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Generalized Time Transit Assignment in a Multi-Modal/Service Transit Network

Title of the paper

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BIOGRAPHICAL SUMMARY FOR MAIN AUTHOR (100 words mini-CV)

Dr. Eric J. Miller is Bahen-Tanenbaum Professor, Department of Civil Engineering and Director, Joint Program in Transportation at the University of Toronto where he teaches urban transportation planning and travel demand modelling. His research interests include: integrated land use-transportation modelling; analysis of the relationship between urban form and travel behaviour; modelling transportation system energy use and emissions; and microsimulation modelling. He is currently a member of the U.S. TRB Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting.

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ABSTRACT (500 words)

In a complex, multi-modal transit network with multiple fare systems and diverse service characteristics such as exists in the Greater Toronto Area (GTA), transit path choice can depend upon path-dependent travel costs (and perhaps other service attributes) in addition to in-vehicle and out-of-vehicle travel times. Modelling transit path/sub-mode choice in such situations can be a challenging proposition. This paper presents a procedure developed for the GTA transit system in which transit fares are converted into equivalent minutes of travel time (using an assumed time value of money) and directly coded into the transit network so that transit assignment is performed using “generalized time” as the basis for path choice. Service-dependent parameters are also incorporated. The key advantage of this approach is that it greatly simplifies “main mode” choice modelling and it can be applied to transit networks of arbitrary complexity. The primary challenge associated with the approach is to achieve reasonable prediction of usage of competing transit services within a given corridor, given the essentially “all or nothing” nature of most path assignments.

This paper discusses the multi-modal transit assignment problem, describes the GTA implementation in detail, and presents model results for a 2001 base case.

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