

6th International Symposium on Highway Capacity and Quality of Service 2011

Procedia Social and Behavioral Sciences Volume 16

**Stockholm, Sweden
28 June – 3 July 2011**

Editors:

**H. N. Koutsopoulos
K. L. Bang**

ISBN: 978-1-62748-910-2

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by Elsevier B.V.
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact Elsevier B.V.
at the address below.

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com



Contents

Preface.....	1
Proactive Ramp Management under the Threat of Freeway-Flow Breakdown Lily Elefteriadou, Alexandra Kondyli, Scott Washburn, Werner Brilon, Jan Lohoff Les Jacobson, Fred Hall and Bhagwant Persaud	4
Measuring the Quality of Service for High Occupancy Toll Lanes Operations Xiaoyue Liu, Guohui Zhang, Yao-Jan Wu and Yin Hai Wang	15
Speed-flow Models for Freeways Werner Brilon and Jan Lohoff	26
The Effect on Lane Utilization and Traffic Capacity of Adding an Auxiliary Lane Yoichi Moriyama, Masahiko Mitsuhashi, Shoichi Hirai and Takashi Oguchi	37
Capacity effects of variable speed limits on German freeways Justin Geistefeldt	48
New Measure of the Level of Service for Basic Expressway Segments Incorporating Customer Satisfaction Takashi Sakai, Kiko Yamada-Kawai, Hirokazu Matsumoto and Takashi Uchida	57
External Factors Affecting Motorway Capacity Ben Morris, Simon Notley, Katharine Boddington and Tim Rees	69
Analysis of the Weaknesses in the Present Freeway Capacity Models for Sweden Per Strömgren	76
Impacts of Weather on Traffic Flow Characteristics of Urban Freeways in Istanbul Darcin Akin, Virginia P. Sisiopiku and Alexander Skabardonis	89
Evaluation of the Impact of Advisory Variable Speed Limits on Motorway Capacity and Level of Service Albania Nissan and Haris N. Koutsopoulos	100
Countermeasure Strategies against Traffic Congestion on Motorways in Japan Yoshiyasu Murashige	110
Level of Service Method for Brazilian Toll Plazas Marta R. Obelheiro, Helena B. B. Cybis and José L. D. Ribeiro	120
A Preliminary Assessment of the 2010 HCM Weaving Methodology Loren Bloomberg, P.E.	131
Traffic Microsimulation Study to Evaluate Freeway Exit Ramps Capacity Martínez, M Pilar, García, Alfredo, Moreno and Ana Tsui	139
A new Model for Level of Service of Freeway Merge, Diverge, and Weaving Segments Ning Wu and Kerstin Lemke	151
Traffic Operations at an Entrance Ramp of a Suburban Freeway First Results Gérard Louah, Dimitri Daucher, Patricia Conde-Céspedes, Frédéric Bosc and Jean-Paul Lhuillier	162
Modeling Factors Influencing the Capacity of Motorway Merge Actions Controlled by Ramp Metering Saad Yousif and Jalal Al-Obaedi	172
Merge: The Current Practice in the UK and Towards Establishing General Principles Ronghui Liu	184
Impact of a Dedicated Lane on the Capacity and the Level of Service of an Urban Motorway Judith Princeton and Simon Cohen	196
Modeling Arterial Travel Time with Limited Traffic Variables using Conditional Independence Graphs & State-Space Neural Networks Ghassan Abu-Lebdeh and Ajay K. Singh	207
Derivation of Capacity Standards for Intercity Roads Carrying Heterogeneous Traffic using Computer Simulation V Thamizh Arasan and Shriniwas S. Arkatkar	218
Arterial Performance Evaluation on an Adaptive Traffic Signal Control System Zong Tian, Fred Ohene and Peifeng Hu	230
Modeling of Time Headway Distribution on Suburban Arterial: Case Study from South Korea Jinhwan Jang, Changsoo Park, Byunghwa Kim and Namkuk Choi	240

Truck Equivalence Factors for Divided, Multilane Highways in Brazil André Luiz Cunha and José Reynaldo Setti	248
Empirical Study of Lane Changing in Urban Streets under Varying Traffic Conditions Saravanan Gurupackiam and Steven L. Jones	259
Traffic Microsimulation Study to Evaluate the Effect of Type and Spacing of Traffic Calming Devices on Capacity García, Alfredo, Torres, Antonio José, Romero, Mario Alfonso, Moreno and Ana Tsui	270
Derivation of ATS and PTSF Functions for Two-lane, Rural Highways in Brazil José Elievam Bessa Jr. and José Reynaldo Setti	282
Implementing Two-lane Highway Simulation Modeling into CORSIM1 Jing Li and Scott S. Washburn	293
Estimating Free-flow Speed from Posted Speed Limit Signs Matthew D. Deardoff, Brady N. Wiesner and Joseph Fazio	306
Relating Safety and Capacity on Urban Freeways Janice R. Daniel and Eugene Maina	317
Platooning on Two-lane Two-way Highways: an Empirical Investigation Ahmed Al-Kaisy and Casey Durbin	329
Empirical Examination of Passing Lane Operational Benefits on Rural Two-Lane Highways Ahmed Al-Kaisy and Zachary Freedman	340
Exploration of 85th Percentile Operating Speed Model on Horizontal Curve: A Case Study for Two-Lane Rural Highways Syed Khairi Syed Abbas, Muhammad Akram Adnan and Intan Rohani Endut	352
Time-dependent Service Quality of Network Sections Anna Bennecke, Bernhard Friedrich, Markus Friedrich and Jochen Lohmiller	364
Vehicle Composition and Lane Distribution in Multilane Highways in Indonesian Cities Leksmono Suryo Putranto and Ni Luh Putu Shinta Eka Setyarini	374
Speed and Capacity for Urban Roads, Indonesian Experience Ahmad Munawar	382
Analysis on Rural Highway Design using Traffic Micro-Simulation in Cold Regions Kazunori Munehiro, Azuma Takemoto, Satoshi Kasai and Motoki Asano	388
The Correction Value of Passenger-Car Equivalents for Motorcycle and Its Impact to Road Performance in Developing Countries Sasana Putra	400
Description, Validation and Use of a Model to Estimate Speed Profile of Heavy Vehicles in Grades Vilhelm Børnes and Arvid Aakre	409
A Comparison of Freeway Work Zone Capacity Prediction Models Nan Zheng, Andreas Hegyi, Serge Hoogendoorn, Henk van Zuylen and David Peters	419
Traffic Flow Characteristics and Capacity in Police-enforced and Intelligent Work Zones Kivanc A. Avrenli, Rahim Benekohal and Hani Ramezani	430
Simulation-based Time-space Management of Workzone Construction Scheduling. Application in the Korinth-Patras Motorway. Constantinos Antoniou, Basil Psarianos and Guénolé Foll	440
Analysis of Queue Formation and Dissipation in Work Zones Hani Ramezani and Rahim Benekohal	450
Operational Evaluation of Dynamic Lane Merging In Work Zones with Variable Speed Limits Essam Radwan, Zaier Zaidi and Rami Harb	460
Investigating Initialization Times, Repetitions, and MOE Variability in Simulation of Under Saturated and Saturated Traffic Signals Saravanan Gurupackiam, Steven L. Jones, Daniel J. Fonseca	470
Modelling Blockage Probability and Capacity of Shared Lanes at Signalized Intersections Ning Wu	481
Assessing Performance Potential of Signalized Intersections and Arterials Nathan H. Gartner, Rahul Deshpande and Chronis Stamatiadis	492
Study on the Saturation Flow Rate and Its Influence Factors at Signalized Intersections in China Chang-qiao SHAO, Jian RONG and Xiao-ming LIU	504
A New Procedure to Determine a User-oriented Level of Service of Traffic Light Controlled Crossroads Thorsten Becher	515
Effects of Bi-directional Pedestrian Flow Characteristics upon the Capacity of Signalized Crosswalks Wael K. M. Alhajyaseen, Hideki Nakamura and Miho Asano	526
An Exploratory Hazard-based Analysis of the First Discharge Headway Ming-Jun LIU, Bao-Hua MAO, Shao-Kuan CHEN, Li-Ping GAO and Quan-Xin Sun	536
Saturation Flow Rate Analysis for Shared Left-turn Lane at Signalized Intersections in Japan Peng Chen, Hideki Nakamura and Miho Asano	548
Delay Underestimation at Free Right-turn Channelized Intersections Gregory S. Macfarlane, Mitsuru Saito and Grant G. Schultz	560

Evaluation of Low Cost Technique iIndirect Right Turni to Reduce Congestion at Urbanized Signalized Intersection in Developing Countries Kamran Ahmed	568
Impacts of Bus Priority in Coordinated Traffic Signals Johan Wahlstedt	578
Examining the Level of Service Consequence of Transit Signal Priority During Urban Evacuation Scott A. Parr, Evangelos I. Kaisar, Aleksandar Stevanovic	588
Impact of Saturation Flow Changes on Performance of Traffic Lanes at Signalised Intersections Janusz Chodur, Krzysztof Ostrowski and Marian Tracz.	600
Impact of Transit Signal Priority on Level of Service at Signalized Intersections Alexander Skabardonis and Eleni Christofa	612
Modification of Saturation Flow Formula by Width of Road Approach Budi Hartanto Susilo and Yanto Solihin	620
The Development of Microscopic Traffic Analysis Software iRoad Canali Reza Sunggiardi and Leksmono Suryo Putranto	630
The Determination of Conflicting Flow Rates for the Calculation of Capacities of Minor Traffic Streams on Priority Intersections Thoralf Knotte	642
Empirical Behavioral Models to Support Alternative Tools for the Analysis of Mixed-Priority Pedestrian-Vehicle Interaction in a Highway Capacity Context Bastian J. Schroeder and Nagui M. Roupail	653
Capacity of TWSC Intersection with Multilane Approaches Haiyuan Li, Zong Tian and Wei Deng	664
Capacity of Unsignalized Intersections under Mixed Traffic Conditions Joewono Prasetijo, Mehdi Hossein Pour and Seyed Mohammad Reza Ghadiri	676
Roundabout Metering Signals: Capacity, Performance and Timing Rahmi Akçelik	686
Analytical Traffic Models for Roundabouts with Pedestrian Crossings Astrid Bergman, Johan Olstamb, Andreas Allström	697
Critical Gap Analysis of Dual Lane Roundabouts Andyka Kusuma and Haris N. Koutsopoulos	709
Density Models and Safety Analysis for Rural Unsignalised Restricted Crossing U-turn Intersections Rafael Olarte, Joe G. Bared, Larry F. Sutherland and Anand Asokan	718
Signal Control of Roundabouts Al-Mudhaffar Azhar and Berg Svante	729
Modeling Differences in Driver Left-Turn Gap Acceptance Behavior Using Bayesian and Bootstrap Approaches Hesham Rakha, Shereef Sadek and Ismail Zohdy	739
Methodology to Evaluate Active Transportation and Demand Management Strategies Richard Dowling, Richard Margiotta, Harry Cohen, Alexander Skabardonis and Aaron Elias	751
Estimation of the Peak-hour Demand in the German Highway Capacity Manual Kerstin Lemke	762
A Review of Guidelines for Applying Traffic Simulation to Level-of-service Analysis Johan Olstam and Andreas Tapani	771
Congestion Indicators and Congestion Impacts: A Study on the Relevance of Area-wide Indicators Carlos A. Moran Toledo	781
Evaluation of the IQA Delay Estimation Method Yaye M. Keita and Mitsuru Saito	792
Estimation of the Network Capacity for Multimodal Urban Systems Burak Boyac and Nikolas Geroliminis	803
How the Risk-Taking Personality Influences Commute Driversi Departure Time Choices Rui Wang, Fumihiko Nakamura, Toshiyuki Okamura and Hiroshi Warita	814
A Utility-Based Evaluation Method on the Perceived Quality of Traffic Service Hideyuki Kita and Akira Kouchi	820
Proposal of an Alternative Model for Speed-Flow Relationship in Two-Lane Highways Manuel G. Romana and Miguel Núñez	832