International Symposium on Enhancing Highway Performance
Final Program – Technical Sessions

ISEHP International Symposium on Enhancing Highway Performance
June 14 – 16, 2016 | Berlin, Germany

Wednesday, June 15

9:00 - 10:30 a.m.	**Capacity Analysis Around the World: Part 1** *Chair: Kerstin Lemke* An Overview of the US HCM Update *Lily Elefteriadou* Managing motorways and urban arterials in Australia: Country Report for Australia* *Rod Troutbeck, Dennis Walsh, Miranda Blogg* Updates on Highway Capacity and Quality of Service Studies in Japan *Hideki Nakamura, Takashi Oguchi* The Development and Practice of China Highway Capacity Research* *Ronggui Zhou, Liande Zhong, Nale Zhao*	**Freeway Work Zone Capacity** *Chair: Nagui Rouphail* Capacity of Freeway Work Zones in Germany* *Nina von der Heiden, Justin Geistefeldt* Analysis of work zone capacity on motorways in Denmark based on field studies *Poul Greibe, Kenneth Kjemtrup* A Model for Capacity Reduction at Roadwork Zone* *Per Strömgren, Johan Olstam* Development and Calibration of Macroscopic and Microscopic Models for Freeway Work Zone Analysis *Bastian Schroeder, Ali Hajbabaie, Nagui Rouphail*	**Integrated Network Management on Cross Border Corridors** *Chair: Ronald Adams* Amsterdam Practical Trial and ArcAtlantique Corridor *Louis Hendriks* Cooperative ITS Corridor in the Netherlands, Germany and Austria *Marko Jandrisits* NordicWay – Cellular C-ITS Corridor Project for Traffic Safety *Ilkka Kotilainen* Utilizing C-ITS for Traffic Management in Germany *Sandro Berndt*	**Incident and Weather Data Collection and Processing** *Chair: Fritz Busch* Spatio-Temporal Congestion Patterns in Urban Traffic Networks* *Felix Rempe, Gerhard Huber, Klaus Bogenberger* Automatic Incident Detection based on Bluetooth Detection in Northern Bavaria* *Martin Margreiter* Estimation of Normal Condition Recovery Time with Traffic Flow Data for Snow Events *Eil Kwon, Chongmyung Park, Thomas Peters, Steve Lund* Usage of Road Weather Sensors for automatic traffic control on motorways* *Andrea Haug, Slavica Grosanic*
11:00 a.m. - 12:30 p.m.	**Capacity Analysis Around the World: Part 2** *Chair: Lily Elefteriadou* The new German Highway Capacity Manual (HBS 2015)* *Kerstin Lemke* Capacity Issues in Sweden – Applications and Research* *Torsten Bergh, Karin Nordqvist , Per Strömgren, Fredrik Davidsson, Karl Lennart Bång, Arne Carlsson* Recent developments and history of Dutch HCM* *Henk Heikoop, Niels Henkens* Farewell to Level of Service? California's Efforts to Create a more Environmentally-Friendly Performance Measure *Erik Ruehr*	**Freeway Work Zone Operation** *Chair: Justin Geistefeldt* Multi-Resolution Assessment of Freeway Work Zones at the Corridor and Network Levels *Bastian Schroeder, Ali Hajbabaie, Behzad Aghdashi, Nagui Rouphail* Traffic Flow at a Freeway Work Zone with Reversible Median Lane* *Helen Waleczek, Justin Geistefeldt, Dijana Cindric-Middendorf, Gerd Riegelhuth* Improving traffic flow at long-term roadworks* *Christoph Schwietering, Michael Feldges* Capacity Analysis and Performance Measures of a Three-Lane Work Zone Segment with Temporary Barriers *H. Joon Park, Lee-Jung Kim, Shuzuan Li, Roger P. Roess* Safety of characteristic subsections of roadwork zones on motorways* *Jean Emmanuel Bakaba, Jörg Ortlepp*	**Connected Vehicles** *Chair: Jon Obenberger* Preparing a Roadmap for Connected Vehicle/ Cooperative Systems Deployment Scenarios: Case Study of the State of Oregon, USA* *Robert Bertini, Haizhong Wang, Tony Knudson, Kevin Carstens* Cooperative ITS for TMC – An open and shared Solution for Cooperative ITS Corridor *Christian Roszak, Mathias Busch, Reiner Dölger* Performance Benefits of Connected Vehicles for Implementing Speed Harmonization* *Richard Dowling, Brandon Nevers, Anxi Jia, Alexander Skabardonis, Cory Krause, Meenakshy Vasudevan* Shockwave Suppression by Vehicle-to-Vehicle Communication* *Nassim Motamedidehkordi, Martin Margreiter, Thomas Benz*	**Managed Lanes** *Chair: Kevin Balke* The Influence of General Purpose Lane Traffic on Managed Lane Speeds: An Operational Study in Houston, Texas* *Raul Avelar, Kay Fitzpatrick, Karen Dixon, Tomas Lindheimer* Examining the Impact of Traffic Incidents on the Travel Time Reliability of Freeway High-occupancy Vehicle Lanes *Xianzhe Chen, Yajie Zou, Benjamin Wright, Yinhai Wang* An Analysis of Express Lanes in Utah* *Grant Schultz, Samuel Mineer, Cody Hamblin*
1:30 - 2:45 p.m.	**Signalized Intersection Capacity** *Chair: Bernhard Friedrich* Capacity and Delay Estimation at Signalized Intersections under Unsaturated Flow Condition Based on Cycle Overflow Probability* *Ning Wu, Stefan Giuliani* Methodology for timing and impact analysis of signalized intersections* *Karl Bang, Johan Wahlstedt, Leif Linse* Variability of Capacity and Traffic Performance at Urban and Rural Signalised Intersections* *Marian Tracz, Janusz Chodur, Krzysztof Ostrowski*	**Roundabouts** *Chair: Werner Brilon* Capacity and operational improvements of metering roundabouts in Spain* *Marilo Martin-Gasulla, Alfredo Garcia, Ana Tsui Moreno, Carlos Llorca* An analysis of heavy vehicle impact on roundabout entry capacity in Japan* *Nan Kang, Hideki Nakamura* Roundabouts in the German Highway Capacity Manual HBS 2015 *Martin Schmotz, Thoralf Knote*	**Advances in Traffic Control Devices and Driver Communication** *Chair: David A. Noyce* Effectively and safely communicating real-time information to freeway road users through in-vehicle or personal communicating devices *David A. Noyce* A V2I-Application for Transmitting Variable Speed Signs and Strategy Compliant Routes from Traffic Control Centers *Berthold Jansen* Smart mobility in the context of the EU presidency – The Declaration of Amsterdam *Tom Alkim*	**Freeway On- and Off-Ramp Control** *Chair: Yinhai Wang* Operational Analyses of Freeway Off-Ramp Bottlenecks* *Alexander Skabardonis, Fanis Papadimitriou, Bill Halkias, Pantelis Kopelias* Impact of Bottleneck Merge Control Strategies on Freeway Level of Service* *Ossama Ramadan, Virginia Sisiopiku* A local non-restrictive Ramp Metering strategy based on stochasticity of capacity* *Roland Trapp*

3:00 - 4:15 p.m.

Multi-Modal Performance Assessment
Chair: Richard Margiotta

Developing a Multimodal Transportation System Simulation Manual: Impacts on Future Transportation Performance
Robert Bertini, Brandon Nevers, George List and Mehdi Mashayekhi

Evaluating the service quality in multi-modal transport networks*
Markus Friedrich

A multi-modal approach for Highway Assessment*
Markus Mailer

Posters

An Investigation of SPSA for Signal Timing Optimization at Isolated Intersections
David Hale, Constantinos Antoniou, Byungkyu Brian Park, Jiaqi Ma, Lei Zhang, Alexander Paz

Saturation Flow Rate Analysis at Signalized Intersections for Mixed Traffic Conditions in Motorcycle Dependent Cities*
Huynh Duc Nguyen

Analysis of traffic operation at signalized junctions with two departure lanes merging into a single lane
Belinda La Cour Lund, Poul Greibe

Estimation Method for Interurban Accessibility: A Highway Performance Measure Indicating Smooth and Safe Traffic Flow*
Hideyuki Kita, Hirofumi Yotsutsuji, Ryo Asaka, Jyun Tsujitani, Tomotaka Watanabe

Passenger Car Drivers Experienced Level of Service on Motorways
Søren Underlien Jensen

Traffic Flow Quality from the User´s Perspective*
Sandra Hohmann, Justin Geistefeldt

Functionally hierarchical road classification considering the area characteristics for the Performance-oriented Road Planning*
Azusa Goto, Hideki Nakamura

Life Cycle Emissions and Cost Study of Light Duty Vehicles*
Panos Prevedouros, Lambros Mitropoulos

Investigation of automated vehicle effects on driver's behavior and traffic performance*
Erfan Aria, Johan Olstam, Christoph Schwietering

Evaluating driver distraction factors in urban motorways. A naturalistic study conducted in Attica Tollway, Greece*
Eleni Misokefalou, Fanis Papadimitriou, Nikolaos Eliou, Pantelis Kopelias

A Study of Collision Risk Estimation and Users Evaluation at Merging Section of Urban Expressway in Japan*
Koji Suzuki, Kazuki Imada, Yuki Matsumura

A Prediction Accuracy-Practicality Tradeoff Analysis of the State-of-the-art Safety Performance Assessment Methods*
Jaehyun So, Silja Hoffmann, Joyoung Lee, Fritz Busch, Keechoo Choi

Collection and Application of High Resolution Data for Highway Capacity Analysis
Nagui Rouphail, Behzad Aghdashi, Sangkey Kim, Goncalo Goncalves, Miguel Aires

Assessing Data Mining Priority Protocol for City-wide Traffic, Bicycle and Pedestrian Data
H. Joon Park, Patrick H. Kim

Making a Case for Microsimulation as a Concept Development Tool: Case Studies of Innovative Design Concepts
Smith Siromaskul, Karen Giese

Evaluation of Mini-roundabouts Performance Using a Microsimulation Platform
Evangelos Kaisar, Constantinos Antoniou

Simulation of a Network Fundamental Diagram based Congestion-Charging-Zone for Munich
Benedikt Bracher, Klaus Bogenberger

FCD-Webportal - Quality Assessment Tool for Bavarian Motorways
Gerhard Listl

Use of Data from Probe Taxis Traveling in the City of Sapporo for Reliability Evaluation of Winter Roads
Kazunori Munehiro, Tetsuya Takada, Tateki Ishida

An Optimization-Based Methodology for Estimating Freeway Facility Demands from Sensor Data
Lake Trask, Behzad Aghdashi, Nagui Rouphail, Bastian Schroeder

Clusterbased forecasting of traffic volume time series – A method to assign cluster to forecast days
Jochen Lohmiller, Juliane Pillat

Emergency Evacuation Management Utilizing Public Transit Systems Using Micro-simulation
Evangelos Kaisar, Scott Parr

Tollways and Freeways – Are they still different when All Electronic Tolling and High Occupancy Toll Lanes are developed?
Chair: Kallistratos Dionelis

Keynote:

Toll Roads and Concessions
Bruno de la Fuente

Panel debate contributions:

The ASECAP policy and initiatives for providing safe, efficient and Innovative Road Infrastructure to the users
Kallistratos Dionelis

Innovative Uses of Pricing and Managed Lanes Operational Strategies to Improve and Freeway Performance
Jon Obenberger

Tolling as a reliable and efficient tool for ensuring road infrastructure financing and sustainable mobility
Emanuela Stocchi

Managed Lanes and AET: Is there really a pot of gold at the end of this rainbow?
Phil Masters

Pricing as a congestion mitigation and sustainability strategy – Evolution of Toll Collection Practices and Technology
Bill M. Halkias

Satellite tolling – A Tool for sustainable revenues and ensuring mobility
Martin Rickmann

Proposals for a sustainable toll concession model
Bruno de la Fuente

ITS for smart, innovative and intelligent road infrastructure
Marko Jandrisits

4:30 - 5:45 p.m.

Non-Motorized Traffic
Chair: Paul Ryus

Capacity and Behaviour on One-way Cycle Tracks of Different Widths*
Poul Greibe, Thomas Skallebæk Buch

Pedestrian Traffic Operations in Urban Networks*
Yinan Zheng, Lily Elefteriadou, Thomas Chase, Bastian Schroeder, Virginia Sisiopiku

Human Ellipse of Indian Pedestrians*
Natasha Singh, Purnima Parida, Mukti Advani, Rajesh Gujar

Rural Highways
Chair: Manuel Romana

Operational Impact of Horizontal and Vertical Alignment of Two-Lane Highways*
Ana Tsui Moreno, Carlos Llorca, Alfredo Garcia

2+1-Roads Recent Swedish Capacity and Level-of-Service Experience*
Torsten Bergh, Mats Remgård, Arne Carlsson, Johan Olstam, Per Strömgren

Capacity Modeling and Control Optimization for Two-lane Highway Lane Closure Work Zones
Wenbo Zhu, Zhibin Li, John Ash, Yinhai Wang, Xuedong Hua

Facilitating and Enhancing Automated Driving
Chair: Tom Alkim

Facilitating Automated Driving in EU
Eetu Pilli-Sihvola

Road infrastructure for automated driving
Bernhard Friedrich, Sebastian Vogt

Coordination of activities in support of road automation
Bastiaan Krosse

Thursday, June 16

9:00 - 11:00 a.m.	**Traffic Simulation** *Chair: Peter Vortisch* Enhanced Vehicle Dynamics Modeling in Traffic Microsimulation *Seckin Ozkul, Scott Washburn* Evaluating Capacity and Delay for Signalized Arterials with Freight Deliveries* *Aaron Keegan, Eric J. Gonzales* Influence of dynamic traffic control systems and autonomous driving on motorway traffic flow* *Thomas Wietholt, Jochen Harding* Effective installation of an auxiliary lane at sag sections to mitigate motorway traffic congestion* *Jian Xing, Jun Tanaka* A Stochastic Car-Following Model* *Andreas Kendziorra, Peter Wagner, Tomer Toledo*	**Freeway Capacity and Quality of Service, Part 1** *Chair: Barbara Ostrom* The contribution of ramp demand in the capacity of merge bottleneck locations* *Alexandra Kondyli, Phani Gubbala, Lily Elefteriadou* Identification of factors that may affect the discharge flow at a bottleneck* *Daisuke Yamaguchi, Takashi Okano, Hajime Sudo, Masahiko Kobayashi, Takayuki Ogihara, Norihiro Izumi, Atsushi Tanaka, Toshio Yoshii* The new Procedures for Diverge, Merge, and Small Weaving Segments in the new Version of German Highway Capacity Manual (HBS 2015)* *Ning Wu, Kerstin Lemke* A Model for Estimating Free-flow Speed on Brazilian Expressways* *Gustavo Riente de Andrade, Cira Pitombo, André Luiz Cunha, Jose Reynaldo Setti* Autonomous and Connected Cars: HCM Estimates for Freeways with Various Market Penetration Rates* *Liang Shi, Panos Prevedouros*	**Integrating Big Data Techniques into Tolling and Traffic Management Systems** *Chair: Ian Patey* Big Data for TMCs: Issues and Opportunities *Phil Masters* Use of Big Data for Managing England's National Network *Ian Patey* CHARM: The Next Generation of TMC's *Marion Braams* What Can We Learn From Big Data Applications *Keith McCabe*	**Freeway and Tollway Operations and Management** *Chair: Bill Halkias* Expressway Traffic Demand Forecasts in the Volatile Economic Environment of Greece* *Panos Prevedouros, Bill Halkias* Use of Advanced Driver Assistance Systems (ADAS) for Driving Behavior Evaluation of the Attica Tollway Patrols *Fanis Papadimitriou, Nikos Raptopoulos, George Kiousis, Mike Maltezakis* A holistic approach in preventive operational management – The case of Attica Tollway in Athens, Greece *Dimitrios Mandalozis, Charalampos Malimoglou, Natalie Kalfa* Intelligent Controlled Compact Parking for Modern Parking Management on German Motorways* *Jens Dierke, Jessica Kleine, Rainer Lehmann* Proposal and Application of Parking Area Performance Measurement Methodology* *Tadahisa Muramatsu, Takashi Oguchi*
11:30 a.m. - 1:00 p.m.	**Signalized Intersection Modeling and Control** *Chair: Ning Wu* Alternative Intersection Designs to Enhance Left-Turn Efficiency *Essam Radwan, Hatem Abou-Senna* Comparing lane based and lane-group based models of signalised intersection networks* *Rahmi Akcelik* A methodology for signal timing estimation based on low frequency floating car data: Analysis of needed sample sizes and influencing factors* *Steffen Axer, Bernhard Friedrich* Comparative Analyses on the Maneuvers of Left-Turning Movements at Signalized Intersections in New York City *H. Joon Park, Miho Iryo-Asano, Wael K.M. Alhajyaseen*	**Freeway Capacity and Quality of Service, Part 2** *Chair: Alexandra Kondyli* Assessment of Level-Of-Service for Freeway Segments Using HCM and Microsimulation Methods* *Dusan Jolovic, Aleksandar Stevanovic, Soheil Sajjadi, Peter T. Martin* Assessment of Basic Freeway Segments in the German Highway Capacity Manual HBS 2015 and Beyond* *Justin Geistefeldt* A rationale for enhancing the German Highway Capacity Manual to incorporate oversaturated freeway facility analysis* *Martin Hartmann, Peter Vortisch* Development of a Mobility-Based Service Measure for Freeway Facilities* *Richard Margiotta, Douglas McLeod, Tyrone Scorsone*	**Freeway Analytics for Real Time Usage** *Chair: Panos Prevedouros* Integrating Data Analytics into Decision Makings for Traffic Operations *Yinhai Wang* Proposed Data-Driven Performance Measures for Comparing and Ranking Traffic Bottlenecks* *David Hale, Ali Hajbabaie, Jiaqi Ma, Jia Hu, Hyoshin Park, Joe Bared* Data Fusion for ITS: Techniques and Research Needs* *Nour-Eddin El Faouzi, Lawrence A. Klein*	**Variable Speed Control** *Chair: Klaus Bogenberger* Evaluation of Driver Compliance to Displayed Variable Advisory Speed Limit Systems: Comparison between Germany and the U.S.* *Gary Riggins, Robert Bertini, Williams Ackaah, Martin Margreiter* Advanced Evaluation Methods for Variable Speed Limit Systems* *Williams Ackaah, Klaus Bogenberger* Harmonization with Variable Speed Limits on Motorways* *Per Strömgren, Gunnar Lind* Evaluation of Variable Speed Limit Pilot Projects for Texas Department of Transportation* *Beverly Kuhn, Kevin Balke, Robert Brydia, Luann Theiss, Ioannis Tsapakis, Leonard Ruback, Minh Le*

* Full paper available in the ISEHP Proceedings