Forecasting

Mr. Milone distributed a handout entitled "Status Report: Determination of the State of Practice in Travel Forecasting". The determination of the state of the practice in travel forecasting study was conducted by the TRB of the National Academies. The project started in late fall 2004 and lasted over a period of eighteen months. It was sponsored by USDOT, FWA and FTA with a budget of $340K. The purpose of the project was to gather information to determine the state of the practice and to further address modeling questions. The study involved detailed interviews of a limited number of MPOs. The survey was designed in spring 2005 and it was tested by five

MPOs in June 2005. Draft results were shared with MPOs on September 9, 2005. Some of the survey findings include:

- Four-step model remains the predominant forecasting method; and
- Strong interest in tour-based/activity-based modeling

The next steps for the survey include getting non-respondent MPOs to answer; clean up the survey file; conduct detailed interviews with a few MPOs to investigate in-depth modeling issues; and provide a final report and/or recommendations in Spring 2006.

Questions and Comments

Mr. Hogan asked what type of information is being sought with the in-depth MPO interviews. Mr. Milone replied that detailed information about each MPO's model strengths and weaknesses is requested through the in-depth interviews.

The next scheduled meeting of the TFS is November 18, 2005.