



Minnesota Department of Transportation

RESEARCH SERVICES

Guide to the Transportation Research Board 89th Annual Meeting



Presentations sponsored by the Minnesota Department of Transportation and the Minnesota Local Road Research Board



January 10–14, 2010
Washington, D.C.

Welcome to the

TRB Annual Meeting

We are pleased to provide this Minnesota Guide to the Transportation Research Board 89th Annual Meeting. On the following pages we highlight the contributions of Minnesota Department of Transportation practitioners and Minnesota university researchers who will be among this year's presenters and session leaders. These presentations span a wide variety of topic areas and modes—from traffic modeling to rural transportation services; from performance-based planning to pavement design; from congestion pricing to the impacts of light rail. The more than 80 entries in this guide are a testament to Minnesota's leadership across the spectrum of transportation research.

The TRB Annual Meeting provides an opportunity for some 10,000 transportation professionals from around the world to exchange information, knowledge and insights on research that can be put to work for a better transportation system. We hope this guide will facilitate dialogue among Minnesota participants in the annual meeting, and among all Minnesota transportation professionals in industry, academia and public agencies.

More information about the TRB Annual Meeting is available at <http://www.trb.org/meeting/>.

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On the cover: Lafayette Bluff tunnel on Highway 61 north of Two Harbors

Back cover: Interstate 35W Bridge over the Mississippi River

Cover and back cover photos by David Gonzalez, Mn/DOT

Minnesota Participants

Sessions in the Minnesota Guide include presenters from the Minnesota Department of Transportation and Mn/DOT-sponsored university researchers. Sessions are listed by date and include the time, location, session number, title, presenters and brief summaries. In addition, Mn/DOT participants on TRB committees, project panels and expert task groups are included. Be sure to check the TRB Final Program for possible room changes. Also see the Interactive Annual Meeting Program at <http://www.trb.org/meeting/>, where you can search for subjects, organizations or presenters of interest to you.

SUNDAY, JAN. 10

9 a.m. – noon, Marriott (Coolidge)

Workshop 105: Geophysics: Help Us to Help You

From Implementation to Full Integration: Development of Geophysics Use at Minnesota Department of Transportation

Derrick Dasenbrock
Minnesota Department of Transportation

Panel Discussion: Implementing Geophysical Tools, Practices and Results into Transportation Projects

Derrick Dasenbrock
Minnesota Department of Transportation

Kevin M. O'Connor
GeoTDR Inc.

Larry D. Olson
Olson Engineering Inc.

Wanfang Zhou
ERT Inc.

9 a.m. – noon, Hilton (International West)

Workshop 123: Livability, Sustainability and Congestion Pricing

Lee W. Munnich (presiding)
University of Minnesota, Humphrey Institute of Public Affairs

What Are the Implications of a Focus on Livability and Sustainability for Congestion Pricing?

Janette Sadik-Khan
City of New York Department of Transportation

Robert Puentes
Brookings Institution

Rosa C. Rountree
Transroute International Canada Services Inc.

Joanne R. Potter
Cambridge Systematics Inc.

Kenneth Buckeye
Minnesota Department of Transportation

Gabriel J. Roth
The Independent Institute

Charles Komonoff
Institute for Global Communications

Anthony May
University of Leeds, United Kingdom

Joshua Schank
Bipartisan Policy Center

9 a.m. – noon, Hilton (International East)

Workshop 127: Transportation Finance 2.0: What Does the Future Hold and How Can We Help to Shape It?

Special Assessment Financing as a Value Capture Strategy

Kerstin Larson
University of Minnesota, Humphrey Institute of Public Affairs

Zhirong (Jerry) Zhao
University of Minnesota, Humphrey Institute of Public Affairs

This article reviews the history of special assessments financing, its extent of use and its mechanisms. It evaluates the applicability of special assessments financing as a transportation finance strategy based on four criteria—efficiency, equity, sustainability and feasibility—and provides legal, administrative and technical recommendations for its use in transportation finance.

Value Capture for Transportation Finance

Michael James Iacono
University of Minnesota, Department of Civil Engineering

David Matthew Levinson
University of Minnesota, Department of Civil Engineering

Zhirong (Jerry) Zhao
University of Minnesota, Humphrey Institute of Public Affairs

This paper identifies eight policies that contain elements of the value capture approach: land value taxes, tax increment financing, special assessments, transportation utility fees, development impact fees, negotiated exactions, joint development and air rights. Each policy is evaluated according to its efficiency, equity, sustainability (in terms of revenue adequacy and stability), and feasibility.

1:30 – 4:30 p.m., Marriott (Thurgood Marshall South)

Workshop 146: Intelligent Compaction for Soils, Subbase, Stabilized Base and Asphalt Pavements

Implementation of Intelligent Compaction in Minnesota

Glenn M. Engstrom
Minnesota Department of Transportation

Future Workshops and Demonstrations, Impacts on Contractors' Operations, Challenges and Open Discussion

Victor Lee Gallivan
Federal Highway Administration

Robert Donald Horan
Asphalt Institute

Larry Michael
LLM Asphalt Technology Consulting

David J. White
Iowa State University

Glenn M. Engstrom
Minnesota Department of Transportation

1:30 – 4:30 p.m., Marriott (Coolidge)

Workshop 154: Rural Road Financing in the United States and Developing Countries

Highway Capacity Improvements and Land Value Responses: Some Estimates of the Economic Impacts of Upgrading Roads

Michael James Iacono
University of Minnesota, Department of Civil Engineering

This presentation addresses the effects of a highway reconstruction project on residential and commercial/industrial property values in Olmsted County and suggests how they can be harnessed for transportation finance purposes. It includes a discussion of the relationship between accessibility and land value, and measurement issues that arise in the context of contemporary studies on transportation, accessibility and land value.

1:30 – 4:30 p.m., Shoreham (Empire)

Workshop 166: Seeking Environmental Sustainability and Economic Competitiveness Through Context-Sensitive Solutions (CSS)

Scott D. Bradley (presiding)
Minnesota Department of Transportation

Balancing Competing Objectives and Optimizing Return on Investment with Context-Sensitive and Sustainable Solutions

Scott D. Bradley
Minnesota Department of Transportation

1:30 – 4:30 p.m., Hilton (International East)

Workshop 173: Distance-Based Fees for Funding Transportation: What Does the Future Hold?

Lee W. Munnich (presiding)
University of Minnesota, Humphrey Institute of Public Affairs

What Does the Future Hold for Distance-Based Fees?

Peter H. Appel
U.S. Department of Transportation

Martin Wachs
RAND Corporation

Edward J. Regan
Wilbur Smith Associates

James Whitty
Oregon Department of Transportation

Max Donath
University of Minnesota, Department of Mechanical Engineering

Tyler Duvall
McKinsey & Company

Joseph M. Giglio
Northeastern University

1:30 – 4:30 p.m., Hilton (Jefferson West)

Workshop 176: International Transportation Research Collaboration: Success Stories

Minnesota Department of Transportation Collaboration with Scandinavian Transport Research

Maureen Rita Jensen
Minnesota Department of Transportation

1:30 – 5:30 p.m., Hilton (Georgetown East)

Workshop 174: Doctoral Student Research in Transportation Modeling

Modeling the Traffic Flow Evolution Process after Network Disruption

Xiaozheng He
University of Minnesota, Department of Civil Engineering

8 – 9:45 a.m., Marriott (Washington B6)

Landscape and Environmental Design Committee (AFB40)

Scott D. Bradley (presiding)
Minnesota Department of Transportation

9:30 a.m. – noon, Marriott (Salon 2)

Poster Session 238: High-Occupancy-Vehicle, High-Occupancy-Toll and Managed Lanes

What Drives Single-Occupant Traveler Decisions in HOT Lanes? Investigation Using Archived Traffic and Tolling Data from MnPASS Express Lanes

Noah Goodall

University of Virginia

Brian Lee Smith

University of Virginia

This paper presents the results of an empirical investigation into the relationship between toll rate, traffic conditions and the behavior of drivers in single-occupant vehicles based on data from the dynamically tolled I-394 high-occupancy toll facility in Minneapolis. A model was developed that predicts HOT lane usage rates based on time savings, time of day and toll rates.

9:30 a.m. – noon, Marriott (Salon 2)

Poster Session 243: Recycled Materials for Transportation Infrastructure

Leaching Characteristics of Fly Ash, Recycled Asphalt and Aggregate Mixtures

Dong Hee Kang

University of Minnesota, Department of Soil, Water and Climate

Satish C. Gupta

University of Minnesota, Department of Soil, Water and Climate

Andry Z. Ranaivoson

University of Minnesota, Department of Soil, Water and Climate

Ruth Roberson

Minnesota Department of Transportation

John A. Siekmeier

Minnesota Department of Transportation

Because of the high cost of virgin aggregates, recycled waste materials are used in road construction and maintenance. Researchers evaluated the suitability of fly ash, reclaimed asphalt pavement, recycled cement material and foundry sand mixed with virgin aggregates as base and subbase materials. The results of contaminant leaching from six mixtures of FA-RAP-aggregates under saturated and unsaturated conditions are given.

Hydraulic and Mechanical Characteristics of Recycled Materials and Aggregate Mixtures

Dong Hee Kang

University of Minnesota

Satish C. Gupta

University of Minnesota

Andry Z. Ranaivoson

University of Minnesota

John A. Siekmeier

Minnesota Department of Transportation

Ruth Roberson

Minnesota Department of Transportation

This research evaluates water retention, hydraulic conductivity, resilient modulus and shear strength characteristics of 17 mixtures of

four recycled materials with aggregates relative to 100 percent virgin aggregate. Recycled materials tested were recycled asphalt pavement, recycled concrete material, fly ash and foundry sand.

9:30 a.m. – noon, Hilton (International Center)

Poster Session 252: Congestion Pricing Showcase: Lessons from Today's Projects and Studies

I-95 Express HOT Lanes in Southern Florida

Ewa Zofka

University of Minnesota, Department of Civil Engineering

This poster provides an update of the progress in implementing the I-95 express lanes in southern Florida.

Enhancing Livability and Sustainability by Linking Congestion Pricing with Transit

Lee W. Munnich

University of Minnesota, Humphrey Institute of Public Affairs

Livability and sustainability have become primary goals for the U.S. transportation system. Projects in several international metro areas along with Minnesota's I-394 and I-35W MnPASS projects demonstrate how significant transit improvements can be linked with congestion pricing and achieve congestion reduction and increased transit ridership with integrated planning and development.

Minnesota Urban Partnership Agreement: Performance Update

Kenneth Buckeye

Minnesota Department of Transportation

This poster provides three months of performance data, including speeds, throughput, reliability, violations and enforcement, along with early lessons learned as well as public reaction and acceptance. The poster includes a map of the corridor and photos of the lanes during operations and of the lane control technologies.

I-94 Managed Lanes Study, Twin Cities, Minnesota

David H. Ungemah

Parsons Brinckerhoff

This poster investigates the application of active traffic management, managed lanes and dynamic shoulder lane strategies to the I-94 corridor between Minneapolis and St. Paul during replacement work on the I-35W Bridge. The poster highlights the use of shoulder lane alternatives and active traffic management for achieving corridor management as compared to the use of congestion pricing on managed lanes, as modeled.

10:15 a.m. – noon, Marriott (Hoover)

Concrete Pavements Subcommittee (AFD50(1))

Lev Khazanovich (presiding)

University of Minnesota, Department of Civil Engineering

Jeffery R. Roesler (presiding)

University of Illinois, Urbana-Champaign

10:15 a.m. – noon, Marriott (Salon 1)

Session 269: Reclaimed Asphalt Pavement Evaluations and Durability of Asphalt Binders

Mihai O. Marasteanu (presiding)
University of Minnesota, Department of Civil Engineering

10:15 a.m. – noon, Hilton (Georgetown West)

Session 285: Innovative Funding and Financing Mechanisms: Implications for Long-Range Planning

Integrating Long-Range Planning and Funding in Minnesota

Bernie Arseneau
Minnesota Department of Transportation

10:15 a.m. – noon, Hilton (Lincoln East)

Session 286: Public Transportation Planning and Development: Key Trends, Issues and Potential Areas for Improvement

Integrating Bicycling and Public Transport in North America

John Pucher
Rutgers University

Ralph Buehler
Virginia Polytechnic Institute and State University

This paper provides an overview of bike-transit integration, beginning with an analysis of national trends in bike-and-ride programs such as the provision of bike racks on buses, accommodation of bikes on rail vehicles, and bike parking at rail stations and bus stops. Case studies of programs in San Francisco, Portland, Minneapolis, Chicago, Washington, New York, Vancouver and Toronto are presented.

1:30 – 3:15 p.m., Marriott (Virginia A)

Session 291: Characterization of Stabilized Materials in Pavements

Evaluation of Characterization and Performance Modeling of Cementitiously Stabilized Layers in the MEPDG

Priyam Saxena
University of Minnesota, Department of Civil Engineering

Derek Tompkins
University of Minnesota, Department of Civil Engineering

Lev Khazanovich
University of Minnesota, Department of Civil Engineering

Jose Tadeu Balbo
University of Sao Paulo, Brazil

This paper evaluates the current characterization of cementitiously stabilized materials and brings to light issues with their modeling in the Mechanistic-Empirical Pavement Design Guide. Addressing these issues will help designers to quantify the benefits of stabilization and improve pavement service life.

1:30 – 3:15 p.m., Marriott (Thurgood Marshall North)

Session 295: Highway Noise and Pavement Parameters, Part 2

Roger C. Olson (presiding)
Minnesota Department of Transportation

Evaluation of Innovative Diamond Grinding at MnROAD

Bernard Igbafen Izevbekhai
Minnesota Department of Transportation

Lev Khazanovich
University of Minnesota, Department of Civil Engineering

In addition to improving the ride quality and friction of degraded pavement, diamond grinding creates a texture that is often significantly quieter than other texture types, such as transverse and longitudinal tining. This paper discusses the results of field testing conventional and alternative (innovative) diamond grinding at the MnROAD facility.

1:30 – 3:15 p.m., Shoreham (Palladian)

Session 303: Accelerated Pavement Testing, Part 1

Investigation of Asphalt Material Low-Temperature Fracture Properties at MnROAD

Raul Andres Velasquez
University of Wisconsin, Madison

Timothy R. Clyne
Minnesota Department of Transportation

Mihai O. Marasteanu
University of Minnesota, Department of Civil Engineering

This paper summarizes a research effort in which traditional and new experimental protocols were used to characterize the low-temperature performance of pavement samples obtained from MnROAD and pavements in Minnesota, Illinois and Wisconsin. Tests used for asphalt mixtures were the semi-circular bending test, disc-shaped compact tension test, single-edge notched beam test, and the indirect tensile test for creep stiffness and strength. The bending beam rheometer, direct tension test and double-edge notch tension test were used for asphalt binders.

1:30 – 3:15 p.m., Hilton (Cabinet)

Session 314: Environmental and Historic Preservation Regulations: Overlap and Divergence

When Sections 106, 4(f) and 7a Collide: Resolving Multiple Natural and Cultural Preservation Conflicts on the St. Croix River

Beth Bartz
SRF Consulting Group Inc.

1:30 – 3:15 p.m., Hilton (Jefferson West)

Session 316: Planning for Light Rail Mobility in the Suburbs: International Perspective

Streetcars and Recovery: Analysis of Post-Katrina Building Permits Around New Orleans Streetcar Lines

Andrew Guthrie
University of Minnesota, Humphrey Institute of Public Affairs

Yingling Fan
University of Minnesota, Humphrey Institute of Public Affairs

Researchers explore the impact of traditional streetcars on development and reinvestment activities through an analysis of post-Hurricane Katrina commercial and residential building permits near streetcar stops in New Orleans. Negative binomial regression is used to estimate how the number of building permits in a street block changes in relation to its distance from the nearest streetcar stop.

2:30 – 5 p.m., Shoreham (Blue Room Foyer)

Poster Session 327: Freight Transportation Economics, Planning and Logistics

Identifying and Characterizing Truck Bottlenecks in the Mississippi Valley Region

Jessica Y. Guo
University of Wisconsin–Madison

Qi Gong
University of Wisconsin–Madison

Andrew Obernesser
University of Wisconsin–Madison

2:30 – 5 p.m., Hilton (International Center)

Poster Session 332: Innovations in Transportation and Land Development

Why Retailers Cluster: Agent Model of Location Choice on Supply Chains

Arthur Huang
University of Minnesota, Department of Civil Engineering

David Matthew Levinson
University of Minnesota, Department of Civil Engineering

This paper investigates the emergence of retail clusters on supply chains composed of suppliers, retailers and consumers. Agent-based models are employed to study retail location choice in a market of homogeneous goods and a market of complementary goods. On a circle composed of discrete locales, retailers play a noncooperative game by choosing locales to maximize profits, which are impacted by their distance from consumers and suppliers.

Impacts of Hiawatha Light-Rail Line on Commercial and Industrial Property Values in Minneapolis

Kate Ko
University of Minnesota, Humphrey Institute of Public Affairs

Xinyu (Jason) Cao
University of Minnesota, Humphrey Institute of Public Affairs

This paper analyzes the property value impacts of the Minneapolis Hiawatha Light Rail Line in terms of the accessibility effect of

proximity to an LRT station. The results on how the impact of Hiawatha LRT is capitalized in these properties can have significant implications on the local transit-oriented economic development along the new LRT line.

2:30 – 5 p.m., Hilton (International Center)

Poster Session 336: National Park Transportation Scholar Research

Thinking Outside the Car: Developing Multimodal Alternative Transportation Plan for Mississippi National River and Recreation Area

Lorin Culver
National Park Foundation

In 2009, the National Park Foundation assisted with the development of a multimodal alternative transportation plan for the Mississippi National River and Recreation Area, a 72-mile corridor that bisects the Twin Cities metropolitan area. Data from nearly 50 local, county, regional and state government plans was analyzed to facilitate continuous development of the Mississippi River Trail on both sides of the river.

3:45 – 5:30 p.m., Shoreham (Ambassador)

Session 358: Low-Impact Development: Benefits, Limitations and Research Needs

Iron-Enhanced Sand Filtration for Stormwater Phosphorus Removal

Andrew J. Erickson
University of Minnesota, Department of Civil Engineering

John S. Gulliver
University of Minnesota, Department of Civil Engineering

Peter T. Weiss
Valparaiso University

Brian J. Huser
Barr Engineering Company Inc.

In this study, iron filings were tested as an enhancement to sand filtration for removing dissolved phosphorus for synthetic stormwater. An iron-enhanced sand filter was installed in Maplewood using approximately 5 percent iron filings by weight to remove both total and dissolved phosphorus from stormwater runoff. A model developed from these studies was used to predict the phosphorus removal in the field application.

3:45 – 5:30 p.m., Hilton (International East)**Session 363: Alternative Financing Mechanisms and Their Impacts**

Economic and Equity Effects of Transportation Utility Fees

Jason R. Junge

University of Minnesota, Department of Civil Engineering

David Matthew Levinson

University of Minnesota, Department of Civil Engineering

Transportation utility fees are a financing mechanism that treats the transportation network as a utility and bills properties in proportion to their use rather than their value, connecting the costs of maintaining the infrastructure more directly to the benefits received from mobility and access to the system. This paper evaluates the economic, equity and administrative effects of these fees as an alternative funding source.

3:45 – 5:30 p.m., Hilton (Georgetown East)**Session 364: Congestion Pricing and Traffic Modeling in Networks****Henry X. Liu (presiding)**

University of Minnesota, Department of Civil Engineering

Sparse Solution to System-Optimal Congestion-Pricing Problem

Xiaozheng He

University of Minnesota, Department of Civil Engineering

Henry X. Liu

University of Minnesota, Department of Civil Engineering

This paper proposes an alternative congestion pricing model using the l_1 -norm regularization scheme. The final solution to the regularized problem contains a tendency to sparsity (large number of zeros in a toll pattern). The l_1 -regularized congestion pricing problem can be reformulated as an inverse variational inequality system. Compared with the minimum toll booth problem, the proposed convex optimization model is easier to solve.

Toll Road with Heterogeneous Users and Elastic Demand

Xiaolei Guo

University of Minnesota, Department of Civil Engineering

Hai Yang

Hong Kong University of Science and Technology

Henry X. Liu

University of Minnesota, Department of Civil Engineering

In this paper, researchers show that when private toll road users are heterogeneous in value of time, the private firm may prefer a toll lower than the socially optimal level. Researchers compare the profit-maximizing and the welfare-maximizing capacity levels and volume/capacity ratios, and conduct self-financing analysis in this heterogeneous user environment.

3:45 – 5:30 p.m., Hilton (Georgetown West)**Session 366: Enhancing Students' Understanding of Core Concepts in Transportation**

Development and Deployment of a Traffic Control Game Integrated with Traffic Engineering Curriculum for Teaching High School Students

Chen-Fu Liao

University of Minnesota, Department of Civil Engineering

David B. Glick

David B. Glick & Associates LLC

Shawn Haag

University of Minnesota, Center for Transportation Studies

Gina Baas

University of Minnesota, Center for Transportation Studies

By integrating educational game modules and curriculums about intelligent transportation control and management, researchers hope to encourage high school students to pursue careers in transportation. This paper presents an interactive, Web-based traffic control simulation module and a professionally enhanced traffic game that were piloted in undergraduate transportation engineering classes and high school summer camps at the University of Minnesota.

7:30 – 9:30 p.m., Marriott (Thurgood Marshall South)**Session 377: Emerging Approaches and Technologies for Design and Construction of Transportation Facilities****Ramankutty Kannankutty (presiding)**

Minnesota Department of Transportation

7:30 – 9:30 p.m., Marriott (Salon 2)**Poster Session 378: Innovative Statistical Methods in Transportation Research**

Bayesian Trajectory-Based Reconstruction of Rear-Ending Events Using Naturalistic Driving Data

Indrajit Chatterjee

University of Minnesota, Department of Civil Engineering

Using microscopic simulation to predict the road safety consequences of engineering decisions may be feasible given the more advanced and sophisticated data collection techniques that are emerging. In this study researchers use vehicle-based data to show how trajectory-based modeling techniques can be implemented to reconstruct crash-related events and estimate the posterior distribution of parameters such as braking accelerations, reaction time and critical headway.

7:30 – 9:30 p.m., Marriott (Salon 2)

Poster Session 382: Regional Transportation Systems Management and Operations

Measuring Winners and Losers from New I-35W Mississippi River Bridge

Shanjiang Zhu
University of Minnesota, Twin Cities

David Matthew Levinson
University of Minnesota, Department of Civil Engineering

Henry X. Liu
University of Minnesota, Department of Civil Engineering

Using detailed GPS data to estimate travel times on links and for origin-destination pairs, this research finds that while on average travel time improved with the reopening of the I-35W Bridge, the subsequent restoration of parts of the rest of the network to their precollapse configuration worsened travel times significantly on average.

7:30 – 9:30 p.m., Hilton (Georgetown West)

Session 393: Assessing Transit System and Network Performance

Development of Data Processing Framework for Transit Performance Analysis

Chen-Fu Liao
University of Minnesota, Department of Civil Engineering

Henry X. Liu
University of Minnesota, Department of Civil Engineering

In this paper, researchers present a methodological data analysis framework to process massive transit data, including vehicle location, passenger count and electronic fare transactions. The developed data analysis framework can allow applications such as transit route performance measurement to support decision making for transit planning and operation. Route running time, schedule adherence and transit performance are also discussed.

7:30 – 9:30 p.m., Hilton (Jefferson East)

Session 396: Traffic Assignment and Equilibrium Models in Networks

Importance Measure of Network Components Under Disequilibrium and Braess Paradox

Xiaolei Guo
University of Minnesota, Department of Civil Engineering

Henry X. Liu
University of Minnesota, Department of Civil Engineering

A traffic management agency is interested in network performance during a time period after a network component is removed, and thus the importance of each network component is measured by the disequilibrium network performance during that period. A dynamic model and an example network are presented to illustrate that the distinction between equilibrium and disequilibrium importance measures of network components could be common.

Graph-Theoretic Approach for Dynamic System Optimum Assignment with Intersection Control

Saif Jabari
University of Minnesota, Twin Cities

Henry X. Liu
University of Minnesota, Department of Civil Engineering

This study proposes a graph-theoretic representation of the many-to-one dynamic system optimum traffic assignment problem that incorporates adaptive signal control with diverse phasing schemes. Reasonable modeling simplifications are adopted and the problem is transformed into a static, one-to-one minimum cost network flow problem in a super-graph.

TUESDAY, JAN. 12

8 a.m. – noon, Marriott (Washington B1)

Pavement Maintenance Committee (AHD20)

Roger C. Olson (presiding)
Minnesota Department of Transportation

8 – 9:45 a.m., Marriott (Coolidge)

Application of Emerging Technologies to Design and Construction Committee (AFH30)

Ramankutty Kannankutty (presiding)
Minnesota Department of Transportation

8 – 9:45 a.m., Marriott (Maryland C)

Session 409: Traffic Flow Theory Applications

A Hybrid Extended Kalman Filtering Approach for Traffic Density Estimation Along Signalized Arterials Using GPS Data

Xuan Di
University of Minnesota, Department of Civil Engineering

Henry X. Liu
University of Minnesota, Department of Civil Engineering

Gary A. Davis
University of Minnesota, Department of Civil Engineering

This paper attempts to estimate traffic density along a signalized arterial, using data from both detectors and GPS. Investigators adopt the approximated MARCOM (Markov Compartment) model to describe arterial traffic states, implement a hybrid extended Kalman filter to integrate the model with detector and GPS measurements, and test the model on Minnesota Trunk Highway 55 with VISSIM simulation.

8 – 9:45 a.m., Shoreham (Ambassador)**Session 415: Emerging Ecological Challenges, Research, and Solutions from 2009 International Conference on Ecology and Transportation**

Scott D. Bradley (presiding)
Minnesota Department of Transportation

Thomas E. Linkous (presiding)
Westerville, Ohio

10:15 a.m. – noon, Marriott (Thurgood Marshall North)**Session 448: ITS Applications for High-Occupancy-Toll and Managed Lanes**

I-35W Managed Lane ITS Applications

Nick Thompson
Minnesota Department of Transportation

10:15 a.m. – noon, Marriott (Salon 1)**Session 449: Pervious Concrete in Transportation Applications**

Construction and Performance of Pervious Concrete Overlay at MnROAD

Vernon Ray Schaefer
Iowa State University

John T. Kevern
University of Missouri, Kansas City

Bernard Igbafen Izevbekhai
Minnesota Department of Transportation

Kejin Wang
Iowa State University

Heath Edward Cutler
Iowa State University

Paul Wiegand
Iowa State University

Portland cement pervious concrete has shown great potential to reduce roadway noise, improve splash and spray, and improve friction as a surface wearing course. This paper reports on the construction and performance of a PCPC overlay seven months after construction at the MnROAD low-volume roadway test facility to determine the effectiveness of pervious concrete as an overlay.

Relationship of Pervious Concrete Pavement Distress and Success to Design, Construction, Maintenance and Environment

Mary Elizabeth Vancura
University of Minnesota, Department of Civil Engineering

Kevin MacDonald
Cemstone Products Company

Lev Khazanovich
University of Minnesota, Department of Civil Engineering

This paper presents the evaluations of 22 pervious concrete pavements that have been in service between one and four years at 15 Minnesota locations (the Twin Cities, Saint Cloud, Sauk Rapids, Detroit Lakes

and Duluth). Researchers conducted pavement distress surveys and interviewed various stakeholders (contractors, engineers, city officials, street maintenance directors and residents) about history, design specifications and maintenance practices.

1:30 – 3:15 p.m., Marriott (Delaware A)**Session 481: Effects of Climate and Seasonal Changes on Roads**

Comprehensive Evaluation of Effect of Climate in MEPDG Predictions

Luke Johanneck
University of Minnesota, Department of Civil Engineering

Lev Khazanovich
University of Minnesota, Department of Civil Engineering

This paper details the effort to design and test an asphalt-over-concrete composite pavement for 610 U.S. locations using the Mechanistic-Empirical Pavement Design Guide version 1.0. The performance prediction contained inconsistencies in predicted transverse cracking in the portland cement concrete layer that are attributed to climate data and to the use of stations with incomplete data, which may adversely affect performance prediction.

1:30 – 3:15 p.m., Shoreham (Ambassador)**Session 483: Accelerated Pavement Testing, Part 2**

Development of GPS-Based Vehicle Tracking System for MnROAD Research Facility

Thomas R. Burnham
Minnesota Department of Transportation

Ahmed Tewfik
University of Minnesota, Department of Electrical and Computer Engineering

Madhavan Vasudevan
University of Minnesota, Department of Electrical and Computer Engineering

To improve the efficiency of load response testing of pavement test sections, investigators developed a GPS-based vehicle tracking system for trial at the MnROAD facility and in greater Minnesota. Also developed were the Wireless Triggering System, which triggers data acquisition as a test vehicle passes by an area containing pavement sensors, and the Vehicle Guidance System, which guides test vehicle drivers through various predetermined paths.

1:30 – 3:15 p.m., Hilton (International East)**Session 491: Addressing Public Acceptance Issues with Road Pricing**

User Perceptions of Fee Lane Concepts in Minnesota

Kenneth Buckeye
Minnesota Department of Transportation

To satisfy the public's concerns about adapting general-purpose traffic lanes to optional toll lanes or flexible, efficient express lanes, focus groups were held to explain policies, conditions, designs and operational characteristics. Three configurations of FEE lanes and a toll credit system were presented. Findings suggest the need for increased education and marketing about road pricing options.

1:30 – 3:15 p.m., Hilton (Lincoln East)**Session 493: Critical Assessment of Environmental Justice and Transportation Equity Since Executive Order 12898**

Equity Effects of Road Pricing: A Review

David Matthew Levinson

University of Minnesota, Department of Civil Engineering

This paper synthesizes current literature about equity in road pricing strategies; the results of empirical and simulation studies implementing road pricing; and suggested remedies for real or perceived inequities. Innovative strategies that provide the right incentives to travelers and use the raised revenues to achieve desired equitable ends (such as cutting other taxes and investing in infrastructure and services) may raise funds for transportation while managing demand.

1:30 – 3:15 p.m., Hilton (Georgetown East)**Session 497: Rural Transportation Research**

Assessment of Demand for Rural Intercity Transportation Services in a Changing Environment

Jeremy Mattson

Upper Great Plains Transportation Institute

Del Peterson

Upper Great Plains Transportation Institute

David Ripplinger

Upper Great Plains Transportation Institute

William Thoms

Upper Great Plains Transportation Institute

Jill Hough

North Dakota State University

Given changes in travel behavior, the optimum level and allocation of resources in highways, rail, air and transit service in rural areas may be changing. This study surveyed residents of North Dakota and northwest and west central Minnesota to determine their preferred travel mode—automobile, air, bus, train or van—in rural and small urban areas.

2:30 – 5 p.m., Marriott (Salon 2)**Poster Session 501: Characterization and Modeling of Asphalt Concrete**

Representative Volume Element of Asphalt Concrete Based on Image and Numerical Analyses

Raul Andres Velasquez

University of Wisconsin, Madison

Mihai O. Marasteanu

University of Minnesota, Department of Civil Engineering

Joseph F. Labuz

University of Minnesota, Department of Civil Engineering

This poster examines the representative volume element—the smallest volume of material that captures the global characteristics of the

material—for asphalt mixtures using image analysis and finite element simulations. The results from 2-D finite element simulations of element tests are used to obtain minimum sizes for the RVE of asphalt concrete.

2:30 – 5 p.m., Marriott (Salon 2)**Poster Session 504: Novel Testing and Other Performance Properties of Asphalt Binders**

Pressure Aging Vessel and Low-Temperature Fracture Properties of Asphalt Binders

Mihai O. Marasteanu

University of Minnesota, Department of Civil Engineering

Eyoab Zegeye Teshale

University of Minnesota, Department of Civil Engineering

Ki Hoon Moon

University of Minnesota, Department of Civil Engineering

Mugurel Turos

University of Minnesota, Department of Civil Engineering

In this paper, researchers investigate the effect of the Pressure Aging Vessel laboratory aging procedure on low-temperature properties of asphalt binders. Creep stiffness and direct tension fracture tests are performed on laboratory-aged binders as well as extracted binders.

Physical Hardening: From Binders to Mixtures

Mugurel Turos

University of Minnesota, Department of Civil Engineering

Ki Hoon Moon,

University of Minnesota, Department of Civil Engineering

Mihai O. Marasteanu

University of Minnesota, Department of Civil Engineering

This paper investigates the presence of physical hardening effects in asphalt mixtures. Bending beam rheometer creep tests were performed on asphalt binder and asphalt mixture beams conditioned at the test temperature for 1 hour and 24 hours to quantify physical hardening effects. Both laboratory-prepared and field samples were used.

2:30 – 5 p.m., Marriott (Salon 2)**Poster Session 505: Surface Characteristics and Mechanistic-Empirical Pavement Design Guide Prediction of Asphalt Mixtures**

Local Calibration of MEPDG Rutting Model for MnROAD Test Sections

Kyle Hoegh

University of Minnesota, Department of Civil Engineering

Lev Khazanovich

University of Minnesota, Department of Civil Engineering

Maureen Rita Jensen

Minnesota Department of Transportation

In this study, time history rutting performance data for pavement sections at the MnROAD facility were used for an evaluation and local calibration of the Mechanistic-Empirical Pavement Design Guide rutting model. A detailed comparison of the predicted total rutting, asphalt layer rutting and measured rutting is presented.

2:30 – 5 p.m., Marriott (Salon 2)**Poster Session 506: Surface Treatment Applications and New Bituminous Emulsion Testing**

Delmar R. Salomon (presiding)
Pavement Preservation Systems LLC

Roger C. Olson (presiding)
Minnesota Department of Transportation

2:30 – 5 p.m., Marriott (Salon 2)**Poster Session 507: TRB's IDEA Programs: Sponsoring Innovation in Transportation**

Development of a Simple Test to Determine the Low Temperature Creep Compliance of Asphalt Mixtures

Mihai O. Marasteanu
University of Minnesota, Department of Civil Engineering

2:30 – 5 p.m., Shoreham (Blue Room Foyer)**Poster Session 511: Various Aspects of Mechanistic Flexible Pavement Analysis and Design**

MnROAD Case Study Using CalBack and CalME

Bor-Wen Tsai
University of California, Berkeley

Rongzong Wu
University of California, Davis

John Harvey
University of California, Davis

This paper demonstrates the applicability of using CalBack and CalME in predicting in situ pavement performance of the MnROAD case study. Two mainline cells of flexible pavements were selected because of material availability for developing material response/performance models for CalME simulation and because of their contrasting pavement performances in fatigue cracking and rutting.

3:45 – 5:30 p.m., Marriot (Virginia C)**Session 539: What Do You See on the Road? Visual Tasks in Night Driving Environment**

Framework for Estimating Safety Effects of Roadway Lighting at Intersections

Eric T. Donnell
Pennsylvania State University

Richard Jon Porter
University of Utah

Venky N. Shankar
Pennsylvania State University

This paper describes a proposed framework to estimate the safety effects of fixed lighting at various intersection types and locations. Issues explored include availability of relevant crash, lighting and roadway inventory data; relevant data element structures; proposed analysis taxonomies to assess lighting-safety effects in different intersection classifications; and specification of models to estimate expected crash frequencies during day and night.

3:45 – 5:30 p.m., Shoreham (Ambassador)**Session 541: Advances in Context-Sensitive Solutions**

Scott D. Bradley (presiding)
Minnesota Department of Transportation

3:45 – 5:30 p.m., Hilton (International West)**Session 554: Preparing for Reauthorization: Emerging Approaches to Performance-Based Planning and Investment at State and Metropolitan Levels**

Balancing Strategic Investment Priorities: Minnesota's Approach to Performance-Based Planning

Peggy Reichert
Minnesota Department of Transportation

7:30 – 9:30 p.m., Marriott (Salon 2)**Poster Session 567: Road Safety Evaluation**

Opportunities to Prevent Rear-End Vehicle Crashes: Findings from Analyzing Actual Crash Data

Byungkyu (Brian) Park
University of Virginia

Yin Chen
University of Virginia

John Hourdos
University of Minnesota, Department of Civil Engineering

Relatively little has been studied about what causes traffic crashes at the individual vehicular level primarily because of a lack of accurate data. This paper analyzes a set of data containing five actual rear-end crashes at the individual vehicular level and attempts to establish a trigger factor that could prevent crashes. An automated braking system may help prevent crashes or mitigate the crash impacts.

Effects of Daylight Saving Time on Vehicle Crashes in Minnesota

Arthur Huang
University of Minnesota, Department of Civil Engineering

David Matthew Levinson
University of Minnesota, Department of Civil Engineering

Using vehicle crash data in Minnesota from 2001 to 2007, this paper evaluates long- and short-term effects of Daylight Saving Time on daily vehicle crashes. Several variables are evaluated, including the impact of DST on crashes during four periods of the day: 3 a.m. to 9 a.m., 9 a.m. to 3 p.m., 3 p.m. to 9 p.m. and 9 p.m. to 12 a.m.

7:30 – 9:30 p.m., Shoreham (Empire)**Session 577: How Departments of Transportation Can Implement Automated Machine Guidance Nationwide**

Emerging Technology Research Requirements

Ramankutty Kannankutty
Minnesota Department of Transportation

7:30 – 9:30 p.m., Hilton (International Center)**Poster Session 582: Congestion Pricing Research: Laying the Foundation for the Future**

Public Perception of Mileage-Based User Fees: Market Survey

Kenneth Buckeye

Minnesota Department of Transportation

Mn/DOT is currently studying the mileage-based user fee as one possible solution to supplement or replace revenue currently generated by the gas tax. Public knowledge and acceptance of these initiatives are critical to developing mileage-based user fee policies. This research establishes a baseline for public acceptance of mileage-based user fees and helps determine the public education, outreach and marketing strategies needed to gain support.

7:30 – 9:30 p.m., Hilton (International Center)**Poster Session 588: Taxation and Finance**

Joint Development as a Value Capture Strategy in Transportation Finance

Zhirong (Jerry) Zhao

University of Minnesota, Humphrey Institute of Public Affairs

Kirti Vardhan Das

University of Minnesota, Humphrey Institute of Public Affairs

Kerstin Larson

University of Minnesota, Humphrey Institute of Public Affairs

This poster examines joint development as a value capture strategy for funding public transportation. It includes a discussion of the concept of joint development, its history and the extent of its use, examples of domestic and international projects, an evaluation of four revenue criteria (efficiency, equity, sustainability and feasibility), and its advantages and disadvantages as a transportation finance strategy.

Air Rights Development as a Value Capture Strategy

Kerstin Larson

University of Minnesota, Humphrey Institute of Public Affairs

Zhirong (Jerry) Zhao

University of Minnesota, Humphrey Institute of Public Affairs

This poster focuses on air rights development—the legal capacity to use a 3-D area of transportation right of way for development. As a value capture strategy, air rights can be used as part of joint development or as a means to generate revenue afterward. This strategy is evaluated based on efficiency, equity, sustainability and feasibility.

Simulating the Effects of Split-Rate Property Taxes on Development Intensity

Jason R. Junge

University of Minnesota, Department of Civil Engineering

David Matthew Levinson

University of Minnesota, Department of Civil Engineering

A significant portion of local transportation funding comes from property tax, which is conventionally assessed on both land and buildings. A more direct, efficient way to fund projects is to tax land at a higher rate than buildings. A simulation is created for three cities to determine the magnitude of the intensity increase for residential and nonresidential development if various levels of split-rate property taxes were enacted.

WEDNESDAY, JAN. 13

8 – 9:45 a.m., Hilton (Monroe)**Congestion Pricing Outreach Subcommittee (ABE25(1))****Lee W. Munnich (presiding)**

University of Minnesota, Humphrey Institute of Public Affairs

8 – 9:45 a.m., Marriott (Maryland A)**Session 595: Current Issues in Roundabout Design and Safety**

Evaluating the Traffic Flow Impacts of Roundabouts in Signalized Corridors

Shauna Hallmark

Iowa State University

Eric J. Fitzsimmons

Iowa State University

Hillary N. Isebrands

Iowa State University

Karen Giese

PTV America

Two case studies were evaluated to compare the traffic flow impacts of roundabouts in a signalized corridor. The microsimulation software VISSIM was used to compare average travel time, stopped delay and average delay for a roundabout and two signalized alternatives as well as a roundabout and a four-way stop-controlled alternative at intersections along signalized corridors.

8 – 9:45 a.m., Marriott (Maryland C)**Session 596: Field and Laboratory Assessments of Crack Sealants**

Threshold Identification and Field Validation of Performance-Based Guidelines for Selection of Hot-Poured Crack Sealants

Shih-Hsien Yang

Nichols Consulting Engineers Chartered

Imad L. Al-Qadi

University of Illinois, Urbana-Champaign

James William McGraw

Minnesota Department of Transportation

Jean-Francois Masson

National Research Council of Canada

This study identified and validated the low-temperature selection thresholds for the new performance-based guidelines for selecting hot-poured bituminous crack sealants. Selection criteria are identified for testing with the crack sealant bending beam rheometer and the crack sealant direct tension tester.

8 – 9:45 a.m., Hilton (Georgetown West)**Session 615: Disaster Planning and Evacuation, and Network Disruptions and Vulnerability**

Unexpected Cause, Unexpected Effect: Empirical Observations of Twin Cities Traffic Behavior After I-35W Bridge Collapse and Reopening

Adam Danczyk

University of Minnesota, Department of Civil Engineering

Henry X. Liu

University of Minnesota, Department of Civil Engineering

This paper discusses the observed evolution of traffic on the Twin Cities road network following both the unexpected collapse and eventual reopening of the I-35W Bridge. Traffic dynamics are quite different when a prolonged, unexpected network disruption occurs rather than a preplanned closure. Two unique trends were witnessed: an avoidance phenomenon after the disruption and a stunted link demand restoration following reopening.

8 – 9:45 a.m., Hilton (International West)**Session 620: Weighing the Inputs: Weigh-in-Motion Data and Pavement Design with Mechanistic-Empirical Pavement Design Guide**

MnROAD Traffic Characterization for Mechanistic-Empirical Pavement Design Guide Using Weigh-in-Motion Data

Matthew Oman

Braun Intertec Corporation

This study describes the use of weigh-in-motion data to develop the required traffic inputs for the Mechanistic-Empirical Pavement Design Guide. TrafLoad software was used to characterize traffic at MnROAD. The output files were imported into the MEPDG and various design scenarios were evaluated. Successful characterization of traffic and materials enables Mn/DOT to locally calibrate and implement the MEPDG.

9:30 a.m. – noon, Marriott (Salon 2)**Poster Session 627: Research in Traffic Flow Theory and Characteristics, Part 1: Measurement and Models**

Properties of Well-Defined Macroscopic Fundamental Diagram for Urban Systems

Nikolas Geroliminis

Ecole Polytechnique Fédérale de Lausanne, Switzerland

Jie Sun

University of Minnesota, Department of Civil Engineering

In this paper, researchers investigate the properties that a network should satisfy so that a macroscopic fundamental diagram with low scatter exists. The spatial distribution of density/occupancy in the network is one of the key components that affect the scatter of an MFD and its shape.

Simplified Traffic Flow Model for Congested Signalized Arterials**Xinkai Wu**

University of Minnesota, Department of Civil Engineering

Henry X. Liu

University of Minnesota, Department of Civil Engineering

Based on the observation that traffic behavior at congested arterials is dictated by recurrent queue buildup and dissipation, this paper presents a simplified shockwave-based arterial traffic flow model that directly simulates queuing dynamics in congested arterials by applying the Lighthill-Whitham-Richards shockwave theory. Traffic dynamics are described analytically in this model by integrating the vehicle conservation over a shockwave profile.

9:30 a.m. – noon, Hilton (International Center)**Poster Session 634: Activity and Travel Behavior and Modeling**

Contacts and Meetings: Location, Duration and Distance Traveled

Nebiyon Yonas Tilahun

University of Minnesota, Department of Civil Engineering

David Matthew Levinson

University of Minnesota, Department of Civil Engineering

This paper illustrates that relationship type along with other meeting-specific and demographic variables is important in explaining the location, duration and distance traveled for social meetings. Data is collected about individuals' social meetings and the choice of in-home/out-of-home meeting locations as well as the distance traveled, the duration of out-of-home meetings, and other meeting attributes.

Review of Research on Planned and Unplanned Disruptions to Transportation Networks

Shanjiang Zhu

University of Minnesota, Department of Civil Engineering

David Matthew Levinson

University of Minnesota, Department of Civil Engineering

Major network disruptions such as the I-35W Bridge collapse disrupt habitual travel behavior. This paper reviews both theoretical and empirical studies on traffic and behavioral impacts of network disruptions. Findings from this paper offer prospective ideas about capturing the impacts of network disruption.

Poster Session 634 (cont.)

The Importance of Being Early

Pavithra Parthasarathi

University of Minnesota, Department of Civil Engineering

Anupam Srivastava

University of Minnesota, Department of Civil Engineering

Nikolas Geroliminis

Ecole Polytechnique Fédérale de Lausanne, Switzerland

David Matthew Levinson

University of Minnesota, Department of Civil Engineering

The objective of this research is to test whether the cost of being early is less than the cost of lateness by empirically observing morning commuter trips from two different sources: individual level travel survey data from six metropolitan regions and aggregate level actual traffic data from the Twin Cities freeway network.

9:30 a.m. – noon, Hilton (International Center)**Poster Session 638: Information and Communication Technology, Travel, Working and Time Use****Frank Douma (presiding)**

University of Minnesota, Humphrey Institute of Public Affairs

10:15 a.m. – noon, Marriott (Maryland B)**Session 642: Developments in Alternative Models for Road Safety**

Structural Modeling and Traffic Safety

Gary A. Davis

University of Minnesota, Department of Civil Engineering

Mechanism for Crash Causation on I-94

John Hourdos

University of Minnesota, Department of Civil Engineering

10:15 a.m. – noon, Marriott (Thurgood Marshall West)**Session 643: Finance and Technology: Is This the Future of Transportation?**

Privacy and Perception: Exploring New Options for VMT Technology

Max Donath

University of Minnesota, Department of Mechanical Engineering

10:15 a.m. – noon, Marriott (Maryland C)**Session 650: Pavement Preservation**

Assessment of Surface Treatment with Textiles for Pavement Rehabilitation and Maintenance

Lita Davis

FHWA Pavement Preservation Expert Task Group

John Miner

TenCate

The objective of this paper is to quantify the climatic areas where chip sealing over paving fabric can be done successfully and can provide a cost-effective contribution to pavement maintenance and preservation. The paper also describes the technique's economic and environmental benefits, and discusses construction materials application depending on climatic condition.

10:15 a.m. – noon, Shoreham (Ambassador)**Session 655: Factors Affecting Strength and Deformation Characteristics of Pavement Sections****Bernard Igbafen Izevbekhai (presiding)**

Minnesota Department of Transportation

10:15 a.m. – noon, Hilton (Lincoln East)**Session 663: Land Use and Travel Behavior: Policies and Their Impacts**

Access for Performance

Kevin J. Krizek

University of Colorado, Denver

David Matthew Levinson

University of Minnesota, Department of Civil Engineering

This paper urges agencies to base policy decisions on important and reliable performance measures. Focusing on accessibility—rather than congestion or mobility—produces a more complete and meaningful picture of metropolitan transport and land use. Investigators describe the use and measurement of accessibility for metropolitan areas; identify robust, concrete and practical issues; and offer prescriptions for resolving measurement issues.

10:15 a.m. – noon, Hilton (Lincoln West)**Session 667: Socioeconomic Differences, Disadvantages and Implications for Transportation**

Planners' War Against Spatial Mismatch: Past Failures and Future Promises

Yingling Fan

University of Minnesota, Humphrey Institute of Public Affairs

This paper reviews empirical studies that examine the effectiveness of existing policy interventions for helping low-income inner-city residents secure jobs and find that few policy responses fare well. Potential factors underlying the current policy failure suggest that divided and often conflicting attentions are paid to inner-city job creation, poverty deconcentration and transportation improvements without acknowledging their interconnected roles.

2:30 – 4 p.m., Marriott (Delaware A)**Session 672: Forensic Evaluation of Pavement Drainage and Infiltration Issues**

Investigation of Joint Deterioration in MnROAD Phase 1 Jointed Concrete Pavement Test Sections

Ryan J. Rohne

Minnesota Department of Transportation

Thomas R. Burnham

Minnesota Department of Transportation

Ahmed Ahmed

Minnesota Department of Transportation

After more than 13 years of live traffic, the original concrete pavement test sections on the Interstate portion of the MnROAD facility still exhibited very good performance. To extract all useful information, a comprehensive forensic investigation was conducted, focused principally on joint performance as little panel cracking had occurred.

2:30 – 4 p.m., Marriott (Thurgood Marshall North)**Session 675: Traffic Control in Oversaturated Conditions**

Identification of Oversaturated Intersections Using High-Resolution Traffic Signal Data

Xinkai Wu

University of Minnesota, Department of Civil Engineering

Henry X. Liu

University of Minnesota, Department of Civil Engineering

Douglas Gettman

Kimley-Horn & Associates Inc.

Conceptually, an oversaturated traffic intersection is one in which traffic demand exceeds capacity. However, this definition cannot be applied directly to identify oversaturated intersections since it is difficult to measure travel demand under congested conditions with fixed-location sensors. In this paper, researchers quantify the detrimental effects of oversaturation on signal operations, both temporally and spatially.

2:30 – 5 p.m., Hilton (International Center)**Poster Session 690: Innovations in Transportation Network Modeling**

Importance Measure of Network Components Under Disequilibrium and Braess Paradox

Xiaolei Guo

University of Minnesota, Department of Civil Engineering

Henry X. Liu

University of Minnesota, Department of Civil Engineering

Graph-Theoretic Approach for Dynamic System Optimum Assignment with Intersection Control

Saif Jabari

University of Minnesota, Department of Civil Engineering

Henry X. Liu

University of Minnesota, Department of Civil Engineering

Unexpected Cause, Unexpected Effect: Empirical Observations of Twin Cities Traffic Behavior After I-35W Bridge Collapse and Reopening

Adam Danczyk

University of Minnesota, Department of Civil Engineering

Henry X. Liu

University of Minnesota, Department of Civil Engineering

Sparse Solution to System-Optimal Congestion-Pricing Problem

Xiaozheng He

University of Minnesota, Department of Civil Engineering

Henry X. Liu

University of Minnesota, Department of Civil Engineering

Toll Road with Heterogeneous Users and Elastic Demand

Xiaolei Guo

University of Minnesota, Department of Civil Engineering

Hai Yang

Hong Kong University of Science and Technology

Henry X. Liu

University of Minnesota, Department of Civil Engineering

4:30 – 6 p.m., Hilton (Jefferson West)**Session 700: Impact of Information and Communication Technology on Shopping and Activities: Further Results and Methodological Developments**

Influence of E-shopping on Shopping Travel: Evidence from the Twin Cities

Xinyu (Jason) Cao

University of Minnesota, Humphrey Institute of Public Affairs

Frank Douma

University of Minnesota, Humphrey Institute of Public Affairs

Fay Cleaveland

Minnesota Department of Transportation

This research reviews the travel impacts of e-shopping in the Minneapolis-St. Paul metropolitan area. Using a sample of Internet users drawn from urban, suburban and ex-urban neighborhoods, researchers sought to identify the relationship between e-shopping and in-store shopping. Data was collected through an online survey and ordered probit models were developed to account for shopping attitudes, shopping accessibility, shopping responsibility and socio-demographics.

8 – 9:45 a.m., Hilton (Jefferson West)

Session 711: Residential Location and Travel Behavior

Exploring Connections Among Residential Location, Self-Selection and Driving: Case Study of Raleigh, North Carolina

Xinyu (Jason) Cao

University of Minnesota, Humphrey Institute of Public Affairs

Zhiyi Xu

University of Minnesota, Humphrey Institute of Public Affairs

Yingling Fan

University of Minnesota, Humphrey Institute of Public Affairs

Using 2006 data collected from a regional travel diary in Raleigh, N.C., this study applies propensity score matching to explore the effects of the regional location of residences on vehicle miles driven. Researchers found that residential location plays a much more important role in affecting driving behavior than residential self-selection.

8 – 9:45 a.m., Hilton (Lincoln East)

Session 712: Route Choice and Traffic Simulation Models

David Matthew Levinson (presiding)

University of Minnesota, Department of Civil Engineering

8 a.m. – noon, Marriott (Thurgood Marshall West)

Workshop 714: Innovations in Project Delivery and Performance Measurement: Highways for LIFE

HfL Case Study: Full Lane Closures on STH35 in Minnesota

Steve Kordosky

Minnesota Department of Transportation

Panel Discussion: Stakeholder Input, Traffic Operations Management During Construction and Performance Measurement

Byron Nelson Lord

Federal Highway Administration

Kathleen Bergeron

Federal Highway Administration

Mary Huie

Federal Highway Administration

Steve Kordosky

Minnesota Department of Transportation

TRB Committee and Panel Members

Minnesota Department of Transportation

Linda Aitken

Tribal Liaison

Committee on Native American Transportation Issues

Rabinder Bains

Senior Economist

Committee on Transportation Economics

NCHRP Project Panel on Setting Effective Performance Targets for Transportation Programs, Plans and Policy

Scott D. Bradley

Director of Context Sensitive Solutions

Design Section

Committee on Landscape and Environmental Design (**Chair**)

Task Force on Context Sensitive Design/ Solutions (CSD/CSS)

NCHRP Project Panel on Citizen's Guide and Discipline-Specific Professionals' Guide for Context-Sensitive Solutions in Transportation

Kenneth Buckeye

Value Pricing Program Manager

Committee on Congestion Pricing

NCHRP Project Panel on Performance Measurement and Evaluation of Tolling and Congestion Pricing Project Benefits and System Impacts (**Chair**)

Thomas R. Burnham

Senior Road Research Engineer

Committee on Rigid Pavement Design

Timothy R. Clyne

MnRoad Forensic Engineer

NCHRP Project Panel on Mix Design Practices for Warm Mix Asphalt Technologies

Jennifer Conover

Team Transit Project Manager

TCRP Project Panel on Design and Operation of Bus-Only Shoulder Riding on Heavily Congested Sections of Highways

Shongtao Dai

Research Operations Engineer

Committee on Characteristics of Bituminous Paving Mixtures to Meet Structural Requirements

Derrick D. Dasenbrock

Assistant Foundations Engineer

Committee on Exploration and Classification of Earth Materials

Petronella L. DeWail

Assistant State Hydraulic Engineer

NCHRP Project Panel on Development of Design Methods for In-stream Flow Control Structures

Robert Edstrom

Chief Toxicologist

NCHRP Project Panel on Sustainable Transportation Systems and Sustainability as an Organizing Principle for Transportation Agencies

Beverly Farraher

Metro Division Traffic Engineer

NCHRP Project Panel on Guidelines for Accessible Pedestrian Signals (APS)

Norman S. Foster

Interim CFO

NCHRP Project Panel on Costs of Alternative Finance Systems

Brian K. Gage

Principal Engineer

NCHRP Project Panel on Guidance for the Provision of Left-Turn Lanes at Unsignalized Intersections (**Chair**)

William D. Gardner

Director, Freight, Rail & Waterways

NCFRP Project Panel on Preserving and Protecting Freight Infrastructure and Routes

Sheila Hatchell

Director, Mn/DOT Library

Committee on Library and Information Science for Transportation

Timothy A. Henkel

Director, Division of Modal Planning and Program Management

NCHRP Project Panel on Research for AASHTO Standing Committee on Planning: Support for Improved Transportation Planning and Project Development

Jay J. Hietpas

Design-Build Program Manager

Committee on Project Delivery Methods

Bernard I. Izevbekhai

Research Operations Engineer

Committees on:

Strength and Deformation Characteristics of Pavement Sections

Surface Properties-Vehicle Interaction

Maureen R. Jensen

Manager, Road Research

Committees on:

International Activities

Subsurface Drainage

Ramankutty Kannankutty

Northwest Area Metro Engineer

Construction Section

Committees on:

Application of Emerging Technologies to Design and Construction (**Chair**)

Construction of Bridges and Structures

Utilities

Jonette R. Kreideweis

Director, Office of Transportation Data and Analysis

Data and Information Systems Section

Committee on Statewide Transportation Data and Information Systems

NCHRP Project Panel on Identifying Credible Alternatives for Producing 5-Year CTPP Data Products from the ACS

Kevin F. Leonard

IT Unit Supervisor

NCHRP Project Panel on Real Estate Data Integration for Project Delivery (Synthesis)

Susan J. Lodahl

Assistant State Maintenance Engineer

Committee on Technology Transfer

NCHRP Project Panel on Next Generation of the FHWA Transportation Pooled Fund (TPF) Web site (**Chair**)

Erland O. Lukanen

Pavement Preservation Engineer

Committees on:

Pavement Management Systems

Seasonal Climatic Effects Including Frost Action on Transportation Infrastructure

James McGraw

Director, Chemical Lab

Committee on Sealants and Fillers for Joints and Cracks

Robert Miller

Director, Facilities Program

NCHRP Project Panel on Wind, Solar and Ground-Source Energy for Maintenance Area Facilities

Mark B. Nelson

Director, Transportation Planning

NCHRP Project Panel on Optimum Life-Cycle Analysis of Maintainable Assets (**Chair**)

Roger C. Olson

Research Operations Engineer

Operations and Preservation Group

Maintenance and Preservation Section

Committees on:

Characteristics of Bituminous-Aggregate Combinations to Meet Surface Requirements

Pavement Maintenance (**Chair**)

Pavement Preservation

NCHRP Project Panels on:

Incorporating Pavement Preservation Into the MEPDG

Optimization of Tack Coat for HMA Pavements

Curt Pape

RWIS Coordinator

Committee on Surface Transportation Weather

Peggy A. Reichert

Director, Statewide Planning

Committee on Statewide Multimodal Transportation Planning

SHRP 2 Expert Task Group on Incorporating Reliability Performance Measures into the Transportation Planning and Programming Processes (Project L05)

James Allen Rosenow

State Geometrics Engineer

NCHRP Project Panel on Superelevation Criteria for Horizontal Curves on Steep Grades

John A. Siekmeier

Senior Research Engineer

Committees on:

Engineering Behavior of Unsaturated Soils

Soils and Rock Instrumentation

Julie Skallman

Director, Division of State Aid

Committee on Low-Volume Roads

Linda Taylor

Director, Research Services Section

State Representative

Curt M. Turgeon

Pavement Engineer

NCHRP Project Panel on Handbook for Pavement Design, Construction and Management

Paul G.A. Walvatne

Roadside Vegetation Management Unit

Committee on Roadside Maintenance Operations

Ryan D. Wilson

Senior Transportation Planner

Committee on Transportation Programming, Planning and Systems Evaluation

Benjamin James Worel

Mn/Road Operations Engineer

Committee on Full-Scale and Accelerated Pavement Testing

Expert Task Group on LTPP Special Activities



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