Applications of Advanced Technology in Transportation

AATT 2006

9th International Conference on

Wyndham Chicago
Chicago, Illinois USA
August 14-16, 2006

Presented by
Transportation & Development Institute of the American Society of Civil Engineers
Committees on Advanced Technology and Infrastructure Systems

In Partnership With
Urban Transportation Center, University of Illinois at Chicago
Transportation Research Board
Delaware Center for Transportation and Department of Civil and Environmental Engineering, University of Delaware
Welcome to Chicago and the 9th International Conference on Applications of Advanced Technology in Transportation! With four different tracks (Infrastructure Management & Operations, Advanced Operation Technologies, Transportation Modeling, and Transportation Planning), the technical program has a wide variety of presentations that cover innovative technologies, different modes, concepts, and applications. We are excited about the program and look forward to hearing the presentations.

Optional technical tours on Wednesday afternoon provide an inside look into operations at the Chicago Transit Authority (CTA) Control Center and Pace Suburban Bus headquarters. Please sign up at the Registration Desk as soon as possible (but no later than 12 NOON on Tuesday), so all arrangements can be confirmed in advance.

The Wyndham Chicago, our conference hotel, was selected so that you have easy access to Chicago’s transit system, and can stroll along the lakefront and Navy Pier, explore Millennium Park, or shop on Michigan Avenue. Chances are, you will also see police – and numerous tourists – on Segways™. For certain, you will also enjoy the great restaurants in the immediate area and the possibility to explore the flavors of the city’s various neighborhoods. Opportunities are abundant!

The “Welcome Reception” on Monday evening is a great opportunity to meet folks, renew acquaintances, or hook up with old friends. We look forward to meeting you and sharing this cutting-edge forum with you.

CO-CHAIR:
David T. McKay, M.ASCE
Research Civil Engineer,
U.S. Army Corps of Engineers,
Engineer Research & Development
Center, Construction Engineering
Research Laboratory,
Champaign, IL

Sue McNeil, Ph.D., P.E., M.ASCE
Professor, Department of Civil and
Environmental Engineering,
University of Delaware,
Newark, DE

Kelvin C. P. Wang, Ph.D., P.E., M.ASCE
Professor, Department of Civil and
Environmental Engineering,
University of Hong Kong,
Hong Kong, China

CONFERENCE ORGANIZERS

STEERING COMMITTEE
David T. McKay, M.ASCE, USACE ERDC CERL, Champaign, IL
Sue McNeil, Ph.D., P.E., M.ASCE,
University of Delaware, Newark, DE
Kelvin C. P. Wang, Ph.D., P.E., M.ASCE,
University of Arkansas, Fayetteville, AR
Chris Garlick, P.E., PMP, M.ASCE, PBS&J, Orlando, FL

INTERNATIONAL ADVISORY COMMITTEE
Kumares Sinha, Ph.D., P.E., Hon.M.ASCE,
Purdue University, West Lafayette, IN
Chris Hendrickson, Ph.D., M.ASCE,
Carnegie Mellon University, Pittsburgh, PA

TECHNICAL COMMITTEE
Chair: Kelvin C.P. Wang, Ph.D., P.E., M.ASCE,
University of Arkansas, Fayetteville, AR
Brian L. Smith, Ph.D., M.ASCE,
University of Virginia, Charlottesville, VA
Donald Ray Uzarski, Ph.D., P.E., M.ASCE,
Uzarski Engineering, Champaign, IL
S.C. Wong, Ph.D., P.E., M.ASCE,
The University of Hong Kong,
Hong Kong, China

Kelvin C.P. Wang
Ph.D., P.E., M.ASCE
Dr. Jon D. Fricker has conducted a series of sidewalk "intercept surveys" to determine the preferences of individuals who are customers of businesses in commercial clusters and the neighborhoods that surround them. An important component of the project was gathering the opinions of individuals and groups at neighborhood association meetings and through surveys. Besides using mail-back surveys, Prof. Fricker conducted a series of sidewalk "intercept surveys" to determine the preferences of individuals who are customers of businesses in the neighborhood. The survey results were sometimes surprising. In the process, he brought urban design theory into contact with residents of existing neighborhoods. The survey results were sometimes surprising. In the process, he brought urban design theory into contact with residents of existing neighborhoods. The survey results were sometimes surprising. In the process, he brought urban design theory into contact with residents of existing neighborhoods.

In Lafayette, IN, Prof. Fricker chairs the county’s Technical Transportation Committee. He also serves on the local bus company’s board of directors. Prof. Fricker also has a long record of participation and leadership in several technical societies, including ASCE, where he has served as Chair of the Transportation Planning Committee when it was a part of the Urban Transportation Division. He currently serves on the Transportation Planning and Economics Committee of ASCE’s Transportation and Development Institute.

As of 7/25/06. Subject to change.
SPECIAL EVENTS & NETWORKING OPPORTUNITIES

WEDNESDAY, AUGUST 16, 2006

8:30 – 10:00 AM • ST. CLAIR 2

PANEL: Location-Based Services
Sponsored by the T&DI Land Use Committee

CHAIR:
George Frangos, GFA Engineering Systems, Baltimore, MD

PANELISTS:
• Wayne Crolley, AT&T-AES Engineering
• Dr. Seshadri Mohan, Systems Engineering Department, University of Arkansas, Little Rock
• Dr. Jeffrey D. Tew, General Motors Corporation

TECHNICAL TOURS (Optional)

Participants will take public transit (with a local guide) to visit the Control Center at the Chicago Transit Authority or the Pace Suburban Bus headquarters for a demonstration of the Intelligent Bus System.  

Photo IDs will be required for entry into these facilities.

FACILITIES OF PACE SUBURBAN BUS
Location: Arlington Heights
Departure from Hotel: 12 NOON (Box Lunch Provided)
Return to Hotel: 4:30 PM
Cost: $7.80 (Metra fare)
Transportation: Metra from Ogilvie Transportation Center to Arlington Heights, Pace Van from Arlington Heights to Pace

Pace Suburban Bus has made a decision to invest in the future of suburban bus services. Pace has invested heavily in an Intelligent Bus System (IBS), which includes Automatic Vehicle Locator (AVL), Transit Signal Priority (TSP), Active Transit Station Signs (ATSS), Transfer Connection Protection (TCP), On Board Next Stop Annunciators, and Automatic Passenger Counters (APC), On Time Performance, and a Farebox / IBS interface. All these components will provide better information to internal and external customers and improve the overall efficiency of the system.

The Pace demonstration will concentrate on the IBS data, and how that data is utilized to improve routing, scheduling, and customer satisfaction throughout the six-county region. Pace is currently utilizing the Farebox / IBS interface to improve data quality and reliability. IBS data is being used to restructure routes and enhance Pace’s Vision 2020 plan.

The demonstration will show how using this data can accurately locate passenger boardings and alightings, calculate passenger loads, and identify heavy boarding locations. Combining IBS and GIS information (business locations, demographics, schools, etc.), this data visually identifies potential ridership opportunities. On-time performance is used to improve routing, and to make timetable adjustments to improve connections and timetable accuracy.

FACILITIES OF THE CHICAGO TRANSIT AUTHORITY (CTA)
Location: 120 North Racine St., Chicago
Departure from Hotel: 1:00 PM
Return to Hotel: 4:00 PM
Cost: $4.00 (CTA fare)
Transportation: Red line to Madison Ave., #20 bus to Racine

The CTA Control Center manages the movement of buses and rapid transit trains and provides power control for rapid transit operations. Both the BusWatch system and Rail Service Management System are resident at the Control Center, as are their dispatchers. This includes CTA Hub that will feed the Illinois Transit Hub.

The CTA, which provides nearly 1 million bus rides on an average weekday using a bus fleet that numbers about 2,000, began outfitting buses with a GPS-gyro-odometer tracking system in 2005 to provide automated voice announcements that make its bus routes easier to navigate for customers who are hearing or visually impaired. Inputs such as real-time position, heading, speed, and other information allow transit agencies to take advantage of continuous tracking in challenging urban environments.

The tour of the Control Center will include an overview of the center and some of the new directions for CTA.
MONDAY, AUGUST 14, 2006
10:30 AM – 12 NOON
SESSION 1 • Erie
Optimal Management and Decision Systems
Moderator: Samer Madanat, Ph.D.
University of California at Berkeley
Applying Bayesian Networks to Assess Vulnerability of Critical Transportation Infrastructure
Manoj K. Jha, Ph.D., P.E. (Morgan State University, Baltimore, MD)
Impacts of Condition Assessment Variability on Lifecycle Costs
Kristen Leslie Sanford Bernhardt, Ph.D., P.E.M.ASCE (Lafayette College, Easton, PA),
Sue McNeil, Ph.D., P.E. (University of Delaware, Newark, DE)
A Hybrid Approach: Adaptive and Robust Infrastructure Management Using Markov Decision Problems
Kenneth Kuhn, Samer Madanat (UC Berkeley, Berkeley, CA)
Dynamic Programming-Based Maintenance and Replacement Optimization for Bridge Decks Using History-Dependent Deterioration Models
Charles-Antoine Robelin, Samer Madanat (UC Berkeley, Berkeley, CA)

MONDAY, AUGUST 14, 2006
3:30 – 5:00 PM
SESSION 3 • Erie
Automated Asset Management
Moderator: Gerardo Flintsch, Ph.D.
Virginia Tech
Automated Tracking System for Inventory of Roadway Signs
Kelvin Chen-Ping Wang, Ph.D., P.E., M.ASCE, Zhiqiong Hou, Weiguo Gong (University of Arkansas, Fayetteville, AR)
Scheduling Bridge and Highway Inspection/Test Activities with QUALITIME
Mireille Battikhla, Ph.D. (Consultant, Toronto, ON, Canada)
Realtime Image Processing Algorithms for the Detection of Road and Environmental Conditions
James G. Haran, John Dillenburg, Ph.D., Peter Nelson, Ph.D. (University of Illinois at Chicago, Chicago, IL)
Optimal Spatial Sampling of Infrastructure Condition
Rabi Mishalani, Ph.D., Liying Gong, M.S. (Ohio State University, Columbus, OH)

TUESDAY, AUGUST 15, 2006
8:30 – 10:00 AM
SESSION 4 • Erie
Project Evaluation and Selection Optimization
Moderator: Mike Grussing
USACE ERDC CERL
Application of Shackles Model for Highway Project Evaluation under Uncertainty
Zongzhi Li, Ph.D., Murat Puyan, Ph.D. (Illinois Institute of Technology, Chicago, IL)
Optimizing Facility Component Maintenance, Repair, and Restoration Investment Strategies Using Financial ROI Metrics and Consequence Analysis
Michael N. Grussing, MSCE, Lance Marrano (US Army Corps of Engineers Construction Engineering Research Labs, Champaign, IL),
Donald Ray Uzarski, Ph.D., P.E. (Uzarski Engineering, Champaign, IL)

As of 7/25/06. Subject to change.
MONDAY WELCOME RECEPTION

ADDITIONAL COPIES OF PROCEEDINGS

Checks must be issued in US dollars, drawn on a US bank. Payment must be made in writing and submitted at least 3 or more weeks prior to the start of the conference.

Gover

1 (Proof of full-time student status required)

(800) 548-2723

Check here if you require Vegetarian or other special meal(s)

TRACK 1: INFRASTRUCTURE MANAGEMENT & OPERATIONS

TUESDAY, AUGUST 15, 2006
1:30 – 3:00 PM
SESSION 6 • Erie

Rail Operation, Object Tracking, and Quality Control
Moderator: Kenny Kuhn
University of California at Berkeley

Investigation on the Vibration Effect Induced by Rail Transit System on Urban Environment
Xiangbai Zhang, Ph.D., Registered Professional Engineer (Tsinghua University, Beijing, China), Daisy Le Le Cao, P.E. (Beijing Institute of Civil Engineering and Architecture, Beijing, China)

Real-Time Three-Dimensional Object Detection and Tracking in Transportation
Jochen Teizer, Dipl.-Ing., Carlos H. Caldas, Ph.D. (The University of Texas at Austin, Austin, TX), Carl T. Haas, Frederic T. Bosche, Ph.D., P.E. (University of Waterloo, Waterloo, ON, Canada)

The Case Study of TQC Controlling in Logistics Project Management
Wu Jie, Peng Qihuan, (Southwest Jiaotong University, Chengdu, Sichuan, China)

Study on Determination of Safe Distance between Railway Out-of-Gauge Goods and Structure on Straight Lines
Mei Han, Liang Pang, Yanhui Han (Beijing Jiaotong University, Beijing, China), Boling Han (Ministry of Railway, Beijing, China)

Algorithms of the Container Feeding Form between Railway Container Junction Station and Railway Container Transaction Station
Yong Yin, Qiuyuan Peng (Southwest Jiaotong University, Chengdu, Sichuan, China), Haifeng Yan (China Academy of Railway Sciences, Beijing, China), Xuecai Xu (Xian Jiaotong University, Xi’an, Shanxi, China)

TUESDAY, AUGUST 15, 2006
3:30 – 5:00 PM
SESSION 7 • Erie

Operation and Data Collection
Moderator: Ray Benekehoh, Ph.D.
University of Illinois at Urbana-Champaign

Evaluation on Route Guidance System and Its Application
Meijng Yan, Ph.D., Jian Sun, Ph.D., Xiaoguang Yang, Ph.D. (Tongji University, Shanghai, China)

Portable Non-Intrusive Traffic Data Collection in Variable Roadside Environments
Lloyd James French III, Ph.D., P.E., Millie Sue French, MSCE, P.E. (French Engineering, LLC, Smithfield, PA)

Visualization of Bus Schedule Adherence Using GIS
Jie (Jane) Lin, Ph.D., Dan Yu (University of Illinois at Chicago, Chicago, IL), Santosh Mishra, M.S. (TranSystems Corporation, Medford, MA)

Using Transit Vehicles to Measure Freeway Traffic Conditions
Benjamin Coifman, Ph.D., Seoungbum Kim (The Ohio State University, Columbus, OH)

Intensity of Lane Changing at a Ramp Weave Section of a Freeway
Ghulam Bham, Ph.D. (University of Missouri Rolla, Rolla, MO), Rahim Benekehoh (University of Illinois at Urbana-Champaign, Urbana, IL)

WEDNESDAY, AUGUST 16, 2006
8:30 – 10:00 AM
SESSION 8 • Erie

Pavement Condition and Construction
Moderator: Kurt Keifer, Ph.D.
USACE ERDC CERL

Neville Parker, Ph.D., P.E., M ASCE (The City College of New York, New York, NY), Sajjad Hussain, Ph.D. (Communication and Works Department, Quetta, Pakistan), Kaan Ozbay, Ph.D. (Rutgers, The State University of New Jersey, Piscataway, NJ), Dima Jawad, Ph.D. (Cultural Heritage and Urban Development-World Bank Project, Beirut, Lebanon)

Vibration-Based System for Pavement Condition Evaluation
Xiong Yu, Ph.D., P.E., M ASCE, Xinbao Yu (Case Western Reserve University, Cleveland, OH)

Definition of Yield Zones on Concrete Barrier Structures under a Transverse Impact Load
Huai Geng, P.E. (JR Engineering, LLC, Greenwood Village, CO), Nien-Yin Chang (University of Colorado at Denver and Health Science Center, Denver, CO), Trever Wang (Colorado Department of Transportation, Denver, CO)

WEDNESDAY, AUGUST 16, 2006
10:30 AM – 12 NOON
SESSION 9 • Erie

Asset Management Technologies
Moderator: Pablo Durango-Cohen, Ph.D.
Northwestern University

Site-Specific Load Evaluation of Long-Span Bridges Using Portable Weigh-In-Motion (WIM) Technology
Julius Chang, P.E. (MTA Bridges and Tunnels, New York, NY), Bala Sivakumar (Lichtenstein Consulting Engineers, Inc., Paramus, NJ)

The Role of Advanced Technology in Asset Management: International Experiences
Daisuke Mizusawa, M.Sc. (University of Illinois at Chicago, Chicago, IL), Sue McNeil, Ph.D., P.E. (University of Delaware, Newark, DE)

Coordination of Maintenance and Rehabilitation Policies for Transportation Infrastructure
Pablo Luis Durango-Cohen, Ph.D., Patharinh Sarutipand (Northwestern University, Evanston, IL)

Impact of Higher Truck Loads on Remaining Safe Life of Louisiana Bridge Decks
Aziz Saber, Ph.D., P.E., Freddy Roberts, Ph.D., Xiang Zhou (Louisiana Tech University, Ruston, LA), Walid Alayvan (Louisiana Transportation Research Center, Baton Rouge, LA)

INCLUDED IN YOUR REGISTRATION FEE

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Monday Reception</th>
<th>Proceedings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Conference Registrant (Member/Non-Member Speaker/Moderator)</td>
<td>Mon Only</td>
<td></td>
</tr>
<tr>
<td>Daily Registrants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Time Student</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MONDAY, AUGUST 14, 2006
10:30 AM – 12 NOON
SESSION 1 • St. Clair 1

Imaging-Based Technology for Detection and Operation
Moderator: Harry Teng, Ph.D.
University of Nevada, Las Vegas

Tests of Automated Incident Detection with Video Image Processors in Attica Tollway Tunnels
Bill D. Halkias, Konstantinos Papandreou, Pantelis Kopelias, Vily Vegiri (Attikes Diadromes, S.A., Peania, Athens, Greece), Panos D. Prevedouros, Ph.D. (University of Hawaii at Manoa, Honolulu, HI)

A Video-Based Method for Evaluating Traffic Data from Detectors
Nan Zou, Jianwei Wang (University of Maryland at College Park, College Park, MD)

Uses of Airborne Imagery for Microscopic Traffic Analysis
Mark Hickman, Ph.D., P.E., Pitu Mirchandani, Sc.D. (University of Arizona, Tucson, AZ)

MONDAY, AUGUST 14, 2006
1:30 – 3:00 PM
SESSION 2 • St. Clair 1

Traffic Visualization, Incident, and Safety Management
Moderator: Adjo Anekudzi, Ph.D.
Georgia Institute of Technology

Temporal Variations in Traffic Flow and Ramp-Related Crash Risk
Chris Lee, Ph.D., Mohamed Abdel-Aty, Ph.D., P.E. (University of Central Florida, Orlando, FL)

Application of Data Mining Techniques for Real-Time Crash Risk Assessment on Freeways
Anurag Pande, Mohamed Abdel-Aty (University of Central Florida, Orlando, FL)

Estimating Pedestrian Counts in Urban Areas for Transportation Planning and Safety Analyses
Srinivas Subrahmanyan Pulugurtha, Ph.D., P.E. (University of North Carolina-Charlotte, Charlotte, NC) Shashi Namhansh (University of Nevada, Las Vegas, Las Vegas, NV), Pankaj Maheshwari (Parsons Transportation Group, Las Vegas, NV)

Introduction to Virtual Traffic Visualization (VTV)
Lorenzo Rotoli, P.E., PTOE (Fisher Associates)

MONDAY, AUGUST 14, 2006
3:30 – 5:00 PM
SESSION 3 • St. Clair 1

Safety and Security
Moderator: Earl Lee, Ph.D.
Rensselaer Polytechnic Institute

A Robust Dynamic Segmentation Tool for Highway Safety Analysis
Kaiyu Liu, Albert Gan, Ph.D. (Florida International University, Miami, FL)

3-D Traffic Simulation for Intermodal Safety and Security
Fang Zhao, Ph.D., Lee-Fang Chow, Ph.D., L. David Shen, Ph.D., P.E., T.E., Xuemei Liu, M.S., Jingtao Shan, M.S., Hongbo Chi, M.S. (Florida International University, Miami, FL)

Effect of Vehicle-to-Vehicle and Vehicle-to-Infrastructure Communication Systems on Transportation Safety
Bruno Dalla Chiara, Ph.D., Francesco Deflorio, Ph.D. (Politecnico di Torino, Torino, Italy), Sarvee Diwan, B.Tech (Indian Institute of Technology Bombay, Mumbai, Maharashtra, India)

Interview Decision Support System for Traffic Incident Management
Hongqiang Li, Huapu Lu, Intikhab Ahmed Qureshi (Tsinghua University, Beijing, China)

TUESDAY, AUGUST 15, 2006
8:30 – 10:00 AM
SESSION 4 • St. Clair 1

Automated Traffic Data Collection and Data Mining
Moderator: Rabi Mishalani, Ph.D.
Ohio State University

Traffic Flow Data Extracted from Imagery Collected Using a Micro Unmanned Aerial Vehicle
Benjamin Coifman, Ph.D., Yuxiong Ji, B.S., Mark McCord, Ph.D., Rabi Mishalani, Ph.D. (The Ohio State University, Columbus, OH), Michael Iswalt, B.S., (Fehr and Peers, Sacramento, CA)

Analyzing Freeway Service Patrol Data
Chengjun Zhan, Albert Gan, Mohammed Hadi, P.E. (Florida International University, Miami, FL)

Using Data Mining to Analyze Archived Traffic Related Data
Vanessa Amado (University of Missouri-Columbia, Trujillo Alto, Puerto Rico)

Dynamic Activity-Travel Diary Data Collection Using a GPS-Enabled Personal Digital Assistant
Bruno Kochan, Tom Bellemans, Davy Janssens, Geert Wets (Transportation Research Institute (IMOB), Hasselt University, Diepenbeek, Belgium)

TUESDAY, AUGUST 15, 2006
10:30 AM – 12 NOON
SESSION 5 • St. Clair 1

Advanced Traffic Management
Moderator: P.S. Sriraj, Ph.D.
University of Illinois at Chicago

Experimenting with Real-Time ATIS: Stepping Forward from ADVANCE
Alxandra Demers, EIT, MSE, George F. List, Ph.D., P.E. (North Carolina State University, Raleigh, NC), Jeffrey Wojtowicz, William Wallace, Ph.D., Earl Lee, Paul Salaszyk (Rensselaer Polytechnic Institute, Troy, NY)

Real-Time Background Generation and Update Using Online CCTV Videos
Woohui Lee, Bin Ran, Ph.D. (University of Wisconsin at Madison, Madison, WI)
Software-Based Traffic Management Information System for Urban Road Networks: An Empirical Study
Regina Gyampo-Vidogah, Ph.D., M.ASCE, MBCS, Robert Moreton, MTech, FMBCS (University of Wolverhampton, Wolverhampton, England, United Kingdom)

Statistical Models for Preferred Time Headway and Time Headway of Drivers in Steady State Car-Following
Ghulam Bham, Ph.D. (University of Missouri Rolla, Rolla, MO), Siva Ancha (North Dakota State University, Fargo, ND)

TUESDAY, AUGUST 15, 2006
1:30 – 3:00 PM
SESSION 6 • St. Clair 1
Probe Vehicles for Data Collection
Moderator: Alixander Demers
North Carolina State University

A Case Study on Measuring Travel Time, Speed, and Delay Using GPS-Instrumented Test Vehicles
Hoe Kyoung Kim, Seung Kook Wu, Michael Hunter, Ph.D. (Georgia Institute of Technology, Atlanta, GA)

Instrumented Vehicle Measured Speed Variation and Freeway Traffic Congestion
Joonho Ko, M.S., Randall Guensler, Ph.D., Michael Hunter, Ph.D., Hainan Li, Ph.D. (Georgia Institute of Technology, Atlanta, GA)

Enhancing Transit Facility Design Using Pedestrian Simulation
Steven P. Scalici, P.E., Patrick J. O’Mara, P.E., Raymond D. Dominguez (STV Incorporated, New York, NY)

A Wireless Mesh Network for Real-Time Vehicle Guidance
Chung-Chieh Lee, Alan Wolff, Northwestern University, Evanston, IL)

TUESDAY, AUGUST 15, 2006
3:30 – 5:00 PM
SESSION 7 • St. Clair 1
Incident and Congestion Management, and Hazard Response System
Moderator: Zong Zhi Li, Ph.D.
Illinois Institute of Technology

Model of a Self-Organizing Traffic Management Hazard Response System
Rafal Kicinger, Ph.D., Michael Bronzini, Ph.D. (George Mason University, Fairfax, VA)

Design, Implementation, and Test of a Wireless Peer-to-Peer Network for Roadway Incident Exchange
Trevor Harmon, James Marca, Raymond Klefstad, Peter Martini (University of California-Irvine, Irvine, CA)

Harnessing Advanced Technologies to Eliminate Recurring Freeway Congestion
Patrick DeCorfa-Souza, AICP (Federal Highway Administration, Washington, DC)

WEDNESDAY, AUGUST 16, 2006
8:30 – 10:00 AM
SESSION 8 • St. Clair 1
Traffic Control Systems
Moderator: David Zavattero
Illinois Department of Transportation

Mapping Misuse Cases to Functional Fault Trees in Order to Secure Positive Train Control Systems
Mark Hartong, P.E. (Federal Railroad Administration, Washington, DC), Rajni Goel, Ph.D. (Howard University, Washington, DC), Duminda Wijesekera, Ph.D. (George Mason University, Fairfax, VA)

Evaluating the Effectiveness of Turning Traffic Must Yield to Pedestrians (R 10-15) Sign
Ganesh Karkee, Shashi Nambisan (University of Nevada-Las Vegas, Las Vegas, NV) Srinivas S. Pulugurtha (University of North Carolina-Charlotte, Charlotte, NC)

Guangwei Zhou, E.I., Albert Gan, Ph.D., Chengjun Zhan, Xiaoxia Zhu (Florida International University, Miami, FL)

Augmented Reality Applications to Traffic Operations
Ghada Moussa, Khaled Hussien, Ph.D. (University of Central Florida, Orlando, FL), Essam Radwan, Ph.D. (CATSS, Orlando, FL)

WEDNESDAY, AUGUST 16, 2006
10:30 AM – 12 NOON
SESSION 9 • St. Clair 1
Data Collection, Simulation, and Modeling
Moderator: Shashi Nambisan, Ph.D., P.E.
University of Nevada, Las Vegas

Bayesian Estimation of Statewide OD Flows Using Link Volumes Estimated from Combined Information in Remotely Sensed Data and Ground Counts
Prem Kumar Goel, Ph.D., Mark R. McCord, Ph.D., Shiling-Ruan, M.S., Morton O’Kelly, Ph.D. (The Ohio State University, Columbus, OH)

An Improved Compound Clustering Algorithm in Vehicular Ad-Hoc Networks
Peng Fan (University of Illinois at Chicago, Chicago, IL)

Developing Microscopic Integrated Freeway-Toll Plaza Model
Haitham M. Al-Deek, Ph.D, P.E., M.ASCE, N. Nezamuddin, B.Tech (University of Central Florida, Orlando, FL)

Block Container Trains Formation Plan between Railway Network Container Freight Stations Based on Genetic Algorithm
Haifeng Yan, Ph.D. (Institute of Transport and Economy, China Academy of Railway Sciences, Beijing, China) Qiyuan Peng, Ph.D., Yunjiang Tan, Master (Southwest Jiaotong University, Chengdu, China)

Criteria for a Steady-State Initialization in a Large-Scale Railroad Network Simulation
Feng Xu, Zong Tian (University of Nevada-Reno, Reno, NV)

CONFERENCE NOTICE

PROFESSIONAL DEVELOPMENT HOURS
Earn up to 13.5 nationally recognized Professional Development Hours (PDHs)!
Please note that there are differences from state to state in continuing education requirements for professional engineering licensure. Each state licensing board has the final authority to approve courses, credits, and professional development hours for courses, and other methods of earning credit in that state. ASCE strongly recommends that individuals regularly check with their state licensing boards for specific continuing education requirements in their jurisdictions that affect professional engineering licensure and the ability to renew licensure.
MONDAY, AUGUST 14, 2006
10:30 AM – 12 NOON
SESSION 1 • St. Clair 2

GA and ANN Algorithms
Moderator: Kumares Sinha, Ph.D., P.E.
Purdue University

Genetic Algorithm-Based Approach for the Optimal Location of Traffic Counts Sections
Ernesto Cipriani, Ph.D., Marco Petrelli, Ph.D. (Università di Roma, Rome, Italy)

An Application of Neural Network in Corridor Travel Time Prediction in the Presence of Traffic Incidents
Yang Tao, Ph.D. (City of Madison, Wisconsin, Madison, WI), Bin Ran, Ph.D. (University of Wisconsin-Madison, Madison, WI)

Multi-Layer Traffic Signal Control Model Based on Fuzzy Control and Genetic Algorithm
Ruimin Li, Ph.D., Huapu Lu, Ph.D. (Institute of Transportation Engineering, Beijing, China), Jiangang Lu (University of Wisconsin-Madison, Madison, WI)

Estimating a Transit Route OD Matrix from On-Off Data through an Artificial Neural Network Method
Jie Yu, Xiaoguang Yang (Tongji University, Shanghai, China)

MONDAY, AUGUST 14, 2006
1:30 – 3:00 PM
SESSION 2 • St. Clair 2

Advanced Simulation Models I
Moderator: Paul Metaxatos, Ph.D.
University of Illinois at Chicago

Tests of Simulation Models FREQ, KRONOS, Integration, and VISSIM in Replicating Congested Freeway Flow
Panos D. Prevedouros, Jerry Ji, Ph.D., (University of Hawaii at Manoa, Honolulu, HI), James Watson (Korve Engineering, Oakland, CA)

Comparison of PASSER V, Synchro, and TRANSYT-7F for Arterial Signal Timing Based on CORSIM Simulation
Yunlong Zhang, Ph.D., P.E., Yuanchang Xie (Texas A&M University, College Station, TX)

Evaluation of ITS Alternatives Targeting Crash Mitigation on Freeways Using Micro-Simulation
Mohamed Abdel-Aty, Ph.D., P.E., Albindeh Dhinda, M.S. (University of Central Florida, Orlando, FL)

Heterogeneous Traffic Flow Modeling and Simulation Using Cellular Automata
Tom V. Mathew, Ph.D., Pradip J. Gundaliya, M.Tech, Sundaralal Lal Dhangra, Ph.D. (Indian Institute of Technology-Bombay, Mumbai, Maharatsra, India)

MONDAY, AUGUST 14, 2006
3:30 – 5:00 PM
SESSION 3 • St. Clair 2

Advanced Simulation Models II
Moderator: Edgar de Leon
Virginia Tech

Topological and Operational Improvements to a Cell-Transmission-Based Simulation Model
Sherif Iskak, Ph.D., Ciprian Aleksandru, M.S., Dan Seedah (Louisiana State University, Baton Rouge, LA)

Examining the Operational Benefits of Freeway Ramp Metering Control Using CORSIM (CORridor SIMulator)
Md Shoaib Chowdhury, Ph.D. (Parsons Brinckerhoff Quade & Douglas Inc., Jersey City, NJ)

Automatic Calibration of Two-Lane Highway Traffic Simulation Models
Cintia Egami, Ph.D., M.L. Mon-ma, Jose Setti (Universidade de Sao Paulo, San Carlos School of Engineering, Sao Carlos, Sao Paulo, Brazil), L.R. Rilett, Ph.D., P.E. (University of Nebraska-Lincoln, Lincoln, NE)

Parameter Calibration for VISSIM Using a Hybrid Heuristic Algorithm: A Case Study of a Congested Traffic Network in China
Haode Liu (Tongji University, Shanghai, China)

Advanced Simulation Technology Applied to Port Safety and Security
Carl M. Berkowitz, Ph.D., P.E., AICP, F.ASCE (Florida Atlantic University, Moriches, NY), Clifford R. Bradgion, Ph.D., AICP (Florida Institute of Technology, Melbourne Beach, FL)

TUESDAY, AUGUST 15, 2006
8:30 – 10:00 AM
SESSION 4 • St. Clair 2

Estimation and Prediction of Traffic and Flow
Moderator: Manoj Jha, Ph.D.
Morgan State University

Application of Wavelet Time Series Analysis in Short-Term Traffic Volume Prediction
Yuanchang Xie, Yunlong Zhang, Ph.D., P.E. (Texas A&M University, College Station, TX)

Real-Time Traffic State Estimation on Urban Road Network: The Application of Unscented Kalman Filter
Rattapraph Pueboopaphan, Takashi Nakatsuji, D.Eng. (Hokkaido University, Sapporo, Hokkaido, Japan)

Revised Approaches for Estimation of Time-Varying Origin-Destination Flows in Freeway Corridors
Pengpeng Jiao, Ph.D., Noboru Harata (University of Tokyo, Tokyo, Japan), Huapu Lu (Tsinghua University, Beijing, China)

A Robust Algorithm of Estimating Dynamic O-D Matrix for Large Freeway Networks with Measurement Errors
Pei-Wei Lin, Gang-Len Chang (University of Maryland, College Park, MD)

Estimation of Freeway Travel Time Based on Sparsely Distributed Detectors
Ying Liu, Gang-Len Chang (University of Maryland, College Park, MD)

TUESDAY, AUGUST 15, 2006
10:30 AM – 12 NOON
SESSION 5 • St. Clair 2

Traffic Management
Moderator: Jane Lin, Ph.D.
University of Illinois at Chicago

Tests of Traffic Sensors and Telemetry Services
Panos D. Prevedouros (University of Hawaii at Manoa, Honolulu, HI), Goro Sulijoaidikusumo (State of Hawaii, Department of Transportation, Honolulu, HI)

Capacity of Multi-Lane Roundabout: Methodology Based on Lane Utilization
Hong K. Lo, Ph.D., Jing Bie (Hong Kong University of Science and Technology, Hong Kong, China), S.C. Wong, Ph.D. (University of Hong Kong, Hong Kong, China)

Measuring the Response of Drivers to a Yellow Phase with a Video-Based Approach
Yue Liu, Gang-Len Chang (University of Maryland, College Park, MD), Ruicha Tao, Eric Tabacek, Thomas Hicks (Maryland State Highway Administration, Hanover, MD)

Evaluation of Urban Traffic Management in China
Pengpeng Jiao, Ph.D., Noboru Harata (University of Tokyo, Tokyo, Japan), Huapu Lu (Tsinghua University, Beijing, China)

Evaluation of Traffic Management Plans in CBD Area within Baghdad City
Araf A. Al Rahman Mahmood Al Azzawi, Ph.D., AIF.M.ASCE (College of Engineering, University of Al Mustansiriya, Baghdad, Iraq)
MONDAY, AUGUST 14, 2006
10:30 AM – 12 NOON
SESSION 1 • St. Clair 3
Demand Modeling I
Rabi Mishalani, Ph.D.
Ohio State University

Determining Origin-Destination Flows across a Two-Intersection Network from Non-Overlapping UAV and Ground-Based Imagery
Mark McCord, Ph.D., Rabi Mishalani, Benjamin Coifman, Yuxiong Ji, Ph.D. (Ohio State University, Columbus, OH) Michael Iswalt, Ph.D. (Fehr & Peers Transportation Consultants, Roseville, CA)

Traffic Demand Reduction Using an Automated Work Zone Information System for Urban Freeway Rehabilitation
Eul-Bum Lee, Ph.D., P.E., PMP (Institute of Transportation Studies, University of California at Berkeley, Richmond, CA), Channo Kim, John T. Harvey, Ph.D., P.E. (University of California at Davis, Davis, CA)

Modeling Tour Mode and Destination Choice in the Jakarta Metropolitan Area
Sadayuki Yagi, M.S., Abolfazl Mohammadian, Ph.D. (University of Illinois at Chicago, Chicago, IL)

An Exploratory Analysis of the Household Travel Behavior and Lifestyle Choices
Sadayuki Yagi, M.S., Abolfazl Mohammadian, Ph.D. (University of Illinois at Chicago, Chicago, IL)

MONDAY, AUGUST 14, 2006
1:30 – 3:00 PM
SESSION 2 • St. Clair 3
Demand Modeling II
Moderator: Kristen Sanford Bernhardt, Ph.D.

Development and Analysis of an Internet-Based Travel Survey
Michael Anderson, Ph.D., P.E., Sampson Gholston, Ph.D. (University of Alabama in Huntsville, Huntsville, AL), Jose Ortega (Prince Contracting Co., Inc., Wildwood, FL), Steven Jones, Ph.D. (University of Alabama, Tuscaloosa, AL)

Transportation Network Analysis to Access Community Resources by Older Populations

An Activity-Based Model of Travel Demand in the Jakarta Metropolitan Area
Sadayuki Yagi, Ph.D., Abolfazl Mohammadian, M.S. (University of Illinois at Chicago, Chicago, IL)

TUESDAY, AUGUST 15, 2006
10:30 AM – 12 NOON
SESSION 4 • St. Clair 3
Transit and Bus Systems
Moderator: Michael Haynes
Chicago Transit Authority

Model and Algorithm for Iterative Design of Bus Network
Bin Yu, Zhongzheng Yang (Dalian Maritime University, Dalian, China)
TUESDAY, AUGUST 15, 2006
1:30 – 3:00 PM
SESSION 6 • St. Clair 3
Evaluation and Decision Models
Moderator: Mitsu Saito, Ph.D., P.E.
Brigham Young University

Field Evaluation of the Effect of Speed Monitoring Displays on Speed Compliance in School Zones
Kelly G. Ash, EIT (PBS&J, Phoenix, AZ), Mitsuru Saito, Ph.D., P.E. (Brigham Young University, Provo, UT)

Development of Group Decision-Support Model and System for Combined Transportation and Utility Construction
Chien-Cheng Chou, Carlos H. Caldas, Ph.D., James T. O’Connor, Ph.D., P.E., Grant K. Goldman (The University of Texas at Austin, Austin, TX)

Study of the Effect of Heterogeneity Developing B/C Ratios for ITS Deployments Using IDAS
Shureen Chada, Cuthbert R. Gibson (University of South Florida, Tampa, FL)

A Study of Lane Change Frequency on a Multilane Freeway
Vivek Goswami, Ghalam Bham, Ph.D. (University of Missouri Rolla, Rolla, MO)

Evaluation of New Coordinated Feedback-Based Freeway Ramp Metering Strategy Using Macroscopic and Microscopic Simulation Models
Ilgin Yasar, M.S., Kaan Ozbay, Ph.D. (Rutgers University, Newark, NJ), Pushkin Kachroo, Ph.D. (Virginia Tech, Blacksburg, VA)

TUESDAY, AUGUST 15, 2006
3:30 – 5:00 PM
SESSION 7 • St. Clair 3
Optimization and Spatial Tools for Planning
Moderator: Daisuke Mizusawa
University of Illinois at Chicago

Continuous Network Design with Emission Pricing as a Bi-Level Optimization Problem
Tom V. Mathew, Ph.D., Sushant Sharma, M.Tech (Indian Institute of Technology Bombay, Mumbai, India)

Resectorization Analysis of Airspace Sector Capacity
Sui-Ling Li, Ph.D. (National Cheng Kung University, Tainan, Taiwan)

Impact of Information on Housing Relocation Using Analytical Hierarchy Process and Interactive GIS
P.S. Sriraj, Ph.D., Mark Minor, MUPP, Piushimita Thakuriah, Ph.D. (University of Illinois at Chicago, Chicago, IL)

Automated Identification of Traffic Patterns from Large Databases
Ramkumar Venkatanarayana, Brian L. Smith, Ph.D., Michael J. Demetsky, Ph.D., Guimin Zhang (University of Virginia, Charlottesville, VA)

Development of Spatial Data Tools to Manage Transportation Networks
Mukund Subrahmanyam Dangeti, P.E., Shashi Nambisan (University of Nevada-Las Vegas, Las Vegas, NV), Srinivas S. Pulugurtha (University of North Carolina-Charlotte, Charlotte, NC)

WEDNESDAY, AUGUST 16, 2006
8:30 – 10:00 AM
SESSION 8 • St. Clair 3
Equilibrium Models, Pricing of Land Use, and Public Information System
Moderator: Mitsu Saito, Ph.D., P.E.
Brigham Young University

An MPEC Model for the Optimal Contraflow Operation Problem with User Equilibrium Constraints
Qiang Meng, Ph.D., Hooi Ling Khoo, Master, Yikai Huang, Master, Ruey Long Cheu, Ph.D. (National University of Singapore, Singapore)

Selecting Path Flow Pattern for Sensitivity Analysis of Deterministic User Equilibrium
Lin Cheng, Ph.D., Wei Wang, Ph.D. (Southeast University, Nanjing, China)

Pricing Incremental Reductions in Vehicular Emissions through Motor Fuel Regulation
W.D. Walls, Ph.D., MCIT, MIEEE (University of Calgary, Calgary, AB, Canada), F.W. Risco, Ph.D. (Centre for Economics, U.S. General Accounting Office, Washington, DC)

Modeling Time-Dependent Tolls under Transport, Land Use, and Environmental Considerations
X.Q. Li, Ph.D., MHKSTS, W.Y. Szeto, M.Sc., Margaret O’Mahony, D.Phil. (Oxon), M.A., CENG, FIDE, FIHT, FTCD, MIET, MICE, MIAT (Trinity College Dublin, Dublin, Ireland)

Multi-System Interconnections Modes of Logistics Public Information Platform
Chen Youlin (Tongji University, Shanghai, China), Yang Yang (Kunming University of Science and Technology, Kunming, China)

Peer-reviewed papers are available to all conference registrants. Additional copies may be purchased on site at the Registration Desk for $80 or after the conference by calling 800-548-2723 (US) or 703-295-6300 (International).
### 2006 Conference Schedule At-A-Glance

#### Sunday, August 13, 2006

- **12 Noon - 5:00 PM** • **Registration** • Lakeshore Ballroom Pre-Function

#### Monday, August 14, 2006

- **7:30 AM - 6:00 PM** • **Registration** • Lakeshore Ballroom Pre-Function
- **8:30 - 10:00 AM** • **Opening Plenary Session** • Lakeshore Ballroom West
  - "The Pending Collision between Autonomous Self-Organizing Systems and Society"

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>Session 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 AM - 12 NOON</td>
<td>Optimal Management and Decision Systems</td>
<td>Imaging-Based Technology for Detection and Operation</td>
<td>GA and ANN Algorithms Session</td>
<td>Demand Modeling I</td>
</tr>
<tr>
<td>1:30 - 3:00 PM</td>
<td>Performance Prediction</td>
<td>Traffic Visualization, Incident, and Safety Management</td>
<td>Advanced Simulation Models I</td>
<td>Demand Modeling II</td>
</tr>
<tr>
<td>3:30 - 5:00 PM</td>
<td>Automated Asset Management</td>
<td>Safety and Security</td>
<td>Advanced Simulation Models II</td>
<td>Urban Transportation Systems</td>
</tr>
<tr>
<td>5:30 - 7:00 PM</td>
<td>Welcome Reception</td>
<td>Lakeshore Ballroom West</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Tuesday, August 15, 2006

- **7:30 AM - 5:00 PM** • **Registration** • Lakeshore Ballroom Pre-Function

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>Session 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 - 10:00 AM</td>
<td>Project Evaluation and Selection Optimization</td>
<td>Automated Traffic Data Collection and Data Mining</td>
<td>Estimation and Prediction of Traffic and Flow</td>
<td>Transit and Bus Systems</td>
</tr>
<tr>
<td>10:30 AM - 12 NOON</td>
<td>Materials and Testing</td>
<td>Advanced Traffic Management</td>
<td>Traffic Management</td>
<td>Planning and Management of Corridor and Rail Systems</td>
</tr>
<tr>
<td>12 NOON - 1:30 PM</td>
<td>Lunch Break (On Your Own)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:30 - 3:00 PM</td>
<td>Rail Operation, Object Tracking, and Quality Control</td>
<td>Probe Vehicles for Data Collection</td>
<td>Data and Experiences</td>
<td>Evaluation and Decision Models</td>
</tr>
<tr>
<td>3:30 - 5:00 PM</td>
<td>Operation and Data Collection</td>
<td>Incident and Congestion Management, and Hazard Response System</td>
<td>Traffic Control Devices and Data Collection</td>
<td>Optimization and Spatial Tools for Planning</td>
</tr>
</tbody>
</table>

#### Wednesday, August 16, 2006

- **8:00 AM - 12 NOON** • **Registration** • Lakeshore Ballroom Pre-Function

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>Session 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 - 10:00 AM</td>
<td>Pavement Condition and Construction</td>
<td>Traffic Control Systems</td>
<td>Location-Based Services Panel</td>
<td>Equilibrium Models, Pricing of Land Use, and Public Information System</td>
</tr>
<tr>
<td>10:30 AM - 12 NOON</td>
<td>Asset Management Technologies</td>
<td>Data Collection, Simulation, and Modeling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 NOON • ADJOURN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Afternoon - Optional Technical Tours**