ISTTT international symposium transportation & traffic theory

NUTC ISTTT22

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Northwestern University Transportation Center

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U.S. Department of Transportation Federal Highway Administration

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JULY 23 - 26, 2017

SYMPOSIUM PROGRAM

NORTHWESTERN UNIVERSITY EVANSTON, ILLINOIS, USA

WELCOME to ISTTT22

JOIN THE CONVERSATION:

@infoNUTC

#ISTTT22

NOTES

NOTES

JULY 2017

WELCOME

Welcome to the 22nd International Symposium on Transportation and Traffic Theory (ISTTT22), and a big welcome to Northwestern, Evanston and Chicago!

Since its launch in 1959 by the late Robert Herman, the ISTTT series has remained the primary venue for advances in the theoretical and methodological aspects of the interdisciplinary field of transportation and traffic systems science. Many key concepts and methods saw their origins in these symposia and their Proceedings.

It is an exciting time for transportation research, as the field continues to grow and evolve. Theoretical developments in an applied domain like transportation are only meaningful when accompanied by observation and measurement. With advances in technologies for sensing, tracking, and otherwise observing the behaviour of people and vehicles, our ability to characterize and model fundamental phenomena and processes in transportation continues to expand. At the same time, our ability to manage and control transportation systems and services increases, giving rise to further challenges in modelling and optimization of these systems. The opportunities of connected vehicle systems, and the advent of autonomous vehicles, also challenge our community to model and predict the operational and strategic implications of these technologies, and to imagine and design new mobility services. Realizing the opportunities, and avoiding potential pitfalls, require development of a solid fundamental base of scientific knowledge and advanced methodologies. The ISTTT series reflects some of the most essential work taking place in the world's leading institutes on the science of traffic and transportation, and presents a view of the rich influences permeating the field.

36 papers have been selected for lectern presentation following a rigorous four-stage refereeing process. In the first stage, nearly 350 extended abstracts were reviewed by up to four members of the scientific and organizing committees, resulting in 117 invitations to submit full papers. The second stage entailed the review of each of the 102 submitted full papers by two to five internationally recognized scholars. Based on that process, 60 papers were retained for revision, and another round of full-paper refereeing. A final review by the three co-editors resulted in the selection of 36 for lectern presentation, and another 21 for poster presentation.

In addition to technical excellence, the ISTTT has also fostered a community of scholars who inspire, and learn from, each other. These gatherings are thus an opportunity to renew friendships and professional associations, and make new ones.

We would like to thank each of you for attending our conference and bringing your expertise to this gathering. We hope you will come away with a renewed sense of interest and excitement, as well as new ideas for addressing the future of transportation.

Hani Mahmassani - Northwestern University
Yu (Marco) Nie - Northwestern University
Karen Smilowitz - Northwestern University

IAC & ISTTT

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JULY 26, 2017

WEDNESDAY

AFTERNOON

1:15 PM - 2:00 PM — **Closing Session** - McCormick Auditorium (1st floor)
Session Chair: William Lam

2:00 PM - 2:15 PM — **Coffee Break** - Dittmar Gallery (1st floor)

2:15 PM — **SPECIAL EVENT: Joint Sessions in Chicago w/ 2017 INFORMS Transportation Science & Logistics (TSL) Society Conference attendees**

(Bus departs from Norris University Center @ 2:15 PM / returns @ 7:15 PM)

3:15 PM - 5:15 PM — **TSL Joint Session** - Prentice Women's Hospital (Chicago)
250 East Superior Street, 3rd Floor (Room "L"), Chicago
Session Chair: Karen Smilowitz

Planning reliable service facilities under continuous traffic equilibrium and disruption risks
- Zhaodong Wang, Yanfeng Ouyang

Logistical challenges and operations research solutions at mass participation events
- Karen Smilowitz, Mehmet Basdere, Sanjay Mehrotra, George Chiampas, Jennifer Chan, Mike Nishi

Design and Control of Driverless Fleets of Electric Vehicles using Approximate Dynamic Programming
- Warren Powell, Andy Deng, Lina Al Kanj, Alain Kornhauser

From 'No Data' to 'Some Data' to 'Big Data': Towards a Cyber-Physical System for Proactive Traffic Management
- Pitu Mirchandani, Kerem Demirtas, Viswanath Potluri

5:30 PM - 7:00 PM — **TSL Reception** - Loyola University (Chicago)
Quinlan Business School - 16 East Pearson Street, Chicago

(Bus returns to Orrington Hotel @ 7:15 PM from Loyola University)

NOTE: Dinner on your own

JULY 26, 2017

WEDNESDAY

MORNING

7:30 AM - 8:00 AM Continental Breakfast - Gathering Place (ground level)

8:00 AM - 10:00 AM SESSION 9: Idealized Bottleneck Theories - McCormick Auditorium (1st floor)
Session Chair: Karen Smilowitz

Pareto-improving policies for an idealized two-zone city served by two congestible modes
- Shu-Xian Xu, Ronghui Liu, Tian-Liang Liu, Hai-Jun Huang

Day-to-day departure time choice under bounded rationality in the bottleneck model
- Ren-Yong Guo, Hai Yang, Hai-Jun Huang, Xinwei Li

Departure Time and Route Choices with Bottleneck Congestion: User Equilibrium under Risk and Ambiguity
- Yang Liu, Yuanyuan Li, Lu Hu

The morning commute in urban areas with heterogeneous trip lengths
- Raphaël Lamotte, Nikolas Geroliminis

10:00 AM - 10:15 AM Coffee Break - Dittmar Gallery (1st floor)

10:15 AM - 12:15 PM SESSION 10: Network Management & Traffic Control - McCormick Auditorium (1st floor)
Session Chair: Alex Skabardonis

Adaptive offsets for signalized streets
- Carlos F. Daganzo, Lewis J. Lehe, Juan Argote-Cabanero

An optimization modeling of coordinated traffic signal control based on the variational theory and its stochastic extension
- Kentaro Wada, Kento Usui, Tsubasa Takigawa, Masao Kuwahara

An Optimization Approach for Deriving Upper and Lower Bounds of Transportation Network Vulnerability under Simultaneous Disruptions of Multiple Links
- Xiangdong Xu, Anthony Chen, Chao Yang

Capturing Value of Reliability through Road Pricing in Congested Traffic under Uncertainty
- Shanjiang Zhu, Gege Jiang, Hong K. Lo

12:15 PM - 1:15 PM Lunch Break - Gathering Place (ground level)

ISTTT22

MEMBERS & CO-CHAIRS

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ISTTT22 CO-CHAIRS

Hani Mahmassani - Northwestern University
Yu (Marco) Nie - Northwestern University
Karen Smilowitz - Northwestern University

SCHEDULE & LOCATION

WEDNESDAY
July 26, 2017

JULY 25, 2017

TUESDAY

AFTERNOON

1:00 PM - 2:30 PM SESSION 7: Travel Demand & Activity Models - McCormick Auditorium (1st floor)
Session Chair: Patricia Mokhtarian

A Decade of Dynamics of Residential Location, Car Ownership, Activity, Travel and Land Use in the Seattle Metropolitan Region
- Jae Hyun Lee, Konstadinos G. Goulias

A Utility-based Dynamic Demand Estimation Model that Explicitly Accounts for Activity Scheduling and Duration
- Guido Cantelmoa, Francesco Viti, Ernesto Cipriani, Marialisa Nigro

Models of Count with Endogenous Choices
- Roger B. Chen

2:30 PM - 2:45 PM Coffee Break - Dittmar Gallery (1st floor)

2:45 PM - 4:15 PM SESSION 8: Macroscopic Flow Models - McCormick Auditorium (1st floor)
Session Chair: Michael Cassidy

Macroscopic Fundamental Diagram for pedestrian networks: theory and applications
- Serge P. Hoogendoorn, Winnie Daamen, Victor L. Knoop, Jeroen Steenbakkers, Majid Sarvi

An analytical framework to model uncertainty in urban network dynamics using Macroscopic Fundamental Diagrams
- Xueyu (Shirley) Gao, Vikash V. Gayah

Minimal Parameter Formulations of the Dynamic User Equilibrium using Macroscopic Urban Models: Freeway vs City Streets Revisited
- Jorge A. Laval, Ludovic Leclercq, Nicolas Chiabaut

5:00 PM - 10:00 PM SPECIAL EVENT: Lake Michigan Dinner Cruise
Dress Code: Business Casual
(please no jeans, t-shirts, athletic shoes or flip-flops)

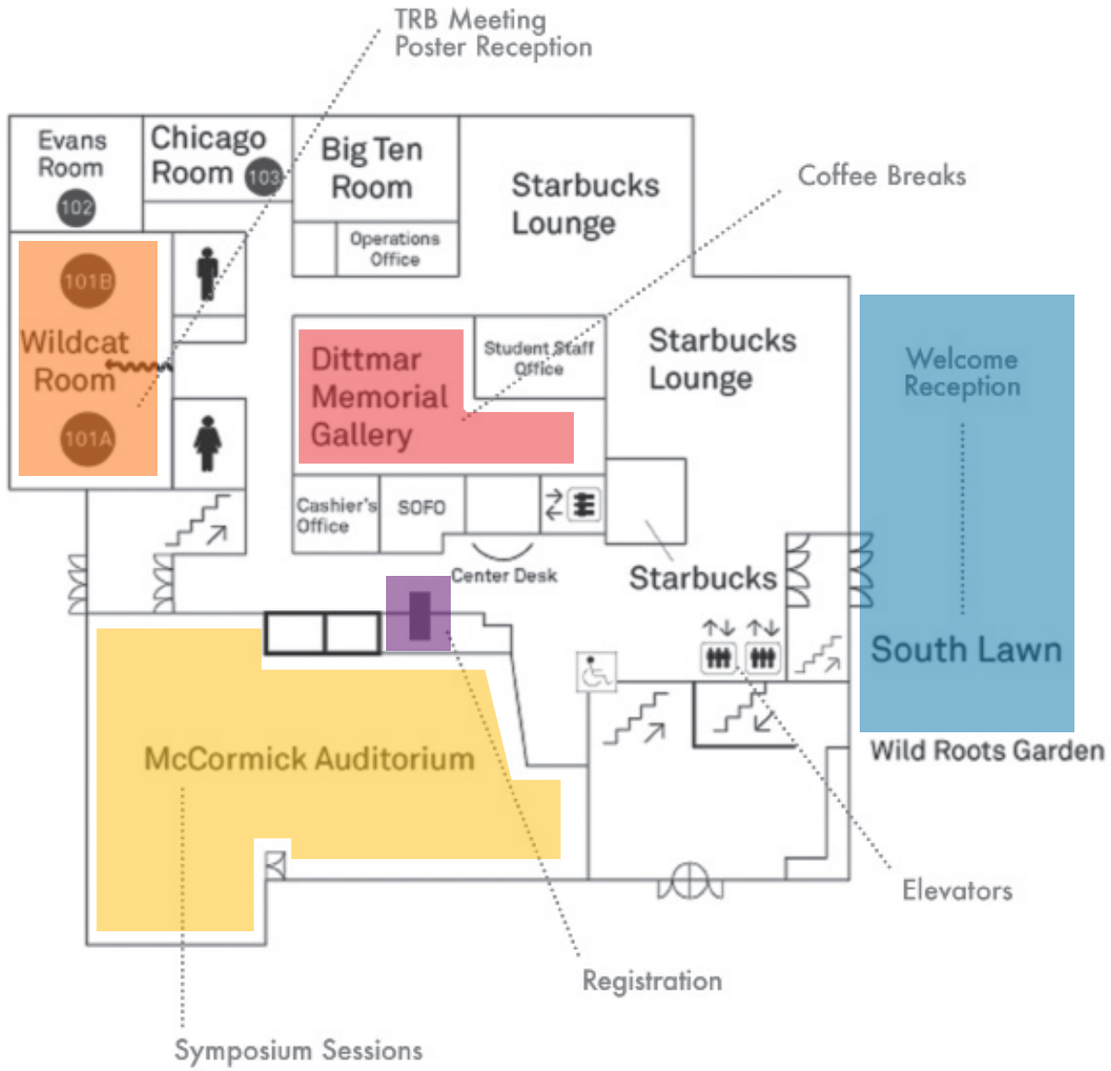
(Bus departs from Orrington Hotel @ 5PM / returns @ 10PM)



NORRIS UNIVERSITY CENTER

1999 Campus Drive, Evanston, IL 60208

1st Floor



JULY 25, 2017

TUESDAY

MORNING

7:30 AM - 8:00 AM Continental Breakfast - Gathering Place (ground level)

8:00 AM - 10:00 AM SESSION 5: Dynamic Network Models - McCormick Auditorium (1st floor)
Session Chair: Yu (Marco) Nie

Statistical metamodeling of dynamic network loading
- Wenjing Song, Ke Han, Yiou Wang, Terry Friesz, Enrique Del Castillo

On the uniqueness of equilibrated dynamic traffic flow patterns in unidirectional networks
- Takamasa Iryo, Michael J. Smith

First-Best Dynamic Assignment of Commuters with Endogenous Heterogeneities in a Corridor Network
- Minoru Osawa, Haoran Fu, Takashi Akamatsu

The discrete-time second-best dynamic road pricing scheme
- Linghui Han, David Z.W. Wang, Chengjuan Zhu

10:00 AM - 10:15 AM Coffee Break - Dittmar Gallery (1st floor)

10:15 AM - 12:15 PM SESSION 6: Transit Planning & Operations - McCormick Auditorium (1st floor)
Session Chair: Joseph Schofer

Integrated Public Transport Timetable Synchronization and Vehicle Scheduling with Demand Assignment: A Bi-objective Bi-level Model Using Deficit Function Approach
- Tao Liu, Avishai (Avi) Ceder

Inferring Left Behind Passengers in Congested Metro Systems from Automated Data
- Yiwen Zhu, Haris N. Koutsopoulos, Nigel H.M. Wilson

Stochastic dynamic switching in fixed and flexible transit services as market entry-exit real options
- Qian-Wen Guo, Joseph Y.J. Chow, Paul Schonfeld

Fair Dynamic Resource Allocation in Transit-based Evacuation Planning
- Soheila Aalami, Lina Kattan

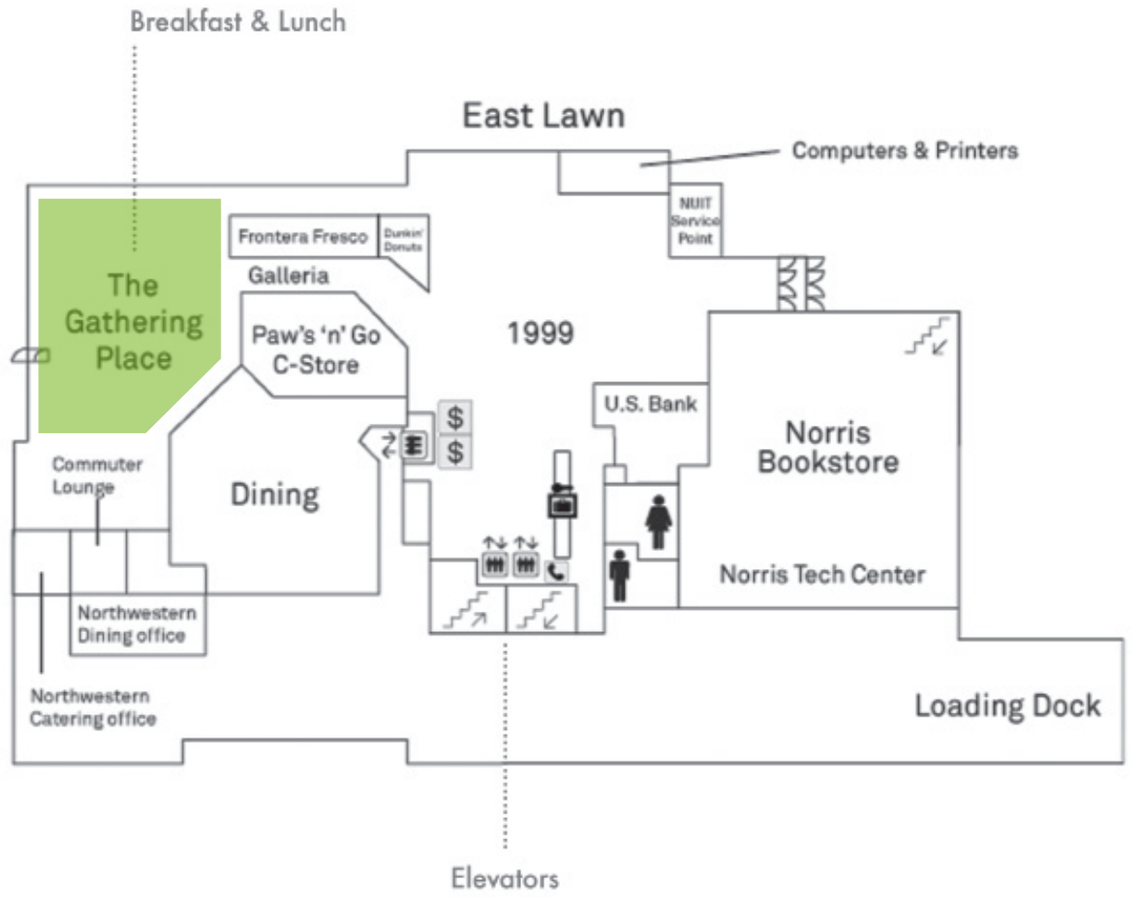
12:15 PM - 1:00 PM Lunch Break - Gathering Place (ground level)

TUESDAY
July 25, 2017

NORRIS UNIVERSITY CENTER

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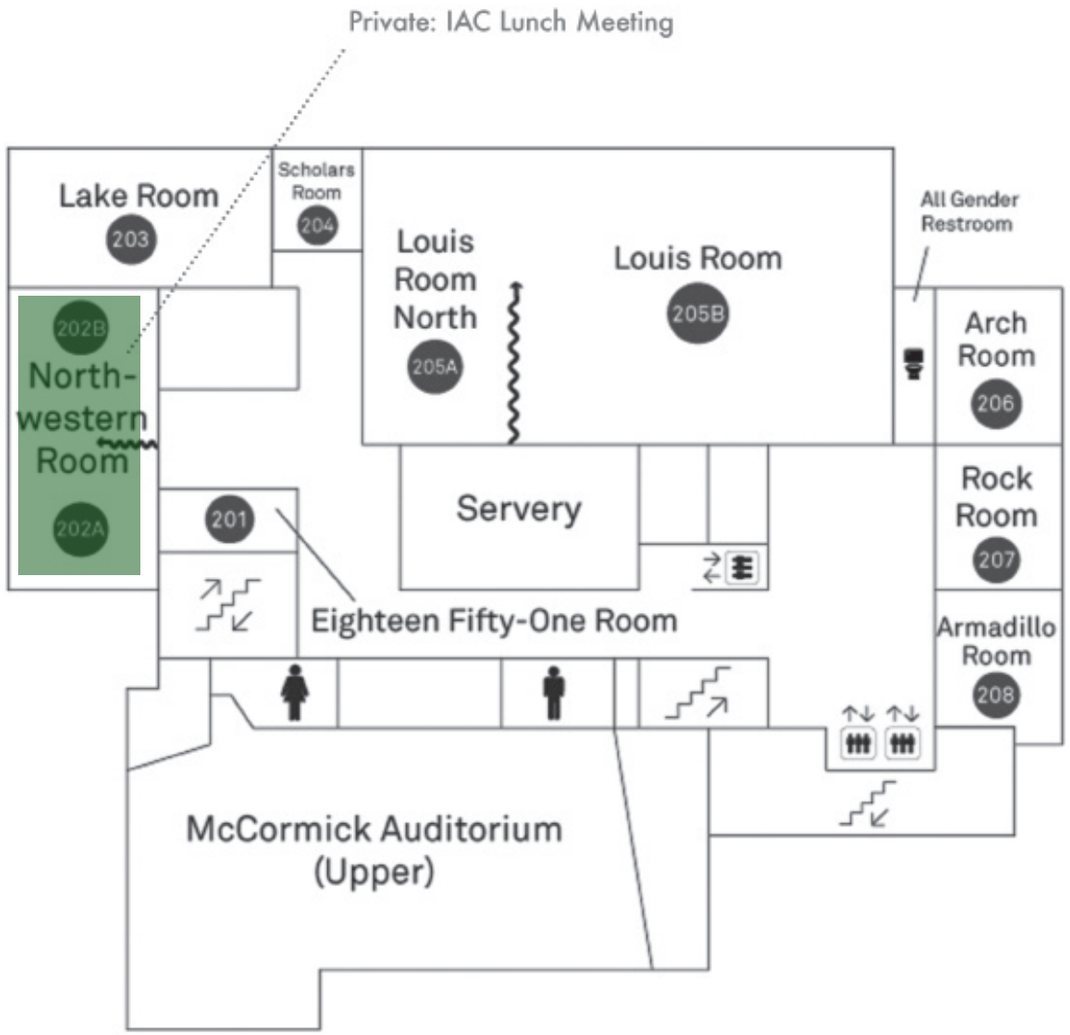
Ground Level



NORRIS UNIVERSITY CENTER

1999 Campus Drive, Evanston, IL 60208

2nd Floor



JULY 24, 2017

MONDAY

AFTERNOON

1:30 PM - 3:30 PM SESSION 3: Vehicular & Pedestrian Traffic Flow - McCormick Auditorium (1st floor)
Session Chair: Yanfeng Ouyang

Unifiable multi-commodity kinematic wave model
- Wen-Long Jin

Experimental & Empirical Investigations of Traffic Flow Instability
- Rui Jiang, Cheng-Jie Jin, H.M. Zhang, Yong-Xian Huang, Jun-Fang Tian, Wei Wang, Mao-Bin Hu, Hao Wang, Bin Jia

The Intelligent Driver Model with Stochasticity - New Insights Into Traffic Flow Oscillations
- Martin Treiber, Arne Kesting

Data-driven spatio-temporal discretization for pedestrian flow characterization
- Marija Nikolić, Michel Bierlaire

3:30 PM - 3:45 PM Coffee break - Dittmar Gallery (1st floor)

3:45 PM - 5:15 PM SESSION 4: Location & Scheduling - McCormick Auditorium (1st floor)
Session Chair: Ian Savage

Locating urban and regional container terminals in a competitive environment: An entropy maximising approach
- Collins Teye, Michael G.H. Bell, Michiel C.J. Bliemer

Reliable Sensor Location for Object Positioning and Surveillance via Trilateration
- Kun An, Siyang Xie, Yanfeng Ouyang

Coordination of scheduling decisions in the management of airport airspace and taxiway operations
- Marcella Samà, Andrea D'Ariano, Francesco Corman, Dario Pacciarelli

5:30 PM - 7:00 PM SPECIAL EVENT: Poster Presentations - Wildcat Room (1st floor)
Session Co-Chairs: Amanda Stathopoulos & Pablo Durango-Cohen

Reception - Dittmar Gallery (1st floor)

NOTE: Dinner on your own

JULY 24, 2017

MONDAY

MORNING

7:30 AM - 5:00 PM ISTTT22 Registration Open - McCormick Auditorium (1st floor)

7:30 AM - 8:00 AM Continental Breakfast - Gathering Place (ground level)

8:00 AM - 8:30 AM Opening Remarks - McCormick Auditorium (1st floor)

8:30 AM - 10:00 AM SESSION 1: Shared Mobility Operations - McCormick Auditorium (1st floor)
Session Chair: Michael Bell

Surge Pricing and Labor Supply in Ride-Sourcing Market
- Liteng Zha, Yuchuan Du, Yafeng Yin

A car sharing auction with temporal-spatial OD connection conditions
- Yusuke Hara, Eiji Hato

Dynamic modeling and control of taxi services in large-scale urban networks: A macroscopic approach
- Mohsen Ramezani, Mehdi Nourinejad

10:00 AM - 10:15 AM Coffee Break - Dittmar Gallery (1st floor)

10:15 AM - 12:15 PM SESSION 2: Connected & Autonomous Vehicles - McCormick Auditorium (1st floor)
Session Chair: Nigel Wilson

Accurate and Cost-Effective Traffic Information Acquisition using Adaptive Sampling: Centralized and V2V Schemes
- Shiau Hong Lim, Yeow Khiang Chia, Laura Wynter

Effect of Information Availability on Stability of Traffic Flow: Percolation Theory Approach
- Alireza Talebpour, Hani S. Mahmassani, Samer H. Hamdar

Multi-scale Perimeter Control Approach in a Connected-Vehicle Environment
- Kaidi Yang, Nan Zheng, Monica Menendez

A capacity maximization scheme for intersection management with automated vehicles
- Weili Sun, Jianfeng Zheng, Henry X. Liu

11:45 AM - 2:00 PM PRIVATE: IAC Lunch Meeting - Northwestern Room (2nd floor)

12:15 PM - 1:30 PM Lunch break - Gathering Place (ground level)

JULY 23, 2017

SUNDAY

PRE-CONFERENCE

10:30 AM - 12:00 PM	TRB Traffic Flow Theory Committee Meeting - Wildcat Room 101 (1st floor)
12:30 PM - 7:00 PM	ISTTT22 Registration Open - McCormick Auditorium (1st floor)
2:00 PM - 5:00 PM	Pre-Conference Workshop: NUTC / FHWA - McCormick Auditorium (1st floor) *Getting There From Here: Traffic Modeling, Data Streams, and Prediction for Connected Vehicle Systems Planning and Operations*
6:00 PM - 10:00 PM	SPECIAL EVENT: ISTTT22 Welcome Reception & BBQ - Norris University Center (south lawn)* **Rain Location: Starbucks Lounge / Dittmar Gallery / Wildcat Room*

MONDAY
July 24, 2017