

# 20<sup>th</sup> International Emme Users' Conference

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## CALL FOR PAPERS

Strategies for Estimation of Park-and-Ride Demand Constrained by Parking Lot Capacities

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**Title of the paper**

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

Luc Deneault received his Master's Degree in Operations Research from the Université de Montréal in 1994 and is a transportation planner with over 12 years of experience. He has developed an expertise in implementing, upgrading and applying transportation models with EMME/2, as a Consultant first (INRO Solutions, LOCTRANS Groupe Conseil) and then as a team member in the public sector (Central Transportation Planning Staff – Boston MPO). He is a transportation analyst for the Ministère des transports du Québec since 2002.

### **AUDIOVISUAL SUPPORT NEEDED**

(A PC with Office XP, a projector, and a microphone will be provided. Please mention any other needs.)

## **ABSTRACT** (500 words)

The Ministère des transports du Québec develops and operates urban transportation models for the most important urban areas of Québec. Some recent or awaited O-D survey data in the regions of Montréal, Québec City and Ottawa-Gatineau<sup>(1)</sup> provide as many opportunities to refine its modelling practice. The MTQ will address the issue of bimodal trips and it contemplates the application of a strategy of estimation of the park-and-ride (PNR) demand explicitly constrained by parking lot capacities.

This presentation first discusses the application of Heinz Spiess's PARKRIDE macro to estimate the parking lot demand of the PNR trips of a model. This macro implements a PNR logit intermediate destination choice model with explicit parking capacities. In its current form, this approach admits violation of capacity constraints if the PNR demand exceeds the total number of parking spaces available at parking lots.

This study presents a procedure which identifies the origin and the destination of PNR trips allocated to parking lots which capacities are exceeded. These trips are then removed from the "drive access to transit" matrix and added to the "auto-only" demand matrix and subsequently assigned to the highway network. This procedure is useful especially when the mode choice model does not incorporate the parking lot capacity as an explicit input variable. In such cases, the mode choice model can overestimate future PNR trips which when assigned can greatly exceed the lot capacity and produce an unrealistic assignment.

This strategy combines the realistic parking choice model implemented in the PARKRIDE macro with the strict satisfaction of the parking lot capacities integrated in the model. It therefore allows the modeller to incorporate the magnitude of planned expansions at selected lots and capture the impact of that expansion not only at the neighbouring stations but throughout the transit system.

This strategy was first implemented in 2001 at the Central Transportation Planning Staff (CTPS) of the Boston Metropolitan Organization. It was instrumental in a commuter rail study in response to the fast growing pace of commuter rail ridership. The local transit operating authority (MBTA) had requested CTPS to update the parking demand forecasts by explicitly considering the parking lot capacities. In that Study, the estimation of the PNR demand under totally unconstrained capacity assumptions was also required to assist the MBTA in developing their long-term capital programs.

The procedure developed in this presentation is compared to several existing variations of the PNR logit intermediate destination model to reflect different constraint assumptions.

(1) The MTQ is part of the TRANS Committee which develops and operates this regional model.

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