Traffic Signal Systems Committee
TRB Annual Meeting – Washington, DC
Monday, January 22, 2007, Marriott Lincoln 2

Draft Agenda

1:30 PM Call to Order (Larry Head)
   Self Introductions (All)
   Approval of Minutes
   TRB Staff Report (Rich Cunard)
   NCHRP Report (Ray Derr)

2:00 PM FHWA and other Related Reports
   Research (Raj Ghaman)
   Arterial Management (Eddie Curtis)

2:30 PM Subcommittee Reports
   Paper Review (Larry Head)
   Best Paper Award (Paul Olson)
   Signal Timing (Peter Koonce)
   Simulation (Brian Park)
   January Workshop (Kevin Balke)
   Strategic Plan (Tom Urbanik)
   Controller Architecture (Larry Head)
   Problem Statements (Jim Powell)

3:00 PM Break

3:30 PM CICAS/VII Update (Gene McHale)

4:00 PM 2007 Summer Meeting
   Location
   Refinement of Topic
   Future Topics for Summer Meetings

5:00 PM Other Business

5:30 PM Adjourn

Note: Subcommittees meet Monday in the, Marriott Park Tower Suite 8228

8:00 – 9:45 AM Signal Timing Koonce
10:00 – 11:00 AM Research Powell
11:00 – 12:00 PM Simulation Park
12:15 – 1:15 PM Controller Architecture Head
Paper and Poster Sessions:

**Paper or Conference Session (S)s**

506 (RCS07-017)

Tuesday, January 23, 2007, 1:30pm-3:15pm, Marriott

**Understanding Traffic Signal Dilemma-Zone Control**

James L. Powell, Parsons Transportation Group Inc., presiding

*Sponsored by Committee on Traffic Signal Systems; Committee on Traffic Control Devices*

Providing safe transitions on approaches to high-speed intersections requires the designer of the traffic signal control plan to consider many factors including the human, the control, and other objectives such as pedestrians and coordination. This session examines some important aspects of designing intersection operations with dilemma-zone considerations.

**Empirical Observations of Dynamic Dilemma Zones at Signalized Intersections** (07-1658)

Yue Liu, University of Maryland, College Park
Gang-Len Chang, University of Maryland, College Park
Ruihua Tao, Maryland Department of Transportation
Thomas Hicks, Maryland State Highway Administration
Eric Tabacek, Maryland State Highway Administration

**Effectiveness of Alternative Detector Configurations for Option Zone Protection on High-Speed Approaches to Traffic Signals** (07-1192)

Jianwen Si, University of Tennessee, Knoxville
Thomas Urbanik, University of Tennessee, Knoxville
Lee David Han, University of Tennessee, Knoxville

**Recasting Dilemma-Zone Design as a Marginal Cost and Benefit Problem** (07-1001)

Anuj Sharma, Purdue University
Darcy M. Bullock, Purdue University
Srinivas Peeta, Purdue University

**Analysis of Dilemma Zone Driver Behavior at Signalized Intersections** (07-3351)

Tim J. Gates, University of Wisconsin, Madison
David A. Noyce, University of Wisconsin, Madison
Luis Laracuente, University of Puerto Rico

**Age and Gender Impact on Driver Behavior at the Onset of a Yellow Phase on High-Speed Signalized Intersection Approaches** (07-0208)

Ihab El-Shawarby, Ain Shams University, Egypt
Hesham Ahmed Rakha, Virginia Polytechnic Institute and State University
Vaughan William Inman, Science Applications International Corporation
Gregory W. Davis, Federal Highway Administration

**Poster Session (P)s**

650 (RCP07-005)

Wednesday, January 24, 2007, 9:30am-12:00pm, Marriott

**Performance Measures to Close the Control Loop**


*Sponsored by Committee on Traffic Signal Systems*

Significant advances have been made in the past few years in measuring performance of traffic signal systems using a variety of methodologies and technologies. Using these performance measures for making control improvements will improve control effectiveness and efficiency. This session presents some new results on measuring performance and some new ways to use performance in traffic signal control.
Time-Dependent Travel Time Estimation Model for Signalized Arterial Network

Henry X. Liu, University of Minnesota, Twin Cities
Wenteng Ma, University of Minnesota, Twin Cities

Event-Based Data Collection for Generating Actuated Controller Performance Measures (07-1094)

Edward James Smaglik, Purdue University
Anuj Sharma, Purdue University
Darcy M. Bullock, Purdue University
James R. Sturdevant, Indiana Department of Transportation
Gary Duncan, Econolite Control Products, Inc.

Input-Output and Hybrid Techniques for Real-Time Prediction of Delay and Maximum Queue Length at a Signalized Intersection (07-0487)

Anuj Sharma, Purdue University
Darcy M. Bullock, Purdue University
James A. Bonneson, Texas Transportation Institute

Traffic State Classification Under Operational Constraints of Condition-Responsive Traffic Control Systems (07-3478)

Geza Pesti, Texas Transportation Institute
Montasir M. Abbas, Virginia Polytechnic Institute and State University
Nadeem A. Chaudhary, Texas Transportation Institute

Traffic State Classification Under Operational Constraints of Condition-Responsive Traffic Control Systems

A Platoon Identification Algorithm for Urban Arterial Links (07-2851)

Rajesh Krishnan, Imperial College London, United Kingdom
John W. Polak, Imperial College London, United Kingdom


Shawn Birst, Advanced Traffic Analysis Center
Jason Baker, Advanced Traffic Analysis Center
Khaled Shouman, Minnesota Department of Transportation

Modeling Traffic Variability and Evaluating Strategies for Designing Arterial Signal Coordination Under Limited Volume Data (07-1553)

Wei Li, Purdue University
Andrew P. Tarko, Purdue University

Analysis of Cycle-Based Data and Development of Enhanced Signal Timing Models to Reduce Red Light Running (07-0774)

Offer Grembek, University of California, Berkeley
Yue Li, University of California, Berkeley
Meng Li, University of California, Berkeley
Wei-Bin Zhang, University of California, Berkeley
Kun Zhou, University of California, Berkeley

Performance of Modern Stop Bar Loop Count Detectors over Various Traffic Regimes (07-1090)

Edward James Smaglik, Purdue University
Srinivas Vanjari, Purdue University
Virgil Totten, Purdue University
Edhi Rusli, Purdue University
Mandoye Ndoye, Purdue University
Allen Jacobs, Reno A&E
Darcy M. Bullock, Purdue University
James V. Krogleimer, Purdue University

Models for Quantitative Assessments of Video Detection System Impacts on Signalized Intersection Operations (07-0455)

Zong Tian, University of Nevada, Reno
Montasir M. Abbas, Virginia Polytechnic Institute and State University

(RCP07-006)
Priority and preemption used to be considered the rare exceptions in signal control; now they are more frequent and need the operation and impacts to be integrated as a normal part of control. This session presents some results aimed at addressing these issues in traffic signal control.

**Modeling Impact of Near-Side Bus Stop on Transit Delays at Transit Signal-Priority-Enabled Intersections** (07-2503)
- Jianyang Zheng, University of Washington
- Yinhai Wang, University of Washington
- Hongchao Liu, Texas Tech University
- Mark E. Hallenbeck, University of Washington

**Artificial Neural Network Bus Arrival Time Prediction Tool for Transit Signal Priority with Near-Side Bus Stops**
- Mohammad Ghanim, Michigan State University
- François Dion, Michigan State University
- Ghassan Abu-Lebdeh, Michigan State University

**Active Signal Priority for Light-Rail Transit at Grade Crossings** (07-1914)
- Meng Li, University of California, Berkeley
- Guoyuan Wu, University of California, Berkeley
- Yue Li, University of California, Berkeley
- Fanping Bu, University of California, Berkeley
- Wei-Bin Zhang, University of California, Berkeley

**Development and Evaluation of a Coordinated and Conditional Bus Priority Approach** (07-1154)
- Wanjing Ma, Tongji University, China
- Xiaoguang Yang, Tongji University, China
- Meiping Yun, Tongji University, China

**SCOOT MC3 and Current Developments** (07-1543)
- David Bretherton, TRL Limited, United Kingdom

**Using Software-in-the-Loop Simulation Methodology to Evaluate Traffic Signal Transition Strategies Employed to Exit Preemption Control** (07-2673)
- Jon T. Obenberger, Federal Highway Administration
- John Collura, University of Massachusetts, Amherst

- Ilsoo Yun, University of Virginia
- Matthew Best, University of Virginia
- Byungkyu (Brian) Park, University of Virginia

**Incorporating Bus and Passenger Car Operations in Arterial Signal Optimization for Emergency Evacuation** (07-0796)
- Ying Liu, University of Maryland, College Park
- Gang-Len Chang, University of Maryland, College Park

**Advance Preemption with Gate Down Confirmation: Solution for Preempt Trap** (07-0282)
- Jacob Russell Yohe, A-Del Construction Company, Inc.
- Thomas Urbanik, University of Tennessee, Knoxville

**Modeling Traffic Signal Operations Using Precedence Graphs** (07-0686)
- Larry Head, University of Arizona
- Douglas Gettman, Siemens ITS
- Darcy M. Bullock, Purdue University
- Thomas Urbanik, University of Tennessee, Knoxville

**Performance Analysis of Coordinated Traffic Signals During Transition** (07-2007)
- David Hayden Cohen, University of Arizona
- Larry Head, University of Arizona
Strategic timing and control of networks of traffic signals involve consideration of the relationships between intersection control as well as the complex tactical control at each intersection. This session presents papers that address both of these critical concerns.

**Solving the Integrated Corridor Control Problem Using Simultaneous Perturbation Stochastic Approximation** (07-1065)
- Jingtao Ma, University of California, Davis
- Yu (Marco) Nie, University of California, Davis
- H. Michael Zhang, University of California, Davis

**VISGAOST: VISSIM-Based Genetic Algorithm Optimization of Signal Timings** (07-0466)
- Aleksandar Stevanovic, University of Utah
- Peter T. Martin, University of Utah
- Jelka Stevanovic, University of Utah

**Short or Long--Which Is Better? Probabilistic Approach to Cycle-Length Optimization** (07-2427)
- Lee David Han, University of Tennessee, Knoxville
- Jan-Mou Li, University of Tennessee, Knoxville

**Evaluation of Adaptive Maximum Feature in EPAC300 Actuated Traffic Controller Using Hardware-in-the-Loop Simulation** (07-1900)
- Ilsoo Yun, University of Virginia
- Matthew Best, University of Virginia
- Byungkyu (Brian) Park, University of Virginia

**Implementation of Lane-by-Lane Detection at Actuated Controlled Intersection** (07-0805)
- Edward James Smaglik, Purdue University
- Darcy M. Bullock, Purdue University
- James R. Sturdevant, Indiana Department of Transportation
- Thomas Urbanik, University of Tennessee, Knoxville

**Intelligent Traffic Signal Control: Adding Pedestrians to the System** (07-0989)
- Richard Wayne Wall, University of Idaho
- Tom Urbanik, University of Tennessee, Knoxville
- Darcy M. Bullock, Purdue University
- Steve Allen, University of Idaho
- Michael Busby, University of Idaho
- Dustin DeVoe, University of Idaho
- Andrew Huska, University of Idaho
- Tyson Rallens, University of Idaho

**Vehicular Projection Dynamics for Real-time Signal Control** (07-1964)
- Fang Fang, University of Hartford
- Lily Elefteriadou, University of Florida

**APPLICATION OF DIAMOND INTERCHANGE CONTROL STRATEGIES AT CLOSELY-SPACED INTERSECTIONS** (07-0261)
- Zong Tian, University of Nevada, Reno

**Data-Driven Algorithms for Real-Time Adaptive Tuning of Offsets in Coordinated Traffic Signal Systems** (07-0651)
- Steven G. Shelby, Siemens ITS
- Douglas Gettman, Siemens ITS
- Larry Head, University of Arizona
Workshop (W)s

130 (RCW07-004)
Sunday, January 21, 2007, 8:30am- 5:00pm, Marriott

Operating Traffic Signal Systems in Oversaturated Conditions
Kevin N. Balke, Texas Transportation Institute; Peter J. V. Koonce, Kittelson and Associates, Inc., presiding
Sponsored by Committee on Traffic Signal Systems; Committee on Regional Transportation Systems Management and Operations

This workshop focuses on the challenge of traffic signal control in oversaturated conditions. Issues addressed relate to defining, detecting, and measuring congested conditions and strategies and philosophies for management of traffic in congested conditions, including multimodal stakeholder (vehicles, transit, goods movement, and pedestrians) objectives. The standard of practice will be presented and discussed. New research topics will be identified to help address areas that need improvement or where there is insufficient experience.

Published Meeting - Committee (M)s

RCM07-009
Monday, January 22, 2007, 1:30pm- 5:30pm, Marriott
Traffic Signal Systems Committee
Larry Head, University of Arizona, presiding
Sponsored by Committee on Traffic Signal Systems

RCM07-020
Monday, January 22, 2007, 8:00am- 9:45am, Marriott
Traffic Signal Timing Manual Subcommittee, AHB25(1)
Peter J. V. Koonce, Kittelson and Associates, Inc., presiding
Sponsored by Committee on Traffic Signal Systems

RCM07-021
Monday, January 22, 2007, 10:00am-11:00am, Marriott
Traffic Signal Systems Research Subcommittee, AHB25(2)
James L. Powell, Parsons Transportation Group Inc., presiding
Sponsored by Committee on Traffic Signal Systems

RCM07-022
Monday, January 22, 2007, 11:00am-12:00pm, Marriott
Simulation of Traffic Signal Systems Subcommittee, AHB25(3)
Byungkyu (Brian) Park, University of Virginia, presiding
Sponsored by Committee on Traffic Signal Systems

RCM07-023
Monday, January 22, 2007, 12:15pm- 1:15pm, Marriott
Traffic Signal Controller Architecture Subcommittee, AHB25(4)
Larry Head, University of Arizona, presiding
Sponsored by Committee on Traffic Signal Systems

AHB25 Cosponsored Sessions

RCM07-015
Monday, January 22, 2007, 7:30pm-9:30pm, Marriott
Traffic Simulation Models Joint Subcommittee of AHB45, AHB20, AHB25, AHB40
Kenneth G. Courage, University of Florida, presiding

RCS07-007
Tuesday, January 23, 2007, 3:45pm-5:30pm, Marriott
Timing Parameters, Signaling Operations, and Pedestrians: Providing Safe and Effective Control for Intersection Users
David A. Noyce, University of Wisconsin, Madison, presiding

Intersection signaling has become more complex as operations have striven to be more efficient. Consideration of driver behavior, signaling strategies, timing, and pedestrians requires careful understanding of the interactions. This session presents a comprehensive view on this interaction.

Foundation for Joint Determination of Passage Time and Detection Zone Length Using Stop Bar Presence Detection (07-1560)
Michael Kyte, University of Idaho
Thomas Urbanik, University of Tennessee, Knoxville
Enas Amin, University of Idaho

Evaluation of Driver Comprehension for Solid Yellow Indications Resulting from Implementation of Flashing Yellow Arrow (07-2293)
Michael A. Knodler, University of Massachusetts, Amherst
David A. Noyce, University of Wisconsin, Madison
Kent C. Kacir, Siemens ITS
Chris Brehmer, Kittelson & Associates, Inc.

Safety Effectiveness of All-Red Clearance Intervals at Urban Low-Speed Intersections (07-2031)
Reginald R. Souleyrette, Iowa State University
Thomas J. McDonald, Iowa State University

Impact of Coordination Parameters on Pedestrian Operations in NEMA Controllers (07-2701)
Srinivasa R. Sunkari, Texas Transportation Institute
Kevin N. Balke, Texas Transportation Institute

Exploratory Analysis of Pedestrian Signalization Treatments at One- and Two-Lane Roundabouts Using VISSIM Microsimulation (07-2655)
Bastian J. Schroeder, North Carolina State University
Nagui M. Routhail, North Carolina State University
Ronald Granger Hughes, North Carolina State University
RCW07-002
Sunday, January 21, 2007, 1:30pm- 5:00pm, Shoreham
Simulation Practices, Needs, and Challenges for Corridor Management

As agencies realize the importance of operating their facilities to make the most of their existing capacity, there has been an increasing interest in the concept of managing multiple transportation facilities as an integrated corridor. Simulation modeling plays a key component in the planning and design of corridor management strategies and plans. There are many challenges in using simulation for a multimodal, multiroadway corridor that implements various intelligent transportation system devices and strategies. This workshop highlights and discusses the current practice, case studies, international experiences, research needs, and various challenges of simulating corridor management applications.

RCW07-003
Sunday, January 21, 2007, 8:30am-12:00pm, Marriott
Doctoral Student Research in Transportation Operations and Traffic Control
David A. Noyce, University of Wisconsin, Madison, presiding