smart mobility

September 9, 2003

Mr. Ronald F. Kirby
Director, Department of Transportation Planning
Metropolitan Washington Council of Governments
777 North Capitol Street, N.E., Suite 300
Washington, DC 20002-4290

Dear Mr. Kirby:

We appreciate the work you and you staff have done in comparing the COG/TPB Version 2.1C travel forecasting model and the Smart Mobility Inc. enhanced model used in preparation of the report: *More Sprawl, More Traffic, No Relief: An Analysis of Proposed Potomac River Crossings*, October 2002.

You have identified some areas where SMI enhanced model outperforms the Version 2.1C model, and other areas where the Version 2.1C performs better.[1]

It is important to remember the context in which the SMI enhanced model was developed. It was developed in a limited time and with limited budget to address potential new Potomac River crossings. At that time, the available COG/TPB model was Version 2.0. It was determined that this model did a poor job in estimating base year Potomac River crossings and was unsuitable for the task at hand. The enhanced model was developed to fill this void. We are hopeful that Version 2.1C, which was released in December 2002, has addressed some of the deficiencies we documented.

We do not have the resources to evaluate whether our earlier criticisms would apply equally to the newest Version 2.1C model. However, an independent panel of experts recently has published a review of the Version 2.1C model, and makes some of the same observations we did last October.[2] This panel includes seven national experts on travel demand models, including representatives from other Metropolitan Planning Organizations, universities, and consulting practices.

In regards to matching traffic volumes, the expert panel concludes:

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[1] Metropolitan Washington Council of Governments National Capital Region Transportation Planning Board. *A Comparison of the COG/TPB Travel Forecasting Model with the Smart Mobility, Inc. Enhanced Model, DRAFT*, August, 20, 2003.

[2] Letter from David J. Forkenbrock, Chair on behalf of the expert panel and the Transportation Research Board, September 8, 2003

> Statistical measures indicate that base-year modeled link volumes do not match observed traffic counts and transit ridership as closely as committee members would typically expect in model validation. (p. 3)

In our October 2002 report, we raised questions about TPB/COG's inflation of trip generation rates, and contrasted them with National Personal Transportation Survey (NPTS) data for the region. Our use of NPTS data was strongly criticized by TPB/COG staff. The expert panel review states:

> TPB's extensive use of adjustment factors in trip generation, trip distribution, and mode choice to enhance the match between simulated and base-year data undermines the fundamental behavioral logic of the four-step process. (p. 3)

> ... the NPTS/NHTS may be a useful source of data for cross-checking local survey results, for example the possible under-reporting of non-home-based travel in the HTS. (p. 10)

> TPB's emphasis on data-fitting to observed base-year through the introduction of mechanical adjustment factors invites the pitfalls of inaccurate and unreliable future-year travel forecasts, especially if over time there are considerable changes in demographics, land use characteristics, and transportation system attributes. The committee observes that substantial factoring of trip productions and attractions is unusual and not a good practice. (p. 13)

In our October 2000 report, we criticized TPB/COG's extensive use of K factors. While it is true that the SMI enhanced model also uses K factors, they are used strictly across the Potomac River and/or state lines. The expert panel supports this type of use:

> Such factors are typically felt to be justifiable when applied to interchanges across jurisdictional boundaries, major physical boundaries such as rivers, or perceived barriers associated with socio-economic differences within a region, conditions found in abundance in the Washington region. (p. 14)

The expert panel expresses concern at the more arbitrary use of K factors in the TPB/COG model.

> ... committee members were concerned that the fraction of inter-zonal pairs to which K factors are applied is inordinately large, in comparison with river crossings and other apparent sources of distortions in the region's travel patterns, and agreed that such extensive application of K factors is inadvisable. (p. 14)

Our October 2002 report criticized the feedback process in the TPB/COG model. The expert panel writes:

> 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. (p. 3)

We criticized the post-processing of model outputs for use in air quality conformity. The expert panel writes:

> TPB's procedure of aggregating period estimates to 24-hour volumes would seem to be inconsistent with the travel models' assumptions for estimating period-based traffic volumes and travel times that, in turn, influence trip patterns. The definition of modeling periods for the travel forecasts incorporates peaking assumptions and relationships between peaks and total 24-hour volumes. The committee agrees this use of disaggregated 24-hour volumes, as opposed to period-specific volumes produced in route assignment, is questionable because it produces emission rates that are not strictly based on peak and off-peak assignment results as directed by conformity network modeling requirements.

Although no model is perfect, the SMI enhanced model addressed many of the concerns expressed by the peer review committee last year, prior to the release of the Version 2.1C model. We believe that it was the best available tool for use in the Potomac River crossing study.

Regards,

Norman L. Marshall
President