

**Highlights of the TPB Travel Forecasting Subcommittee Meeting
Held on Friday, November 19, 2004**

Mona Sutton of Maryland State Highway Administration chaired this meeting.

Item 1: Approval of the September 17, 2004 Meeting Highlights

The highlights were approved as written.

Item 2: Data Clearinghouse and Use of Traffic Volume Estimates in Transportation Planning

Bob Griffiths began the presentation with a general overview of the Data Clearinghouse. The Data Clearinghouse links the regional network to the state and local government traffic counts. Available information is migrated through COG's GIS database and matched with the regional network. The purpose of this presentation is to demonstrate recent updates made to the Data Clearinghouse. These updates provide more detailed volume estimates for future years. Mr. Griffiths urged that it is the responsibility of an analyst to use this data wisely and appropriately, particularly when used to evaluate the performance of a regional travel demand model. Charlene Howard stated that the Data Clearinghouse includes datasets from 1986 to 2003. Various updates are made to the Data Clearinghouse as information becomes available. Currently the Data Clearinghouse includes: COG's transportation network (Master Network) data without centroid connectors, traffic volume data for DC, Maryland and Virginia, various COG survey data, Cooperative Forecast Data with Round 6.4a, and alternative transportation trends (i.e. bicycle, park and ride, etc.). The Data Clearinghouse project is in ArcView 3.2 format and has 6 different views: a basic clearinghouse view, regional trends view, survey view, transit view, census view and a detailed transit view. There are view specific choices and various buttons associated with each view to manipulate the datasets. Data can be viewed spatially using ESRI ArcView shapefiles. The Data Clearinghouse will be distributed on CD at the December Technical Committee meeting. Future plans for the Data Clearinghouse include further data acquisition of additional sources and years along with detailed traffic views with AM peak, PM peak and off-peak periods.

Questions and Comments

Mr. Luo asked if the data in the Data Clearinghouse could be viewed in a chart format. Mrs. Kile responded that this data cannot be viewed in a chart format at this time but that capability can be added in the near future.

Mr. Griffiths said that the VMT tracking was done for the modeled area including Howard and Anne Arundel Counties and that there are about 60 permanent count stations in the modeled area. Mr. Clifford said that when we report out for VMT tracking, it is at the MSA level, so you have about 40 permanent count stations, not 60.

Mr. Replogle commented that it is very good for the region to focus on improving the quality of count databases, but at the same time it is important to think about other ways of finding data already being collected or that could be collected at a much lower cost than actually going out and simply creating more count stations. There are new technologies that may offer a more effective way of enriching the data.

Mr. Replogle also expressed the view that there is no evidence that suggests there is a tendency for random error to be different for low volume vs. high volume or intermediate volume traffic counts. When taking this observed traffic count data and looking at the big picture pattern it paints of traffic trends and the overall character of traffic on low versus high volume facilities, and comparing it with the traffic models, the expectation is that the traffic models would be calibrated and validated to match the patterns of traffic. He expressed the opinion that the COG model systematically overestimates traffic on the low volume links and systematically underestimates traffic on the high volume links. And the farther you are from your median volume on a link the more that tendency is pronounced. It is a systematic pattern in which the errors are not randomly distributed and that is something that still needs the attention of this committee in improving the model validation.

Mr. Griffiths observed that there are few data points for extreme values, some of these outliers being manually estimated, with the result that the simulation actually may be closer to reality than the “observed” estimates. Where we have data for continuous count stations, the highest average weekday volume was 114,000 vehicles per day. In the few places where we did have high volume with good quality counts they were the same order of magnitude as what was being estimated in the model. You need to be careful about generalizing in terms of extreme values on either end of the curve. If you were to look at a scatter plot of all the counts and draw a line through and look at the bulk of it in terms of minimizing error, through most of the volume ranges where we have real observed data there is generally a very, very good fit.

Mr. Replogle responded that he does not think the data shows that, and he would love to see that analysis done on a rigorous level. Mr. Griffiths replied that we have the data for Maryland.

Mr. Replogle asked if there would be resources for the committee to commission a panel review of this question? Is there a systematic bias in the observed traffic data that comports to what appears to be a systematic mismatch that is based on the amount of traffic volume that is estimated and observed on a link, or is this a non-statistically significant aberration of low data quality?

Mr. Kirby replied that we just had an independent review by the National Academy of Sciences. They looked at those exact same tables in the 2.1C model and commented on the RMSE’s. However, they didn’t see any issue with regard to “systematic bias”. He said that Mr. Replogle is doing exactly what staff has warned against: taking small subsets of data of very questionable quality and reaching conclusions that are not justified.

Mr. Milone said that we have hurt ourselves by providing statistical information in a too specific way. We should not have been showing things in 10,000 count increments because the observed data is just not good enough to support that. He said that he has looked at RMSE statistics in many other cities. The highest level volume group in Atlanta is 60,000+, in Denver it is 80,000+, in our case it is 130,000+. We have shown more information than any other city in terms of RMSE statistics.

Mr. Replogle commented that NYMTC has put out similar information, and they have similar problems with their model.

Mr. Kirby commented that everybody will have this problem if they try to look at the data at too disaggregated a level and draw conclusions from very limited data of very questionable quality. You have to be very careful about what you are looking at, the quality of it, level of disaggregation, and the statistical reliability, and not jump to conclusions that are not justified.

Mr. Replogle replied that the r-squared relationship shows a statistically highly significant difference between observed and simulated data, and there is a systematic bias.

Mr. Kirby said we have had the National Academy of Sciences panel look at this, and they didn't find any issue with regard to "systematic bias". We've had lots of professionals around this region look at it, and nobody else seems to have a problem with it.

Mr. Spear asked if there was consistency among the three jurisdictions in the way the count data is analyzed. Bob Griffiths replied there is consistency in theory, but not necessarily in practice. Because of the design of statewide programs, there are individual variations in terms of how count data is analyzed.

Item 3: Status Report on Integrating Emissions Post-Processor with Travel Demand Model to Address Peak Spreading

Ron Milone distributed a handout entitled "Integrating the Mobile Emissions Post Processor with the Version 2.1 D, Draft #50 Model". The post processor is used to estimate mobile emission tonnage for the region, specifically VOC, NO_x (ozone season), and CO (wintertime). COG is required by law to assess mobile source emissions associated with each TIP cycle. The post processor refines the AM, PM, and off-peak link speeds produced by the regional model into hourly speeds. The refinement is necessary because hourly highway speeds are needed for the mobile emission calculation.

Mr. Milone explained that the Draft #50 post processor is very similar to the Version 2.1/TP+, Release C post processor. Mobile emissions are computed by applying MOBILE6.2 pollutant rates to hourly travel demand estimates. Emissions are developed explicitly for the trip-end (starting and soaking) and the stabilized (running) portions of the trip cycle. Trip-end emissions are calculated on a per trip basis, by hour of the day. Running emissions are calculated on a per mile basis, by hour of the day. The post processor includes an hourly volume 'spreading' process based on the comparison of an initially estimated hourly volume with available roadway capacity.

The Version 2.1 D Draft #50 post processor now includes two key refinements from the procedure used with Version 2.1 C. First, the initial hourly volumes developed within the post processor are now consistent with the period level volumes resulting from the travel model. Such consistency was not ensured previously. Second, the speed-flow relationships and speed calculation procedures have been refined to better reflect observed operating conditions.

The prospect of incorporating the post processor into the travel model is now being considered. It is believed that the refined speeds developed by the post processor would improve the speed feedback linkage in the travel model. There are technical difficulties with this option, however. It will be difficult to reconcile hourly speeds from the post processor with the three AM, PM, off-peak) travel periods currently assumed in the travel model. TPB staff feels the treatment of time periods in the travel model should be revisited. TPB is also aware of federal research that is underway in the area of time-of-day modeling.

Questions and Comments

Mr. Mann asked if all links in the 2030 network have a V/C ratio of greater than 1.0. Mr. Milone responded that a large proportion of the links exceed a V/C ratio of 1.0, but he was not able to cite a specific percentage. Mr. Kirby added that the speed flow relationship in the post processor

assumes that highway speed 'bottoms out' at a reasonable minimum. Highway speeds do not congest down to unreasonably low levels.

Bruce Spear asked if any analysis has been done to look at the 24-hour count data. The 24-hour count data should be used as a basis for determining whether you should go to a four hour AM peak period opposed to a three hour AM peak period. Ron Kirby replied that TPB staff is looking at that very issue right now.

Item 4: 2000 CTPP Worker Flow

Bob Griffiths reported that the CTPP-Part 3 Worker TAZ Data is available; however, staff is still working on it. The CTPP provides special tabulations from the Census of workers by place of residence and place of work. Part one, workers by place of residence and part two, workers by place of work were previously analyzed. Data for the initial part three data for the Greater Washington area that included TAZ data for the modeled region along with Baltimore was received in early July 2004. This detailed analysis was reviewed, but the control totals did not match with initial tabulations, particularly in Arlington County. The Census verified the processing problem and corrected it. Several weeks ago, an updated file was provided, and the control totals now match at the jurisdictional level within rounding error.

Mr. Griffiths explained that further work will be done to the Part 3 Worker TAZ data to:

- Eliminate "out-of-town" workers;
- Convert CTPP TAZs to the TPB 2191 TAZ area system;
- Adjust for daily/weekly worker absenteeism;
- Adjust for occasional transit use; and
- Adjust for daily carpooling.

Questions and Comments

Mr. Spear commented that the coding of the workplace data is problematic and should not be exclusively used to do TAZ to TAZ validation.

Mr. Griffiths commented that the Federal Highway Administration wants to arrange a workshop on the Census data in conjunction with the next TFS meeting in January 2005.

The next TFS meeting will be held on January 21, 2005.

COG/TPB Travel Forecasting Subcommittee

Sign-In Sheet

Meeting of November 19, 2004

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