Annual CTS
TRANSPORTATION RESEARCH CONFERENCE

FINAL PROGRAM

November 7, 2019
Graduate Minneapolis
East Bank Campus
Minneapolis, MN
c.ts.umn.edu
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.

Wi-Fi
Network: Graduate Convention Center Network
Password: CTS2019!

Social Media
@UMNCTS
facebook.com/UMNCTS

Planning Committee

Manik Barman
University of Minnesota Duluth, Civil Engineering

Robert Chaucierre
MnDOT

Heidi Corcoran
University of Minnesota, Humphrey School of Public Affairs

Curtis Craig
University of Minnesota, HumanFIRST Lab

Ginny Crowson
Athey Creek Consultants

Sandy Cullen
University of Minnesota, Parking and Transportation Services

Frank Douma
University of Minnesota, Humphrey School of Public Affairs

Shannon Fiecke
MnDOT

Alan Forsberg
Blue Earth County (retired)

Sophia Ginis
Metro Transit

Michael Iacono
MnDOT

Alireza Khani
University of Minnesota, Department of Civil, Environmental, and Geo-Engineering

Mark Maloney
City of Shoreview

Paul Morris
SRF Consulting

Hafiz Munir
MnDOT

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


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.
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.
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

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

Tweet #ctsresconf and follow @UMNCTS

Follow facebook.com/UMNCTS
## Program Schedule

Thursday, November 7, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30−8:30 a.m.</td>
<td>Registration and Buffet Breakfast <em>(Meridian Foyer)</em></td>
</tr>
<tr>
<td>8:30−10:15 a.m.</td>
<td>Welcome <em>(Meridian Ballroom)</em></td>
</tr>
<tr>
<td></td>
<td><em>Laurie McGinnis, Director, Center for Transportation Studies, University of Minnesota</em></td>
</tr>
<tr>
<td></td>
<td>Opening Comments</td>
</tr>
<tr>
<td></td>
<td><em>Margaret Anderson Kelliher, Commissioner, MnDOT</em></td>
</tr>
<tr>
<td></td>
<td><strong>Keynote Presentation: Transport and Urban Governance in a Platform-Driven World</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Speaker</strong> Kevin Webb, Co-director, SharedStreets</td>
</tr>
<tr>
<td></td>
<td><strong>Panelists</strong></td>
</tr>
<tr>
<td></td>
<td>Steve Elkins, Representative, Minnesota House of Representatives</td>
</tr>
<tr>
<td></td>
<td>Robin Hutcheson, Director of Public Works, City of Minneapolis</td>
</tr>
<tr>
<td></td>
<td>Andrew Owen, Director and Research Fellow, Accessibility Observatory, Center for Transportation Studies, University of Minnesota</td>
</tr>
<tr>
<td></td>
<td>Russ Stark, Chief Resilience Officer, City of Saint Paul</td>
</tr>
<tr>
<td></td>
<td>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 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. Following Webb’s presentation, a panel of Minnesota leaders and experts will share perspectives on managing digital data in today’s complex transportation industry.</td>
</tr>
<tr>
<td>10:15−10:30 a.m.</td>
<td>Break <em>(Meridian Foyer)</em></td>
</tr>
<tr>
<td>10:30−11:45 a.m.</td>
<td><strong>Concurrent Sessions</strong></td>
</tr>
<tr>
<td>1</td>
<td><strong>Keeping Traffic Moving: Monitoring and Managing Roads for Mobility and Safety</strong> <em>(Summit Room)</em></td>
</tr>
<tr>
<td></td>
<td><strong>Moderator</strong> Brian Sorenson, MnDOT</td>
</tr>
<tr>
<td></td>
<td><strong>Operation Sign Harvest</strong></td>
</tr>
<tr>
<td></td>
<td>Mark Ray, City of Crystal</td>
</tr>
<tr>
<td></td>
<td><strong>Assessing the Safety Impacts of Stop Lines at Stop-Controlled Intersections</strong></td>
</tr>
<tr>
<td></td>
<td>Peter Dirks, Minnesota Traffic Observatory, University of Minnesota</td>
</tr>
<tr>
<td></td>
<td>Co-authors: Melissa Duhn, Andrew Loutfi, and John Hourdos, Minnesota Traffic Observatory, University of Minnesota</td>
</tr>
<tr>
<td></td>
<td><strong>Work Zone Mapping and Tag Deployment System</strong></td>
</tr>
<tr>
<td></td>
<td>Andrew Loutfi, Minnesota Traffic Observatory, University of Minnesota</td>
</tr>
<tr>
<td></td>
<td>Co-author: John Hourdos, Minnesota Traffic Observatory, University of Minnesota</td>
</tr>
<tr>
<td></td>
<td><strong>Evolution and Utility of MnDOT Detector Data</strong></td>
</tr>
<tr>
<td></td>
<td>Michael Janson, SRF Consulting Group</td>
</tr>
</tbody>
</table>
### Concurrent Sessions

#### 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

### 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

### 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
Luncheon and Presentation (Meridian Ballroom)

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 speedingly 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.

Break (Meridian Foyer)

1:45−3:00 p.m. Concurrent Sessions

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 Cho, 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*
### Concurrent Sessions

#### 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 Kobielu, Alex Shephard, Elizabeth Borer, Marta 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

#### 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

#### 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
**Concurrent Sessions**

**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*

---

**Reception—Hors d’Oeuvres and Cash Bar** *(Pinnacle Foyer)*
Conference services provided by the University of Minnesota’s Center for Transportation Studies and College of Continuing and Professional Studies.

Disability accommodations will be provided upon request. This publication is available in alternative formats. Please call 612-625-2765.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

The University of Minnesota is an equal opportunity educator and employer.

© 2019 Regents of the University of Minnesota. All rights reserved.

16_CFS_CTS_ResearchConference_FinalProgram_10.19