

**Descriptions of Program Elements the
TPB Staff Proposes to Undertake to**

- (a) Address Concerns Raised by the
TRB Committee's First Letter
Report**
- (b) Advance the State of Modeling Practice
in the Metropolitan Washington
Region**

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**National Capital Region
Transportation Planning Board
Metropolitan Washington Council of Governments
777 North Capitol Street, N.E. – Suite 300
Washington, D.C. 20002-4239**

**Contact: Deborah Leigh
202/962-3315
e-mail- cogdtp@mwkog.org**

Proposed Work Elements for the TPB Models Development Program

Introduction

The TRB Review Committee indicated during the September 12, 2003 telephone conference with TPB staff that it would be very helpful to review work program elements from the TPB staff as the panel prepares its second letter report. Dr. David Forkenbrock's letter of September 18, 2003 to Dr. Ronald Kirby further articulated the requested information as follows:

“Detailed descriptions of work-program elements that ...(TPB) staff proposes to undertake to (a) address concerns raised by our first letter report and (b) advance the state of modeling practice in the Metropolitan Washington region. We very much hope that these descriptions will be fairly explicit and detailed and will include your anticipated schedule for undertaking the work. Additionally, we hope that these descriptions will include consideration of MWCOG's strategy for mobilizing resources in the region to accomplish the work-program elements.”

This document describes TPB staff's proposed outline of work elements in the models development program over the next four and a half years. This time frame extends from the second half of the current fiscal year (FY-2004) until the end of FY-2008. The work elements were developed in response to the TRB peer review panel's recommendations in the first letter report, as well to meet immediate planning study objectives while continuing to implement incremental improvements to TPB modeling practices.

TPB staff has historically envisioned the models development program as a series of five parallel 'tracks' upon which the travel forecasting methods would advance over time. Operating concurrently, the following tracks provide useful context for staging modeling improvements:

- **Track 1 – Application:** Improvement of the currently adopted model set to produce adequate forecasts while enhanced models are in development.
- **Track 2 – Methods Development:** The incorporation of advanced practice in travel demand modeling that can be made operational in the next few years.
- **Track 3 – Research:** Keeping abreast of research developments in the areas of travel modeling, surveying, data (GIS) maintenance practices and integration, and simulation.
- **Track 4 – Data Collection:** The implementation of data collection designed to meet the needs of tracks 1, 2, and 3.
- **Track 5 – Maintenance:** Documentation of the current modeling applications, including recent improvements to software and data requirements. This track also includes an ongoing effort to train staff in the use of current and updated application procedures.

Activities aimed at improving the current application method now known as the Version 2.1/TP+, Release C model constitute the Application track (Track 1). These would occur most intensively in the near-term and would include sensitivity tests and validation checks of the model. These types of activities could potentially lead to parameter adjustments and/or structural modifications to the application model based on an assessment of the various model checks.

The development of an enhanced model in the longer term, i.e., either a more advanced four-step travel model, or possibly a ‘successor’ application to the present four-step process is the focus of the Methods Development track (Track 2). The phasing of activities in this track is heavily dependent upon the selected model specification and data collection schedule (Track 4) required to support the enhanced model.

Activities associated with an ongoing review of emerging travel modeling approaches that could inform long-term model improvements constitutes the Research track (Track 3). These activities take several forms, including participation in modeling conferences, reviews of the literature, as well as information gathering from relevant websites.

The Data Collection track (Track 4) requires resources which are equal to or greater than those expended in models development. Several travel surveys have been conducted during the past ten years which supported the models development work element. These have included a household travel survey (1994), continuing panel surveys during the past five years, an external auto survey (1994), an internal truck survey (1996), external truck surveys (1996 and 2003), Metrorail ridership surveys (1994 and 2002), a regional on-board bus survey (2000), and the 2000 Census Journey to Work. Given the vintages of some of these surveys, it is envisioned that a new round will be needed during the balance of this decade, costing several million dollars in total when all pre-survey and post-processing elements are included. Should the TPB conclude that a departure from the traditional four-step travel demand modeling practice be undertaken in Track 2, there would be substantial implications for the structuring of surveys, including associated costs and staging.

The Maintenance track (Track 5) is another ongoing work activity that formalizes technical documentation and training with respect to incremental updates and modifications to the travel modeling procedures. The objective is to provide up-to-date training and dissemination of materials for the current application of the travel demand models in any given year.

The proposed multi-year program in models development below addresses these five tracks. As part of the application track, TPB staff proposes to investigate issues raised by the TRB Committee in its first letter report. The activities are mapped in a series of timelines shown in Figure 1.

**Figure 1
Multi-Year Staging of Models Development Activities**

Models Development	Balance of FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
1. APPLICATION TRACK					
1.A Alternate Speed Feedback Methods:					
- Sensitivity Analysis	■				
- Documentation	■				
- Implement changes if needed to ensure consistency of speeds	■				
1.B Bus Speeds as a Function of Highway Speed					
- Analysis	■				
- Documentation	■				
- Implement changes to transit network building if practicable	■				
1.C Investigation of Adjustment Factors:					
- Sensitivity Analysis	■				
- Documentation	■				
- Implement changes if warranted	■				
1.D Incremental Refinement of Version 2.1 Model:					
- Version 2.1D	■				
- Version 2.1E		■			
- Version 2.1F			■		
- Version 2.1G				■	
- Version 2.1H					■
1.E Migrate Mode Choice Sub Models from MINUTP to TP+ (Estimation/Calibration)		■			
1.F Highway & Transit Validation of V2.1 Model					
- Analysis		■			
- Documentation		■			
1.G Continue Airport Ground Access Model Development		■	■	■	
1.H Truck Model Development:					
- Design Models/Counts/Survey	■				
- Implement Counts/Survey		■	■		
- Calibrate Models			■	■	
2. METHODS DEVELOPMENT TRACK					
3. RESEARCH TRACK					
4. DATA COLLECTION TRACK					
4.A Household Travel Survey					
- Data Collection		■			
- Processing / Cleaning			■	■	
- Final Report					■
4.B Auto External Survey					
- Data Collection		■			
- Processing / Final Report			■		
4.C Analysis of Census Data		■			
4.D Regional Transportation Clearinghouse		■	■	■	■
5. MAINTENANCE TRACK					

Application (Track 1)

Potential modifications to the Version 2.1C model will be investigated during the balance of FY-2004, with some activities continuing into the next two to three years. These include alternative speed feedback approaches, developing bus speeds in transit networks which reflect future road network congestion, and the issue of adjustment factors. As these modifications are incorporated into the application model, an updated model (2.1D, 2.1E, etc.) will be documented and brought into production mode. Also included in these activities will be completion of the migration from MINUTP to TP+ of the mode choice sub models, a highway and transit validation, the inclusion of an airport ground access model, and a new set of truck models.

1.A Investigation into Alternative Speed Feedback Methods

The peer review panel has commented that “TPB’s feedback of highway and transit times to trip distribution bypasses mode choice and is not typical of good modeling practice in regions with significant transit services and ridership.” Staff has begun an investigation of the practices employed in several large metropolitan areas to determine what is typical. This activity will be completed during FY2004, including documentation of the analysis and the investigation of practice in other MPOs, and a recommendation to implement a change to the modeling process if necessary.

1.B Investigation into Developing Bus Speeds as a Function of Congested Highway Speeds

The peer review panel has observed, “The use of fixed bus speeds in TPB networks may misstate the influence of transit estimates in future trip distribution and mode choice.” Staff has begun investigating how other MPO’s relate bus speeds to congested highway link speeds. Staff will identify a selected method, and integrate the method into the Version 2.1 model, if it is determined to be practicable. Documentation of the selected method and related modeling changes will be produced, during the second half of FY-2004.

1.C Investigation of Model Adjustment Factors

The peer review panel has commented that “TPB’s extensive use of adjustment factors in trip generation, trip distribution, and mode choice to enhance the match between simulated and observed base-year data undermines the fundamental behavioral logic of the four-step modeling process.” Staff disagrees with the statement that the fundamental behavioral logic is undermined, and has undertaken a review of practice in several major MPOs. Staff plans to more fully document the use of these factors in the modeling process, which staff feels reflect, not undermine, the behavioral patterns that cannot be adequately portrayed by a travel demand model largely structured around time and cost variables alone. Staff maintains that the number of trip interchanges employing adjustment factors is not extensive in the Version 2.1C model, but will undertake a sensitivity analysis to see if reductions could be made. Documentation of these activities will be completed during the balance of FY2004.

1.D Implement Incremental Refinements to the Version 2.1 Model

This is a global activity which is to integrate the latest refinements emerging from the ongoing program, as these can be made ready for production modeling (i.e., air quality conformity of the TIP and Plan, project planning studies). As indicated in Figure 1, a new label (Version 2.1D, 2.1E, etc.) would be affixed to the production model as these refinements are incorporated into the regional modeling process. While the timeline suggests an annual update, in fact, the update might occur at irregular intervals, as warranted by the refinements.

A prime example of modeled refinements resulting from local project planning work are those that have been developed in the ongoing ICC study in Maryland. TPB staff has been working with local consultants on a number of fronts to improve the model performance in the study subarea. The study team has investigated, for example, the use of refined free-flow speed and capacity values, a refinement of the zonal area type assignments, adjusted volume-delay functions for certain facility types, and improvements relating to network coding. The activities have not only resulted in an improved performance within the subarea, but have also had beneficial effects in the model performance in neighboring counties. TPB staff feels that the regional model can take advantage of the lessons learned from this project planning work, and that similar refinements can be made through collaborative efforts with local consultants working on other project planning studies in the region.

1.E Migration of Mode Choice Sub Models from MINUTP to TP+

This project will complete the migration of the Version 2 modeling process to the new TP+ software platform, such that improvement in transit assignments can be undertaken. It had been deferred due to the adjustment of staff priorities to meet the need to couple the EPA-mandated Mobile6 emissions model with the travel demand model.

Two models, a sub-mode split model which estimates the shares of rail-related and bus-only transit trips and a mode-of-arrival model which estimates the shares of access modes at Metrorail stations, are to be migrated to the TP+ platform. These models will be estimated using information contained in the 1994 HTS and the 1994 Metrorail Survey.

1.F Highway and Transit Validation

Following the calibration of the mode choice sub models, a validation effort will be undertaken to assess the accuracy of highway and transit simulations using the most recent sources of observed data. It is anticipated that highway ground counts corresponding to calendar year 2002 will be available to check daily screenline crossings and regional VMT. Hourly traffic data from Maryland databases will also be obtained to assess highway performance by time period. Transit validation checks will be accomplished using the 2000 Regional Bus On-Board Survey and the

2002 Metrorail On-Board Survey. It is important to note that the bus on-board survey incorporates most, but not all, of the major operators in the Washington, D.C. region.

The TRB Committee has commented in the first letter report that, “ The goodness of fit for transit passenger volumes is normally conducted in more detail than systemwide averages and cordon crossings. Additional comparisons by subarea, district interchange, corridor, and rail line and station are typically performed....” COG/TPB staff has historically examined Metrorail assignments in detail after the application of the transit sub models. In contrast, bus trip patterns have not received as much scrutiny beyond a review at jurisdiction levels, due to limitations in local bus data. The 2000 regional on-board bus survey is the first of its kind since 1972. It is hoped that this will allow a more detailed comparison of bus trip patterns produced in the modeling process.

1.G Continue Airport Ground Access Model Development

The Washington region has three major airports: Dulles International, Baltimore-Washington International, and Ronald Reagan Washington National. The existence of three airports poses a complex situation in attempting to forecast ground access by mode to these airports. Fortunately, there is an ongoing program to collect ground access travel data at approximately two-year intervals. Staff activities during FY-2004 involve the review of these data and investigation of ground access modeling practices in other metropolitan areas. It is envisioned that development of a model specification and calibration file could be undertaken in FY-2005 with the goal of implementing a production model during FY-2006.

1.H Begin Refinement of Truck/Commercial Vehicle Models

As is the case in many metropolitan areas, the structure of the truck models employed by TPB were developed many years ago, and have been informed by the results of internal and external truck surveys periodically. Most recently, an external truck survey was undertaken for the region in spring and summer 2003, and the information is being tabulated this fall. Post-processing including logic checking, geocoding, and factoring is scheduled to be undertaken during the balance of FY-2004. The last internal truck survey was conducted in 1996 and did not produce a useable dataset for updating the truck models.

The TRB Committee noted that TPB subsumes the estimation of light truck travel in the NHB trip purpose and does not recommend this approach. TPB has responded that until a better means of estimating light truck trips can be developed, there is no choice but to use the NHB trip purpose as a placeholder.

At the urging of the TRB Committee, TPB staff has begun to investigate truck modeling practice in other metropolitan areas. Staff is reviewing the approach adopted in 2002 by the Baltimore Metropolitan Council and has obtained a complete set of model documentation. This effort to develop a full set of truck models using a synthetic travel pattern derived from classification counts offers promise, given the increased difficulty with internal truck surveys.

For the balance of FY-2004 staff plans to complete its review of modeling practice in this area and develop a design for updating models, including the development of a set of classification counts which could be used to develop a synthetic “survey” trip pattern, in conjunction with the recently completed external truck survey. During FY-2005, as part of travel monitoring work program activities, a series of classification counts should be conducted. The budget for this effort will need to be funded from sources outside the planning funds in the UPWP, possibly tapping state SPR funding in D.C., Maryland, and Virginia. Assuming completion of the counting program during FY-2005, the development of synthetic trip patterns would commence in FY-2006 with model calibration to follow. It is envisioned that the models development work program would provide the resources needed for the design in FY-2004 and the calibration phase in FY-2006/2007. The product would be models providing separate forecasts of light, medium, and heavy trucks.

Methods Development (Track 2)

The activities in the methods development track are associated with the development of a ‘next generation’ of travel forecasting procedures using the current state of the art in modeling, including improvements to the existing four-step model or the implementation of more advanced approaches such as tour-based models.

There are several areas where the current four-step approach can be enhanced. These include the implementation of a more rigorous feedback structure in the model, an improved method for addressing peak-spreading in the future, and possibly the use of dynamic traffic assignment procedures.

Before embarking on the development of an enhanced model, there are several preparation activities that will need to be considered. It will be important to anticipate data requirements necessary to support the enhanced modeling approach. New types of required information may not be readily obtained using conventional data collection techniques. The software and hardware requirements to support the newer models will also need to be funded and put into place. Staff development and training will also need to be addressed. It is envisioned that the use of GIS-aided procedures will play an increasingly important role in the development of model enhancement plans.

Research (Track 3)

Activities in the research track are important to an ongoing models development program, but are sometimes neglected. Keeping abreast of modeling practice is facilitated by participation in the Transportation Research Board, the AMPO Travel Modeling Subcommittee, the Travel Model Improvement Program, and ITE. Additionally, literature reviews are facilitated by access to MPO and other websites.

Data Collection (Track 4)

Activities in this track are designed to support further refinement and development of COG/TPB travel forecasting models.

4.A Regional Household Travel Survey

Current plans are to conduct a major new regional household travel survey in the spring and fall of 2004. It is anticipated that this survey will be very similar to the 1994 COG/TPB Household Travel Survey and designed to support further refinement and validation of the COG/TPB Version 2.1 four-step travel forecasting model. Data collection for the 2004 COG/TPB Survey is planned to occur in two phases. The first data collection phase is to be conducted in May and June of 2004 and the second phase in September and October.

A completed sample size of 2,500 households would be obtained in each survey data collection phase for a total sample size of about 5,000 households. This sample will be stratified by major jurisdiction with the total number of samples allocated to each jurisdiction roughly proportional to each jurisdiction's relative share of regional households. Slight exceptions to this proportional allocation of survey samples will be in the District of Columbia and in lower density outlying semi-rural jurisdictions. District households will be over-sampled by one-third to ensure a sufficient number of sample households residing in higher-density urban areas well served by transit in the overall regional sample. Also, a minimum completed sample size of 150 households will be established for the outlying semi-rural jurisdictions regardless of their proportionate share of regional households to ensure an adequate number of samples for analysis from this jurisdictional area-type. This sample allocation plan will result in approximately 1,000 completed samples in the District of Columbia, 250-300 samples each in the other inner core area jurisdictions of Arlington and Alexandria, 500-700 samples in each of the three major Beltway jurisdictions, 250-300 samples in each of four outer suburban jurisdictions, and about 150 samples in each of two outlying semi-rural jurisdictions in the TPB planning region.

A Computer-Assisted Telephone Interviewing (CATI) survey methodology is planned for the 2004 Household Travel Survey. Random digit dialing techniques (RDD) will be used to develop a geographically stratified telephone sample of households to be contacted. Households in the RDD sample with published telephone numbers will be identified and sent pre-survey letters explaining the purpose of the travel survey, informing them that someone will be calling them shortly and encouraging their participation. Initial survey recruitment calls will then be made in an attempt to contact all potentially eligible households drawn in the RDD sample regardless of whether or not the household has a published telephone number. A minimum of seven call attempts on at least 5 different days will be made to reach and recruit each potentially eligible household to participate in the household travel survey. When a potentially eligible household is reached an initial screener interview will be conducted to obtain some basic information about the household and attempt to elicit the household's participation in the survey. Households agreeing to participate in the travel survey will be sent travel diaries for each member of the household age 5 and older to be completed for a randomly assigned travel day. Travel day trip

diary information and personal characteristic data for each household member will then be retrieved via diary retrieval interviews and recorded into the CATI system.

Some planned survey quality control and response enhancement procedures for this survey will include: (1) pre-survey letters to households with published phone numbers, (2) use of experienced, well-trained multi-lingual survey interviewers, (3) use of refusal conversion techniques, (4) survey reminder cards and calls, (5) a 1-800-Help Line, (8) use of trip rostering techniques and (7) limited use of proxy interviews.

The CATI travel survey methodology planned for the 2004 COG/TPB Household Survey is very similar to that used in the 1994 COG/TPB Household Survey, the 1998-2003 COG/TPB Longitudinal Household Travel Surveys, and the 2001 National Household Travel Survey (NHTS). Staff has found in prior surveys that use of this type of survey methodology has resulted in acceptable survey responses rates and high quality survey data free of any systematic biases. Estimates for key model variables developed from these prior CATI-collected travel survey data have matched well with Census data and transportation data from other sources. (See Appendix A concerning questions for peer review panel.)

4.B Auto External Survey

This project will obtain information on auto travel to and through the modeled region by persons living in areas beyond the external travel cordon for the modeled area. Information on the origin and destination of the external auto trip, the trip purpose, the number of persons in the vehicle, number of vehicles regularly used by the trip makers household and the Potomac River Bridges that may be crossed will be obtained via a very short, mail-out/mail back postcard questionnaire. Data collected in this survey together with survey data in the 2003 Truck External Survey and 2004 COG/TPB survey will be used to update and recalibrate the travel forecasting models.

4.C Analysis of Census Journey to Work Data

This project will obtain, tabulate, and analyze Census Journey to Work data collected in the 2000 Census. This work activity will include tabulation and analysis of Summary File 3 (SF 3), the Public Use Microdata Sample (PUMS) and the Census Transportation Planning Package (CTPP 2000). Place of work geocoding for the CTPP 2000 will be used by comparing it to COG's small area TAZ-level employment data and develop place of work adjustment factors, if necessary. Trip conversion factors will be developed to convert CTPP 2000 worker flow data into Home-Based Work (HBW) commuting trips consistent with the definitions used in COG/TPB travel forecasting model. After applying appropriate HBW conversion factors a TAZ-level data file will be built for use in travel model validation and refinement efforts.

The CTPP 2000 data tabulations and analysis will also be used to review the current 2191-TAZ areas system and to suggest updates and refinements to it, especially in geographic areas that currently have large TAZs.

4.D Regional Transportation Data Clearinghouse

Staff will update TPB's Regional Transportation Data Clearinghouse databases with updated traffic volumes and transit ridership data as well as transportation-related data from the 2000 Census. Formal arrangements with local, state, WMATA, and other regional agencies will be continued and expanded to transfer new data to and from the Regional Transportation Data Clearinghouse. The necessary database and communications infrastructure needed to incorporate better access to ITS and other more detailed traffic volume and speed data will also be developed.

Maintenance (Track 5)

This is envisioned to be an ongoing work element in the models development program, to provide staff and others with hands-on training in the application of the Version 2.1 model as it is incrementally updated. Documentation of the current modeling applications, including recent improvements to software and data requirements, is to be completed at the close of each fiscal year.

Appendix A

Questions on Planned New Regional Household Travel Survey for TRB Committee

Sample Size Needed for Future Models Development – The currently planned 2004 Household Travel Survey data collection is designed to fit within expected FY 2004-FY 2005 UPWP budget levels. Estimated survey contractor costs for 5,000 household samples are \$750,000 to \$1,000,000 spread over two fiscal years. This is why planned 2004 data collection is divided into two phases, as was done in 1994. Expected budget constraints will require termination of the Continuing Longitudinal Panel Household Travel Survey to permit the planned new cross-sectional 2004 COG/TPB Regional Household Survey in fiscal years FY 2004 and FY 2005.

Our models development staff would like to have a new regional household travel survey with a sample size more than twice that currently being planned for 2004. Ideally, our model developers would like to have a sample size in the 10,000 to 15,000 household range for models development. This would represent a one quarter to one half percent sample of all households in the modeled region. The main reason why our modelers would prefer a larger new regional cross-sectional travel survey as opposed to a continuing longitudinal panel survey is that the size of our current panel travel survey is too small (approximately 2,400 households) and lacks sufficient geographic detail at the sub-regional level.

We note with interest that the Puget Sound Regional Council, which has had an on-going continuing panel travel survey for more than a decade, conducted a new 6,000 household cross-sectional travel survey in 1999, in addition to their continuing panel survey, and currently plan to conduct another 6,000 household cross-sectional survey around the middle of this decade. We also note that the New York metropolitan region conducted an 11,000 household travel survey in 1997, the San Francisco region conducted a 15,000 household travel survey in 2000, and the metro Atlanta region conducted an 8,000 household travel survey in 2001.

To achieve the total household sample size desired by our models development staff will require a travel survey budget in the 2 to 3 million dollar range, a figure two to three times more than we currently expect to have available from existing budget resources. We note that the 2001 8,000 household sample regional household travel survey for Atlanta was budgeted at 2.7 million dollars.

We would like the TRB Committee to comment on the cost/benefit trade-offs in increasing our planned new regional cross-sectional survey from 5,000 households to a sample size of 10,000 to 15,000 households. Is there a compelling need for future models development in our region to increase regional household travel survey sample size to a minimum of 10,000 households? Also, the geographic area of our modeled region extends beyond the TPB planning region. Currently, we plan to collect new household travel survey data only for jurisdictions within the TPB's planning region and "borrow" any available data from other "similar" areas to develop household trip generation rates and other parameters for areas outside of the TPB's planning region, but within our modeled region. Is there a compelling need for our models development

to collect some minimum number of household samples for jurisdictions beyond our planning area, but included in our modeled area?

Activity-Based v. Trip-Based Travel Survey Diaries – While most other major metropolitan regions that conduct their own travel surveys have moved to some type of activity-based diaries in their regional household travel surveys, TPB has continued to use traditional trip-based travel survey diaries in its household travel surveys. The issue of changing to an activity-based diary was discussed with our Travel Forecasting Subcommittee in planning our 1994 Household Travel Survey and rejected. The rationale for this decision was that activity diaries were too complicated and burdensome for most survey respondents and would likely negatively impact survey response rates and overall survey data quality. Further, it was noted that detailed activity-based information was not necessary for the enhanced trip-based four-step model that was planned for development using the household survey data.

Since 1994, activity-based travel survey diaries have been greatly simplified and used successfully in a number of regional household travel surveys, although diary retrieval response rates for some activity-based travel surveys have been somewhat lower than for traditional trip-based travel diaries, even with the inclusion of some small incentive with the activity diary. One of the questions we would like the TRB Committee to comment on is whether or not there is a compelling reason to move to activity-based travel diaries in our future surveys and the likely trade-offs we will face in terms of survey response rates and overall survey data quality. This issue will also require some coordination with our colleagues in the metropolitan Baltimore region because they also chose to go with a trip-based travel diary in deciding to purchase a metro region add-on sample as part of the 2001 NHTS.

One Day v. Multi-day Travel Survey Diaries – Another conscious decision made in planning the 1994 Household Travel Survey was to maintain a one-day travel survey as opposed to a multi-day survey where each respondent would report on their daily travel or activities for two or more days. Again the concern was that going to a multi-day survey would negatively impact survey response rates and overall survey data quality because of greater respondent burden and greater respondent fatigue in reporting second day travel and other activities. Another question we would like the Committee to comment on is whether or not there is a compelling reason from a models development perspective to move to a multi-day survey and what are the likely trade-offs we will face in terms of survey response rates and overall survey data quality.

Declining Telephone Survey Response Rates – We have observed in the RDD panel replacement component of our Continuing Longitudinal Panel Household Travel Survey that initial CATI survey recruitment response rates drop from about 45% in 1999 to 37% percent of potentially eligible households in 2003. (RDD component diary retrieval response rates have remained constant at 70-71% in the same period.) We have also observed lower initial CATI household recruitment response rates reported for households in travel surveys recently conducted in other metropolitan areas. We believe this decline in CATI survey response rates is because of increased use of caller ID, answering machines, voice mail and other call screening technology by households residing in large metropolitan areas like Washington. We are further concerned about the exclusive use of mobile wireless telephones as a replacement for traditional land line telephone services by some households, especially those households composed

primarily of young males and females aged 18 to 24 who make many daily trips throughout the day. Finally, we are concerned about the recently initiated and highly popular “DO NOT CALL” database registry. Even though survey research firms are exempted from these recently enacted “DO NOT CALL” regulations, we are very worried that individual households (especially those with unpublished numbers) are not going to make this distinction between these survey firms and telemarketers who are prohibited from calling them.

We are interested in the Committee’s comments on the advisability of continuing to use RDD sample frames for our future household travel surveys and on other sampling and survey methods we might consider in selecting our travel survey sample households.

Survey Respondent Trip Underreporting – One of the perennial issues in the use of household travel survey data for models development is travel underreporting by respondents in these surveys. Research has shown that even in the best household travel surveys there is some level of underreporting or misreporting of daily travel, especially for short non-commuting trips. Modelers have generally found that they have to adjust upward non-work trip generation rates to match observed vehicle volumes from traffic counts. Some of this upward adjustment is because of household survey respondent trip underreporting, but some of it is also likely due to an under accounting of commercial light vehicles that are currently not well measured or captured in our travel surveys. Without additional data and analysis it is not possible to determine how much of the needed upward adjustment is because of survey respondent underreporting and how much is because of under measurement of daily commercial vehicle travel.

To obtain more information on this problem we are currently considering a GPS household vehicle tracking add-on sub-sample to our planned new household travel survey. This add-on sub-sample would recruit approximately 200 households who had agreed to participate in CATI to also agree to carry GPS tracking devices in their household vehicles on their travel survey day. Household respondent vehicle trip reports recorded in the CATI would then be compared with the vehicle tracking records recorded using the GPS device. In this manner the GPS add-on sub-sample would provide a direct measure of survey respondent vehicle-trip underreporting and misreporting of vehicle trip details because the GPS tracking would also provide direct measures of trip starting and ending times as well as very accurate measures of trip distances. Preliminary results from such a GPS tracking add-on sub-sample in a California household travel survey showed an estimated CATI survey vehicle trip-underreporting rate of approximately 27%. It is estimated that such a 200 household GPS tracking add-on sample would increase travel survey costs by about \$100,000. Results from such an add-on sample could be used to develop more precise vehicle trip adjustment factors to account for survey respondent trip underreporting.

We would be interested in the TRB Committee’s comments on the cost/benefits of a GPS household vehicle tracking add-on sub-sample to our regional household survey in terms of our future model development activities.

“Typical Season” Data Collection v. Year-Round Survey Data Collection – Historically, most travel survey and travel monitoring data in the Washington region has been collected in the late spring or mid-fall seasons which are considered representative of “typical” daily travel conditions in the region (i.e. children in school, not a large number of tourists, fewer workers on

vacations, etc.) and are fairly uniform throughout the 6-9 week survey period, with no major snow storms, heat waves or other weather-related event that might disrupt daily travel patterns. We have observed that some other metropolitan areas with large sample household travel surveys collect their travel data throughout a 12-month period. We are interested in the Committee's comments on the advantages and disadvantages from a models development perspective of moving from a "typical season" to a year-round data collection strategy for our future household travel surveys.

New Household Travel Survey Options/Opportunities

In reviewing the TRB Committee's first letter report and considering how we might address some of the issues raised through new data collection, TPB staff sees three potential options in terms of our planned new regional household travel survey and would be interested in the TRB Committee's comments on these options.

Option 1 – Conduct CATI as planned.

Option 2 – Conduct planned CATI with GPS tracking add-on sub-sample.

Option 3 – Defer data collection for a new regional household travel survey until 2005. Begin now the design a large-sample methodologically enhanced regional household travel survey and seek additional funding from sources outside the planning funds in the UPWP. Methodological enhancements would include: (1) development of GIS-based housing unit sampling frame that would enable selections of travel survey sample households by area type; (2) development of a multi-modal data collection survey methodology that permits household recruitment and diary retrieval by mail, telephone, Internet and in-person contacts; (3) a GPS add-on sub-sample; and (4) a follow-up survey of non-responding households and household members. It is estimated that such an enhanced survey would cost on the order of 3 to 5 million dollars for a 10,000 to 15,000 household sample and would require significant pre-testing of the design enhancement in 2004.