



Annual CTS

TRANSPORTATION RESEARCH CONFERENCE

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FINAL PROGRAM

November 7, 2019

Graduate Minneapolis
East Bank Campus
Minneapolis, MN

cts.umn.edu



**CENTER FOR
TRANSPORTATION STUDIES**

UNIVERSITY OF MINNESOTA



General Information

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 a week after the conference at cts.umn.edu/events/conference.

Conference Credit Professional Development Hours (PDHs)

This conference awards up to 6.75 PDHs. A credit form is included in your conference folder and on the conference website.

AICP Maintenance Credits

This conference has been approved for 6.75 AICP maintenance credits. A complete list of sessions approved for credit is included in your conference folder and on the conference website.

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.

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Metro Transit

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Jerry Zhao

University of Minnesota,
Humphrey School of Public Affairs

Mark Your Calendar

Toward Zero Deaths Conference

Tuesday and Wednesday, October 20-21, 2020
Duluth Entertainment and Conference Center,
Duluth, Minnesota

2020 Annual CTS Transportation Research Conference

Thursday, November 5, 2020
Graduate Minneapolis, Minneapolis, Minnesota

Welcome to the Conference

Curiosity. Discovery. Innovation.

The Center for Transportation Studies is pleased to present its 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.



Keynote Presentations



Transport and Urban Governance in a Platform-Driven World Thursday, November 7, 2019: 8:30–10:15 a.m.

Kevin Webb, Co-director, SharedStreets

Many of the challenges governments and transport authorities grapple with today stem from a broader restructuring of our economy and governance systems driven by private-platform technologies. And these challenges are not entirely new: long before the emergence of digital communication technologies, cities faced questions about how to regulate private-sector innovation in providing public services. In this presentation, Kevin Webb will explore what we can learn from the history of airline and utilities regulation—as well as retail and consumer finance platforms—and how these lessons can help us manage emerging digital layers of the public realm.

Kevin Webb codirects SharedStreets, a nonprofit organization that builds tools for public-private collaboration around transport data. Blending technology and policy, SharedStreets is building standards, digital infrastructure, and governance models to support new ways of managing and sharing data about transport systems.

Following Webb's presentation, a panel of Minnesota leaders and experts will share perspectives on managing digital data in today's complex transportation industry.

Panelists

Steve Elkins, Representative, Minnesota House of Representatives

Robin Hutcheson, Director of Public Works, City of Minneapolis

Andrew Owen, Director and Research Fellow, Accessibility Observatory, Center for Transportation Studies, University of Minnesota

Russ Stark, Chief Resilience Officer, City of Saint Paul

Minnesota Department of Transportation Commissioner Margaret Anderson Kelliher will offer opening remarks.

Keynote Presentations



Aerotropolis: Shaping Transportation and Regional Development into the Future

Thursday, November 7, 2019: 11:45 a.m.–1:30 p.m.

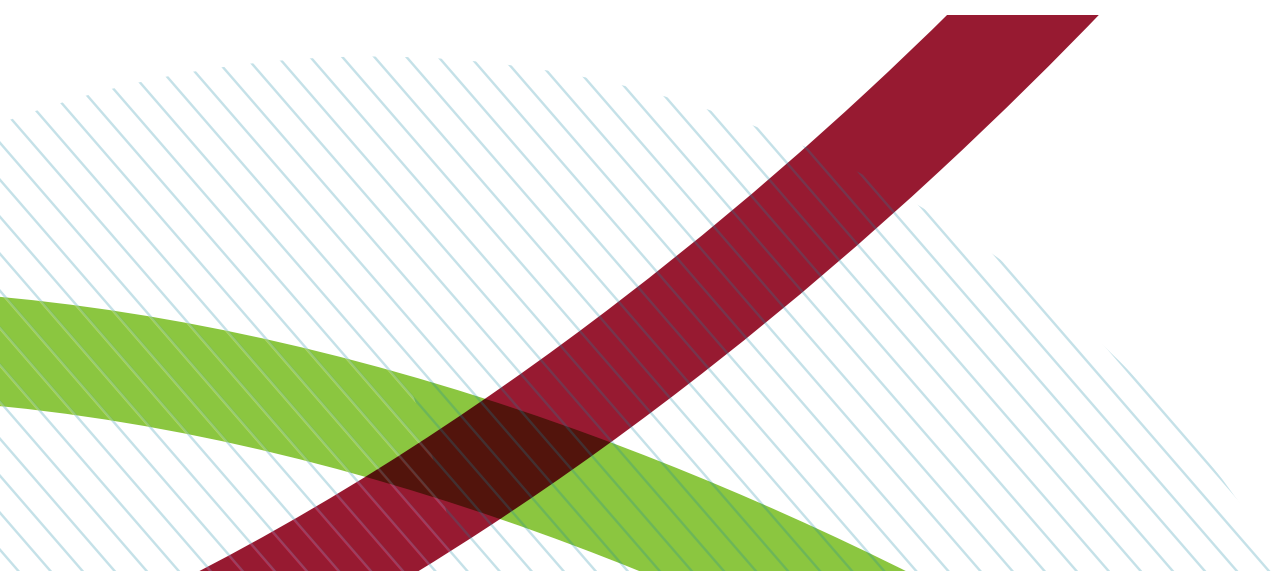
John Kasarda, Director, Center for Air Commerce, University of North Carolina Kenan-Flagler Business School; CEO, Aerotropolis Business Concepts LLC; and President, Aerotropolis Institute

Major airports have become key nodes in global production and enterprise systems, offering speed, agility, and connectivity. They are also powerful engines of local and greater-metropolitan region development, attracting aviation-linked businesses to their environs and beyond. The “aerotropolis” is an urban form where cities are built around airports speedily connecting time-sensitive suppliers, manufacturers, distributors, and businesspeople to distant customers, clients, and marketplaces.

This presentation will feature the aerotropolis model, its economic rationale, and how it can bring competitive advantages to firms and municipalities in the Minneapolis-Saint Paul region and to the entire state. Illustrations of successful aerotropolis development elsewhere in the world will also be detailed. Concluding the presentation will be a unique video on what a future Minneapolis-Saint Paul Aerotropolis might look like in terms of transportation infrastructure and coordinated commercial development.

John Kasarda is an academic and airport business consultant focused on aviation-driven economic development. He is director for the Center for Air Commerce at the University of North Carolina’s Kenan-Flagler Business School, the CEO of Aerotropolis Business Concepts LLC, an airport-economy consulting firm, and the president of the Aerotropolis Institute in China.

The University of Minnesota’s Vice President for Research Chris Cramer will offer opening remarks.

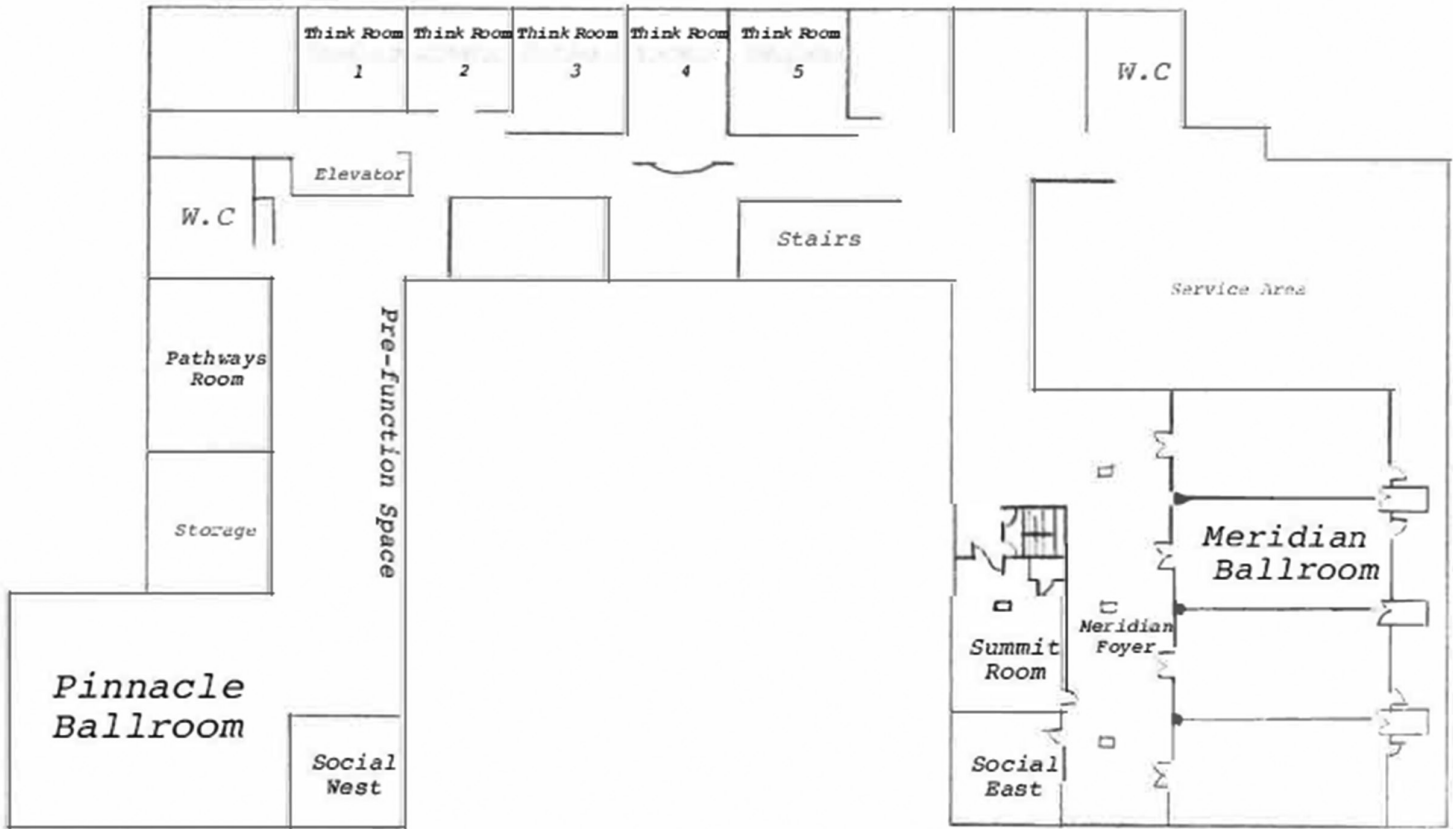


Program at a Glance

Thursday, November 7, 2019

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, University of Minnesota Opening Comments <i>Margaret Anderson Kelliher</i> , Commissioner, MnDOT Keynote Presentation: Transport and Urban Governance in a Platform-Driven World Speaker <i>Kevin Webb</i> , Co-director, SharedStreets <i>Steve Elkins</i> , Representative, Minnesota House of Representatives; <i>Robin Hutcheson</i> , Director of Public Works, City of Minneapolis; <i>Andrew Owen</i> , Director and Research Fellow, Accessibility Observatory, Center for Transportation Studies, University of Minnesota; <i>Russ Stark</i> , Chief Resilience Officer, City of Saint Paul			
10:15–10:30 a.m.	Break (Meridian Foyer)			
10:30–11:45 a.m.	Concurrent Sessions			
	1 Keeping Traffic Moving: Monitoring and Managing Roads for Mobility and Safety <i>Summit Room</i>	2 Advanced Data Applications for Transportation Planning and System Management <i>Think 4</i>	3 Connected and Automated Vehicle Policy, Planning, and Traffic Impacts <i>Pinnacle Ballroom</i>	4 From Local Perspective to National Public Opinion Data: Public Engagement Fits into Your Project <i>Pathways Room</i>
11:45 a.m.–1:30 p.m.	Luncheon and Presentation (Meridian Ballroom) Opening Comments <i>Chris Cramer</i> , Vice President for Research, University of Minnesota Keynote Presentation: Aerotropolis: Shaping Transportation and Regional Development into the Future Speaker <i>John Kasarda</i> , Director, Center for Air Commerce, University of North Carolina Kenan-Flagler Business School; CEO, Aerotropolis Business Concepts LLC; and President, Aerotropolis Institute			
1:30–1:45 p.m.	Break (Meridian Foyer)			
1:45–3:00 p.m.	Concurrent Sessions			
	5 New Innovation and Practices in Minnesota Freight Transportation <i>Summit Room</i>	6 How Follows Why: Planning and Building Better Bike Infrastructure <i>Think 4</i>	7 Safety Issues <i>Pinnacle Ballroom</i>	8 Transportation Finance & Economics <i>Pathways Room</i>
3:00–3:15 p.m.	Break (Meridian Foyer)			
3:15–4:30 p.m.	Concurrent Sessions			
	9 Healthy Roads, Roadsides, and Waterways <i>Think 4</i>	10 Asset Management <i>Summit Room</i>	11 Planning for Transit: Estimating User Behavior and Service Quality Measures <i>Pathways Room</i>	12 Transportation Equity and Access: A Lightning Round <i>Pinnacle Ballroom</i>
4:30–5:30 p.m.	Reception with Hors d'Oeuvres and Cash Bar (Pinnacle Foyer)			

Graduate Minneapolis Floor Plan



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Program Schedule

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8:30–10:15 a.m.	Welcome (Meridian Ballroom) <i>Laurie McGinnis</i> , Director, Center for Transportation Studies, University of Minnesota Opening Comments <i>Margaret Anderson Kelliher</i> , Commissioner, MnDOT
Keynote Presentation: Transport and Urban Governance in a Platform-Driven World	
Speaker <i>Kevin Webb</i> , Co-director, SharedStreets	<p>Many of the challenges governments and transport authorities grapple with today stem from a broader restructuring of our economy and governance systems driven by private-platform technologies. And these challenges are not entirely new: long before the emergence of digital communication technologies, cities faced questions about how to regulate private-sector innovation in providing public services. In this presentation, Kevin Webb will explore what we can learn from the history of airline and utilities regulation—as well as retail and consumer finance platforms—and how these lessons can help us manage emerging digital layers of the public realm.</p> <p>Kevin Webb co-directs SharedStreets, a non-profit organization that builds tools for public-private collaboration around transport data. Blending technology and policy, SharedStreets is building standards, digital infrastructure, and governance models to support new ways of managing and sharing data about transport systems.</p> <p>Following Webb's presentation, a panel of Minnesota leaders and experts will share perspectives on managing digital data in today's complex transportation industry.</p>
Panelists <i>Steve Elkins</i> , Representative, Minnesota House of Representatives	
<i>Robin Hutcheson</i> , Director of Public Works, City of Minneapolis	
<i>Andrew Owen</i> , Director and Research Fellow, Accessibility Observatory, Center for Transportation Studies, University of Minnesota	
<i>Russ Stark</i> , Chief Resilience Officer, City of Saint Paul	
10:15–10:30 a.m.	Break (Meridian Foyer)
10:30–11:45 a.m.	Concurrent Sessions
1	Keeping Traffic Moving: Monitoring and Managing Roads for Mobility and Safety (Summit Room)
Moderator <i>Brian Sorenson</i> , MnDOT	Operation Sign Harvest <i>Mark Ray</i> , City of Crystal Assessing the Safety Impacts of Stop Lines at Stop-Controlled Intersections <i>Peter Dirks</i> , Minnesota Traffic Observatory, University of Minnesota Co-authors: <i>Melissa Duhn</i> , <i>Andrew Loutfi</i> , and <i>John Hourdos</i> , Minnesota Traffic Observatory, University of Minnesota Work Zone Mapping and Tag Deployment System <i>Andrew Loutfi</i> , Minnesota Traffic Observatory, University of Minnesota Co-author: <i>John Hourdos</i> , Minnesota Traffic Observatory, University of Minnesota Evolution and Utility of MnDOT Detector Data <i>Michael Janson</i> , SRF Consulting Group

2

Advanced Data Applications for Transportation Planning and System Management (Think 4)

Moderator *Jim Henricksen*, MnDOT

Extracting Trip Destinations from GPS Trajectories with Irregular Sampling Frequency

Ying Song, Department of Geography, Environment and Society, University of Minnesota

Co-authors: *Tianci Song and Rui Kuang*, Computer Science and Engineering, University of Minnesota

Highway Network Congestion Measurement in the Twin Cities

Michael Iacono, MnDOT

Congestion Management Through Region-Wide/Data-Driven Screening Analysis

Paul Morris, SRF Consulting Group

Co-author: *Declan Gallen*, SRF Consulting Group

10:30–11:45 a.m.

Concurrent Sessions

3

Connected and Automated Vehicle Policy, Planning, and Traffic Impacts (Pinnacle Ballroom)

Moderator *Kristin White*, MnDOT

Planning for Disruption: Visualizing the future of Autonomous Vehicles Through Policy Narratives

Fernando Burga, Humphrey School of Public Affairs, University of Minnesota

Scenarios and Justification for Automated Vehicle Demonstration in Nonurban Minnesota

Frank Douma, Humphrey School of Public Affairs, University of Minnesota

Co-author: *Erin Peterson*, Law School, University of Minnesota

Traffic Flow Impacts Partially Autonomous Vehicles

Raphael Stern, Department of Civil, Environmental, and Geo- Engineering, University of Minnesota

How Locals Need to Prepare for the Future of V2V/V2I-Connected Vehicles

Melissa Duhn, Minnesota Traffic Observatory, University of Minnesota

Co-authors: *Gordon Parikh*, SRF Consulting Group; *John Hourdos*, Minnesota Traffic Observatory, University of Minnesota

4

From Local Perspective to National Public Opinion Data: Public Engagement Fits into your Project (Pathways Room)

Moderator *Sophia Ginis*,
Metro Transit

Roadway Safety in American Indian Reservations: Perspectives from Tribal Governments in Minnesota

Kathryn Quick, Humphrey School of Public Affairs, University of Minnesota

Co-author: *Guillermo Narvaez*, Proxemic Insights

Next Generation Public Engagement: Guess What? It's Still About Relationships

Frank Alarcon, Ramsey County Public Works – Multimodal Planning Union Depot

Public Opinion on Values and Policy Preferences for Transportation Infrastructure and Finance

Guillermo Narvaez, Proxemic Insights

Opening Comments

Chris Cramer, Vice President for Research, University of Minnesota

Aerotropolis: Shaping Transportation and Regional Development into the Future

Speaker *John Kasarda, Director, Center for Air Commerce, University of North Carolina Kenan-Flagler Business School; CEO, Aerotropolis Business Concepts LLC; and President, Aerotropolis Institute*

Major airports have become key nodes in global production and enterprise systems offering them speed, agility, and connectivity. They are also powerful engines of local and greater metropolitan region development, attracting aviation-linked businesses to their environs and beyond. The "aerotropolis" is an urban form where cities are built around airports speedily connecting time-sensitive suppliers, manufacturers, distributors, and businesspeople to distant customers, clients, and marketplaces.

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1:30-1:45 p.m. **Break** (Meridian Foyer)

1:45-3:00 p.m. **Concurrent Sessions**

5

New Innovation and Practices in Minnesota Freight Transportation (Summit Room)

Moderator *Andrew Andrusko, MnDOT*

Moving Freight That Last Mile—and Then the First One!

Frank Douma, Humphrey School of Public Affairs, University of Minnesota

Minnesota's Medical Device Industry Cluster and the Transportation Implications

Joanne Cha, College of Science and Engineering, University of Minnesota
Co-authors: *Lee Munnich Jr. and Tom Horan, Humphrey School of Public Affairs, University of Minnesota*

High Turnover in US Long-Distance Truck Load (TL) Motor Freight: Is It a Driver Shortage and Will Teenage Drivers Fix It?

Stephen Burks, Department of Social Sciences, University of Minnesota Morris

Co-authors: *Arne Kildegaard, Division of Social Science, University of Minnesota Morris; Kristen Monaco, Office of Compensation and Working Conditions, Bureau of Labor Statistics*

Commerce in the I-94 Corridor between the Twin Cities and St. Cloud

Ben Zietlow, Quetica, LLC

Co-authors: *Mark Berndt, Weiwen Xie, and Prakash Jamar-Kattel, Quetica, LLC*

How Follows Why: Planning and Building Better Bike Infrastructure (Think 4)

Moderator *Sandra Cullen*, Parking and Transportation Services, University of Minnesota

Using Data to Prioritize Bicycle Facility Investments Across Minnesota

Jake Rueter, MnDOT
Co-author: *Connor Cox*, Toole Design

National Bicycle Accessibility Evaluation: Results, Challenges, and Opportunities

Brendan Murphy, Accessibility Observatory, Center for Transportation Studies, University of Minnesota
Co-author: *Andrew Owen*, Accessibility Observatory, Center for Transportation Studies, University of Minnesota

Producing Guidance for the Design and Maintenance of Separated Bicycle Lanes in Minnesota

Peter Dirks, Minnesota Traffic Observatory, University of Minnesota
Co-authors: *Greg Lindsey*, Humphrey School of Public Affairs, University of Minnesota; *Melissa Duhn and John Hourdos*, Minnesota Traffic Observatory, University of Minnesota

Safety Issues (Pinnacle Ballroom)

Moderator *Brian Davis*, Department of Mechanical Engineering, University of Minnesota

Sight Distances at Rural Intersections and their Impact on Decision Making

Nichole Morris, HumanFIRST Laboratory, University of Minnesota
Co-authors: *Curtis Craig and Jacob Achtemeier*, HumanFIRST, University of Minnesota

Higher-than-Usual Monthly Temperatures are Associated with Pedestrian Crashes

Curtis Craig, HumanFIRST Laboratory, University of Minnesota
Co-author: *Nichole Morris*, HumanFIRST Laboratory, University of Minnesota

Transferability of Crash Modification Factors Via Graphical Causal Models: An Exploration

Gary Davis, College of Science and Engineering, University of Minnesota
Co-author: *Jingru Gao*, Department of Civil, Environmental, and Geo-Engineering, University of Minnesota

Transportation Finance & Economics (Pathways Room)

Moderator *Jerry Zhao*, Humphrey School of Public Affairs, University of Minnesota

The Use of Performance Measures in Transit Funding Allocation: Experiences Across States

Camila Fonseca, Humphrey School of Public Affairs, University of Minnesota
Co-authors: *Jerry Zhao*, Humphrey School of Public Affairs, University of Minnesota; *Raihana Zeerak*, Institute for Urban & Regional Infrastructure Finance, University of Minnesota

Taxing Shared Mobility: Pricing Schemes, Rationales, and Media Discussions

Raihana Zeerak, Humphrey School of Public Affairs, University of Minnesota
Co-authors: *Jerry Zhao and Camila Fonseca*, Humphrey School of Public Affairs, University of Minnesota

Optimizing Transportation Funding Decisions: Evaluating Project Alternative Life-Cycle and User Costs to Maximize Agency Return on Investment

Nick Semeja, SRF Consulting Group

9

Healthy Roads, Roadsides, and Waterways (Think 4)

Moderator *Marni Karnowski,*
MnDOT

Optimizing the Nutrition of Roadside Plants for Pollinators

Emilie Snell-Rood, College of Biological Sciences, University of Minnesota;
Co-authors: *Tim Mitchell, Lauren Agnew, Megan Kobiela, Alex Shephard, Elizabeth Borer, Marla Spivak, Dan Cariveau, Clay Carter, Karen Oberhauser, and Alison Cariveau,* University of Minnesota

Minnesota Guide for Stream Connectivity and Aquatic Organism Passage Through Culverts

Matt Hernick, St. Anthony Falls Laboratory, University of Minnesota;
Co-authors: *Jessica Kozarek,* St. Anthony Falls Laboratory, University of Minnesota; *Christian Lenhart and John Nieber,* Department of Bioproducts and Biosystems Engineering, University of Minnesota

Urban Stormwater Management: Planning Across Jurisdictional Lines

Erin Hunker, SRF Consulting Group;
Co-authors: *Lisa Goddard,* City of Minneapolis; *Stephanie Johnson,* Mississippi Watershed Management Organization

Development of a Rapid Screening Tool for Siting Infiltration Stormwater Control Measures

Nicholas Tecca, Department of Civil, Environmental, and Geo- Engineering, University of Minnesota;
Co-authors: *John Gulliver and John Nieber,* University of Minnesota

10

Asset Management (Summit Room)

Moderator *Mark Maloney,*
City of Shoreview

Characterization of Structural Fibers for Thin Concrete Overlays

Manik Barman, Department of Civil Engineering,
University of Minnesota Duluth

Evaluation of High-Density Asphalt Mix Designs for Sustainable Pavements Infrastructure

Tianhao Yan, Department of Civil, Environmental, and Geo- Engineering, University of Minnesota;
Co-authors: *Mihai Marasteanu, Jialiang Le, and Mugurel Turos,* Department of Civil, Environmental, and Geo- Engineering, University of Minnesota

Remaining Service Life Asset Measure

Jhenyffer Lorrany Matias de Oliveira, Department of Civil, Environmental, and Geo- Engineering, University of Minnesota;
Co-authors: *Ravi Kumar, Arturo Schultz, and Mihai Marasteanu,* Department of Civil, Environmental, and Geo- Engineering, University of Minnesota

11

Planning for Transit: Estimating User Behavior and Service Quality Measures (Pathways Room)

Moderator *Eric Lind,* Metro Transit

Toward a Twin Cities Transit Route Choice Model

Benjamin Tomhave, Department of Civil, Environmental, and Geo- Engineering, University of Minnesota;
Co-author: *Alireza Khani,* Department of Civil, Environmental, and Geo- Engineering, University of Minnesota

Statistical Quantification of Speed and Reliability Advantages from Transit Signal Priority (TSP) Using High-Frequency Bus GPS Records

Brandon Whited, Metro Transit
Co-author: *Eric Lind,* Metro Transit

Targeting and Evaluating Speed and Reliability Improvements With Detailed Bus Time Budgets

Joseph Reid, Metro Transit

Park and Ride User Behavior in the Twin Cities

Alex Webb, Department of Civil, Environmental, and Geo- Engineering, University of Minnesota;
Co-author: *Alireza Khani,* Department of Civil, Environmental, and Geo- Engineering, University of Minnesota

3:15–4:30 p.m.

Concurrent Sessions

12

Transportation Equity and Access: A Lightning Round (Pinnacle Ballroom)

Moderator *Gina Baas*, Center for Transportation Studies, University of Minnesota

Advancing Transportation Equity

Hally Turner, MnDOT

Choosing Fairness: Promoting Service Equity Analysis in Transit Planning

Travis Ormsby, Department of Geography, Environment and Society, University of Minnesota

Bringing a Gender-Based Lens to CAV Planning and Development

Heidi Corcoran, Humphrey School of Public Affairs, University of Minnesota

How Does Built Environment Affect Activity Space of People Living in Different Income Level Areas?

Tao Tao, Humphrey School of Public Affairs, University of Minnesota

Using Accessibility as a Planning and Evaluation Tool for Metro BRT Lines

Shannon Evans Engstrom, Humphrey School of Public Affairs, University of Minnesota

Travel-Cost-Based Accessibility in the Twin Cities

Kristin Carlson, Accessibility Observatory, Center for Transportation Studies, University of Minnesota;

Co-author: *Andrew Owen*, Accessibility Observatory, Center for Transportation Studies, University of Minnesota

Those Who Need It Most: Maximizing Transit Accessibility and Removing Barriers to Employment in Areas of Concentrated Poverty

Yingling Fan, Humphrey School of Public Affairs, University of Minnesota;

Co-authors: *Andy Guthrie*, University of Memphis; *Shannon Crabtree*, Hourcar; *Fernando Burga*, University of Minnesota

4:30–5:30 p.m.

Reception—Hors d'Oeuvres and Cash Bar (Pinnacle Foyer)

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