

From Survey to Model: Capturing Relative Perceptions of Transit Time in the Emme Strategy Transit Assignment

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This presentation documents a suite of recent enhancements to the Portland Metro regional transportation model. The efforts described here were undertaken with a dual emphasis on (1) maximizing the extent to which the explanatory power of the mode choice model lies in variables as opposed to constants; and (2) promoting consistency between mode choice and path choice parameters, which is of particular importance where New Starts analysis is concerned.

A stated preference (SP) survey was conducted on Metro's behalf in an effort to add further acuity to the mode choice model with regard to transit travel. Specifically, the survey made it possible to quantify relative perceptions of in-vehicle and wait time associated with variations in transit mode and stop type, respectively. While the SP survey was initiated without a clearly identified methodology in place for incorporating the results, the recently implemented Emme Strategy Transit Assignment with Variants facilitated the complete integration of the survey findings into the travel demand model.

Analysis of the SP survey led to updated mode choice utility expressions with constants and in-vehicle time coefficients specific to individual transit modes and a range of stop types varying by size, amenities, service level, and location. In-vehicle time perception factors were developed by calculating the ratio of the in-vehicle time coefficient for each mode to the in-vehicle time coefficient for the bus base; similarly, wait time perception factors were developed by calculating the ratio of the wait time coefficient for each stop type to the wait time coefficient for the "basic pole" base. In addition, individual constants from the SP survey were compared to the more negative generic transit constant to develop positive constant additives by mode and stop type.

A number of the enhancements to transit assignment functionality introduced within the Emme Strategy Transit Assignment with Variants module make it possible to incorporate the in-vehicle and wait time perception factors into the transit network and to calculate average constant additives according to zone-to-zone paths. Furthermore, additional flexibility in the calculation of skim matrices allows for the required matrices to be saved. Therefore, the traveler's varying perceptions are accounted for in path choice and in the skim matrices that are passed into the mode choice model.