INNOVATIONS IN TRAFFIC FLOW THEORY AND CHARACTERISTICS, AND HIGHWAY CAPACITY AND QUALITY OF SERVICE SYMPOSIUM

JUNE 19-22, 2012

HILTON FORT LAUDERDALE BEACH HOTEL
FORT LAUDERDALE, FLORIDA
Conference Planning Committee

Dr. Mohammed Hadi, Florida International University, Chair
Dr. Rober Bertini, Portland State University
Dr. Darcy Bullock, Purdue University
Dr. Nikolas Geroliminis, L'Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland
Dr. Lily Elefteriadou, University of Florida
Dr. Samer Hamdar, George Washington University
Mr. William Sampson, University of Florida
Dr. Bastian Schroeder, North Carolina State University
Mr. Robert Sheehan, Federal Highway Administration

Sponsoring Committees

Highway Capacity and Quality of Service (AHB40)
Committee website: http://www.ahb40.org
Dr. Lily Elefteriadou, Chair
University of Florida

Traffic Flow Theory and Characteristics (AHB45)
Committee website: http://www.tft.pdx.edu/
Dr. Robert L. Bertini, Chair
Portland State University

TRB Staff

Richard Cunard, Senior Program Officer - Traffic and Operations Engineer
Freda Morgan, Senior Program Associate
Conference Agenda

Monday, June 18

2:00 p.m.–5:00 p.m., Del Sol Foyer
Registration

Tuesday, June 19

7:00 a.m.–5:00 p.m., Del Sol Foyer
Registration

8:30 a.m.–Noon, Del Sol Ballroom I

This workshop is to utilize the knowledge of traffic operations professionals present at the Joint Committee Meetings in June 2012 to gage the interest and insights of these professionals on the topic of predictive demand and traffic flow, to enable pro-active implementation of operational strategies to influence and alter the future performance in a favorable manner to align with the performance goals. The objective of pro-active management of the transportation highway network is to prevent potential problems before they occur to allow for the achievement of performance goals.

Operational concepts such as congestion pricing, speed harmonization, route diversion, parking information/restrictions, hard shoulder use, ramp metering and control, optimizing traffic signal timing changing transit frequency, adjusting the mix of transit services, etc depend on knowledge of the near-term future demand patterns and traffic flow conditions. However without prediction capabilities the ability to manage the system utilizing technologies such as speed limit changes, variable tolling rates, hard shoulder running or user advisory messages often prove to be reactive instead of pro-active and the window of opportunity to manage the system performance is often lost. That is, the traffic flow breakdown point may have already occurred before the pro-active action can be implemented and/or understood by the user. The lack of predictive methods not only diminishes the effectiveness of the strategy but also instills user mistrust of what is being implemented, leading to lack of compliance or use.

Today’s workshop consists of a series of brief presentations relating to the topic of predictive methods and will be followed with a “roundtable” discussion with the audience and panel members.
8:30 a.m.–9:50 a.m.  
**Introduction to the Workshop**  
Aimee Flannery, Applied Engineering Management Corporation  
**ATDM Program Introduction and the Vision of Real-Time Pro-Active Traffic Operations**  
Bob Sheehan and John Halkias, Federal Highway Administration  
**Forecasting in Non-Transportation Fields: Currency Markets**  
Brian Fox, Applied Engineering Management Corporation  
**Connected Corridors: Toward a Decision Support System for Proactive Corridor Management**  
Alex Skabardonis, UC Berkeley  
**Edmonton Yellowhead Trail ATDM Test Laboratory**  
Dr. Jintao Ma, Mygistics, Inc.  
**San Diego I-15 ICM – Real time Traffic Modeling and Network Flow Prediction**  
Matt Jukes, TSS – Transport Simulation Systems

9:50 a.m.–10:10 a.m. *Del Sol Foyer*  
**Morning Break**

10:10 a.m.–Noon  
**Roundtable Discussion**  
**Purpose/Ground Rules**, Aimee Flannery

10:15 a.m.–10:35 a.m.  
**Topic 1 – Relationship between Operators & Modelers**

10:35 a.m.–11:00 a.m.  
**Topic 2 – Performance Measures for use in Real Time Proactive Operations**

11:00 a.m.–11:45 a.m.  
**Topic 3 – ATDM and Traffic Prediction – Focusing on Traffic Operator Needs**

11:45 a.m.–11:55 a.m.  
**Topic 4 – Next Steps for FHWA**

11:55 a.m.–Noon  
**Wrap up**

Noon–1:00 p.m.  
**Lunch (on your own)**
1:00 p.m. –2:30 p.m., *Del Sol Ballroom II*
Traffic Flow Theory and Characteristics Meeting Committee and Traffic Simulation Models Joint Subcommittee Meeting

1:00 p.m.–3:00 p.m., *Del Sol Ballroom I*
SHRP2 L08 Travel Time Reliability in the HCM Workshop

2:30 p.m.–5:00 p.m., *Aurinko*
Research Needs Workshop

3:00 p.m.–5:00 p.m., *Del Sol Ballroom II*
FDOT LOS Task Force Meeting

5:30 p.m.–6:30 p.m., *Sunrise Terrace/Del Sol Ballroom*
**WELCOME RECEPTION**
**Wednesday, June 20**

7:00 a.m.–5:00 p.m., *Del Sol Foyer*

Registration

7:00 a.m.–8:00 a.m., *Del Sol Foyer*

Continental Breakfast

8:00 a.m.–8:30 a.m., *Del Sol Ballroom I*

**Welcome and Opening Session**

The Need for Compatible Traffic Flow and Highway Capacity Analysis Techniques

8:45 a.m.–10:30 a.m., *Del Sol Ballroom I*

**Session 1A—Analyses of Active Management Strategies**

Nikolas Geroliminis, Swiss Federal Institute of Technology, Lausanne, *Moderator*

*Estimation of Disruption Probability for Different Ramp Control Conditions Based on Queuing and Gap-Acceptance Models*, Ning Wu, Ruhr University Bochum, Germany; and Zong Tian, University of Nevada, Reno

*An Initial Evaluation of Variable Speed Limit Algorithms along Freeway Facilities*, Clark Letter and Lily Elefteriadou, University of Florida

*An Investigation of the Interactions between Managed Lane Operations and Ramp Metering: The I-95 Express*, Evangelos Mintsis and Lily Elefteriadou, University of Florida

*A Twin Cell Modeling Approach for Parallel Freeway Facilities – A Managed Lane Example*, Xiaoyue Cathy Liu, University of Washington; Guohui Zhang, University of New Mexico; and Yinhai Wang, University of Washington

*Gap Metering for Active Traffic Control at Freeway Merging, Diverging, and Weaving Sections*, Peter Jin and C. Michael Walton, University of Texas, Austin; Jie Fang, University Wisconsin, Madison; and Mike Degaspari, University of Texas, Austin

*Speed Harmonization: Effectiveness Evaluation under Congested Conditions*, Hani Mahmassani, Northwestern University

8:45 a.m.–10:30 a.m., *Del Sol Ballroom II*

**Session 1B –Interrupted Facility Performance Assessment**

Darcy Bullock, Purdue University, *Moderator*

*Estimation of Delay Variability at Signalized Intersections for Urban Arterial Performance Evaluation*, Peng Chen, Hideki Nakamura and Miho Asano, Nagoya University, Japan

*A Probability Model for Assessing Arterial Performance with Non-Coordinated Signals*, Zong Tian, Rasool Andallbian and Ning Wu, University of Nevada, Reno

*Effect of Bus Stop Location and Bus Dwell Time on Saturation Flow at Signalized Intersections*, Robert Campbell, Eleni Christofa and Alexander Skabardonis, University of California, Berkeley
A Revised Version of the HCM 2010 Urban Streets Automobile LOS Methodology for Florida, Seckin Ozkul and Scott Washburn, University of Florida; and Doug McLeod, Florida Department of Transportation

Alternative Level-of-Service and Quality of Progression Models For Urban Street Analysis, Nathan Gartner, University of Massachusetts, Lowell; and Marguerite Zarrillo, University of Massachusetts, Dartmouth

10:30 a.m.–10:45 a.m., Del Sol Foyer
Morning Break

10:45 a.m.–12:30 p.m., Del Sol Ballroom I
Session 2A–Methodologies and Tools for Active Traffic Management
Robert Sheehan, Federal Highway Administration, Moderator


Evaluating the Impacts of Incident Management using ITS Data Capture and Performance Management Tool, Yan Xiao, Mohammed Hadi, Chengjun Zhan, and Halit Ozen, Florida International University

Urban Road Evaluation Index System for Managers Based on the Traffic Temporal and Spatial Characteristics, Yanli Wang, Linbo Li and Bing Wu, Tongji University, China

Comparison of Real-Time Prediction of Incident Impacts utilizing Data –Driven Modeling, Microscopic Simulation, and HCM Freeway Facility Procedures, Chengjun Zhan, Mohammed Hadi, Yan Xiao and Patricio Alvarez, Florida International University

The Impact of Two-Capacity Phenomenon on ATDM Freeway Facilities Analysis, Soheil Sajjadi, Bastian Schroeder and Nagui Rouphail, North Carolina State University

Integrated Corridor Management Benefits: Results from Real-World Testing, Robert Sheehan, Federal Highway Administration

10:45 a.m.–12:30 p.m., Del Sol Ballroom II
Session 2B–Alternative Tools/Simulation/Non-Motorized Transportation
Samer Hani Hamdar, George Washington University, Moderator

A Mesoscopic Simulation Model for an Integrated Diamond Interchange-Ramp Metering Control System, Zong Tain, University of Nevada, Reno

An Efficient Methodology for Calibrating Car-Following Models Based on Bisection Method, Chaoqun (Enzo) Jia, Gabriel Leiner and Daiheng Ni, University of Massachusetts, Amherst

Assessment of Level of Service by Traffic Flow Simulation in Compliance with the German Highway Capacity Manual, Justin Geistefeldt, Ruhr University Bochum, Germany; Kerstin Lemke, Federal Highway Research Institute, Germany; Andrea Rascher, Technical University Munchen, Germany; and Peter Vortisch, Karlsruhe Institute of Technology, Germany

Modeling Driver Yielding Rate to Pedestrians at Yield Controlled Crosswalks: Application to Pedestrian Delay Analysis in the Highway Capacity Manual, Katayoun Salamati, Bastian Schroeder and Nagui Rouphail, North Carolina State University
Using Micro-simulation and NGSIM Data to Validate HCM Methodology for Oversaturated Freeway Weaving Segments, Dusan Jolovic, Aleksandar Stevanovic, Jarice Rodriguez-Seda and Evangelos Kaisar, Florida Atlantic University

12:30 p.m.–1:30 p.m., Del Sol Terrace/Jua

Joint Lunch

1:30 p.m.–3:15 p.m., Del Sol Ballroom I

Session 3A–Estimation and Prediction of System Performance
Mohammed Hadi, Florida International University, Moderator

Predicting Corridor-Level Time-Dependent Travel Time Distributions Based On Stochastic Flow And Capacity Variations, Hao Lei and Xuesong Zhou, University of Utah; George List, North Carolina State University; and Jeffrey Taylor, University of Utah

Travel Time Estimation and Prediction in Freeway Systems, Mehmet Yildirimoglu and Nikolas Geroliminis, Swiss Federal Institute of Technology, Lausanne

Multivariate Short-Term Traffic Flow Forecasting: Multi-dimensional Scaling Combined GRNN Based Approach, Yanru Zhang, University of Maryland; Yunlong Zhang, Texas A&M University; Chunfu Shao, Beijing Jiaotong University, China; and Ali Haghani, University of Maryland

Measuring Road Congestion in Europe with Data from In-Vehicle Navigation Systems, Panayotis Christidis and Juan Nicolas Ibanez Rivas, European Commission, Spain

Measuring Performance on Interrupted Flow Facilities with Probe Data, Stanley Young, University of Maryland

Arterial Performance Measurement Using Probe Trajectory Data, Yang Cheng, University of Wisconsin, Madison; Xiao Qin, South Dakota State University; and Bin Ran, University of Wisconsin, Madison

1:30 p.m.–3:15 p.m., Del Sol Ballroom II

Session 3B–Capacity and Traffic Flow Modeling
Thomas Creasey, Stantec Consulting, Inc., Moderator

A Quantitative Evaluation of the Effect of Hierarchical Road Network, Azusa Goto, Hideki Nakamura and Miho Asano, Nagoya University, Japan

Comparing Capacity Models at Congested Wisconsin Roundabouts, Michael DeAmico, Andrea Bill, Madhav Chitturi, John Shaw and David Noyce, University of Wisconsin, Madison

Genealogy of Traffic Flow Models, Femke van Wageningen-Kessels, Hans van Lint, Kees Vuik and Serge Hoogendoorn, Delft University of Technology, Netherlands

Capacity Drop Phenomena in Urban Networks, Meead Saberi and Hani Mahmassani, Northwestern University

Impact of Ramp and Mainline Flow Mix on Some Freeway Breakdown Characteristics, Amjad Dehman, Yarmouk University, Syria

Some Traffic Features During On-ramp Queue Flush, Bhargava Chilukuri, Danjue Chen and Jorge Laval, Georgia Institute of Technology

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Critical Lane Volume Based Double Crossover Diamond Interchange Analysis Procedure, Avijit Maji, Maryland State Highway Administration; Prabhati Bhattacharya, Consulting Engineering Services (India) Private Ltd.; and Manoj Jha, Morgan State University

3:15 p.m.–3:45 p.m., Del Sol Foyer
Afternoon Break

3:45 p.m.–5:30 p.m., Del Sol Ballroom I
Session 4A–Reliability and User Satisfaction
Bastian Schroeder, North Carolina State University, Moderator

Study in Driving Satisfaction Model for Truck Drivers on the Expressway, Koji, Jian Zheng, Motohiro Fujita and Daichi Ito, Nagoya Institute of Technology, Japan

Corridor Level Travel Time Reliability Performance Measures: A Case Study, T. Brennan, R. Gallagher, E. Cox, and D. Bullock, Purdue University

Freeway Reliability for the Highway Capacity Manual, Nagui Rouphail, Bastian Schroeder and Behzad Aghdashi, North Carolina State University

Understanding Travel Time Reliability in Freeway and Arterial Networks, George List, Billy Williams and Nagui Rouphail, North Carolina State University; and Alan Karr, National Institute of Statistical Sciences

3:45 p.m.–5:30 p.m., Del Sol Ballroom II
Session 4B–Freeway Operation Analyses
William Sampson, University of Florida, Moderator

Freeway Traffic Analysis – Modern Methods in Germany, Werner Brilon, Ruhr University Bochum, Germany

A Behavior Based Work Zone Capacity Model, Michael Zhang, University of California, Davis


Freeway Work Zone Speed-Flow Relationship and Its Impact on Drivers' Lane Change Behavior, Janice Daniel and Yang He, New Jersey Institute of Technology

A Hypothesis of Freeway Breakdown Using Extreme Value Analysis (EVA), Paul Ossenbruggen and Eric Laflamme, University of New Hampshire

Towards the Formulation of an Empirical Model of HOV/HOT Traffic Flow: Investigation of Platoon Formation and Characteristics, Panagiotis Stanitsas and John Hourdos, University of Minnesota

5:30 p.m.–6:45 p.m., Del Sol Ballroom I
User Liaison Subcommittee
Thursday, June 21

7:00 a.m.–5:00 p.m., Del Sol Foyer
Registration

7:00 a.m.–8:00 a.m., Del Sol Foyer
Continental Breakfast

8:00 a.m.–9:15 am
Freeways and Highways Subcommittee, Aurinko
Signalized Intersections Subcommittee, Jua

9:30 a.m.–10:30 am
Two-Lane Highways Subcommittee, Aurinko
Interchanges Subcommittee, Jua

10:30 a.m.–10:45 a.m., Del Sol Foyer
Morning Break

10:45 a.m.–Noon
Traffic Simulation Applications Subcommittee, Aurinko
Urban Streets Subcommittee, Jua

Noon–1:30 p.m., Del Sol Ballroom
Buffet Luncheon with ITE Gold Coast Chapter and WTS South Florida Chapter

1:30 p.m.–2:30 p.m.
Planning and Preliminary Engineering Subcommittee, Aurinko
Unsignalized Intersections Subcommittee, Jua

2:45 p.m.–4:00 p.m.
Group 2 Uninterrupted Flow Subcommittee, Aurinko
Group 3 Interrupted Flow Subcommittee, Jua

4:00 p.m.–4:15 p.m., Del Sol Foyer
Afternoon Break

4:15 p.m.–5:15 p.m.
Performance Measures Subcommittee, Aurinko
Research Subcommittee, Jua

5:30 p.m.–6:45 p.m.
Bike and Ped Subcommittee, Aurinko
ATM Subcommittee, Jua

7:30 p.m., Tai Yang
HCQS Leadership Meeting (by invitation)
FRIDAY, JUNE 22

7:00 a.m.–10:00 a.m., Del Sol Foyer
Registration

7:00 a.m.–8:00 a.m., Del Sol Foyer
Continental Breakfast

8:00 a.m.–Noon, Del Sol Ballroom II
Highway Capacity and Quality of Service Committee Meeting
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