

27th Annual CTS

TRANSPORTATION RESEARCH CONFERENCE

Curiosity. Discovery. Innovation.

FINAL PROGRAM

November 3, 2016

The Commons Hotel
East Bank Campus
Minneapolis, MN

cts.umn.edu/events/conference



**CENTER FOR
TRANSPORTATION STUDIES**
UNIVERSITY OF MINNESOTA

Welcome to the Conference

The Center for Transportation Studies is pleased to present its 27th Annual Transportation Research Conference and welcomes you to the University of Minnesota campus. The conference convenes researchers and practitioners from Minnesota and the Upper Midwest to highlight new learning, emerging ideas, and the latest innovations in transportation. Concurrent session topics align with the Center's research emphasis areas—Transportation Safety and Traffic Flow, Transportation Infrastructure, Transportation Planning and the Economy, Environment and Energy in Transportation, and Transportation Education and Engagement.

Reception

A reception with hors d'oeuvres and a cash bar will take place following the final concurrent sessions, offering attendees further opportunity to socialize with fellow participants and presenters.

Conference Presentations Online

PowerPoint presentations for which we receive permission from presenters to post will be available in PDF format approximately one week following the conference. These presentations will be available at: cts.umn.edu/events/conference/2016.

Conference Credit

Professional Development Hours (PDH)

This conference awards up to 6.5 PDHs. A credit form is included in your conference folder.

AICP Maintenance Credits

This conference has been approved for 12.25 AICP maintenance credits. A complete list of sessions approved for credit is included in your conference folder, on the conference website and in the program schedule.

Twitter and Facebook

To participate in Twitter conversations around this year's Research Conference, please add the hashtag #ctsresconf to your tweets. For the latest news and events from the Center for Transportation Studies, follow @UMNCTS on Twitter and like us on Facebook at facebook.com/UMNCTS.

Mobile App

Enhance your conference experience by downloading the conference app on your iPhone or Android device. With the app you can:

- View the conference program
- View conference abstracts
- Engage in Twitter conversations
- Upload conference photos
- Keep track of AICP credits and PDHs

To get the guide for iOS and Android users: Download 'Guidebook' from the Apple App Store or the Android Marketplace, search for "CTS Transportation Research Conference" or scan the following image using Guidebook's QR Code reader:



Wireless Access

Conference attendees can access free wireless Internet by selecting "Commons Convention" from the list of networks and entering password: CTS16.

Keynote Presentations

Creating Sustainable, Livable, Forward-Compatible Cities for Economic Resilience

Thursday, November 3, 2016: 8:30–10:15 a.m.



Gabe Klein
author, *Start-up City: Inspiring Private and Public Entrepreneurship, Getting Projects Done, and Having Fun*

Cities at different stages of development all grapple with managing the traditional challenges of transportation, infrastructure financing, housing, and environmental sustainability. These complexities are further compounded by rapidly changing modes of operation, new and disruptive technologies, and changing expectations and demands from citizens and business. What innovations are taking place in cities these days, and how can government, business, and nonprofit leaders utilize this wave of change to shape a quality of life that is improved and not compromised? How can they work together—instead of at cross-purposes?

Gabe Klein will discuss the larger macro trends in society and address process innovation and governance. He will also share how city leaders are reorganizing their urban systems to be synergistic rather than at odds with one another and the cities's goals. High-return public-private partnerships, active transportation, and enhanced public space projects all play a role in the ideal city of the future.

Following Klein's presentation, a panel of experts will share perspectives on the implications for the future of transportation systems in Minnesota cities.

Panelists include: *Mayor Ardeell Brede*, City of Rochester; *Mayor Chris Coleman*, City of Saint Paul; *Anu Ramaswami*, Humphrey School of Public Affairs, University of Minnesota

Copies of Gabe Klein's book, *Start-up City: Inspiring Private and Public Entrepreneurship, Getting Projects Done, and Having Fun*, will be on sale in the Meridian Foyer. Mr. Klein will be available for signing after his presentation.

How to Promote and Prepare for Automated Driving

Thursday, November 3, 2016: 11:45 a.m.–1:30 p.m.



Bryant Walker Smith
Assistant Professor,
School of Law,
University of South Carolina

Bryant Walker Smith will outline steps that governments can take to encourage the development, deployment, and use of automated driving systems. Built on a solid understanding of the related technologies, applications, and existing legal infrastructure, these steps include key administrative, legal, and community strategies that focus as much on today's problems as tomorrow's solutions.

Following his presentation during the Luncheon General Session, Bryant Walker Smith will be joining the panel in Session 5: Q&A on Connection & Autonomous Vehicle Technology & Policy to continue the conversation around preparing for automated vehicles.

Join the Conversation



Tweet [#ctsresconf](#) and follow [@UMNCTS](#)



Follow [facebook.com/UMNCTS](#)



Download **Guidebook** and search for **CTS Transportation Research Conference**



Program At-a-Glance



Thursday, November 3, 2016

7:30–8:30 a.m.	Registration and Buffet Breakfast Meridian Foyer			
8:30–10:15 a.m.	Welcome – Meridian Ballroom <i>Laurie McGinnis</i> , Director, Center for Transportation Studies Keynote Presentation Creating Sustainable, Livable, Forward-Compatible Cities for Economic Resilience <i>Gabe Klein</i> , author, <i>Start-up City: Inspiring Private and Public Entrepreneurship, Getting Projects Done, and Having Fun</i> Mr. Klein will be available for book-signing after his presentation.			
10:15–10:30 a.m.	Break – Meridian Foyer			
10:30–11:45 a.m.	Session 1 Roadway Safety Summit Room	Session 2 Transit: It's Not Just About Moving People Pinnacle Ballroom	Session 3 Growing the Transportation Workforce in Minnesota Meridian Ballroom, Section 4	Session 4 Curtailing Congestion Pathways Room
11:45 a.m.–1:30 p.m.	Luncheon and Presentation – Meridian Ballroom How to Promote and Prepare for Automated Driving <i>Bryant Walker Smith</i> , Assistant Professor, School of Law, University of South Carolina			
1:30–1:45 p.m.	Break – Meridian Foyer			
1:45–3:00 p.m.	Session 5 Q&A on Connection & Autonomous Vehicle Technology & Policy Pinnacle Ballroom	Session 6 Looking at the Bigger Picture: Multimodal Visualization and Mapping Summit Room	Session 7 Advancing Sustainable Transportation and Community-Engaged Learning Meridian Ballroom, Section 4	Session 8 Pioneering Pavements and Maintenance: The Future of Minnesota's Roads Pathways Room
3:00–3:15 p.m.	Break – Meridian Foyer			
3:15–4:30 p.m.	Session 9 Technology and Safety Summit Room	Session 10 Economic Impacts of Different Modes Meridian Ballroom, Section 4	Session 11 A Model Discussion: Linking Creative Environmental Justice and Title VI Analysis to Equity and Community Engagement Pinnacle Ballroom	Session 12 Roadside Maintenance and the Environment Pathways Room
4:30–5:30 p.m.	Reception with Hors d'Oeuvres and Cash Bar Meridian Foyer			

Program Schedule

7:30–8:30 a.m.

Registration and Buffet Breakfast
(Meridian Foyer)

8:30–10:15 a.m.

Welcome
(Meridian Ballroom)

Laurie McGinnis, Director, Center for Transportation Studies, University of Minnesota

Keynote Presentation

Creating Sustainable, Livable, Forward-Compatible Cities for Economic Resilience

Gabe Klein, author, *Start-up City: Inspiring Private and Public Entrepreneurship, Getting Projects Done, and Having Fun*

Approved for AICP credit

Cities at different stages of development all grapple with managing the traditional challenges of transportation, infrastructure financing, housing, and environmental sustainability. These complexities are further compounded by rapidly changing modes of operation, new and disruptive technologies, and changing expectations and demands from citizens and business. What innovations are taking place in cities these days, and how can government, business, and nonprofit leaders utilize this wave of change to shape a quality of life that is improved and not compromised? How can they work together—instead of at cross-purposes? This session will discuss the larger macro trends in society and address

process innovation and governance. How city leaders are reorganizing their urban systems to be synergistic rather than at odds with one another will also be explored. High-return public-private partnerships, active transportation, and enhanced public space projects all play a role in the ideal city of the future.

Following Mr. Klein's presentation, a panel of experts will share their perspectives on the implications for the future of the Minnesota cities transportation systems.

Panelists include: *Mayor Ardele Brede*, City of Rochester; *Mayor Chris Coleman*, City of Saint Paul; *Anu Ramaswami*, Humphrey School of Public Affairs, University of Minnesota

Copies of Gabe Klein's book, *Start-up City: Inspiring Private and Public Entrepreneurship, Getting Projects Done, and Having Fun*, will be on sale in the Meridian Foyer. Mr. Klein will be available for signing after his presentation.

10:15–10:30 a.m.

Break
(Meridian Foyer)

10:30–11:45 a.m.

Concurrent Sessions

Session 1: Roadway Safety

(Summit Room)

Moderator: *Tom Sohrweide*, SEH, Inc.

Performance-Based Superelevation Transition Design

James Rosenow, Minnesota Department of Transportation

Spreadsheet Tool for Time-of-Day Use of Flashing Yellow Arrows

Vahid Moshtagh, SRF Consulting Group, Inc.

Safety Performance Functions for Permitted Left-Turn Crashes Based on Different Crash Databases

Vahid Moshtagh, SRF Consulting Group, Inc.

Session 2: Transit: It's Not Just About Moving People

(Pinnacle Ballroom)
Approved for AICP credit

Moderator: *Lyssa Leitner*, Washington County

Improving Transit Safety and Efficiency Using Open-Source Analytics and Visualization Tools

Joel Huting, Metro Transit

Network Modeling: Ridership on the Twin Cities Transit Network Before and After METRO Green Line Implementation

Jacqueline Nowak, College of Science and Engineering, University of Minnesota

When and How Much Did the Green Line LRT Increase Residential Property Values in St. Paul, Minnesota?

Shengnan Lou, Humphrey School of Public Affairs, University of Minnesota

Session 3: Growing the Transportation Workforce in Minnesota

(Meridian Ballroom, Section 4)
Approved for AICP credit

Moderator: *Stephanie Malinoff*, Center for Transportation Studies, University of Minnesota

According to a recent federal report, transportation-related employers will need to hire and train a total of 4.6 million new workers—1.2 times the current transportation workforce—due to expected growth, retirements, and turnover in the transportation industry from 2012 to 2022. Is Minnesota ready to answer this need? This session will highlight workforce development initiatives underway in Minnesota at both the state and local levels. Panelists will briefly describe programs currently underway to help meet this workforce demand, and time will be allocated for audience discussion with the panelists following their presentations.

Panelists: *Liz Grzechowiak*, Concessions & Business Development, Metropolitan Airports Commission; *Gary Courtney*, Office of Equal Opportunity, Metropolitan Council; *Desiree Doud and Jessica Etukudo*, Minnesota Department of Transportation; *Don Theisen*, Public Works, Washington County

Join the Conversation



Tweet [#ctsresconf](#) and follow [@UMNCTS](#)



Follow [facebook.com/UMNCTS](#)



Download **Guidebook** and search for **CTS Transportation Research Conference**



Session 4: Curtailing Congestion

(Pathways Room)

Moderator: *Nick Thompson*, WSP | Parsons Brinckerhoff

Massive GPS Travel Pattern Data for Urban Congestion Relief in the Twin Cities

Paul Morris, SRF Consulting Group, Inc.

Clogged Arteries: Empirical Analysis of Highway Congestion

Vivek Sakhrani, Canadian Pacific Consulting Services

A Framework for Evaluating Dynamic Methods of Multimodal Arterial Traffic Control

Ted Morris, Computer Science and Engineering, University of Minnesota

11:45 a.m.–1:30 p.m.

Luncheon and Presentation
(Meridian Ballroom)

Keynote Presentation

How to Promote and Prepare for Automated Driving

Bryant Walker Smith, Assistant Professor, School of Law, University of South Carolina

Approved for AICP credit

This presentation will outline steps that governments can take to encourage the development, deployment, and use of automated driving systems. Built on a solid understanding of the related technologies, applications, and existing legal infrastructure, these steps include key administrative, legal, and community strategies that focus as much on today's problems as tomorrow's solutions.

1:30–1:45 p.m.

Break
(Meridian Foyer)

1:45–3:00 p.m.

Concurrent Sessions

Session 5: Q&A on Connection & Autonomous Vehicle Technology & Policy

(Pinnacle Ballroom)
Approved for AICP credit

Moderator: *Philip Schaffner*, Minnesota Department of Transportation

This session will be an exploration on the technical and broader policy perspectives of connected vehicles and autonomous vehicles.

Panelists: *Bryant Walker Smith*, University of South Carolina; *Imran Hayee*, Electrical Engineering, University of Minnesota Duluth; *Ken Buckeye*, Minnesota Department of Transportation; *Frank Douma*, Humphrey School of Public Affairs, University of Minnesota

Session 6: Looking at the Bigger Picture: Multimodal Visualization and Mapping

(Summit Room)
Approved for AICP credit

Moderator: *Jacob Achtemeier*, HumanFIRST Laboratory, University of Minnesota

Industry Clusters, Supply Chains, and the Freight Economy

Lee Munnich, Humphrey School of Public Affairs, University of Minnesota

Mapping Bicycle and Pedestrian Crashes of St. Paul (and Greater Minnesota)

Rebecca Barney, District Council Collaborative/Minnesota Department of Transportation/University of Minnesota/U-Spatial

Session 7: Advancing Sustainable Transportation and Community-Engaged Learning Through the Resilient Communities Project

(Meridian Ballroom, Section 4)
Approved for AICP credit

Moderator: *Mike Greco*, Center for Urban and Regional Affairs, University of Minnesota

The Resilient Communities Project (RCP) is a highly successful, cross-disciplinary program at the University of Minnesota that supports one-year partnerships between the university and local government agencies in Minnesota, facilitating faculty-supervised course-based projects that address community-identified environmental, social, economic, and transportation issues and needs. This session will feature a panel discussing their firsthand experience working with RCP. Panelists will describe the program model; discuss strategies, challenges, and lessons learned for incorporating RCP projects in the classroom; and explore the community benefits and impacts of RCP partnerships.

Panelists: *John Gulliver*, Department of Civil, Environmental and Geo-Engineering, University of Minnesota;

James Wheeler, Department of Architecture, University of Minnesota; *Sarah Sularz*, Graduate of Department of Landscape Architecture, University of Minnesota; *Tyler Olsen*, Graduate of Department of Civil, Environmental and Geo-Engineering, University of Minnesota; *Nate Kabat*, City of Chaska

Session 8: Pioneering Pavements and Maintenance: The Future of Minnesota's Roads

(Pathways Room)

Moderator: *Mark Maloney*, City of Shoreview

Winter Maintenance Assessment Tool (WMA_t)

Connie Fortin, Fortin Consulting, Inc.

Nondestructive Evaluation of Bituminous Compaction Uniformity: GPR Technologies to Enhance Quality Control on Asphalt Pavements

Lev Khazanovich, Department of Civil, Environmental, and Geo-Engineering, University of Minnesota

An Overview of Recent Taconite-Based Repair and Pavement Preservation Applications: Innovative Pavement Repair and Patching Project and Alaska Glenn Highway Sand Seal Project

Lawrence Zanko, Natural Resources Research Institute, University of Minnesota Duluth

Join the Conversation



Tweet [#ctsresconf](#) and follow [@UMNCTS](#)



Follow [facebook.com/UMNCTS](#)



Download **Guidebook** and search for **CTS Transportation Research Conference**



3:15–4:30 p.m.
Concurrent Sessions

Session 9: Technology and Safety

(Summit Room)

Moderator: *Dan Rowe*, Minnesota Department of Transportation

Truck Rollover Warning Systems Evaluation
Tom Sohrweide, SEH Inc.

Collision Avoidance System on an Instrumented Bicycle
Woongsun Jeon and Rajesh Rajamani, Department of Mechanical Engineering, University of Minnesota

Rural Intersection Collision Warning System (RICWS) Evaluation and Design Investigation
Disi Tian, HumanFIRST Laboratory, University of Minnesota

Session 10: Economic Impacts of Different Modes

(Meridian Ballroom, Section 4)
Approved for AICP credit

Moderator: *Jonathan Ehrlich*, Metropolitan Council

Manufacturers's Perspectives on Minnesota's Transportation System: Summary Results from South, Central, and Northwest Minnesota
Donna Koren, Minnesota Department of Transportation

Estimating the Economic Impact of the Health Benefits Associated with Bicycle Commuting

Xinyi Qian, Tourism Center, University of Minnesota

Modeling Park-and-Ride Location Choice of Heterogeneous Commuters
Alireza Khani, Department of Civil, Environmental, and Geo-Engineering, University of Minnesota

Session 11: A Modal Discussion: Linking Creative Environmental Justice and Title VI Analysis to Equity and Community Engagement Through the Minnesota Freight Plan

(Pinnacle Ballroom)
Approved for AICP credit

Moderator: *Wanda Kirkpatrick*, Metropolitan Council

Title VI of the Civil Rights Act and Executive Order 12898 define the populations that federal actions cannot have a disproportionately high adverse effect on or discriminate against. But how can we more creatively analyze Title VI and Environmental Justice concepts in order to create a more equitable state and region? This session will feature a presentation on how the Minnesota Freight Plan considered Environmental Justice and will then host a multimodal panel discussion.

Panelists: *Chris Ryan*, SRF Consulting Group, Inc.; *John Tompkins*, Minnesota Department of Transportation; *Cyndi Harper*, Metro Transit; *Jansa Hadzic*, Minnesota Department of Transportation; *Anita Urvina*, Richardson, Richter, and Associates, Inc.

Session 12: Roadside Maintenance and the Environment

(Pathways Room)

Moderator: *Andy Golfis*, System G Inc.

Treatment of Runoff with Roadside Drainage Ditches
Maria Garcia-Serrana, St. Anthony Falls Laboratory, University of Minnesota

Iron-Enhanced Ditch Checks in Roadside Drainage Ditches Can Mitigate Runoff
Poornima Natarajan, St. Anthony Falls Laboratory, University of Minnesota

Developing Sustainable Turfgrass Mixtures for Roadsides in Minnesota
Eric Watkins, Department of Horticultural Science, University of Minnesota

4:30–5:30 p.m.
Reception Hors d'Oeuvres and Cash Bar
(Meridian Foyer)

Planning Committee

Amber Cameron, University of Minnesota
Frank Douma, University of Minnesota
Jonathan Ehrlich, Metropolitan Council
Cathy French, University of Minnesota
Steve Gentry, Metropolitan Airports Commission
Andy Golfis, System G Inc.
Lyssa Leitner, Washington County
Mark Maloney, City of Shoreview
Nichole Morris, University of Minnesota
Tom Sohrweide, SEH, Inc.

Mark Your Calendar

Toward Zero Deaths Conference
November 16–17, 2016
Duluth Convention Center, Duluth, Minnesota

2017 CTS Research Conference
October 2, 2017
The Commons Hotel, Minneapolis, Minnesota

Join the Conversation



Tweet #ctsresconf
and follow @UMNCTS



Follow
facebook.com/UMNCTS

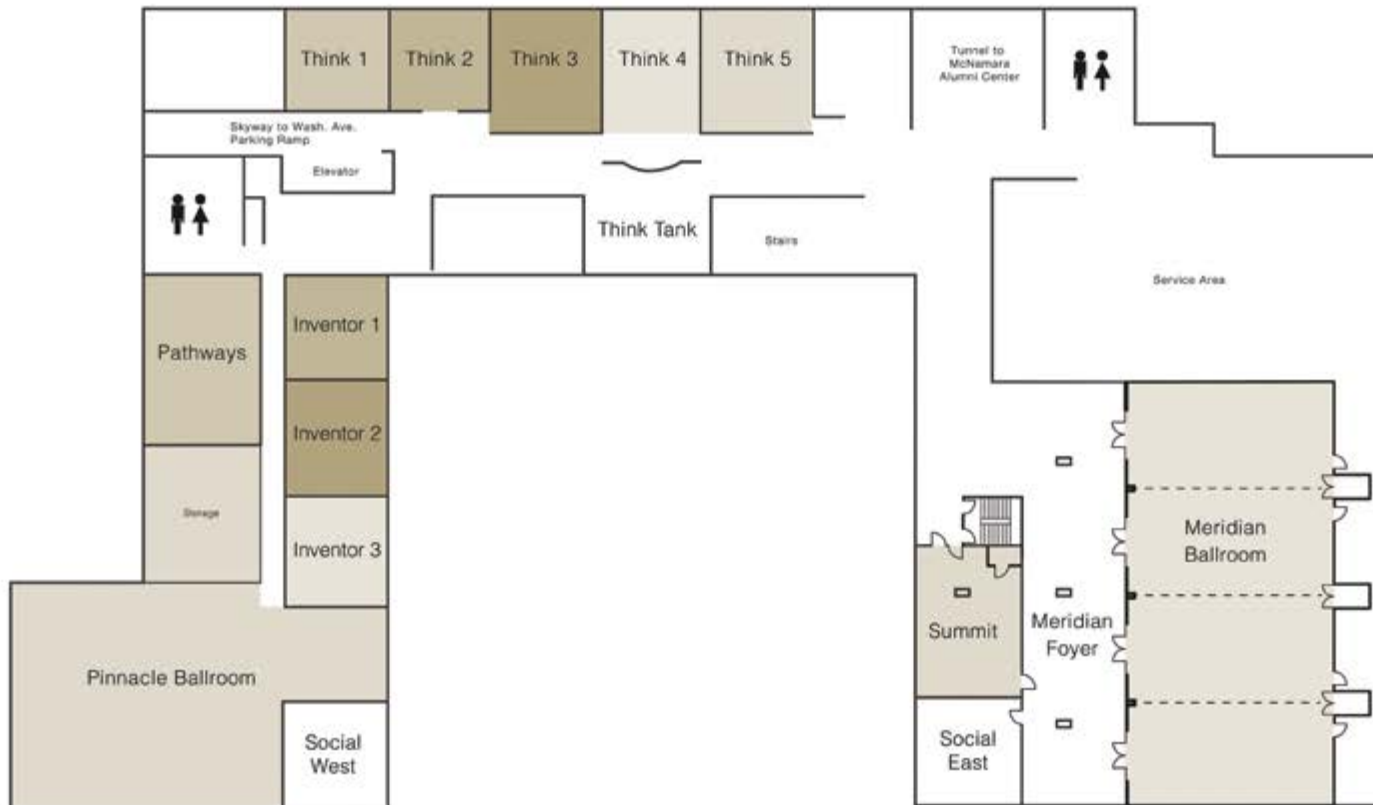


Download Guidebook
and search for
CTS Transportation
Research Conference



The
COMMONS
HOTEL

MEZZANINE LEVEL ROOMS



**CENTER FOR
TRANSPORTATION STUDIES**

UNIVERSITY OF MINNESOTA

COLLEGE OF CONTINUING EDUCATION

UNIVERSITY OF MINNESOTA

Conference services provided by the University of Minnesota's
Center for Transportation Studies and College of Continuing Education.

Disability accommodations will be provided upon request. This publication is available in alternative formats. Please call 612-624-3708.

The University of Minnesota shall provide equal access to and opportunity in its programs, facilities, and employment without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression.

© 2016 Regents of the University of Minnesota. All rights reserved.

CFS-Minnesota CTS Research Conference FY17-Final Program 10.21.16