



MICROSIMULATION

Number 19, 2009

This Hot Topic is designed to provide information on resources offering an overview of microsimulation techniques, within the context of selected publications highlighting specific applications of microsimulation.

1 Developing calibration tools for microscopic traffic simulation final report part 1: overview methods and guidelines on project scoping and data collection

Zhang, M & Ma, J

California PATH Working paper no. UCB-ITS-PWP-2008-3, 2008

Institute of Transportation Studies, Berkeley, California

This report is a literature review and development of certain guidelines for properly scoping a microscopic simulation project and coding its network to minimize coding errors. A wide range of transportation applications of microsimulation is reviewed. Note also the existence of parts 2 and 3 of this final report, encompassing:

Part 2 – Calibration framework and calibration of local/global driving behaviour and departure/route choice model parameters

Part 3 – global calibration, OD estimation, traffic signal enhancements, and a case study.

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2 Large scale microscopic simulation: toward an increased resolution of transportation models.

Smith, MC, Sadek, AW & Huang, S

Journal of Transportation Engineering, 2008

Volume 134, Number 7, pages 273-281

Microsimulation models have vast potential for modelling large-scale transportation networks. This paper describes the process of developing and calibrating a large scale model, based on a case study. It includes a summary of the main lessons learned and modelling pitfalls.

3 The principles of calibrating traffic microsimulation models

Hollander, Y & Liu, R

Transportation, 2008

Volume 35, Number 3, pages 347-362

Many parameters must be calibrated before traffic microsimulation can be used as a tool for prediction. This paper reviews various methodologies and, based on this, discusses the requirements of the microsimulation models. It includes discussion on underlying assumptions, scope of the calibration problem, formulation and automation, measuring goodness-of-fit, and the need for repeated model runs.

- 4 Development of a nanoscopic traffic simulation tool**
Koskinen, K, Kosonen, I, Luttinen, T, Schirokoff, A & Luoma, J
Advances in Transportation Studies, 2009
Volume 17, pages 89-96

This paper presents a concept of enhancing a microscopic traffic simulator Hitsim, towards a more detailed driver behaviour. The model presented here is expected to give more detailed information on drivers' behaviour and safety issues .

- 5 A comparative analysis of currently used microscopic and macroscopic traffic simulation software**

Ratrouf, NT & Rahman, SM
The Arabian Journal of Science and Engineering, 2009
Volume 34, Number 1B, pages 121-133

A review of the features of traditionally used macroscopic and microscopic traffic simulation models and provides a comparative analysis. It focuses on freeway operations, urban congested networks, project-level emission modelling and variations in delay and capacity estimates.

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- 6 Beauty or the beast: stability of large scale microsimulation models**

Ahuja, S & van Vuren, T
European Transport Conference 2007
Leiden, The Netherlands

Research, experiences, problems and issues associated with building and managing large scale microsimulation models are presented in this conference paper. Discusses three fundamental problems arising from the increasing size of microsimulators. Solutions to these problems are suggested.

Online [accessed 29 October 2009] [Click here](#) to view

- 7 How microsimulation modelling can address the real-world problems of navigation in congested networks**

Cragg, S
Traffic Engineering and Control, 2007
Volume 48, Number 3, pages 123-6

Paper stating that many aspects of driver behaviour are well understood but route choice is not well advanced. Discusses issues of routing problems and outlines how microsimulation assignment methodologies address real-world problems on navigation in congested networks.

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- 8 Is micro-simulation a waste of time ?**

Fox, K
European Transport Conference, 2008
Leeuwenhorst, The Netherlands

Exploring the problems of using microsimulations to perform transport assessments, this paper describes new products that integrate macro, micro and meso models.

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9 Network equilibrium with activity-based microsimulation models: the New York experience

Vovsha, P, Donnelly, R & Gupta, S
Transportation Research Record 2008
Number 2054, pages 102-109

In addition to examining the research needs required to achieve network equilibrium with activity-based microsimulation models, this paper also aims to offer practical guidelines for the use of activity-based models in a range of projects and policy areas.

10 Traffic simulation modelling of rural roads and driver assistance systems

Tapani, A
Dissertations number 1211, 2008
Linköping Department of Science and Technology. Linköping University, Sweden.

A doctoral thesis from Sweden outlining the development of a microsimulation tool for rural roads – the Rural Traffic Simulation (RuTSim).

Online [accessed 29 October 2009] [Click here](#) to view

11 Harnessing the power of microscopic simulation to evaluate freeway service patrols

Ma, Y, Chowdhury, M, Fries, R & Ozbay, K
Journal of Transportation Engineering, 2009
Volume 135, number 7, pages 427-439

Using PARAMICS software, this study evaluated the benefits of freeway service patrols in reducing the duration of roadway blockage and vehicle delay following a crash. Outcomes included a benefit cost analysis showing that freeway service patrols can obtain a benefit-cost ratio of up to 22:1, which decreases as the number of freeway service patrols increases, the number of crashes per year decreases, and the discount rate increases.

12 Super computers: how pedestrians are forcing their way into traffic simulation

Burtenshaw, G
Traffic Technology International 2009
No. 02/03, pages 20-26

A look at TRL Ltd's latest version of their traffic network software, TRANSYT 13, marking over forty years since the first published descriptions of TRANSYT in 1968.

13 International Microsimulation Association

From its beginnings in 2005, this group aims to promote the free interchange of experience and ideas between practitioners of microsimulation worldwide.

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14 Microsimulation Hub

ARRB Group
Vermont South, Vic.

The Microsimulation Hub is designed to provide a central point for information sharing in relation to microsimulation techniques and sector developments.

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