



National Research  
Council Canada

Conseil national  
de recherches Canada

**NRC · CNRC**

Canadian  
Journal of  
Civil Engineering

Revue  
canadienne  
de génie civil

Volume 30, Number 6, December 2003

Volume 30, numéro 6, décembre 2003

**Includes  
Special Issue on  
Innovations in  
Transportation Engineering**

**Comprend  
un numéro spécial consacré  
aux innovations dans  
l'ingénierie des transports**



<http://cjce.nrc.ca>

<http://rcgc.cnrc.ca>



# Canadian Journal of Civil Engineering

# Revue canadienne de génie civil

Volume 30, Number 6, December 2003

Volume 30, numéro 6, décembre 2003

## Special Issue on Innovations in Transportation Engineering

## Numéro spécial consacré aux innovations dans l'ingénierie des transports

Tarek Sayed, Ph.D. and  
Frank Navin, Ph.D. v-vi

Introduction / Introduction

### ARTICLES

### ARTICLES

Qoutaiba Al-Qaysi, Said M. Easa, and  
Nouman Ali 955-969

Proposed Canadian automated highway system  
architecture: object-oriented approach

Homayoun Vahidi and Tarek Sayed 970-980

Using the Canadian ITS architecture for evaluating the  
safety benefits of intelligent transportation systems

Baher Abdulhai and Lina Kattan 981-991

Reinforcement learning: Introduction to theory and  
potential for transport applications

Jamal Abed and Isam Kaysi 992-999

Identifying urban boundaries: application of remote  
sensing and geographic information system technologies

Amer Shalaby, Baher Abdulhai, and  
Jinwoo Lee 1000-1009

Assessment of streetcar transit priority options using  
microsimulation modelling

Hesham Rakha, Kyoung-ho Ahn, and  
Antonio Trani 1010-1021

Comparison of MOBILE5a, MOBILE6, VT-MICRO, and  
CMEM models for estimating hot-stabilized light-duty  
gasoline vehicle emissions

Said M. Easa and Essam Dabbour 1022-1033

Design radius requirements for simple horizontal curves on  
three-dimensional alignments

Chris Lee, Bruce Hellinga, and  
Frank Saccomanno 1034-1041

Proactive freeway crash prevention using real-time traffic  
control

Yasser Hassan 1042-1054

Traffic and speed characteristics on two-lane highways:  
field study

Said M. Easa 1055-1065

Improved speed-profile model for two-lane rural highways

*Continued on inside back cover / Suite au verso*

**Front cover:** Merging of Greater Vancouver EMME/2 model traffic volumes with Digital Orthophotos (C. Lim and B. Clement, Strategic Planning Department, Greater Vancouver Transportation Authority). EMME/2 is a trademark of Les Conseillers INRO Consultants, Inc. (digital orthophoto (1999) courtesy of McElhanney Consulting, Vancouver, B.C.).

**Page couverture :** Fusionnement des modèles de volumes de circulation EMME/2 du Grand Vancouver à l'aide d'orthophotos digitales (Digital Orthophotos) (C. Lim et B. Clement, Département de planification stratégique, Département des transports du Grand Vancouver). EMME/2 est une marque déposée des Conseillers INRO Consultants, Inc. (orthophoto digitale (1999) courtoisie de McElhanney Consulting, Vancouver, C.-B.).

