Sessions and Events

Day
Sunday, January 12 (Sessions 1001 - 1090)
Monday, January 13 (Sessions 1091 - 1290, 1292 - 1358, 1422, 1484, 1553)
Tuesday, January 14 (Sessions 1291, 1359 - 1421, 1423 - 1482, 1485 - 1552, 1554 - 1656)
Wednesday, January 15 (Sessions 1483, 1657 - 1766)
Thursday, January 16 (Sessions 1767)

Spotlight and Hot Topic Sessions

More than 50 sessions and workshops will focus on the spotlight theme for the 2019 Annual Meeting: *Transportation for a Smart, Sustainable, and Equitable Future*. In addition, more than 170 sessions and workshops will look at one or more of the following hot topics identified by the TRB Executive Committee:

- **Transformational Technologies:** New technologies that have the potential to transform transportation as we know it.
- **Resilience and Sustainability:** How transportation agencies operate and manage systems that are economically stable, equitable to all users, and operated safely and securely during daily and disruptive events.
- **Transportation and Public Health:** Effects that transportation can have on public health by reducing transportation related casualties, providing easy access to healthcare services, mitigating environmental impacts, and reducing the transmission of communicable diseases.

To find sessions on these topics, look for the Spotlight icon and the Hot Topic icon in the "Sessions, Events, and Meetings" section beginning on page 37.

Poster Sessions

Convention Center, Lower Level, Hall A (new location this year)
Poster Sessions provide an opportunity to interact with authors in a more personal setting than the conventional lecture. The papers presented in these sessions meet the same review criteria as lectern session presentations. For a complete list of poster sessions, see the "Sessions, Events, and Meetings" section, beginning on page 37. The full description for each poster session—including the titles and locations of individual posters—is available via the mobile app (see page 11). A floor plan of the posters appears on page 20.

Continuing Education Credits

Professional Development Hours (PDHs) may be claimed for attending the TRB Annual Meeting. Each hour of participation earns one PDH. Attendees must maintain their own record of attendance and can do so using the form on page 34. At the request of a licensing or certifying agency, TRB will confirm an individual's meeting registration; however, TRB is not able to confirm attendance at specific sessions. Please note that, at this time, neither TRB nor the 2019 Annual Meeting is certified with the state licensing boards of Florida and New York.

Certification Maintenance (CM) credits—approved by the American Planning Association (APA) for retaining American Institute of Certified Planners (AICP) certification—are offered for some sessions at the 2019 TRB Annual Meeting. Persons seeking AICP CM credits must record their credits directly with APA. In the Annual Meeting mobile app, tap the "Program" icon on the home screen and then tap "CM Sessions" for a list of sessions approved for CM credits. Also, on the Annual Meeting Interactive Program, you can click the "Features" drop-down menu in the left column, then check only the box for "AICP Certification" to filter just for sessions with approved CM credits.

Sunday, January 12 (Sessions 1001 - 1090)

1001

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 145A

The 2050 Transportation Workforce Transformation Challenges: International Prospects and Strategies

Caroline Alméras, European Conference of Transport Research Institutes, presiding
Christos Xenophontos, Rhode Island Department of Transportation, presiding
Sponsored By Standing Committee on International Cooperation, Standing Committee on Strategic Management, Standing Committee on Management and Productivity, Standing Committee on Women's Issues in Transportation

The transportation sector, which employs millions of persons worldwide, is affected significantly by the challenges of a growing and shifting population, climate change, and rapid technological change such as automation and electrification. To address these challenges, the sector faces an unprecedented acceleration of workforce transformation, resulting in major challenges in staffing its several domains with qualified personnel. Considered one of 12 critical issues in transportation by TRB, workforce affects both the public and private sectors in all modes of transportation and calls those sectors to work out strategies for adapting their workforce capacities and for addressing changing employment types and future skills gaps and needs.

Preparing for the Future Transportation Workforce (P20-21782)
Diana Furchtgott-Roth/Office of the Secretary of Transportation (OST)
The Future Transport Workforce: Perspectives and Actions from the European Commission (P20-21783)
Torsten Klimke/European Commission
The Challenges for Transportation Engineering Education in China (P20-21784)
Shengchuan Zhao/Dalian University of Technology
Skills and Training Requirements for the Future Transportation Sector of Europe (P20-21785)
Evangelos Bekiaris/CERTH-HIT
Skills and Training Challenges and Prospects for the Road Sector (P20-21786)
Patrick Mallejacq/PIARC, the World Road Association
How to Bridge the Skill Gap for Rail? (P20-21787)
Carlo M. Borghini/Shift2Rail
Automation, Technology, and Employment: The future of Public Transport Workforce (P20-21788)
Michele Tozzi/Union Internationale des Transports Publics (UITP)

1002

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 146B

Human-Centered Design Thinking Crash Course

Charlene McArthur, Idaho Transportation Department, presiding
Sponsored By Standing Committee on Management and Productivity

'An interactive crash course in applying human-centered design thinking to a real-life situation. The participant will empathize with a user; define a problem; and ideate, test, iterate, and prototype solutions. The hands-on experience will enable participants to experience end-to-end application of design thinking. Fast-paced, engaging, and fun, this course is suited for anyone at any stage of leadership or in any function. This is not a lecture—it is an experience.'

Workshop Panelist (P20-21810)
Charlene McArthur/Idaho Transportation Department
Workshop Panelist (P20-21812)
Seamus McArthur/One Stone High School
Workshop Panelist (P20-21811)
Laura Meyer/Idaho Transportation Department
Workshop Panelists (P20-21813)
Andrew Reovan/Office of the Assistant Secretary for Research and Technology (OST-R), Laura Black/OST-R/Volpe Center
Workshop Panelist (P20-21814)
Eileen Barron/Utah Department of Transportation

1003

Are You All Really Paddling in the Same Direction: Creating Effective Organizational Alignment and Performance Management
Mara Campbell, Jacobs, presiding
David Putz, Iowa Department of Transportation, presiding
Sponsored By Standing Committee on Performance Management

Constantly changing demands, stretched financial resources, and finding skilled employees are issues all organizations face. Little wonder leaders find themselves struggling to set a "North Star" or find the information needed to know what, if any, progress is being made. This workshop will discuss aligning organizations around performance, identifying strategies, and using information to understand and improve organizational performance. Learning common challenges & pitfalls, hearing insights from private & public sector leaders, and interacting with fellow attendees are all intended to help avoid future rapids. Attendees will gain information on how to avoid getting drenched as they dive into alignment and performance management efforts.

Organizational Alignment at the Iowa DOT (P20-20137)
Mark Lowe/Iowa Department of Transportation
International Approaches to Organizational Alignment (P20-20198)
Ilaria Coppa/ANAS S.p.A.
How Organizational Alignment Works in Other Sectors (P20-20199)
Matthew Ries/District of Columbia Water and Sewer Authority

1004   CM (3.00)

Speed Management
Valerian Kwigizile, Western Michigan University, presiding
Aimee Jefferson, North Jersey Transportation Planning Authority, presiding
Sponsored By Standing Committee on Transportation Issues in Major Cities, Standing Committee on International Cooperation, Standing Committee on Geometric Design, Standing Committee on Traffic Control Devices, Standing Committee on Transportation Safety Management Systems, Standing Committee on Highway Safety Performance, Standing Committee on Traffic Law Enforcement, Standing Committee on Safe Mobility of Older Persons, Standing Committee on Pedestrians, Standing Committee on Bicycle Transportation

Speed management is integral to safer roadways, especially for nonmotorized users like pedestrians and bicyclists; however, limited resources and policy challenges make speed enforcement difficult. This workshop will provide an overview on communitywide speed management strategies and resources, followed by three case studies of the city, state, and international experience. It will conclude with a breakout session to discuss topics like speed-setting laws, design solutions, and level-of-service impacts. '

Preliminary Indications from NCHRP 17-76 Guidance for the Setting of Speed Limits (P20-20914)
Kay Fitzpatrick/Texas A&M Transportation Institute
NACTO's Forthcoming Speed Limit Setting Guidance (P20-20926)
Jenny O'Connell/NACTO-GDCI
Speed Management for Safety (P20-20920)
Sarah Abel
Imposing City-wide Speed Limits: Seattle's Experience (P20-20825)
Dongho Chang/City of Seattle
Legislating New Approaches: Assembly Bill 2363 and the California Zero Traffic Fatalities Task Force (P20-20916)
Rachel Carpenter/California Department of Transportation (CALTRANS)
Applying the Speed Management Guide to New Zealand Cities (P20-20905)
Shane Turner/Abley Transportation Consultants Ltd.

1005

Not the Cost, Not the Price: What's the Value of Your Curb, Redux
Rachel Weinberger, Weinberger & Associates, presiding
Sponsored By Standing Committee on Transportation Demand Management, Standing Committee on Transportation Economics, Standing Committee on Congestion Pricing, Standing Committee on Transportation Issues in Major Cities, Subcommittee on Parking Management, Standing Committee on Freight Transportation Economics and Regulation

' Cities face the challenge of allocating curb among different uses with coarse assumptions and few principles . This workshop's objective is to improve decision-making tools by seeking a framework for understanding the value of different curb uses to society and a system for balancing allocations to meet the social and economic goals of urban centers. As a follow up to a workshop convened four years ago, participants will explore this topic in light of changing curb demands and management practices.

What Are Your Values When Valuing the Curb? (P20-21001)
Alex Rixey/Fehr & Peers
Valuing Kerb Space for What It Is... Parking or Parkland? (P20-21003)
Knowles Tivendale/Movement & Place Consulting
Innovative Partnerships/Technology Critical to Ending Chaos (P20-21004)
Matthew Kaufman/UrbanTrans North America
Taming the Curb (P20-21468)
Rachel Weinberger/Weinberger & Associates
An Evaluation Framework for Any Use of the Curb (P20-21475)
Harry Potter/Parking Perspectives

1006

Small- and Medium-Sized Developing City Transportation Needs and Opportunities
V. Setty Pendakur, Pacific Policy and Planning Associates, presiding
Samuel Zimmerman, The World Bank, presiding
Sponsored By Standing Committee on Transportation in the Developing Countries

All developing countries are urbanizing rapidly. Although South America's population is more than 80% urban, countries in Africa and South Asia generally are less than 50% urban; moreover, growth is fastest in small- and medium-sized cities. Unfortunately, urban transportation research has focused on the largest cities that have different issues and many more resources of all kinds. This workshop will explore the needs of as well as the approaches and technologies most appropriate for small- and medium-sized developing cities. '

Modernizing Transport Services for Small- and Medium-Sized Asian Cities (P20-21066)
Jamie Leather/Asian Development Bank
The Role of Rideshare/TNC Technology in Small- and Medium-Sized Developing City Public Transport (P20-210 67)
Andrew Salzberg/Uber Technologies, Inc.
A Medium-Sized Chinese City Transport Case (P20-21068)
YI Yang/The World Bank
Challenges in Urban Transport Reform in the City of Freetown (P20-21091)
Hindolo Shiaka/Sierra Leone Ministry of Transport and Aviation
Small-Medium Size India City Challenges and Opportunities (P20-21092)
Om Agarwal/World Resources Institute - India
Discussants (P20-21093)
Lynn Scholl/Inter-American Development Bank, Ajay Kumar/The World Bank

1007

Dwight David Eisenhower Transportation Fellowship Program Innovative Doctoral Transportation Research Showcase
Sponsored By Section - Research and Education

1008

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 147B
Section 508 Compliance and Document Accessibility: How to Make Your Reports Accessible for Everybody
Kendra Levine, University of California, Berkeley, presiding
Sponsored By Standing Committee on Library and Information Science for Transportation , Standing Committee on Conduct of Research

This workshop addresses how to make sure research deliverables meet the new electronic document accessibility requirements of the 2018 revised standards under the Section 508 Amendment to the Rehabilitation Act of 1973 (29 U. S.C. § 794d). This session will include background as well as recommended tools and workflows to ensure deliverables meet federal standards and allow for richer indexing of reports in databases and search engines like Google.

508 Compliance and Document Accessibility: Why It Matters and How to Do It (P20-20893)
Mary Moulton/OST-R/Bureau of Transportation Statistics, Judith Salter, Timothy Creagan/U.S. Access Board, Craig Pryor/National Highway Traffic Safety Administration (NHTSA)

1009

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 154
Infrastructure Spatial Sensing at Intersections
Lei Zhu, National Renewable Energy Laboratory (NREL), presiding
Sponsored By Standing Committee on Geographic Information Science and Applications , Standing Committee on Transportation Asset Management

The sensing technology that is enabling vehicle automation also can revolutionize traffic intersection safety , control, and efficiency. Infrastructure spatial sensing technology—for example, mounting lidar sensors and video imaging at an intersection and using software to produce full-scale 3-D trajectories of all objects within a field of view—provides key information for significant advancements. Combining this technology with connected vehicle capability facilitates such applications as eco-approach and departure, optimizing efficient vehicle–signal coordination , and reducing traffic accidents through increased safety.

1010

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 150B
A Primer on Machine Learning for Transportation
David Reinke, Kittelson & Associates, Inc. (KAI), presiding
Mecit Cetin, Old Dominion University, presiding
Sponsored By Standing Committee on Artificial Intelligence and Advanced Computing Applications

The Standing Committee on Artificial Intelligence and Advanced Computing Applications Committee will publish a primer on machine learning and transportation in fall 2019. This workshop will present a guided tour of the primer to transportation data at large, particularly for data analysts and modelers. This is a follow-up to the highly successful big data and machine learning workshop at the 2019 TRB Annual Meeting. Topics include the role of machine learning in big data analysis; supervised, unsupervised, and reinforcement learning methods; and resources for machine learning. '

Panelist (P20-21879)
Cathy Wu/Massachusetts Institute of Technology (MIT)
Panelist (P20-21881)
J. James Yang

(continued)

Panelist (P20-21880)
Xudong Fan/Case Western Reserve University
Panelist (P20-21882)
Sherif Ishak/Old Dominion University

1011 CM (3.00)

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 151A
Community Disaster Emergency Supplies Procurement and Delivery Simulation
Anne Strauss-Wieder, North Jersey Transportation Planning Authority, presiding
Sponsored By Standing Committee on the Logistics of Disaster Response and Business Continuity, Special Task Force on Climate Change and Energy, Section - Transportation Systems Resilience, Subcommittee for Resilience Communications, Joint Subcommittee on Resilience and Sustainability Cooperation of ABR00, ABR10, ABR20, ABR30, and A0020T, Standing Committee on Critical Transportation Infrastructure Protection, Standing Committee on Freight Transportation Planning and Logistics, Freight Systems and Marine Group Young Members Council

The ALAN simulation uses virtual and live action role-playing to simulate post-disaster supply chains for key commodities. Attendees use smartphones or tablets to play the role of a business, government agency, or nonprofit organizations working in a crisis scenario. The workshop includes visual performance metrics to allow players to review systemwide impacts of their actions and a hot wash–style discussion reveals strategies for addressing real-world gaps reflected in game play.

ALAN Simulation (P20-20027)
Kathy Fulton/American Logistics Aid Network

1012 CM (3.00)

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 151B
Evacuation Planning Strategies and Solutions from the National Disaster Preparedness Training Center
Karl Kim, University of Hawai'i at Manoa, presiding
Sponsored By Standing Committee on Emergency Evacuations

' This MGT-461 workshop is designed to equip emergency managers, first responders, transportation professionals, security and safety professionals, and government administrators with the ability to utilize current tools and technologies to institute best practices and strategies to plan for and execute an emergency evacuation. Participants will discusses hazard conditions for which an emergency evacuation could be an appropriate protective action and the methods to help prepare for evacuation.'

Evacuation Planning Strategies and Solutions (P20-21659)
Karl Kim/University of Hawai'i at Manoa

1013 CM (3.00)

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 140B
Survey Says: Measuring the Effectiveness of Public Involvement Activities
Rusty Ennemoser, Florida Department of Transportation, presiding
Michael Garau, Kimley-Horn and Associates, Inc., presiding
Sponsored By Standing Committee on Public Involvement in Transportation, Joint Subcommittee on Community Impact Assessment of ADD20, ADA60, ADC10, and ADD50, Standing Committee on Environmental Justice in Transportation

' Although widespread resources are available for conducting public outreach as well as a growing body of literature and experience on how to engage the public, few practical methods are available to gauge the success of these public involvement approaches. This interactive workshop will walk through the components of the results of National Cooperative Highway Research Program Project 08-105, which includes the Public Involvement Effectiveness Survey for both public participants and sponsoring agencies. Participants will work with scenarios to evaluate various measurement techniques. '

1014

Historic Bridge Rehabilitation: How Much Is Too Much?
Kristen Zschomler, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Historic and Archeological Preservation in Transportation, Standing Committee on Steel Bridges, Standing Committee on Concrete Bridges, Standing Committee on Bridge Preservation

This workshop will pull from the 2019 TRB Annual Meeting session on the same topic, as well as a summer meeting session on bridges, and will serve as a culmination of the discussions conducted to date. State DOT representatives, engineers, and preservation professionals will present case studies and discuss how much rehabilitation is too much before it results in an adverse effect to a historic bridge. Case studies will include a variety of bridge types, including metal truss and concrete bridges. The session will be interactive, engaging the audience in case studies and discussion .'

Minnesota Examples of Historic Bridge Rehabilitations (P20-20769)
Kristen Zschomler/Minnesota Department of Transportation, Nicole Bartelt/Minnesota Department of Transportation, Nancy Daubenberger/Minnesota Department of Transportation
California Examples of Historic Bridge Rehabilitations (P20-20770)
Helen Blackmore/California Department of Transportation (CALTRANS), Chad Moffett/Mead & Hunt, Inc.
Oklahoma Examples of Historic Bridge Rehabilitations (P20-20771)
Rhonda Fair/Oklahoma Department of Transportation

1015   CM (3.00)

How Community Impact Assessment Lays a Foundation for Equitable, Resilient Communities
Veronica Murphy, New Jersey Department of Transportation, presiding
Sponsored By Standing Committee on Environmental Justice in Transportation, Standing Committee on Public Involvement in Transportation, Standing Committee on Social and Economic Factors of Transportation, Joint Subcommittee on Community Impact Assessment of ADD20, ADA60, ADC10, and ADD50

' The community impact assessment (CIA) process has evolved since its creation more than 20 years ago. This workshop promotes the CIA process to show practitioners how to use new tools, data sources, and analytic strategies to perform CIA, integrate it with interrelated analyses, and address current community goals. Presenters will demonstrate application of CIA process steps on real projects. Interactive exercises will reinforce the process and inform a future topic-based webinar series.'

1016

Impacts Connected and Automated Vehicles Could Have on Geometrics
Brian Toombs, Burgess and Niple, Inc., presiding
Sponsored By Standing Committee on Geometric Design, Standing Committee on Freeway Operations, Standing Committee on Vehicle-Highway Automation, Standing Committee on Managed Lanes, Standing Committee on Operational Effects of Geometrics, Standing Committee on Tort Liability and Risk Management, Standing Committee on Pedestrians, Standing Committee on Bicycle Transportation

'As continued research on connected and automated vehicles (CAVs) shows promise for implementation, questions arise on how they may influence the future of geometric design of roadways and intersections. This workshop will explore possible scenarios that could change the geometric design process for all users and will facilitate discussion on how the criteria could be revised. Current research will be examined using multiple brief presentations. Finally, four breakout groups—focused on freeways and interchanges, intersections, highways, and methodology—will discuss foreseen changes and proactive strategies to ensure that geometric design meets the safety needs for all users during all phases of CAV implementation.'

Assessing the Effectiveness of Managed Lane Strategies for the Near-Term Deployment of Cooperative Adaptive Cruise Control (P20-21737)
Joyoung Lee/New Jersey Institute of Technology
An Update on NCHRP Project 20-24(112): Connected Roadway Classification System Development (P20-21738)
Edward Seymour/Texas A&M Transportation Institute
The Impacts of CAVs: Compromise Between Law and Design (P20-21819)
Amanda Hamm/Virginia Department of Transportation

1017

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 203
USDA–Natural Resources Conservation Service Hydrology Methods
Thomas Knight, South Carolina Department of Transportation, presiding
Sponsored By Standing Committee on Hydrology and Hydraulics, Standing Committee on Stormwater

The USDA Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service, SCS) continually updates NRCS-developed hydrology methods, models, and references to incorporate the latest academic research and data updates developed by other Federal agencies. NRCS also continues to expand the capability of NRCS-developed software to accept user developed region- or site-specific inputs to more accurately model local watershed conditions. This workshop introduces participants to the NRCS National Engineering Handbook Part 630, Hydrology, the source document for all NRCS hydrology methods; summarizes the most current updates to NRCS hydrology methods, models, and references; and provides discussion of the areas outlined below.

USDA–Natural Resources Conservation Service Hydrology Methods (P20-20960)
Claudia C. Hoeft/USDA-NRCS, Donald Woodward/USDA-NRCS, Quan Quan/USDA-NRCS

1018

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 206
Smart and Multifunctional Pavements
James Bryce, Marshall University, presiding
Zhanmin Zhang, University of Texas, Austin, presiding
Sponsored By Standing Committee on General and Emerging Pavement Design

' Pavements occupy valuable real estate, so there is a need to move beyond designing pavements for their traditional purpose of carrying traffic loadings. Pavements can serve as an integrated part of stormwater quality and flood control management systems and as sources of energy. Additionally, heavier electric vehicles in the short term—and connected and automated vehicles (CAVs) in the long term—present additional needs and opportunities for advancing pavement design and construction. This workshop will present case studies of projects that have used pavements as an integrated part of bigger systems and provide feedback to CAVs or that allow for real-time sensing applications.'

1019

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 208
Pavement Smoothness Analysis with Profile Viewing and Analysis (ProVAL)
Magdy Mikhail, AgileAssets, Inc., presiding
Sponsored By Standing Committee on Pavement Surface Properties and Vehicle Interaction, Standing Committee on Concrete Pavement Construction and Rehabilitation, Standing Committee on Asphalt Pavement Construction and Rehabilitation, Standing Committee on Surface Requirements of Asphalt Mixtures

' The FHWA Profile Viewing and Analysis (ProVAL) is included in AASHTO R 54 and R 56 specifications as a standard software tool for profile analysis and reporting. Many state agencies have adopted the AASHTO recommendation and require contractors or DOT inspectors to use ProVAL software for analysis and reporting in their smoothness specifications. This workshop will present the current version of ProVAL and case studies from state agencies and contractors, sharing lessons to improve pavement smoothness. This workshop requires participants to bring their own fully charged laptop computers preinstalled with ProVAL software for hands-on exercises to maximize learning objectives. '

Pavement Smoothness Analysis with Proval (P20-21070)
George Chang/The Transtec Group, Inc., David Merritt/The Transtec Group, Inc.

1020

Introducing the Bridge Load Testing E-Circular
Eva Lantsoght, Universidad San Francisco de Quito, presiding
Sreenivas Alampalli, New York State Department of Transportation, presiding
Sponsored By Standing Committee on Testing and Evaluation of Transportation Structures, Standing Committee on Structures Maintenance, Standing Committee on Bridge Management, Standing Committee on Bridge Preservation

Load testing is a recognized method to evaluate and rate bridges. Through carefully designed case studies, this interactive workshop provides information to decision makers on when and whether to conduct a load test and on preparing for a load test, its execution, and the interpretation of the test results. Also included is the topic of quantifying safety in terms of the reliability index after a load test. AASHTO's Manual for Bridge Evaluation and the 1998 Manual for Bridge Rating Through Load Testing generally are used as load testing guidance. This workshop will use the new Transportation Research E-Circular, which provides significant updates to current documents, and will be based completely on case studies and attendee participation.

Introduction to the Workshop (P20-20461)
Sreenivas Alampalli/New York State Department of Transportation
Introduction to E-Circular (P20-20462)
Eva Lantsoght/Universidad San Francisco de Quito
Diagnostic Load Testing, Including Case Study and Cost-Benefit (P20-20463)
Jesse Grimson/BDI Bridge Diagnostics, Inc.
Proof Load Testing, Including Case Study and Cost-Benefit (P20-20464)
Yi Zhou/AECOM
Reliability and Cost-Benefit (P20-20465)
David Yang/Lehigh University, Dan Frangopol/Lehigh University
Load Rating Exercise by Participants (P20-20466)
David Kosnik/CTL Group, Eva Lantsoght/Universidad San Francisco de Quito
Short Presentations on Field Experience (P20-20467)
Marvin Halling/Utah State University
Panel Discussion (P20-20468)
Sreenivas Alampalli/New York State Department of Transportation

1021

Rehabilitation of Large Culverts
Brian Carmody, New York State Department of Transportation, presiding
Sponsored By Standing Committee on Culverts, Buried Bridges, and Hydraulic Structures, Standing Committee on Subsurface Soil-Structure Interaction

Transportation agencies are struggling with aging buried culvert and storm drain systems. Maintenance demands frequently outpace technical solutions and available budgets. This workshop will present some options for person entry–sized culvert rehabilitation, including investigation of deficiencies, selection of rehabilitation method, and consideration of needed service life. A panel discussion will consider owner's needs, contractor procedures, and material capabilities. Research on durability and testing procedures also will be discussed.

Introduction (P20-21473)
Brian Carmody/New York State Department of Transportation
Joint Degradation, Gasket Loss CLSM, and Flowable Grout (P20-21476)
Don LeBlanc/DLVEWS, Inc.
Shotcrete for Culvert Rehabilitation (P20-21477)
Charles Hanskat/American Shotcrete Association
Slip-Lining Grout Strength (P20-21478)
Ian Moore/Queen's University

(continued)

Spray Applied Pipe Liner Research and Soil Box Testing (P20-21479)
Mohammad Najafi/University of Texas, Arlington
Non-Destructive Testing (P20-21480)
William Horne/NDT Corporation
Filling Localized Voids Within the Pipe Backfill and Piping Concerns (P20-21481)
Chris Hamilton/Avanti International, Britt Babcock/Avanti Engineering Group

1022

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 209BC
Evolution of Project Delivery Information Systems: Where We Were and Where We Are Headed
Aaron Costin, University of Florida, presiding
Sponsored By Standing Committee on Construction Management, Standing Committee on Information Systems and Technology, Subcommittee on Information Systems in Construction Management, Joint Subcommittee of AFH10, ABJ50

' Organized as an interactive session, this workshop offers a critical evaluation of the history and evolution of project delivery information systems used for transportation projects. First, case studies from major projects and power users will be presented. Attendees then will break into small groups, each led by a presenter with predefined discussion questions, to have a deeper dialogue and to analyze the case studies. Finally, the results will be reported back to the general workshop, followed by a question-and-answer session by a panel of experts. The goal is to identify lessons learned and best practices from history to develop recommendations for the future generation of transportation projects. '

Structured Data: The Future Promise of BIM (P20-20132)
Connor Christian/HDR
Field Data Acquisition, Access, and Analysis (P20-20453)
Ron Perkins/Jobsite Tech Group
No More Orange Field Books: Eliminating Siloed Data Through Unified Databases and Integrations (P20-20454)
Chad Schafer/Infotech
Enhancing Project Delivery for Earthwork QC/QA Using Intelligent Inspection (P20-20134)
David White/Ingios Geotechnics, Inc.
Pennsylvania Department of Transportation Development of eConstruction Mobile Applications and Software Systems (P20-20455)
James Foringer/Pennsylvania Department of Transportation
On the Front Lines of Change (P20-20133)
Francesca Maier/Fair Cape Consulting LLC
Virginia Department of Transportation Construction Division Digital Transformation Strategy (P20-20729)
Julia Simo/Virginia Department of Transportation

1023

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 207B
Construction of High-Quality Longitudinal Joints: The Secret for Long-Lasting Asphalt Pavements
Rajib Mallick, Worcester Polytechnic Institute, presiding
Danny Gierhart, Asphalt Institute, presiding
Sponsored By Standing Committee on Surface Requirements of Asphalt Mixtures, Standing Committee on Quality Assurance Management, Standing Committee on Asphalt Pavement Construction and Rehabilitation

Construction of high-quality longitudinal joints is critical for ensuring long-lasting asphalt pavements. Over the years, several field studies have been conducted using innovative techniques and quality control measures. In this workshop, representatives from the industry, agencies and academia will share their experience and discuss about existing challenges, which will help us develop a research need statement in this topic. This interactive workshop will combine short presentations, plenary sessions and table breakouts. Participants will be able to understand the suitability of the different techniques and hence utilize them more effectively.

Improving Performance of Longitudinal Joints: A Cooperative Effort Between the FHWA and the Asphalt Institute (P20-20086)
Timothy Aschenbrener/Federal Highway Administration (FHWA)

(continued)

What's Important and How Does an Agency Get There (P20-20087)
Mark Buncher/Asphalt Institute
Best Practices for Placing and Compacting Longitudinal Joints (P20-20088)
H. Wayne Jones/Asphalt Institute
State Implementation: Implementation of a Longitudinal Joint Specification (P20-20089)
Derek Nener-Plante/Maine Department of Transportation
State Implementation: Longitudinal Joint Seal (P20-20090)
James Trepanier/Illinois Department of Transportation
Infrared Heaters: A Path to Sustainable Pavement Construction (P20-20091)
Bob Kieswetter/Heat Design Equipment Inc.
Construction of Longitudinal Joints in Airfields (P20-20092)
Matthew Hoyle/Transportation Systems Center

1024

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 202A
Use of Self-Consolidating Concrete in Bridge Applications
Anton K. Schindler, Auburn University, presiding
Kamal Khayat, Missouri University of Science and Technology, presiding
Sponsored By Standing Committee on Basic Research and Emerging Technologies Related to Concrete, Standing Committee on Concrete Bridges, Standing Committee on Durability of Concrete, Standing Committee on Concrete Materials and Placement Techniques, Standing Committee on Properties of Concrete

' Self-consolidating concrete (SCC) is a highly flowable, nonsegregating concrete that is placed without any mechanical consolidation. SCC can fill heavily congested or irregularly shaped members more easily than conventional-slump concrete while providing improved in-place quality and superior surface finish. The use of SCC also may decrease construction costs because of reduced labor requirements during construction. This workshop will cover the following SCC-related topics: 1) mixture proportioning, 2) fresh properties, 3) mechanical properties, 4) time-dependent deformations, 5) construction aspects, 6) flexural and shear behavior, 7) bond behavior, 8) prestress losses, and 9) the structural behavior of real-world elements made with SCC.'

Introduction, Fresh Properties, and Testing of Self-Consolidating Concrete (P20-21231)
Kamal Khayat/Missouri University of Science and Technology
Hardened Properties of Self-Consolidating Concrete (P20-21232)
George Morcous/University of Nebraska, Lincoln
Contractor's Perspective on Using Self-Consolidating Concrete in Bridge Projects (P20-21233)
Oscar Antommattei/Kiewit Engineering Group
Performance of Self-Consolidating Concrete in Prestressed Girder Applications (P20-21234)
Samuel Keske/Wiss, Janney, Elstner Associates, Inc.
Self-Consolidating Concrete Implementation in Real-World DOT Projects (P20-21235)
H. Celik Ozyildirim/Virginia Department of Transportation
Moderated Question and Answer Session (P20-21277)
Anton Schindler/Auburn University

1025

Enhancing Resiliency by Better Moisture Measurement Near Pavements and Structures
John Siekmeier, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Engineering Behavior of Unsaturated Geomaterials, Standing Committee on Engineering Geology, Standing Committee on Aggregates, Standing Committee on Geotechnical Instrumentation and Modeling

The resiliency of transportation infrastructure will be enhanced by better moisture measurement near pavements and structures because moisture is critical to properly compact geomaterials and to properly assess the stability of slopes and other geotechnical structures. New technologies are available and this workshop will share the current state of knowledge concerning moisture measurement. Field tests and best practices for effectively characterizing unsaturated geomaterials will be summarized. Case studies of embankment and pavement design using unsaturated properties will be included as will field measurement devices applicable to landslide warning systems, extreme weather induced slope failures, and geotechnical asset management.

The Value of Asset Management Below the Pavement (P20-20093)
Mark Vessley/BGC Engineering Inc
Considering Moisture While Evaluating Risk Along Roadway Corridors (P20-20066)
Derrick Dasenbrock/Minnesota Department of Transportation, Andrew Shinnefield/Minnesota Department of Transportation
Evaluating the Impact of Moisture Variation on Stiffness Parameters of Compacted Pavement Layers (P20-20067)
Mehran Mazari/California State University, Los Angeles, Soheil Nazarian/University of Texas, El Paso
Stiffness-Based Compaction QA Using Lightweight Deflectometers with Moisture Dependent Targets (P20-20068)
Sadaf Khosravifar/Dynatest North America, Inc., Zahra Afsharikia/Wood Technical Consulting Solutions, Charles Schwartz/University of Maryland
New Techniques for Continuous Moisture Monitoring of Road Materials and Soils (P20-20069)
Timo Saarenketo/Roadscanners
Panel Discussion (P20-21046)
Derrick Dasenbrock/Minnesota Department of Transportation, Mark Vessley/BGC Engineering Inc, Mehran Mazari/California State University, Los Angeles, Sadaf Khosravifar/Dynatest North America, Inc., Timo Saarenketo/Roadscanners

1026

Acceptability Criteria for Aggregates in Road Construction
Reza Ashtiani, University of Texas, El Paso, presiding
Sponsored By Standing Committee on Aggregates, Standing Committee on Resource Conservation and Recovery, Standing Committee on Stabilization of Geomaterials and Recycled Materials

It can be challenging for state agencies to obtain approval of marginal or reclaimed aggregates for construction and rehabilitation of pavements, since many will not pass specifications intended to regulate supplies from rock quarries. These alternative aggregates must be regulated better, both to beneficially consume materials that currently are wasted or not exploited and to assure users of their adequate performance. This workshop will expose participants to the current rationale behind criteria that successfully regulate the use of marginal aggregate sources in different state agencies and will identify the areas of improvement in specifications. The workshop will comprise presentations, hands-on evaluation, and roundtable discussions.

General Introduction/Welcome (P20-20346)
Reza Ashtiani/University of Texas, El Paso
Sustainable Use of All Quarry Materials (P20-20348)
Kevin Vaughan/Vulcan Materials Company
DOT Source Property Impacts on Aggregate Reserve Sustainability (P20-20350)
Randy Weingart/National Stone, Sand, and Gravel Association
Break (P20-20368)
Reza Ashtiani/University of Texas, El Paso

(continued)

The Looming Aggregate Supply Crisis: Causes and Solutions (P20-20369)
Patrick Jacomet/Ohio Aggregates & Industrial Minerals Association
Innovations in Aggregate Production and Supply (P20-20370)
Peter Compher/Luck Stone Corporation, Ryan Emmons/Luck Stone Corporation
Panel Discussion (P20-20371)
Kevin Vaughan/Vulcan Materials Company, Randy Weingart/National Stone, Sand, and Gravel Association, Patrick Jacomet/Ohio Aggregates & Industrial Minerals Association, Peter Compher/Luck Stone Corporation, Ryan Emmons/Luck Stone Corporation
Concluding Remarks (P20-20372)
Reza Ashtiani/University of Texas, El Paso

1027

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 204B
Making Sense of Sensors Used in Geotechnical Applications
Eli Cuelho, TRI/Environmental Inc., presiding
Sponsored By Standing Committee on Geotechnical Instrumentation and Modeling, Standing Committee on Testing and Evaluation of Transportation Structures, Standing Committee on Geotechnical Site Characterization, Standing Committee on Geosynthetics

For decades, engineers and researchers have been monitoring the performance of the built environment on and in soil and rock formations. These monitoring activities range from "low-tech" qualitative assessments using visual inspections to "high-tech" methods using sophisticated instrumentation. Available technologies and techniques to accomplish this work are advancing rapidly. For those that want to use more sophisticated methods, establishing the appropriate sensors and associated data processing and analysis methodologies to achieve their specific program goals can be daunting. '

Why (or Why Not) Monitor (P20-20473)
W Allen Marr/GEOCOMP Corporation
Developing Instrumentation and Test Plans (P20-20474)
Jeb Tingle/U.S. Army Corps of Engineers (USACE)
Instrumentation Specifics: Choices and Trade-Offs (P20-20475)
Anthony Simmonds/Geokon, Inc.
What to Do with the Data (P20-20476)
Andrew Ridley/Geotechnical Observations Limited
Case Study on Embankment Instrumentation (P20-20477)
Andrew Ridley/Geotechnical Observations Limited
A Case Study on Slope Instrumentation (P20-21641)
George Machan/Landslide Technology

1028

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 209A
3-Minute Thesis Competition: A Guide for Effective Communication and Concise Research Portrayal to a General Audience
Leila Hajibabai, North Carolina State University, presiding
Chieh (Ross) Wang, Oak Ridge National Laboratory, presiding
Sponsored By Operations and Preservation Group, Subcommittee on Young Professionals, Section - Operations

' The 3-Minute Thesis Competition invites young TRB participants to present their research in such a way that workshop attendees can absorb the key objectives and components of their research in three minutes. The presentation is followed by a discussion forum with a panel of judges, including a question-and-answer session and required poster showcase by competitors. The judges will provide tips on communication skills, comment on presentations, and answer questions. During the poster presentations, attendees will have the chance to communicate with competitors and ask specific questions on the work presented. These segments of the workshop offer an interactive environment for workshop attendees. '

1029

Doctoral Student Research in Transportation Operations and Traffic Control
Michael Knodler, University of Massachusetts, Amherst, presiding
Sponsored By Section - Operations

'This annual seminar consists of presentations from Ph.D. student researchers on transportation operations and traffic control. Reports of recently completed—or nearly completed—Ph.D. dissertations and research in progress are welcome.'

Trajectory-Based Traffic Oscillation Analysis and Control Utilizing Connected Autonomous Vehicles (P20-21411)
Yu "Crystal" Wang/University of South Florida
Trajectory Planning Strategies of Connected Automated Vehicles for Cooperative On-Ramp Merging and Mainline Facilitating Maneuvers (P20-21412)
Yue Zhou/New York University
Control Theoretic Approaches for High-Occupancy Toll Lanes Operation (P20-21413)
Xuting Wang/Pennsylvania State University University Park : Penn State
Investigation of Smart Work Zones to Improve Safety and Efficiency Using Mixed Simulator and Field Studies (P20-21414)
Siyang Zhang/University of Missouri, Columbia
Impact of Bicycle-Specific Infrastructure Treatments and Control Strategies on Bicyclists Safety and Mobility (P 20-21415)
Aikaterini Deliali/University of Massachusetts, Amherst
A Real-Time Algorithm for Network Signal Control (P20-21416)
Chaolun Ma/Texas A&M University
Freeway Performance Measurement in the Connected Vehicle Environment (P20-21417)
Leila Azizi/Florida International University
Microscopic Modeling of the Area-Based Traffic Flow (P20-21418)
Nikhil Chandra Sarkar/Queensland University of Technology
The Impact of Inclement Weather on Transportation Systems and the Future of Connected and Autonomous Vehicles (P20-21419)
Andrew Bartlett/Niagara International Transportation Technology Coalition
Transportation Safety Improvement Through Connected Vehicles and Deep Learning (P20-21420)
Jiajie Hu/Case Western Reserve University
Assessment of the Operations of Automated and Connected Automated Vehicles on Interstates with Considerations for Heavy Vehicles and Aggressiveness Levels (P20-21421)
Mirla Abi Aad/Virginia Polytechnic Institute and State University
Modeling Automated and Connected Automated Vehicles on a Highway (P20-21422)
Bumsik Kim/Virginia Polytechnic Institute and State University
Real-Time Prediction of Secondary Crash Risk Using Probabilistic Reasoning Approach (P20-21423)
Angela Kitali/Florida International University
Effects of Emerging Transportation Technologies on Driver Behavior and Safety at Signalized Intersections (P2 0-21424)
Pedro Adorno-Maldonado/University of Florida
Leveraging Linked Crash and EMS Data to Investigate Signalized Left Turn Safety (P20-21425)
Francis Tainter/University of Massachusetts, Amherst
Utilizing Microsimulation Modeling for Estimating Mobility and Safety Benefits of Signalized Left Turn Assistant Application in Connected Vehicles (P20-21426)
Mahmoud Arafat/Florida International University

<u>Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, Salon B</u>
Vision, Concepts, and Capabilities for the Next Generation of Traffic Management Systems
Jon Obenberger, Federal Highway Administration (FHWA), presiding
Matthew Junak, HNTB Corporation, presiding
Sponsored By Standing Committee on Freeway Operations, Standing Committee on Regional Transportation Systems Management and Operations, Standing Committee on Artificial Intelligence and Advanced Computing Applications, Standing Committee on Traffic Signal Systems, Standing Committee on Intelligent Transportation Systems, Subcommittee on Active Traffic Management

' This workshop will feature a highly interactive, breakout-session to discuss successful practices, available resources, and topics agencies should consider when developing a vision, preparing a concept of operations, and identifying the capabilities needed for their Next Generation of Traffic Management Systems (TMSs). To make these decisions agencies will need a clear vision, strategic direction, needs, and resources available to plan for and develop these TMSs. '

Welcome: Introductions, Workshop Purpose, and Desired Outcomes (P20-21455)
Jon Obenberger/Federal Highway Administration (FHWA)
Developing a Vision, Concept of Operations, and Capabilities for the Next Generation of TMSs: What Issues and Challenges Should Agencies Consider? (P20-21456)

Moderator (P20-21457)
Bill Halkias/Attikes Diadromes, SA
Topics and Presenters (P20-21459)

Framing the Next Generation of TMSs (P20-21460)
Les Jacobson/WSP
Preparing a Vision for a Next-Generation TMS (P20-21461)
Philip Masters/Parsons
Developing a Concept of Operations for a Next-Generation TMS (P20-21462)
Peter Marshall/Siemens
Key Capabilities of Next-Generation TMSs (P20-21463)
Daniel Lukasik/Parsons
Breakout Session: Identify Issues to Consider, Successful Practices, and Resources to Use (P20-21464)

Moderator (P20-21465)
Susanna Zammataro/International Road Federation (IRF)
Discuss Breakout Session Results (P20-21467)

Moderator (P20-21468)
Lisa Burgess/Kimley-Horn and Associates, Inc.
Action Planning: Identify Topics for Research or Industry Consideration and Collaboration (P20-21469)

Moderator (P20-21470)
Douglas Gettman/Kimley-Horn and Associates, Inc.
Immediate Next Steps and Sponsor's Perspectives (P20-21471)

Moderator (P20-21472)
Beverly Kuhn/Texas A&M Transportation Institute
Presenters (P20-21474)
Catherine McGhee/Virginia Transportation Research Council, Sherif Ishak/Old Dominion University, Susan Langdon/SL Engineering, LLC, Matthew Junak/HNTB Corporation, Daniel Lukasik/Parsons, Lisa Burgess/Kimley-Horn and Associates, Inc., Malika Seddi/Autoroutes, Emanuela Stocchi/AISCAT (Italian Association of Toll Motorways and Tunnels Operators)

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, Salon C
Highlights from the 2019 Automated Vehicle Symposium
Jane Lappin, Toyota Research Institute, Inc., presiding
Sponsored By Standing Committee on Vehicle-Highway Automation

' This workshop will assemble a selection of plenary and breakout session speakers from the 2019 Automated Vehicle Symposium to provide TRB Annual Meeting participants with a summary of the symposium and critical insight into current automated vehicles policy and research issues.'

AVS19 Keynote Address on Automated Driving Systems (P20-21529)
Chris Urmson/Aurora
Safety Assurance of Automated Driving (P20-21530)
Adrian Zlocki/fka GmbH
AV Safety Assurance Principles, Standards, and Best Practices (P20-21531)
Edward Straub/SAE
What the Public Really Thinks About Automated Vehicles: Evidence from Survey Research (P20-21532)
Johanna Zmud/Texas A&M Transportation Institute
Artificial Intelligence and Machine Learning in Infrastructure Readiness for AVS (P20-21533)
Haizhong Wang/Oregon State University
HMI Design Strategies for Assisted Driving Automation (P20-21534)
Bobbie Seppelt/Massachusetts Institute of Technology (MIT)
Trucking Automation: Deployment Challenges and Opportunities (P20-21535)
Richard Bishop/Bishop Consulting
Enabling Technologies: A Peek Under the Hood (P20-21536)
Valentin Scinteie/Kontron
An AV Crash Happens: The Trial (P20-21537)
Karlyn Stanley/RAND Corporation
Working with Infrastructure Owner-Operators to Overcome Public-Sector Institutional Barriers and Safely Implement Roadway Automation (P20-21538)
Daniela Bremmer/Washington State Department of Transportation
Energy and Environmental Implications of Connected and Automated Vehicles: Trends in Industry, Research, Regulations, and Policy (P20-21539)
Dimitris Assanis/Assanis & Associates Inc.
Steps Toward Putting the Public Safety Community at Ease with Advanced Vehicle Technologies (P20-21540)

Planning for AVS20 (P20-21541)
Valerie Shuman/Shuman Consulting Group, LLC
Part 1 (P20-21542)

Part 2 (P20-21543)

Q&A (P20-21544)

European AV Research and Innovation Programs (P20-21545)
Signe Ratso/European Commission
Understanding Travel Behaviors (P20-21821)
Yoram Shiftan/Technion Israel Institute of Technology

1032

The Advancement of Modeling Connected and Automated Vehicles: Past and Future
Soyoung Ahn, University of Wisconsin, Madison, presiding
Samer Hamdar, George Washington University, presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

'Connected and automated vehicles (CAVs) appear more frequently on roads. Many universities, companies, and public agencies plan to deploy these vehicles, given the insights such deployment brings to researchers and practitioners and given the attention and the exposure CAVs provide to their developers and adopters .'

Analytical Modeling for Control in Traffic Environments with Connected and Autonomous Vehicles (P20-21148)
Srinivas Peeta/Georgia Institute of Technology (Georgia Tech)
The Evolution of Driver Behavior in a Connected, Automated Driving Environment (P20-21149)
Alireza Talebpour/University of Illinois, Urbana Champaign
Integrating Autonomy into Urban Systems (P20-21150)
Cathy Wu/Massachusetts Institute of Technology (MIT)
Modeling and Field Experiments on Lane Changing of an Autonomous Vehicle in Mixed Traffic (P20-21151)
Xiaopeng (Shaw) Li/University of South Florida
Benefits of Connectivity for Automatic Vehicle Following Systems (P20-21152)
Swaroop Darbha/Texas A&M Transportation Institute
Taming Phantom Jams with Vehicular Control at Low-Penetration Rates (P20-21153)
Daniel Work/Vanderbilt University
Critical Reflection on the Descriptive Power of Microscopic Traffic Models for Connected and Automated Vehicles (P20-21154)
Meng Wang/Delft University of Technology
Cooperative Adaptive Cruise Control Vehicle String Operations in Mixed Traffic: Models and Applications (P20-21155)
Hao Liu/University of California, Berkeley, Xiao-Yun Lu/University of California, Berkeley
Q&A (P20-21174)

1033

The Nexus of Speed Management and Human Factors as a Focal Point of Safe Systems
Joseph Marek, Clackamas County, presiding
Offer Grembek, University of California, Berkeley, presiding
Sponsored By Standing Committee on Transportation Safety Management Systems, Standing Committee on Vehicle User Characteristics

Speed management is a core principle of Safe Systems—a holistic view of safety recognizing that road users will make safety-critical errors, but that those events should not result in death. Although professionals consider environment, vehicle, and road user factors to reduce speeding, knowledge about human factors is underutilized. Incorporating human factors into speed management practices can reduce inherent road user misjudgment as well as the elevated levels of kinetic energy created by speeding.

Safe Systems and Speed (P20-21310)
Seth Lajeunesse/UNC Highway Safety Research Center
Human Factors and Legal and Culture Aspects (P20-21312)
Jennifer Oxley/Monash University Accident Research Centre
Posted Speed Limit Trends (P20-21314)
Kay Fitzpatrick/Texas A&M Transportation Institute
Road Design Related to Speed Management (P20-21316)
Leah Shahum/Vision Zero Network
Vehicle Factors (P20-21317)
David Harkey/Insurance Institute for Highway Safety

(continued)

Foundation for the Future: Safe Systems Approach to Speed (P20-21319)
Robert Wunderlich/Texas A&M Transportation Institute

1034

Surrogate Measures of Safety for Heterogeneous Traffic: Automation, Cyclists, and Pedestrians
Nicolas Saunier, Ecole Polytechnique de Montreal, presiding
Aliaksei Laureshyn, Lund University, presiding
Sponsored By Standing Committee on Safety Data, Analysis and Evaluation, Standing Committee on Pedestrians

As traffic systems quickly evolve with the automation of driving , the safety of vulnerable road users will remain as important as ever. In these changing conditions, it is crucial to be able to assess safety swiftly, which can only be done with noncrash observations or surrogate measures of safety. Such measures also contribute to a better understanding of the factors that lead to collisions. This workshop will cover the recent developments in the field, including automated data-collection methods. '

SMoS Validation Revisited: Serious Hinders for Making a "Classical" Validation Study and Relative Validation as a Possible Way Out (P20-21308)
Aliaksei Laureshyn/Lund University
Extreme Value Theory Approaches for Traffic Conflict–Based Crash Estimation: Modeling Advancements and Applications (P20-21309)
Tarek Sayed/University of British Columbia
Probabilistic Approach to Motion Prediction in Detection of Evasive Actions and Application of Extreme Value Theory (P20-21311)
Carl Johnsson/Lund University
Video Analytics for Smart Cities: Generating Better Data to Make Our Intersections Smarter and Safer (P20-213 13)
Franz Loewenherz/City of Bellevue
Signalized Intersection to Roundabout Conversion in Heterogeneous Traffic Context: Estimation of Safety Benefits Using Surrogate Measures (P20-21314)
Anurag Pande/California Polytechnic State University, San Luis Obispo
Let's Not Wait for Micromobility Crashes (P20-21318)
Annie Chang/McGill University
Automated Shuttle Interactions in City Traffic (P20-21320)
Etienne Beauchamp/Ecole Polytechnique de Montreal

1035

Strategic Approaches for Advancing Infant and Child Occupant Protection: Birth to 15 Years
Joyce Pressley, Columbia University, presiding
Maria Vegega, Road Safety Consulting, presiding
Sponsored By Standing Committee on Occupant Protection

 This workshop will examine strategic approaches and best practices for addressing current and emerging issues in infant and child motor vehicle occupant safety across the four critical stages of pediatric occupant protection, from birth to 15 years of age. A broad array of speakers will provide updates and a framework to guide discussion of current and emerging factors contributing to infant and child endangerment, effective interventions, expanded social media communication tools, knowledge gaps, and research needs. Speakers and discussants include research and policy institutions, practitioners, university researchers, government agencies and private consulting organizations.

State of Motor Vehicle Safety in 0–15-Year-Old Passengers (P20-21300)
Joyce Pressley/Columbia University
2019 Child Occupant Protection Workshop: Summary and Challenges (P20-21301)
Maria Vegega/Road Safety Consulting
CDC Motor Vehicle Occupant Safety Initiatives with Implications for 0–15-Year-Olds (P20-21302)
Erin Sauber-Schatz/Centers for Disease Control and Prevention (CDC)

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 102B
Cannabis Legalization: State, Provincial, and Local Metrics to Assess Outcomes
Robyn Robertson, Traffic Injury Research Foundation, presiding
Tara Kelley-Baker, AAA Foundation for Traffic Safety, presiding
Sponsored By Standing Committee on Alcohol, Other Drugs, and Transportation

This session will discuss the collection and reporting of data to assess effects of cannabis legalization on drug -impaired driving. Types of data that are most accurate and robust and that can inform discussion about outcomes and measures of success will be considered. Strategies to reduce the misuse and misinterpretation of data related to negative outcomes will be shared, along with experiences and lessons learned about the communication of key metrics from cannabis-legalized jurisdictions.

Marijuana and Impaired Driving: Policy, Practice, and Metrics in Oregon (P20-21321)
Daniel Estes/Oregon Department of Transportation
This Is Not Your Father's Marijuana: Promise, Challenges, and Opportunities for Cannabis Policy in Ontario (P2 0-21322)
Yoassry Elzohairy/Ontario Ministry of Transportation
Measuring Drug-Impaired Driving in Colorado: Lessons Learned (P20-21323)
Jack Reed/Colorado Division of Criminal Justice
Legal Weed and Probation Supervision: Indicators for Criminal Justice Populations (P20-21324)
Mark Stodola/American Probation & Parole Association

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 103A
Safety Management in Light Vehicle Fleets
Sharon Newnam, Monash University, presiding
Peter VanDyne, Liberty Mutual Insurance Company, presiding
Sponsored By Standing Committee on Truck and Bus Safety

This workshop will address the safety of workers using light vehicle fleets. The workshop will invite key experts to present 1) the extent of the problem, 2) best practices in light vehicle fleets, 3) challenges managing the safety of workers operating light vehicle fleets, and 4) a case study to demonstrate exceptional safety management practices and associated safety outcomes. The workshop will conclude with a group activity to translate lessons learned. '

Introduction to Workplace Road Safety: Extent of the Problem, Definitions of Light Vehicles, and Overview of the Agenda (P20-21031)
Sharon Newnam/Monash University
Data on Light Vehicle Fleets and Safety Outcomes: Insurance Data Capturing Crash Characteristics (P20-21032)
Peter VanDyne/Liberty Mutual Insurance Company
Safety Management in Workplace Road Safety: The Factors That Both Support and Constrain Safety Driving Behavior (P20-21033)
Sharon Newnam/Monash University
Benchmarking in Light Vehicle Fleets: Characteristics of High- and Low-Performing Companies (P20-21034)
Peter VanDyne/Liberty Mutual Insurance Company
Best Practice in Safety Management: A Case Study of a Company That Has Achieved Good Safety Outcomes (P 20-21035)
Peter VanDyne/Liberty Mutual Insurance Company

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, Salon A
Protecting Cyclists at Intersections: Design Guidance, Research, and Knowledge Gaps
Lee Reis, Fehr & Peers, presiding
Sponsored By Standing Committee on Bicycle Transportation, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Geometric Design, Standing Committee on Traffic Signal Systems

Over 40% of urban bicyclist fatalities occurred at intersections in 2017, and cities are increasingly exploring the use of protected intersections to increase bicycle safety. This workshop will provide an overview of current design guidance and research, including NACTO's recent "Don't Give up at the Intersection" guidebook and presentations from leading researchers in the field on current knowledge gaps. The review will be followed by an interactive breakout discussion based on selected case studies to identify bicycle intersection design knowledge gaps and research needs.

Overview of the NACTO Don't Give Up at the Intersection Guidebook (P20-20724)
Matthew Roe/National Association of City Transportation Officials
The FHWA's New Web-Based Bicycle Facility Design Course (P20-20725)
Darren Buck/Federal Highway Administration (FHWA)
Urban Bikeway Intersection Safety, Design, and Comfort: State of the Research (Part 1 of 3) (P20-20726)
Kari Watkins/Georgia Institute of Technology (Georgia Tech)
Urban Bikeway Intersection Safety, Design, and Comfort: State of the Research (Part 2 of 3) (P20-20727)
Krista Nordback/UNC Highway Safety Research Center
Urban Bikeway Intersection Safety, Design, and Comfort: State of the Research (Part 1 of 3) (P20-20728)
Chris Monsere/Portland State University

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 144A
Mitigating Public Transit Areas of Critical Safety Risk
Lisa Staes, USF Center for Urban Transportation Research, presiding
Sponsored By Task Force on Transit Safety and Security

This interactive session will include presentations on topics deemed critical in public transit and commuter rail safety, with topics including technologies to address hazardous grade crossings, provide roadway worker protection, and avoid transit bus collisions through active alerts and automated braking, transit bus mirror designs to reduce transit collisions, and exportable power systems for emergency response activities. This interactive session will include transit agency personnel, technology vendors, Federal agency personnel, and university researchers.

How We Are Testing an Automated Collision Avoidance and Emergency Braking System for Buses and What We Have Learned So Far (20-00844)
Heidi Soule/New Jersey Transit, Skip Huck/New Jersey Transit, Andrew Krum/New Jersey Transit, Yinhai Wang/New Jersey Transit, Ruimin Ke/New Jersey Transit, Dave Valadez/New Jersey Transit, Dan Sellers/New Jersey Transit, Jerome Lutin/New Jersey Transit
LiDAR-Based Scanning Technology to Address Hazardous Grade Crossings (P20-21264)
Francesco Bedini Jacobini/Federal Railroad Administration (FRA), Eric Sherrock/ENSCO, Inc.
Right-of-Way Worker Protection Demonstration at the Maryland Transit Authority (P20-21265)
Matt Edmonds/Miller Ingenuity
How We Are Testing an Automated Collision Avoidance and Emergency Braking System for Buses and What We Have Learned So Far (P20-21271)
Jerome Lutin/New Jersey Transit, Heidi Soule/Pierce Transit
New York City Transit Bus Mirror Configuration Project (P20-21273)
Andrew Krum/Virginia Polytechnic Institute and State University
Exportable Power System for Emergency Response (P20-21274)
Jason Hanlin/Center for Transportation and the Environment
Performance Measurement and Evaluation of Safety Research Demonstrations: Opportunities and Challenges (P20-21276)
Sisinnio Concas/USF Center for Urban Transportation Research

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 147A
Mobility Innovation: A Vision for Our Transportation Future, Part 1 (Part 2, Session 1081)
Susan Shaheen, University of California, Berkeley, presiding
Jeffrey Chernick, RideAmigos CORP, presiding
Sponsored By Standing Committee on Emerging and Innovative Public Transport and Technologies, Standing Committee on Transportation Demand Management, Standing Committee on Regional Transportation Systems Management and Operations, Subcommittee on Shared-Use Vehicle Public Transport Systems, Subcommittee on Emerging Ridesharing Solutions, Standing Committee on Automated Transit Systems

' Innovative services are offering travelers and consumers more options to access mobility, goods, and services. Two complementary approaches to multimodal access are emerging. In North America, consumers are assigning economic values to transportation services and making mobility decisions (e.g., the decision not to travel and instead have a package delivered) based on cost, travel and wait time, number of connections, convenience, and other attributes – referred to as Mobility on Demand (MOD). In Europe, services that allow travelers to sign up for mobility services in one bundled service are gaining popularity – known as Mobility as a Service (MaaS). Both MOD and MaaS are about providing travelers with more seamless travel options.'

Workshop Introductions (P20-20258)
Susan Shaheen/University of California, Berkeley, Jeffrey Chernick/RideAmigos CORP
TED Talk: Mobility Innovation (P20-20250)
Vincent Valdes/Federal Transit Administration (FTA)
The Future of Mobility Innovation (P20-20251)
Andrew BATA/Union Internationale des Transports Publics (UITP), Arthur Guzzetti/American Public Transportation Association (APTA), Timothy Papandreou/Emerging Transport Advisors, Gabe Klein/CityFi, Harriet Tregoning/NUMO Alliance
TED Talk: Shared Automated Vehicles and Mobility Innovation (P20-20253)
Randell Iwasaki/Contra Costa Transportation Authority
Ensuring Equitable Access and Managing Public–Private Partnerships: Lessons Learned from Innovative Mobility (P20-20252)
Gary Thomas/Dallas Area Rapid Transit (DART), Carlos Cruz-Casas/Miami-Dade County, Sharon Feigon/Shared-Use Mobility Center, Hans Arby/UbiGo, Elliot Martin/University of California, Berkeley

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 144C
Tactile Walking Surfaces for Wayfinding in Transit and Public Rights of Way
Elizabeth Hilton, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Passenger Intermodal Facilities, Standing Committee on Accessible Transportation and Mobility, Standing Committee on User Information Systems, Standing Committee on Pedestrians

Wayfinding and safety for travelers with vision disabilities can be aided by tactile walking surface indicators like guide strips in such facilities as plazas, channelized turn lanes and roundabouts, curbless streets, shared bicycle lanes, and intermodal transportation facilities. Standards and practice in the United States and around the world will be presented, along with current research and case studies. The workshop will conclude with a discussion and next steps.

State of the Art and Standards in the United States (P20-21287)
Janet Barlow/Accessible Design for the Blind (ADB)
An International Perspective (P20-21288)
Billie Bentzen/Accessible Design for the Blind (ADB)
Tactile Walking Surfaces for Locating Crosswalks and Aligning to Cross (P20-21289)
Robert Wall-Emerson/Western Michigan University
Introduction to TCRP B-46: Tactile Wayfinding in Transportation Settings for Travelers Who Are Blind or Visually Impaired (P20-21290)
Sarah O'Brien/UNC Highway Safety Research Center
Case Study: Seattle (P20-21296)
Dongho Chang/City of Seattle

(continued)

Case Study: San Francisco (P20-21297)
Cristina Olea/San Francisco Public Works
Case Study: Los Angeles (P20-21298)
Daniel Levy/Los Angeles Metro
Case Study: Vancouver (P20-21299)
Dylan Passmore/City of Vancouver

1042	CM (3.00)

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 146A
Commuter Rail 101: A Primer for Startups
Katherine O'Neil, Keolis Commuter Services, presiding
Sponsored By Standing Committee on Commuter Rail Transportation

Commuter Rail is the fastest growing rail transit mode in North America with new systems starting up all over the continent as legacy systems seek to redefine themselves. This workshop is designed to give pointers and lessons learned to those contemplating the commuter rail arena, organized around the recently released TRCP #200, describing state-of-the-art practices for contracting for commuter rail services.

Commuter Rail in America (P20-20881)
David Nelson/Jacobs
Rolling Stock Choices for Commuter Rail (P20-20898)
Mark Walbrun/Quandel Consultants, Inc
TCRP 200: Contracting for Commuter Rail (P20-20882)
Emmanuel Horowitz/ESH Consult
Case Study: Utah Transit Authority FrontRunner (P20-20894)
Bruce Cardon/Utah Transit Authority
Case Study: Virginia Railway Express (P20-20896)
Douglas Allen
Case Study: Metrolink (P20-20900)
Darrell Maxey/Southern California Regional Rail Authority

1043

Sunday, 09:00 a.m. - 12:00 p.m., Convention Center, 143C
Can This Train Go Any Faster?: Achieving High(er)-Speed Rail Service Through Improvements to Existing Infrastructure, Part 1 (Part 2, Session 1084)
Theodore Sussmann, OST-R/Volpe Center, presiding
Sponsored By Standing Committee on Railroad Track Structure System Design, Standing Committee on Railway Maintenance

' Existing railway lines present unique opportunities to reduce traffic congestion, improve travel times, and enhance mobility. Although these lines provide corridors that reduce the cost of establishing rail transportation services, they present operational challenges and constraints including sharp curves, poor or nonexistent drainage, and degraded track conditions. Several case studies of speed upgrades will highlight challenges and opportunities, including the challenge of reducing the degree of curvature. Current and emerging tools and techniques used in design, construction, and maintenance will be discussed. International experience will highlight the similarity of the problems and innovative approaches.'

Managing Intercity Passenger Rail Planning with Limited Staff: A Case Study of the Northern Lights Express (P20-21735)
Francis Loetterle/Minnesota Department of Transportation
Michigan DOT's Venture into High-Speed Rail (P20-21744)
Robert Lippert/Michigan Department of Transportation
Experience in Coordinating with State DOTs (P20-21745)
David Staplin/Consultant
Planning and Execution Roundtable (P20-21746)
Francis Loetterle/Minnesota Department of Transportation, Carl Jackson/Connecticut Department of Transportation, Robert Lippert/Michigan Department of Transportation, David Staplin/Consultant

(continued)

Hartford Line Project: Development, Commissioning, and Lessons Learned (P20-21862)
Carl Jackson/Connecticut Department of Transportation
Capacity Enlarging Modification Measures for Existing Heavy Haul Railway Lines in China: A Case Study on Shuohuang Freight Railway Line (20-04556)
Chunyan Zhao/Tongji University, Shunhua Zhou/Tongji University, Carlton Ho/Tongji University, Yao Shan/Tongji University

1044 CM (3.00)

Freight Beyond the City: Approaches to Improving Freight Mobility in the Suburban Context
William Eisele, Texas A&M Transportation Institute, presiding
Tamiko Brim-Burnell, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Urban Freight Transportation, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Freight Transportation Planning and Logistics

A panel session will present different perspectives on studying, planning, and facilitating freight mobility in suburban contexts. Following the panel session, participants will participate in facilitated breakout sessions to identify future research needs in these areas. After the breakout sessions, participants will report out and engage in a facilitated prioritization exercise to identify the most urgent or pressing research needs in urban freight for the upcoming year. '

1045 CM (3.00)

Reimagining the Future of Transportation with Personal Flight: Preparing and Planning for Urban Air Mobility, Part 1 (Part 2, Session 1087)
Justin Guan, ARUP, presiding
Adam Cohen, University of California, Berkeley, presiding
Sponsored By Aviation Group, Young Members Council - Aviation, Standing Committee on Intergovernmental Relations in Aviation, Standing Committee on Aviation System Planning, Standing Committee on Environmental Impacts of Aviation, Standing Committee on Aviation Economics and Forecasting, Standing Committee on Airport Terminals and Ground Access, Standing Committee on Airfield and Airspace Capacity and Delay, Subcommittee on Unmanned Aircraft Systems (UAS), Standing Committee on Aircraft/Airport Compatibility, Standing Committee on Light Commercial and General Aviation, Standing Committee on Aviation Security and Emergency Management

' This workshop features a moderated panel discussion of thought leaders, from the public and private sectors as well as academia, in the emerging space of urban air mobility (UAM). The program emphasizes technological developments, opportunities and challenges, technologies, equity issues, and potential societal barriers to implementing UAM. Participants will learn the following: What UAM is and how it will affect planning, The opportunities and challenges that arise when planning for UAM at the local and regional level, andBest practices and guiding principles to prepare for this new transportation mode. '

Urban Air Mobility: History, Nuts and Bolts, and the Current State of UAM (P20-20260)
Adam Cohen/University of California, Berkeley
Potential Opportunities and Challenges of UAM (P20-20261)
Adam Cohen/University of California, Berkeley, Tom Gunnarson/Cora, William Goodwin/Skyryse, Bradley Brandt/Louisiana Department of Transportation and Development, Jim Herrera/Federal Aviation Administration (FAA), Christopher Hart/Hart Solutions LLC
Community Acceptance and Public Perception (P20-20263)
Matthew Beamer/Cambridge Systematics, Inc., Rohit Goyal/Uber Technologies, Inc., Mary Ellen Eagan/HMMH, Daniel Friedenzohn/Embry Riddle Aeronautical University, Paul Wheeler/Utah Department of Transportation, Michael Doty/NASA Langley Research Center, Chris Fernando/Booz Allen Hamilton, Inc.
NASA Advanced Air Mobility Research (P20-21681)
Davis Hackenberg/National Aeronautics and Space Administration

Sunday, 10:00 a.m. - 11:30 a.m., Marriott Marquis, Marquis Salon 1&2 (M2)
TRB All Chairs Meeting
Sponsored By Technical Activities Council

Sunday, 10:00 a.m. - 02:00 p.m., Convention Center, Hall A
Careers in Motion Networking Fair
Sponsored By Executive Committee

1046   CM (3.00)

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 152B
Strategic War Games: Moving a Shifting Demographic
Andrea d'Amato, Massachusetts Department of Transportation, presiding
Stephen Woelfel, Massachusetts Department of Transportation, presiding
Sponsored By Standing Committee on Strategic Management, Standing Committee on Management and Productivity, Standing Committee on Performance Management, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Technology Transfer, Standing Committee on Statewide Multimodal Transportation Planning, Standing Committee on Public Involvement in Transportation, Standing Committee on Transportation and Economic Development, Standing Committee on Social and Economic Factors of Transportation, Standing Committee on Transportation Law, Standing Committee on Transit Management and Performance, Standing Committee on Emerging and Innovative Public Transport and Technologies, Standing Committee on Public Transportation Planning and Development

Demographic shifts are tectonic: slow movement marked by sudden, rapid change. Shifts in demographics will change the way cities and regions move people and goods. What transportation policies, technology, or infrastructure might best accommodate new demographics? This workshop offers the chance to participate in a structured discussion of an uncertain future. Teams representing different regions will compete to win research funds to develop robust regional strategies.

1047   CM (3.00)

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 151A
Cross-Cutting Issues in Urban Congestion Pricing
Sharon Greene, InfraStrategies LLC, presiding
Sponsored By Standing Committee on Revenue and Finance, Standing Committee on International Cooperation, Standing Committee on Transportation Economics, Standing Committee on Congestion Pricing, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Transportation and Economic Development, Standing Committee on Social and Economic Factors of Transportation, Standing Committee on Transportation and Land Development, Standing Committee on Public Transportation Planning and Development

This session will address planned cordon pricing programs and proposals being considered for New York , Los Angeles, Seattle, San Francisco, Boston, Portland, and Washington, D.C., and lessons learned from global cities. Speakers will address impacts on congestion management, equity considerations, coordination with transit services, implementation approaches, securing stakeholder buy-in, and public outreach. Workshop will feature facilitated roundtable discussions on relevant topics. [NOTE: MOST OF THE INTERNATIONAL PRESENTERS ARE "INVITED" AND NOT CONFIRMED AS OF 30 SEPTEMBER 2019.]

Overview of Congestion Pricing Options and Existing International Programs (P20-20422)
Daniel Firth/WSP
London's Cordon Pricing Program (P20-20423)
Luke Blair/Imperial College London

(continued)

Stockholm's Cordon Pricing Program (P20-20424)
Mathias Lundbergh/City of Stockholm
Milan's Cordon Pricing Program (P20-20425)
Valentino Sevino/Agenzia Mobilita Ambiente Territorio (AMAT)
Singapore's Cordon Pricing Program (P20-20426)
Peter Quek/Land Transport Authority Singapore
Overview of Proposed and Planned Congestion Pricing Programs in North America (P20-20427)
Angela Fogle/Federal Highway Administration (FHWA)
New York's Proposed Cordon Pricing Program (P20-20428)
Allison C. de Cerreno/MTA Bridges & Tunnels
San Francisco's Proposed Approach to Cordon and Congestion Pricing (P20-20429)
Tilly Chang/San Francisco County Transportation Authority (SFCTA), Rachel Hiatt/San Francisco County Transportation Authority (SFCTA)
Los Angeles's Proposed Approach to Cordon Pricing (P20-20430)
Phillip Washington/Los Angeles County Metropolitan Transportation Authority
Washington, D.C.'s Parking and Congestion Pricing Program (P20-20431)
Soumya Dey/District Department of Transportation
Vancouver's Study of Congestion Pricing (P20-20472)
Kevin Desmond/TransLink
Discussant/Facilitator: Applying Lessons Learned from Existing Congestion Pricing Programs to Proposed and Planned Projects (P20-20432)
Martin Wachs/University of California, Los Angeles

1048

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 150B
Accelerating Automated Vehicle Acceptance with Technology Transfer
Cynthia Jones, Ohio Department of Transportation, presiding
Stephanie Harrell, UNC Highway Safety Research Center, presiding
Valerie Shuman, Shuman Consulting Group, LLC, presiding
Sponsored By Standing Committee on Technology Transfer, Standing Committee on Transportation Education and Training, Joint Subcommittee on Human Factors in Road Vehicle Automation, Pedestrian and Autonomous Vehicle Interactions Subcommittee, ANF10(3)

Automated vehicle (AV) technologies, like most any technology, have the potential to help road safety professionals meet their goals of reducing and traffic-related injuries and fatalities. AV technology is still in its infancy and therefore is not standardized or well-understood by the public. The benefits of AVs can be accelerated by discourse around how AVs can help address safety issues, and how policies, transparency, standards, and data sharing and partnerships are aligned with safety needs and goals. In this workshop, panels will explore and document how to advance safe, effective use of AVs that will serve the needs of all road users.

Policy and Transparency (P20-20577)
Kelley Coyner/Stantec
Standards (P20-20578)
Edward Straub/SAE International
Trusting Increasingly Autonomous Vehicles (P20-20969)
John Lee/University of Wisconsin, Madison
Creating Metrics for Rating ADAS Systems (P20-20865)
David Harkey/Insurance Institute for Highway Safety
Human–Machine Interaction Failures (P20-20579)
Michael Clamann/UNC Highway Safety Research Center
Data Exchange to Accelerate Safe Rollout of Automated Vehicles (P20-20974)
Ariel Gold/Federal Highway Administration (FHWA)
City of Columbus (P20-20870)
Jeff Kupko/Michael Baker International, Inc.

1049

NCHRP Project 08-123: Census Transportation Data Field Guide for Transportation Applications
Penelope Weinberger, American Association of State Highway and Transportation Officials, presiding
Sponsored By Standing Committee on National Transportation Data Requirements and Programs

The goal of National Cooperative Highway Research Program (NCHRP) Project 08-123 is to build a census data guide for transportation applications. In this age of big data, census data are critical to provide context and ensure decisions are made on a foundation of sound representative data that includes at-risk subpopulations. The diversity of stakeholders at the TRB Annual Meeting who can provide insights on integrating census data into their analytical toolkits is an opportunity to make this NCHRP research product more robust and useful to a wide audience .

Census Data Inventory for Transportation Applications (P20-20921)
Krishnan Viswanathan/Cambridge Systematics, Inc.
Transportation Application Uses of Census Data (P20-20922)
Edward Christopher/Independent
Census Transportation Data Field Guide Framework (P20-20923)
Kimon Proussaloglou/Cambridge Systematics, Inc.
Breakout Groups: Census Transportation Data (P20-20924)
Penelope Weinberger/American Association of State Highway and Transportation Officials
Summary and Report Back on Census Transportation Data Field Guide for Transportation Applications (P20-20 925)
Edward Christopher/Independent

1050

Travel Behavior and Safety Studies from the Psychological and Neurophysiological Perspective: Application of Virtual Reality
Anae Sobhani, Delft University of Technology, presiding
Zachary Patterson, Concordia University, presiding
Sponsored By Standing Committee on Travel Survey Methods, Standing Committee on Urban Transportation Data and Information Systems, Standing Committee on Traveler Behavior and Values

Virtual reality (VR) and associated VR tools have opened a new window for the scientific investigation of human travel behavior and safety in hypothetical situations. Combining VR with psychological and neurophysiological monitoring is an emerging direction in this research that is expected to introduce new dimensions in understanding behavior and safety. This workshop will enrich comprehension of the interactions between emotions and mental processing and between travel behavior and safety.

Welcome and Opening Remarks (P20-20676)
Anae Sobhani/Delft University of Technology, Zachary Patterson/Concordia University
Using Virtual Reality to Help Children Learn the Cognitive-Perceptual Skills Required for Safe Street Crossing (P20-20677)
David Schwebel/University of Alabama, Birmingham
Analysis of Driver Willingness to Adapt to Connected and Autonomous Vehicle Using Virtual Immersive Reality Environment (P20-20678)
Shadi Djavadian/Ryerson University
Using Virtual Reality to Understand Travel Behavior: What Do We Gain and What Do We Risk? (P20-20680)
Elisabetta Cherchi/Newcastle University
Expanding on Immersive Virtual Reality Environment: Integrating Physiological and Neuropsychological Measures in Pedestrian Behavior and Risk Perception Analysis (P20-20682)
Bart Hendriks/Universiteit Utrecht
Psychophysiological Methods in the Context of Pedestrian Mobility (P20-20683)
Panos Mavros/ETH Centre
Hands on Workshop on the Use of the Virtual Immersive Reality Environment from the Psychological/Neurophy siological Perspective (P20-20684)
Zachary Patterson/Concordia University, Anae Sobhani/Delft University of Technology

1051

Data Governance Issues for Transportation Agencies
Terrence Bills, Environmental Systems Research Institute (ESRI), presiding
Colin Brooks, Michigan Technological University, presiding
Meredith Cebelak, Gresham Smith and Partners, presiding
Steven Parker, University of Wisconsin, Madison, presiding
Sponsored By Standing Committee on Information Systems and Technology, Standing Committee on Statewide Transportation Data and Information Systems, Standing Committee on Geographic Information Science and Applications

Data governance issues have emerged as a central challenge for many transportation agencies. As agencies become more data-driven, the challenges of organizing, maintaining, and distributing data have taken on greater importance. This workshop will focus on best practices in data governance, with a particular focus on the key issues of managing big data, data governance for data analytics and artificial intelligence, and data security. Attendees will hear from industry and agency experts and will have an opportunity to collaborate, share best practices, and identify key considerations for incorporating data governance support into a transportation organization. Interactive sessions will play a key role in the workshop.

Panelist (P20-20599)
Anita Vandervalk-Ostrander/ITERIS, Inc.
Panelist (P20-20601)
John Selmer/Iowa Department of Transportation
Panelist (P20-20603)
Allen Ibaugh/Data Transfer Solutions
Panelist (P20-20605)
C Douglass Couto/Independent Consultant
Panelist (P20-20606)
April Blackburn/Florida Department of Transportation

1052

Unobserved Heterogeneity in Transportation Data Analysis: Emerging Methodological Approaches
Jonathan Aguero-Valverde, University of Costa Rica, presiding
Sponsored By Standing Committee on Statistical Methods

' Participants in this workshop will explore the sources of unobserved heterogeneity, as well as possible consequences of and methods for dealing with this problem. Presenters will approach the issue of unobserved heterogeneity from different thematic areas and model types. The workshop will also present real-life cases of transportation data with unobserved heterogeneity issues that will be discussed in smaller groups.'

Accounting for Unobserved Heterogeneity in Transportation Research: Applications of Mixed Generalized Ordered Model (P20-21117)
Shamsunnahar Yasmin/Queensland University of Technology
Addressing Grouped Heterogeneity in Transportation Data Analysis (P20-21118)
Grigorios Fountas/Edinburgh Napier University
Unobserved Heterogeneity and Spatial Correlation (P20-21119)
Jonathan Aguero-Valverde/University of Costa Rica
Modeling Different Sources of Variability in Human Factors Experiments (P20-21120)
Birsen Donmez/University of Toronto, Braden Hansma/University of Toronto

1053 CM (3.00)

New Strategic Planning Tools in the VisionEval Framework
Jeremy Raw, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Transportation Planning Applications

' VisionEval (visioneval.org) is an open-source framework for building disaggregated strategic transportation planning tools. The workshop first will cover key VisionEval concepts and applications and will provide examples of their use . The second half of this interactive workshop will use the VisionEval software to illustrate how researchers can develop scenarios, evaluate policy impacts of those scenarios, and implement new modules and models using the framework.'

1054

Developing National Standards for Animal–Vehicle Collision Data Collection Systems: Brief Review and Working Discussion
Robert Ament, Western Transportation Institute (WTI), presiding
Sponsored By Standing Committee on Ecology and Transportation

' Experts will explore the need to develop national standards for the collection of animal–vehicle collision (AVC) data in the United States, and will chart a path forward. Many different AVC data collection systems are used by a variety of agencies and nonprofit organizations; however, no agreement exists on the necessary baseline data or spatial accuracy requirements of these systems, or on quality control and the ability to share data. The workshop will offer a review of the needs for a systematic approach for the future. '

Facilitated Discussion of Experts with Audience Participation (P20-20827)
Daniel Buford/Federal Highway Administration (FHWA), Julianne Schwarzer/OST-R/Volpe Center, Nathan Beauchamp/ U.S. Fish and Wildlife Service, Amanda Hardy/U.S. National Park Service, Fraser Shilling/University of California, Davis

1055

Hands-on Modeling Workshop with Refueling and Recharging Infrastructure Models
Don MacKenzie, University of Washington, presiding
Sponsored By Standing Committee on Transportation Energy， Standing Committee on Alternative Transportation Fuels and Technologies

This workshop will demonstrate and share models and tools for planning electric vehicle recharging infrastructure. The four main topics include 1) EVI-Pro for assessing charging needs at the county level, 2) REVISE 2.0 for planning long-di stance corridor charging, 3) MJ Bradley & Associates' GIS-based tools, and 4) BEAM with a special focus on infrastructure siting issues and opportunities in the context of shared and automated vehicles.

Intercity Long-Distance Corridor Charging Infrastructure Planning Using the Regional Electric Vehicle Infrastructure Strategic Evolution 2.0 Model (P20-20930)
Fei Xie/Oak Ridge National Laboratory
County-Level EV Infrastructure Planning Using the Electric Vehicle Infrastructure Projection Tool (P20-20931)
Eric Wood/National Renewable Energy Laboratory (NREL)
EV Infrastructure for Ridehailing and Autonomous Vehicle Fleets Using the Behavior, Energy, Autonomy, and Mobility Framework (P20-20933)
Colin Sheppard/Lawrence Berkeley National Laboratory
M.J. Bradley & Associates, LLC, Perspective (P20-21512)
Grace Van Horn/M. J. Bradley & Associates LLC

1056   CM (3.00)

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 156
Adaptive Right Sizing: Building and Managing a Transportation System to Meet Evolving Needs
Naomi Stein, EBP, presiding
Chandler Duncan, Metro Analtyics, presiding
Gregory Bischak, Community Development Financial Institutions Fund, presiding
Sponsored By Standing Committee on Transportation and Economic Development, Standing Committee on Strategic Management, Standing Committee on Metropolitan Policy, Planning, and Processes

' Aging infrastructure, unstable funding, and changing needs mean that decision-makers must develop and sustain transportation systems of the appropriate size, function, and composition. In this workshop, participants will 1) learn about methods from National Cooperative Highway Research Program Project 19-14 and Federal Highway Administration research to identify, evaluate, and implement right-sizing solutions that will unlock economic value and improve efficiency and 2) engage in exercises to explore right-sizing situations, key questions, diagnostics, and partnerships.'

1057   CM (3.00)

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 145A
Emerging Mobility Services for the Transportation Disadvantaged: New Pilot Programs and Assessment of Social Benefit
Eleni Bardaka, North Carolina State University, presiding
Sponsored By Standing Committee on Social and Economic Factors of Transportation, Standing Committee on Public Transportation Planning and Development, Standing Committee on Accessible Transportation and Mobility, Joint Subcommittee on Health and Transportation of ADD50 and ABJ30

' This workshop focuses on emerging mobility services, such as ride hailing, carsharing, and bikesharing, used to achieve transportation equity goals. Attendees will learn about pilot projects that target transportation-disadvantaged populations and will gain a better understanding on how to evaluate such programs. The workshop will feature presentations from government agencies and academics and is intended for practitioners and researchers.'

Presentation 1 (P20-21843)
Matthew Burke/Griffith University
Presentation 2 (P20-21844)
Steven Farber/University of Toronto
Presentation 3 (P20-21845)
John MacArthur/Portland State University
Presentation 4 (P20-21846)
Megan Zeilinger/Dakota County Social Services, robyn Bernardy/Dakota County Social Services
Presentation 5 (P20-21847)
Ryan Brumfield/Appalachian Regional Commission
Presentation 6 (P20-21848)
Hamish Campbell/Via On-Demand Transit

1058

Developments in Low-Volume Road Management
Khaled Ksaibati, University of Wyoming, presiding
Sponsored By Standing Committee on Low-Volume Roads

Low-volume roads are critical to national economies but receive very little funding and are often managed by agencies with very limited resources. This workshop will introduce recently developed tools that can help agencies that manage both paved and unpaved low-volume roads make informed decisions on the most appropriate road management practices for different circumstances. This workshop will highlight case studies and practical solutions to common problems related to low-volume road networks and will provide a forum for peers to exchange experiences, best practices, and ideas associated with current and emerging technologies.

Workshop Introduction (P20-20389)
Khaled Ksaibati/University of Wyoming
Asset Management Plans for Low-Volume Roads: Why Should I Bother? (P20-20362)
Tim Colling/Michigan Technological University
Michigan's Transportation Asset Management Council: Supporting the Management of Low-Volume Roads (P2 0-20390)
Joanna Johnson/Michigan Transportation Asset Management Council
Use of Unmanned Aerial Systems in Health Monitoring and Management of Transportation Infrastructure Systems (P20-20391)
Halil Ceylan/Iowa State University
Multi-Year Optimization Analysis of Low-Volume Paved Roads in Colorado (P20-20392)
Marwan Hafez/University of Wyoming
Customer Performance-Based Gravel Road Management System (P20-20393)
Theunis Henning/University of Auckland
Gravel Roads Performance Assessment (P20-20394)
Paul Brown/Felsburg Holt and Ullevig
Network-Level Road Distress Collection for Unpaved Roads: A Case Study with the Federal Highway Administration and the U.S. Fish & Wildlife Service (P20-20397)
Leanne Whiteley-Lagace/Stantec
Automated Assessment of Dust Emission on Gravel Roads (P20-20395)
Lars Forslöf/Roadroid CEO/Inventor
Utilizing Smartphones and Image Processing Analysis for Evaluating Dust on Gravel Roads (P20-20396)
Omar Albatayneh/University of Wyoming

1059

Developing Performance Prediction Models
Nima Kargah-Ostadi, iEngineering Corporation, presiding
Sponsored By Standing Committee on Pavement Management Systems, Standing Committee on Transportation Asset Management

Performance prediction models are a central part of network-level pavement management systems (PMS) to predict future performance of the pavement network, identify maintenance and rehabilitation (M&R) needs, and estimate the network conditions after the application of various M&R alternatives. The objective of this workshop is to provide guidance for state and municipal roadway authorities to improve the prediction capabilities of their PMS. The state of the art—providing an overview of the available tools for developing and validating pavement performance models—and the state of the practice—presenting an example of successful model development and implementation in state and municipal agencies—will be discussed.

Audience Survey (P20-21021)
Nima Kargah-Ostadi/iEngineering Corporation, Timothy Miller/Kimley-Horn and Associates, Inc.
Application of Models in PMS Decision Making (P20-21022)
Adrian Archilla/University of Hawaii, Magdy Mikhail/AgileAssets, Inc., Sui Tan/Metropolitan Transportation Commission (MTC), Zhongren Wang/California Department of Transportation (CALTRANS)

(continued)

Data Issues and Pre-Processing (P20-21023)
Jeremy Lea/University of California, Davis
Deterministic Empirical Models (P20-21024)
Omar Swei/University of British Columbia
Probabilistic Models (P20-21025)
Jorge Prozzi/University of Texas, Austin
Mechanistic Empirical Models (P20-21026)
James Bryce/Marshall University
Model Validation Success Metrics (P20-21027)
Cristina Torres-Machi/University of Colorado, Boulder

1060

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 207B
Impact of Connected and Automated Vehicles on Pavement Design and Performance
Thomas Kazmierowski, Golder Associates Inc., presiding
Sponsored By Standing Committee on Full-Scale Accelerated Pavement Testing, Standing Committee on Design and Rehabilitation of Concrete Pavements, Standing Committee on Design and Rehabilitation of Asphalt Pavements, Standing Committee on Vehicle-Highway Automation

Truck platooning offers several reported benefits, such as lower fuel consumption and CO_2 emissions, improved safety, and efficient delivery of goods with less traffic congestion. As truck platooning increases and pavement loading becomes more concentrated and frequent, greater demands will be placed on pavement systems. New pavement design and evaluation methodologies will be needed to account for the increased loading frequencies and channelized traffic. Collaboration with the connected and automated vehicle industry, as well as development of new pavement design scenarios, may help minimize and perhaps decrease pavement damage by better managing truck-loading scenarios. '

Connected and Automated Vehicle Capabilities and Limitations and Their Deployment Uncertainties (P20-20018)
Steven Shladover/University of California, Berkeley
Outlook for Commercial Deployment of Truck Platooning (P20-20301)
Richard Bishop/Bishop Consulting
Optimizing Truck Platooning and Correspondence Pavement Performance (P20-20026)
Imad Al-Qadi/University of Illinois, Urbana Champaign
Potential Impacts from Automated and Connected Vehicles on Flexible Pavement Performance (P20-20037)
B. Shane Underwood/North Carolina State University
Grand Challenges and Grand Opportunities of Autonomous Trucking (P20-20249)
Tyler Ley/Oklahoma State University
How Tech Is Changing the Way We Design, Build, and Use Highways (P20-20689)
Dan Rozycki/The Transtec Group, Inc.

1061

Building Information Modeling for Bridges and Structures: A Chance to Be Heard
Richard Dunne, GPI, presiding
Ahmad Abu-Hawash, Iowa Department of Transportation, presiding
Sponsored By Standing Committee on General Structures, Standing Committee on Steel Bridges, Standing Committee on Emerging Design and Construction Technologies, Standing Committee on Construction of Bridges and Structures, Standing Committee on Fabrication and Inspection of Metal Structures

' Building information modeling (BIM) for bridges and structures is being advanced at individual DOTs as part of a pooled fund study by researchers and industry. This workshop will begin with short panel presentations and audience members then will be asked to describe the features that they want from BIM for bridges and structures. These ideas will be captured on easels and laptops and each panelist then will discuss whether the specific area of BIM for bridges and structures that they are involved with provides these features. The desired-features list will be a key takeaway for researchers, BIM industry providers, and DOTs to continue the development of practical, useable BIM for bridges and structures. '

Part 1: Current Practices and Panel Discussion with Practitioners (P20-21139)
Brenda Crudele/New York State Department of Transportation, Cheryl Hersh Simmons/Utah Department of Transportation, Ahmad Abu-Hawash/Iowa Department of Transportation
Part 2: Research and What's Next? (P20-21140)
Julie Rivera, Deborah Chase
buildingSMART International role in U.S. BIM Transportation Infrastructure Transition to IFC (P20-21836)
Ian Howell/BSI Group

1062

Seismic Design Basics
Elmer Marx, Alaska Department of Transportation and Public Facilities, presiding
Sponsored By Standing Committee on Seismic Design and Performance of Bridges

This workshop will focus on the modeling and analysis of highway bridges subject to earthquake loading in accordance with the AASHTO Guide Specifications for LRFD Seismic Bridge Design, or SGS. Participants will be guided through the SGS modeling recommendations for elastic response spectra analysis. Workshop topics will address the following: the fundamentals of structural dynamics, determining superstructure and substructure stiffness, incorporation of boundary conditions, verification of computer models, creation of seismic response spectra, and identification of common problems. Participants will gain knowledge on determining earthquake displacement demands on typical highway bridges in accordance with SGS.'

Part 2: Structural Dynamics for Seismic Analysis (P20-20001)
Lee Marsh/WSP
Part 3: Computer Modeling for Seismic Analysis (P20-20002)
Derek Soden/Federal Highway Administration (FHWA)
Part 1: Seismic Hazards and Seismic Demands on Bridges (P20-20003)
Thomas Ostrom/California Department of Transportation (CALTRANS)

1063

Fiber-Reinforced Polymers Deployment in Transportation Infrastructure
Wael Zatar, Marshall University, presiding
Maria Lopez, Modjeski and Masters, Inc., presiding
John Busel, American Composites Manufacturers Association, presiding
Steven Nolan, Florida Department of Transportation, presiding
Sponsored By Standing Committee on Structural Fiber Reinforced Polymers

' Fiber reinforced polymers (FRP) were first deployed in structural retrofitting. Initially, it was viewed as a material that could substitute for steel in special applications and in aggressive environments. Subsequent research and development led to design guides making new applications possible. FRP composites in new and existing transportation infrastructure has been successfully installed and proven to be a cost-effective material option, but also remains an important topic of research world-wide. This workshop focuses on past, current, and future deployment of FRP in all kinds of transportation infrastructure along with lessons learned and recommendations .'

1064

Lessons Learned from 100 Years of Project Delivery
Karen Hedlund, WSP, presiding
Sponsored By Standing Committee on Project Delivery Methods, Standing Committee on Contract Law

'The workshop will provide an overview of project delivery in America in the past 100 years, presenting lessons learned and emerging trends over that period and their relevance to the transportation sector today. Workshop attendees will learn about these lessons and trends and will have an opportunity to discuss their impacts on the transportation sector and the future of project delivery.'

Impact of NEPA Requirements on Project Delivery (P20-21650)
Edward Kussy/Nossaman LLP
Development of Florida East Coast Railway to Key West and Destruction by 1935 Labor Day Hurricane (P20-216 51)
R. Edward Minchin/University of Florida
Transfer of Right-of-Way to FDOT: Development and Operation of Overseas Highway (P20-21652)
Mike Ciscar/Corradino Group
I-15 Reconstruction Project: First Use of DB for Major Federal-Aid Highway Project (P20-21653)
Carlos Braceras/Utah Department of Transportation
Worskhop Introduction (P20-21654)
Karen Hedlund/WSP
History of Interstate Highway System (P20-21655)
Jim Ray/HNTB Corporation
Project Delivery in Today's Complex World (P20-21656)
Steven DeWitt/ACS Infrastructure Development, Inc.
Panel Discussion, Questions, and Answers (P20-21657)
Karen Hedlund/WSP

1065

Quality Assurance: Past, Present, and Future
Rick Kreider, Kansas Department of Transportation, presiding
Georgene Geary, GGfGA Engineering, LLC, presiding
Sponsored By Standing Committee on Quality Assurance Management, Standing Committee on Concrete Pavement Construction and Rehabilitation, Standing Committee on Asphalt Pavement Construction and Rehabilitation

' This workshop highlights the accomplishments in the past 50-plus years of the TRB Quality Assurance (QA) Management Committee. Looking at the historical accomplishments, which is documented in the centennial record, will provide the foundation for the workshop. The remaining presentations will showcase the diverse uses by departments of transportation and will look at the potential challenges facing QA in the future. Workshop participants will discuss potential areas for improvements for both present and future QA programs. '

Quality Assurance: Past, Present, and Future (P20-20042)
Charles Hughes/C S Hughes, PE, Kevin McGhee/Virginia Transportation Research Council, Ashley Buss/Iowa State University
Maine DOT Quality Assurance Program (P20-20043)
Richard Bradbury/Maine Department of Transportation
South Dakota DOT Quality Assurance Program (P20-20044)
David Huft/South Dakota Department of Transportation
Texas DOT Quality Assurance Program (P20-20045)
Carol Luschen/Texas Department of Transportation, Weng Tam/Tam Consulting Services LLC
How Do We Incorporate New Technologies into the QA Environment? (P20-20046)
Robert Conway/Federal Highway Administration (FHWA)

1066

Automating Bridge Construction Through Robotics and 3D Printing
Travis Konda, HNTB Corporation, presiding
BalaRama Iyer, WSP, presiding
Christofer Harper, Colorado State University, presiding
Sponsored By Standing Committee on Construction of Bridges and Structures, Standing Committee on General Structures, Standing Committee on Steel Bridges, Standing Committee on Concrete Bridges, Standing Committee on Fabrication and Inspection of Metal Structures

' Robotics, automation, and additive construction—or 3-D printing—is at an emergent stage in bridge construction. This workshop will feature introductory presentations by industry leaders sharing the state of knowledge and capabilities of 3-D printing, robotic equipment, and automated systems for both concrete and steel bridges (presentations will not be product endorsements nor specific supplier advertising). Follow-on interactive group discussions will collect audience comments and thoughts on obstacles, opportunities for further research needs, and development of these emerging bridge construction technologies. '

Applications of UAS for Bridge Inspection and Earth Work (P20-20949)
Victor Hunt/University of Cincinnati
Utah DOT Implementation of UAS for Construction and Bridges Inspection (P20-20950)
Paul Wheeler/Utah Department of Transportation
New Hampshire DOT Demonstration of Automated Rebar Tying (P20-20951)
Philip Brogan/New Hampshire Department of Transportation
Practical, Commercial Application of Large-Scale, Cement-Based 3D Printing for Construction (P20-20952)
Ali Memari/Pennsylvania State University
Additive Manufacturing of Metals: Background and Overview (P20-20953)
Ryan Sherman/Georgia Institute of Technology (Georgia Tech), Matthew Hebdon/Virginia Polytechnic Institute and State University, Hang Yu/Virginia Polytechnic Institute and State University
Implementation of 3D printing technology for the construction of Civil Infrastructure (P20-21863)
Eric Kreiger/U.S. Army Corps of Engineers (USACE)

1067

Cracking Characterization of Asphalt Materials: Challenges to Consider for Implementation
Matthew Corrigan, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Critical Issues and Emerging Technologies in Asphalt , Standing Committee on Asphalt Binders

Cracking is a major distress for asphalt pavements, yet the phenomenon is complex and not fully understood. Recently, the research community has focused on index-based performance testing to predict cracking in all its manifestations, resulting in many test methods to handle diverse types of cracking. These mixture and binder test methods have strengths and weaknesses. This workshop will present considerations and challenges for the use and implementation of these methods, along with recent application and implementation efforts , experiences, and issues identified by practitioners. An interactive panel discussion among practitioners & additional researchers will identify: challenges, current state of practice, and needed advancements.

Cracking Characterization of Asphalt Materials: Agency Challenges (P20-21377)
Derek Nener-Plante/Maine Department of Transportation
Cracking Characterization of Asphalt Materials: An Industry Perspective (P20-21378)
Gaylon Baumgardner/Paragon Testing Services
A Consultant Lab's Experience with Cracking Tests (P20-21379)
Ramon Bonaquist/Advanced Asphalt Technologies, LLC
The Implementation of Index Performance Cracking Tests: Contractor's Lab Field Experience (P20-21380)
Jean-Paul Fort/Colas, Inc.
Contractor Experience with Performance Testing and Future Needs (P20-21381)
Andrew Hanz/MTE Services, Inc.
Navigating the Performance Test Jungle: Recommendations for Implementation (P20-21382)
David J. Mensching/Federal Highway Administration (FHWA)
Panel Discussion: Other Researchers and Speakers (P20-21383)
Jean-Pascal Planche/Western Research Institute, Amy Martin/Texas A&M University, Donald Christensen/Advanced Asphalt Technologies, LLC, Youngsoo Kim/North Carolina State University, Derek Nener-Plante/Maine Department of Transportation, Gaylon Baumgardner/Paragon Testing Services, Ramon Bonaquist/Advanced Asphalt Technologies, LLC, Jean-Paul Fort/Colas, Inc., Andrew Hanz/MTE Services, Inc., David J. Mensching/ Federal Highway Administration (FHWA)

1068

Influence of Subgrade and Unbound Layers on Pavement Performance
Deb Mishra, Oklahoma State University, presiding
Sponsored By Standing Committee on Aggregates , Standing Committee on Seasonal Climatic Effects on Transportation Infrastructure, Subcommittee on Unbound Granular Materials , Standing Committee on Transportation Earthworks

The performance of flexible and rigid pavements is closely related to properties of the subgrade and base or subbase layers, yet pavement performance as predicted by AASHTOWare Pavement ME Design is insensitive to the properties of these layers. A recently completed NCHRP research study, "Proposed Enhancements to Pavement ME Design: Improved Consideration of the Influence of Subgrade and Unbound Layers on Pavement Performance," (NCHRP web-only document 264) has proposed modifications to the current method so as to make a major improvement in the ability to accurately predict pavement performance. This workshop will highlight the project findings and will comprise technical presentations and hands-on exposure to case study problems.

Chair's Introduction (P20-20218)
Deb Mishra/Oklahoma State University
Background and Justification for NCHRP Project 1-53 (P20-20219)
Andrew Dawson/University of Nottingham
Improved Consideration of the Influence of Subgrade and Unbound Layers on Pavement Performance: Framework Development (P20-20220)
Xue Luo/Zhejiang University

(continued)

Improved Consideration of the Influence of Subgrade and Unbound Layers on Pavement Performance: Model Development and Integration (P20-20221)
Fan Gu/Auburn University
Design Challenge Specification (P20-20222)
Deb Mishra/Oklahoma State University, Xue Luo/Zhejiang University, Fan Gu/Auburn University
Hands-on Response by Attendees (P20-20223)
Xue Luo/Zhejiang University, Fan Gu/Auburn University
Feedback, Review, and Conclusions (P20-20224)
Xue Luo/Zhejiang University, Fan Gu/Auburn University

1069

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 201
Impact of the Mischaracterization of Rock on Construction Projects
Derrick Dasenbrock, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Geotechnical Instrumentation and Modeling, Standing Committee on Construction Management, Standing Committee on Engineering Geology, Standing Committee on Geotechnical Site Characterization, Standing Committee on Soil and Rock Properties, Standing Committee on Transportation Earthworks, Standing Committee on Foundations of Bridges and Other Structures, Standing Committee on Subsurface Soil-Structure Interaction

The mischaracterization of rock can lead to significant project cost overruns, legal claims, and project delays if the volumes, types, or locations of material are substantially different from bidding documents . This highly interactive workshop will involve facilitated collaborative discussions on such topics as: 1) How to technically or contractually better characterize soil and rock types and the interfaces between these materials [e.g. geophysics, measurement while drilling]; 2) The current state of practice; 3) Potential improvements to the state of practice; 4) Evaluation or estimation of direct or indirect impact on project cost and schedule; and 5) How these impacts compare depending on type of construction work.

Construction Management Perspectives (P20-20478)
Derrick Dasenbrock/Minnesota Department of Transportation
Rock Blasting: Design Needs and Expectations Versus Construction Needs and Expectations (P20-20479)
Robert Group/Colorado Department of Transportation
Bring Your "A-GAME": Reduce Uncertainty and Risk in Mischaracterization of Rock (P20-20480)
Benjamin Rivers/Federal Highway Administration (FHWA)
Is It Soil or Is It Rock?: How Project Outcomes Depend on Properties and Word Choices (P20-20481)
Robert Bachus/Geosyntec Consultants, Inc.
Role of Instrumentation and Modeling in Improving the Identification and Description of Rock (P20-20482)
Lee Petersen/Itasca Consulting Group, Inc.
Engineering Challenges in "Rock" Characterization and Associated Outcomes: Case Histories (P20-20483)
Sharid Amiri/California Department of Transportation (CALTRANS)
Effects of Mischaracterization and Analysis of Rock and Subsurface Conditions on Design and Performance of Buried Structures (P20-20484)
Joel Hahm/Big R Bridge

1070

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 202B
Structural Evaluation of Pavements as They Drain
Gabriel Bazi, American University, presiding
Sponsored By Standing Committee on Subsurface Drainage, Standing Committee on Pavement Structural Modeling and Evaluation

' Pavement surface and subsurface drainage are critical components in the design and construction of long-lasting pavements. This workshop will focus on the structural evaluation of pavements as they drain after saturation or being close to saturation from rainfall, flooding, or a high water table. The benefits of subsurface drainage systems will be evaluated and discussed.'

(continued)

Geo-Composite Joint Drain in Concrete Pavements (P20-20993)
Bernard Izevbekhai/Minnesota Department of Transportation, Raul Velasquez/Minnesota Department of Transportation
Guidelines for Limiting Moisture Damage in Pavements (P20-20994)
Stephen Seeds/Applied Pavement Technology, Inc.
Water Impact on the Structural Behavior of Pavements (P20-20995)
Mohamed Elshaer/U.S. Army Engineer Research and Development Center
Decision-Support Approach to Structural Adequacy and Opening to Traffic for Flood Inundated Roadways (P20-20996)
Guangming Wang/Florida Department of Transportation
Pavement System Structural Analysis for Inundated Roads: New and Past Approaches (P20-20997)
Mostafa Elseifi/Louisiana State University
Developing Time-Depth-Damage Functions for Flooded Roads (P20-20998)
Jo Sias/University of New Hampshire

1071

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, Salon B
Managed Lanes: Lessons Learned from the Past, Bold Predictions for the Future
Keith Mullins, Gannett Fleming Inc., presiding
Murali Ramanujam, Santa Clara Valley Transportation Authority, presiding
Jane Lappin, Toyota Research Institute, Inc., presiding
Sponsored By Standing Committee on Managed Lanes, Standing Committee on Congestion Pricing, Standing Committee on Vehicle-Highway Automation

Building upon the 99th TRB Annual Meeting theme "A Century of Progress: Foundation for the Future," this interactive workshop will cover the past and future of managed lanes and will include a history of managed lanes in the United States; lessons learned from previous deployments; funding, social, and other deployment challenges; and impacts of transformational technologies. Attendees will participate in a small-group visioning exercise, taking a blank-page approach to developing bold predictions for the future.

Introductions (P20-21428)
Keith Mullins/Gannett Fleming Inc.
Opening Remarks and Keynote: A Brief History of Managed Lanes (P20-21429)
Charles Fuhs/Chuck Fuhs LLC
Panel Session: Previous Deployments: What Have We Learned? (P20-21430)

Facilitator (P20-21431)
John Brady/Cintra
Georgia's Network of Express Lanes (P20-21432)
Matthew Fowler/Georgia Department of Transportation
Lincoln Tunnel Exclusive Bus Lane (XBL) (P20-21433)
Mark Muriello/The Port Authority of New York and New Jersey
I-30 HOV: 30 Years of Operations (P20-21435)
Nicholas Wood/Texas A&M Transportation Institute
Breakout Session #1 (P20-21436)

Panel Session: Current Deployments: What Challenges Are We Facing Today? (P20-21437)

Facilitator (P20-21438)
Laura Huizinga-Barton/Lindsay Transportation Solutions
Why Do Motorists Choose to Use a Managed Lane Facility? (P20-21439)
Mark Burris/Texas A&M University
Bay Area Express Lanes: Current Challenges (P20-21440)
Nidal Tuqan/California Department of Transportation (CALTRANS)
Breakout Session #2 (P20-21441)

Panel Session: The Impacts of Transformational Technologies (P20-21442)

(continued)

Facilitator (P20-21443)
Jane Lappin/Toyota Research Institute, Inc.
Florida's Approach to Transformational Technologies (P20-21444)
Javier Rodriguez/Florida Department of Transportation
Smart Roadways and Connected Vehicles (P20-21445)
Christopher Armstrong/Panasonic
Closing Remarks (P20-21446)
Keith Mullins/Gannett Fleming Inc.

1072

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 103B
Traffic Flow Simulation: Persistent Challenges
Peter Vortisch, Karlsruhe Institute of Technology, presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics, Standing Committee on Highway Capacity and Quality of Service, Standing Committee on Freeway Operations, Standing Committee on Traffic Signal Systems, Standing Committee on Work Zone Traffic Control, Standing Committee on Managed Lanes, Standing Committee on Transportation Network Modeling, Standing Committee on Transportation and Air Quality

' Recently, the simulation of automated vehicles dominated the discussion in the research community. The advent of this new challenge does not mean that all other problems have been solved, however. This workshop will bring together researchers, vendors, and users of traffic flow simulation to identify persistent challenges and to discuss approaches to solutions. Examples include tactical driving, micro–meso integration, vehicle–pedestrian interaction, non-lane-based traffic, microscopic dynamic traffic assignment, and real-time applications.'

Welcome and Introduction (P20-20094)

Traffic Analysis Challenges and the Role of the FHWA (P20-20095)
John Halkias/Federal Highway Administration (FHWA)
Large-Scale Traffic Simulation and Assignment (P20-20096)
Michael Mahut/INRO Consultants, Inc.
Practical Deployment Considerations for Successful High-Fidelity Microscopic DTA (P20-20098)
Ramachandran Balakrishna/Caliper Corporation
Real-Time Simulation for Traffic Management: Challenges and Solutions (P20-20100)
Jordi Casas/Aimsun, Inc.
From Lane-Based to Spatial-Based Traffic Flow Simulation (P20-20101)
Martin Fellendorf/Graz University of Technology
Traffic Simulation Between Traffic Engineering and Automotive (P20-20102)
Peter Vortisch/Karlsruhe Institute of Technology
Interactive Voting Session on Simulation Challenges (P20-20103)

One, a Multitude, or the Crowd: Who Determines How We Move? (P20-21196)
Tobias Kretz/PTV Group
Simulation for Traffic Safety Research (P20-21197)
Hans Van Lint/Delft University of Technology

1073

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, Salon C
Lessons Learned Using "Big Data" to Evaluate Geometric Effects
Jeffrey Shaw, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Operational Effects of Geometrics, Standing Committee on Geometric Design, Standing Committee on Highway Safety Performance

Presenters will share lessons learned from utilizing second Strategic Highway Research Program Naturalistic Driving Study and Roadway Information Database data sets, as well as other large "big data" sets, to explore the safety and operational effects of geometric design elements. Attendees will gain a better understanding of how they can use these large data sources and will get tips from experienced researchers on what challenges may be expected.

(continued)

Utilizing Big Data Sets to Discover Patterns and Trends and Derive Insights into Infrastructure (Geometric and Other) Deficiencies (P20-20315)
Wei Zhang/Federal Highway Administration (FHWA)
Deriving Vertical Curvature from SHRP2 NDS/RID Grade Data (P20-20316)
Raghavan Srinivasan/University of North Carolina, Chapel Hill
Experience Using SHRP2 NDS/RID and Other Big Data for Geometrics Research (P20-20318)
Shauna Hallmark/Iowa State University
Using SHRP2 NDS/RID to Conduct Operational Effects of Geometrics Research (P20-20319)
Jessica Hutton/Burns & McDonnell

1074

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 103A
Applying Your Multimodal Access Management Toolbox
Marc Butorac, Kittelson & Associates, Inc. (KAI), presiding
Sponsored By Standing Committee on Access Management

'There are currently three important tools in the access management toolbox to assist practitioners and public agencies in managing access in their jurisdictions: Access Management Manual, 2 nd Edition; Access Management Application Guide (AMAG); and the Guide for the Analysis of Multimodal Corridor Access Management . This workshop will provide an overview of these tools and a lightning round of important research ongoing and completed since publication of the three main resource documents.'

Overview: Access Management Manual, 2nd Edition (P20-21103)
Kristine Williams/University of South Florida
Overview: Access Management Application Guide (P20-21279)
Karen Dixon/Texas A&M Transportation Institute
Overview: Guide for the Analysis of Multimodal Corridor Access Management (P20-21280)
Kristine Connolly/Kittelson & Associates, Inc. (KAI)
Overview: Summary of Recent and Ongoing Research on Access Management (P20-21281)
Chris Huffman/Huffman Corridor Consulting
Breakout Groups (P20-21282)

Report Back and Discussion (P20-21516)

1075

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 209A
Joint Sealing Matters
Hasan Ozer, Arizona State University, presiding
Kurt Smith, Applied Pavement Technology, Inc., presiding
Sponsored By Standing Committee on Sealants and Fillers for Joints and Cracks, Standing Committee on Pavement Preservation, Standing Committee on Pavement Maintenance

The purpose of this workshop is to bring to light the often overlooked benefits of joint sealing. It will emphasize the basics of joint sealant design and why they are important. It will address construction practices and importance of factors affecting pavement performance. Case studies will be presented from different regions in US. The goal is to raise the level of awareness of the benefits of joint sealants if installed properly.

Joint Sealing in Concrete Pavements: A Brief Historical Review (P20-20582)
Kurt Smith/Applied Pavement Technology, Inc.
Florida's Experience with Quantifying Joint Sealant Adhesion (P20-20584)
James Greene/Florida Department of Transportation
Concrete Pavement Joint Sealing in Minnesota: Practices, Observations, and Research (P20-20643)
Thomas Burnham/Minnesota Department of Transportation
Role of Joint Sealants in Concrete Pavement Performance (P20-20610)
Dan Zollinger/Texas A&M University, College Station

(continued)

Penetrating Sealers for Improving Concrete Pavement Life Cycle (P20-20688)
John Kevern/University of Missouri, Kansas City
Proper Concrete Pavement Joint Sealing and Resealing Basics (P20-20585)
Scott Eilken/Quality Saw & Seal, Inc.
Joint Sealant Manufacturer's Perspective (P20-20634)
Jason Sika/Dow Corning Corporation
A Look at Performance History of Hot Applied Joint Sealants (P20-20653)
Lowell Parkison/Crafco, Inc.
The FHWA Guidelines on Joint Sealing (P20-21175)
Hyunhwa Yu/Federal Highway Administration (FHWA)

1076

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 149
Developing Local Road Safety Plans: Partnering with State DOTs, Metropolitan Planning Organizations, and Local Agencies
Hillary Isebrands, Federal Highway Administration (FHWA), presiding
Rosemarie Anderson, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Transportation Safety Management Systems, Standing Committee on Low-Volume Roads, Subcommittee on Low Volume Roads Conference Planning, Standing Committee on Safety Data, Analysis and Evaluation

Local road safety plans (LRSPs) are a proven safety countermeasure to develop a roadmap for reducing fatalities and serious injuries on all public roadways. In recent years, great strides have been made in expanding the use of these plans under various models of implementation. This workshop will bring together representatives from DOTs, metropolitan planning organizations, and local agencies to share these practices and further the use of LRSPs.

National Perspective and Funding for Locals (P20-21335)
Brian Roberts/BCR Consulting, LLC
Findings from the FHWA Pilots and Peer Exchanges (P20-21337)
Rosemarie Anderson/Federal Highway Administration (FHWA)
Models on Plan Development (P20-21339)
Jerry Roche/Federal Highway Administration (FHWA)
Panel on Barriers and Challenges and Solutions (P20-21342)
Hillary Isebrands/Federal Highway Administration (FHWA)

1077

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 102B
Use of Safety Performance in Day-to-Day Transportation Decision Making
Kimberly Kolody Silverman, Jacobs, presiding
Michael Dimaiuta, GENEX Systems, presiding
Elizabeth Hilton, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Highway Safety Performance, Standing Committee on Operational Effects of Geometrics, Standing Committee on Safety Data, Analysis and Evaluation, Standing Committee on Geometric Design

' This workshop will build upon prior discussions about using theHighway Safety Manual and will present case studies; will discuss unique aspects of safety performance calculations using various analysis tools, outcomes, and use in day-to-day transportation decision-making; and will offer suggestions for addressing needs and communicating results to obtain outcomes.'

Upcoming HSM Research and Resources (P20-21266)
Priscilla Tobias/Arora and Associates, P.C., Jerry Roche/Federal Highway Administration (FHWA)
Why Quantitative Safety Performance Is Important and the Process for Achieving Appropriate Decisions (P20-21267)
Elizabeth Wemple/HDR, Michael Dimaiuta/GENEX Systems
Intersection Safety Performance Analysis: Limitations and Overcoming Them (P20-21268)
Bonnie Polin/Massachusetts Department of Transportation

(continued)

Intersection Safety Performance Analysis Case Studies from Nevada, Grand Teton, and Pennsylvania (P20-212 69)
Jacob Farnsworth/Kimley-Horn and Associates, Inc., David Petrucci/Federal Highway Administration (FHWA)
Freeway and Interchange Safety Performance Analysis: Limitations and Overcoming Them (P20-21270)
Robert Miles/Utah Department of Transportation
Freeway and Interchange Safety Performance Analysis Case Studies from Indiana and Arizona (P20-21272)
Sai Sravya Polavarapu/Parsons, Tyler Bosshardt/Parsons, John Nitzel/Jacobs, Carl Chaifetz/Parsons
Vision for Quantitative Safety Performance Decision Making (P20-21275)
Stephen Read/Virginia Department of Transportation

1078

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 101
The Future of Graduated Driver Licensing: Building a Framework for Best Practices
Rebecca Weast, Insurance Institute for Highway Safety, presiding
Rory Austin, National Highway Traffic Safety Administration (NHTSA), presiding
Sponsored By Standing Committee on Operator Education and Regulation, Subcommittee on Young Drivers

Graduated driver licensing (GDL) policies have helped reduce teen driver crash rates in the United States; however, no state has adopted all the strongest GDL provisions and legislative progress has slowed . In this workshop, experts in the field of young driver safety will work to draft a framework of GDL best practices for use in guiding policymakers , advocates, and programs that incentivize stronger GDL provisions.

The National Highway Traffic Safety Administration's Graduated Driver Licensing Law Grants (P20-21303)
Rory Austin/National Highway Traffic Safety Administration (NHTSA)
GDL Research: How Does GDL Work and Why Is It Effective? (P20-21304)
Rebecca Weast/Insurance Institute for Highway Safety
History and Current State of GDL Laws in the United States (P20-21305)
Laurel Sims/Insurance Institute for Highway Safety

1079

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, Salon A
Designing Safer Streets in Developing Countries: Hands-on Workshop
Holly Krambeck, presiding
Sponsored By Standing Committee on Pedestrians, Standing Committee on Transportation in the Developing Countries

The majority of global pedestrian fatalities occur in developing countries , where budget constraints can prevent investment in high-quality pedestrian infrastructure and services. Street design methods that can improve safety at a low cost are receiving increased interest. At this hands-on workshop, participants will be guided by representatives from the National Association of City Transportation Officials' (NACTO's) Global Designing Cities Initiative to redesign high-fa tality streets in metropolitan Manila, Philippines, using NACTO's Global Street Design Guide. '

Road Safety Challenges for Pedestrians and Cyclists in Emerging Economies (P20-20779)
Dipan Bose/The World Bank, Holly Krambeck
Introduction to the Global Street Design Guide (P20-20780)
Skye Duncan/National Association of City Transportation Officials
Hands-on Workshop: Let's Redesign an Intersection (P20-20782)
Fabrizio Prati/National Association of City Transportation Officials , Abhimanyu Prakash

1080

Telling the Tale of Transit with Data: Sharing Methods and Means for Transit Planning
Catherine Lawson, University at Albany State University of New York, presiding
Sponsored By Public Transportation Group, Subcommittee on Information on Transformative Trends in Transit Data, Standing Committee on Transit Management and Performance

' This workshop will introduce the concept of transit software ecosystems to help inform policies and plans. This includes identifying transit data sources, defining what they can tell researchers and practitioners, identifying the software being used, and exploring how to tell interesting stories with transit data. Invited speakers will focus on data pipelines—from source systems to agency databases to data integration and analytics processes to front end visualizations and tools—and active audience participation is encouraged.'

The Role of the Whole Organization in Effective Use of Data for Transit Planning and Management (P20-20492)
John Levin/Metro Transit, Minneapolis-St. Paul
Solving Shared Transit Problems with Open-Source Transit Data Tools (P20-20493)
Eric Lind/Metro Transit, Minneapolis-St. Paul
GTFS for Small- and Medium-Sized Agencies (P20-20495)
Manny Insignares/Consensus Systems Technologies
Subway Visualizations: Mapping Real-Time Train Speed Delays and Gaps (P20-20906)
Alla Reddy/New York City Transit
Transitland Version 2.0: Real-Time, Validation, and Regional GTFS Feeds (P20-20589)
Drew Dara-Abrams/Interline Technologies LLC
New Versions: How to Maintain Institutional Knowledge in a Sea of Change (P20-20494)
Raymond Chan/Chicago Transit Authority
Pooling Third-Party Passenger Count Data (P20-20496)
Ruth Miller/Lyft, Inc.

1081

Mobility Innovation: A Vision for Our Transportation Future, Part 2 (Part 1, Session 1040)
Susan Shaheen, University of California, Berkeley, presiding
Jeffrey Chernick, RideAmigos CORP, presiding
Sponsored By Standing Committee on Emerging and Innovative Public Transport and Technologies, Standing Committee on Transportation Demand Management, Standing Committee on Regional Transportation Systems Management and Operations, Subcommittee on Shared-Use Vehicle Public Transport Systems, Subcommittee on Emerging Ridesharing Solutions, Standing Committee on Automated Transit Systems

' This workshop highlights the growing role of on-demand mobility across the globe, developments in mobility innovation, lessons learned in forming and managing partnerships, shared micromobility policies and practices, and the role of mobility innovation in transportation systems management and operations. The workshop features three keynote TED-style talks from leading experts and five sessions representing diverse public and private stakeholder best practices and lessons learned. '

TED Talk: Scenario Planning for Advancing Micromobility (P20-20254)
Shari Schaftlein/Federal Highway Administration (FHWA)
Shared Micromobility: Policies and Practices for Implementation (P20-20255)
Samantha Herr/North American Bikeshare Association, Maurice Henderson/Bird, Annie Chang/SAE International, Marcel Porras/City of Los Angeles, Gabriel Scheer/Lime
Mobility Marketplace and Transportation Systems Management and Operations (P20-20256)
Carol Schweiger/Schweiger Consulting LLC, Jim Hunt/Federal Highway Administration (FHWA), Robert Sheehan/Federal Highway Administration (FHWA), Jean Ruestman/Michigan Department of Transportation, Jana Sochor/RISE Viktoria
Mobility Innovation Town Hall (P20-20257)
Susan Shaheen/University of California, Berkeley, Jeffrey Chernick/RideAmigos CORP

1082

Preparing the Emerging Autonomous Vehicle Market for Paratransit Services and Meeting the Needs for Persons with Disabilities
Cecilia Feeley, Rutgers, The State University of New Jersey, presiding
Andrea Lubin, Rutgers, The State University of New Jersey, presiding
Sponsored By Standing Committee on Paratransit, Standing Committee on Emerging and Innovative Public Transport and Technologies, Standing Committee on Accessible Transportation and Mobility

'This workshop will address how the emerging Level 5 Autonomous Vehicle market can and is being shaped to address the needs of the paratransit services sector. After an overview of AVs and paratransit services, we will review the issue from 4 different viewpoints: vehicles (universal design, redesign, OEM), service providers (transit agencies), legal environment (current laws, proposed legislation, the ADA), and customers (riders' perspective). Attendees will then be invited to join breakout sessions to identify research needs and important issues. Then we will reconvene with report-outs and a facilitated exercise to identify the most pressing research needs and issues. The workshop will conclude with a brainstorming session on next steps.'

Keynote (P20-20983)
Scott Robertson/U.S. Department of Labor
Views from Connected and Autonomous Vehicle Innovators (P20-20984)
Jean Ruestman/Michigan Department of Transportation, Kurtis Hodge/Local Motors
Understanding of Legal Issues and Regulations (P20-20985)
Matthew Daus/Windels Marx, Ian Detamore/Pennsylvania Department of Transportation
Perspectives of the Consumers (P20-20986)
Carol Tyson/Disability Rights Education & Defense Fund (DREDF), Jinuk Hwang/Texas A&M Transportation Institute
Views from Transit Agencies and Service Providers (P20-20987)
John Dean/New Jersey Transit Corporation, Erin McAuliff/San Francisco Municipal Transportation Agency, Annette Williams/San Francisco Municipal Transportation Agency
Reconvene, Report out, Discussion, and Brainstorming of Next Steps (P20-20988)
David Rishel/Delta Services Group, Inc., Cecilia Feeley/Rutgers, The State University of New Jersey, Andrea Lubin/Rutgers, The State University of New Jersey

1083

Unlocking Rail Performance Through the Use of Big Data, Analytics, and Digital Technologies
Maite Pena Alcaraz, McKinsey & Company, presiding
Eric Peterson, Eric C. Peterson, presiding
Sponsored By Standing Committee on Intercity Passenger Rail, Standing Committee on Freight Rail Transportation

' In a world in which customers and competitors have shifted significantly, railroads have many opportunities to leverage digital technologies and data analytics capabilities. This two-part workshop will share best practices in the industry and the most common use cases to 1) improve on time performance and 2) drive value with other use cases, including customer experience, improvement of operations and business process redesign, and safety.'

1084

Can This Train Go Any Faster?: Achieving High(er)-Speed Rail Service Through Improvements to Existing Infrastructure, Part 2 (Part 1, Session 1043)
Theodore Sussmann, OST-R/Volpe Center, presiding
Sponsored By Standing Committee on Railway Maintenance, Standing Committee on Railroad Track Structure System Design

'Existing railway lines present unique opportunities to reduce traffic congestion, improve travel times, and enhance mobility. Although these lines provide corridors that reduce the cost of establishing rail transportation services, they present operational challenges and constraints including sharp curves, poor or nonexistent drainage, and degraded track conditions. Several case studies of speed upgrades will highlight challenges and opportunities, including the challenge of reducing the degree of curvature. Current and emerging tools and techniques used in design, construction, and maintenance will be discussed. International experience will highlight the similarity of the problems and innovative approaches.'

Increasing Train Speeds Between Chicago and Detroit Through Curve Modifications (P20-21752)
Daniel Schulte/Quandel Consultants, LLC
Optimizing Superelevation for Mixed Freight and Higher-Speed Passenger Trains (P20-21753)
Tyler Dick/University of Illinois, Urbana Champaign
Optimization of Track Components for Shared Corridor Use (P20-21754)
J. Riley Edwards/University of Illinois, Urbana Champaign
Reference Surfacing: The Future of Track Maintenance (P20-21755)
Amanda Kessler/National Railroad Passenger Corporation (Amtrak)
Amtrak Curve Modifications (P20-21870)
Bert Wescott/National Railroad Passenger Corporation (Amtrak)
Tools for Technical Analysis of Old Roadbeds (P20-21871)
Steven Chrismer/National Railroad Passenger Corporation (Amtrak)
Design Issues (P20-21872)

Construction and Maintenance Issues (P20-21873)

Speed Improvements (P20-21874)
Daniel Seery/HNTB Corporation
Downeaster Track Structural Improvements on the Brunswick, Maine Line (P20-21875)
Radim Bruzek/ENSCO, Inc.
Maintenance for Higher Speeds (P20-21876)
Andy Keefe/National Railroad Passenger Corporation (Amtrak)

1085   CM (3.00)

Improving Last-Mile and 50-Feet Logistics with Smart Initiatives to Improve Freight Mobility
Evangelos Kaisar, Florida Atlantic University, presiding
Charles H.W. Edwards, University of North Carolina, Chapel Hill, presiding
Sponsored By Standing Committee on Freight Transportation Planning and Logistics, Standing Committee on Urban Freight Transportation

' The workshop will address the last-mile critical issues affecting freight transporters, planners, and policy makers. Presenters will identify worldwide technology solutions. Breakout sessions will facilitate deeper understanding and potential deployment of solutions. Relevant topics will include fulfillment location optimization, shared delivery options, dynamic routing using big data, and smart active freight mobility. '

Welcome and Overview of Workshop (P20-21758)
Evangelos Kaisar/Florida Atlantic University, Charles H.W. Edwards/University of North Carolina, Chapel Hill
Last Mile and Smart Initiatives (P20-21759)

(continued)

Analyzing the Competitiveness and Sustainability of Autonomous Delivery Vehicles (P20-21760)
Miguel Figliozzi/Portland State University
Re-Introducing Portering to London (P20-21761)
Tom Cherrett/University of Southampton
Understanding Faster and Faster Deliveries: Traditional Facility Location Problems and New Delivery Technologies and Services (P20-21762)
Miguel Jaller/University of California, Davis
Curbing Conflict (P20-21763)
Tom Madrecki/Grocery Manufacuters Association
Energy Impacts of Using Drones and Alternative Last-Mile Deliveries (P20-21764)
Victor Walker/Idaho National Laboratory
Delivering Goods and E-Commerce (P20-21765)

On-Demand Instant Delivery Services Around the World (P20-21766)
Laetitia Dablanc/IFSTTAR
Tapping into Autonomous Mobility-on-Demand Spare Capacity to Move Parcels: How Much Freight Can be Moved? Are Passengers Affected? (P20-21768)
Andre Romano Alho/Singapore-MIT Alliance
Citywide Impacts of E-Commerce: Does Parcel Delivery Travel Outweigh Household Shopping Travel Reductions? (P20-21774)
Monique Stinson/Argonne National Laboratory
Urban Freight and Road Safety in the Era of E-Commerce (P20-21776)
Noreen McDonald/University of North Carolina, Chapel Hill
Viewing Last-Mile Delivery Behavior through an Economic Lens (P20-21777)
Peter Plumeau/EBP
Research Prioritization Discussion (P20-21779)
Evangelos Kaisar/Florida Atlantic University, Charles H.W. Edwards/University of North Carolina, Chapel Hill

1086

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 145B
Employing Weigh-in-Motion Data to Design, Rate, Manage, and Preserve the Nation's Bridge Structures
Anne-Marie McDonnell, Connecticut Department of Transportation, presiding
Sponsored By Standing Committee on Truck Size and Weight, Standing Committee on Highway Traffic Monitoring, Standing Committee on Structures Maintenance

 The nation's transportation system depends upon the load-carrying capacity of its bridges. Weigh-in-motion technology measures and characterizes actual truck traffic loadings in the field. This workshop brings together bridge and traffic data-collection experts and practitioners to discuss how real-world data from existing technologies can be leveraged to reduce risk and more efficiently address bridge needs and utilization of funding.

Welcome and Opening Statements by TRB Committee Chairs (P20-21397)
Anne-Marie McDonnell/Connecticut Department of Transportation, Daniel Haake/HDR, Jonathan Regehr/University of Manitoba, George Hearn/University of Colorado, Boulder
Focus on 2020 Needs: TRB Research Roadmap Consensus Study (P20-21398)
Gongkang Fu/Illinois Institute of Technology, Bala Sivakumar/HNTB Corporation, Ales Znidaric/Slovenian National Building and Civil Engineering Institute (ZAG)
Weigh-in-Motion/Bridge Weigh-in-Motion Data Collection and Technology (P20-21399)
Steven Jessberger/Federal Highway Administration (FHWA), Andy Lees/Q-Free, Ales Znidaric/Slovenian National Building and Civil Engineering Institute (ZAG), Darren Hazlett/University of Texas, Austin
Case Studies Using Weigh-in-Motion Load Data for Bridge Applications (P20-21454)
Ping Lu/Federal Highway Administration (FHWA), Zhengzheng Fu/Louisiana Department of Transportation and Development, Bala Sivakumar/HNTB Corporation, Gongkang Fu/Illinois Institute of Technology

1087 CM (3.00)

Reimagining the Future of Transportation with Personal Flight: Preparing and Planning for Urban Air Mobility, Part 2 (Part 1, Session 1045)

Justin Guan, ARUP, presiding
Matthew Beamer, Cambridge Systematics, Inc., presiding
Ryan Dittoe, Sacramento County Department of Airports, presiding
Adam Cohen, University of California, Berkeley, presiding

Sponsored By Aviation Group, Young Members Council - Aviation, Standing Committee on Intergovernmental Relations in Aviation, Standing Committee on Aviation System Planning, Standing Committee on Environmental Impacts of Aviation, Standing Committee on Aviation Economics and Forecasting, Standing Committee on Airport Terminals and Ground Access, Standing Committee on Airfield and Airspace Capacity and Delay, Subcommittee on Unmanned Aircraft Systems (UAS), Standing Committee on Aircraft/Airport Compatibility, Standing Committee on Light Commercial and General Aviation, Standing Committee on Aviation Security and Emergency Management

' This workshop features a moderated panel discussion of thought leaders, from the public and private sectors as well as academia, in the emerging space of urban air mobility (UAM). The program emphasizes technological developments, opportunities and challenges, technologies, equity issues, and potential societal barriers to implementing UAM. Participants will learn the following: What UAM is and how it will affect planning, The opportunities and challenges that arise when planning for UAM at the local and regional level, andBest practices and guiding principles to prepare for this new transportation mode. '

Airspace System and Operational Challenges (P20-20264)
Ryan Dittoe/Sacramento County Department of Airports, John Robbins/Embry Riddle Aeronautical University, Byron Thurber/ARUP, Ella Atkins/University of Michigan, Ann Arbor, Jim Gregory/Ohio State University, Chris Metts/Deloitte, Darshan Divakaran/North Carolina Department of Transportation

Brainstorming Roundtable Discussion (P20-20265)
Justin Guan/ARUP, Matthew Beamer/Cambridge Systematics, Inc., Ryan Dittoe/Sacramento County Department of Airports, Adam Cohen/University of California, Berkeley, Sajad Mokhtarimousavi/Florida International University

Closing Statement (P20-20266)
Justin Guan/ARUP

Issues Around Planning and Implementation (P20-20262)
Yu Zhang/University of South Florida, Richard Stephens/WHPacific Inc., Gregory Bowles/ Joby Aviation, Ghassan Khankarli/City of Dallas, Michael Rogers/City of Dallas, Fred Judson/ Ohio Department of Transportation

1088 CM (3.00)

Aviation Data Needs and Opportunities for Economic Analysis and Forecasting

Tony Diana, Federal Aviation Administration (FAA), presiding

Sponsored By Standing Committee on Aviation Economics and Forecasting, Standing Committee on Aviation System Planning

The workshop will discuss data needs and opportunities to support economic analysis and forecasting in aviation with the objective of identifying current data gaps, limitations, and research needs to address data gaps and enhance the transparency and usability of existing data sources. The first part will address aviation data needs and opportunities, followed by a discussion. In the second part, the workshop attendees will divide into a number of discussion groups that will each address data needs and opportunities in one of the topics addressed earlier and develop recommendations for future research activities to resolve current data gaps and enhance the transparency and usability of existing data sources.

Provider Perspective on the Use and Limitations of Available Aviation Data (P20-21069)
William Chadwick/Office of the Assistant Secretary for Research and Technology (OST-R)

Challenges Involved in Using U.S. DOT Airline Data (P20-20342)
Damien Agostinelli/Volanno

Measuring Air Passenger Delay as Distinct from Aircraft Delay (P20-20343)
Lance Sherry/George Mason University

(continued)

Data Needs to Support the Economic Contribution of Aviation and Airports (P20-20359)
Steven Landau/EBP
Data on Air Passenger Characteristics (P20-20360)
Geoffrey Gosling/Aviation System Consulting, LLC

1089

Sunday, 01:30 p.m. - 04:30 p.m., Convention Center, 144B
Test Bed Development for Maritime Autonomous Surface Ships
R. Glenn Wright, GMATEK, Inc., presiding
Sponsored By Standing Committee on Marine Safety and Human Factors, Standing Committee on Artificial Intelligence and Advanced Computing Applications, Standing Committee on Ports and Channels

This workshop will promote the interactive exchange of thoughts and ideas to enhance understanding of current issues related to research, development, establishment of commercial testbeds and simulation needs to advance Maritime Autonomous Surface Ships in the United States. Discussions will include issues pertaining to MASS enabling technologies, including marine safety and human factors implications, and their safe implementation. Four panelists will present, followed by Q&A and round table discussions of issues pertinent to MASS testbeds.

Pathway to Classification for MASS (P20-20776)
James Watson/American Bureau of Shipping
MASS Testing: Incremental Steps Enabling a Step Change for the Maritime Industry (P20-20777)
Oliver Cadet/Kongsberg Maritime Inc.
Vessel Autonomy: Ongoing Development and Regulatory Implementation (P20-20778)
CAPT Robert Compher/U.S. Coast Guard (USCG)
Testing MASS-Related Applications: One Sea Companies on the Way Toward Maritime Autonomy (P20-20781)
Päivi Haikkola/OneSea Autonomous Marine Ecosystem
Roundtable Facilitator (P20-21658)
Andrew Ziegwied/L3Harris ASV

1090

Sunday, 01:30 p.m. - 05:00 p.m., Convention Center, 146B
Doctoral Research in Transportation Modeling
Rolf Moeckel, Technical University of Munich, presiding
Patricia Mokhtarian, Georgia Institute of Technology (Georgia Tech), presiding
Sponsored By Section - Travel Analysis Methods, Standing Committee on Traveler Behavior and Values, Standing Committee on Effects of Information and Communication Technologies (ICT) on Travel Choices, Standing Committee on Transportation Network Modeling, Standing Committee on Transportation Demand Forecasting, Standing Committee on Transportation Planning Applications

'The goal of this workshop is to provide a platform for younger TRB Annual Meeting attendees to present their research in transportation modeling and travel behavior analysis and to obtain feedback from more senior meeting attendees. The workshop will feature presentations followed by questions from a designated panelist and the audience. Previous workshops have shown that the early career stage presenters benefited greatly from the experience of presenting research and receiving feedback from panelists who are experts in their topics. A self-funded reception after the workshop will allow for additional interaction.'

An Analysis of Transportation Demand Patterns in Ghana (P20-21236)
Marian Ankomah/University of Florida
Built Environment Predictors of Transit Ridership by Mode (P20-21237)
Laura Aston/Monash University
Investigation in Crowdshipping Enabled Last-Mile Urban Delivery Paradigms (P20-21238)
Sudheer Ballare/University of Illinois, Chicago
A New Model for Platooning and Overtaking on Single-Lane Roads (P20-21239)
Francis Brooks-Tyreman/University of Bristol
Advanced Econometric Models for Modeling Flows: Application to Shared Economy (P20-21240)
Bibhas Kumar Dey/University of Central Florida

(continued)

Traveler Responses to Ridehailing and Autonomous Vehicles: Understanding the Forces That Will Shape the Future of Transportation (P20-21241)
Felipe Dias/University of Texas, Austin

The Hybrid Vehicle–Drone Routing Problem for Pickup and Delivery Services (P20-21242)
Aline Karak/Southern Methodist University

Multi-Scale Pattern Recognition of Transport Network Dynamics and Its Applications (P20-21243)
Panchamy Krishnakumari/Delft University of Technology

Investigating the Impact of the Electrification of Transport to Reduce Carbon Emissions on Natural Capital (P20-21245)
Kathryn Logan/University of Aberdeen

Data-Driven Analysis and Modeling of Passenger Flows and Service Networks for Public Transport Systems (P20-21246)
Ding Luo/Delft University of Technology

Statistical Inference of Spatio-Temporal Transportation Networks Through Large-Scale, Multi-Source Data (P20-21247)
Wei Ma/Carnegie Mellon University

On-Demand Public Transport Systems: Service Design and Impact on Urban Mobility (P20-21249)
Jishnu Narayan/Delft University of Technology

Preparing College Towns for Shared Mobility with Autonomous Vehicles (P20-21250)
Qifan Nie/University of Alabama

Improving Multimodal Public Transport Timetable Coordination: A Holistic Approach (P20-21251)
Rejitha Ravindra/Monash University

Modeling Shared E-Scooters in Louisville, Kentucky: A Spatial Regression Approach (P20-21252)
Daniel Reck/ETH Zurich

Sustainable Urban Logistics: Issues and Impacts of Economic, Organizational, and Environmental Optimization (P20-21253)
Ibrahim Savadogo/Universite de Lyon

Integration of Machine Learning and Discrete Choice Models to Better Predict and Describe Decision Makers' Choices (P20-21254)
Georges Sfeir/American University of Beirut

Supply Side Effects of the Sharing Economy: Household Vehicle Ownership as an Investment Decision (P20-21255)
Monique Stinson/University of Illinois, Chicago

Unravelling Mode and Route Choice Behavior of Active Mode Users (P20-21256)
Danique Ton/Delft University of Technology

Modeling and Managing Connected and Automated Vehicle Platoon Dynamics in Mixed Traffic: A Human-leading Strategy (P20-21257)
Shengyue Yao/Technical University of Braunschweig

Passenger-Oriented Timetable Rescheduling in Railway Disruption Management (P20-21258)
Yongqiu Zhu/Delft University of Technology

Sunday, 02:30 p.m. - 04:00 p.m., Convention Center, Ballroom AB
New Attendee Orientation–TRB Bootcamp
Sponsored By Technical Activities Council

Sunday, 04:00 p.m. - 07:00 p.m., Convention Center, Hall D&E
Exhibit Hall Opening Reception
Sponsored By Technical Activities Council

The opening of the Exhibit Hall includes the popular reception with light hors d'oeuvres and cash bars. Visit the nearly 200 exhibits, including the TRB booth, showcasing the many transportation-related products and services. View the floor plan and interactively search for exhibiting organizations on the Mobile App .

(continued)

Networking Reception for Committee Communication Coordinators and Committee Research Coordinators
Stephanie Camay, WSP, presiding
Mia Zmud, Central Texas Regional Mobility Authority, presiding
Susan Sillick, Montana Department of Transportation, presiding
Sponsored By Operations and Preservation Group, Technical Activities Council, Committee Communications Coordinators Council, Committee Research Coordinators Council

A0000

Sunday, 07:00 p.m. - 08:30 p.m., Convention Center, Ballroom South Pre-Function A
International Participants Welcome Reception
Caroline Alméras, European Conference of Transport Research Institutes, presiding
Christos Xenophontos, Rhode Island Department of Transportation, presiding
William Anderson, Transportation Research Board, presiding
Sponsored By Standing Committee on International Cooperation, Standing Committee on Transportation in the Developing Countries, Standing Committee on International Trade and Transportation, Executive Subcommittee on International Activities

Sunday, 09:00 p.m. - 10:30 p.m., Convention Center, Ballroom South Pre-Function C
Young Professionals Reception
Nikola Ivanov, University of Maryland, College Park, presiding
Sponsored By Young Members Council (YMC)

1091

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 140A
What's Next for Brexit?: Exploring the Impacts on International Passenger and Freight Transportation
Martine Micozzi, Global Impacts, LLC., presiding
Sponsored By Standing Committee on International Cooperation

This session will explore a range of Brexit's potential effects on international passenger and freight transport. The speakers will help to separate the myths from the muddle and provide an overview of the current state of this policy.

The Transport Logistics of Brexit: Myths, Muddle, and Mayhem (P20-20200)
Alan McKinnon/Kühne Logistics University
Brexit and European Aviation (P20-20201)
Jagoda Egeland/International Transport Forum
The Effects of Brexit on Europe and Beyond (P20-20202)
Maximilian Bauernfeind/Austrian Ministry for Transport, Innovation and Technology

1092   CM (1.75)

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 151A
CEO Session: Equity's Role in Transportation Decision Making
Andrea d'Amato, Massachusetts Department of Transportation, presiding
Stephen Woelfel, Massachusetts Department of Transportation, presiding
Sponsored By Standing Committee on Strategic Management

This session will feature the nation's female CEO's of transportation as they discuss the role of equity in their decision making. This session is also tied to the War Games Workshop, which will focus on the disruptive impacts of demographic growth and shifts as they relate to equity policy.

Equity Impacts on Decision Making: Delaware (P20-20008)
Jennifer Cohan/Delaware Department of Transportation
Equity Impacts on Decision Making: Massachusetts (P20-20009)
Stephanie Pollack/Massachusetts Department of Transportation
Equity Impacts on Decision Making: Mississippi (P20-20010)
Margaret Melinda McGrath/Mississippi Department of Transportation
Equity Impacts on Decision Making: New Hampshire (P20-20011)
Victoria Sheehan/New Hampshire Department of Transportation
Equity Impacts on Decision Making: New Jersey (P20-20012)
Diane Gutierrez-Scaccetti/New Jersey Department of Transportation
Equity Impacts on Decision Making: Kansas (P20-20015)
Julie Lorenz/Kansas Department of Transportation
Equity Impacts on Decision Making: Colorado (P20-20017)
Shoshana Lew/Colorado Department of Transportation
Equity Impacts on Decision Making: Pennsylvania (P20-20295)
Leslie Richards/Southeastern Pennsylvania Transportation Authority

1093

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 146C
Gender and Mobility Through the Course of Life
Aditi Misra, University of Michigan, Ann Arbor, presiding
Sponsored By Standing Committee on Women's Issues in Transportation

The session will focus on the impacts of gender on mobility throughout a person's lifespan, from gender differences when learning to drive to differences we see in the elderly.

(continued)

Life Course as a Contextual System to Investigate the Effects of Life Events, Gender, and Generation on Travel Mode Use (20-02200)

Ling Jin/Lawrence Berkeley National Laboratory, Alina Lazar/Lawrence Berkeley National Laboratory, James Sears/Lawrence Berkeley National Laboratory, Annika Todd/Lawrence Berkeley National Laboratory, Alexander Sim/Lawrence Berkeley National Laboratory, Kesheng Wu/Lawrence Berkeley National Laboratory, C. Anna Spurlock/Lawrence Berkeley National Laboratory

Examining the Impact of Stereotype Threat on Women Learner Drivers' Driving Performance and Confidence in a Reverse Stall Parking Task (20-04931)

Xiaoxiao Wang/Wuhan University of Technology, Liangjie Xu/Wuhan University of Technology, Wenjing Ma/Wuhan University of Technology, Yanping Hao/Wuhan University of Technology

Travel Behavior of Care Trips: Data Analysis, Modeling, and Transport Policy Insights (20-04287)

Floridea Di Ciommo/cambiaMO, Gianni Rondinella/cambiaMO, Tomas Ruiz/cambiaMO, Rosa Arroyo/cambiaMO

Gender Differences in Travel Patterns of the Elderly in the United States (20-02877)

Suman Mitra/University of Arkansas, Fayetteville, Mingqi Yao/University of Arkansas, Fayetteville, Stephen Ritchie/University of Arkansas, Fayetteville

How Much and What For?: The Interrelated Effects of Gender and Age on Mobility and Trip Purpose (20-02903)

Gwen Kash/Georgia Institute of Technology (Georgia Tech), Patricia Mokhtarian/Georgia Institute of Technology (Georgia Tech)

1094

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 154
Use of Ridehailing Services in Developing Countries
Joanna Moody, Massachusetts Institute of Technology (MIT), presiding
Sponsored By Standing Committee on Transportation in the Developing Countries

Evaluation of Ridehail Service Impact on Public Transport Bus Trips in the Context of Developing Countries (20-01636)

Kadali Raghuram/Visvesvaraya National Institute of Technology, Mr. Shantanu Ingole/Visvesvaraya National Institute of Technology, Dr. Kannan K R Iyer/Visvesvaraya National Institute of Technology

Complementing or Competing?: Investigating the Demand for App-Based Ridesourcing Trips and Their Determinants in Tehran, Iran (20-03816)

Roya Etminanighasrodashti/University of Texas, Arlington, Shima Hamidi/University of Texas, Arlington

Exploring the Factors Affecting the Choice of Ridesharing's Service Patterns: Comparison Between Users with and Without Household Vehicle (20-03939)

Xuefeng Li/Southeast University, Yong Zhang/Southeast University, Mingyang Du/Southeast University, Ting Wang/Southeast University

Joint Model of App-Based Ridehailing Adoption, Intensity of Use, and Intermediate Public Transport Consideration Among Workers in Chennai City (20-06113)

Aravinda Devaraj/Indian Institute of Technology, Madras, Ganesh Ambi Ramakrishnan/Indian Institute of Technology, Madras, Gopindra Sivakumar Nair/Indian Institute of Technology, Madras, Karthik Srinivasan/Indian Institute of Technology, Madras, Chandra Bhat/Indian Institute of Technology, Madras, Abdul Pinjari/Indian Institute of Technology, Madras, Gitakrishnan Ramadurai/Indian Institute of Technology, Madras, Ram Pendyala/Indian Institute of Technology, Madras

Ridesourcing Versus Public Transit: Potential Accessibility Analysis in Bogotá, Colombia (20-02343)

Daniel Oviedo Hernandez/University College London, Daniel Perez/University College London, Isabel Granada/University College London

1095

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 150B
Research Implementation and Management Best Practices
Emily Parkany, Vermont Agency of Transportation, presiding
Sponsored By Standing Committee on Conduct of Research

This session will include presentations on best practices in research management. Topics will include: developing a framework for research-based guidebooks and manuals, a performance-based approach to research implementation, dynamic synthesis and dissemination of research results, and research timeliness and quality.

(continued)

A Performance-Based and Evidence-Based Approach to Research Implementation at the Georgia Department of Transportation (20-04100)
Binh Bui/Georgia Department of Transportation, Adjo Amekudzi-Kennedy/Georgia Department of Transportation, Russell Clark/Georgia Department of Transportation, Janille Smith-Colin/Georgia Department of Transportation, Stephanie Amoaning-Yankson/Georgia Department of Transportation
Implementation Framework for Research-Based Guidebooks and Manuals (20-04219)
Emily Craigie/Gransberg & Associates, Douglas Gransberg/Gransberg & Associates, Brendon Gardner/Gransberg & Associates
Dynamic Synthesis and Dissemination of Research Results (P20-20849)
Lisa Kay Schweyer/Carnegie Mellon University
Research Timeliness and Quality: Feedback from the Field (P20-20850)
Jennifer Harper/Missouri Department of Transportation, Jason Bittner/Applied Research Associates, Inc. (ARA)

1096

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 152B
Modeling Intercity Travel: Can Big Data Bring Air and Surface Modes Together
Megan Ryerson, University of Pennsylvania, presiding
Sponsored By Standing Committee on National Transportation Data Requirements and Programs, Subcommittee on Long Distance and Intercity Travel

Why It Is Time to Consider the Air and Surface Networks as One Integrated System (P20-20937)
Megan Ryerson/University of Pennsylvania
Business and Leisure Travelers and Connected Fleet Data (P20-20946)
Jeff Kaelin/Avis Budget Group
Approaches to Owning Big Data in Europe (P20-20941)
Philippe Crist/International Transport Forum
Who Owns the Big Data? (P20-20943)
Martin Wachs/University of California, Los Angeles
Collecting and Using Long-Distance Traffic Data (P20-21869)
Theodore Trepanier/Inrix, Inc.

1097

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 151B
Blockchain: Opportunities and Challenges for the Transport Sector
Caitlin Cottrill, University of Aberdeen, presiding
Sponsored By Task Force on Data Privacy, Security and Protection Policy, Standing Committee on Emerging Technology Law

The concept of blockchain, a distributed ledger technology, is being increasingly raised as a potential disruptor of the transportation market. From tracking supply chains to protecting personal information, blockchain has been posited as allowing for traceability, privacy, and auditability along the transportation data chain. However, such opportunities do not come without challenges. The infrastructure and knowledge base needed for blockchain to realize its potential is not yet well understood. In this session, we present a discussion of the opportunities and challenges of blockchain, followed by a potential use case to highlight emerging considerations.

Challenging Blockchain (P20-20739)
Alan Chachich/OST-R/Volpe Center
Privacy-by-Design Mode Choice Modeling Using Blockchain (20-01007)
David Lopez/Ryerson University, Bilal Farooq/Ryerson University

1098

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 103A
Emerging Methods in Statistical and Econometric Modeling
Jonathan Aguero-Valverde, University of Costa Rica, presiding
Sponsored By Standing Committee on Statistical Methods

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Unobserved Heterogeneity and Temporal Instability in the Analysis of Work Zone Crash-Injury Severities (20-00424)
Mouyid Islam/University of South Florida, Fred Mannering/University of South Florida, Nawaf Alnawmasi/University of South Florida

Developing Safety Performance Functions for Bicycle–Vehicle Crashes in Alabama Using Different Techniques (20-03233)
Niloufar Shirani-bidabadi/Western Kentucky University, Venkata Sai Mallipaddi/Western Kentucky University, Kirolos Haleem/Western Kentucky University, Michael Anderson/Western Kentucky University

Modeling of Incident Type and Incident Duration Using Data from Multiple Years (20-02503)
Sudipta Dey Tirtha/Queensland University of Technology, Shamsunnahar Yasmin/Queensland University of Technology, Naveen Eluru/Queensland University of Technology

Bayesian Analysis of Multivariate Crash Counts Using Copulas (20-00209)
Eun Sug Park/Texas A&M Transportation Institute, Rosy Oh/Texas A&M Transportation Institute, Jae Youn Ahn/Texas A&M Transportation Institute, Man-Suk Oh/Texas A&M Transportation Institute

Simultaneous Modeling of Travel Time and Distance: A Bivariate Hazard-Based Approach with Correlated Grouped Random Parameters (20-01154)
Sheikh Shahriar Ahmed/University at Buffalo - The State University of New York, Grigorios Fountas/University at Buffalo - The State University of New York, Panagiotis Anastasopoulos/University at Buffalo - The State University of New York

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1099

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 152A
Innovative Methodologies for Emergency Evacuations
Xianfeng Yang, University of Utah, presiding
Sponsored By Standing Committee on Emergency Evacuations

A Zero Truncated Poisson Model of the Number of Household Vehicles Used to Evacuate from Hurricane Matthew (20-00169)
Roaa Alawadi/Clemson University, Ruijie Bian/Clemson University, Pamela Murray-Tuite/Clemson University, Satish Ukkusuri/Clemson University, Yue "Gurt" Ge/Clemson University

Investigation of Spatio-Temporal Variations in Traffic Conditions on the Houston Freeway Network Induced by Hurricane Harvey (20-05003)
Srijith Balakrishnan/University of Texas, Austin, Zhanmin Zhang/University of Texas, Austin, Randy Machemehl/University of Texas, Austin, Michael Murphy/University of Texas, Austin

A Statistical Approach to Synthetic Population Generation as a Basis for Carless Evacuation Planning (20-05768)
Mohammad Nejad/University of Maryland, College Park, Sevgi Erdogan/University of Maryland, College Park, Cinzia Cirillo/University of Maryland, College Park

Modeling the Dynamics of Spatial Segregation After Disasters Using Mobile Phone Data (20-01327)
Takahiro Yabe/Purdue University, Satish Ukkusuri/Purdue University

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1100   CM (1.75)

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 156
Innovations in Safety and Asset Management to Guide Investment Priorities
J. Matthew Carpenter, Sacramento Area Council of Governments, presiding
Sponsored By Standing Committee on Transportation Programming and Investment Decision-Making

Performance-based tools and methods are increasingly being used to shape investment priorities for safety, freight and asset management programs. A diverse set of four case studies will highlight innovative approaches relevant for state DOTs, MPOs, and local jurisdictions.

Planning for an Uncertain Future (P20-20814)
Matthew Haubrich/Iowa Department of Transportation
Guide Toward Zero Deaths: Analyze Data and Select Strategies to Address Safety Issues (P20-20817)
Eric Tang/VHB
Performance-Based Maintenance at the Michigan DOT (P20-20820)
Gareth McKay/WSP

(continued)

Analyzing Freight Flows and Trends to Improve Freight Investments (P20-20822)
Michael Vanderhoof/Illinois Department of Transportation

1101

Autonomous Vehicles and Travel Behavior
Naveen Eluru, University of Central Florida, presiding
Sponsored By Standing Committee on Traveler Behavior and Values

Looking Through the Perceptions of Blinds: The Potential Impacts of Connected Autonomous Vehicles (CAVs) on Pedestrians with Visual Impairment (20-00898)
Sina Azizisoldouz/University of Toronto, Md Sami Hasnine/University of Toronto, Mahadeo Sukhai/University of Toronto, Khandker Nurul Habib/University of Toronto
Impacts of Travel-Based Multi-Tasking on Productivity of Transit Users: A Latent Modeling Approach (20-02861)
Ali Shamshiripour/University of Illinois, Chicago, Ehsan Rahimi/University of Illinois, Chicago, Abolfazl (Kouros) Mohammadian/University of Illinois, Chicago, Joshua Auld/University of Illinois, Chicago
The Impact of Multi-Tasking on the Value of Travel Time in the Context of Autonomous Vehicles: A Latent Class Approach (20-01567)
Adam Weiss/University of Calgary Schulich School of Engineering, Bar Bergman/University of Calgary Schulich School of Engineering, Yoram Shiftan/University of Calgary Schulich School of Engineering
Do People Expect Autonomous Vehicles to Change Their Residential Location and Vehicle Ownership?: Early Glimpses from the State of Georgia (20-03111)
Sung Hoo Kim/Georgia Institute of Technology (Georgia Tech), Patricia Mokhtarian/Georgia Institute of Technology (Georgia Tech), Giovanni Circella/Georgia Institute of Technology (Georgia Tech)
Online Platform for Matching and Trading Shares of Autonomous Vehicles (20-04194)
Mahdieh Allahviranloo/City College of New York, Coline Bouyeure/City College of New York

1102

New Ways of Thinking About Decision Making in Travel Demand Modeling
Aruna Sivakumar, Imperial College London, presiding
Sponsored By Standing Committee on Transportation Demand Forecasting

A Decision Field Theory Model for Dynamic Choice Contexts: Further Steps Toward Bridging Choice Modeling with Mathematical Psychology (20-03055)
Thomas Hancock/University of Leeds Institute for Transport Studies, Stephane Hess/University of Leeds Institute for Transport Studies, Charisma Choudhury/University of Leeds Institute for Transport Studies
Modeling Route Choice Behavior Using the Concepts of Regret and Rejoice (20-02905)
Sunghoon Jang/Eindhoven University of Technology, Soora Rasouli/Eindhoven University of Technology, Harry Timmermans/Eindhoven University of Technology
Quantum Rotation: A New Method for Capturing a Change of Perspective (20-01263)
Thomas Hancock/University of Leeds Institute for Transport Studies, Stephane Hess/University of Leeds Institute for Transport Studies, Charisma Choudhury/University of Leeds Institute for Transport Studies
Discussants (P20-20892)
Khandker Nurul Habib/University of Toronto, Eric Miller/University of Toronto, Jason Lemp/Cambridge Systematics, Inc.

1103 CM (1.75)

Electric Vehicle Market Development: Moving to Mainstream Adoption
Reid Heffner, Booz Allen Hamilton, Inc., presiding
Mehrnaz Ghamami, Michigan State University, presiding
Sponsored By Standing Committee on Alternative Transportation Fuels and Technologies , Standing Committee on Transportation Energy

This session will focus on the growing market for battery-powered electric vehicles with zero tailpipe emissions in the Light Duty Vehicle (LDV) sector. Participants will learn about market trends, electric vehicle driver behavior, economic factors, and the latest incentive policies.

Effect of Electric Vehicle Usage on Attitudes, Perceptions, and Valuations in an Introduction-Stage Market: Evidence from a Randomized Experiment (20-00630)
C. Angelo Guevara/Universidad de Chile, Esteban Figueroa/Universidad de Chile, Marcela Munizaga/Universidad de Chile
Plug-in Electric Vehicle Diffusion in California: The Role of Exposure in New Technology at Home and Work (20 -03015)
Debapriya Chakraborty/University of California, Davis, David Bunch/University of California, Davis, David Brownstone/University of California, Davis, Bingzheng Xu/University of California, Davis, Gil Tal/University of California, Davis
Effects of Charging Infrastructure Characteristics on Electric Vehicle Preferences of U.S. Private Car Owners: A Comparative Analysis Between New and Used Car Buyers (20-05154)
Tianqi Zou/University of Washington, Moein Khaloei/University of Washington, Don MacKenzie/University of Washington
Consumers' Preferences for Purchasing Alternative Fuel Vehicles (20-03074)
Zulqarnain H. Khattak/Oak Ridge National Laboratory, Asad Khattak/Oak Ridge National Laboratory

1104

Environmental Justice at 25 Years: A National Perspective
Carolyn Nelson, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Environmental Justice in Transportation

The Executive Order 12898 for Environmental Justice has been in place for 25 years. This session will take a dive into the impacts the Executive Order has had on transportation and public stakeholders. The session will highlight some of the challenges and accomplishments from the perspective of the stakeholder implementers at the grassroots level. Department of Transportation, Consultant and Public Advocacy Leaders will come together to discuss impacts and reflect on benefits, legal challenges and transportation decisions based on the implementation of the Executive Order.

Environmental Justice in Transit (P20-21839)
Sharyn Lacombe/Federal Transit Administration (FTA)
Presentation 2 (P20-21840)
Charlie Webb/Jacobs Engineering Group
Black Health Coalition of Wisconsin (P20-21841)
Patricia McManus
Environmental Justice in North Carolina Transportation (P20-21842)
Harrison Marshall/WSP

1105

Selected Presentations from the 12th TRB International Conference on Low-Volume Roads
Alex Campbell, Anyway Solutions, presiding
Sponsored By Standing Committee on Low-Volume Roads

 Four select presentations from the 12th TRB International Conference on Low Volume Roads will be presented again in this session for the benefit of those who could not attend the conference. The selection of presentations was based on votes by the Conference Planning Committee, Session Moderators, and whether the presenter was able to attend the Annual Meeting.

Applying Pavement Preservation Principles in Unpaved Road Management with Specific Reference to Fines Preservation and Dust Control (P20-20537)
David Jones/University of California, Davis
Options for Aging and Deficient Low-Volume Road Bridges (P20-20623)
Gordon Keller/Genesee Geotechnical
Development of a New Daytime Process for the Evaluation of Sign Retroreflectivity (P20-20872)
Dale Heglund/North Dakota State University
Improving Roads Stream Crossings for Storm Resiliency and Aquatic Organism Passage: A Pennsylvania Case Study (P20-20851)
Steven Bloser/Pennsylvania State University

1106

Data Acquisition for Design and Construction: A Look at Technologies and Specifications
Kyle Ince, Ohio Department of Transportation, presiding
Sponsored By Standing Committee on Geospatial Data Acquisition Technologies

Unanticipated Uses of Mobile LiDAR (P20-20698)
Joseph Thomas/Oregon Department of Transportation
Support from Above: Creating Accurate Digital Terrain Models with Unmanned Aerial Systems to Support Pre-Construction Surveys (P20-20699)
Ryan Burley/Juniper Unmanned
Aligning Project Specifications with LiDAR and UAS Technologies: The New Hybrid Product Approach (P20-20701)
Qassim Abdullah/Woolpert, Inc.

1107

Designing Pavements for Sustainability, Resilience, and the Urban Heat Island
Milena Rangelov, Turner-Fairbank Highway Research Center, Federal Highway Administration, presiding
Sponsored By Section - Pavements, Subcommittee on Pavement Materials and the Urban Climate

Thermoelectric Energy Harvesting Technology for Roadway Sustainability (20-04583)
Seyed Amid Tahami/University of Texas, San Antonio, Mohammadreza Gholikhani/University of Texas, San Antonio, Samer Dessouky/University of Texas, San Antonio
Quantification of Warming Temperature Impact on Flexible Pavement Overlay Performance in New Jersey (20-05473)
Xiaodan Chen/Rutgers, The State University of New Jersey, Hao Wang/Rutgers, The State University of New Jersey
Economical and Environmental Impact of Climate Change on Texas Pavements (20-05935)
Megha Sharma/University of Texas, El Paso, Sundeep Inti/University of Texas, El Paso, Vivek Tandon/University of Texas, El Paso, Harshini Byreddy/University of Texas, El Paso
Reflective Parking Lots for Microscale Urban Heat Island Mitigation (20-04231)
Sushobhan Sen/University of Pittsburgh, Juan Pablo Fernandèz/University of Pittsburgh, Jeffery Roesler/University of Pittsburgh

1108

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 204C
MnROAD: A Quarter Century of Concrete Design and Rehabilitation Contributions
Thomas Burnham, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Design and Rehabilitation of Concrete Pavements, Standing Committee on Full-Scale Accelerated Pavement Testing

 Invited and paper presentations related to MnRoads contribution to concrete pavement research.

Contribution of MnROAD Research to Improvements in Concrete Pavement Technology from 1994–2019 (20-04 638)
Thomas Burnham/Minnesota Department of Transportation, Benjamin Worel/Minnesota Department of Transportation, Bernard Izevbekhai/Minnesota Department of Transportation
MnROAD Recent Research Results (P20-20452)
Bernard Izevbekhai/Minnesota Department of Transportation
Verification and Validation of the Response of a 3D Finite Element Model for the Characterization of Jointed Concrete Pavements (20-05093)
Abbasali TaghaviGhalesari/University of Texas, El Paso, Nancy Aguirre/University of Texas, El Paso, Cesar Carrasco/University of Texas, El Paso, Michael Vrtis/University of Texas, El Paso, Navneet Garg/University of Texas, El Paso

1109

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 203
Network-Level Pavement Structural Evaluation
Christina Plati, National Technical University of Athens (NTUA), presiding
Dirk Jansen, Federal Highway Research Institute (BASt), presiding
Sponsored By Standing Committee on Pavement Structural Modeling and Evaluation

A Mechanistic-Based Approach to Utilize Traffic Speed Deflectometer Measurements into Backcalculation Analysis (20-02053)
Zia Zihan/Louisiana State University, Mostafa Elseifi/Louisiana State University, Patrick Icenogle/Louisiana State University, Kevin Gaspard/Louisiana State University, Zhongjie Zhang/Louisiana State University
Deriving Pavement Deflection Indices from Layered Elastic Theory (20-03412)
Christoffer Nielsen/Greenwood Engineering A/S
Field Evaluation of Laser-Based Rolling Wheel Deflectometer (20-04320)
Salil Gokhale/Dynatest North America, Inc., Omar Elbagalati/Dynatest North America, Inc., Buzz Powell/Dynatest North America, Inc., David Timm/Dynatest North America, Inc., Jack Larsen/Dynatest North America, Inc., Albert Navarro Comes/Dynatest North America, Inc., Mathias Anderson/Dynatest North America, Inc.
Development of an Approach to Incorporate Pavement Structural Condition into the Treatment Selection Process at the Network Level (20-04191)
Samer Katicha/Virginia Polytechnic Institute and State University, Shivesh Shrestha/Virginia Polytechnic Institute and State University, Gerardo Flintsch/Virginia Polytechnic Institute and State University, Brian Diefenderfer/Virginia Polytechnic Institute and State University

1110

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 202A
Advances in Bridge Engineering and Performance
Richard Dunne, GPI, presiding
Sponsored By Standing Committee on General Structures, Standing Committee on Bridge Management, Standing Committee on Bridge Preservation

This session provides presentations of four papers that will be of interest to the practicing bridge engineer and bridge owner. The topics include: the role of skew on bridge performance; load and resistance factor rating for emergency vehicles; the effects of elastomeric bearing stiffness on the structural behavior of link slabs ; and the effect of confinement of narrow baseplates on adhesive anchor breakout resistance. Hope to see you in this session!

(continued)

Effects of Elastomeric Bearing Stiffness on the Structural Behavior of Link-Slabs (20-02061)
Antoine Gergess/University of Balamand, Elie Douaihy/University of Balamand
Load and Resistance Factor Rating for Emergency Vehicles (20-02249)
Michel Ghosn/City University of New York (CUNY), Bala Sivakumar/City University of New York (CUNY), Ekin Senturk/City University of New York (CUNY)
Effect of Confinement of Narrow Baseplate on Adhesive Anchor Breakout Resistance (20-03738)
Nakin Suksawang/Florida Institute of Technology, Steven Nolan/Florida Institute of Technology, Cheryl Hudson/Florida Institute of Technology
Role of Skew on Bridge Performance (20-04752)
Mauricio Diaz Arancibia/University at Buffalo - The State University of New York, Lucas Rugar/University at Buffalo - The State University of New York, Pinar Okumus/University at Buffalo - The State University of New York

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 207A
The Impact of Alternative Project Delivery on Institutional Practices Throughout Public Transportation Agencies: Rethinking the Risk Profiles of Alternative Delivery
Steven DeWitt, ACS Infrastructure Development, Inc., presiding
Sponsored By Standing Committee on Project Delivery Methods

Alternative delivery approaches such as design-build, public-private partnerships, and related contracting methods have become an important part of delivering key infrastructure projects in most DOTs . This session will focus on the broad issue of risk in these fixed-priced contracts with a particular focus on the historical approach to risk apportionment/transfer, its impact on major market competitors, and thoughts on how the risk can be better balanced to provide the public overall better value through ensuring limited bidding contingencies, strong project performance, and enhanced competition.

Panel Discussion (P20-21716)
Darryl VanMeter/Georgia Department of Transportation, Joe Wingerter/Kiewit Engineering Group, Charles Kilpatrick/The Lane Construction Corporation

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1112

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 150A
Doctoral Research in Asphalt: Blended Podium and Poster Session
Amir Golalipour, Engineering and Software Consultants, Inc., presiding
Sponsored By Section - Asphalt Materials, Standing Committee on Critical Issues and Emerging Technologies in Asphalt, Standing Committee on Asphalt Binders, Standing Committee on Non-Binder Components of Asphalt Mixtures, Standing Committee on Surface Requirements of Asphalt Mixtures, Standing Committee on Structural Requirements of Asphalt Mixtures

Data-Driven Modeling of Pavement In-Service Performance (P20-21363)
Arash Mohammad Hosseini/Temple University
Quantitative Assessment of the Pavement Modulus and Surface Crack (P20-21364)
Xue Wang/Tongji University
Development of Performance Testing for Low-Temperature Cracking and Reflective Cracking in Asphalt Mixtures and Application in QC/QA (P20-21365)
Poura Arabali/Texas A&M University, College Station
Probabilistic Modeling of the Fatigue and Rutting Behavior of Asphalt Concrete Using Advanced Mechanistic Models (P20-21366)
Zaher Al Basiouni Al Masri/American University of Beirut
Multi-Scale Characterization of the Influence of Aging and Recycling Agents on the Properties of High RAP Binders (P20-21367)
Amal Abdelaziz/Texas A&M University
Developing Best Practices for Rehabilitation of Concrete with Hot Mix Asphalt Overlays Related to Density and Reflective Cracking (P20-21368)
Katie Haslett/University of New Hampshire

(continued)

An Impact of Different Flexible Insulated Pavements on Temperature Distribution: An Experimental and Numerical Analysis (P20-21369)
Zhuang Zhuo/Rowan University

Sensitivity to Sample Fabrication Procedures for Asphalt Emulsion Cold In-Place Recycling (P20-21370)
Sadie Casillas/University of Arkansas, Fayetteville

1113

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 201
Plastics in Asphalt
Ben Cox, U.S. Army Corps of Engineers (USACE), presiding
Sponsored By Standing Committee on Critical Issues and Emerging Technologies in Asphalt, Standing Committee on Resource Conservation and Recovery

The use of plastics in asphalt has gained considerable attention of late. Beneficially re-purposing or recycling plastic is a topic of interest for many groups involved with materials, environmental, construction, policy, or other endeavors. This session aims to assess the state of the art of plastics use in asphalt, and to identify positive and potentially negative attributes of different types of plastic uses in asphalt.

History of Plastics in Asphalt (P20-20416)
Rebecca McDaniel/Purdue University
Types of Plastics and Their Compatibility in Asphalt: Part 1 (P20-20417)
Jean-Pascal Planche/Western Research Institute
Types of Plastics and Their Compatibility in Asphalt: Part 2 (P20-20418)
Gaylon Baumgardner/Paragon Testing Services
Case Study: Wet Processed Plastics in Asphalt (P20-20419)
Charles DuBois/Dow Chemical Company
Case Study: Dry Processed Plastics in Asphalt (P20-20420)
Jean-Paul Fort/Colas, Inc.

1114

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 202B
How Tired Is My Asphalt?: Recent Developments in Asphalt Binder Fatigue Characterization
Amir Golalipour, Engineering and Software Consultants, Inc., presiding
Robert Kluttz, Kraton Polymers, presiding
Sponsored By Standing Committee on Asphalt Binders

In 2019, committee AFK20 sponsored two sessions on asphalt binder specifications where there are established performance criteria, high temperature permanent deformation and low temperature thermal cracking. For 2020, there are two more sessions in specification areas where development work is ongoing, fatigue cracking and aging. This session on fatigue cracking will present work from four different groups on fatigue cracking tests and specifications.

Revisiting Measurement of Fatigue Cracking Resistance of Asphalt Binders (P20-20514)
Amit Bhasin/University of Texas, Austin, Panos Apostolidis/Delft University of Technology
NCHRP 9-59: Asphalt Concrete Mixture Fatigue Performance and Binder Properties (P20-20518)
Donald Christensen/Advanced Asphalt Technologies, LLC
NCHRP 1-52: A Mechanistic-Empirical Model for Top-Down Cracking of Asphalt Pavement Layers (P20-20519)
Meng Ling/Texas A&M University, College Station
Fatigue Damage Characterization in the Dynamic Shear Rheometer (P20-20522)
Cassie Castorena/North Carolina State University, B. Shane Underwood/North Carolina State University

1115

Resilient Modulus and Compaction Advances
Jamal Nusairat, E. L. Robinson Engineering Company, presiding
Sponsored By Standing Committee on Soil and Rock Properties

A podium session to describe recent advances made in Resilient Modulus and Compaction Advances .

Evaluating a National Database for Subgrade Resilient Moduli Values (20-02800)
James Bryce/Marshall University, Janie Matics/Marshall University
The Effects of Gyratory Compaction of Granular Materials in the Laboratory on the Engineering Properties (20-02705)
Poura Arabali/Texas A&M University, College Station, Sang-Ick Lee/Texas A&M University, College Station, Robert Lytton/Texas A&M University, College Station, Maryam Sakhaeifar/Texas A&M University, College Station, Stephen Sebesta/Texas A&M University, College Station
Electrical Resistivity Changes in Wet and Dry Sides of Optimum Moisture Content for Soils with Low to High Fines Content (20-05338)
Hamid Rostami/Southern Illinois University, Edwardsville, Dennis Davis/Southern Illinois University, Edwardsville, Abdolreza Osouli/Southern Illinois University, Edwardsville, Brent Vaughn/Southern Illinois University, Edwardsville
Field and Laboratory Characterization of Subgrade Resilient Modulus for Pavement MEPDG Application (20-04 679)
Kazi Moinul Islam/University of South Carolina, Sarah Gassman/University of South Carolina, Md Mostaqur Rahman/University of South Carolina

1116

Bio-Mediated Enhancement of Transportation Materials and Infrastructure
Aiyoub Abbaspour, George Mason University, presiding
Eric Seagren, Michigan Technological University, presiding
Sponsored By Standing Committee on Geo-Environmental Processes

Preliminary Study of Fungi-Mediated, Self-Healing Concrete (20-03895)
Xijin Zhang/Case Western Reserve University, Yuan Guo/Case Western Reserve University, Xudong Fan/Case Western Reserve University, Xiong Yu/Case Western Reserve University
Effects of Microbial Bio-Mineralization Surface Erosion Control Treatments on Vegetation and Re-Vegetation Along Highways (20-04171)
Bret Lingwall/South Dakota School of Mines and Technology, Tash Hodges/South Dakota School of Mines and Technology
Improving Soil Surface Erosion Resistance by Fungal Mycelium (20-04426)
Xijin Zhang/Case Western Reserve University, Xudong Fan/Case Western Reserve University, Chanjuan Han/Case Western Reserve University, Chen Wang/Case Western Reserve University, Xiong Yu/Case Western Reserve University
Desiccation Cracking Behavior of Clayey Soils Treated with Bio-Cement and Bottom Ash Admixture During Wetting-Drying Cycles (20-05165)
Mark Vail/Rowan University, Cheng Zhu/Rowan University, Chao-Sheng Tang/Rowan University, Nate Maute/Rowan University, Melissa Montalbo-Lomboy/Rowan University

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 209B
Geosynthetics in Pavements: Lab and Field Testing
Jayhyun Kwon, Kennesaw State University, presiding
Sponsored By Standing Committee on Geosynthetics

Pavement design frequently includes geosynthetics to function either as separators, filters, reinforcement, or drainage to improve the performance and design life of the pavement structure. This session will have presentations on lab and field testing performed on geosynthetic reinforced pavements.

Quantifying the Conditioning Period for Geogrid-Reinforced Aggregate Base Materials Through Cyclic Loading (20-05914)
Chad Vickery/Brigham Young University, William Guthrie/Brigham Young University
Geogrid Stabilization of Unbound Aggregates Evaluated Through Bender Element Shear Wave Measurement in Repeated Load Triaxial Testing (20-04113)
Mingu Kang/University of Illinois, Urbana Champaign, Joon Han Kim/University of Illinois, Urbana Champaign, Issam Qamhia/University of Illinois, Urbana Champaign, Erol Tutumluer/University of Illinois, Urbana Champaign, Mark Wayne/University of Illinois, Urbana Champaign
Stiffness and Strength Improvement of Geosynthetic-Reinforced Pavement Foundation Under Traffic Wheel Loading (20-01766)
Jason Wright/University of Georgia, S. Sonny Kim/University of Georgia, Bumjoo Kim/University of Georgia
Pumping Mitigation in Pavement Shoulder Using Wicking Geotextile: An Experimental Study (20-05667)
Javad Galinmoghadam/Missouri University of Science and Technology, Chuang Lin/Missouri University of Science and Technology, Xiong Zhang/Missouri University of Science and Technology, Yipeng Guo/Missouri University of Science and Technology
Field Performance of Geocell Reinforced Recycled Asphalt Pavement Base Layer (20-05918)
Md Ashrafuzzaman Khan/Texas A&M University, Nripojyoti Biswas/Texas A&M University, Aritra Banerjee/Texas A&M University, Anand Puppala/Texas A&M University

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 209C
Soil Stabilization for Unusual Soils and Environmental Conditions
(Garth) Ben Reese, Raba Kistner Consultants Inc, presiding
Sponsored By Standing Committee on Stabilization of Geomaterials and Recycled Materials

 This session includes a selection of presentations on the testing and stabilization of soils with unusual characteristics and the durability of stabilized soils exposed to moisture for extended periods of time.

Feasibility Study of Collapse Remediation of Illinois Loess Using Electrokinetics Technique by Nanosilica and Salt (20-02592)
Pourya Kargar/Southern Illinois University, Edwardsville, Abdolreza Osouli/Southern Illinois University, Edwardsville, Brent Vaughn/Southern Illinois University, Edwardsville, Arash Mohammad Hosseini/Southern Illinois University, Edwardsville, Hamid Rostami/Southern Illinois University, Edwardsville
Application of Deep Soil Mixing in Sabkha Soils for Foundation Support in the United Arab Emirates (20-02488)
Chulmin Jung/Samsung Engineering, Rafael Ceglarek/Samsung Engineering, Thibaut Clauvelin/Samsung Engineering, Mohamed Ayeldeen/Samsung Engineering, Donghyun Kim/Samsung Engineering
Laboratory Investigation of Moisture Susceptibility Protocols for Cement Treated Aggregate Bases and Soils (20-00707)
Mohammad Rashidi/University of Texas, El Paso, Reza Ashtiani/University of Texas, El Paso, Jimmy Si/University of Texas, El Paso
Evaluating the Long-Term Durability of Lime Treatment in Hydraulic Structures: A Case Study on the Friant-Kern Canal (20-04769)
Narain Hariharan/Texas A&M University, Pavan Akula/Texas A&M University, Dallas Little/Texas A&M University, Didier Lesueur/Texas A&M University, Gontran Herrier/Texas A&M University

1119

Moving to Smarter Management and Operations: Innovations in Planning and Performance Management
Jocelyn Bauer, Leidos, Inc., presiding
Sponsored By Standing Committee on Regional Transportation Systems Management and Operations , Standing Committee on Metropolitan Policy, Planning, and Processes

This panel session will examine how State and metropolitan planning organizations are including innovations in their planning, programming, and project development processes to enable smarter management and operations systems and services to be delivered. The session will look at aspects such as organizational innovations, applying performance management, using of archived data, establishing goals and objectives, and creating a program evaluation and analysis structure. Panelists will share their experiences on these as well as other related topics. This session will consist of short presentations followed by discussion questions from the moderator and then audience.

Panelists (P20-21121)

Innovative Data Sources and Operational Investment Decisions (P20-21122)
John MacAdam/Ohio Department of Transportation
Integration of TSMO Programs into Statewide Transportation Planning (P20-21123)
Subrat Mahapatra/Maryland State Highway Administration
Improving Motorist Delay Estimates at Highway Rail Grade Crossings for Investment Prioritization (P20-21124)
Thomas Murtha/Chicago Metropolitan Agency for Planning (CMAP)
Using Data to Balance Track Maintenance and Transit Operations (P20-21125)
Amanda Barnett/Washington Metropolitan Area Transit Authority
National Framework for Regional Vehicle Connectivity and Automation Planning (P20-21127)
Bill Keyrouze/Association of Metropolitan Planning Organizations
Metropolitan Planning for Automated and Connected Vehicles (P20-21128)
Thomas Bamonte/North Central Texas Council of Governments
Open Discussion (P20-21129)

1120

Traffic Flow Modeling for Connected Automated Vehicles
Danjue Chen, University of Massachusetts, Lowell, presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

A Game-Theory Based Framework for Modeling Pedestrian–Vehicle Interactions (20-05193)
Yalda Rahmati/University of Illinois, Urbana Champaign, Alireza Talebpour/University of Illinois, Urbana Champaign, Archak Mittal/University of Illinois, Urbana Champaign, James Fishelson/University of Illinois, Urbana Champaign
Ecodriving Algorithm with a Moving Bottleneck on a Single Lane (20-05560)
Pengyuan Sun/University of California, Irvine, Dingtong Yang/University of California, Irvine, Wenlong Jin/University of California, Irvine
Impacts of Connected and Autonomous Vehicles on Traffic Flow with Heterogeneous Drivers Spatially Distributed Over Large-Scale Networks (20-04682)
Fatemeh Fakhrmoosavi/Michigan State University, Ramin Saedi/Michigan State University, Ali Zockaie/Michigan State University, Alireza Talebpour/Michigan State University
Chained Asymmetric Driver Behavior Under Stop-and-Go Oscillations: Modeling and Control Using Connected and Automated Vehicles (20-02900)
Anupam Srivastava/University of Wisconsin, Madison, Soyoung Ahn/University of Wisconsin, Madison, Danjue Chen/University of Wisconsin, Madison
Lane Changing Maneuver for Autonomous Vehicle in Mixed Traffic (20-02911)
Zhen Wang/University of South Florida, Xiangmo Zhao/University of South Florida, Zhigang Xu/University of South Florida, Xiaopeng (Shaw) Li/University of South Florida

1121

Statistical Modeling of Highway-Rail Grade Crossing Data
Aemal Khattak, University of Nebraska, Lincoln, presiding
Sponsored By Standing Committee on Highway/Rail Grade Crossings

Evaluation of the Accident and Hazard Prediction Models for Prioritization of the Highway-Rail Grade Crossing Safety Projects in Florida (20-00671)
Junayed Pasha/Florida A&M University-Florida State University College of Engineering, Maxim Dulebenets/Florida A&M University-Florida State University College of Engineering, Olumide Abioye/Florida A&M University-Florida State University College of Engineering, Masoud Kavoosi/Florida A&M University-Florida State University College of Engineering, Ren Moses/Florida A&M University-Florida State University College of Engineering, John Sobanjo/Florida A&M University-Florida State University College of Engineering, Eren Ozguven/Florida A&M University-Florida State University College of Engineering

Real-Time Traffic Congestion Assessment and Decongestion Time Prediction at Grade Crossing for the First Responders (20-00756)
Feng Guo/University of South Carolina, Yu Qian/University of South Carolina, Yi Wang/University of South Carolina, Dimitris Rizos/University of South Carolina, Shaofeng Wang/University of South Carolina, Huayang Yu/University of South Carolina

Development of a LiDAR-Based System Prototype for Detection, Classification, and Tracking of Road Users at Railway Facilities (20-02602)
Ehsan Nateghinia/McGill University, Luis Miranda-Moreno/McGill University

Identifying Highway Rail Grade Crossings with Accidents in the Future: Improving Selections Using Prediction Models (20-03096)
Jacob Mathew/University of Illinois, Urbana Champaign, Rahim Benekohal/University of Illinois, Urbana Champaign

1122

The Influence of the Interstate Commerce Clause on Transportation
Alais Griffin, Griffin Strategic Law Advisors, presiding
Sponsored By Standing Committee on Transportation Law

The Commerce Clause has had far-reaching influence on transportation. It gives Congress the power to regulate commerce with foreign nations, among the states, and with Indian Tribes. Inherent in the regulation of commerce is the regulation of the movement of goods, and people across state lines. This session the panelists will discuss the role of the Commerce Clause is regulating transportation and how it has been used to protect the freedom of movement and fair access to transportation systems.

Panel Discussion (P20-21315)
Deanna Longo/Linebarger Goggan Blair & Sampson, LLP, Marcelle Jones/Stantec Consulting Service

1123

Analysis of International Road Safety Data
Chou-Lin Chen, National Highway Traffic Safety Administration (NHTSA), presiding
Stephen Perkins, International Transport Forum, presiding
Sponsored By Section - Safety

Road Safety Performance in IRTAD Countries and Cities of the Safer City Streets Network (P20-21402)
Stephen Perkins/International Transport Forum
Understanding the Difference Between the Road Death Estimates of the World Health Organization and Data from Official National Statistics (P20-21403)
Nhan Tran/World Health Organization
Road Safety Data and Public Intervention (P20-21404)
Laurent Carnis/IFSTTAR

(continued)

Safety of Micromobility (P20-21405)
Alexandre Santacreu/International Transport Forum
Evaluation of the Reduction of Speed Limit from 90 to 80 km/h and Analysis of Risk Factors in France (P20-21406)
Manuelle Salathé/French Ministry of Interior
Forecasting the Benefits of the Use of Electronic Stability Control by 2030 (P20-21407)
David Hynd/TRL

1124

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 102B
The History Behind BAC Laws: The Groundwork for Preventing Impaired Driving
Tara Kelley-Baker, AAA Foundation for Traffic Safety, presiding
Tara Casanova Powell, Association of Traffic Safety Information Professionals, presiding
Sponsored By Standing Committee on Alcohol, Other Drugs, and Transportation

Keeping with the theme of the annual TRB meeting "A Century of Progress: Foundation for the Future" we invite attendees to learn about the history of BAC laws and gain an understanding of their potential.

.05 BAC: The NTSB Perspective: A History and Understanding (P20-20888)
Leah Walton/National Transportation Safety Board (NTSB)
.05 BAC and Its Potential to Reduce Impaired Driving (P20-20889)
James Fell/NORC at the University of Chicago
Benefits of an Administrative .05–.07 in Canada (P20-20890)
Andrew Murie/MADD Canada
Evaluation of Utah's .05 BAC Law (P20-20891)
Amy Berning/National Highway Traffic Safety Administration (NHTSA)

1125

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 102A
Research on Safe Mobility of Older Persons
Lesley Ross, Pennsylvania State University, presiding
Sponsored By Standing Committee on Safe Mobility of Older Persons

Understanding Older Adults' Travel Characteristics and Immobility: Findings from 2017 National Household Travel Survey Data (20-05509)
Siwon Jang/USF Center for Urban Transportation Research, Gyeo Reh Lee/USF Center for Urban Transportation Research
Situation Awareness Fast-Tracking, Including Identifying Escape Routes for Older Drivers (SAFER-Senior): A Process and Impact Evaluation of SAFER-Senior (20-03849)
Bridie Scott-Parker/University of the Sunshine Coast, Bonnie Huang/University of the Sunshine Coast
Evaluation of Advanced Driver-Assistance System Trainings for Older Adults (20-00071)
Maryam Zahabi/Texas A&M University, College Station, Ashiq Mohammed Abdul Razak/Texas A&M University, College Station, Ranjana Mehta/Texas A&M University, College Station, Michael Manser/Texas A&M University, College Station
Measuring the Applicability of Intersection-Based Older Driver Training Programs (20-03846)
Craig Schneider/University of Massachusetts, Amherst, Foroogh Hajiseyedjavadi/University of Massachusetts, Amherst, Francis Tainter/University of Massachusetts, Amherst, Michael Knodler/University of Massachusetts, Amherst, Jingyi Zhang/University of Massachusetts, Amherst, Matthew Romoser/University of Massachusetts, Amherst, Siby Samuel/University of Massachusetts, Amherst, Donald Fisher/University of Massachusetts, Amherst

1126

Current Research in Motorcycle Safety—Hybrid Session
Arthur Goodwin, UNC Highway Safety Research Center, presiding
Sponsored By Standing Committee on Motorcycles and Mopeds

This hybrid session will showcase the variety of research currently being undertaken in North America and elsewhere .

Assessing Driving Anger Among Vietnamese Motorcyclists (20-02326)
Hiep Bui/University of Liège, Ismaïl Saadi/University of Liège, Mario Cools/University of Liège
Severity Analysis of Roadway Departure Motorcycle Crashes as They Relate to Roadside Fixed Objects and Safety Systems (20-01296)
Bahar Dadashova/Texas A&M Transportation Institute, Chiara Silvestri-Dobrovolny/Texas A&M Transportation Institute, Marcelina Perez/Texas A&M Transportation Institute, Jayveersinh Chauhan/Texas A&M Transportation Institute, Roger Bligh/Texas A&M Transportation Institute
Investigating the Impacts of Body Mass Index on Self-Reported Crashes Among Motorcycle Taxi Drivers (20-01375)
Long Truong/La Trobe University, Richard Tay/La Trobe University, Hang Nguyen/La Trobe University
Factors Affecting Traffic Crashes Caused by Turn Signal Neglect Between Car Drivers and Motorcyclists in Vietnam (20-01710)
Duy Nguyen-Phuoc/Danang University of Science and Technology, Oscar Oviedo-Trespalacios Oviedo-Trespalacios/Danang University of Science and Technology, Quang Le/Danang University of Science and Technology, Nhat Vo/Danang University of Science and Technology, My Cao/Danang University of Science and Technology, Diep Su/Danang University of Science and Technology
Toward Better Measurement of Traffic Injuries: Comparison of Anatomical Injury Measures in Predicting Poor Clinical Outcomes in Motorcycle Crashes (20-02301)
Behram Wali/Massachusetts Institute of Technology (MIT), Numan Ahmad/Massachusetts Institute of Technology (MIT), Asad Khattak/Massachusetts Institute of Technology (MIT)
Investigating Powered Two-Wheelers Risk Factors Using Automated Surrogate Safety Methods in Latin American Cities (20-03478)
Mohamed Elagaty/McGill University, Luis Miranda-Moreno/McGill University, Lynn Scholl/McGill University, Agustina Calatayud/McGill University, Jairo Patino/McGill University
Logit Model with Social Factors for Motorcycle Accident Gravity (20-04771)
Jessica de Lima/Universidade Federal de Pernambuco, Anderson Santos/Universidade Federal de Pernambuco, Maria Leonor Maia/Universidade Federal de Pernambuco
A Survey of Other Motorists Regarding Motorcyclists Safety, Behaviors, and Legitimate Practices (20-05775)
DEJA JACKSON/WSP USA Corp, Sivaramakrishnan Srinivasan/WSP USA Corp

1127

Improving Transit Safety Performance Through Safety Risk Management
Henrika Buchanan, Federal Transit Administration (FTA), presiding
Sponsored By Public Transportation Group

Transit is the safest mode of surface transportation . For the transit industry to realize meaningful improvements in safety performance, it must be proactive in identifying and preventing potential accidents . The Federal Transit Administration (FTA) has adopted Safety Management Systems (SMS) as the foundation of the Public Transportation Safety Program. SMS is a proactive, data-driven approach to identifying, prioritizing, and managing safety risk. This session, organized by FTA, will provide an overview of the Public Transportation Agency Safety Plan regulation and examples for how agencies can meet the safety risk management (SRM) requirements. The session also will provide an overview of FTA's internal SRM process.

Presentation (P20-21692)
Henrika Buchanan/Federal Transit Administration (FTA)
Presentation (P20-21693)
Candace Key/Federal Transit Administration (FTA)

(continued)

Presentation (P20-21694)
Paulina Orchard/Federal Transit Administration (FTA)
Presentation (P20-21695)
James Bartell/Federal Transit Administration (FTA)
Presentation (P20-21696)
Travis Johnson/Maryland Transit Administration

1128

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 147A
Shared Mobility and Traveler Choices
Vincent Valdes, Federal Transit Administration (FTA), presiding
Sponsored By Standing Committee on Emerging and Innovative Public Transport and Technologies

Shared mobility is the most common theme in this era of new mobility options, but is everyone willing to share? What influences a traveler's behavior when faced with the decision to share or not to share? This session will present four research papers with differing perspectives on factors that influence the choices travelers make regarding shared mobility.

Factors Influencing Bicycling Propensity: Evidence from the California Millennials Data Set 2015 (20-01382)
Tatsuya Fukushige/University of California, Davis, Susan Handy/University of California, Davis
User Interest in On-Demand, Shared, and Driverless Mobility: Evidence from Stated Preference Choice Experiments in Southern Ontario (20-00734)
Matthias Sweet/Ryerson University
On the Influence of Cost and Time on the Willingness to Share a Ride: A Scenario Analysis (20-02762)
María J. Alonso-González/Delft University of Technology, Oded Cats/Delft University of Technology, Niels van Oort/Delft University of Technology, Sascha Hoogendoorn-Lanser/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology
Factors Influencing Willingness to Share in Ridehailing Trips (20-05135)
Yi Hou/National Renewable Energy Laboratory (NREL), Venu Garikapati/National Renewable Energy Laboratory (NREL), Dustin Weigl/National Renewable Energy Laboratory (NREL), Alejandro Henao/National Renewable Energy Laboratory (NREL), Matthew Moniot/National Renewable Energy Laboratory (NREL), Joshua Sperling/National Renewable Energy Laboratory (NREL)

1129

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 149
Bus System Operations, Technology, and Applications, Part 1 (Part 2, Session 1678)
Chun-Hung Peter Chen, Santa Clara Valley Transportation Authority, presiding
Sponsored By Standing Committee on Bus Transit Systems

This session covers toics like schedule inconsistencies, frequency setting, and speed and delay performance analysis.

Identifying System-wide Inconsistencies Between Scheduled and Actual Travel Times at Stop Level: A Case Study of Columbus, Ohio (20-04963)
Yuxuan Wang/The Ohio State University, Zhenhua Chen/The Ohio State University
Incorporating Practical Degree of Saturation in Capacity Estimation of On-Street, Mid-Block, Off-Line Bus Stops (20-00312)
Faheema Hisham/Queensland University of Technology, Jonathan Bunker/Queensland University of Technology, Ashish Bhaskar/Queensland University of Technology
Frequency Setting and Timetabling to Synchronize Transit Lines at Common Stops: A Bi-Objective and Integrated Approach. (20-02667)
Yadira Isabel Silva Soto/Universidad Autonoma de Nuevo Leon (UANL), Omar Ibarra Rojas/Universidad Autonoma de Nuevo Leon (UANL)
An Empirical Performance Analysis of Bus Speed and Delay at Intersections for Emerging Spot Improvement Programs (20-03672)
Graham Devitt/IBI Group, Mahmood Mahmoodi Nesheli/IBI Group, Ehab Diab/IBI Group, Amer Shalaby/IBI Group

1130

Mind the Gap: Improving Passenger Rail Accessibility and Safety Through Platform and Equipment Design
Davidson Ward, FMW Solutions LLC, presiding
Sponsored By Standing Committee on Rail Rolling Stock and Motive Power, Standing Committee on Intercity Passenger Rail

The design of rail station infrastructure and rolling stock has a substantial impact on overall network efficiency , safety, and accessibility. These constraints are compounded when considering the co- mingling of passenger and freight traffic, especially in North America. This session provides current state of research and case study, with perspectives from intercity, commuter, and academic speakers addressing issues of accessibility, equipment design, and infrastructure constraints on legacy systems in North America.

Improving Accessibility on VIA's Fleet of Intercity Passenger Rail Equipment (P20-20938)
Robert Becker/VIA Rail Canada
Impact of Station Platform Design on Accessibility and Risk (P20-20939)
Katharine Hunter-Zaworski/Oregon State University
Impact of Accessibility on Intercity Passenger Rail Decision Making (P20-20940)
Jonathan Dees/Simpson Engineers & Associaates
Accessibility Features Included in NGEC PRIAA Passenger Equipment Specifications (P20-21901)
John Madden/Erdman Anthony and Associates

1131

Deterioration Rate and Ride Quality of All Rail Crosstie Types
Hamed Kashani, HyGround/Loram, presiding
Sponsored By Standing Committee on Railroad Track Structure System Design

The Effects of Track Components and Track Geometry on Rail Wear in Heavy Haul Curved Track (P20-21729)
Ananyo Banerjee/Transportation Technology Center, Inc., David D. Davis/Transportation Technology Center, Inc.
Deterioration of Concrete Crossties Considering the Role of Moisture and Track Support Conditions (P20-21730)
Josué César Bastos/University of Illinois, Urbana Champaign
Capital Planning Using Predictive Modeling of Wood Crosstie Degradation Rates (P20-21731)
Samuel Minton/BNSF Railway, Antonio Mauricio/Georgetown Rail Equipment Co.
Correlating Track Structure Condition and Track Geometry at Weak Track Locations (P20-21732)
Radim Bruzek/ENSCO, Inc., Theodore Sussmann/OST-R/Volpe Center, Hugh B. Thompson, II/Federal Railroad Administration (FRA)

1132

Current Research in Intermodal Freight Transportation
Jolene Hayes, Fehr & Peers, presiding
Sponsored By Standing Committee on Intermodal Freight Transport

A Multi-Period Optimization Model for Siting Capacitated Intermodal Facilities (20-05120)
Vishal Badyal/Clemson University, William Ferrell/Clemson University, Nathan Huynh/Clemson University, Bhavya Padmanabhan/Clemson University
Benefits of Technology Adoption for Enhanced Integration of Port-Hinterland Operations (20-02219)
Agustina Calatayud/Texas A&M University Transportation Institute, Mario Monsreal/Texas A&M University Transportation Institute, John Mangan/Texas A&M University Transportation Institute, Juan Villa/Texas A&M University Transportation Institute
A Dynamic and Stochastic Shipment Matching Problem in Multimodal Transportation (20-03265)
Wenjing Guo/Delft University of Technology, Bilge Atasoy/Delft University of Technology, Wouter Beelaerts van Blokland /Delft University of Technology, Rudy Negenborn/Delft University of Technology

(continued)

Research on the Routing Optimization of Multimodal Transportation Considering the Use of Containers (20-017 14)

Dandan Chen/Southeast University, Yong Zhang/Southeast University, Liangpeng Gao/Southeast University, Russell Thompson/Southeast University

1133

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 143B

New Tools for Transportation: Current and Emerging Uses of Drones for Infrastructure Monitoring and Equipment Maintenance

Daniel Friedenzohn, Embry Riddle Aeronautical University, presiding

Sponsored By Aviation Group, Standing Committee on Maintenance and Operations Management, Standing Committee on Structures Maintenance, Rail Group, Standing Committee on Railway Maintenance, Standing Committee on Transportation of Hazardous Materials, Subcommittee on Unmanned Aircraft Systems (UAS)

This cross-cutting session brings together speakers from several modes – air, rail, public transit, highways, bridges - to present ways that UAVs or drones are being used in their sectors and to describe how these uses may multiply and evolve in future years. Comparing these uses and opportunities across modes may be cross-fertilizing as well as cross-cutting. Assessing the industry-wide potential for UAV services may also provide examples and proofs-of-concept of UAV uses that can be taken up or adapted by other industries or infrastructures. Such outcomes would be a concrete example of innovation in transportation "steering the technology revolution" for the rest of the economy.

UAVs in Use by State DOTs (P20-20140)
Basil Yap/North Carolina Department of Transportation, Darshan Divakaran/North Carolina Department of Transportation
UAVs in Applications for Hazardous Materials (P20-20142)
Brandon-Dean Morris/Transportation Technology Center, Inc.
UAVs in Highway Maintenance Applications (P20-20143)
Bill Toothill/DBI Services, Inc.
What's Around the Corner?: Future Opportunities for UAVs (P20-20139)
Chris Fernando/Booz Allen Hamilton, Inc., Ravi Singh/Booz Allen Hamilton, Inc.
Current and Emerging Applications for UAVs for Maintaining Railroad Infrastructure: The FRA Perspective and Role (P20-21427)
Cameron Stuart/Federal Railroad Administration (FRA)

1134

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 143A

Emerging Hypersonic Markets

Ken Davidian, Federal Aviation Administration (FAA), presiding

Sponsored By Standing Committee on Intergovernmental Relations in Aviation, Aviation Group, Subcommittee on Commercial Space Transportation, Standing Committee on Aviation Economics and Forecasting

Suborbital Point-to-Point Market Characteristics (P20-20590)
Oscar Garcia/FastForward
Topics of Spaceport Policy and Law (P20-20591)
Diane Howard/U.S. Department of Commerce
Historic Research into Hypersonic Flight (P20-20592)
Jess Sponable/Icefox Technologies
Potential Point-to-Point Market Activities (P20-20593)
Stephanie Bednarek/SpaceX
New Firms in Potential Supersonic Markets (P20-20594)
Eric Stallmer/Commercial Spaceflight Federation
NASA-FAA Sonic Boom Research Activities (P20-20595)
Lee Olson/National Aeronautics and Space Administration

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, 144C
Current Research in Marine Environmental Issues
James Corbett, University of Delaware, presiding
Sponsored By Standing Committee on Marine Environment

Bayesian Projections on the Spectrum of Marine Bunker Fuel What Is the Impact of Fossil Fuels in the Maritime Transportation? (20-02066)
Jiahui Liu/Nanyang Technological University, Okan Duru/Nanyang Technological University
The Cost-Benefit Analysis of Sulphur Abatement Options: Fuel Switching Versus Scrubber Installation (20-03331)
Lixian Fan/Shanghai University, Bingmei Gu/Shanghai University, Meifeng Luo/Shanghai University
Marine Environmental Emission Reduction Policy in the Liner Shipping: The Economic Impact from Trade Lane Perspective (20-00425)
Elyakim BenHakoun/Technion Israel Institute of Technology, Eddy Van De Voorde/Technion Israel Institute of Technology, Yoram Shiftan/Technion Israel Institute of Technology
Concrete pH Profiles in Marine and Freshwater Environments (20-00042)
Liv Haselbach/Lamar University, Qin Qian/Lamar University, Hayden Rice/Lamar University, Andre Trottier/Lamar University, Harley Myler/Lamar University

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Congestion Pricing and Managed Lane Showcase, Part 1 (Part 2, Session 1143)
Donald Samdahl, Fehr & Peers, presiding
Sponsored By Standing Committee on Congestion Pricing, Standing Committee on Managed Lanes

Smartphone-Based, Real-Time Dynamic Pricing Technology for Highways (P20-20434) - A126
Francisco Torrealba/Blissway
Characterizing Reliability for Express Tolled Lanes Facilities: A Case Study of the Virginia I-66 Inside the Beltway Lanes (P20-20435) - A127
Simona Babiceanu/Virginia Department of Transportation, T. Donna Chen/University of Virginia
Using Part-Time Shoulder Lanes as Managed Lanes (P20-20436) - A128
Raj Paradkar/Kimley-Horn and Associates, Inc., Susan Keen/Virginia Department of Transportation, Kavita Boddu/Kimley-Horn and Associates, Inc.
Priced Managed Lanes in the United States: Past, Present, and Future (P20-20437) - A129
Ronald Davis/CDM Smith, Ganapathi Bharadwaj Badireddi/CDM Smith
2019 FHWA National Inventory of Specialty Lanes and Roads (P20-20438) - A120
Nicholas Wood/Texas A&M Transportation Institute, vivek gupta/Texas A&M University, James Cardenas/Texas A&M Transportation Institute, Deepak Raghunathan/ICF, Neil Spiller/Federal Highway Administration (FHWA)
Equity Analysis of Payments Made on the I-405 Express Toll Lanes in Washington State (P20-20439) - A122
Mark Hallenbeck/University of Washington, Kiana Roshan Zamir/University of Maryland, College Park
Usage Patterns of the I-405 Express Toll Lanes in Washington State and Price Sensitivity (P20-20440) - A123
Mark Hallenbeck/University of Washington, Kiana Roshan Zamir/University of Maryland, College Park
Revenue Loss of Managed Lanes Due to Operational Speed Threshold: A Case Study of 95-Express in South Florida (P20-20441) - A130
Md Sakoat Hossan/CDM Smith, Phani Jammalamadaka/CDM Smith
Case Studies on Approaches to Economic Evaluation of Price-Managed Lanes (P20-20444) - A131
David Luskin/Federal Highway Administration (FHWA), Sean Peirce/OST-R/Volpe Center
Case Study of the Dallas I-30 Movable Barrier System (P20-20445) - A121
Nicholas Wood/Texas A&M Transportation Institute, Laura Huizinga-Barton/Lindsay Transportation Solutions
Time-Dependent Pricing for High-Speed Railway in China Based on Revenue Management (20-01037) - A132
Yijia Zeng/Central South University, Jin Qin/Central South University
Congestion Pricing Scheme Considering Travel Perception Difference: A Cumulative Prospect Theory Approach (20-01063) - A133
Yifan Chen/Monash University, Nan Zheng/Monash University, Hai Vu/Monash University

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Evaluating the Traffic and Emissions Impacts of New York City Cordon Pricing (20-01523) - A134

Amirhossein Baghestani/City College of New York, Mohammad Tayarani/City College of New York, Mahdieh Allahviranloo/City College of New York, H. Oliver Gao/City College of New York

Ride-Sourcing, Congestion, and Regulation (20-01761) - A135

Daniel Vignon/University of Michigan, Ann Arbor, Yafeng Yin/University of Michigan, Ann Arbor

Congestion Pricing and Car Culture: Under What Situations Does Pricing Contribute to Mode Shift Away from Cars? (20-01826) - A136

Rosalie Ray/Columbia University

Travelers' Attitude Toward Road Pricing: A Comparison of Quali-Quantitative Segmentation Techniques (20-02 174) - A137

Valentina Rappazzo/Politecnico di Torino, Cristina Pronello/Politecnico di Torino

Improving Urban Multimodal Transport Systems Through Congestion Pricing and Bus Fleet Sizing: Bi-Modal Network Fundamental Diagram Modeling Approach (20-02995) - A138

Irene Martinez/University of California, Irvine, Michael Hyland/University of California, Irvine, Wenlong Jin/University of California, Irvine

Differentiable Road Pricing for Electric Vehicles and Gasaline Vehicles to Manage the Congestion and Emissions (20-04161) - A125

Haoning Xi/University of New South Wales, Vinayak Dixit/University of New South Wales, Liu He/University of New South Wales

A Simulation-Based Paradox: Longer Blockage, Less Delay? (20-04697) - A139

Hao Liu/University of Texas, Austin, Carolina Baumanis/University of Texas, Austin, Randy Machemehl/University of Texas, Austin, Yun Li/University of Texas, Austin

Road Pricing Scheme for EV and GV Users with Environmental Awareness (20-04413) - A124

Haoning Xi/University of New South Wales, Vinayak Dixit/University of New South Wales, Liu He/University of New South Wales

1137

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Improving Accessibility for Pedestrians, Transit, and Emerging Transportation Modes

Joseph Goldman, Kearns & West, presiding

Sponsored By Standing Committee on Accessible Transportation and Mobility

This poster session will showcase research in transportation accessibility in a variety of topics and modes of transportation, including pedestrian infrastructure, new technologies, on-demand transportation, ridehail/rideshare and public transit.

Evaluating the Effectiveness of Street-Crossing Tactile Paving: An Outdoor Experimental Study in China (20-05 038) - A143

Yongfeng Ma/Southeast University, Wenqian Zhang/Southeast University, Shuqin Hu/Southeast University, Haodong Liu/Southeast University, Jiguang Zhao/Southeast University, Shuyan Chen/Southeast University

Addressing Family Chauffeur Associated Burdens (20-04115) - A144

Daniel Piatkowski/University of Nebraska

System Integration for Access: Using Policy and Technology to Advance the Public Good of Accessible Transportation (20-04084) - A145

Steven Winters/Transport Canada

Oldest Old's Travel Mode Choice and New Mobility Technology Acceptance: Comparison Analysis of American and Chinese Samples (20-03577) - A142

Jinping Guan/Zhejiang University of Finance and Economics, Lisa D'Ambrosio/Zhejiang University of Finance and Economics, Jinyan Chen/Zhejiang University of Finance and Economics, Julie Miller/Zhejiang University of Finance and Economics, Chaiwoo Lee/Zhejiang University of Finance and Economics, Kai Zhang/Zhejiang University of Finance and Economics, Joseph Coughlin/Zhejiang University of Finance and Economics

Using Community-Based Participatory Research Strategies in Age-Friendly Communities to Solve Mobility Challenges (20-03342) - A146

Holly MSW/The Ohio State University, Noelle Fields/The Ohio State University, Katie White/The Ohio State University, Kristen Ravi/The Ohio State University, Sarah Robinson/The Ohio State University, Ian Murphy/The Ohio State University, Claire Jennings/The Ohio State University

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How the Active Oldest Old Manage Their Mobility Needs: Transportation Insights from a Panel of Adults Ages 85+ (20-02978) - A141

John Rudnik/Massachusetts Institute of Technology (MIT), Chaiwoo Lee/Massachusetts Institute of Technology (MIT), Taylor Patskanick/Massachusetts Institute of Technology (MIT), Julie Miller/Massachusetts Institute of Technology (MIT), Joseph Coughlin/Massachusetts Institute of Technology (MIT)

Equity of Transit Accessibility Across Chicago (20-02793) - A140

Alireza Ermagun/Mississippi State University, Nebiyou Tilahun/Mississippi State University

Demand for On-Demand: Use of Conventional Taxis and App-Based Ridehailing Services by Adults with Disabilities (20-02342) - A147

Abigail Cochran/University of California, Berkeley, Daniel Chatman/University of California, Berkeley

A Review of Shared-Use Mobility Policies and Programs at the State and Local Levels Related to Individuals with Disabilities (20-01114) - A148

Judy Shanley/Easterseals, Albert Benedict/Easterseals, Jerom Theunissen/Easterseals

Older Canadians' Preferences, Challenges, and Concerns to Use Current and Emerging Transportation Alternatives (20-00892) - A149

Hany Hassan/Louisiana State University, Kassandra Byrne/Louisiana State University, Mark Ferguson/Louisiana State University, Brenda Vrkljan/Louisiana State University, K. Bruce Newbold/Louisiana State University, Saiedeh Razavi/Louisiana State University

Reducing Travel Anxiety by Making Infrastructure and Services More Accessible (20-00798) - A150

Roger Mackett/University College London

Will Connected Autonomous Vehicles Be Able to Communicate with Visually Impaired Pedestrians?: Findings and Policy Lessons from a Stated-Adaptive Survey (20-00446) - A151

Sina Azizisoldouz/University of Toronto, Md Sami Hasnine/University of Toronto, Mahadeo Sukhai/University of Toronto, Khandker Nurul Habib/University of Toronto

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1138

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Dwight David Eisenhower Transportation Fellowship Program Poster Session, Part 1 (Part 2, Session 1274; Part 3, Session 1551)

Sponsored By Section - Research and Education

1139

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Information Systems and Technology

Guohui Zhang, University of Hawai'i at Manoa, presiding

Sponsored By Standing Committee on Information Systems and Technology

A Variable Dimension-Based Method for Roadside LiDAR Background Filtering (20-00374) - A152

Bin Lv/University of Nevada, Reno, Jianqing Wu/University of Nevada, Reno, Hao Xu/University of Nevada, Reno, Rui Yue/University of Nevada, Reno

Detecting Ships from Coastal Surveillance Videos with a Canny-Gaussian Morphology Framework (20-00685) - A153

Xinqiang Chen/Shanghai Maritime University, Yongsheng Yang/Shanghai Maritime University, Zewei Yu/Shanghai Maritime University, Huafeng Wu/Shanghai Maritime University, Ruimin Ke/Shanghai Maritime University

The Existence of Hypercongestion in Highways: A Truth or a Fallacy? (20-01289) - A154

Anupriya -/Imperial College London, Daniel Graham/Imperial College London, Daniel Horcher/Imperial College London

An Online Learning Framework for Axle Temperature Prediction of High-Speed Trains (20-01656) - A155

Xiaoming Yang/Beijing Jiaotong University, Honghui Dong/Beijing Jiaotong University, Limin Jia/Beijing Jiaotong University, Yong Qin/Beijing Jiaotong University

Kinematic and Dynamic Vehicle Model Assisted Global Positioning Method for Autonomous Vehicle with Low-Cost GPS Camera In-Vehicle Sensors (20-01665) - A156

Haigen MIN/Chang'an University, Xia Wu/Chang'an University, Xiangmo Zhao/Chang'an University, Zhigang Xu/Chang'an University, Guoqiang Mao/Chang'an University, Lei Feng/Chang'an University

A Method for Detection and Measurement of Point Missing Regions Within Road Range in Mobile LiDAR Data (20-01894) - A157

Yang Ma/Southeast University, Yubing Zheng/Southeast University, Jianchuan Cheng/Southeast University

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Mathematical Formulations for Understanding Interference and Transmission Range of V2V Communication in an Urban Road Intersection (20-02404) - A158

Ala Alobeidyeen/University of Florida, Lili Du/University of Florida

Evaluation of Headway Threshold-Based Coordinated Platooning Over a Cascade of Highway Junctions (20-02746) - A159

Xi Xiong/New York University, Teze Wang/New York University, Li Jin/New York University

The Design of Personalized Multimodal Traveler Information System for Advocating Greener Modes (20-03264) - A160

HeLing Cui/University of Shanghai for Science and Technology, Hong-cheng Gan/University of Shanghai for Science and Technology

Video-Based Intelligent Traffic Analysis System: A Comprehensive and Effective Solution to Extract Trajectories from Aerial Videos (20-03469) - A161

Xiaopeng (Shaw) Li/University of South Florida, Dongfang Zhao/University of South Florida

Automated Safety Diagnosis Based on Unmanned Aerial Vehicles Videos and Deep-Learning Algorithm (20-03570) - A162

Yina Wu/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Ou Zheng/University of Central Florida, Qing Cai/University of Central Florida, Shile Zhang/University of Central Florida

Optimal Time Interval for Investigating Prior Information in Network Sensor Location Problem (20-03709) - A167
Congcong Xie/Tongji University, Minhua Shao/Tongji University

Measuring Streetscape Features with High-Density Aerial LiDAR (20-03925) - A168

Yaneev Golombek/University of Colorado, Denver, Wesley Marshall/University of Colorado, Denver

Dynamically Collected Local Density Using Low-Cost LiDAR and Its Application to Traffic Models (20-04711) - A169

Azhagan Avr/North Carolina State University, Shams Tanvir/North Carolina State University, Nagui Rouphail/North Carolina State University, Ishtiak Ahmed/North Carolina State University

Development of a Positioning Technique for Traffic Data Collection Using Wireless Signal Scanners (20-05080) - A170

Shahriar Mohammadi/Carleton University, Karim Ismail/Carleton University, Amir Ghods/Carleton University

Visual Simultaneous Localization and Mapping with Applications to Monitoring of Underground Transportation Infrastructure (20-05103) - A171

Antonio Marangi/California State University, Los Angeles, Fred Daneshgaran/California State University, Los Angeles, Nicola Bruno/California State University, Los Angeles, Fausto Lizzio/California State University, Los Angeles, Marina Mondin/California State University, Los Angeles, Khashayar Olia/California State University, Los Angeles

CCTV Traffic Video ANALYTICS with Fast Recalibration Assisted by 3D Infrastructure Data (20-05152) - A172

Tianya Zhang/Rutgers, The State University of New Jersey, Mengyang Guo/Rutgers, The State University of New Jersey, Jing Jin/Rutgers, The State University of New Jersey, Jie Gong/Rutgers, The State University of New Jersey

What Can Publicly Available API Data Tell Us About Supply and Demand for New Mobility Services? (20-05519) - A177

Amir Hassanpour/University of British Columbia, Alexander Bigazzi/University of British Columbia, Don MacKenzie/University of British Columbia

An RSE-Assisted Connection Restoration Method for Urban Arterial Roads in a Connected Vehicle Environment (20-05552) - A178

Kaizhe Hou/University of Alberta, Jiangchen Li/University of Alberta, Mudasser Seraj/University of Alberta, Tony Qiu/University of Alberta, Jianming Hu/University of Alberta

Short-Term Passenger Flow Prediction in Urban Hot Spots Based on Mobile Phone Data (20-05735) - A179

Jinbiao Huo/Southeast University, Qi Zhang/Southeast University, Zhiyuan Liu/Southeast University, Xiao Fu/Southeast University

Automatic Conflation of Different Transportation Layers (20-05638) - A180

Neetu Choubey/University of Missouri Columbia Ellis Library, Yaw Adu-Gyamfi/University of Missouri Columbia Ellis Library

Survey of Bicyclists and Pedestrians Toward Autonomous Vehicles (20-05661) - B363

Subasish Das/Texas A&M Transportation Institute

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Research Topics in Construction Management
Roy Sturgill, Iowa State University, presiding
Sponsored By Standing Committee on Construction Management

The poster session hosted by the the Standing Committee on Construction Management (AFH-10) presents papers concerned with management of construction for all types of transportation facilities. This includes the integration of construction management in planning, design, and construction for the performance of projects for the purpose of meeting or exceeding requirements related to quality, scope, cost, schedule, context, variable financing, and worker safety

Development of a Fully Automated Unit Price Visualization and Estimating Framework and Tool Using ArcObjects .NET SDK (20-00151) - B426
K. Joseph Shrestha/East Tennessee State University
Research on Gradation Control System for Asphalt Pavement Mixture in Construction Process (20-00360) - B427
Fan Ding/Southeast University, Ying Gao/Southeast University, Yanshun Jia/Southeast University
Disaggregate Highway Construction Cost Indices for Transportation Agencies (20-02031) - B428
Emily Wong/University of British Columbia, Omar Swei/University of British Columbia
Predicting the Market Competition for Highway Construction Projects (20-02630) - B421
Yu Qiao/Purdue University, Jon D. Fricker/Purdue University, Samuel Labi/Purdue University
The Similarity Between Highway Project Types: A Proposed Measure and Its Practical Usefulness (20-02670) - B422
Yu Qiao/Purdue University, Jon D. Fricker/Purdue University, Samuel Labi/Purdue University
Implementation of Visualization and Modeling Technologies for Highway Construction: Current Practices and Future Trends (20-04391) - B423
Christofer Harper/Colorado State University, Dan Tran/Colorado State University, Edward Jaselskis/Colorado State University
Evaluation of Project Development Process at State Transportation Agencies (20-04658) - B420
Weimin Jin/Clemson University, Tanin Haidary/Clemson University, Dennis Bausman/Clemson University, Mashrur Chowdhury/Clemson University
Exploring Instrumentation and Sensor Technologies for Highway Design and Construction Projects (20-04684) - B424
Christofer Harper/Colorado State University, Dan Tran/Colorado State University, Edward Jaselskis/Colorado State University
A Methodology to Identify Cross-Functional Synergies of CIM Knowledge Within a Transportation Agency (20-05424) - B425
Alireza Shams/University of California, Davis, Sean Donohoe/University of California, Davis, Bahram Ravani/University of California, Davis

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Design and Performance Attributes of Drilled Shaft and Driven Pile Foundation
Sharid Amiri, California Department of Transportation (CALTRANS), presiding
Sponsored By Standing Committee on Foundations of Bridges and Other Structures

Evaluation of drilled shaft defects, pile load testing on different driven pile types, drilled shaft foundation design and numerical analysis in design of foundation are presented.

Safety Factor for Drilled Shaft Foundations Subjected to Wind-Induced Torsion (20-00825) - B430
Victor Aguilar-Vidal/Auburn University, Andrzej Nowak/Auburn University, Michael Stallings/Auburn University, Brian Anderson/Auburn University
Load Testing Program on Two Different Pile Types to Study Pile Setup Behavior in Alabama (20-04066) - B431
Md. Nafiul Haque/Ardaman and Associates, Inc., Eric Steward/Ardaman and Associates, Inc.

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Stress Distribution Angles for Replaced Foundations Under Flexible Loading: Numerical Analysis (20-05119) - B432

Jie Han/University of Kansas, Hao Liu/University of Kansas

Non-Destructive Evaluation of Drilled Shaft Defects Using Full Waveform Tomography of Crosshole Data (20-05681) - B433

Joseph Coe/Temple University, Alireza Kordjazi/Temple University, Michael Afanasiev/Temple University

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Freeway Operations 2020
Justin Geistefeldt, Ruhr University, Bochum, presiding
Sponsored By Standing Committee on Freeway Operations

Sequential Prediction for Large-Scale Traffic Incident Duration Application and Comparison of Survival Models (20-00108) - A216

Xiaobing Li/University of Alabama, Jun Liu/University of Alabama, Asad Khattak/University of Alabama, Shashi Nambisan/University of Alabama

Benefit-Cost Analyses of Rectangular Flashing Beacon Wrong-Way Driving Countermeasures on Toll Road Exit Ramps in Florida (20-00748) - A215

Adrian Sandt/University of Central Florida, Haitham Al-Deek/University of Central Florida, Md Imrul Kayes/University of Central Florida, Patrick Blue/University of Central Florida, Valentina Gamero/University of Central Florida

Pilot Study on Dynamic Ramp Metering in Houston: Preliminary Results from Phase I Study (20-05566) - A217

Hongmin Zhou/Texas A&M Transportation Institute, Magdy Kozman/Texas A&M Transportation Institute

Outlier Analysis to Improve the Performance of an Incident Duration Estimation and Incident Management System (20-03600) - A218

Minsu Won/The Korea Transport Institute (KOTI)

Can We Estimate the Safety Effects of Congestion Warning Systems from Just Carriageway Aggregate Data? (20-01476) - A219

Hans Van Lint/Delft University of Technology, Tin Nguyen/Delft University of Technology, Panchamy Krishnakumari/Delft University of Technology, Simeon Calvert/Delft University of Technology, Henk Schuurman/Delft University of Technology, Marco Schreuder/Delft University of Technology

Rain Influence on Breakdown Probability (20-02261) - A220

Douglas Zechin/Universidade Federal do Rio Grande do Sul, Felipe Caleffi/Universidade Federal do Rio Grande do Sul, Helena Cybis/Universidade Federal do Rio Grande do Sul

Operational and Safety Impact Analysis of Implementing Emergency Shoulder Use for Hurricane Evacuation (20-04878) - A221

Rakesh Sharma/HNTB Corporation, Md Omar Faruk/HNTB Corporation, Alan El-Urfali/HNTB Corporation

Augmenting Traffic Incident Detection Performance with Redefined Event Labels (20-05960) - A222

Zhenyu Wang/Old Dominion University, Hong Yang/Old Dominion University, Mecit Cetin/Old Dominion University

Short-Term Traffic Prediction Under Non-Recurrent Incident Conditions Integrating Data-Driven Models and Traffic Simulation (20-01059) - A223

Sajjad Shafiei/Commonwealth Scientific and Industrial Research Organisation, Adriana-Simona Mihăiţă/Commonwealth Scientific and Industrial Research Organisation, Hoang Nguyen/Commonwealth Scientific and Industrial Research Organisation, Christopher Bentley/Commonwealth Scientific and Industrial Research Organisation, Chen Cai/Commonwealth Scientific and Industrial Research Organisation

Hard Shoulder Use in Greek Freeways: Effects and Practical Considerations (20-04657) - A224

Anna-Mariam Psarrou-Kalakoni/National Technical University of Athens (NTUA), Ioanna Spyropoulou/National Technical University of Athens (NTUA), Kostas Papandreou/National Technical University of Athens (NTUA), Christos Karadimas/National Technical University of Athens (NTUA)

The Role of Capacity Drop in Freeway Traffic Flow Control (20-02554) - A225

Siyu Zhang/Zhejiang University, Xianghua Yu/Zhejiang University, Mingming Zhao/Zhejiang University, Yibing Wang/Zhejiang University, Pengjun Zheng/Zhejiang University, Jingqiu Guo/Zhejiang University, Lihui Zhang/Zhejiang University, Simon Hu/Zhejiang University

A Fuzzy Self-Adaptive Proportion-Integral-Derivative Control Strategy for Ramp Metering at Distance Downstream Bottlenecks (20-02520) - A226

Ling Zhao/Southeast University, Zemian Ke/Southeast University, Meng Li/Southeast University, Zhibin Li/Southeast University

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Maximizing Efficiency of Adaptive Ramp Metering Control for Freeway Congestion Mitigation Using CAV Mobility Data (20-04339) - A227

Heng Wei/University of Cincinnati, Hao Liu/University of Cincinnati, Karteek Kumar Allam/University of Cincinnati, Ting Zuo/University of Cincinnati

Choice of Speed Under Compromised Dynamic Message Signs (20-02810) - A228

Kaveh Bakhsh Kelarestaghi/ICF Incorporated LLC, Alireza Ermagun/ICF Incorporated LLC, Kevin Heaslip/ICF Incorporated LLC, John Rose/ICF Incorporated LLC

Before-After Analysis of Freeway Corridor Efficiency Following Adaptive Ramp Metering Deployment: An Empirical Bayes Approach (20-05635) - A229

Nivedha Murugesan/California Polytechnic State University, San Luis Obispo, Cristina Tortora/California Polytechnic State University, San Luis Obispo, Anurag Pande/California Polytechnic State University, San Luis Obispo, Jacky Loh/California Polytechnic State University, San Luis Obispo

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Managed Lane and Congestion Pricing Showcase, Part 2 (Part 1, Session 1136)
Srikanth Panguluri, Jacobs, presiding
Sponsored By Standing Committee on Managed Lanes, Standing Committee on Congestion Pricing

Integrating Route Choice and Dynamic Pricing in Microsimulation: A Case Study of the MoPac Express Lanes (P20-20446) - A230

Bharathwaj Sankaran/WSP, Mahmoud Raoufi/WSP USA Corp, Carlos Campo/WSP

Application of an Exploratory Modeling Approach to a Managed Lanes Network When Considering Deep Uncertainty from Connected Autonomous Vehicles (P20-20447) - A231

Jack Klodzinski/AECOM, Lihe Wang/AECOM, Barbara Davis/Florida Department of Transportation, Genoveva Fruet/AECOM, Cesar Segovia

Potential Changes in Commute Routes with Construction of Managed-Lane Designated Access Points (P20-20449) - A232

Chia-Huai Chang/AECOM, Haobing Liu/Georgia Institute of Technology (Georgia Tech), Hanyan Li/Indeed, Yuanbo Wang/The Home Depot, Yingping Zhao/Georgia Institute of Technology (Georgia Tech), Randall Guensler/Georgia Institute of Technology (Georgia Tech)

Exploring Gaps in Climate Risks for Transportation Economic Modeling (P20-20451) - A233
Bryan Kiel/WSP

A Comprehensive Welfare Impact Analysis for Road Expansion Projects: A Case Study (20-01377) - A234

Wooseok Do/McGill University, Omid Rouhani/McGill University, Raymond Geddes/McGill University, Arash Beheshtian/McGill University

Assessment of Operational Benefits of Connected and Automated Vehicles in Congested Facilities: A Case Study of the San Francisco Bay Bridge (20-01421) - A235

Waleed Aleadelat/University of Wyoming, Sherif Gaweesh/University of Wyoming, Milan Zlatkovic/University of Wyoming, Raoul Maltez/University of Wyoming

Vulnerable Option-Based Reservation Pricing Scheme for Highway Reservation System to Manage Truck-Only Lanes (20-01960) - A236

Choungryeol Lee/Georgia Institute of Technology (Georgia Tech), Srinivas Peeta/Georgia Institute of Technology (Georgia Tech), Chih-Peng Chu/Georgia Institute of Technology (Georgia Tech), Yong Hoon Kim/Georgia Institute of Technology (Georgia Tech)

Leveraging Existing High-Occupancy Vehicle Lanes for Mixed-Autonomy Traffic Management with Emerging Infrastructure and Operational Strategies (20-02094) - A237

Yi Guo/University of Cincinnati, Jiaqi Ma/University of Cincinnati, Zhitong Huang/University of Cincinnati

Developing a Dynamic Utilization Scheme for Exclusive Bus Lanes on Urban Elevated Expressways (20-02389) - A240

Fangfang Zheng/Southwest Jiaotong University, Jinbiao Chen/Southwest Jiaotong University, Heng Wang/Southwest Jiaotong University, Xiaobo Liu/Southwest Jiaotong University, Youhua Tang/Southwest Jiaotong University

Comparing Regional Vehicle Emission Impacts of Different Tolling Schemes (20-02758) - A241
Farinoush Sharifi/Texas A&M University, Jeffrey Shelton/Texas A&M University, Yanzhi Xu/Texas A&M University

Application of Data-Driven Safety Analysis to Support Port Authority Investment Decisions (20-03133) - A242
Frank Gross/VHB, Scott Himes/VHB, Benjamin Szeto/VHB, Rizwan Baig/VHB

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Impact of Accurate Detection of Freeway Traffic Conditions on the Dynamic Pricing of I-95 Express Lanes (20-04024) - A243

Suhaib shayeb/University of Pittsburgh, Aleksandar Stevanovic/University of Pittsburgh, Nikola Mitrovic/University of Pittsburgh, Branislav Dimitrijevic,/University of Pittsburgh

Evaluation of Alternative Methods for Dynamic I-95 Express Lane Pricing (20-04346) - A244

Djurdjija Mitrovic/Florida Atlantic University, Aleksandar Stevanovic/Florida Atlantic University, Drazenko Glavic/Florida Atlantic University

Attitudes Toward HOT Lanes Using Dimensionality Reduction and Clustering (20-05389) - A245

Reinaldo Sanchez-Arias/Florida Polytechnic University, Sravani Vadlamani/Florida Polytechnic University, Yingyan Lou/Florida Polytechnic University

Quantifying the Mobility Benefits of Express Lanes Using Real-Time Traffic Data (20-05796) - A246

Cecilia Kadeha/Florida International University, Priyanka Alluri/Florida International University, Thobias Sando/Florida International University

Using Support Vector Machine Algorithms for Crash Injury Severity Analysis on Express Lane Facilities (20-05997) - A247

Angela Kitali/Florida International University, Sajad Mokhtarimousavi/Florida International University, Cecilia Kadeha/Florida International University, Priyanka Alluri/Florida International University

Colorado Senate Bill 18-01 Managed Lanes Study (P20-20703) - A250

Scott Pitera/WSP, Nicholas Farber/Colorado High Performance Transportation Enterprise

Evolution of HOV and HOT Lanes in California (P20-20704) - A251

Lawrence (Jesse) Glazer/Federal Highway Administration (FHWA)

TEXpress Lanes Benefits and Economic Impacts to Regional Community (P20-20982) - A252

Ning Zhang/NTE Mobility Partners

Development of a Framework Considering Deep Uncertainty of CAV Impacts on Express Lanes Using a New Dynamic Traffic Assignment Model (20-05076) - A253

Jack Klodzinski/AECOM, Lihe Wang/AECOM, Barbara Davis/AECOM, Genoveva Fruet/AECOM, Cesar Segovia/AECOM

UDOT I-15 Express Lanes Occupancy Validation Application Trial (P20-21156) - A254

Jamie Mackey/Utah Department of Transportation, Mike Papineau/RideFlag Technologies, Inc., Mark Feltham/RideFlag Technologies, Inc.

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Bicycle Research Poster Session
Rachel Carpenter, California Department of Transportation (CALTRANS), presiding
Sponsored By Standing Committee on Bicycle Transportation

An Empirical Reappraisal of the Four Types of Cyclists (20-00173) - A181
Laura Cabral/Toole Design, Amy Kim/Toole Design

Comparing Methods and Data Sources for Classifying Bicycle Level of Traffic Stress: How Well Do Their Outcomes Agree? (20-00187) - A182
Chester Harvey/University of California, Berkeley, Daniel Rodriguez/University of California, Berkeley, Kevin Fang/University of California, Berkeley

Who Cycles to Work and Where?: A Comparative Microdata Analysis of Urban Commuters in the United States and Mexico (20-00225) - A184
Erick Guerra/University of Pennsylvania, He Zhang/University of Pennsylvania, Luke Hassall/University of Pennsylvania, Jialin Wang/University of Pennsylvania, Anna Cheyette/University of Pennsylvania

Understanding Electric Bike Riders' Traffic Rule Violating Intention and Accident Proneness in China (20-00400) - A185
Tianpei Tang/University of Hawaii, Yuntao Guo/University of Hawaii, Xizhou Zhou/University of Hawaii, Senlai Zhu/University of Hawaii

Analysis of Duration of Overtaking to Cyclists on Two-Lane Rural Roads (20-00541) - A186
Sara Moll/Universitat Politècnica de València, GRISELDA LÓPEZ/Universitat Politècnica de València, Alfredo Garcia/Universitat Politècnica de València

Are They Really Interested But Concerned?: A Mixed Methods Exploration of the Geller Bicyclist Typology (20-00581) - A187
Kate Hosford/Simon Fraser University, Karen Laberee/Simon Fraser University, Daniel Fuller/Simon Fraser University, Yan Kestens/Simon Fraser University, Meghan Winters/Simon Fraser University

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Direct Demand Modeling Approach to Forecast Cycling Activity on a Proposed Bike Facility (20-00721) - A188

Steven Gehrke/Northern Arizona University, Timothy Reardon/Northern Arizona University

Cyclists' Preferences Regarding Pavement Markings on Bicycle Paths Located Outside Urban Areas in the Netherlands (20-00855) - A189

Peter Van Der Waerden/Eindhoven University of Technology, Jaap van der Waerden/Eindhoven University of Technology, Maurice Veltrop/Eindhoven University of Technology

Infrastructure Efficiency of T-Junctions for Cyclists (20-01086) - A190

Alexandra Gavriilidou/Delft University of Technology, Winnie Daamen/Delft University of Technology, Yufei Yuan/Delft University of Technology, Nicole van Nes/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

Identify Complex Risk Pattern of E-Bike Riders in China Based on Machine Learning Techniques (20-01697) - A 191

Siyuan Kou/Southeast University, Yanchao Song/Southeast University, Chen Wang/Southeast University

What Makes the Gears Go Round?: An Analysis of Factors Influencing Bicycling to Suburban Regional Rail Stations (20-01915) - A192

Matthew Graystone/Ryerson University, Raktim Mitra/Ryerson University, James Schofield/Ryerson University

Evaluating the Effects of a Classroom-Based Bicycle Education Intervention on Bicycle Activity, Self-Efficacy, Personal Safety, Knowledge, and Mode Choice (20-01964) - A183

Daniel Rodriguez/University of California, Berkeley, Elizabeth Nachman/University of California, Berkeley

Perception of Measures for Safer Interactions Between Trucks and Cyclists at Signalized Intersections (20-01976) - A193

Petr Pokorny/Norwegian University of Science and Technology (NTNU), Christoffer Tonheim/Norwegian University of Science and Technology (NTNU), Kelly Pitera/Norwegian University of Science and Technology (NTNU)

Commuting Mode Choices and Bicycle Level of Traffic Stress: Findings from the Franklin County, Ohio (20-02201) - A194

Gulsah Akar/University of California, Davis, Kailai Wang/University of California, Davis, Kevin Lee/University of California, Davis, Meredyth Sanders/University of California, Davis

Safety and Non-Optimal Usage of a Protected Bicycle Intersection: A Before-and-After Case Study in Salt Lake City, Utah (20-02663) - A195

Torrey Lyons/University of North Carolina, Chapel Hill, Dong-ah Choi/University of North Carolina, Chapel Hill, S. Hassan Ameli/University of North Carolina, Chapel Hill, Keunhyun Park/University of North Carolina, Chapel Hill

Application of GIS Analysis to Obtain Anisotropic Bicycle Catchment Areas with Level of Traffic Stress and Energy Consumption (20-02822) - A196

Rachel Tillinghast/University of Maryland, Devin McNally/University of Maryland, Hiroyuki Iseki/University of Maryland

Delineator for Separated Bicycle Lanes at Sidewalk Level (20-02962) - A197

Billie Bentzen/Elon University, Alan Scott/Elon University, Linda Myers/Elon University

Red Light Running Behaviors of Electric Bike Riders at Urban Signalized Intersections: Considering the Group Effect (20-02993) - A198

Lu Bai/Southeast University, N.N. Sze/Southeast University

A Naturalistic Cycling Study in Ann Arbor, Michigan (20-03009) - A199

Fred Feng/University of Michigan, Dearborn, Shan Bao/University of Michigan, Dearborn, Colleen Hillard/University of Michigan, Dearborn, Mark Gilbert/University of Michigan, Dearborn, Jacopo Serafin/University of Michigan, Dearborn

Uptake of Cycling After a New Urban Greenway: A Longitudinal Study from Vancouver, Canada (20-03026) - A201

Lawrence Frank/The University of British Columbia, Andy Hong/The University of British Columbia, Victor Ngo/The University of British Columbia

Improved Engineered Scoring System for Bicycle Lane Mapping Development (20-03315) - A202

Nitish Bastola/University of Texas, Tyler, Mena Souliman/University of Texas, Tyler, Pedro Zavagna/University of Texas, Tyler, Gabriella Morales-Alvarez/University of Texas, Tyler

Young Cyclists Ready for Road Traffic?: Physical Activity Among Children and Their Cycling Skills (20-03516) - A203

Juliane Stark/University of Natural Resources and Life Sciences, Michael Meschik/University of Natural Resources and Life Sciences, Natalie Weber/University of Natural Resources and Life Sciences, Bernhard Kalteis/University of Natural Resources and Life Sciences

Alternate Bicycle Forecasting Methodology for the San Francisco-Oakland Bay Bridge West Span Pathway Project with the Presence of Electric Assist Bikes (20-04037) - A204

Joseph Kaylor/ARUP, Richard Coffin/ARUP, Andrew Fremier/ARUP

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Re-examining the Relationship Between Bicycle Volume and the Built Environment: A Focus on Non-Linearity (20-04338) - A205
Naifu Fan/Tongji University, Xiaohong Chen/Tongji University

Development of a Pedestrian and Bicyclist Safety Data Clearinghouse (20-04390) - A206
Wesley Kumfer/University of North Carolina, Krista Nordback/University of North Carolina, Julia Griswold/University of North Carolina, Katie Heuser/University of North Carolina, Seth LaJeunesse/University of North Carolina, Libby Thomas /University of North Carolina

Safer for Cycling: Evaluating Operational and Safety Effects of a Protected Intersection Design (20-05247) - A20 7
Abigail Preston/University of North Carolina, Charlotte, Srinivas Pulugurtha/University of North Carolina, Charlotte

One-Way Streets and Bicycle Contraflow: Impact on Connectivity and Accessibility for Low-Stress Bicycling (2 0-05252) - A208
Theja Putta/Northeastern University, Peter Furth/Northeastern University

Do Bicycles Reduce Passenger Car Travel Speeds on Urban Roads Without Bicycle Lanes?: Evidence from Roadways in Portland (20-05261) - A200
Jaclyn Schaefer/Portland State University, Miguel Figliozzi/Portland State University, Avinash Unnikrishnan/Portland State University

Estimated Effectiveness of Bicycle-Automatic Emergency Braking Using the WATS Data Set (20-05271) - A209
Ryan Anderson/Virginia Polytechnic Institute and State University, Samantha Haus/Virginia Polytechnic Institute and State University, Hampton Gabler/Virginia Polytechnic Institute and State University

Empirical Study on Bicycle Traffic Flow Characteristics at Signalized Intersections (20-05925) - A210
Georgios Grigoropoulos/Technical University of Munich, Heather kaths/Technical University of Munich, Marek Junghans /Technical University of Munich, Axel Leonhardt/Technical University of Munich, Michael Baier/Technical University of Munich, Busch Fritz/Technical University of Munich

Passing Events Evaluation in Mixed Two-Wheeled Traffic with the Development of Dockless Bikesharing System (20-06063) - A211
Feifei Xin/Tongji University, Yuxuan Huang/Tongji University, Xiaobo Wang/Tongji University, Jing Liu/Tongji University

Using Virtual Reality to Study Bicycle Level of Service for Urban Street Segments (20-06111) - A212
Mohsen Nazemi/ETH Zürich, IVT - Institute for Transport Planning and Systems, Michael van Eggermond/ETH Zürich, IVT - Institute for Transport Planning and Systems, Alexander Erath/ETH Zürich, IVT - Institute for Transport Planning and Systems

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

TRB's Transit Innovations Deserving Exploratory Analysis Program
Velvet Basemera-Fitzpatrick, Transportation Research Board, presiding
Sponsored By Public Transportation Group

TRB's Transit IDEA Program (P20-21084) - B350
Velvet Basemera-Fitzpatrick/Transportation Research Board

Augmented Reality Transit Dispatcher Interface (P20-21085) - B351
Carl Stanton/Ross & Baruzzini

An Open Platform for Transit Agencies to Improve the Quality of Their Real-Time Data (P20-21086) - B352
Drew Dara-Abrams/Interline Technologies LLC, Ian Rees/Interline Technologies LLC, Sean Barbeau/University of South Florida

Evaluation of Transit Vehicle Brake Inspection Through Ultrasonic Emissions Analysis (P20-21087) - B353
Brian Hearing/BrakeAudit

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Optimizing Transit Capital and Operations Investments
Konstantinos Gkiotsalitis, University of Twente, presiding
Sponsored By Standing Committee on Transit Management and Performance

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Optimal Infrastructure Reinvestment in Urban Rail Systems: A Dynamic Supply Optimization Approach (20-012 61) - B399

Praj Xuto/Imperial College London, Richard Anderson/Imperial College London, Daniel Graham/Imperial College London, Daniel Horcher/Imperial College London

Graph-Based Method for the Minimum Fleet Size of an Autonomous Modular Public Transit System (20-03321) - B396

Tao Liu/TUMCREATE, Avishai Ceder/TUMCREATE, Andreas Rau/TUMCREATE

Research on Optimal Utilization Model and Algorithm of Urban Rail Transit Rolling Stock (20-05813) - B397

Yixiang Yue/University of Delaware, Mingxuan Zhong/University of Delaware, Wenrong Wang/University of Delaware, Mingxin Li/University of Delaware

Multi-Objective Transit Timetable Synchronisation: Controlling the Length of Transfer Waiting Time at All Transfer Stops (20-06146) - B398

Vahid Poorjafari/University of South Australia

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Observing Behavior and Using Predictive Models to Manage Headways
Konstantinos Gkiotsalitis, University of Twente, presiding
Sponsored By Standing Committee on Transit Management and Performance

Passenger Loading Behavior in San Francisco (20-04085) - B394
Alexander Jonlin/San Francisco Municipal Transportation Agency

Understanding What Elements Influence a Bus Driver to Use Headway Regularity Tools: A Case Study of the Santiago Public Transit System (20-04415) - B395

Yerly Martinez/Pontificia Universidad Católica de Chile, Felipe Delgado/Pontificia Universidad Católica de Chile, Juan Muñoz/Pontificia Universidad Católica de Chile, Kari Watkins/Pontificia Universidad Católica de Chile

Real-Time Holding Control for Multiline Networks (20-00521) - B404
Georgios Laskaris/University of Luxembourg, Oded Cats/University of Luxembourg, Erik Jenelius/University of Luxembourg, Marco Rinaldi/University of Luxembourg, Francesco Viti/University of Luxembourg

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Managing for Transit Service Disruptions
Konstantinos Gkiotsalitis, University of Twente, presiding
Sponsored By Standing Committee on Transit Management and Performance

Quantification and Control of Disruption Propagation in Multi-Level Public Transport Networks (20-00189) - B40 3

Menno Yap/Delft University of Technology, Oded Cats/Delft University of Technology, Johanna Törnquist Krasemann/De lft University of Technology, Niels van Oort/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

Public Transport Disruption Management by Collaboration with Demand Responsive Services (20-05047) - B39 3

Matej Cebecauer/KTH Royal Institute of Technology, Erik Jenelius/KTH Royal Institute of Technology, Tatiana Babicheva/KTH Royal Institute of Technology, David Leffler/KTH Royal Institute of Technology, Wilco Burghout/KTH Royal Institute of Technology

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Current Research in Transit Safety and Security
Sponsored By Task Force on Transit Safety and Security

Assessing the Risk of Collisions Between Trams Due to SPADs in Conflict Areas of an LRT Network (20-01848) - B354

Moshe Itzhaki/University of Birmingham, Felix Schmid/University of Birmingham

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A Review of the Impacts of Crime on Transport and Travel Behavior: Understanding Interrelationships and Underlying Mechanisms (20-02318) - B355
Eva Heinen/University of Leeds
The Effectiveness of Installing Platform Screen Doors for Preventing Metro Suicides in China (20-02524) - B358
Shuo Ding/Tongji University, Chongyi Li/Tongji University, Yingying Xing/Tongji University, Jian Lu/Tongji University
Research on the Metro Train Collaborative Disposal Method for Mass Passenger Flow at Stations (20-04392) - B359
Wei Li/Shenzhen Technology University, Qin Luo/Shenzhen Technology University, Jingnan Zhou/Shenzhen Technology University
Modeling Passenger Flow Limitation Under Emergency in an Urban Rail Transit Network (20-04653) - B356
Mengfei Chen/Tongji University, Wei Zhu/Tongji University
Evaluating Vehicle Safety in the Vicinity of Bus Stops Near Intersections Using Traffic Conflict Models (20-05311) - B357
Ning Xu/Southeast University, Xiaojian Hu/Southeast University
Research on Safety Ensuring Technology of Trains in Urban Rail Transit (20-01015) - B390
Yongneng Xu/Nanjing University of Science and Technology, Tianwen Xiao/Nanjing University of Science and Technology, Song Liu/Nanjing University of Science and Technology

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Designing and Planning of Automated Transit Systems in Mixed-Use Environments
Nadereh Moini, New Jersey Sports & Exposition Authority, presiding
Sponsored By Standing Committee on Automated Transit Systems

The session presents papers focusing on the optimization, scheduling, and simulation of Automated bus/rail transit in fully and partial automated environment.

Evaluation of an Automated People Mover in Downtown Indianapolis (20-03006) - B406
Jiaxiao Feng/Purdue University, Runjia Du/Purdue University, Sikai Chen/Purdue University, Zhirui Ye/Purdue University , jiahao Wang/Purdue University, Samuel Labi/Purdue University
Optimal Bus Fleet Problem with Demand Uncertainty: Comparison Between Autonomous and Conventional Vehicles (20-01870) - B407
Qingyun Tian/Nanyang Technological University, Yunhui Lin/Nanyang Technological University, David Wang/Nanyang Technological University
CAB Lanes in Multimodal Networks with Limited CAV Access (20-05900) - B419
Lihui Zhang/Zhejiang University, Guomin Qian/Zhejiang University, Ziqi Song/Zhejiang University, Chunguang He/Zhejiang University, Man Guo/Zhejiang University
Platooning of Autonomous Public Transport Vehicles: A Trade-Off Between System Performance and Passenger Ride Comfort (20-01215) - B405
Te Ron Nguyen/TUMCREATE, Meng Xie/TUMCREATE, Xiaodong Liu/TUMCREATE, Nimal Arunachanlam/TUMCREATE, Andreas Rau/TUMCREATE, Bernhard Lechner/TUMCREATE, Busch Fritz/TUMCREATE, Wong Y.D./TUMCREATE
A Planning Framework for Autonomous Shuttles: A Case Study Approach (20-02362) - B408
Antora Mohsena Haque/University of Tennessee, Knoxville, Candace E. Brakewood/University of Tennessee, Knoxville
Modular Transit: Making Public Transportation Flexible (20-00884) - B409
Zhenhao Zhang/University of Michigan, Ann Arbor, Neda Masoud/University of Michigan, Ann Arbor
Enabling In-Depot Automated Routing and Recharging Scheduling for Automated Electric Bus Transit Systems (20-00594) - B418
Lei Wang/Tongji University, Wanjing Ma/Tongji University, Ling Wang/Tongji University, Hongge Zhu/Tongji University, Xiaodong Zhu/Tongji University

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Managing Stations, Time, and People: How Many People? How Much Time? What If Something Goes Wrong?
Deborah Matherly, WSP, presiding
Sponsored By Standing Committee on Passenger Intermodal Facilities, Standing Committee on Passenger Intermodal Facilities, Art and Design Excellence in Transportation Subcommittee, AP045(1)

Predicting Disruption Exposure and Impact to Assess Station Criticality in a Public Transport Vulnerability Analysis (20-02346) - B402
Menno Yap/Delft University of Technology, Oded Cats/Delft University of Technology
Subway Station Dwell Time Prediction and User-Induced Delay (20-04236) - B401
Matthew Volovski/Manhattan College, Evangelia Ieronymaki/Manhattan College, Cara Cao/Manhattan College, John O'Loughlin/Manhattan College
Using Passenger Flow Simulation to Plan Transfer Tunnel Construction Between Railway and Subway Stations Based on Wifi-Bluetooth MAC Addresses (20-04399) - B400
Arman Tadayon/Iran University of Science and Technology, Morteza Bagheri/Iran University of Science and Technology, Mahdi Samadzad/Iran University of Science and Technology

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Technical Practices and Tools for Improving Rural and Tribal Transit
Jonathan Brooks, LINK Houston, presiding
Sponsored By Standing Committee on Rural Public and Intercity Bus Transportation

Have a technical question about ways to improve rural or tribal transit -- such as better cost allocation among services, modeling success in volunteer driver programs, and advanced measurement of service reliability? Visit these three presenters' posters for face-to-face conversation about new tools and concepts to improve rural, small city, and tribal transit services.

Moving Beyond Case Studies: How a Maturity Model Approach Could Quantify Success Factors of Volunteer Driver Programs (20-00070) - B413
Matthieu Goudreau/University of New Brunswick, Trevor Hanson/University of New Brunswick
Application Tool for Two-Variable Cost Allocation for Small Urban, Rural, and Tribal Transit Agencies (20-03100) - B414
Todd Hansen/Texas A&M Transportation Institute, Michael Walk/Texas A&M Transportation Institute, Shuman Tan/Texas A&M Transportation Institute
Public Transit Service Reliability Assessment Using Two-Fluid Model (20-04806) - B415
Seungho Yang/York University, Peter Park/York University, Afnan Ahmad/York University, Gunho Sohn/York University, Jeremy Krygsman/York University

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Models and Analysis for Paratransit Demand and Operations
Jee Eun Kang, University at Buffalo, The State University of New York, presiding
Sponsored By Standing Committee on Paratransit

This session includes posters on modeling and analysis related to demand and operations of paratransit and microtransit services.

Medium-Term Demand Forecasting Under On-Demand Paratransit Services (20-01291) - B410
Ektoras Chandakas/Transamo, Transdev Group
A Cluster-Based Route Design of Multi-Capacity Vehicle in Large-Scale Demand Responsive Transport Service for the Disabled (20-01880) - B411
Eunhan Ka/Seoul National University, Dongju Ka/Seoul National University, Yeonwoo Jung/Seoul National University, Chungwon Lee/Seoul National University

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Barriers and Opportunities for Paratransit Users to Adopt On-Demand Micro Transit (20-05806) - B412

Md. Mintu Miah/University of Texas, Arlington, Farah Naz/University of Texas, Arlington, Kyung Hyun/University of Texas, Arlington, Stephen Mattingly/University of Texas, Arlington, Courtney Cronley/University of Texas, Arlington, Noelle Fields/University of Texas, Arlington

Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Urban Rail Development and Operations
Jason Mumford, AECOM, presiding
Saeid Saidi, University of Calgary, presiding
Sponsored By Standing Committee on Rail Transit Systems

This poster session includes a series of quantitative analysis techniques and case studies for rail operations and passenger modeling. Themes include predictive models for passenger demand and flow; optimizing system performance from the passenger and the operator perspectives; accessibility, safety, and energy efficiency in rail transit systems; and testing innovative modeling approaches against detailed real-world observations.

Evaluating Crowding in Individual Train Cars Using a Dynamic Transit Assignment Model (20-00300) - B392
Soumela Peftitsi/Kungliga Tekniska Hogskolan, Erik Jenelius/Kungliga Tekniska Hogskolan, Oded Cats/Kungliga Tekniska Hogskolan

Hybrid Optimization Approach for Last Service Coordination in Subway Networks (20-00325) - B391
Liujiang Kang/Beijing Jiaotong University, Huijun Sun/Beijing Jiaotong University, Jianjun Wu/Beijing Jiaotong University, Ziyou Gao/Beijing Jiaotong University

Integrated Timetable Design and Operational Planning for Urban Rail Transit: A Deep Q-Learning Approach (20-00372) - B380
Chengshuo Ying/City University of Hong Kong, Andy Chow/City University of Hong Kong, KS Chin/City University of Hong Kong

Research on the Accessibility of Urban Rail Transit Station Considering Passenger Volume (20-00591) - B383
Jinqu Chen/Southwest Jiaotong University, Jie Liu/Southwest Jiaotong University, Yong Yin/Southwest Jiaotong University, Fusheng Yu/Southwest Jiaotong University

A Comparative Study of Machine Learning Classifiers for Urban Rail Transit Route Choice of Commuters (20-00960) - B384
Chunyu Liu/Southwest Jiaotong University, Xin Chen/Southwest Jiaotong University, Xia Luo/Southwest Jiaotong University

Optimization Design of Passenger Flow Buff Area for the Crossover Interchange Urban Rail Station (20-01134) - B385
Yongneng Xu/Nanjing University of Science and Technology, Zhewei Dong/Nanjing University of Science and Technology, Yu Xin/Nanjing University of Science and Technology, Zhiwei Xu/Nanjing University of Science and Technology

Dynamic and Objective Evaluation of Passenger Satisfaction at Metro Station: A Case Study in Shanghai, China (20-01690) - B386
Linbo Li/Tongji University, Tianshuang Gao/Tongji University, Ling Yu/Tongji University, Yahua Zhang/Tongji University

A Hybrid CEEMDAN-GRU Model for Short-Term Metro Passenger Flow Prediction (20-01863) - B381
Hao Huang/Southwest Jiaotong University, Jiannan Mao/Southwest Jiaotong University, Weike Lu/Southwest Jiaotong University, Guojing Hu/Southwest Jiaotong University, Lan Liu/Southwest Jiaotong University

Reconstructing Train Logs from Smartcard Data Using Passenger Correlations (20-01872) - B387
De Wen Soh/Institute of High Performance Computing, Hong En Tan/Institute of High Performance Computing, Yong Sheng Soh/Institute of High Performance Computing

A Three-Level Optimization Framework for the Implementation of Eco-Driving Strategies in the Case of Rolling Stock Breakdowns (20-01938) - B388
Marilisa Botte/University of Naples Federico II, Luca D'Acierno/University of Naples Federico II

Rapid Evacuation Oriented Bus Bridging Routes Optimization for Urban Metro (20-02250) - B389
Zhengyu Duan/Tongji University, Lei Zhang/Tongji University, Weifeng Li/Tongji University, Mingji Tan/Tongji University

Mining Public Transit Ridership Flow and Origin-Destination Information from Wi-Fi and Bluetooth Sensing Data (20-02675) - B374
Ziyuan Pu/University of Washington, Xiaoyu Guo/University of Washington, Zhiyong Cui/University of Washington, Meixin Zhu/University of Washington, Yinhai Wang/University of Washington

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Short-Term Forecasting of Metro Transit Passenger Flows: A Hybrid Approach Combining Modified Gravity Model and Deep Learning (20-03122) - B376
Loutao Shen/Zhejiang University, Zengzhe Shao/Zhejiang University, Yuansheng Yu/Zhejiang University, Xiqun (Michael) Chen/Zhejiang University

Short-Term Passenger Flow Prediction of a Passageway in a Subway Station Using Time-Space Correlations Between Multi-Sites (20-03373) - B377
Dewei Li/Beijing Jiaotong University, Chen Zhang/Beijing Jiaotong University, Jinming Cao/Beijing Jiaotong University

Service Network Design for Regional Multimodal Rail Transit System (20-03579) - B382
Yihan Wang/Southwest Jiaotong University, Lan Liu/Southwest Jiaotong University, Weike Lu/Southwest Jiaotong University, Jiannan Mao/Southwest Jiaotong University, Yalong Lao/Southwest Jiaotong University

Contributing Factors Affecting the Severity of Metro Escalator Injuries at Guangzhou Metro (20-03752) - B368
Xiaochen Zhao/Tongji University, Yingying Xing/Tongji University, Yuming Jiang/Tongji University, Jian Lu/Tongji University

A Smart Path Finding Method for Metro Systems with Passenger Preferences (20-03973) - B369
Wei Li/Shenzhen Technology University, Qin Luo/Shenzhen Technology University, Jingnan Zhou/Shenzhen Technology University

Transforming Predictive Models into Decision Frameworks: Evidence from San Francisco Bay Area Rail Transit Models (20-05544) - B378
Mackenzie Watten/Fehr & Peers, Jennifer Ziebarth/Fehr & Peers, David Wasserman/Fehr & Peers, Melissa Jones/Fehr & Peers, Sebastian Petty/Fehr & Peers, Dennis Lee/Fehr & Peers, Ryan Greene-Roesel/Fehr & Peers

Passenger Route Choice in Urban Rail Transit Considering Transfer and Congestion (20-05885) - B379
Yiling Kuang/Southwest Jiaotong University, Hezhou Qu/Southwest Jiaotong University, Steven Chien/Southwest Jiaotong University

Understanding Reverse Routing Path Choice Behavior in Congested Metro Systems (20-06046) - B367
Morten Eltved/Technical University of Denmark, Haris Koutsopoulos/Technical University of Denmark, Nigel Wilson/Technical University of Denmark, Kerem Tuncel/Technical University of Denmark, Zhenliang Ma/Technical University of Denmark

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Street Car Development in China
Jeffrey Brown, Florida State University, presiding
Sponsored By Standing Committee on Light Rail Transit, Subcommittee on International Developments in Light Rails Transit

This session provides an overview of streetcar development in China

Streetcar Development in China: A Reflection of Five Case Cities (20-04792) - B373
Meng An/Southeast University, Xuewu Chen/Southeast University

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Current Research in Freight Planning and Logistics
Kyung Hyun, University of Texas, Arlington, presiding
Sponsored By Standing Committee on Freight Transportation Planning and Logistics

Current research in freight and logistics will be presented in this session in the form of posters based on research papers submitted to the Freight Planning and Logistics Committee.

Logistics Sprawl in Chinese Metropolises: Evidence from Wuhan (20-00226) - B339
Quan Yuan/University of Southern California, Jiren Zhu/University of Southern California

Regional Freight Demand Model for Bangladesh: An Application of Freight Origin-Destination Synthesis (20-01295) - B322
Jose Holguin-Veras/Rensselaer Polytechnic Institute (RPI), Lokesh Kalahasthi/Rensselaer Polytechnic Institute (RPI), Abdelrahman Ismael/Rensselaer Polytechnic Institute (RPI), Wilfredo Yushimito/Rensselaer Polytechnic Institute (RPI), Matías Herrera-Dappe/Rensselaer Polytechnic Institute (RPI), Shamsul Hoque/Rensselaer Polytechnic Institute (RPI)

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Assessment of Horizontal Collaboration Benefits in Vehicle Routing Problems with Pickup and Delivery (20-02357) - B330

Bhavya Padmanabhan/University of South Carolina, Nathan Huynh/University of South Carolina, William Ferrell/University of South Carolina, Vishal Badyal/University of South Carolina

What Influences Load Factors of LTL Delivery Tours: An Analysis with Operation Data (20-02660) - B323

Linglin Ni/Rensselaer Polytechnic Institute (RPI), Xiaokun (Cara) Wang/Rensselaer Polytechnic Institute (RPI)

Optimization of Integrated Production and Distribution Planning for an Online Grocer (20-03280) - B328

Arjan Braemer/Delft University of Technology, Bilge Atasoy/Delft University of Technology, Joris van Tatenhove/Delft University of Technology, Henk Polinder/Delft University of Technology

The Potential of Private Autonomous Vehicles for Parcel Delivery (20-02150) - B340

Tilmann Schlenther/Technische Universitat Berlin Fakultat V Verkehrs- und Maschinensysteme, Kai Martins-Turner/Technische Universitat Berlin Fakultat V Verkehrs- und Maschinensysteme, Joschka Bischoff/Technische Universitat Berlin Fakultat V Verkehrs- und Maschinensysteme, Kai Nagel/Technische Universitat Berlin Fakultat V Verkehrs- und Maschinensysteme

Assessing the Online Shopping Frequency of U.S. Internet Users (20-02788) - B324

Joshua Schmid/Rensselaer Polytechnic Institute (RPI), Xiaokun (Cara) Wang/Rensselaer Polytechnic Institute (RPI), Jose Holguin-Veras/Rensselaer Polytechnic Institute (RPI)

Preference-Based Facility Location for On-Demand Logistics (20-03450) - B329

Joep Paulusse/Delft University of Technology, Bilge Atasoy/Delft University of Technology, Yousef Maknoon/Delft University of Technology, Jafar Rezaei/Delft University of Technology

The Influence of Tour Formation Assumptions on the Reproducibility of Freight Vehicle Flows (20-03524) - B325

Andre Romano Alho/Singapore-MIT Alliance, Takanori Sakai/Singapore-MIT Alliance, Ming Hong Chua/Singapore-MIT Alliance, Max Raven/Singapore-MIT Alliance, Yusuke Hara/Singapore-MIT Alliance, Moshe Ben-Akiva/Singapore-MIT Alliance

Reliability Measures in Bottlenecks Identification Along Freight Arterial Segments (20-03934) - B331

Deo Chimba/Tennessee State University, Suleiman Swai/Tennessee State University, Tinotenda Jonga/Tennessee State University

Facilitating the Conversation: Creating an Approach and Web Tool to Disseminate Effective Goods Movement Strategies for Communities (20-04098) - B326

Quanquan Chen/North Jersey Transportation Planning Authority, Anne Strauss-Wieder/North Jersey Transportation Planning Authority, Melissa Hayes/North Jersey Transportation Planning Authority, Jakub Rowinski/North Jersey Transportation Planning Authority, Kaitlynn Davis/North Jersey Transportation Planning Authority, Derek Bedarf/North Jersey Transportation Planning Authority, Dralyn Veech/North Jersey Transportation Planning Authority

The Alternative Pickup and Delivery Problem (20-04303) - B332

Jérémy Decerle/Eidgenossische Technische Hochschule Zurich, Francesco Corman/Eidgenossische Technische Hochschule Zurich

Optimization of Service Zones and Frequencies for Freight Deliveries (20-04458) - B333

Chelsie Raleigh/Western New England University, Myungseob Kim/Western New England University, Paul Schonfeld/Western New England University

Research on Container Transportation's Discrete Choose Model Considering Carbon Tax (20-04536) - B334

Li Song/University of North Carolina, Charlotte, Xiaoning Wang/University of North Carolina, Charlotte, Peijie Wu/University of North Carolina, Charlotte

Evaluating the Costs and Distribution Structure in Last-Mile Deliveries Under Short Time Windows (20-04694) - B335

Anmol Pahwa/University of California, Davis, Miguel Jaller/University of California, Davis

Effects of Business Age and Size on Freight Demand: A Decomposition Analysis of Indian Establishments (20-04887) - B341

Furqan Bhat/Birla Institute of Technology and Science, Agnivesh Puliyappatta/Birla Institute of Technology and Science, Prasanta Sahu/Birla Institute of Technology and Science

A Comprehensive Approach to Measure the Efficiency of Freight Transport: Freight Mobility Energy Productivity Metric (20-05442) - B342

Kyungsoo Jeong/National Renewable Energy Laboratory (NREL), Venu Garikapati/National Renewable Energy Laboratory (NREL), Yi Hou/National Renewable Energy Laboratory (NREL), Alicia Birky/National Renewable Energy Laboratory (NREL), Kevin Walkowicz/National Renewable Energy Laboratory (NREL)

Platform-Based Collaborative Routing Using Dynamic Prices as Incentives: The Case of Quicargo (20-05989) - B327

Bilge Atasoy/Delft University of Technology, Frederik Schulte/Delft University of Technology, Alex Steenkamp/Delft University of Technology

Mobile Parcel Locker Scheduling Problem (20-00570) - B343
Yang Wang/Beijing University of Technology, Mengyu Bi/Beijing University of Technology, Yanyan Chen/Beijing University of Technology

Network Location and Assignment Design for Cooperation of Multi-Type Fire Vehicles (20-01344) - B346
Han Liu/University of South Florida, Xiaopeng (Shaw) Li/University of South Florida, Saeid Soleimaniamiri/University of South Florida, Siyang Xie/University of South Florida

An Energy Efficiency Optimization Method for Inland Ship Fleet Considering Multiple Influencing Factors (20-03214) - B344
Kai Wang/Dalian Maritime University, Lianzhong Huang/Dalian Maritime University, Yupeng Yuan/Dalian Maritime University, Xiaoli Jiang/Dalian Maritime University, Jiayuan LI/Dalian Maritime University, Rudy Negenborn/Dalian Maritime University

Spatial Pattern Analysis on Neighborhoods of Amazon E-Commerce Logistics Facility Locations (20-04492) - B345
Merenchige Chathura De Silva/Nagaoka University of Technology, Kazushi Sano/Nagaoka University of Technology, Kiichiro Hatoyama/Nagaoka University of Technology

Vehicle Routing Problem of Perishable Product Delivery Considering Congested Road Setting (20-05583) - B336
Fang Zhao/Beijing Jiaotong University, Bingfeng Si/Beijing Jiaotong University, Zhenlin Wei/Beijing Jiaotong University, Tianwei Lu/Beijing Jiaotong University

A Study of Road Autonomous Delivery Robots and Their Potential Impacts on Freight Efficiency and Travel (20-05614) - B347
Dylan Jennings/Portland State University, Miguel Figliozzi/Portland State University

Modeling Freight Mode Choice Using Machine Learning Classifiers: A Comparative Study Using the Commodity Flow Survey Data (20-05699) - B337
Majbah Uddin/University of Missouri, Columbia, Sabreena Anowar/University of Missouri, Columbia, Naveen Eluru/University of Missouri, Columbia

Megaregion Truck Flow Estimation Model (20-06109) - B338
Qisheng Pan/Texas Southern University, Bumseok Chun/Texas Southern University, Zhonghua Jin/Texas Southern University

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Monday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Advances and Innovations in Urban Freight Transportation Planning
Peter Plumeau, EBP, presiding
Sponsored By Standing Committee on Urban Freight Transportation

The Urban Freight Transportation Committee's annual presentation of posters describing the latest in urban freight innovations, research, and practices from around the world.

The Simulation of Logistics Planning for Shipment-to-Vehicle Tour Conversion in an Agent-Based Urban Freight Modeling System (20-00387) - B314
Takanori Sakai/Singapore-MIT Alliance for Research and Technology, Andre Romano Alho/Singapore-MIT Alliance for Research and Technology, Yusuke Hara/Singapore-MIT Alliance for Research and Technology, Moshe Ben-Akiva/Singapore-MIT Alliance for Research and Technology

Stakeholder Selection of the Most Appropriate Urban Freight Transport Solution Using a Real-Time Delphi Platform (20-00389) - B306
Ioannis Karakikes/University of Thessaly, Eftihia Nathanail/University of Thessaly

Parcel Lockers Enabled Dynamic Pickup and Delivery for City Transshipment Network (20-00445) - B309
Chaojie Guo/University of Melbourne, Russell Thompson/University of Melbourne, Xiang T.R. Kong/University of Melbourne, Greg Foliente/University of Melbourne

Centrality and Measures of Spread to Characterize Metropolitan Statistical Areas (20-00579) - B310
Jose Holguin-Veras/Rensselaer Polytechnic Institute (RPI), Carlos Rivera-Gonzalez/Rensselaer Polytechnic Institute (RPI), Joshua Schmid/Rensselaer Polytechnic Institute (RPI), Oriana Andreina Calderon Quevedo/Rensselaer Polytechnic Institute (RPI), Benjamin Caron/Rensselaer Polytechnic Institute (RPI), Woojung Kim/Rensselaer Polytechnic Institute (RPI)

Electric Vehicle Routing Problem with Time Windows and Public Recharging Stations (20-00819) - B307
Yuehui Wu/Tongji University, Liucheng Sun/Tongji University, Shitong Cui/Tongji University, Di Wu/Tongji University

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An Empirical Shipment Size Model for Urban Freight and Its Implications (20-00857) - B315

Takanori Sakai/Singapore-MIT Alliance for Research and Technology, Andre Romano Alho/Singapore-MIT Alliance for Research and Technology, Tetsuro Hyodo/Singapore-MIT Alliance for Research and Technology, Moshe Ben-Akiva/Singapore-MIT Alliance for Research and Technology

Express Package Delivery Optimization Using Walkers, Cargo Bicycles, and Delivery Trucks (20-01053) - B304

Patrick Meredith-Karam/University of Toronto, Jia Jiang/University of Toronto, Sina Bahrami/University of Toronto, Matthew Roorda/University of Toronto

Evaluation of the Potential Impacts of Off-Hour Deliveries (20-01203) - B308

Ibrahim Savadogo/Universite de Lyon, Adrien Beziat/Universite de Lyon

Incorporating the Flying Line of Sight Rule in the Integrated Vehicle–Drone Routing Problem for Product Pickup and Delivery Services (20-01284) - B300

Aline Karak/Southern Methodist University, Khaled Abdelghany/Southern Methodist University

Toward a Sustainable Transportation Network Incorporating Green Modes for Urban Freight Delivery (20-01380) - B301

MohammadHossein (sam) Shojaei/Michigan State University, Fatemeh Fakhrmoosavi/Michigan State University, Ali Zockaie/Michigan State University, Mehrnaz Ghamami/Michigan State University, Archak Mittal/Michigan State University, James Fishelson/Michigan State University

Using Drones in the Last-Mile Logistics Processes of Medical Product Delivery: A Feasibility Case Study in Rotterdam (20-01600) - B302

Irene Zubin/Delft University of Technology, Bart Wiegmans/Delft University of Technology, Ron van Duin/Delft University of Technology, Bart van Arem/Delft University of Technology

Guidance to Facilitate Implementation of Effective Metropolitan Freight Transportation Strategies (20-01735) - B311

Seckin Ozkul/University of South Florida, Mario Monsreal/University of South Florida, William Eisele/University of South Florida, Fatemeh Ranaiefar/University of South Florida, Shuang Guo/University of South Florida

Bottom of the Pyramid Urban Logistics: Case Studies of Goods Distribution in Slums (20-02589) - B312

Orlando Lima Jr./Universidade Estadual de Campinas, selma isa/Universidade Estadual de Campinas, Ana Hirakawa/Universidade Estadual de Campinas, Giulliane Fioravanti/Universidade Estadual de Campinas, Henrique Oliveira/Universidade Estadual de Campinas

Before/After Freight Impact Analysis of the New York City Clear Curbs Initiative Phase 2: Area-wide Parking Violation Analysis (20-02646) - B317

Yaxin Zhang/North Jersey Transportation Planning Authority, Quanquan Chen/North Jersey Transportation Planning Authority, Alison Conway/North Jersey Transportation Planning Authority, Carla Tejada/North Jersey Transportation Planning Authority

Cargo Bikes for Last-Mile Delivery Services: Impacts on Traffic Congestion and Emissions (20-04109) - B303

Carlos LLorca/Technical University of Munich, Rolf Moeckel/Technical University of Munich

Freight and Service Parking Needs in Historic City Centers: A Case Study in São João Del Rei, Brazil (20-04439) - B320

Kaique Silva/Federal University of Itajuba (UNIFEI), Renato Lima/Federal University of Itajuba (UNIFEI), Roberta Alves/Federal University of Itajuba (UNIFEI), Wilfredo Yushimito/Federal University of Itajuba (UNIFEI), Jose Holguin-Veras/Federal University of Itajuba (UNIFEI)

A Heuristic for Learn-and-Optimize New Mobility Services with Equity and Efficiency Metrics (20-04662) - B313

Qi Luo/University of Michigan, Ann Arbor, Fangzhou Yu/University of Michigan, Ann Arbor, Tayo Fabusuyi/University of Michigan, Ann Arbor, Robert Hampshire/University of Michigan, Ann Arbor

Exploring the Characteristics of Light Electric Vehicle Performance in Urban Logistics (20-04699) - B305

Mojdeh Azad/University of Tennessee, Knoxville, Christopher Cherry/University of Tennessee, Knoxville, John MacArthur/University of Tennessee, Knoxville, William Rose/University of Tennessee, Knoxville

Estimating Small Area Demand for Online Package Delivery (20-04700) - B318

Tayo Fabusuyi/University of Michigan, Ann Arbor, Richard Twumasi-Boakye/University of Michigan, Ann Arbor, Andrea Broaddus/University of Michigan, Ann Arbor, James Fishelson/University of Michigan, Ann Arbor, Robert Hampshire/University of Michigan, Ann Arbor

Simulation-Based Design and Application of Multimodal Automated Last-Mile Delivery System (20-04726) - B319

Farah Samouh/Ryerson University, Veronica Gluza/Ryerson University, Shadi Djavadian/Ryerson University, Seyed Mehdi Meshkani/Ryerson University, Bilal Farooq/Ryerson University

Freight and Service Activity Patterns in U.S. Cities (20-04860) - B321

Jose Holguin-Veras/Rensselaer Polytechnic Institute (RPI), Diana Ramirez-Rios/Rensselaer Polytechnic Institute (RPI), Lokesh Kalahasthi/Rensselaer Polytechnic Institute (RPI), Julia Coutinho Amaral/Rensselaer Polytechnic Institute (RPI)

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Exploring Benefits of Cargo Cycles Versus Trucks for Urban Parcel Delivery Under Different Demand Scenarios (20-05725) - B316
Giacomo Dalla Chiara/Singapore-MIT Alliance, Andre Romano Alho/Singapore-MIT Alliance, Cheng Cheng/Singapore-MIT Alliance, Moshe Ben-Akiva/Singapore-MIT Alliance, Lynette Cheah/Singapore-MIT Alliance

Monday, 09:00 a.m. - 04:00 p.m., Convention Center, Hall D&E
Exhibits
Sponsored By Technical Activities Council

Plan to visit the nearly 200 exhibits, including the TRB booth, showcasing the many transportation-related products and services. View the floor plan and interactively search for exhibiting organizations on the Mobile App . Between sessions, food concessions are available in the Exhibit Hall.Located in the exhibit hall, theSolutions Showcasetheaters will feature presentations from exhibiting and patron organizations on the goods, services, and solutions they provide. Presentations begin every half hour during exhibit hours, and are 30 minutes in length. Presentations that start on the hour are in Theater #1 (booth #1239). Those that start on the half hour are in the Theater #2(booth #1234). For a list of presentations, see the mobile app (available in early December) or the onsite printed program.

Monday, 09:30 a.m. - 03:30 p.m., Convention Center, Exhibit Hall D Theaters
Solutions Showcase Theater
Sponsored By Technical Activities Council

Located in the exhibit hall, the Solutions Showcase theater (booth 1237) features presentations from exhibiting and patron organizations on the goods, services, and solutions they provide.

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Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 154
Biggest Steps to Decarbonization
Marie Venner, Venner Consulting, presiding
Sponsored By Special Task Force on Climate Change and Energy

Road transport accounts for more than one-quarter of all U.S. greenhouse gas emissions. Cars and light-duty trucks are responsible for more than 60% of the CO_2 emitted from transportation in the US. Drawdown and the GREET model have identified biggest steps we can take to decarbonize, which break down into rough thirds: transit, vehicle electrification, and increased walkability and protected bikeways, micromobility and avoided trips, such as through telecommuting (24% of workers telecommute at least some days per week now and 42% with advanced degrees) and videoconferencing. This session will review the latest findings.

Top Action Areas in Transportation to Reach 2 C Targets (P20-20795)
Ryan Allard/Project Drawdown
LA and LA DOT Targets and Strategy (P20-20796)
Michael Samulon/City of Los Angeles
Swedish Efforts (P20-20797)
Mattias Goldmann/Fores 2030
Telecommuting Potential (P20-20798)
Patricia Mokhtarian/Georgia Institute of Technology (Georgia Tech)
MDOT and Maryland Smart Growth (P20-20799)
Elizabeth Habic/Federal Highway Administration (FHWA)

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Improving Findability of Transportation Agency Information
Jezmynne Arroway, Idaho Transportation Department, presiding
Sponsored By Task Force on Knowledge Management, Standing Committee on Library and Information Science for Transportation, Standing Committee on Statewide Transportation Data and Information Systems, Standing Committee on Management and Productivity

How much time do people in your organization spend looking for information? What is the impact on productivity? Finding information often frustrates employees and slows progress. We want the retail experience that helps us navigate to the item we're looking for. In this session we'll cover basic methods for improving information findability, and present case studies from the private sector and several DOTs. Test your wayfinding skills and find this session.

Findability 101: Learning from Exemplars (P20-20604)
Ralph Poole/iknow, llc
Making DOT Content Findable: Working Behind the Scenes (P20-20607)
Frances Harrison/Spy Pond Partners, LLC
Manual Modernization Pilot (P20-20611)
Leni Oman/Washington State Department of Transportation

1160   CM (1.75)

Do You Feel Me?: Creative Strategies to Engage a Diversity of Users
Andrea d'Amato, Massachusetts Department of Transportation, presiding
Walter Moore, Neel-Schaffer, Inc., presiding
Sponsored By Standing Committee on Strategic Management, Standing Committee on Public Involvement in Transportation, Standing Committee on Environmental Justice in Transportation

It has become challenging to have meaningful conversations in the 21st Century. How we reach a diversity of users and how we hear each other's ideas and concerns is becoming more difficult as we have become a culture of categories. Some of this reflects personal bias and, training, new technologies, and basic barriers to reaching those not engaged. In this new era of labeling, this session will demonstrate the challenges of communicating and engaging people of different abilities and backgrounds in transportation projects and services. It will feature new and emerging methods and techniques to inform and engage people in a world of information overload with technologies and devices that leave big gaps in reaching with critical populations.

Demonstrating Communication Mishaps and Challenges (P20-20520)
Derek Krevat/Massachusetts Department of Transportation
Reaching the Underserved Transit-Dependent Communities (P20-20020)
Danny Levy/Massachusetts Bay Transportation Authority
Rethinking the I-94 Project in Minnesota (P20-20048)
Gloria Jeff/Minnesota Department of Transportation
Mounting Barriers to Mobility (P20-20049)
Beryl Neurman/United States Department of Labor
Public Involvement Management Application Tool (P20-20019)
Erica Blonde/HNTB Corporation

1161

Greener in More Ways Than One: Environmentally Sustainable Funding and Financing Opportunities
Nathan Macek, WSP, presiding
Sponsored By Standing Committee on Revenue and Finance, Standing Committee on Congestion Pricing, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Transportation Demand Management, Standing Committee on Ecology and Transportation, Standing Committee on Transportation and Economic Development, Standing Committee on Transportation and Sustainability, Standing Committee on Public Transportation Planning and Development

The session examines the intersection of environmental sustainability and transportation funding /financing, including approaches that encourage transportation patterns and infrastructure investment that protects the environment and promotes sustainability and resiliency. Presentations address resiliency and climate change in the federal surface transportation authorization, realignment of state transportation spending to achieve greenhouse gas emission reductions, a multi-state transportation climate initiative, the impact of zero-emission vehicles on state transportation revenues, and ratings agency perspectives on climate change and resiliency.

Addressing Resiliency and Climate Change in the Federal Surface Transportation Authorization (P20-20336)
Rebecca Higgins/U.S. Senate
Realignment of State Transportation Spending to Achieve Greenhouse Gas Emission Reductions (P20-20337)
Darwin Moosavi
The Impact of ZEV Adoption on California Transportation Revenue (20-02422)
Hannah King/University of California, Los Angeles, Martin Wachs/University of California, Los Angeles, Asha Weinstein Agrawal/University of California, Los Angeles
Northeast/Mid-Atlantic Transportation Climate Initiative (P20-20338)
Vicki Arroyo/Georgetown University
Ratings Agency Perspectives on Climate Change and Resiliency Financing (P20-20339)
Scott Zuchorski/Fitch Ratings

1162

Applications Natural Language Processing in Transportation Science
Kendra Levine, University of California, Berkeley, presiding
Sponsored By Standing Committee on Library and Information Science for Transportation

The TRB Standing Committee on Library and Information Science for Transportation (LIST) ABG40 hosts a variety of research presentations demonstrating natural language processing (NLP) intransportation engineering and science.

Carbon Pricing, Mobility, and Social Exclusion: Using Natural Language Processing to Find Specific Topics in a Large Corpus (20-00735)
Darcy Reynard/University of Alberta
National Access Points for Intelligent Transport Systems Data: From Conceptualization to Operation and Benefits Recognition (20-01746)
Georgia Aifadopoulou/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Alexandros Dolianitis /Centre for Research and Technology Hellas - Hellenic Institute of Transport, Chrysostomos Mylonas/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Evangelos Mitsakis/Centre for Research and Technology Hellas - Hellenic Institute of Transport, AFRODITI STAMELOU/Centre for Research and Technology Hellas - Hellenic Institute of Transport
Transportation Research Record Articles: A Case Study of Trend Mining (20-04830)
Subasish Das/Texas A&M Transportation Institute, Anandi Dutta/Texas A&M Transportation Institute, Marcus Brewer/Texas A&M Transportation Institute

1163

Chief Information Officers Roundtable: The Pressing Issues and Concerns from Our Leaders
Kevin Green, eVision Partners, Inc., presiding
Steven Parker, University of Wisconsin, Madison, presiding
Sponsored By Standing Committee on Information Systems and Technology, Standing Committee on Statewide Transportation Data and Information Systems, Standing Committee on Geographic Information Science and Applications

 Advances in information systems and technology are continuing to have a profound impact on all areas of transportation, presenting new opportunities and challenges for Transportation agencies. This session will discuss the most critical issues that State DOT IT Executives (CIO's) face from this emerging data, technology and cybersecurity landscape. Through a moderated roundtable format, the session will explore how DOT IT Leadership can better engage and support the Transportation agencies, and how we can develop collaborative relationships to work together to solve technology related challenges for state DOT's

Panelist: Montana DOT (P20-20379)
Mike Bousliman/Montana Department of Transportation
Panelist: State of Iowa (P20-20381)
Annette Dunn/Iowa Department of Transportation
Panelist: Texas DOT (P20-20382)
Cassandra Jordan/Alliance Transportation Group
Panelist: Tennessee DOT (P20-20383)
Joe Kirk/Tennessee Department of Transportation
Panelist: Virginia DOT (P20-20384)
Murali Rao/Virginia Department of Transportation

1164

GIS Data Needs for Connected Autonomous Vehicles
Edward Strocko, OST-R/Bureau of Transportation Statistics, presiding
Sponsored By Standing Committee on Geographic Information Science and Applications, Standing Committee on Statewide Transportation Data and Information Systems, Standing Committee on Information Systems and Technology

Connected Autonomous Vehicles (CAV) are rapidly presenting new opportunities, requirements and issues for GIS. A new range of players are emerging to produce HD maps, geospatially enabled data, and apps. On the public side, CAV have the potential to impact agencies at all levels of government and redefine the roles of providing HD maps and mining these data. What IT infrastructure will we need, how will real-time updates to and from vehicles work, what will data sharing look like, what are the new roles for the public and private sector in this space? This session will provide an overview of public sector GIS considerations for CAV along with projects and perspectives from mapping and technology companies working in this space.

Understanding HD Maps (P20-21823)
James Nenaber/HERE Technologies
HD Maps: The Lyft experience (P20-21831)
Charlotte Tao/Lyft, Inc.
Considerations for Developing Standards in the HD Map World (P20-21832)
George Percivall/Open Geospatial Consortium
HD Maps: A Necessity for Safe Autonomy (P20-21902)
Christopher Stapleton/DeepMap

1165 CM (1.75)

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 156
Transportation Planner Talent Management
Jerri Bohard, Oregon Department of Transportation, presiding
Sponsored By Standing Committee on Statewide Multimodal Transportation Planning

What skills will it take to be a 21st Century Planner that supports strategic decision making in a rapidly evolving transportation landscape? How should transportation planning organizations attract, train, and retain a talented workforce of 21st Century planners?

Early Results from NCHRP 8-125: Attracting, Retaining, and Developing the Transportation Workforce: Transportation Planners (P20-20772)
Michael Meyer/WSP
A State DOT Perspective on the Key Challenges (P20-20788)
Lynn Zanto/Montana Department of Transportation
Transportation Planning Talen Management (P20-21878)
Stephen Lockwood/Steve Lockwood, LLC, Transportation Consultant

1166 CM (1.75)

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 146B
Addressing Equity in a Changing World: Emerging Research and Practices for Integrating Equity into Transportation Planning Across the United States and Europe
Hannah Twaddell, ICF, presiding
Sponsored By Standing Committee on Metropolitan Policy, Planning, and Processes, Standing Committee on Environmental Justice in Transportation

Public sector transportation agencies are responsible for providing equitable access to safe, efficient transportation facilities and services for all people within their service area, with the intended outcome of enabling all people to conduct the essential economic and social interactions they need in order to survive, thrive and prosper. Yet achieving these outcomes involves many factors beyond the agency's control, from urban gentrification that pushes low-income families out to transit-inaccessible suburbs to changing demographic patterns in "majority-minority" communities. In this session, participants will glean insights from cutting-edge research and practitioner experience on the dynamics of equitable transportation planning.

Regional Equity Analysis Frameworks and State of the Practice in the United States (P20-20956)
Hannah Twaddell/ICF, Alex Karner/University of Texas, Austin, Fleming El-Amin/Federal Highway Administration (FHWA)
Addressing Changing Demographics in Environmental Justice Analysis (P20-20957)
Aaron Golub ADD50/Portland State University, Les Brown/ICF International Inc
Addressing Changing Demographics Report Featured Case Study: Metropolitan Transportation Commission Housing Displacement Risk Assessment and Action Plan (P20-20958)
Vikrant Sood/Metropolitan Transportation Commission (MTC)
Guidelines and Roadmap for Equity Planning in the European Union (P20-20959)
Floridea Di Ciommo/cambiaMO, Yoram Shiftan/Technion Israel Institute of Technology
Addressing Changing Demographics in Environmental Justice Analysis: Review of Demographic Trends and State of Practice (20-02649)
Aaron Golub ADD50/Portland State University, Les Brown/Portland State University, Michael Grant/Portland State University, Nathan McNeil/Portland State University, Charles Rynerson/Portland State University, Matt Gray/Portland State University, Stephanie Lonsdale/Portland State University, Madison Levy/Portland State University

1167

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 145A
Shared Mobility, Automated Vehicles, and the Future of Mobility
Patricia Lavieri, University of Melbourne, presiding
Sponsored By Standing Committee on Effects of Information and Communication Technologies (ICT) on Travel Choices

(continued)

Controlling for Selection and Simultaneity Biases in the Relationships Between Ridehailing Use and Vehicle Ownership in the 2017 NHTS (20-02708)
Yongsung Lee/Georgia Institute of Technology (Georgia Tech), Farzad Alemi/Georgia Institute of Technology (Georgia Tech)
Exploring Consumer Preference for Taxis Against Ridesourcing Services: An Integrated Choice and Latent Variable Approach in Seoul, Korea (20-03128)
Sunghoon Jang/Seoul National University, Doosun Hong/Seoul National University, Chungwon Lee/Seoul National University
Exploring Individual Preferences and Willingness to Pay for Mobility-as-a-Service (20-05049)
Ioanna Pagoni/University of the Aegean, Amalia Polydoropoulou/University of the Aegean, Ioannis Tsouros/University of the Aegean, Athena Tsirimpa/University of the Aegean
Virtual Immersive Reality-Based Behavioral Analysis of Automated Vehicle Control (20-01000)
Shadi Djavadian/Ryerson University, Rafael Vasquez/Ryerson University, Bilal Farooq/Ryerson University
Adoption of Ridehailing in Four Megacities in Developing Countries (20-06045)
Jai Malik/University of California, Davis, Giovanni Circella/University of California, Davis, Farzad Alemi/University of California, Davis, Lewis Fulton/University of California, Davis, Adam Davidson/University of California, Davis, Jyot Chadha/University of California, Davis

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1168

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 146A
Understanding and Mitigating Exposure to Traffic-Related Air Pollution
Alexander Bigazzi, University of British Columbia, presiding
Sponsored By Standing Committee on Transportation and Air Quality

 This session includes papers investigating human exposure to traffic-related air pollution on local and regional scales, including the impacts of mitigation strategies.

Quantification of Sources of Variability of Air Pollutant Exposure Concentrations Among Selected Transportation Micro-Environments (20-05235)
H. Christopher Frey/North Carolina State University, Disha Gadre/North Carolina State University, Sanjam Singh/North Carolina State University, Prashant Kumar/North Carolina State University
Monetized Health Benefits of Regional Emissions Changes Due to Scenarios of Vehicle Automation (20-01002)
Kristen Brown/U.S. Environmental Protection Agency (EPA), Rebecca Dodder/U.S. Environmental Protection Agency (EPA)
Trucking Bans in Urban Areas as a Strategy to Reduce Air Pollution: Are They Efficient? (20-02661)
Carlos Gonzalez-Calderon/Universidad Nacional de Colombia, Daniel Ocampo-Giraldo/Universidad Nacional de Colombia, John Jairo Posada-Henao/Universidad Nacional de Colombia
Impacts of Vegetation Barriers on the Submicron Particulate Matter (PM1) in Near-Road Residential Buildings (20-03052)
Xin Liu/Shanghai Jiao Tong University, Zhongren Peng/Shanghai Jiao Tong University, Hong-Di He/Shanghai Jiao Tong University, Yue-Ping Jia/Shanghai Jiao Tong University, Kaifa Lu/Shanghai Jiao Tong University, Tie Zheng/Shanghai Jiao Tong University
Comparison of Modeled-to-Monitored PM2.5 Exposure Concentrations Resulting from Transportation Emissions in a Near-Road Community (20-03296)
Mayra Chavez/University of Texas, El Paso, Ivan Ramirez/University of Texas, El Paso, Wen-Whai Li/University of Texas, El Paso
Particulate Exposure During Taxi, Bus, and Metro Commuting in Four Megacities of China (20-03922)
Ying Zhang/Shenzhen University, Zhengdong Huang/Shenzhen University, Jiacheng Huang/Shenzhen University

1169 CM (1.75)

<u>Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 140A</u>
Emerging Issues with Per- and Polyfluoroalkyl Substances (PFAS) and Other Organic Contaminants in Transportation, Part 1 (Part 2, Session 1443)
David Wilson, Virginia Department of Transportation, presiding
Sponsored By Standing Committee on Resource Conservation and Recovery, Standing Committee on Geo-Environmental Processes, Standing Committee on Culverts, Buried Bridges, and Hydraulic Structures, Standing Committee on Environmental Impacts of Aviation

Participants will learn about the potential health effects attributed to PFAS contamination along with laboratory methods that are evolving to detect this emerging contaminant in the environment. A case study will also be presented on a Superfund site where PFAS contamination was the result firefighting foam used in the aviation industry . A second case study will inform the participants on how New Hampshire DOT conducts preconstruction soil sampling in areas of potential PFAS contamination

A Summary of the Possible Health Effects of PFAS (P20-20907)
Christopher Zevitas/Office of the Assistant Secretary for Research and Technology (OST-R)
Evolving Laboratory Methods for Detecting PFAS (P20-20908)
Kuo Tian/George Mason University
PFAS Issues and Lessons Learned Surrounding Joint Training, System Testing, Emergency Response, and Incidental Spills at Federal and Commercial Aviation Facilities (P20-20910)
Rosa Gwinn/AECOM
New Hampshire DOT's Preconstruction Assessment Plan for Addressing PFAS Impacts (P20-20911)
Harrison Roakes/Sanborn Head & Associates

1170 CM (1.75)

<u>Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 140B</u>
A Century of Progress?: Reflecting on How Transportation Has or Has Not Promoted Sustainability Outcomes in Equity, the Economy, and the Environment
Ralph Hall, Virginia Polytechnic Institute and State University, presiding
Timothy Sexton, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Transportation and Sustainability

Panelists will discuss how transportation experts and the research community really isn't coming to grips with the sustainability challenges we face. Our system is not environmentally friendly, not equitable, and not economically sensible, and much of our transportation research being is too esoteric to affect decision -making or still oriented toward old paradigms of highway building.

Progress in Illinois (P20-21815)
Chuey Garcia/U.S. House of Representatives
Progress in California (P20-21816)
Mark Takano/U.S. House of Representatives

1171

<u>Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 204C</u>
Pavement Management Optimization and Cost Assessment
Cristina Torres-Machi, University of Colorado, Boulder, presiding
Sponsored By Standing Committee on Pavement Management Systems

Optimal Highway Maintenance Budget and Optimal Budget Allocation Based on Cost-Benefit Analysis (20-00072)
Ponlathep Lertworawanich/Bureau of Highway Maintenance Management
Sensitivity Analysis of Pavement Management System Using Multi-Year Optimization on Colorado Low-Volume Paved Roads (20-00797)
Marwan Hafez/University of Wyoming, Khaled Ksaibati/University of Wyoming, Rebecca Atadero/University of Wyoming

(continued)

LCA- and LCCA-Based Multi-Objective Optimization of Pavement Maintenance (20-01119)
Mengyu Huang/Southeast University, Qiao Dong/Southeast University, Fujian Ni/Southeast University, Tianjie Zhang/Southeast University
Accounting for Uncertainty in the Life-Cycle Cost Analysis of Pavements: A Reinforcement Learning Approach (20-02413)
Ayatollah Yehia/University of British Columbia, Omar Swei/University of British Columbia

1172

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 202A
The Future of Pavement Condition Evaluation
Pedro Serigos, Wood Environment & Infrastructure Solutions, Inc., presiding
Sponsored By Standing Committee on Pavement Condition Evaluation

This session will explore the future of pavement condition evaluation. It will examine novel condition detection techniques, crowd sourcing from on-board vehicle telemetry, and other new and promising technologies

Investigation on Identifying Road Anomalies Using In-Vehicle Sensors for Cooperative Applications and Road Asset Management (20-01484)
Moksheeth Padarthy/Hogeschool van Arnhem en Nijmegen, Mohammed Sami/Hogeschool van Arnhem en Nijmegen, Emiliano Heyns/Hogeschool van Arnhem en Nijmegen
Crowdsensing Road Surface Quality Using Connected Vehicle Data (20-04065)
Jinzhu Chen/General Motors Company, Donald Grimm/General Motors Company, Fan Bai/General Motors Company, John Grace/General Motors Company, Sangeeta Relan/General Motors Company, William Vavrik/General Motors Company
Novel Assessment Method for Support Conditions of Concrete Pavement Under Traffic Loads Using Distributed Optical Sensing Technology (20-05889)
Mengyuan Zeng/Tongji University, Difei Wu/Tongji University, Hongduo Zhao/Tongji University, Hui Chen/Tongji University
Quality Assurance Methodologies of Pavement Condition Data Collection Using 3D Technology (20-02275)
Danilo Balzarini/Applied Research Associates, Inc. (ARA), James Greene/Applied Research Associates, Inc. (ARA), Bouzid Choubane/Applied Research Associates, Inc. (ARA)

1173

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 208
Concrete Overlays: Modeling, Fibers, and Materials
Becca Lane, Ontario Ministry of Transportation, presiding
Sponsored By Standing Committee on Design and Rehabilitation of Concrete Pavements

Presentations related to concrete overlays

Modeling the Development of Permanent Deformation in Asphalt Interlayers of Unbonded Concrete Overlays of Concrete Pavements (20-05145)
Nicole Souder/University of Pittsburgh, John DeSantis/University of Pittsburgh, Julie Marie Vandenbossche/University of Pittsburgh, Steven Sachs/University of Pittsburgh
Selection of Structural Fibers for Concrete for Overlays (20-04973)
Manik Barman/University of Minnesota, Duluth, Bryce Hansen/University of Minnesota, Duluth
Construction of Novel Jointless Engineered Cementitious Composites Ultrathin Whitetopping Overlay (20-00399)
Ricardo Hungria/Louisiana State University, Gabriel Arce/Louisiana State University, Marwa Hassan/Louisiana State University, Michele Anderson/Louisiana State University, Moinul Mahdi/Louisiana State University, Tyson Rupnow/Louisiana State University
Evaluation of the Moisture Dependence of Concrete CTE and Its Impacts on the Thermal Deformations and Stresses of Concrete Pavements (20-03002)
Angel Mateos/University of California, Berkeley, John Harvey/University of California, Berkeley, Dulce Feldman/University of California, Berkeley, Rongzong Wu/University of California, Berkeley, Julio Paniagua/University of California, Berkeley, Fabian Paniagua/University of California, Berkeley

1174

Pavement Structural Modeling and Evaluation
Zahra Afsharikia, Wood Technical Consulting Solutions, presiding
Daba Gedafa, University of North Dakota, presiding
Sponsored By Standing Committee on Pavement Structural Modeling and Evaluation

Mechanistic Analysis and Modeling of Pavement Sections Utilizing Sustainable Aggregate Quarry By-Product Applications (20-04195)
Issam Qamhia/University of Illinois, Urbana Champaign, Erol Tutumluer/University of Illinois, Urbana Champaign, Hasan Ozer/University of Illinois, Urbana Champaign, Pranshoo Solanki/University of Illinois, Urbana Champaign
Field Characterization of Pavement Materials Using Falling Weight Deflectometer and Sensor Data from an Instrumented Pavement Section (20-04088)
Zafrul Khan/University of New Mexico, Rafi Tarefder/University of New Mexico, Md Amanul Hasan/University of New Mexico
Method for Direct Measurement of Structural Rolling Resistance for Heavy Vehicles (20-03767)
Natasja Nielsen/Roskilde University, Karim Chatti/Roskilde University, Christoffer Nielsen/Roskilde University, Imen Zaabar/Roskilde University, Poul Hjorth/Roskilde University, Tina Hecksher/Roskilde University
Structural Characterization of Fractured Portland Cement Concrete Pavements in Pennsylvania from Falling Weight Deflectometer Data (20-01505)
Luis Ramirez/Quality Engineering Solutions, Inc., Dennis Morian/Quality Engineering Solutions, Inc.

1175

Precast Concrete Bridge Deck Systems
Sponsored By Standing Committee on Concrete Bridges, Subcommittee on Accelerated Bridge Construction

 This event focuses on the Precast Bridge Deck Systems details and durability .

Flexural Response of UHPC Hybrid Bridge Deck Connections Made with Local Materials (20-00880)
Sabreena Nasrin/University of Idaho, Ahmed Ibrahim/University of Idaho
Long-Term Performance of Full-Depth Precast Concrete Deck Panels (20-02825)
Esmail Shahrokhinasab/Florida International University, David Garber/Florida International University
Full-Scale Testing of Precast Bridge Deck Panels with UHPC and Polymer Concrete Transverse Field Joints Under Static Loading (20-05965)
Mohamed Abokifa/University of Nevada, Reno, Mohamed Moustafa/University of Nevada, Reno
Simplified Shear Pocket for Full-Depth Precast Concrete Deck Systems (20-00254)
George Morcous/University of Nebraska, Lincoln, Raed Tawadrous/University of Nebraska, Lincoln

1176

High Recycled Asphalt Pavement Contents in Asphalt Mixtures, Part 1: Pros, Cons, and Fundamentals (Part 2, Session 1381)
Danny Gierhart, Asphalt Institute, presiding
Sponsored By Standing Committee on Critical Issues and Emerging Technologies in Asphalt , Standing Committee on Non-Binder Components of Asphalt Mixtures

This invited session is part 1 of 2 where the pros and cons of recycled material use within asphalt pavement is discussed. This session introduces fundamental principles that impact the effectiveness of recycled material use (primarily RAP, with some possible discussion of RAS). This session also discusses recycled materials usage trends and rejuvenators. This session is a compliment to a session that focuses on agency experiences presented in a case study format that is led by AFK30.

State of the States: Recycled Material Usage Trends (P20-20412)
Christopher Williams/Iowa State University

(continued)

Fundamentals of Binder Diffusion and Blending with Recycled Materials (P20-20413)
Pavel Kriz/Imperial Oil, Ltd.
Recycled Materials and Rejuvenators (P20-20414)
Amy Martin/Texas A&M University
Findings from the FHWA's Turner-Fairbank Recycled Laboratory and Field Experiments (P20-20415)
Jack Youtcheff/Federal Highway Administration (FHWA)

1177

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 201
Integrating Chemistry, Rheology, and Field Performance for Design of Longer-Life Asphalt Pavements
David J. Mensching, Federal Highway Administration (FHWA), presiding
Ala R. Abbas, University of Akron, presiding
Sponsored By Standing Committee on Asphalt Binders

This session highlights research being conducted to tie chemical and physical properties of field-aged asphalt materials to durability. The link between chemistry and rheology has shown to be important to understand long-term impacts on performance and will influence the design decisions of the future.

Development of a Rheology-Based Mixture Aging Model to Evaluate the Cracking Performance of Asphalt Material Over Time (P20-20433)
Runhua Zhang/University of New Hampshire
Update on NCHRP 09-61, Short- and Long-Term Binder Aging Methods to Accurately Reflect Aging in Asphalt Mixtures (P20-20740)
Ramon Bonaquist/Advanced Asphalt Technologies, LLC
A Tale of Two Deltas: Toward a Universal Framework for Asphalt Durability (P20-21012)
Michael Elwardany/Western Research Institute
Binder Compatibility: A Moving Target with Sources, Modifications, and Aging (P20-20741)
Jean-Pascal Planche/Western Research Institute

1178

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 209A
Cone Penetration Methods in Geotechnical and Geohazard State of Practice
Sponsored By Standing Committee on Engineering Geology, Standing Committee on Geotechnical Site Characterization

Generation and Evaluation of Synthetic CPT Data Using Various Spatial Interpolation Techniques (20-00348)
Md Habibur Rahman/Louisiana Department of Transportation and Development, Murad Abu-Farsakh/Louisiana Department of Transportation and Development, Navid Jafari/Louisiana Department of Transportation and Development
Development of Combined Pile-CPT Methods for Estimating the Ultimate Axial Capacity of Piles Driven in Different Soil Categories (20-00347)
Murad Abu-Farsakh/Louisiana Department of Transportation and Development, Mohsen Amirmojahedi/Louisiana Department of Transportation and Development, George Voyiadjis/Louisiana Department of Transportation and Development
Sinkhole Vulnerability Assessment Using the CPT Raveling Index (20-03198)
Ryan Shamet/University of Central Florida, Boohyun Nam/University of Central Florida
Site Characterization and Visualization Using Seismic Cone Penetration Tests (20-04888)
Santiago Caballero/South Dakota School of Mines and Technology, Tejo Bheemasetti/South Dakota School of Mines and Technology, Anand Puppala/South Dakota School of Mines and Technology, Sayantan Chakraborty/South Dakota School of Mines and Technology

Large Diameter Bridge Pile Foundation Design and Performance
Sharid Amiri, California Department of Transportation (CALTRANS), presiding
Sponsored By Standing Committee on Foundations of Bridges and Other Structures

 Evaluation of pile design methods, pile capacity criteria and performance for large diameter bridge pile foundation are presented.

Bearing Performance of Large Diameter Open-Ended Steel Pile Foundation for Bridges (20-00157)
Jiale Li/Hebei University of Technology, Xuefei Wang/Hebei University of Technology
Evaluation of Several Interpreted Pile Capacity Criteria for Large Diameter Open-Ended Piles (20-00801)
Antonio Kodsy/New York University, Nick Machairas/New York University, Magued Iskander/New York University
Coupled Versus Uncoupled Axial-Lateral Analysis of Large Diameter Piles and Drilled Shafts (20-00872)
Amirata Taghavi/University of Florida, Anand Patil/University of Florida, Michael Davidson/University of Florida, Michael McVay/University of Florida
Evaluation of Pile Design Methods for Large Diameter Open-Ended Piles (20-01294)
Nikolaos Machairas/New York University, Andrew Rizk/New York University, Magued Iskander/New York University

Behavior of Geosynthetic Reinforced Soil Through Lab and Field Testing, Numerical Modeling, and Artificial Intelligence
Munir Nazzal, University of Cincinnati, presiding
Sponsored By Standing Committee on Geosynthetics

Geosynthetic reinforced soil (GRS) is commonly used for retaining walls and bridge support. The properties and behavior of these systems are therefore very important to understand and assess. Lab and field testing are often used as one mechanism to evaluate the response of GRS to static and dynamic loading. They are also used to calibrate numerical models which can then expand the range of design parameters to measure variations in performance. Finally, the use of artificial intelligence is rising and could eventually serve to predict the behavior of GRS in the field. This session will bring together these different methods of evaluating geosynthetic reinforced soil .

Long-Term Stability of High-Speed Railway GRPS Embankment Subjected to Traffic Loading Considering Arching Effect (20-00061)
Zongqi Bi/Tongji University, Quanmei Gong/Tongji University, Jiandan Huang/Tongji University
An Experimental Study on Piled Embankment Geosynthetic Reinforced Systems with Different Pile Cap Shapes (20-01502)
Hamid Mortazavi Bak/Isfahan University of Technology, Mohammadali Rowshanzamir/Isfahan University of Technology, Sayyed M Abtahi/Isfahan University of Technology, Arman Khoshghalb/Isfahan University of Technology, Mohamadtaqi Baqersad/Isfahan University of Technology
Comparison of Field Behavior with Results from Numerical Analysis of a Geosynthetic Reinforced Soil Integrated Bridge System Subjected to Thermal Effects (20-02167)
Arshia Taeb/University of Hawaii, Phillip Ooi/University of Hawaii
An Innovative Artificial Intelligence Approach for Predicting the Bearing Capacity of Strip Footing on Reinforced Soils (20-03316)
Ali Heidaripanah/Design of Superior Pavements, Pishro Pars Rah Company, Behnaz Jahani/Design of Superior Pavements, Pishro Pars Rah Company, Maziar Moaveni/Design of Superior Pavements, Pishro Pars Rah Company, Fazlollah Soltani/Design of Superior Pavements, Pishro Pars Rah Company, Abolfazl Hassani/Design of Superior Pavements, Pishro Pars Rah Company

1181

TRB Committee Communication Coordinators: The Un-Session
Mia Zmud, Central Texas Regional Mobility Authority, presiding
Stephanie Camay, WSP, presiding
Sponsored By Section - Operations, Committee Communications Coordinators Council

Whoever said being a Committee Communication Coordinator (CCC) was easy? Bring your burning issues to this "Un-Session." The format will allow you to ask your questions, share your successes, present tutorials on communication tactics and best practices, and connect with CCC Councilmembers and like-minded CCCs. Prepare by making a list of your questions, communication triumph story, or communication tutorials and coming to the session with an open mind. Facilitators will encourage lively discussions. Expect to get hands-on tips, ideas, and tools to help you fulfill your role as a CCC in the coming year.

1182

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Salon A
Regional/Corridor Coalitions for Smarter Management and Operations: An Update of Innovative Activity
Ralph Volpe, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Regional Transportation Systems Management and Operations

This panel session will examine recent trends and innovations in establishing regional/corridor coalitions to advance better management and operations. The session will explore the purpose, scope, and characteristics of regional coalitions. In addition, the session speakers will address the benefits, challenges, and impacts resulting from the regional coalitions that they represent. Topics addressed may include technology applications; coordination with other agencies, such as emergency responders; and engagement with other service providers, such as for freight, traveler information, and public transportation. This session will consist of short presentations followed by discussion questions from the moderator and audience.

Panel Discussion (P20-21130)

Open Discussion (P20-21131)

Panelist 1 (P20-21291)
Athena Hutchins/Niagara International Transportation Technology Coalition
Panelist 2 (P20-21292)
Denise Markow/I-95 Corridor Coalition
Panelist 3 (P20-21293)
Eric Hill/MetroPlan Orlando
Panelist 4 (P20-21294)
Nicolaas Swart/Maricopa County Department of Transportation
Panelist 5 (P20-21295)
Steven Levine/TRANSCOM

1183

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 101
Recent Developments in Network-Level Modeling and Control
Hani Mahmassani, Northwestern University, presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

Investigating the Impacts of Heterogeneous Inter-Region Travel Demand and Boundary Flow Control on Urban Road Networks (20-00532)
Sunghoon Kim/Korea Advanced Institute of Science and Technology (KAIST), Monica Menendez/Korea Advanced Institute of Science and Technology (KAIST), Hwasoo Yeo/Korea Advanced Institute of Science and Technology (KAIST)

(continued)

Toward Sustainable Ridesourcing Services: A Simulation Study on the Effects of Congestion, Fleet Size, and Willingness to Share (20-01673)
Caio Vitor Beojone/Ecole Polytechnique Federale de Lausanne (EPFL), Nikolas Geroliminis/Ecole Polytechnique Federale de Lausanne (EPFL)
Resilient Multi-Variable Control of Urban Road Networks Under Cyberattacks (20-01744)
Pedro Mercader/Technion Israel Institute of Technology, Jack Haddad/Technion Israel Institute of Technology
The Role of Trip Lengths in Perimeter Control Strategies (20-01776)
Sergio Batista/New York University - Abu Dhabi Campus, Deepak Ingole/New York University - Abu Dhabi Campus, Ludovic Leclercq/New York University - Abu Dhabi Campus, Monica Menendez/New York University - Abu Dhabi Campus
Demand Management with Limited Schedule Changes in a Two-Region Urban Network (20-01933)
Sakitha Kumarage/University of Queensland, Mehmet Yildirimoglu/University of Queensland, Mohsen Ramezani/University of Queensland, Zuduo Zheng/University of Queensland

1184

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 204B
Corrosion Evaluation and Prevention in Transportation Structures
David Meggers, Kansas Department of Transportation, presiding
Sponsored By Standing Committee on Corrosion

 This session will present papers on corrosion prevention and evaluation using various materials for construction and methods for evaluation.

In Situ Corrosion Potential of Mechanically Stabilized Earth Wall Backfill (P20-21018)
Stacey Kulesza/Kansas State University
Load-Bearing Capacity and Durability of the Girder Prestressed by CFCC at 29 Years After Construction (P20-21019)
Yoshiaki Yamamoto/Tokyo Rope International Inc.
Higher Corrosion Resistance Steel Bridges (P20-21020)
Hormoz Seradj/Consultant
Development of New Load Rating Procedures for Deteriorated Steel Beam Ends: Experiments, Computations and Proposed Methods (P20-21029)
Simos Gerasimidis/University of Massachusetts, Amherst, Georgios Tzortzinis/University of Massachusetts, Amherst, Alexander Bardow/Massachusetts Department of Transportation
Different Corrosion Mitigation Methods to Increase Bridge Service Life in Virginia (P20-21030)
Stephen Sharp/Virginia Transportation Research Council, Soundar Balakumaran/Virginia Department of Transportation

1185

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 209B
Alternative Practices in Winter Maintenance
Anna Arvidsson, Swedish National Road and Transport Research Institute, presiding
Sponsored By Standing Committee on Winter Maintenance

Snow and Ice Breakers for Sustainable Winter Road Maintenance: Field Performance and Potential Benefits (20-00146)
Taimur Usman/University of Waterloo, Liping Fu/University of Waterloo, Max Perchanok/University of Waterloo, Chaozhe Jiang/University of Waterloo
Before-and-After Empirical Bayes Evaluation of Achieving Bare Pavement Using Anti-Icing on Urban Roads. (20-05050)
Maged Gouda/University of Alberta, Karim El-Basyouny/University of Alberta
Optimized Route to Clear Diverging Diamond Interchange Using Discrete Optimization Method (20-03560)
Jun Liu/Southern Illinois University, Edwardsville, Yan Qi/Southern Illinois University, Edwardsville, Na Cui/Southern Illinois University, Edwardsville, David Bergner/Southern Illinois University, Edwardsville

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Vision for Road Visibility Inspection Using Driving Video Images Recorded by On-Board Video Camera (20-043 08)

Yasuhiro Nagata/Hokkaido Development Engineering Center, Toru Hagiwara/Hokkaido Development Engineering Center, Yuki Nakamura/Hokkaido Development Engineering Center, Yasuhiro Kaneda/Hokkaido Development Engineering Center, Naoki Matsuoka/Hokkaido Development Engineering Center, Sho Takahashi/Hokkaido Development Engineering Center, Hiroshi Hoshino/Hokkaido Development Engineering Center

| 1186 |

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 207A
Regulating the Unknown: Balancing Legal and Policy Considerations for the Future of Mobility
Gregory Rodriguez, Stantec, presiding
Sponsored By Standing Committee on Transit and Intermodal Transportation Law

As planning and integration of new mobility innovations like demand-responsive transit, dockless micromobility, automated and connected vehicles, and Hyperloop continue, there are untested legal and policy issues that cannot be ignored. This session will convene a forward-thinking panel with on-the-ground experience to discuss the opportunities and challenges around the future of mobility.

Panel Discussion (P20-21083)
Susan Cleveland-Knowles/City of San Francisco, Grace Gallucci/Northeast Ohio Areawide Coordinating Agency, Kelley Coyner/Stantec, Kristin White/Minnesota Department of Transportation, Justin Erlich/Voyager Search

| 1187 |

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 202B
Suspension and Debarment: Trends and Perspectives from Government and Industry
Lisa MacPhee, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Contract Law

Experts from the Government and Industry will provide perspectives on present trends in Federal suspension and debarment actions and how those trends inform the differing perspectives of the parties involved in those actions. Trends discussed will include overall government-wide actions for suspensions, debarments, and monitoring agreements. The experts on the panel will provide perspectives on successful resolution of suspension and debarment cases, and how Government and Industry can work together to improve contract compliance and performance on transportation contracts.

Panel Discussion (P20-21079)
Duc Nguyen/U.S. Environmental Protection Agency (EPA), Rodney A. Grandon/Affiliated Monitors, Inc., Mike Wagner/Covington and Burling LLP

| 1188 |

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 103A
Tools for Transforming Road Safety Practice to Safe Systems
Shane Turner, Abley Transportation Consultants Ltd., presiding
Sponsored By Standing Committee on Transportation Safety Management Systems

Many cities and jurisdictions (countries and states) around the world, including in the USA, have or are considering Vision Zero, i.e., the goal of eliminating road fatality and serious injury crashes across their transport systems. The drive towards achieving Vision Zero requires transport authorities, road safety partners, and the public to make a major shift in the way they view road trauma and a change in road safety practice. The safe system approach enables the change to occur. This session will draw on selective safe system practices from Australia and New Zealand that are transforming road safety practice to focus on achieving Vision Zero. The main focus is in urban areas and vulnerable road users.

Safe System and Vision Zero – How it is Being Applied Around the World (P20-21098)
Seth Lajeunesse/UNC Highway Safety Research Center

(continued)

The Safe System Assessment Framework and application to Mixed Use Arterials (P20-21099)
Blair Turner/ARRB Group, Ltd.
Speed Management under Safe System Approach (P20-21100)
Shane Turner/Abley Transportation Consultants Ltd.
The Victoria Safe System/Towards Zero Approach and Challenges of Implementation (P20-21101)
Jennifer Oxley/Monash University Accident Research Centre
Safe Movement and Safe Place (P20-21102)
Jennifer Rivera-Gonzalez/Monash University

1189

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Salon B
Doctoral Student Research in Transportation Safety—Hybrid Session
Peter Savolainen, Michigan State University, presiding
Sponsored By Standing Committee on Safety Data, Analysis and Evaluation, Standing Committee on Statistical Methods

The Committees on Safety Data, Analysis, and Evaluation and Statistical Methods are pleased to sponsor a special hybrid session, which will highlight ongoing work by PhD students who are nearing the completion of their doctoral research in the area of transportation safety. This session will be composed of a series of short (3-5 minute) introductory presentations, followed by a poster session in the same venue that will allow for more extensive discussions with students on individual projects.

Application of Big Data in Transportation Safety Analysis Using Statistical and Deep-Learning Methods (P20-21666)
Ramin Arvin/University of Tennessee, Knoxville
Modeling and Evaluation of Transportation Safety Using SHRP2 Naturalistic Driving Data (P20-21667)
Nipjyoti Bharadwaj/University of Missouri, Columbia
Econometric Frameworks for Multi-Variate Models: Application to Crash Frequency Analysis (P20-21668)
Tanmoy Bhowmik/University of Central Florida
Surrogate Model for Safety Assessment of Expressways in Non-Lane-Based Mixed Traffic Conditions (P20-21669)
Anna Charly/Indian Institute of Technology, Bombay
Investigating Driver Lateral Behavior in Adverse Weather Conditions: Machine Learning Techniques Using Big Trajectory-Level Naturalistic Driving Data (P20-21670)
Anik Das/University of Wyoming
Developing a Psychophysical Car-Following Model to Estimate More Reliable Surrogate Safety Measures in Microscopic Traffic Simulation (P20-21671)
Umair Durrani/University of Windsor
Real-Time Intersection Traffic Video Understanding for Analysis of Behavior and Safety (P20-21672)
Xiaohui Huang/University of Florida
Integration of Human Factors Toward the Development of a Variable Speed Limit Algorithm Using Real-Time, Trajectory-Level Weather Data: An Application of SHRP2 Naturalistic Driving Study in Wyoming (P20-21673)
Md Nasim Khan/University of Wyoming
Real-Time Prediction of the Likelihood of Secondary Crashes on Freeways (P20-21674)
Angela Kitali/Florida International University
Developing Real-Time Crash Risk Models Using Emerging Transport Data (P20-21675)
Cheuk Ki Man/Loughborough University
The More You Know: Driver Training and Behavioral Adaptation to Driving Automation Systems (P20-21676)
Alexandria Noble/Virginia Tech Transportation Institute
Road Safety in Ghana: Analysis of Passenger Safety Evaluations and Public Transport Use (P20-21677)
Enoch Frederick Sam/Hasselt University

1190

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 103B
Using Crowdsource Data to Improve Operations and Emergency Response
Scott Parr, Embry Riddle Aeronautical University, presiding
Grady Carrick, Enforcement Engineering, Inc., presiding
Sponsored By Standing Committee on Traffic Law Enforcement, Standing Committee on Emergency Evacuations, Standing Committee on Freeway Operations

Harnessing the Knowledge of the Crowd in Kentucky: Better Informed Decisions Using Crowdsourced Data (P 20-20981)
Jason Siwula/Kentucky Transportation Cabinet
Managing Traffic with Probe Data (P20-21346)
Edward Cox/Indiana Department of Transportation
Utah Citizen Reporter App (P20-21739)
Lisa Miller/Utah Department of Transportation

1191

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 102B
Evaluation of Signs and Markings Based on User Needs
Bryan Katz, Toxcel, LLC, presiding
Sponsored By Standing Committee on User Information Systems

Freeway Traffic Sign Design for Interstate 80 Smart Corridor in California: A Driving Simulator Study (20-03907)
Pei Wang/University of California, Berkeley, Tingting Zhang/University of California, Berkeley, Xiao Zhou/University of California, Berkeley, Sanaz Motamedi/University of California, Berkeley, Ching-Yao Chan/University of California, Berkeley
Assessing the Impact of Variable Message Signs Through Prediction and Simulation (20-05868)
Panagiota Mavrogenidou/University of Thessaly Polytechnic School, Eftihia Nathanail/University of Thessaly Polytechnic School
Compromised Dynamic Message Signs and Driver Distraction (20-02797)
Kaveh Bakhsh Kelarestaghi/ICF Incorporated LLC, Alireza Ermagun/ICF Incorporated LLC, Kevin Heaslip/ICF Incorporated LLC
On-Road Signage and Driver Distraction: An Application of Machine Learning (20-01412)
Maryam Zahabi/Texas A&M University, College Station, Ashiq Mohammed Abdul Razak/Texas A&M University, College Station, Stephanie Stolte/Texas A&M University, College Station
Detecting Driver Perception Using Eye Tracking Device to Evaluate the Use of Colors for Express Lane Markers (20-05823)
Hatem Abou-Senna/University of Central Florida, Jiawei Wu/University of Central Florida, Mohamed El-Agroudy/University of Central Florida, Mustapha Mouloua/University of Central Florida, Essam Radwan/University of Central Florida

1192   CM (1.75)

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 147B
Innovative Approaches to Procuring Innovations
Amy Van Doren, Marin Transit, presiding
Sponsored By Standing Committee on Transit Management and Performance, Standing Committee on Emerging and Innovative Public Transport and Technologies

How do public transit agencies identify and implement technological solutions in a fast-paced innovative environment? This session will highlight innovative procurement processes at Metro Transit in Minneapolis St Paul, Massachusetts Bay Transportation Authority, and Los Angeles Metro. The presenters will join a panel that includes the Federal Transit Administration to discuss how to structure partnerships with the private sector and universities to identify and implement good ideas and successful projects. What are the challenges, and what have we learned?

A Performance-Based Procurement for Real-Time Predictions in Two Phases (P20-20421)
Eric Lind/Metro Transit, Minneapolis-St. Paul

(continued)

Lessons Learned from an Innovation Proposal Process (P20-20671)
Laurel Paget-Seekins/Massachusetts Bay Transportation Authority
LA Metro's Toolkit for Doing Things Differently and Doing Different Things (P20-20674)
Nolan Borgman/Los Angeles Metro
Perspective from FTA's Office of Research, Demonstration, and Innovation (P20-20807)
Vincent Valdes/Federal Transit Administration (FTA)
Consultant Perspective (P20-20808)
Carol Schweiger/Schweiger Consulting LLC

1193

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 144C
Evaluating Innovative Public Transportation Fare Policies: Low-Income Programs, Fare Capping, Incentives, and More
Andrea Hamre, Western Transportation Institute (WTI), presiding
Sponsored By Standing Committee on Public Transportation Marketing and Fare Policy

This session focuses on new and innovative public transportation fare policies. Examples of policies that will be discussed include fare reductions for low income transit riders, fare capping (or guaranteed best fares), and individualized incentive schemes. The presentations will evaluate different policy proposals or implemented changes using transit smart card data, randomized controlled trials, and other innovative methods.

The Effect of Fare Reductions on Low-Income Transit Riders: A Randomized Controlled Trial (20-02442)
Margaret Dalziel/University of Waterloo
The Development and Field Validation of a System Optimal Individualized Incentive Scheme for a Metro Transit System (20-06007)
Ali Arian/University of Arizona, Zirui (Raymond) Huang/University of Arizona, Yi-Chang Chiu/University of Arizona, Ryan Greene-Roesel/University of Arizona
Guaranteed Best Fare, a Risky Affair?: A Scenario-Based Analysis on Fare Capping Using Smartcard Fare Validation Records (20-02930)
Ka Kee Alfred Chu/Autorité régionale de transport métropolitain, André Lomone/Autorité régionale de transport métropolitain
Application of Clustering Segmentation to Better Understand Chicago Transit Authority Rider Patterns and Inform Policy Decisions (20-03691)
Mary Rose Fissinger/Massachusetts Institute of Technology (MIT), Maulik Vaishnav/Massachusetts Institute of Technology (MIT)

1194   CM (1.75)

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 144A
Recent Developments in Commuter Rail System Analysis
Walter Zullig, Metro-North RR (ret.), presiding
Sponsored By Standing Committee on Commuter Rail Transportation

Commuter rail is a dynamic form of regional rail transit that often shares tracks with Amtrak and freight railroad operations. As such it faces a myriad of special challenges that are neither absolutely rail transit nor railroad in character. This session presents recent research into the operational and policy issues unique to commuter rail systems.

Passenger Satisfaction with Commuter Train Service Quality: A Structural Equation Modeling Approach (20-008 21)
Asal Farajpour/Iran University of Science and Technology, Morteza Bagheri/Iran University of Science and Technology, Saeed Rastegar/Iran University of Science and Technology, Amir Golroo/Iran University of Science and Technology
Adjustment of Operation Delay of Suburban Express and Slow Train Based on Dynamic Passenger Flow Demand (20-01855)
lianhua Tang/Tongji University, Xingfang Xu/Tongji University
Reducing Delays on High-Density Railway Lines: A Crossrail Case Study (20-03080)
Giorgio Medeossi/crowdsourced-transport.com, Andrew Nash/crowdsourced-transport.com

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Finding the Relationship Between Travel-Time Estimation and the Accessibility to High-Speed Railway Station (20-04875)

Yuyang Zhou/Beijing University of Technology, Minhe Zhao/Beijing University of Technology, Songtao Tang/Beijing University of Technology, William Lam/Beijing University of Technology, Anthony Chen/Beijing University of Technology, N.N. Sze/Beijing University of Technology, Yanyan Chen/Beijing University of Technology

Integrated Optimization of Train Services Plan and Passenger Flow Control on an Oversaturated Suburban Metro Line (20-04911)

Jiajie Li/Beijing Jiaotong University, Yun Bai/Beijing Jiaotong University, Tang Li/Beijing Jiaotong University, Zhongsheng Xiao/Beijing Jiaotong University, Wen Zhou/Beijing Jiaotong University

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1195

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 145B

Maximizing Synergies Between Passengers and Performance: How People Live, Work, and Interact with High-Speed Rail

Erik Steavens, SL King and Associates, presiding

Sponsored By Standing Committee on Intercity Passenger Rail

Exploring Intercity Trip Patterns of Railway Systems on National Holidays Using Deep Auto-Encoder (20-05666)

Wen-Yu Lee/National Taiwan University, Yu-Ting Hsu/National Taiwan University, Chian-Shan Suen/National Taiwan University, Ming-Hsuan Wu/National Taiwan University, Ying-Chuan Ni/National Taiwan University

Considering Multiple Perspectives to Better Understand the Urbanization Impacts of High-Speed Rail in China (20-00260)

Taotao Deng/Simon Fraser University, Anthony Perl/Simon Fraser University, Dandan Wang/Simon Fraser University, Yulin Yan/Simon Fraser University

Research on Differential Pricing of High-Speed Railway Based on Prospect Theory in China (20-00593)

Wenxuan Qu/Central South University, Jin Qin/Central South University, Xuanke Wu/Central South University, Yijia Zeng/Central South University

A Comparison of High-Speed Rail Operations in Two Typical Areas of Japan and China (20-01018)

Lu Chen/Tongji University, Tomio Miwa/Tongji University, Takayuki Morikawa/Tongji University, Ruihua Xu/Tongji University

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1196

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 150A

Railway Capacity and Performance—Hybrid Session

Tyler Dick, University of Illinois, Urbana Champaign, presiding

Mohd Rapik Saat, Association of American Railroads (AAR), presiding

Sponsored By Standing Committee on Freight Rail Transportation, Standing Committee on Railroad Operating Technologies, Subcommittee on Rail Capacity

This hybrid session combines lectern and poster presentations to highlight recent advances in research on railway capacity and performance. During the first portion of the session, a five-minute lectern presentation will be given for each research paper. Once all of the papers have been presented, the remainder of the session will be used to display research posters on the presented papers. The poster portion of the session allows attendees to engage with the authors and discuss their mathematical modeling, optimization and simulation research work in more detail. It also allows authors to network and discuss their respective research topics in a more interactive environment than a traditional lectern session.

A Simplified Capacity Model Considering Heterogeneous Traffic of Trains (20-00854)

Kyung Min Kim/S K Innovation, Suk-Moon Oh/S K Innovation, Bum Hwan Park/S K Innovation, Suk-Joon Ko/S K Innovation

Allocating Railway Capacity Using Simulated Annealing and Tabu Search (20-03508)

Heehyeon Jeong/Korea Rail Network Authority, Hyunseung Kim/Korea Rail Network Authority, Injae Jeong/Korea Rail Network Authority, Dongjoo Park/Korea Rail Network Authority

Integrated Overnight Train Scheduling and Maintenance Planning for High-Speed Railway Lines (20-00490)

Shuguang Zhan/Hong Kong University, Dian Wang/Hong Kong University, Qiyuan Peng/Hong Kong University, Wentao Zhou/Hong Kong University

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Multi-Objective Capacity Estimation on Railway Networks: A Timetable Saturation Approach Based on Time-Space Networks (20-02298)
Zhengwen Liao/Beijing Jiaotong University, Jianrui Miao/Beijing Jiaotong University, Haiying Li/Beijing Jiaotong University, Francesco Corman/Beijing Jiaotong University

Modeling Rail System Delay Influences to Support Improved Delay Propagation Prediction (20-02806)
ZhongCan Li/Southwest Jiaotong University, Ping Huang/Southwest Jiaotong University, CHAO WEN/Southwest Jiaotong University, Weiwei Mou/Southwest Jiaotong University, Xinyue xu/Southwest Jiaotong University

Dynamic Rail Freight Car Fleet Sizing Problem with Look-Ahead for a Coordinated Rail Fleet Planning System (20-00719)
Hajar Kazemi Zahrani/Islamic Azad University Najafabad Branch, Mohammad H. Nadimi-Shahraki/Islamic Azad University Najafabad Branch, Hamid R. Sayarshad, PhD/Islamic Azad University Najafabad Branch

Lean Railroading for Improving the Efficiency of Iron Ore Loading, Unloading, and In-Transit Operation: A Case Study of Planimate Simulation (20-03369)
Hamed Mehranfar/Iran University of Science and Technology, Morteza Bagheri/Iran University of Science and Technology, Melody Khadem Sameni/Iran University of Science and Technology

Rail Bundling Policy Evaluation for Port to Hinterland Transport: A Combination of Serious Gaming, Simulation, and Optimization (20-03497)
IOANNA KOUROUNIOTI/Delft University of Technology, Dimitrios Karampelas/Delft University of Technology, Lóránt Tavasszy/Delft University of Technology, Yousef Maknoon/Delft University of Technology, Mark Duinkerken/Delft University of Technology

Forecasting Railroad Fuel Consumption by Train Type (20-04814)
Denver Tolliver/Upper Great Plains Transportation Institute, Pan Lu/Upper Great Plains Transportation Institute

Components of Minimum Total Energy Requirements for Rail (20-05221)
H. Kirk Mathews/GE Research, James Brooks/GE Research

1197

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 143C
Innovations in Rail Transit System Structures
John Lobo, HDR, presiding
Sponsored By Standing Committee on Rail Transit Infrastructure

Asset Management: Focus on Bridges (P20-21352)
David Burrows/Gannett Fleming Inc., Frank Palmeri/Washington Metropolitan Area Transit Authority
Rail Structure Interaction on a Long Transit Structure (P20-21353)
Ying Tan/HDR
Installation of Direct Fixation Track on Transit Bridges (P20-21354)
Jennifer Holder/Balfour Beatty Infrastructure, Inc.
RSI for Complex Bridges in California High-Speed Rail Project (P20-21355)
Ebadollah Honavar/Jacobs

1198

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 147A
Global Trade Disruptions: Impacts on the Transportation System
Juan Carlos Villa, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on International Trade and Transportation, Standing Committee on Agriculture and Food Transportation

In recent years, international trade policies have changes bringing havoc on global supply chains. These changes have the multimodal transportation system stakeholders reacting to keep the transportation system efficient and competitive. The goal of the session is to discuss how rail carriers, ports, states and federal officials in the U.S. and abroad are approaching international trade flow disruptions of planning for the future.

Global Trade Disruptions: Impacts in the Transportation System, the Port of Los Angeles Experience (P20-20823)
Eugene Seroka/Port of Los Angeles

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Global Trade Disruptions: Impacts in the Transportation System, U.S. Customs and Border Protection Experience (P20-20824)
Manuel Garza/U.S. Customs and Border Protection
Global Trade Disruptions: Impacts in the Transportation System: Kansas City Southern Experience (P20-20901)
Brian Hancock/Kansas City Southern Railway Company
Global Trade Disruptions: Impacts in the Transportation System: Brexit Potential Impacts (P20-20902)
Maximilian Bauernfeind/Austrian Ministry for Transport, Innovation and Technology

1199   CM (1.75)

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 144B
Barriers to Increasing Truck Parking Supply and Availability
Elliot Martin, University of California, Berkeley, presiding
Sponsored By Standing Committee on Trucking Industry Research, Standing Committee on Truck and Bus Safety, Standing Committee on Freight Transportation Economics and Regulation

The demand for truck parking spaces has increased in recent years with the increased truck traffic associated with the strong economy. While the demand for truck parking has grown, the number of truck parking spaces has not kept pace with demand, particularly within metropolitan areas. This has created shortages in truck parking, particularly in localized areas of high demand, such as metropolitan areas. As a result, the issue continues to be reported as a leading concern in the trucking industry. This panel explores the deeper challenges and dynamics of truck parking supply and availability from several perspectives in the industry including government, the truck parking industry, the truck driving industry, and other stakeholders.

Panel Discussion (P20-21616)
Rickey Fitzgerald/Florida Department of Transportation, Lisa Mullings/NATSO, Darrin Roth/American Trucking Associations, Tom Kearney/Federal Highway Administration (FHWA), Thomas Weakley/Owner-Operator Independent Drivers Association Foundation, Inc. (OOIDA)

1200

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 143A
Impact of Airspace Users on Capacity
Yu Zhang, University of South Florida, presiding
Sponsored By Standing Committee on Airfield and Airspace Capacity and Delay

Untapped Capacity at Single-Runway Airports: Short Final Curved Approach, Double Glide Slope, and Double Threshold (20-00697)
Vojin Tosic/University of Belgrade - Faculty of Transport and Traffic Engineering, Bojana Mirkovic/University of Belgrade - Faculty of Transport and Traffic Engineering
A Study of Runway Capacity Limits by Simulating Runway Operations with Application of Dynamic Wake Separations (20-00770)
Julio Roa/California State University, Fresno, Antonio Trani/California State University, Fresno, Junqi Hu/California State University, Fresno, Navid Mirmohammadsadeghi/California State University, Fresno
A Deep Unsupervised Approach for Airspace Complexity Evaluation (20-01169)
Biyue Li/Beihang University, Wenbo Du/Beihang University, Yu Zhang/Beihang University, Xianbin Cao/Beihang University

1201

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 143B
International Aviation: A Look at Airfield Research and Projects Worldwide
Rita Fortes, Latersolo Engineering, presiding
Sponsored By Standing Committee on Aircraft/Airport Compatibility, International Members Council-Aviation

New ICAO Pavement Rating System: The Aircraft/Pavement Classification Rating (P20-20380)
cyril FABRE/Airbus Industrie

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Research and Innovation in Airport Pavement Construction: A Case Study of Singapore Changi East Development (P20-20385)
Ghim Ong/National University of Singapore, Choon San/Changi Airport Group (Singapore) Private Limited
Latin American and Caribbean Association of Airfield Pavements and Its Contributions to Airfield Pavements (P 20-20386)
Fernando Ratto/ALACPA
From the Field to the Field: The Infrastructure Workgroup of the French-Speaking Airports (P20-20387)
Gael Le Bris/WSP, FRANCOIS JULLEMIER/GROUPE ADP
Precast Concrete Airfield Pavement Rehabilitation Pilot Project at Vancouver International Airport (P20-20388)
David Anderson/Associated Engineering

1202

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 149
Applications of Automatic Identification System Data for Port Performance Estimation
Loukas Dimitriou, University of Cyprus, presiding
Sponsored By Standing Committee on Ports and Channels

This session will present research for marine port performance estimation using Automatc Identification System (AIS) data.

Intensity of Maritime Activities at Major U.S. Ports: A Ports Activity Score Index (20-01149)
Felix Ammah-Tagoe/E-Ternational Research Consulting, Monique Fahie/E-Ternational Research Consulting, Douglas Scheffler/E-Ternational Research Consulting, Senanu Ashiabor/E-Ternational Research Consulting
An AIS Data–Based, One-Way Traffic Delay Analysis in Houston Ship Channel (20-03134)
Uttara Roy/Lamar University, Sepideh Zohoori/Lamar University, Xing Wu/Lamar University, Maryam Hamidi/Lamar University
Development of Seaport Berth Utilization Measures Using Vessel AIS Data (20-05229)
Makarand Gawade/HDR, Brittany Wood/HDR, Jerry Scott/HDR
Container Ship Size: Which Dimensions Can Be Expected? (20-04622)
Javier Garrido/Center For Innovation in Transport - CENIT, Sergi Saurí/Center For Innovation in Transport - CENIT, África Marrero/Center For Innovation in Transport - CENIT, Ümit Gül/Center For Innovation in Transport - CENIT, Carles Rúa/Center For Innovation in Transport - CENIT

1203

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, 146C
FHWA Leadership in Innovation
Tony Furst, Federal Highway Administration (FHWA), presiding
Sponsored By Executive Committee

Research to Practice - The session will highlight the importance of implementing and deploying research results into practice. It will cover perspectives from the practitioner, how to monitor research along the continuum from idea to deployable result, pathways to operationally test innovations that are ready or deploy innovations that are proven, and ensuring that the skills to deploy the innovations are included in the research to practice endeavor.

Research to Practice (P20-21740)
Brian Ness/Idaho Transportation Department
Technology Readiness (P20-21797)
Hari Kalla/Federal Highway Administration (FHWA)
Technology Delivery Options (P20-21798)
Thomas Harman/Federal Highway Administration (FHWA)
Workforce Readiness (P20-21799)
Karen Bobo/Federal Highway Administration (FHWA)

1204

Combating Human Trafficking in the Transportation Sector: Everyone Has a Role
Joel Szabat, US Department of Transportation - OST, presiding
Sponsored By Executive Committee

This panel on human trafficking will be comprised of DOT leadership and members of the DOT Advisory Committee on Human Trafficking (ACHT), who represent transportation stakeholders across the industry. January is annually proclaimed to be National Human Trafficking Prevention and Awareness month and 2020 marks the 20th anniversary of the passage of Trafficking Victims Protection Act, the landmark legislation on human trafficking. Leaders across the transportation industry will underscore the importance of all transportation stakeholders having active and actionable roles in combating human trafficking.

Panel Discussion (P20-21660)
Catherine Bailey/U. S. DOT Advisory Committee on Human Trafficking, Nicole Clifton/United Parcel Service (UPS), Kendis Paris/Truckers Against Trafficking, Keith Slotter/Jet Blue Airways

1205

Agility in Transportation Agencies Through Effective Performance Management
Mara Campbell, Jacobs, presiding
Praveen Pasumarthy, Cambridge Systematics, Inc., presiding
Sponsored By Standing Committee on Performance Management

This informative poster session will feature papers submitted to the Performance Management Committee (ABC30).

Utilizing Taxi GPS Trajectory Data to Optimize the Spatial Layout of Urban Taxi Stands (20-00853) - A204
Xin Wang/Jilin University, Zhaowei Qu/Jilin University, Xianmin Song/Jilin University, Haitao Li/Jilin University, Zhaotian Pan/Jilin University
Analyzing Characteristics of the Unreliable Segments of the National Highway System Across Southeastern States of the United States (20-01453) - A205
Chowdhury Siddiqui/South Carolina Department of Transportation
A Probability-Based Model for Queue Service Time Distribution Estimation Using Accumulative Vehicle Trajectory Data (20-01568) - A206
Jiachao Liu/Southeast University, Chengchuan An/Southeast University, Jingxin Xia/Southeast University, Ruicheng Xiong/Southeast University, Hanjun Ye/Southeast University
A Data-Driven Approach to Derive Traffic Intersection Geography Using High-Resolution Controller Logs (20-03 381) - A207
Dhruv Mahajan/University of Florida, Tania Banerjee/University of Florida, Yashaswi Karnati/University of Florida, Anand Rangarajan/University of Florida, Sanjay Ranka/University of Florida
Analyzing Velocity Dispersions of Probe Vehicle Data: A Linear Mixed Model Approach (20-04376) - A208
Hiromichi Yamaguchi/Kanazawa University, Shoichiro Nakayama/Kanazawa University
A Pervasive Framework Toward Sustainability and Smart Growth: Assessing Multi-Faceted Transportation Performance Measures for Smart Cities (20-04647) - A209
Ahmad Feizi/Western Michigan University, Shinhye Joo/Western Michigan University, Valerian Kwigizile/Western Michigan University, Jun-Seok Oh/Western Michigan University
Using Third-Party Data for Congestion Performance Measures in Highway Project Prioritization (20-05522) - A2 10
Mei Chen/Kentucky Transportation Cabinet, Xu Zhang/Kentucky Transportation Cabinet, Fahmida Rahman/Kentucky Transportation Cabinet, Eileen Vaughan/Kentucky Transportation Cabinet, Reginald Souleyrette/Kentucky Transportation Cabinet
Travel Time Uncertainty Prediction in the Presence of Non-Recurrent Traffic Congestions (20-04865) - A211
Zilin Bian/New York University, Kaan Ozbay/New York University, Abdullah Kurkcu/New York University
A Hierarchical Bayesian Model for Estimating Left Behind Patterns in the Metro System Using AFC Data and Train Timetable Data (20-02920) - A212
Chao Yu/Beijing Jiaotong University, Haiying Li/Beijing Jiaotong University, Xinyue xu/Beijing Jiaotong University, Jun Liu/Beijing Jiaotong University, Qi Sun/Beijing Jiaotong University

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Hot Topics in Urban Transportation: Micromobility and Beyond

Julia Salinas, Los Angeles County Metropolitan Transportation Authority, presiding

Sponsored By Standing Committee on Transportation Issues in Major Cities

Hot topics in urban transportation feature research on micromobility and management of curb space from multiple vintage points. Policies, regulations and operations are addressed across mulitple cities for scooters, dockless bikeshare and other micromobility modes. Cycling infrastructure and mobility on demand round out the session.

Data-Driven Methods for Effective Micromobility Parking (20-03135) - A130

William Barbour/Vanderbilt University, Michael Wilbur/Vanderbilt University, Ricardo Sandoval/Vanderbilt University, Caleb Van Geffen/Vanderbilt University, Brandon Hall/Vanderbilt University, Abhishek Dubey/Vanderbilt University, Daniel Work/Vanderbilt University

Comparative Review of Peer City Scooter Policy: City-to-City and Temporal Assessment (20-06050) - A131

Caroline Janssen/Vanderbilt University, William Barbour/Vanderbilt University, Erin Hafkenschiel/Vanderbilt University, Mark Abkowitz/Vanderbilt University, Craig Philip/Vanderbilt University, Daniel Work/Vanderbilt University

Key Factors Determining the Adoption of Moped Scooter Sharing in Urban Areas: The Case of Spain (20-00292) - A142

Álvaro Aguilera-García/Universidad Politécnica de Madrid, Juan Gomez/Universidad Politécnica de Madrid, Natalia Sobrino/Universidad Politécnica de Madrid, Jose Manuel Vassallo/Universidad Politécnica de Madrid

A Spectrum of Bikeshare Regulation: Dockless Bikeshare Ordinances and Policies in America's Largest Cities (20-00067) - A143

James Wood/Center for Transportation Equity, Decisions and Dollars, Shima Hamidi/Center for Transportation Equity, Decisions and Dollars, Jinat Jahan/Center for Transportation Equity, Decisions and Dollars

Dockless E-Scooter Usage Patterns and Urban Built Environments: A Comparison Study of Austin, Texas, and Minneapolis, Minnesota (20-04334) - A144

Shunhua Bai/University of Texas, Austin, Junfeng Jiao/University of Texas, Austin

Context-Sensitive Strategies for Evaluating the Potential Benefits of Micromobility with Insights from Chicago's Public E-Scooter Sharing Pilot Program (20-06004) - A145

Christopher Smith/DePaul University, Joseph Schwieterman/DePaul University

Shared E-Scooter: Business, Pleasure, or Transit? (20-02221) - A146

Pascal Van Hentenryck/Georgia Institute of Technology (Georgia Tech), William Espinoza/Georgia Institute of Technology (Georgia Tech), Julia Lane/Georgia Institute of Technology (Georgia Tech), Matthew Howard/Georgia Institute of Technology (Georgia Tech)

The Canadian Bikeway Comfort and Safety Classification System: A Common Naming Convention for Cycling Infrastructure (20-00903) - A147

Meghan Winters/Simon Fraser University, Moreno Zanotto/Simon Fraser University, Gregory Butler/Simon Fraser University

Parking Violations: The Frequency of Improper Scooter, Bike, and Car Parking (20-02685) - A148

Anne Brown/Univeristy of Oregon, Nicholas Klein/Univeristy of Oregon

Municipal Adaptation to Changing Curbside Demands: Findings from Semi-Structured Interviews with 10 U.S. Cities (20-05595) - A141

Polina Butrina/Transpo Group, Scott Le Vine/Transpo Group, Alejandro Henao/Transpo Group, Joshua Sperling/Transpo Group, Stanley Young/Transpo Group

Scenario Planning for the Future of Disruptive Transportation Technologies: A Community-Partnered Approach (20-05653) - A140

Muhammad Habib/Dalhousie University, Katie Walker/Dalhousie University

Simulation and Evaluation of Automated Mobility On-Demand Strategies in Dense Transit-Oriented Cities (20-05237) - A134

Jimi Oke/University of Massachusetts, Amherst, Arun Akkinepally/University of Massachusetts, Amherst, Siyu Chen/University of Massachusetts, Amherst, Youssef Aboutaleb/University of Massachusetts, Amherst, Yifei Xie/University of Massachusetts, Amherst, Bat-hen Nahmias-Biran/University of Massachusetts, Amherst, Carlos Lima Azevedo/University of Massachusetts, Amherst, P. Christopher Zegras/University of Massachusetts, Amherst, Joseph Ferreira/University of Massachusetts, Amherst, Moshe Ben-Akiva/University of Massachusetts, Amherst

Bundled Mobility Passes in Chicago: Consumer Preference and Revenue Implications (20-02754) - A133

Apaar Bansal/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT)

(continued)

Unsupervised Learning Combined Model for Traffic Congestion Assessment of Metropolitan Areas (20-04309) - A139

Alexander Lee/Los Alamos National Laboratory, Wei-Hua Lin/Los Alamos National Laboratory

A Needs-Gap Analysis of Street Space Allocation (20-05348) - A138

Gabriel Lefebvre-Ropars/Ecole Polytechnique de Montreal, Catherine Morency/Ecole Polytechnique de Montreal, Paula Negron-Poblete/Ecole Polytechnique de Montreal

Do Ridesharing Services Crowd Out Taxi Cabs?: Ridesharing Trips, Taxi Trips, and Traffic Speed in New York City (20-02331) - A137

Quanquan Chen/3333 Broadway, Fei Li/3333 Broadway, Jialei Cheng/3333 Broadway, Zhan Guo/3333 Broadway

The Street Grid and Car Ownership: Trends in U.S. Transportation Network Design (20-00153) - A136

Geoff Boeing/University of Southern California

Can Car-Lite Policies Reduce Private Vehicle Ownership?: Evidence from Singapore Using Agent-Based Microsimulation (20-00396) - A135

Rounaq Basu/Massachusetts Institute of Technology (MIT), Joseph Ferreira/Massachusetts Institute of Technology (MIT)

Measuring Policy Leakage of Beijing's Car Ownership Restriction in Neighboring Cities (20-01144) - A132

Yunhan Zheng/Massachusetts Institute of Technology (MIT), Joanna Moody/Massachusetts Institute of Technology (MIT), Shenhao Wang/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT)

Location Design of Electrification Road in Transportation Networks for On-Way Charging (20-03713) - A149

No Other Authors /No Organization

1207

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Understanding and Modeling Heterogeneous Travel and Traffic in Developing Countries

Samuel Zimmerman, The World Bank, presiding

Sponsored By Standing Committee on Transportation in the Developing Countries

Investigating Performance of a Novel Safety Measure for Assessing Potential Rear-End Collisions: An Insight Representing a Scenario in Developing Nation (20-04359) - A100

Narayana Raju/Sardar Vallabhbhai National Institute of Technology, Surat, Aayush Jain/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Gaurang Joshi/Sardar Vallabhbhai National Institute of Technology, Surat

Modeling Freight Trip Generation and Establishment Classifier for Developing Countries (20-04590) - A101

Marimuthu Venkadavarahan/National Institute of Technology, Calicut, Sankaran Marisamynathan/National Institute of Technology, Calicut

Parent's Time Allocation in Low-Income Households: A Case Study of Bhubaneswar, India (20-04897) - A111

Punyabeet Sarangi/Indian Institute of Technology, Delhi, Manoj M/Indian Institute of Technology, Delhi

Link Cost Function and Link Capacity for Mixed Traffic Network (20-05002) - A102

AATHIRA K. DAS/Indian Institute of Technology, Madras, Bhargava Chilukuri/Indian Institute of Technology, Madras

Modeling and Analysis of Longitudinal Response of Vehicles Using Mixed Traffic Trajectory Data by Considering the Effects of Size Differential Interaction, Areal Density, and Driving Regimes (20-05842) - A103

Kavitha Madhu/Indian Institute of Technology, Madras, Karthik Srinivasan/Indian Institute of Technology, Madras, R. Sivanandan/Indian Institute of Technology, Madras

Lessons Learned and Challenges on Travel Surveys and Forecasting in Urban Transportation Studies of Developing Countries (20-06115) - A104

Sadayuki Yagi/ALMEC Corporation, Hirohisa Kawaguchi/ALMEC Corporation, Deo Nobel/ALMEC Corporation

Time Dimension Analysis: Comparison of Nanjing Local Driving Cycles in 2009 and 2017 (20-00143) - A105

Yang Yang/Southeast University, Tiezhu Li/Southeast University, Tao Zhang/Southeast University, Qian Yu/Southeast University

Micro-Level Speed Choice Behavior on a Rural Highway in an Heterogeneous Traffic Environment: A Latent Class Modeling Approach (20-00744) - A106

S.M. Sohel Mahmud/University of Queensland, Luis Ferreira/University of Queensland, Md. Hoque/University of Queensland, Ahmad Tavassoli/University of Queensland

How Public Services Configuration Impacts Visitors' Travel Behaviors: The Case of Chinese County (20-01437) - A107

Weicen Ling/Southeast University, Qian Chen/Southeast University, Yue Zheng/Southeast University, Tan Chen/Southeast University

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Travel Behavior Effects of Rural-Urban Migration in Indonesia: A Difference-in-Differences Estimator (20-01716) - A114

Alyas Widita/Georgia Institute of Technology (Georgia Tech), Timothy Welch/Georgia Institute of Technology (Georgia Tech)

Analysis of Intermodal Travel Behavior: A Case Study from the Nanjing Metropolitan Area (20-02621) - A108

Jiao Ye/Southeast University, Mikkel Thorhauge/Southeast University, Yu Jiang/Southeast University, Jun Chen/Southeast University, Otto Nielsen/Southeast University

Identifying Optimal Reconstruction Plans for Separating Trucks and Passenger Vehicles System for Urban Intersections (20-03056) - A109

Jie Ma/Southeast University, Lin Cheng/Southeast University, Dawei Li/Southeast University, Senlai Zhu/Southeast University, Qiang Tu/Southeast University

A Multi-Variate Modeling Analysis of Commuters' Non-Work Activity Allocations in Xiaoshan District of Hangzhou, China (20-03764) - A110

Xin Guan/Tongji University, Xin Ye/Tongji University, Cheng Shi/Tongji University, Yajie Zou/Tongji University

A Conceptual Framework to Determine Safe Speed for Negotiating Horizontal Curves on Two-Lane Highways in India (20-04433) - A113

SUDIPA CHATTERJEE/The World Bank, SUMIT BIRHADE/The World Bank, Sudeshna Mitra/The World Bank

An Exploratory Analysis of Activity Participation and Travel Patterns of Pilgrims in the World's Largest Mass Religious Gathering: A Case Study of Kumbh Mela Ujjain, India (20-00949) - A112

Ashish Verma/Indian Institute of Science, Meghna Verma/Indian Institute of Science, Vivek Yadav/Indian Institute of Science, Punyabeet Sarangi/Indian Institute of Science, Manoj M/Indian Institute of Science

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1208

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Transportation Policy Making and Public Transportation Provision: Process and Impacts in Developing Countries

Manjiri Akalkotkar, VIA Metropolitan Transit, presiding
Sponsored By Standing Committee on Transportation in the Developing Countries

Impact of Risk and Benefit on the Intention of Shared Parking in Residential Areas (20-00363) - A116

Jin Xie/Ningbo University, Xiaofei Ye/Ningbo University, Xingchen Yan/Ningbo University, Lili Lu/Ningbo University

Can "Congestion Pricing" Equilibrate Boarding Passengers' Queue Length on the Metro Station Platform?: A Case Study in Nanjing City, China (20-01181) - A117

Jiajie Yu/Southeast University, Yanjie Ji/Southeast University, Junyi Chen/Southeast University, Jining Zhang/Southeast University, Xiaoyu Shi/Southeast University, Siyu Gu/Southeast University

Impact of the MRT Jakarta on Congestion: Evidence from a Before-After, Treatment-Control Evaluation Using Big Data (20-01815) - A115

Alyas Widita/Georgia Institute of Technology (Georgia Tech), Timothy Welch/Georgia Institute of Technology (Georgia Tech), Deden Rukmana/Georgia Institute of Technology (Georgia Tech), Andyan Diwangkari/Georgia Institute of Technology (Georgia Tech)

Measuring the Effects of the 2018 Taxicab Fare Increase in Greater Tunis (20-02077) - A118

Simon Saddier/TRANSITEC Consulting Engineers Ltd, Chris Harding/TRANSITEC Consulting Engineers Ltd, Cyrine Mlaouah/TRANSITEC Consulting Engineers Ltd

TOD Potential and the 6Ds in the Spatial Context of a Developing City: Comparison Among Planned and Unplanned Neighborhoods (20-02431) - A119

Afsana Haque/The University of Hong Kong, Rebecca Chiu/The University of Hong Kong

The Impact of Awareness Raising to Promote Public Bus for School Travel in Developing Cities: A Case Study in Semarang City, Indonesia (20-03094) - A122

SudarmantoBudi Nugroho/Institute for Global Environmental Strategies

Mapping of Bus Travel Time to Stream Travel Time Using Econometric Modeling (20-03692) - A121

Sharmili Banik/Indian Institute of Technology, Madras, Lelitha Vanajakshi/Indian Institute of Technology, Madras, Darcy Bullock/Indian Institute of Technology, Madras

Innovative Data Collection and Processing Methods for Mapping Liberian Roads (20-03958) - A123

Michael Baicker/Booz Allen Hamilton, Inc., Phil Zager/Booz Allen Hamilton, Inc., Sarah Hoban/Booz Allen Hamilton, Inc., Drew Quinton/Booz Allen Hamilton, Inc., Stephanie Fischer/Booz Allen Hamilton, Inc.

Modal Mismatch and Accessibility Gap in Dhaka: A Time-of-Day-Based Approach (20-04467) - A124

Paromita Nakshi/Bangladesh University of Engineering and Technology, Anindya Debnath/Bangladesh University of Engineering and Technology

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Assessing the Impacts of Autonomous Bus-on-Demand Based on Agent-Based Simulation: A Case Study of Fuyang, Zhejiang, China (20-04795) - A120

Zhikang Zhai/Tongji University, Ying Yang/Tongji University, Yu Shen/Tongji University, Yuxiong Ji/Tongji University, Yuchuan Du/Tongji University

Walkability in Developing Countries: Problems and Solutions (20-04987) - A125

Khaled Shaaban/Qatar University

Evaluation of Public Bus Comfort Considering Socioeconomic, Demographic, and Trip Attributes (20-05409) - A 126

Md. Anik/Islamic University of Technology (IUT), Moinul Hossain/Islamic University of Technology (IUT), Md. Asif Raihan/Islamic University of Technology (IUT), Safkat Tajwar Ahmed/Islamic University of Technology (IUT), Md. Mobasshir Rashid/Islamic University of Technology (IUT)

Urban Transit Accessibility Analysis Using Big Data: A Case Study of Nanjing, China (20-05695) - A127

MEINA ZHENG/Southeast University, Xiucheng Guo/Southeast University, Feng Liu/Southeast University, Xinyue Lei/Southeast University

Policy Process Management of Urban Bus Improvement in Developing Cities: A Case Study from Hanoi, Vietnam (20-00373) - A128

Tung Nguyen/The University of Tokyo, Binh Phan/The University of Tokyo, Hironori Kato/The University of Tokyo

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1209

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

New Modeling Contexts: Nothing Beats a Good Data Source

Jeffrey LaMondia, Auburn University, presiding

Sponsored By Standing Committee on National Transportation Data Requirements and Programs

Specification of Route Switching Behavior Reflecting Reference Alternative in Long-Distance Travel: A Case Study in Korea (20-02103) - A225

Sunghoon Jang/Seoul National University, Doosun Hong/Seoul National University, Chungwon Lee/Seoul National University

A Regional Assessment of Crash Reporting Processes (20-02438) - A226

Shane Warmbrodt/University of Idaho, Kevin Chang/University of Idaho, Ellen Simpson/University of Idaho, David S. Hurwitz/University of Idaho

A Comprehensive Review of High-Priority Information Needs and Travel Data Sources (20-03356) - A227

Aly Tawfik/California State University, Fresno, Dr. Eazaz Sadeghvaziri/California State University, Fresno

Development and Assessment of County-Level National Long-Distance Travel Accessibility Measures for Planning Applications (20-04539) - A228

Jacob McGhee/Auburn University, Jeffrey LaMondia/Auburn University

Traveling Long Distance with Bad Conscience?: Discrepancies Between Everyday and Long-Distance Travel of Urbanites (20-06043) - A229

Miriam Magdolen/Karlsruhe Institute of Technology, Sascha von Behren/Karlsruhe Institute of Technology, Bastian Chlond/Karlsruhe Institute of Technology, Peter Vortisch/Karlsruhe Institute of Technology

Has the Younger Population's Vehicle Availability Changed Over the Years?: A Comparative Analysis of the Recent National Household Travel Surveys (20-03538) - A230

Emmanuel Adanu/University of Alabama, Jun Liu/University of Alabama, Margaret McNamara/University of Alabama, Praveena Penmetsa/University of Alabama, Abhay Lidbe/University of Alabama, Xiaobing Li/University of Alabama, Alex Hainen/University of Alabama

What Counts as Commute Travel?: Identification and Resolution of Key Issues Around Measuring Complex Commutes in the National Household Travel Survey (20-05340) - A231

Gwen Kash/Georgia Institute of Technology (Georgia Tech), Patricia Mokhtarian/Georgia Institute of Technology (Georgia Tech)

Census Transportation Planning Products 2012–2016: New Data Analyses and Uses
Clara Reschovsky, OST-R/Bureau of Transportation Statistics, presiding
Kathleen Yu, North Central Texas Council of Governments, presiding
Sponsored By Standing Committee on Urban Transportation Data and Information Systems

New CTPP data was released in March 2019 for the years 2012 to 2016. These posters will share how users of the new data are utilizing the data for analysis and visualization as well as provide assessments of the data.

Validation of the OKI Activity-Based Model Using the 2012–2016 CTPP (P20-20106) - A213
Liren Zhou/OKI Regional Council of Governments
Park-and-Ride Market Size Estimator (P20-20109) - A214
Yohan Chang/Korea Research Institute for Human Settlements, Kyeongsu Kim/Connetics Transportation Group, Ashutosh Kumar/Connetics Transportation Group, Khalilah Ffrench/Florida Department of Transportation
An Agent-Based Simulation Model of Autonomous Vehicles Based on CTPP Commuting Data (P20-20111) - A215
Hua Cai/Purdue University, Konstantina (Nadia) Gkritza/Purdue University, Zimo Zhang/Purdue University
Estimation of Dynamic Origin-Destination Demand Using Day-to-Day Traffic Counts and CTPP Journey-to-Work Flow Data (P20-20113) - A216
Wei Ma/Carnegie Mellon University, Sean Qian/Carnegie Mellon University
Optimization and Utilization of CTPP Data in Regional and Local Transportation Planning Projects (P20-20114) - A217
Jiaxu Zhou/AECOM, Kaiqi Zhang/AECOM
Regional Commute Atlas: NY-NJ-CT-PA Commuters Working in Manhattan and Other Key Business Districts (P20-20115) - A218
Eunah Kang/The Port Authority of New York and New Jersey, He Zhang/University of Pennsylvania
Exploring Mobility Inequality Using CTPP Data (P20-20118) - A219
Chieh (Ross) Wang/Oak Ridge National Laboratory, Shih-Miao Chin/Oak Ridge National Laboratory, Ho-Ling Hwang/Oak Ridge National Laboratory, Hyeonsup Lim/Oak Ridge National Laboratory, Yuandong Liu/Oak Ridge National Laboratory
Using Available Data Sources on Work-at-Home Characteristics to Forecast the Potential Effects of Telecommuting Incentives (P20-20119) - A220
Kevin Tierney/Bird's Hill Research
Exploring a Measure of Commuting Burden for Low-Income Workers in Indiana Using Census Transportation Planning Products Program Data (P20-20121) - A221
Davis Chacon-Hurtado/Purdue University, Indraneel Kumar/Purdue University, Konstantina (Nadia) Gkritza/Purdue University, Jon D. Fricker/Purdue University
Understanding Missing Records at the Workplace for Small Geographic Summary Levels in the 2012–2016 CTPP: A Case Study of New York City (P20-20123) - A222
Le Zhang/New York City Department of City Planning
What Happened to Our Transit Usage? (Part II) (P20-20129) - A223
Tom Vo/Southern California Association of Governments, Jung Seo/Southern California Association of Governments, Marisa Laderach/Southern California Association of Governments, Frank Wen/Southern California Association of Governments
Analyzing Toll Road Impact on Demographics, Equity, and Accessibility: A Case Study Using 2012–2016 CTPP Data (P20-20130) - A224
Huimin Zhao/Big View Analytics LLC, Yong Zhao/Jacobs

Advances in Artificial Intelligence Applications in Transportation and Road Infrastructure, Part 1 (Part 2, Session 1278)

Byungkyu Brian Park, University of Virginia, presiding

Sponsored By Standing Committee on Artificial Intelligence and Advanced Computing Applications

Applications of state of the art machine learning techniques such as deep neural nets, reinforcement learning, convolution neural networks for traffic monitoring, traffic prediction, travel behavior, mode choice, real-time congestion monitoring, driver behavior, developing and assessing technologies for Connected and Autonomous Vehicles.

Short-Term Prediction of Parking Area States Using Real-Time Data and Machine Learning Techniques (20-00100) - B341

Luc Wismans/Goudappel Group, Jesper Provoost/Goudappel Group, Sander Van der Drift/Goudappel Group, Maurice Van Keulen/Goudappel Group, Andreas Kamilaris/Goudappel Group

Object Detection–Based License Plate Localization and Recognition in Complex Environments (20-00127) - B340

Ting Tao/Tongji University, Huang Shize/Tongji University, Decun Dong/Tongji University, Wei Chen/Tongji University, Lingyu Yang/Tongji University

Detecting Spatiotemporal Traffic Anomalies with Low-Rank Tensor Regression (20-00427) - A152

Xudong Wang/McGill University, Lijun Sun/McGill University

Using Smartphone Sensors to Estimate Vehicle Trajectories and Detect Lane Changes in the Context of Connected Vehicles (20-00437) - A153

Zubayer Islam/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Dhrubo Hasan Chowdhury/University of Central Florida, Qing Cai/University of Central Florida

A Novel Hybrid Neural Network for Dense Depth Estimation Using On-Board Monocular Images (20-00484) - A154

Shaocheng JIA/Tsinghua University, Xin PEI/Tsinghua University, Zi YANG/Tsinghua University, Shan TIAN/Tsinghua University, Yun YUE/Tsinghua University

Inferring Individual's Activity and Trip Purpose from GPS Data Using Wavelet Decomposition and K-Means (20-00600) - A155

Ali Arian/Metropia Inc., Meiyu Pan/Metropia Inc., Yi-Chang Chiu/Metropia Inc.

Model Free Identification of Traffic Conditions Using Unmanned Aerial Vehicles and Deep Learning (20-00663) - A156

Eleni Vlahogianni/National Technical University of Athens (NTUA), Javier Del Ser/National Technical University of Athens (NTUA), Konstantinos Kepaptsoglou/National Technical University of Athens (NTUA), George Davos/National Technical University of Athens (NTUA)

Toward Predicting Traffic Shockwave Formation and Propagation: A Convolutional Encoder-Decoder Network (20-00666) - A157

Mohammadreza Khajeh Hosseini/University of Illinois, Urbana Champaign, Alireza Talebpour/University of Illinois, Urbana Champaign

Adaptation of a Freeway Discretionary Lane Changing Model to a Freeway Mandatory Lane Changing Model (20-00682) - A158

Matthew Vechione/University of Texas, Tyler, Ruey Cheu/University of Texas, Tyler

Cooperative Highway Work Zone Merge Control Based on Reinforcement Learning in a Connected and Automated Environment (20-00807) - A159

Tianzhu Ren/University of Massachusetts, Lowell, Yuanchang Xie/University of Massachusetts, Lowell, Liming Jiang/University of Massachusetts, Lowell

Identifying High-Risk Intersections for Walking and Bicycling Using Multiple Data Sources in the City of San Diego (20-01042) - A160

Mahdie Hasani/Texas A&M Transportation Institute, Arash Jahangiri/Texas A&M Transportation Institute, Ipek Sener/Texas A&M Transportation Institute, Sirajum Munira/Texas A&M Transportation Institute, Justin Owens/Texas A&M Transportation Institute, Bruce Appleyard/Texas A&M Transportation Institute, Sherry Ryan/Texas A&M Transportation Institute, Shawn Turner/Texas A&M Transportation Institute, Sahar Ghanipoor Machiani/Texas A&M Transportation Institute

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Trip Purpose Inference for Tourists by Machine Learning Approaches Based on Mobile Call Detail Record Data (20-01043) - A161

Haodong Sun/Beijing University of Technology, Yanyan Chen/Beijing University of Technology, Yang Wang/Beijing University of Technology

Modeling of the Pavement Acoustic Longevity in Hong Kong Through Data Mining Techniques (20-01045) - A162

Ruijun Cao/Hong Kong Polytechnic University, Zhen Leng/Hong Kong Polytechnic University, Shu-Chien Hsu/Hong Kong Polytechnic University

Predicting Travel Mode Choice with 86 Machine Learning Classifiers: An Empirical Benchmark Study (20-01057) - A167

Shenhao Wang/Massachusetts Institute of Technology (MIT), Baichuan Mo/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT)

Origin-Destination Flows Estimation Using Automatic Vehicle Identification Data: A 3D Convolutional Neural Network Approach (20-01122) - A168

Keshuang Tang/Tongji University, Yumin Cao/Tongji University, Can Chen/Tongji University, Jiarong Yao/Tongji University, Chaopeng Tan/Tongji University, Jian Sun/Tongji University

Real-Time Traffic Congestion Monitoring Using Internet Traffic Imagery and Deep Learning (20-01202) - A169

Gary Au/Monash University, Cuong Nguyen/Monash University, Retham Lai/Monash University, Hai Vu/Monash University

Modeling Travel Time Volatility Using Copula-Based Monte Carlo Simulation Method for Probabilistic Traffic Prediction (20-01212) - A170

Sen Luan/Beihang University, Xi Chen/Beihang University, Yuelong Su/Beihang University, Zhening Dong/Beihang University, Xiaolei Ma/Beihang University

Transfer Learning in Short-Term Traffic Flow Prediction with Deep-Learning Tools (20-01239) - A171

Junyi Li/Imperial College London, Fangce Guo/Imperial College London, Aruna Sivakumar/Imperial College London, Yanjie Dong/Imperial College London

Large-Scale Pavement Roughness Measurement with Vehicle Crowdsourced Data Using Semi-Supervised Learning (20-01264) - A172

Chenglong Liu/Tongji University, Difei Wu/Tongji University, Yishun Li/Tongji University, Yuchuan Du/Tongji University

Predicting Passengers' Boarding Stops Under Different Weather Conditions Using Machine Learning Technique (20-01363) - A177

Tianli Tang/University of Leeds, Achille Fonzone/University of Leeds, Ronghui Liu/University of Leeds, Charisma Choudhury/University of Leeds

Understanding the Effect of Traffic and Roadway-Related Attributes on Interstate Truck Reliability in Urbanized Areas Across the Eastern United States (20-01472) - A178

Chowdhury Siddiqui/South Carolina Department of Transportation

Arc Detection and Recognition in the Pantograph-Catenary System Based on Multi-Information Fusion (20-01489) - A179

Huang Shize/Shandong University of Science and Technology, Wei Chen/Shandong University of Science and Technology, Bo Sun/Shandong University of Science and Technology, Ting Tao/Shandong University of Science and Technology, Lingyu Yang/Shandong University of Science and Technology

Short-Term Traffic Prediction Using a Spatial-Temporal CNN Model with Transfer Learning (20-01604) - A180

Bo Wang/Monash University, Inhi Kim/Monash University, Hai Vu/Monash University

Short-Term Traffic State Prediction from Latent Structures: Accuracy Versus Efficiency (20-01625) - A181

Wan Li/University of Washington, Jingxing Wang/University of Washington, Rong Fan/University of Washington, Yiran Zhang/University of Washington, Qiangqiang Guo/University of Washington, Choudhury Siddique/University of Washington, Xuegang Ban/University of Washington

Real-Time Vehicle Maneuvers Detection Based on Smartphone Sensors and Deep Learning (20-01654) - A182

Pei Li/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Qing Cai/University of Central Florida, Zubayer Islam/University of Central Florida

Spatial-Temporal Traffic State Collaborative Forecast in Urban Road Network Based on Dynamic Factor Model (20-01679) - A183

Kun Tang/Southeast University, Shuyan Chen/Southeast University, Yongfeng Ma/Southeast University, Yingjiu Pan/Southeast University, Aemal Khattak/Southeast University

A Pseudo-3D Convolutional Neural Network–Based Framework for Short-Term Mixed Passenger Flow Prediction in Large-Scale Public Transit (20-01756) - A184

Siyu Hao/National University of Singapore, Dingyi Zhuang/National University of Singapore, De Zhao/National University of Singapore, Der-Horng Lee/National University of Singapore

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Scenario-Based Exploration Issue in the Design of Perimeter Control–Based on Reinforcement Learning (20-01767) - A185

Jinwon Yoon/Korea Advanced Institute of Science and Technology (KAIST), Young-Ji Byon/Korea Advanced Institute of Science and Technology (KAIST), Hwasoo Yeo/Korea Advanced Institute of Science and Technology (KAIST)

Use of Deep-Learning Image Classification Models and Vehicle-Mounted Cameras for Automatic Pavement Distress Detection (20-01803) - A186

Jong-Sub Lee/Korea Expressway Corporation Research Institute, Juyoung Park/Korea Expressway Corporation Research Institute, Jang-Rak Kim/Korea Expressway Corporation Research Institute

Direct Characterization of the Driving Environment Using a Deep-Learning Algorithm for Purposes of Autonomous Driving Simulation (20-01828) - A187

Sikai Chen/Purdue University, Yue Leng/Purdue University, Samuel Labi/Purdue University

Forecasting Travel Behavior of PEV Users: A Deep-Learning Approach Equipped with a Clustering Technique Based on Travel Purpose (20-01838) - A188

HamidReza Jahangir/Cornell University, Hanif Tayarani/Cornell University, Masoud AliAkbar Golkar/Cornell University, Ali Ahmadian/Cornell University, Mohammad Tayarani/Cornell University, H. Oliver Gao/Cornell University

Incorporating Network Traffic State for Urban Vehicle Trajectory Prediction (20-01907) - A189

Seongjin Choi/Korea Advanced Institute of Science and Technology (KAIST), Jiwon Kim/Korea Advanced Institute of Science and Technology (KAIST), Hwasoo Yeo/Korea Advanced Institute of Science and Technology (KAIST)

Vehicle Trajectory Construction Framework from Aerial Videos Based on Convolution Neural Network Detection (20-01916) - A190

Ruyi Feng/Southeast University, Changyan Fan/Southeast University, Zhibin Li/Southeast University, Xinqiang Chen/Southeast University

Data Science Models for Analyzing Cruising for On-Street Parking (20-01930) - A191

Eleni Mantouka/National Technical University of Athens (NTUA), Eleni Vlahogianni/National Technical University of Athens (NTUA), Panagiotis Fafoutellis/National Technical University of Athens (NTUA)

Developing a Traffic Conflict Technique for Motorways Using Real-Time Data (20-01950) - A192

Nicolette Formosa/Loughborough University, Alkis Papadoulis/Loughborough University, Mohammed Quddus/Loughborough University

Deep Reinforcement Learning Algorithm for Dynamic Pricing of Express Lanes with Multiple Access Locations (20-01951) - A193

Venktesh Pandey/University of Texas, Austin, Evana Wang/University of Texas, Austin, Stephen Boyles/University of Texas, Austin

Predicting Traffic Speed Under Non-Recurrent Events: A Transfer Learning Approach with Multi-Source Spatio-Temporal Traffic Data (20-01969) - A194

Shuguan Yang/Carnegie Mellon University, Wei Ma/Carnegie Mellon University, Sean Qian/Carnegie Mellon University

High-Order Markov Model for Prediction of Secondary Crash Likelihood Considering Incident Duration (20-02092) - A195

Nigel Pugh/North Carolina Agricultural and Technical State University, Hyoshin Park/North Carolina Agricultural and Technical State University

Automated Information Extraction from Textual Data: Application in Transit Disruption Management (20-02131) - A196

Peyman Noursalehi/Massachusetts Institute of Technology (MIT), Haris Koutsopoulos/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT)

A Novel Three-Stage Framework for Prioritizing and Selecting Feature Variables for Short-Term Metro Passenger Flow Prediction (20-02148) - A197

Yangyang Zhao/Southwest Jiaotong University, Lu Ren/Southwest Jiaotong University, Zhenliang Ma/Southwest Jiaotong University, Xinguo Jiang/Southwest Jiaotong University

Dynamic Origin-Destination Matrix Prediction with Line Graph Neural Networks and Kalman Filter (20-05860) - A198

Xi Xiong/New York University, Kaan Ozbay/New York University, Li Jin/New York University, Chen Feng/New York University

Investigating the Influential Factors for Practical Application of Multi-Class Vehicle Detection for Images from Unmanned Aerial Vehicle Using Deep-Learning Models (20-05937) - A199

Seung Woo Ham/Seoul National University, Ho-Chul Park/Seoul National University, Eui-Jin Kim/Seoul National University, Seung-Young Kho/Seoul National University, Dong-Kyu Kim/Seoul National University

Real-Time Prediction of Traffic State on Freeways Based on Trajectory Data: A Machine Learning Approach (20-05949) - A200

Leila Azizi/Florida International University, Mohammed Hadi/Florida International University, Maryamossadat Aghili/Florida International University, Shekoofeh Mokhtari/Florida International University

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Comparing Machine Learning Approaches for Public Transit Trip Purpose Inference (20-06034) - A201

Pengyao Ye/Southwest Jiaotong University, Xin Wen/Southwest Jiaotong University, Yu Liu/Southwest Jiaotong University, Kun Xie/Southwest Jiaotong University, Hong Yang/Southwest Jiaotong University

Improving the Accuracy of Surrogate Safety Measures with Machine Learning Techniques: A Comparative Study Between Feature-Based and Deep-Learning Tracking (20-01771) - A202

Passant Reyad/University of Central Florida, Tarek Sayed/University of Central Florida, Mohamed Zaki/University of Central Florida

Machine Learning–Based Classification of Pedestrian Trajectory Patterns Using LiDAR Sensors in Subway Stations (20-00933) - A203

Young Jo/Hanyang University, Eunbi Jeong/Hanyang University, Soyoung You/Hanyang University, Cheol Oh/Hanyang University

Quantifying Privacy Vulnerability Under Linkage Attack Across Multi-Source Individual Mobility Data (20-01384) - A151

Jing Gao/Sun Yat-Sen University, Qinglong Lu/Sun Yat-Sen University, Ming Cai/Sun Yat-Sen University

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Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Geometric Design Research: Freeways, Intersections, and Alignments
Matthew Dawson, Hanson Professional Services, Inc., presiding
Michael Shea, CRS Engineers, presiding
Sponsored By Standing Committee on Geometric Design

Passing Sight Distance Assessment Through the Interaction of Road–Vehicle Parameters (20-02377) - B365

Stergios Mavromatis/National Technical University of Athens (NTUA), Vassilios Matragos/National Technical University of Athens (NTUA), Rania Liza/National Technical University of Athens (NTUA), Konstantinos Apostoleris/National Technical University of Athens (NTUA), Lazaros Grammatikopoulos/National Technical University of Athens (NTUA), George Yannis/National Technical University of Athens (NTUA)

Exploration- and Exploitation-Based Ant Algorithm for Optimized Vertical Highway Alignment (20-02776) - B367

Sushma Mb/Indian Institute of Technology, Bombay, Sandeepan Roy/Indian Institute of Technology, Bombay, Omkar Karmarkar/Indian Institute of Technology, Bombay, Avijit Maji/Indian Institute of Technology, Bombay

Deriving Effective Turning Radii for Intersections (20-03395) - B364

Jesse Boudart/Toole Design Group, LLC

Design Optimization of Single-Lane Entrance and Exit Ramps (20-05387) - B366

Cassandra Garcia/California State Polytechnic University, Pomona, Yongping Zhang/California State Polytechnic University, Pomona, Dinh Vu/California State Polytechnic University, Pomona, Wen Cheng/California State Polytechnic University, Pomona, Shitong Li/California State Polytechnic University, Pomona

Safety Effects of Freeway Geometries and Pavement Conditions: A Random Parameters Approach with Heterogeneity in Means and Variances (20-05941) - B363

Qinzhong Hou/Harbin Institute of Technology - Weihai, Xiaoyan Huo/Harbin Institute of Technology - Weihai, Junqiang Leng/Harbin Institute of Technology - Weihai, Weining Zhao/Harbin Institute of Technology - Weihai

An Approach and Case Study Research in Building BIM Model for Existing Roads (P20-21157) - B355

Heng Huang/Southeast University

Comparison Analysis of Operational Performance for Grade-Separated Intersections (P20-21158) - B351

Taehun Lee/North Carolina State University

Planning-Level Safety Evaluation and Comparison Between Different Geometries of Intersections Using Movement-Based Safety Performance Functions (P20-21159) - B352

Taehun Lee/North Carolina State University

Work Zone Lane Drop Placement Evaluation (P20-21160) - B353

A B M Tausif Ullah Chy/University of Alabama, Birmingham

Mathematical Formulations for Understanding Interference and Transmission Range of V2V Communication in an Urban Road Intersection (P20-21161) - B354

Ala Alobeidyeen/University of Florida

Reltaionship Between Horizontal Curve Density and Safety Performance on Rural Two-Lane Highways (P20-21162) - B350

Meghna Chakraborty/Michigan State University

Evaluation of Driver's Longitudinal and Lateral Performance Along Horizontal Curves of Two-Lane Rural Highways (P20-21163) - B356

Tushar Choudhari/Indian Institute of Technology, Bombay

(continued)

Data-Driven Understanding of Safety Effects of Horizontal Curves in a Large Network (P20-21164) - B357
Qingyu Ma/Old Dominion University

Assessment of Freeway Merging Strategies Through a Transition to a Connected Autonomous Vehicles Environment (P20-21165) - B358
Afshin Pakzadnia/Carleton University

Road Infrastructure Requirements for Improved Performance of Lane Assistance Systems (P20-21166) - B359
Nagarjun Reddy/Delft University of Technology

Safety Performance Functions for Rural Two-Way Stop-Controlled Intersections (P20-21167) - B368
Ming Sun/University of Louisiana, Lafayette

Transportability of Crash Modification Factors via Graphical Causal Models: The Case of Intersection Sight Distance at Stop-Controlled Intersections (P20-21168) - B369
Jingru Gao/University of Minnesota, Twin Cities

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Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Safety, Traffic, and Maintenance Management on Low-Volume Roads
Andrew Ceifetz, WSP, presiding
Sponsored By Standing Committee on Low-Volume Roads

This poster session covers developments in safety, traffic, and maintenance management of low volume roads.

Developing an Optimization Tool for Selecting Gravel Roads Maintenance Strategies Using a Genetic Algorithm (20-00239) - B440
Waleed Aleadelat/University of Wyoming, Omar Albatayneh/University of Wyoming, Khaled Ksaibati/University of Wyoming

Complementary Modeling of Gravel Road Traffic–Generated Dust Levels Using Bayesian Regularization Feedforward Neural Networks and Binary Probit Regression (20-00249) - B441
Omar Albatayneh/University of Wyoming, milhan moomen/University of Wyoming, Ahmed Farid/University of Wyoming, Khaled Ksaibati/University of Wyoming

Evaluating Road Assessment Systems for Tropical Low-Volume Unpaved Roads (20-00802) - B442
laura ribeiro/University of Wyoming, Khaled Ksaibati/University of Wyoming, Taciano da Silva/University of Wyoming

Traffic Problems at Popular Rural Tourist Attractions (20-02953) - B434
Panos Prevedouros/University of Hawaii, Diana Nomura/University of Hawaii, Rafaela Barros/University of Hawaii

Best Practices of Road User Maintenance Agreements: The Case of Ohio (20-03536) - B437
Praveen Gopallawa/Ohio University Russ College of Engineering and Technology, Issam Khoury/Ohio University Russ College of Engineering and Technology, Bhaven Naik/Ohio University Russ College of Engineering and Technology, Roger Green/Ohio University Russ College of Engineering and Technology

Applicability of Smartphone-Based Roughness Data for Rural Road Network-Level Pavement Condition Evaluation (20-03543) - B436
R.M.K. Sandamal/University of Moratuwa, H.R. Pasindu/University of Moratuwa

Minimizing Disruption to the Transportation Network Using Low-Volume Roads to Recover from Natural Disaster: A New Zealand Case Study (20-03819) - B439
Xavier Wood-Aliberch/University of Nebraska, Lincoln, Phil Barutha/University of Nebraska, Lincoln, Jacobus Van der Walt/University of Nebraska, Lincoln

Estimating Truck Traffic Generated from Well Developments on Low-Volume Roads (20-05461) - B438
Ioannis Tsapakis/Texas A&M Transportation Institute

Effect of Driveway Land Use Type on Safety Performance for Two-Lane Rural State Highways and County Roads (20-05646) - B430
Meghna Chakraborty/Michigan State University, Timothy Gates/Michigan State University

Impact of Speed Limit Increase on Passing Maneuvers on Two-Lane Rural Highways (20-05669) - B431
Md Shakir Mahmud/Michigan State University, Timothy Gates/Michigan State University

Selection of Sustainable Low-Volume Rural Roads for Northeast India Through Multi-Objective Optimization (20-05703) - B435
Sundeep Inti/Purdue University, Northwest, Anjan Siddagangaiah/Purdue University, Northwest

Safety Performance of Rural Curved Corner Intersections (20-05799) - B432
Anthony Ingle/Michigan State University, Timothy Gates/Michigan State University

Safety Performance of Rural Offset T Intersections (20-06061) - B433
Anthony Ingle/Michigan State University, Timothy Gates/Michigan State University

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Advancements in Geospatial Technologies for Design and Construction
Salvatore Antonio Biancardo, Universita degli Studi di Napoli Federico II, presiding
Sponsored By Standing Committee on Geospatial Data Acquisition Technologies

Evaluation of High-Resolution Mobile LiDAR Mapping of Roadway Drainage Ditches (20-02247) - B418
Yi Chun Lin/Purdue University, Yi-Ting Cheng/Purdue University, John Flatt/Purdue University, Ayman Habib/Purdue University, Darcy Bullock/Purdue University
Drivable Space Data Sets Created by Airborne LiDAR and Aerial Images (20-05307) - B417
Ryan Dow/University of New Mexico, Susan Bogus/University of New Mexico, Su Zhang/University of New Mexico
Geospatial Analysis of Landsat-8 Satellite Imagery to Classify Terrain and Built Infrastructure for Assessing Coastal Disaster Impacts (20-06025) - B416
Salma Sultana/University of Mississippi, Rulian Barros/University of Mississippi, Waheed Uddin/University of Mississippi
Concatenate Features and Dynamic Decoder in Road Extraction from Satellite Images: A Case Study of Urban and Rural Roads (20-00283) - B414
Jin Wang/Beijing University of Technology, Duo Wang/Beijing University of Technology

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Sustainable, Recycled, and Intelligent Pavement Materials
Krishna Prapoorna Biligiri, Indian Institute of Technology, Tirupati, presiding
Sponsored By Standing Committee on General and Emerging Pavement Design, Subcommittee on Sustainable Pavements

This session explores the wide range of sustainable, recycled and intelligent pavement materials to foster innovation while preserving the environment.

Moisture Damage Investigations of OGAFC Mixtures with BOF Steel Slag as Coarse Aggregate Under Different pH Environments (20-05834) - B380
Santanu Pathak/Indian Institute of Technology, Guwahati, Rajan Choudhary/Indian Institute of Technology, Guwahati, Abhinay Kumar/Indian Institute of Technology, Guwahati
Experimental Investigation on the Effect of Fibers on the Mechanical Properties of Asphalt Mortar at Intermediate and High Temperature (20-06107) - B381
Yun Su Kim/University of Alaska, Fairbanks, Augusto Cannone Falchetto/University of Alaska, Fairbanks, Di Wang/University of Alaska, Fairbanks, Goshtasp Cheraghian/University of Alaska, Fairbanks, Lily Poulikakos/University of Alaska, Fairbanks, Moises Bueno/University of Alaska, Fairbanks, Johannes Buchner/University of Alaska, Fairbanks, Michael P. Wistuba/University of Alaska, Fairbanks
Performance of Hot and Cold Recycled Mixtures with High Reclaimed Asphalt Pavement Content (20-00242) - B 382
Edith Arambula Mercado/Texas A&M Transportation Institute, Santiago Chavarro Muñoz/Texas A&M Transportation Institute, Sheng Hu/Texas A&M Transportation Institute, Howard Moseley/Texas A&M Transportation Institute
Laboratory and Field Evaluation of Plant Produced RAP Mixtures in Hot Climate Areas: A Case Study of Phoenix, Arizona (20-03175) - B383
Ali Zalghout/Arizona State University School of Sustainable Engineering and the Built Environment, Samuel Castro Brockman/Arizona State University School of Sustainable Engineering and the Built Environment, Ramadan Salim/Arizona State University School of Sustainable Engineering and the Built Environment, William Campbell/Arizona State University School of Sustainable Engineering and the Built Environment, Kamil Kaloush/Arizona State University School of Sustainable Engineering and the Built Environment
Use of Fine Aggregate Matrix to Analyze the Rheological Behavior of Cold Recycled Materials (20-04373) - B384
Andrea Graziani/Ecole de technologie superieure, Simone Raschia/Ecole de technologie superieure, Chiara Mignini/Ecole de technologie superieure, Alan Carter/Ecole de technologie superieure, Daniel Perraton/Ecole de technologie superieure
Effect of Temperature on Activation of Aged Asphalt in Recycled Asphalt Pavement (20-03670) - B399
Yifu Meng/Tongji University, Liping Liu/Tongji University

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Using the Light Weight Deflectometer to Assess Cement Stabilized Subgrade Construction Quality (20-03196) - B398

Peter Becker/Indiana Department of Transportation, Boonam Shin/Indiana Department of Transportation, Nayyar Siddiki/Indiana Department of Transportation

Performance Evaluation of Pre-Swollen Crumb Rubber Modified Mixture: Laboratory Investigation and Field Experience in Michigan (20-01228) - B397

Angela Farina/Michigan State University, M. Emin Kutay/Michigan State University, Michele Lanotte/Michigan State University

Effect of Metallic Waste Types and Addition on Microwave Self-Healing Properties of Asphalt Mixtures (20-00649) - B396

Aimin Sha/Chang'an University, Baowen Lou/Chang'an University, Yupeng Li/Chang'an University, Wentong Wang/Chang'an University, Zhuangzhuang Liu/Chang'an University, Wei Jiang/Chang'an University

Toward Automated Pavement: Full-Scale Testing Validation of a Novel Energy-Based Sensing Approach for Continuous Pavement Monitoring (20-01416) - B395

Mario Manosalvas-Paredes/University of Nottingham, Nizar Lajnef/University of Nottingham, Karim Chatti/University of Nottingham, Juliette Blanc/University of Nottingham, Nick Thom/University of Nottingham, Gordon Airey/University of Nottingham, Davide Lo Presti/University of Nottingham

Field Pilot Study of Porous Asphalt Pavement Reinforced by Cured Carbon Fiber Composite Materials (20-00134) - B394

Kun Zhang/California State University, Chico, Justin Lim/California State University, Chico, Somayeh Nassiri/California State University, Chico, Othman AlShareedah/California State University, Chico, Hui Li/California State University, Chico, Karl Englund/California State University, Chico

A Decision Support Model Applied to Additive Selection in Porous Hot Mix Asphalt (20-00109) - B393

Carlos Slebi-Acevedo/Universidad de Cantabria, Daniel Castro-Fresno/Universidad de Cantabria, Daniel Zuluaga-Astudillo/Universidad de Cantabria, Pedro Lastra-Gonzáez./Universidad de Cantabria, Pablo Pascual Muñoz/Universidad de Cantabria

An Investigation on Mechanism for the Influence of Fine Solid Waste on Performance of Asphalt Materials (20-03635) - B392

Hengji Zhang/Tongji University, Hui Li/Tongji University, Ahmed Abdelhady/Tongji University, Ning Xie/Tongji University

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<u>Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A</u>

Life-Cycle Assessment and Climate Resilience of Pavements

Joseph Shacat, National Asphalt Pavement Association, presiding

Sponsored By Standing Committee on General and Emerging Pavement Design, Subcommittee on Sustainable Pavements

This session will focus on life-cycle assessment of pavement systems including recent developments in Product Category Rules and Environmental Product Declarations. Pavement resilence to climate change will also be addressed.

Climate Change Impact on Pavement Performance in Newfoundland, Canada (20-04650) - B406

Md. Masud Rana/Memorial University of Newfoundland, Surya T. Swarna/Memorial University of Newfoundland, Kamal Hossain/Memorial University of Newfoundland

Life-Cycle Analysis for Sustainable Rehabilitation Strategies in Pavement Management Systems (20-02510) - B407

Yunpeng Zhao/University of Maryland, College Park, Dimitrios Goulias/University of Maryland, College Park

Structural Performance of Pavements Under Extreme Events: Toward a Resilient Pavement (20-05572) - B405

Narges Matini/North Carolina State University, Saqib Gulzar/North Carolina State University, Boris Goenaga/North Carolina State University, Andrew Fried/North Carolina State University, B. Shane Underwood/North Carolina State University, Cassie Castorena/North Carolina State University

Technical and Organizational Challenges for the Use of Environmental Product Declarations in Public Procurement (20-05158) - B391

Chaitanya Bhat/Michigan Technological University, Amlan Mukherjee/Michigan Technological University

Technical and Organizational Challenges to Developing Product Category Rules for Asphalt Pavement Construction (20-04465) - B390

Chaitanya Bhat/Michigan Technological University, Joseph Shacat/Michigan Technological University, Amlan Mukherjee/Michigan Technological University

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Project-Level Highway Treatment Selection Framework Featuring Life-Cycle Cost Analysis and Life-Cycle Assessment (20-00794) - B408
SONG HE/George Mason University, Ossama Salem/George Mason University, Baris Salman/George Mason University

Multi-Scale In Situ Investigation of Infiltration Parameter in Pervious Concrete Pavements (20-04300) - B409
Poornachandra Vaddy/Indian Institute of Technology, Tirupati, Avishreshth Singh/Indian Institute of Technology, Tirupati, Prasanna Venkatesh Sampath/Indian Institute of Technology, Tirupati, Krishna Prapoorna Biligiri/Indian Institute of Technology, Tirupati

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Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Calibration of Mechanistic-Empirical Asphalt Pavement Design Systems
Mena Souliman, University of Texas, Tyler, presiding
Sponsored By Standing Committee on Design and Rehabilitation of Asphalt Pavements

Lessons Learned from Mississippi's Effort to Locally Calibrate the AASHTOWare Pavement ME Design Software (20-01470) - B419
L. Cooley/Burns Cooley Dennis, Inc., William Barstis/Burns Cooley Dennis, Inc., William Middleton/Burns Cooley Dennis, Inc., Scott Bivings/Burns Cooley Dennis, Inc.

Calibration of the Performance Models of the AASHTOWare Pavement ME Design Software (V2.5.3) for Flexible Pavements in Idaho (20-03260) - B400
Mumtahin Hasnat/University of Idaho, Ahmed Muftah/University of Idaho, Emad Kassem/University of Idaho, Fouad Bayomy/University of Idaho

Calibrating the AASHTOWare Pavement ME Design Software for Rehabilitated Pavements (20-03734) - B401
Shuvo Islam/Kansas State University, Mustaque Hossain/Kansas State University, Ryan Barrett/Kansas State University, Nat Velasquez, Jr./Kansas State University

Calibration/Validation of the Texas Mechanistic-Empirical Flexible Pavement Design Method (20-04437) - B402
Ahmed Masad/University of Texas, San Antonio, Esra'a Alrashydah/University of Texas, San Antonio, Athanassios Papagiannakis/University of Texas, San Antonio, Enad Mahmoud/University of Texas, San Antonio

Local Calibration of Pavement ME Design for Flexible Pavements in Oklahoma (20-04524) - B403
Mahmood Tabesh/Texas A&M University, College Station, Maryam Sakhaeifar/Texas A&M University, College Station

Development of Preliminary Transfer Functions for Performance Predictions in FlexPAVE™ (20-04617) - B404
Yizhuang Wang/North Carolina State University, Amir Ghanbari/North Carolina State University, B. Shane Underwood/North Carolina State University, Youngsoo Kim/North Carolina State University

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Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Recent Advances in Small-Scale and Site Variability
Antonio Gomes Correia, University of Minho, presiding
Sponsored By Standing Committee on Soil and Rock Properties

A poster session to describe recent advances on Small-scale and Site Variability

The Effect of Gradation on Macro-Meso Shear Properties of Alluvial-Diluvial Soil-Rock Mixture (20-01307) - B411
Longqi Liu/Chang'an University, Xuesong Mao/Chang'an University, Menglan Nie/Chang'an University, Qian Wu/Chang'an University, Xinlei Tang/Chang'an University

Evaluation of Site Variability Effect on the Geotechnical Data and Its Application (20-05564) - B413
Ismaail Ghaaowd/Louisiana Department of Transportation and Development, Abu Hakim Faisal/Louisiana Department of Transportation and Development, Md Habibur Rahman/Louisiana Department of Transportation and Development, Murad Abu-Farsakh/Louisiana Department of Transportation and Development

Investigating the Influence Factors on the Disintegration of Soft Rock (20-02565) - B412
Zongtang Zhang/Hunan University of Science and Technology, Wenhua Gao/Hunan University of Science and Technology, Zhimin Zhang/Hunan University of Science and Technology, Xiaoyu Tang/Hunan University of Science and Technology, Jun Wu/Hunan University of Science and Technology

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Granular Materials and Aggregates
Kelly Cook, Edward C. Levy Co., presiding
Sponsored By Standing Committee on Aggregates

Posters covering a range of topics concerning the use of particulate materials in road and rail applications, granular material behavior and particle characterization.

An Analysis of the Relations Between Aggregates' Shape and Mechanical Properties Throughout the Railway Ballast Service Life (20-00501) - B422
Daianne Diogenes/Universidade Federal do Ceara, Daianne Diógenes/Universidade Federal do Ceara, Verônica Castelo Branco/Universidade Federal do Ceara, Renan Maia/Universidade Federal do Ceara
DEM Optimization of Polydisperse Granular Material Packing (20-00856) - B423
Guil Khan/Korea Institute of Civil Engineering and Building Technology (KICT), Touqeer Shoukat/Korea Institute of Civil Engineering and Building Technology (KICT), Evgeny Rusin/Korea Institute of Civil Engineering and Building Technology (KICT), Evgeny Rusin/Korea Institute of Civil Engineering and Building Technology (KICT), Pyeong Jun Yoo/Korea Institute of Civil Engineering and Building Technology (KICT)
A Practical Gravel Loss Prediction Model for Local Agencies (20-02145) - B420
Shafkat Alam-Khan/Michigan State University, Bora Cetin/Michigan State University, H. David Jeong/Michigan State University, Jeramy Ashlock/Michigan State University, Meng Yaw/Michigan State University
Discrete Element Modeling Speedup of Asphalt Mixture Compaction: Effects of the Reduced Material Moduli (20-02512) - B425
Xiaodong Zhou/Michigan Technological University, Siyu Chen/Michigan Technological University, Dongdong Ge/Michigan Technological University, Dongzhao Jin/Michigan Technological University, Qingli Dai/Michigan Technological University, Zhanping You/Michigan Technological University
The Application of Real Aggregates Morphological Properties in the Discrete Element Models of Granular Material (20-02816) - B424
Chonghui Wang/RWTH Aachen University, Xiaodong Zhou/RWTH Aachen University, Hainian Wang/RWTH Aachen University, Markus Oeser/RWTH Aachen University
Effect of Sample Size on TDA Shear Strength Parameters in Direct Shear Tests (20-03351) - B410
Khaled Zahran/Dalhousie University, Hany El Naggar/Dalhousie University
Freeze-Thaw Rates and Unbound Carbonate Aggregate Soundness Measurements (20-03519) - B427
Erik Lyngdal/Wisconsin Department of Transportation, Matthew Andreini/Wisconsin Department of Transportation, Robert Downing/Wisconsin Department of Transportation, Russell Frank/Wisconsin Department of Transportation
Discrete Element Modeling of Granular Mixture of Non-Cohesive Granular Soil and Chip-Like, Tire-Derived Aggregates (20-03618) - B421
Junqi Zhang/Central South University, Xiaobin Chen/Central South University, Jiasheng Zhang/Central South University
Laser-Induced Florescence Spectroscopy to Predict Aggregate Freeze-Thaw Susceptibility (20-03946) - B428
Christopher Jones/Kansas State University, Tonu Reinot/Kansas State University, Ryszard Jankowiak/Kansas State University
Accelerating and Improving the Predictive Capability of Concrete Freezing and Thawing Tests by the Inclusion of Dissolved Ionic Species (20-03979) - B429
Hossein Mosavi/University of Florida, Cale Armstrong/University of Florida, Christopher Jones/University of Florida, Kyle Riding/University of Florida
Foam Glass Lightweight Aggregate as an Innovative Lightweight Fill Material for Flexible Pavements in Canada : Engineering and Environmental Assessement (20-06055) - B426
Pezhouhan Tavassoti-Kheiry/University of Waterloo, Yassaman Yousefi/University of Waterloo, Goretty Dias/University of Waterloo, Hassan Baaj/University of Waterloo

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Innovations in Traffic Signal Control and Optimization
Sponsored By Standing Committee on Traffic Signal Systems

(continued)

Developing Decision Boundaries for Left-Turn Treatments (20-00035) - A246

Michael Adamson/Brigham Young University, Grant Schultz/Brigham Young University, Mitsuru Saito/Brigham Young University, Michael Stevens/Brigham Young University

Dilemma Zone Length and Location: Safety Measure of Rural High-Speed Signalized Intersections (20-00086) - A237

Min-Wook Kang/University of South Alabama, Moynur Rahman/University of South Alabama, Joyoung Lee/University of South Alabama

Sensitivity Analysis to Define Guidelines for Predictive Control Design (20-00991) - A245

Muriel Verkaik-Poelman/Delft University of Technology, A. Hegyi/Delft University of Technology, A. Verbraeck/Delft University of Technology, Hans Van Lint/Delft University of Technology

Research on Key Technology of Signal Control Sub-Area Partition-Based on Correlation Degree Analysis (20-01 254) - A235

Huihui Lan/Beijing Jiaotong University, Xianyu Wu/Beijing Jiaotong University

The Green Light SONATA: Foundations for Musical Control of Traffic Signals (20-01612) - A238

Montasir Abbas/Virginia Polytechnic Institute and State University, Charles Nichols/Virginia Polytechnic Institute and State University, Anne Elise Thomas/Virginia Polytechnic Institute and State University, Qichao Wang/Virginia Polytechnic Institute and State University

Simulation-Based Traffic Signal Control Strategies Comparison Under Normal and Incident Conditions (20-017 41) - A244

Hao Yu/University of Hawai'i, Manoa, Jie Bao/University of Hawai'i, Manoa, Lu Bai/University of Hawai'i, Manoa, Pan Liu/University of Hawai'i, Manoa

A Queueing Theory–Based Stochastic Traffic Delay Model for Adaptive Signal Control (20-01850) - A239

Hao Liu/University of Texas, Austin, Randy Machemehl/University of Texas, Austin

Real-Time Network Traffic Signal Control Based on Non-Linear Decision Rule (20-01947) - A247

Junwoo Song/Imperial College London, Ke Han/Imperial College London, Simon Hu/Imperial College London

Design of Multi-Path Traffic Progression for Congested Arterials with Connected Local Progression Bands (20-02412) - A249

Yen-Hsiang Chen/University of Maryland, College Park, Yao Cheng/University of Maryland, College Park, Gang-Len Chang/University of Maryland, College Park

Analysis of Signalized Intersection with Dynamic Use of Left Turn Lane for Opposite Through (20-02619) - A243

Yongtao Zheng/Southeast University, Xuedong Hua/Southeast University, Wei Wang/Southeast University, Jialiang Xiao/Southeast University, Dongya Li/Southeast University

An Adaptive Signal Control Method Using a First Order Macroscopic Traffic Flow Model (20-02706) - A240

Hao Liu/University of Texas, Austin, Amber Chen/University of Texas, Austin, Randy Machemehl/University of Texas, Austin

Traffic Signal Re-Timing: A Cost-Effective Approach to Improve Corridor Performance (20-04139) - A234

Rui Yue/Institute for Transportation Research and Education (ITRE), Guangchuan Yang/Institute for Transportation Research and Education (ITRE), Dongmei Lin/Institute for Transportation Research and Education (ITRE), Zong Tian/Institute for Transportation Research and Education (ITRE)

A Signalization Approach to Improve the Right Turn Capacity of an Intersection (20-04166) - A242

Yujing Zheng/Tongji University, Yu Shen/Tongji University, Yuxiong Ji/Tongji University, Yuchuan Du/Tongji University, Xiaoyu Cai/Tongji University

Multi-Objective Signal Timing Coordinated Optimization Based on Fuzzy Compromise Programming Approach (20-04406) - A241

Haoxuan Fan/Southeast University, Gang Ren/Southeast University

Modeling Back-of-Queue Uncertainty at Signalized Intersections (20-05078) - A232

Chang-Jen Lan/Town of Jupiter

Identifying Time-of-Day Breakpoints Based on Clustering Techniques and Visual Analytics (20-05979) - A248

Nemanja Dobrota/University of Pittsburgh, Rodolfo Alfaro-Carcoba/University of Pittsburgh, Nikola Mitrovic/University of Pittsburgh, Aleksandar Stevanovic/University of Pittsburgh

A Macroscopic Fundamental Diagram Approach to Evaluating Performance of Regional Traffic Controls (20-060 30) - A233

Weike Lu/Alabama Transporation Institute, Jun Liu/Alabama Transporation Institute, Jiannan Mao/Alabama Transporation Institute, Guojing Hu/Alabama Transporation Institute, Chuqiao Gao/Alabama Transporation Institute, Lan Liu/Alabama Transporation Institute

Investigating the Distribution of Available Gaps in the Opposing Traffic from the Field Using Real-Time Data for Four-Section Head Signals (20-05921) - A236

Hatem Abou-Senna/University of Central Florida, Essam Radwan/University of Central Florida, Hesham Eldeeb/University of Central Florida

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Operational Effects Medley
Mohammad Amin, Jacobs, presiding
Sponsored By Standing Committee on Operational Effects of Geometrics

A Decision Support Framework for Converting Signalized Arterials to Free-Flow Corridors (20-02618) - A250
Yu Qiao/Purdue University, Nathaniel Shellhamer/Purdue University, Jon D. Fricker/Purdue University, Samuel Labi/Purdue University

Freeway Continuous Speed Model Development and Model Transferability Analysis (20-02695) - A251
Xuesong Wang/Tongji University, Zhigui Chen/Tongji University, Cristhian Lizarazo Jimenez/Tongji University, Andrew Tarko/Tongji University

Evaluating Passing Behavior and Passing-Related Crashes on Two-Lane Rural Highways (20-03982) - A252
Md Shakir Mahmud/Michigan State University, Timothy Gates/Michigan State University, Peter Savolainen/Michigan State University

Investigating the Relationship Between Safety and Reliability Outcomes with Multi-Variate Models and LiDAR Data: A Case Study of Horizontal Curves with Insufficient Sight Distance (20-04101) - A253
Amr Shalkamy/University of Alberta, Karim El-Basyouny/University of Alberta

Driveway Access Spacing Considerations for Rural Highways with High Truck Volumes (20-05655) - A254
Marcus Brewer/Texas A&M Transportation Institute, Kay Fitzpatrick/Texas A&M Transportation Institute, James Cline/Texas A&M Transportation Institute

Monday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Safety and Operational Effects of Intersections and Interchanges
Vichika Iragavarapu, Stantec, presiding
Sponsored By Standing Committee on Operational Effects of Geometrics

Development of a Progression-Based, Signal-Timing Strategy for Continuous Flow Intersections (20-00537) - A255
Yi Qi/Qilu University of Technology, Shaojie Liu/Qilu University of Technology, Qun Zhao/Qilu University of Technology, Wenrui Qu/Qilu University of Technology

Modeling the Effect of Length of Weaving Sections on Traffic Conditions at Unconventional U-Turns (20-04790) - A256
Syed Muzammil Abbas Rizvi/NED University of Engineering and Technology, Afzal Ahmed/NED University of Engineering and Technology, Mir Shabbar Ali/NED University of Engineering and Technology, Dong Ngoduy/NED University of Engineering and Technology

Operational and Safety Impacts of Right Turn Deceleration Lane for Multimodal Users at Signalized Intersections: A Simulation-Based Study (20-05182) - A257
Zhenyu Wang/University of South Florida, Kristine Williams/University of South Florida, Marc Butorac/University of South Florida, James Bonneson/University of South Florida, Bastian Schroeder/University of South Florida, Jerome Gluck/University of South Florida, Kristine Connolly/University of South Florida, Dharmin Kukadia/University of South Florida, Seckin Ozkul/University of South Florida

Operational Effects of the Michigan Left Interchange (20-06085) - A258
Peter Yu/Pullman High School

Design Considerations for an Urban Intersection to Improve Safety and Reduce Congestion Using Diverging Diamond Interchanges (20-02968) - A259
Ambria Vasquez/California State University, Los Angeles, John Shamma/California State University, Los Angeles, Jason Song/California State University, Los Angeles, Howard Lum/California State University, Los Angeles, Rupa Purasinghe/California State University, Los Angeles, Mehran Mazari/California State University, Los Angeles

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Access Management 2020
Grant Schultz, Brigham Young University, presiding
Sponsored By Standing Committee on Access Management

Optimal Spatial Configuration of Left-Turn Restrictions on Urban Grid Networks Using Enumeration and Population-Based Incremental Learning (20-00049) - B450
Murat Bayrak/Pennsylvania State University, Zhengyao Yu/Pennsylvania State University, Vikash Gayah/Pennsylvania State University

Comparative Analysis of Access Control Techniques at the Exit Ramp Terminals to Deter Wrong-Way Driving in Different States (20-04636) - B451
Md Atiquzzaman/Johnson, Mirmiran & Thompson, Inc, Huaguo Zhou/Johnson, Mirmiran & Thompson, Inc

Safety Impact of Two Types of Median Opening Access Control Treatments at Unsignalized Intersections on Multilane Divided Highways: Case Studies in Alabama (20-05763) - B452
Beijia Zhang/Auburn University, Md Atiquzzaman/Auburn University, Huaguo Zhou/Auburn University, Rod Turochy/Auburn University

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Optimizing Highway Maintenance
Mark Robinson, DBI Services, Inc., presiding
Sponsored By Standing Committee on Maintenance and Operations Management

This session highlights different models and guidance for optimizing the planning and execution of highway maintenance.

Novel Method for Short-Term Road Maintenance Operation Starting Time Optimization Based on Real-Time Traffic Map Data (20-00320) - B373
Zhepu Xu/Tongji University, Qun Yang/Tongji University

Operation and Maintenance Recommendations for Emergency Escape Ramps Located in Mountain States (20-02234) - B385
Deniz Besiktepe/Colorado State University, Rodolfo Valdes-Vasquez/Colorado State University, Kelly Strong/Colorado State University, Scott Shuler/Colorado State University

Family Groups of Road Segments Considering Weather, Traffic, and Maintenance: A Clustering Approach (20-03116) - B386
Arash Karimzadeh/University of North Carolina, Charlotte, Sepehr Sabeti/University of North Carolina, Charlotte, Adrian Burde/University of North Carolina, Charlotte, Hamed Tabkhi/University of North Carolina, Charlotte, Omidreza Shoghli/University of North Carolina, Charlotte

Minimizing Cost of Highway Maintenance Considering the Impact of Vehicle Emissions: An Artificial Bee Colony Approach (20-05164) - B387
Celina Semaan/New Jersey Institute of Technology, Steven Chien/New Jersey Institute of Technology, Ching-Jung Ting/New Jersey Institute of Technology

Regression Models of Road User Cost Prediction for Highway Maintenance and Rehabilitation for Life-Cycle Planning in California (20-05403) - B388
Sampat Kedarisetty/University of California, Davis, Changmo Kim/University of California, Davis, John Harvey/University of California, Davis

Optimization of Pavement Repair Activities and Equipment Based on Fuzzy Modeling (20-03568) - B389
John Sprouse/Applied Research Associates, Inc. (ARA), Alessandra Bianchini/Applied Research Associates, Inc. (ARA)

Innovations in Traffic Marking and Sign Materials
Carmine Dwyer, Applied Research Associates, Inc. (ARA), presiding
Chieh (Ross) Wang, Oak Ridge National Laboratory, presiding
Sponsored By Standing Committee on Signing and Marking Materials

Sign Retroreflectivity Deterioration and Sign Service Life: State of the Art Review (20-00058) - B374
William Rasdorf/North Carolina State University, Patricia Machado/North Carolina State University
Simulation-Based Analysis of Sign Blanket Replacement Strategies (20-00321) - B375
William Rasdorf/North Carolina State University, Patricia Machado/North Carolina State University
A Condition-Based Maintenance of Retroreflective Pavement Markings (20-01099) - B376
Maxime Redondin/Institut VEDECOM
Analysis of Pavement Marking Durability Utilizing Both Northern and Southern Regional NTPEP Test Decks (20 -05507) - B377
Eric Greyson/Dow, Richard Cooper/Dow, Joy Gallagher/Dow
Evaluation of Structured Pavement Markings (20-05844) - B378
Adam Pike/Texas A&M Transportation Institute, Herbert Bickley/Texas A&M Transportation Institute
Optimizing Routing of Mobile Retroreflectivity Units for Pavement Marking Performance Assessment (20-05936) - B379
Yu-Chun Lin/National Taiwan University, Chieh (Ross) Wang/National Taiwan University, Albert Chen/National Taiwan University

Ridesourcing, Ridesharing, and Carsharing
Carol Schweiger, Schweiger Consulting LLC, presiding
Sponsored By Standing Committee on Emerging and Innovative Public Transport and Technologies

Are Drivers Cool with Pool?: Driver Attitudes Toward the Shared TNC Services Uber Pool and Lyft Shared (20-0 0077) - B302
Eric Morris/Clemson University, Ying Zhou/Clemson University, Anne Brown/Clemson University, Sakib Khan/Clemson University, John Derochers/Clemson University, Harry Campbell/Clemson University, Angela Pratt/Clemson University, Mashrur Chowdhury/Clemson University
Measuring When Uber Behaves as a Substitute or Complement to Transit: An Examination of Travel-Time Differences in Toronto (20-00091) - B303
Mischa Young/University of Toronto, Jeff Allen/University of Toronto, Steven Farber/University of Toronto
How Scheduling Advances Affect Level of Service, Fleeting, and Critical Mass in Smartphone-Based Vanpooling (20-00419) - B304
Donghui Li/Tsinghua University, Constantinos Antoniou/Tsinghua University, Hai Jiang/Tsinghua University, Wei Shen/T singhua University, Liang Zhang/Tsinghua University, Weijian Han/Tsinghua University
Exploring the Ridership Impacts of Ridehailing on Multimodal Public Transit in Toronto (20-00921) - B312
Wenting Li/University of Toronto, Amer Shalaby/University of Toronto, Khandker Nurul Habib/University of Toronto
Analyzing the Impact of Ridesharing Program on Multimodal Commute Behavior (20-01087) - B305
Zheng Zhu/Hong Kong University of Science and Technology, Xiaoran Qin/Hong Kong University of Science and Technology, Jintao Ke/Hong Kong University of Science and Technology, Zhengfei Zheng/Hong Kong University of Science and Technology, Hai Yang/Hong Kong University of Science and Technology
Adaptive Control Model of Vehicular Accumulation for Shared Use Autonomous Vehicle Mobility Service (20-01 148) - B306
Takahiko Kusakabe/University of Tokyo
Does Sharing a Ride with Strangers Take Cars Off the Street?: Evidence from Uber and Lyft (20-01189) - B307
Bruce Schaller/Schaller Consulting
Ridesharing Efficiency and Level of Service Under Alternative Demand and Behavioral and Pricing Settings (20 -01311) - B311
Arjan de Ruijter/Delft University of Technology, Oded Cats/Delft University of Technology, Javier Alonso-Mora/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

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Exploring the Factors Affecting the Combination of Electric Vehicle Timeshare Rentals and Rail Transit Using Partial Proportional Odds Models (20-02279) - B308

Jingfeng Ma/Southeast University, Shunchao Wang/Southeast University, Jingcai Yu/Southeast University, Lichao Wang/Southeast University

Insights from the California Mobility Panel Study: Evolution in the Use, Impacts, and Limitations on the Use of (Shared) Ridehailing (20-02731) - B309

Farzad Alemi/University of California, Davis, Giovanni Circella/University of California, Davis, Grant Matson/University of California, Davis, Daniel Sperling/University of California, Davis

The Evolution, Usage, and Trip Patterns of Taxis and Ridesourcing Services (20-02732) - B300

Xiatian Wu/University of California, Davis, Don MacKenzie/University of California, Davis

Assessing the VMT Effect of Ridesourcing Services in the United States: Evidence from the 2017 National Household Travel Survey (20-02750) - B301

Xiatian Wu/University of California, Davis, Don MacKenzie/University of California, Davis

Availability-Based Dynamic Pricing on a Roundtrip Carsharing Service: An Experimental Design Using Agent-Based Simulation (20-02869) - B313

Giulio Giorgione/University of Luxembourg, Francesco Ciari/University of Luxembourg, Francesco Viti/University of Luxembourg

Empirical Evaluation of the Efficiency and Effectiveness of a Ridesourcing Service (20-02922) - B310

Oded Cats/Delft University of Technology, Panchamy Krishnakumari/Delft University of Technology, Nicholas Arbez/Delft University of Technology, Nicolas Chiabaut/Delft University of Technology, Hans Van Lint/Delft University of Technology

Transportation Network Company Service Usage in the University Community: Service Adoption, Usage Frequency, and Service Type Choice (20-03177) - B314

Jiali Zhou/Monash University, Zhenliang Ma/Monash University, Santiago Hirschmann/Monash University, Felix Yik Kin Lao/Monash University

Network Equilibrium Analysis of Competitive Ridesourcing Market (20-03283) - B315

Linglin Ni/Zhejiang University, Chuqiao Chen/Zhejiang University, Xiqun (Michael) Chen/Zhejiang University

A Survival Analysis of Ridesourcing Drivers' Dwelling Behavior at Spot Markets (20-03432) - B316

Zhengtian Xu/University of Michigan, Ann Arbor, Yafeng Yin/University of Michigan, Ann Arbor, Hongtu Zhu/University of Michigan, Ann Arbor, Jieping Ye/University of Michigan, Ann Arbor

A Holistic Approach to the Rebalancing Problem of Vehicle Sharing Schemes (20-03733) - B317

Georgia Aifadopoulou/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Andreas Nikiforiadis/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Georgios Tsaples/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Neofytos Boufidis/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Josep Maria Salanova Grau/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Katerina Chrysostomou/Centre for Research and Technology Hellas - Hellenic Institute of Transport

Effects of the Built Environment on Public Adoption of Autonomous Vehicles and Shared Autonomous Vehicles: A Case Study of the Dallas-Fort Worth Metropolitan Area (20-04094) - B318

Hamid Hajjafari/University of Texas, Arlington, Stephen Mattingly/University of Texas, Arlington

Fleet Sizing for Pooled Automated Vehicle Fleets (20-04116) - B319

Milos Balac/ETHZ - Swiss Federal Institute of Technology, Sebastian Hörl/ETHZ - Swiss Federal Institute of Technology, Kay Axhausen/ETHZ - Swiss Federal Institute of Technology

Impact of Transportation Network Companies on U.S. Public Transit Ridership Trends (20-04733) - B325

Kurt Lehmann/Cambridge Systematics, Inc., Richard Driscoll/Cambridge Systematics, Inc.

Carsharing and Mobility of Lower-Income Populations in California (20-04923) - B326

Suman Mitra/University of Arkansas, Fayetteville

A Comprehensive Study of Important Indicators for the Deployment of a Dynamic Shuttle Service in Washtenaw County (20-05175) - B327

Richard Twumasi-Boakye/Ford Motor Company, Xiaolin Cai/Ford Motor Company, James Fishelson/Ford Motor Company, Archak Mittal/Ford Motor Company, Andrea Broaddus/Ford Motor Company

A Top-Down Approach to Assessing the Upper-Bound Carpool Potential for SOV Commuters (20-05809) - B328

Diyi Liu/Georgia Institute of Technology (Georgia Tech), Ziyi Dai/Georgia Institute of Technology (Georgia Tech), Kara Todd/Georgia Institute of Technology (Georgia Tech), Yingping Zhao/Georgia Institute of Technology (Georgia Tech), Natcha O-Charoen/Georgia Institute of Technology (Georgia Tech), Kyle Mayans/Georgia Institute of Technology (Georgia Tech), Randall Guensler/Georgia Institute of Technology (Georgia Tech)

Who Uses Ridehailing?: Using Cluster Analysis to Identify Traveler Markets in the Greater Toronto and Hamilton Area (20-00925) - B329

Hong Yun (Eva) Shi/Ryerson University, Matthias Sweet/Ryerson University

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Bumps on the Road to Autopia: A Realistic Look at Autonomous Taxis (20-03077) - B349
Daniel Smith/The Tioga Group, Inc.

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Bus Transit Research and Practices, Part 1 (Part 2, Session 1568)
Thomas Schwetz, Lane Transit District, presiding
Sponsored By Standing Committee on Bus Transit Systems

Robust Bus Scheduling Considering Transfer Synchronizations (20-00085) - B320
Konstantinos Gkiotsalitis/University of Twente, Oskar Eikenbroek/University of Twente, Oded Cats/University of Twente
Designing Bus Rapid Transit Systems: Lessons for Service Reliability and Operations (20-00113) - B321
Oded Cats/Delft University of Technology, Robert Ishaq/Delft University of Technology
Structural, Economic, and Environmental Analysis of Guadalajara Bus Network (20-00985) - B323
Orlando Barraza Aguilar/Universitat Politecnica de Catalunya, Sergio Garmendia/Universitat Politecnica de Catalunya, Miguel Estrada/Universitat Politecnica de Catalunya
Optimal Berth Allocation at Bus Terminal Integrated with Passenger Choice of Overlapping Routes (20-01146) - B324
Hui Jin/Soochow University, Haiming Hao/Soochow University, Xiaoguang Yang/Soochow University, Dong Zhang/Soochow University
Optimal Operational Strategies for Multiple Bus Lines Considering Passenger's Preferences (20-01479) - B335
Chunyan Tang/Dalian Maritime University, Avishai Ceder/Dalian Maritime University, Ying-En Ge/Dalian Maritime University, Na Wu/Dalian Maritime University
Analytical Modeling of Semi-Flexible Transit System: Effect of Service Delivery Type on Operating Cost Efficiency and Critical Passenger Demand (20-01736) - B336
Sushreeta Mishra/University of Manitoba, Babak Mehran/University of Manitoba
Dwelling Sequence Optimization of Connected Buses at Isolated Curbside Stops (20-01978) - B337
Shiqi Ou/Tongji University, Chunhui Yu/Tongji University, Wanjing Ma/Tongji University, Renxin Zhong/Tongji University, Jian Gao/Tongji University
A Compatibility-Based Approach for Routing and Scheduling the Demand Responsive Connector (20-02067) - B331
Yunxue Lu/Southeast University, Hao Wang/Southeast University, Li Wenquan/Southeast University
The Application and Performance of LSSVM for Short-Term Passenger Flow Forecasting with Diverse Input (20-02390) - B330
Dongya Li/Southeast University, Xuedong Hua/Southeast University, Wei Wang/Southeast University, Pandi Wang/Southeast University
An Inventory of Bus Stop Amenities Guidelines at U.S. Transit Agencies (20-02440) - B338
Samuel Jensen/University of Arizona, Arlie Adkins/University of Arizona, Keith Bartholomew/University of Arizona, Ja Kim/University of Arizona
A POPMUSIC Algorithm for Customized Bus Network Design (20-02769) - B339
Yining Hu/Kyoto University, Nobuhiro UNO/Kyoto University
Multi-Objective Optimal Allocation of Wireless Bus Charging Stations Considering Costs and the Environmental Impact (20-02865) - B342
Yuval Hadas/Bar Ilan University, Oren Nahum/Bar Ilan University
Flexible Bus Dispatching System with Modular and Fully Automated Bus Units (20-02871) - B333
Igor Dakic/Stanford University, Kaidi Yang/Stanford University, Monica Menendez/Stanford University, Joseph Chow/Stanford University
Investigating the Effects of User Behavior and Trip Length Patterns on the Optimal Bus Network Design (20-03144) - B334
Igor Dakic/Eidgenossische Technische Hochschule Zurich, Ludovic Leclercq/Eidgenossische Technische Hochschule Zurich, Monica Menendez/Eidgenossische Technische Hochschule Zurich
The Influence of Walkability Around Feeder Bus Stops on Rapid-Transit Station Boardings: The Case of Los Angeles Multimodal Transit System (20-03240) - B343
Luis Ramos-Santiago/Clemson University
Where to First Electrify Bus Transit Routes: A Case Study for Austin, Texas (20-03554) - B344
Jugal Amodwala/University of Texas, Austin, Kara Kockelman/University of Texas, Austin

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Preferences for Autonomous Public Transit Vehicles: Insights from a Survey and a Public Engagement Event in Singapore (20-03687) - B345

Samuel Chng/University of Missouri, Columbia, Sabreena Anowar/University of Missouri, Columbia, Lynette Cheah/University of Missouri, Columbia

A Bi-Level Optimization Model for Exclusive Bus Lane Design to Improve Passenger Travel Time Reliability (20-03854) - B346

Weibin Kou/Beijing Jiaotong University, Xumei Chen/Beijing Jiaotong University, Lei Yu/Beijing Jiaotong University

Optimal Design for Hub-and-Spoke Bus Transit Network with Heterogeneous Demand (20-03997) - B347

Lijun Yu/South China University of Technology, Yizhou Zhu/South China University of Technology, Xue Li/South China University of Technology, Yipeng Peng/South China University of Technology

Improving Transfer Time Optimization Modeling for Public Transit Systems (20-04000) - B322

Zahra Ansarilari/University of Toronto, Mahmood Mahmoodi Nesheli/University of Toronto, Merve Bodur/University of Toronto, Amer Shalaby/University of Toronto, Siva Srikukenthiran/University of Toronto

Reliable Schedule Coordination for a Bus Transit Corridor: A Shanghai Case (20-04092) - B348

Xiongfei Lai/Tongji University, Jing Teng/Tongji University, Paul Schonfeld/Tongji University, Lu Ling/Tongji University

Transit Route and Frequency Design for Environmental Sustainability (20-04127) - B332

Mei Zhu/Southeast University, Zhu Mei/Southeast University, Li Wenquan/Southeast University, Chen Qian/Southeast University

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Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 146C
Return on Resilience Investments
Anne Choate, ICF, presiding
Sponsored By Special Task Force on Climate Change and Energy

Transportation agencies have become more adept at understanding the vulnerability of their networks to extreme weather and even to changes in climate, yet there are few best practices on how to use that information to inform resilience investments. Given limited budgets and competing priorities, a sound economic analysis is needed to inform when, where, and how much to invest in resilience. By providing insights on the costs and benefits of investments, economic analyses can assist in identifying and selecting the most efficient design and management alternatives that will provide an efficient return on investment. This session will include decision makers who are advancing the state of the art as relates to economic resilience analyses.

New York City Climate Resiliency Design Guidance (P20-20210)
Susanne DesRoches/City of New York
Flood Resilience Measures in Miami Beach (P20-20211)
Peter Schultz/ICF
Hillsborough 2040 Long-Range Transportation Plan (P20-20212)
Beth Alden/Hillsborough MPO
Colorado DOT I-70 Pilot Study (P20-20213)
Aimee Flannery/Applied Engineering Management Corporation

1229 CM (1.75)

Equity Reframed: Looking Back and Planning Ahead
Andrea d'Amato, Massachusetts Department of Transportation, presiding
Gloria Jeff, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Strategic Management, Standing Committee on Statewide Multimodal Transportation Planning, Standing Committee on Public Involvement in Transportation, Standing Committee on Effects of Information and Communication Technologies (ICT) on Travel Choices, Standing Committee on Transportation and Economic Development, Standing Committee on Social and Economic Factors of Transportation, Standing Committee on Transportation and Sustainability, Standing Committee on Transit Management and Performance, Standing Committee on Emerging and Innovative Public Transport and Technologies, Standing Committee on Public Transportation Planning and Development, Standing Committee on Paratransit

This session will contain two parts. Part 1 will focus on the past; specifically, how equity in transportation been defined and how policy has addressed equity in transportation since the modern Civil Rights Movement. Part 2 will focus on the future, examining how practitioners can identify equity issues that result from technological change, use policies to advance equity principles, and apply new public involvement techniques and equity performance measures. This session will have two moderators and six panelists, three of which will focus on Part 1 (Looking Back) and three focusing on Part 2 (Planning Ahead).

Lessons Learned from Past Failures and Successes in Community-Based Transportation Planning (P20-20038)
Karilyn Crockett/Massachusetts Institute of Technology (MIT)
Equity Issues Prompting Transportation Policies (P20-20022)
Thomas W Sanchez/Virginia Polytechnic Institute and State University
Advocacy Perspective on the History of Equity in Transportation (P20-20021)
Jacquelyne Grimshaw/Center for Neighborhood Technology
Mobility Patterns of Seniors (P20-20023)
Sandra Rosenbloom/University of Texas, Austin
Equity Issues Facing People with Disabilities from a Transit Perspective (P20-20036)
Laura Brelsford/MBTA
Equity Performance Measurement (P20-20025)
Beth Zgoda/ICF
Equity and Inclusion Considerations When Dealing with Emerging Mobility Technologies (P20-20024)
Richard Ezike/The Urban Institute

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Rethinking Performance: Incorporating New Data and Tools to Improve Decision Making and Outreach
Jay Styles, Virginia Department of Transportation, presiding
Sponsored By Standing Committee on Performance Management, Task Force on Data for Decisions and Performance Measures, Standing Committee on Strategic Management, Standing Committee on Management and Productivity, Standing Committee on Transportation Asset Management

In today's environment, there are crowdsourced, Internet of Things (IoT), CAV, and other big data available for transportation organizations to leverage in addition to traditional agency data. Moreover, new data analysis techniques and tools are making it easier for organizations to mine data to get more useful insights far more easily and quickly than ever before. This session will provide thoughtful perspectives on how practitioners are using new data and tools – and how it is changing the landscape of performance measures, decision-making, and stakeholder engagement.

The Right Ingredients for a Balance Performance "Meal" to Fuel Decision Making in Atlanta: Visual, Numeric, Historic, and Real-Time Data Integration (P20-20138)
Kyung-Hwa Kim/Atlanta Regional Commission
From Siloed Data to Actionable Intelligence: Addressing Virginia's Opioid Epidemic (P20-20197)
Carlos Rivero/Commonwealth of Virginia
KYTC's Real-Time Integration of Crowdsourced and Traditional Data for Improved Visualization and Operations Decision Making (P20-20268)
Jason Siwula/Kentucky Transportation Cabinet

(continued)

Integrating Multi-Agency/Multi-State Data to Improve Traffic Incident Management (TIM): Challenges and Successes from the FHWA EDC-4 Innovation Using Data to Improve TIM (P20-20334)
Paul Jodoin/Federal Highway Administration (FHWA), Benjamin Pecheux/Applied Engineering Management Corporation

1231

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 150B
New Research in Transportation Demand Management
Jia Li, Texas Tech University, presiding
Sponsored By Standing Committee on Transportation Demand Management

This session discusses new and inovative ways to reduce the demand for drive alone access.

Transportation Demand Management (TDM) and Social Justice: A Case Study of Differential Impacts of TDM Strategies on Various Income Groups (20-00687)
Md Sami Hasnine/Massachusetts Institute of Technology (MIT), Khandker Nurul Habib/Massachusetts Institute of Technology (MIT)
Building a Partnership Between a Transit Agency and a Shared Mobility Company: Incentivizing App-Based Carpooling in the Seattle Region (20-01161)
Qing Shen/University of Washington, Yiyuan Wang/University of Washington, Casey Gifford/University of Washington
Buying Traffic Decongestion by Paying Drivers to Become Passengers: Methodology and Data Sources (20-040 51)
Paul Minett/Trip Convergence Ltd., John Niles/Trip Convergence Ltd., Richard Lee/Trip Convergence Ltd., Brittany Bogue/Trip Convergence Ltd.

1232

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 151A
Tribal Mobility and Sustainability: Effects of Climate Change
Angelena Campobasso, Eastern Washington University, presiding
Sponsored By Standing Committee on Native American Transportation Issues, Subcommittee on Tribal Safety Issues, Subcommittee on Tribal Historical and Archeological Preservation

Across the U.S. there are 573 federally recognized tribes with critical infrastructure that are threatened by climate change. While many non-tribal governments face similar challenges, tribal transportation programs are particularly disadvantaged in addressing incidents and planning for future scenarios. This session will describe the vulnerabilities of tribal transportation infrastructure to climate change driven incidents, the resources available, and the need for further research and policy developments in this area.

First Panelist (P20-21711)
Angelena Campobasso/Eastern Washington University
Second Panelist (P20-21712)
Ronald Hall/Bubar & Hall Consulting, LLC
What Makes a Carbon Policy Effective? (P20-21713)
Julia Sanders
Third Panelist (P20-21714)
Gerry Hope/Tribal Government
Fourth Panelist (P20-21715)
Megan Heller

1233

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 154
Promoting Your Research: Success Stories from Academia, State DOTs, and Journals
Cait McCusker, Portland State University, presiding
Sponsored By Section - Research and Education

(continued)

Promoting Your Research: The Research Center Perspective (P20-21699)
Hilary Nixon/San Jose State University, Cait McCusker/Portland State University
Promoting Your Research: The State DOT Perspective (P20-21700)
Mara Campbell/Jacobs
Promoting Your Research: The Journal Perspective (P20-21706)
Patti Lockhart/Transportation Research Board
Promoting Your Research: The Researcher's Perspective (P20-21707)
Jennifer Dill/Portland State University

1234

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 151B
New Solutions to Traffic Monitoring Challenges
John Ash, University of Washington, presiding
Sponsored By Standing Committee on Highway Traffic Monitoring

 This session presents new solutions to common challenges experienced by agencies in their system -wide traffic monitoring programs. These solutions focus on making use of novel data sources and/or innovative methodologies to provide insights on addressing a variety of issues from AADT estimation to newer problems surrounding connected vehicle technologies.

Data-Driven Roadside Unit Location Optimization for Information Propagation Under Stochastic Traffic Condition (20-01608)
Yunyi Liang/Tongji University, Ning Ma/Tongji University, Jia Hu/Tongji University, Xin Li/Tongji University, Xianfeng Yang/Tongji University
GIS-Based Multi-Variate Spatial Clustering for Traffic Pattern Recognition Using Continuous Counting Data (20-05492)
MD Mehedi Hasan/Western Michigan University, Jun-Seok Oh/Western Michigan University
Enhancing Statewide Annual Average Daily Traffic Estimation with Ubiquitous Probe Vehicle Data (20-05533)
Xu Zhang/Kentucky Transportation Cabinet, Mei Chen/Kentucky Transportation Cabinet
From Twitter to Predictor: Next-Day Morning Traffic Prediction Using Social Media Data (20-02417)
Weiran Yao/Carnegie Mellon University, Sean Qian/Carnegie Mellon University
A Data Infrastructure for Connected Vehicle Applications (20-03305)
Xingmin Wang/University of Michigan, Transportation Research Institute, Shengyin Shen/University of Michigan, Transportation Research Institute, Debra Bezzina/University of Michigan, Transportation Research Institute, James Sayer/University of Michigan, Transportation Research Institute, Henry Liu/University of Michigan, Transportation Research Institute, Yiheng Feng/University of Michigan, Transportation Research Institute

1235   CM (1.75)

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 145A
Planning for Mega-Regions: New Initiatives and Technical Approaches to Address Complex Issues and Foster Productive Partnerships
James Garland, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Metropolitan Policy, Planning, and Processes, Subcommittee on Mega-Regions

Megaregional planning is a complex, dynamic undertaking that requires sponsoring agencies and partners to develop strong skills in relationship-building among traditionally "siloed" public and private sector partners as well as robust technical capacities for multi-disciplinary analyses that integrate a wide array of geographic scales and planning contexts. During this session, a panel of seasoned researchers and Federal and regional transportation planning agency staff will share insights and experiences from projects underway through the FHWA -sponsored National Economic Partnerships initiative; research on the salience of megaregional planning among MPOs; and insights on the location and clustering patterns of high-tech employment hubs.

Advancing Megaregional Policy and Planning Through Federal and Local Partnerships (P20-20961)
James Garland/Federal Highway Administration (FHWA)

(continued)

Addressing Complex Issues at the Megaregional Scale: Featured National Economic Partnership Case Studies from the Arizona Sun Corridor and the Chattanooga Region (P20-20962)
Edward Brown/Maricopa Association of Governments, Daniel Pallme/Tennessee Department of Transportation, Catherine Ross/Georgia Institute of Technology (Georgia Tech), Kyle Schroeckenthaler/EBP
The Salience of Megaregional Geographies for Inter-Metropolitan Transportation Planning and Policy Making (20-01368)
Michael Oden/University of Texas, Austin, Gian-Claudia Sciara/University of Texas, Austin
Exploring the U.S. Geography of Specialized High-Tech Zones (20-02443)
Ahoura Zandiatashbar/University of Illinois, Chicago, Shima Hamidi/University of Illinois, Chicago

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1236

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 156
Advanced Methods for Travel Behavior
Abolfazl (Kouros) Mohammadian, University of Illinois, Chicago, presiding
Sponsored By Standing Committee on Traveler Behavior and Values

Understanding Route Choice of Drivers Under Stop-and-Go Traffic: Frequentist Versus Bayesian Approaches (20-05323)
Neeraj Saxena/University of New South Wales, Ruiyang Wang/University of New South Wales, Vinayak Dixit/University of New South Wales, S. Travis Waller/University of New South Wales
Inferring the Purposes of Using Ridehailing Services Through Data Fusion of Trip Trajectories, Secondary Travel Surveys, and Land Use Data (20-02230)
Sanjana Hossain/University of Toronto, Khandker Nurul Habib/University of Toronto
Linking Car Owners' Affective and Instrumental Motives to Their Car Use: An Application of an Integrated Choice and Latent Variable Model (20-03438)
Sascha von Behren/Karlsruhe Institute of Technology, Lisa Boenisch/Karlsruhe Institute of Technology, Ulrich Niklas/Karlsruhe Institute of Technology, Bastian Chlond/Karlsruhe Institute of Technology
Modeling Destination Choice Behavior of the Dockless Bikesharing Service Users: Assessing Origin-Destination Interdependency Using Their Built Environment Attributes (20-05767)
Muntahith Orvin/University of British Columbia, Okanagan, Mahmudur Fatmi/University of British Columbia, Okanagan
A Multiple Discrete-Continuous Modeling Framework for Disaggregate Activity Participation and Time-Use Analysis (20-01685)
Shobhit Saxena/Indian Institute of Science, Abdul Pinjari/Indian Institute of Science, Rajesh Paleti/Indian Institute of Science

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1237   CM (1.75)

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 146B
Automated Transportation and Shared Mobility
Xiaopeng (Shaw) Li, University of South Florida, presiding
Sponsored By Standing Committee on Transportation Network Modeling

A Continuous Model for Designing Corridor Systems with Modular Vehicles Enabling En-Route Docking (20-01188)
Zhiwei Chen/University of South Florida, Xiaopeng (Shaw) Li/University of South Florida
A Unified Equilibrium Framework of New Shared Mobility Systems (20-01575)
Xuan Di/Columbia University, Xuegang Ban/Columbia University
Multi-Stage Discrete Trajectory Control for Merging Two Traffic Streams at Highway-Ramp Intersection (20-01835)
Chen Mu/University of Florida, Lili Du/University of Florida
An Optimization Method for Ridesharing Routing Problem with Mixed Autonomous Vehicles (20-02715)
Ming Li/Beihang University, Zhongxia Xiong/Beihang University, Xiang Huo/Beihang University, Xinkai Wu/Beihang University
Book Ahead and Performance Management for Ridesharing Platforms (20-02818)
Cesar Yahia/University of Texas, Austin, Gustavo de Veciana/University of Texas, Austin, Michael Stecklein/University of Texas, Austin, Jean Abou Rahal/University of Texas, Austin, Stephen Boyles/University of Texas, Austin

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Dynamic Car–Passenger Matching of Online and Reservation Requests (20-04389)
Marvin Erdmann/Universitat der Bundeswehr, Munchen, Florian Dandl/Universitat der Bundeswehr, Munchen, Bernd Kaltenhäuser/Universitat der Bundeswehr, Munchen, Klaus Bogenberger/Universitat der Bundeswehr, Munchen
Simulation Framework for Autonomous On-Demand Urban Air Mobility (20-05562)
Haleh Ale Ahmad/Northwestern University, Hani Mahmassani/Northwestern University, Michael Hyland/Northwestern University
Dual-Horizon Forecasts and Repositioning Strategies for Operating Shared Autonomous Mobility Fleets (20-05 757)
Florian Dandl/Northwestern University, Michael Hyland/Northwestern University, Klaus Bogenberger/Northwestern University, Hani Mahmassani/Northwestern University
Robust Maximum Coverage Facility Problem with Drones Considering Uncertainties in Battery Availability and Consumption (20-05491)
Darshan Rajesh Chauhan/Portland State University, Avinash Unnikrishnan/Portland State University, Miguel Figliozzi/Portland State University, Stephen Boyles/Portland State University

1238

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 146A
Planes, Trains, and Maritime Mobility: Advanced Technology Energy Opportunities in New Sectors
Rachael Nealer, U.S. Department of Energy (DOE), presiding
Sponsored By Section - Environment and Energy, Standing Committee on Transportation Energy, Standing Committee on Alternative Transportation Fuels and Technologies, Subcommittee on Alternative Aviation Fuels, Standing Committee on Marine Environment

There has been significant investment in R&D and commercialization of alternative fuel vehicles (i.e., biofuel, hydrogen and fuel cell, and electrification) focused on light duty, and more recently, heavy duty. However, it is increasingly clear that these technologies have potential beyond conventional applications. Hydrogen trains, electric puddle jumpers, bio-fueled shipping vessels are among the many potential combinations of advanced energy technologies and mobility. This session will explore the opportunities for research and deployment, paying special attention to the varying degrees of market development, research advancement, and industry interest and unique challenges of these sectors.

Hydrogen Marine Perspective (P20-20875)
Lennie Klebanoff/Sandia National Laboratories
Electric Aviation Perspective (P20-20876)
Andrew Gibson/Empirical Systems Aerospace
Hydrogen Rail Perspective (P20-20877)
Andreas Hoffrichter/Michigan State University
Electric Aviation Perspective (P20-20883)
Venkat Viswanathan/Carnegie Mellon University
Electric Rail Perspective (P20-21602)
Michael Cleveland/BNSF Railway
Biofuel Aviation Perspective (P20-21603)
Nikita Pavlenko/International Council for Clean Transportation
Local Government Perspective (P20-21698)
Eugene Seroka/Port of Los Angeles

1239 CM (1.75)

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 140A
Hot Topics and Emerging Issues in Ecology and Transportation
Alexander Levy, VHB, presiding
Sponsored By Standing Committee on Ecology and Transportation

Addressing the Requirements of the U.S. Migratory Bird Treaty Act When Conducting Maintenance on Bridges (P20-20804)
Sean Connolly/South Carolina Department of Transportation
Preventing Animal–Vehicle Crashes Using a Smart Detection Technology and Warning System (20-04130)
Cristian Druta/VTTI, Andrew Alden/VTTI

(continued)

Assessment of Wildlife–Vehicle Crash Mitigation Structures on the U.S. 33 Nelsonville Bypass (20-04193)

Benjamin Sperry/Ohio University, Viorel Popescu/Ohio University, Eileen Wyza/Ohio University, Steve Porter/Ohio University, Rob Wiley/Ohio University, Devon Cottrill/Ohio University, Deborah McAvoy/Ohio University

Episodic, Pulsed Brown Pelican (Pelicanus occidentalis) Mortality on South Texas Roads: Causes and Solutions (20-05927)

Andrew Birt/Texas A&M Transportation Institute, Farinoush Sharifi/Texas A&M Transportation Institute, Arezoo Samimi Abianeh/Texas A&M Transportation Institute, John Young/Texas A&M Transportation Institute

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1240

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 140B
Social and Economic Factors of Car Ownership
Nicholas Klein, Cornell University, presiding
Steven Farber, University of Toronto, presiding
Sponsored By Standing Committee on Social and Economic Factors of Transportation

A Portrait of Zero-Car and Car-Owning Household Mobility Trends in the United States: Insights from the 2009 and 2017 National Household Travel Survey (20-05611)

Gabriella Abou-Zeid/Portland State University, Michael McQueen/Portland State University, Anaisabel Crespo-Leiva/Portland State University, Kelly Clifton/Portland State University

"Un-separating" Church and Travel?: Religious Culture and Rural Car Ownership (20-03043)

Gregory Newmark/Kansas State University, Emma Rearick/Kansas State University

"Desperately in Need of a Car": Analyzing Crowdfunding Campaigns for Car Purchases and Repairs on Gofundme.com (20-02266)

Nicholas Klein/Cornell University, Minh Tran/Cornell University, Sarah Riley/Cornell University

Residential Relocations and Vehicle Ownership Among Low-Income Households (20-01145)

Andrew Schouten/University of California, Los Angeles

1241

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 209A
Current Trends in Landscape and Environmental Design
Willson McBurney, SNC Lavalin - Atkins, presiding
Jeffrey Lormand, Parsons, presiding
Keith Robinson, Gray Bowen Scott, presiding
Sponsored By Standing Committee on Landscape and Environmental Design, Standing Committee on Roadside Maintenance Operations

 This session will provide attendees with information from four distinct presentations on issues facing the planning , design and management of highway corridors related to climate change, bio-diversity, endangered species and human factors.

Managing Urban Freeway Roadsides (20-01515)

Beverly Storey/Texas A&M University Transportation Institute, John Habermann/Texas A&M University Transportation Institute

A Multifaceted Approach to Improve Conditions for Pollinators Along Washington State Highways (20-01088)

Jeff Dreier/Washington State Department of Transportation, Mark Bakeman/Washington State Department of Transportation, Juli Hartwig/Washington State Department of Transportation, Kelly McAllister/Washington State Department of Transportation, Raymond Willard/Washington State Department of Transportation

Green Infrastructure and Living Shorelines: Adaptation of Transportation Systems (20-02941)

Wendy Meguro/University of Hawaii, Karl Kim/University of Hawaii

Virtual Reality for Evaluating Active Transportation Improvements for Roadways (20-05642)

Muhammad Habib/Dalhousie University, Devin Holmes/Dalhousie University

1242

Evaluation of Pavement Structures Using Full-Scale Accelerated Pavement Testing
Erdem Coleri, Oregon State University, presiding
Sponsored By Standing Committee on Full-Scale Accelerated Pavement Testing

Full-scale accelerated pavement testing (APT) is an efficient and economical method to evaluate pavement systems. The papers presented in this session will describe how APT was used to assess bonded concrete overlays, permanent deformation of pavement structures, and the effect of geogrid reinforcement on flexible pavement performance.

Measuring Pavement Permanent Deformation in Accelerated Pavement Testing (20-04173)
Wenjing Xue/Virginia Polytechnic Institute and State University, Gerardo Flintsch/Virginia Polytechnic Institute and State University, Brian Diefenderfer/Virginia Polytechnic Institute and State University
Evaluation of Bonded Concrete Overlay of Asphalt Under Accelerated Loading (20-04443)
Moinul Mahdi/Louisiana Transportation Research Center (LTRC), Zhong Wu/Louisiana Transportation Research Center (LTRC), Tyson Rupnow/Louisiana Transportation Research Center (LTRC)
Full-Scale Evaluation of Concrete-Asphalt Interphase in Thin Bonded Concrete Overlay on Asphalt Pavements (20-04925)
Fabian Paniagua/University of California, Davis, Julio Paniagua/University of California, Davis, Angel Mateos/University of California, Davis, Rongzong Wu/University of California, Davis, John Harvey/University of California, Davis
Accelerated Pavement Testing to Evaluate the Geogrid Reinforcement in Flexible Pavement Structures (20-05398)
Bingye Han/University of Tennessee, Knoxville, Pawel Polaczyk/University of Tennessee, Knoxville, Rong Ma/University of Tennessee, Knoxville, Yuetan Ma/University of Tennessee, Knoxville, Hongren Gong/University of Tennessee, Knoxville, Fulu Wei/University of Tennessee, Knoxville, Baoshan Huang/University of Tennessee, Knoxville

1243

Design and Analysis of Pavement Friction and Texture
Emmanuel Fernando, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Pavement Surface Properties and Vehicle Interaction

Determining Investigatory Levels of Friction with Crashes (20-02320)
Ross McCarthy/Virginia Polytechnic Institute and State University, Samer Katicha/Virginia Polytechnic Institute and State University, Gerardo Flintsch/Virginia Polytechnic Institute and State University, Edgar de León Izeppi/Virginia Polytechnic Institute and State University
Friction and Texture Retention of Concrete Pavements (20-04709)
Satyavati Komaragiri/University of Texas, Austin, Armen Amirkhanian/University of Texas, Austin, Amit Bhasin/University of Texas, Austin
Dynamic Calibration Method for the Measurement Model of Dual-Wheel Side Force Tester (20-00699)
Genqiang Jing/Ministry of Transport Research Institute of Highway, Lu Peng/Ministry of Transport Research Institute of Highway, Bing Zhang/Ministry of Transport Research Institute of Highway, Lu Liu/Ministry of Transport Research Institute of Highway, Xin Yuan/Ministry of Transport Research Institute of Highway
Using Close-Range Photogrammetry to Measure Pavement Texture Characteristics and Predict Pavement Friction (20-02535)
Mohammad Al-Assi/University of Idaho, Emad Kassem/University of Idaho, Richard Nielsen/University of Idaho

1244

Innovative Concrete Bridge Topics
Sponsored By Standing Committee on Concrete Bridges

This session presents various relevant topics in Concrete Bridge Design.

(continued)

High Strength Concrete Filled Fiber Tube Bridge Columns Wrapped with Shape Memory Alloy Spirals (20-02919)
Pratik Deogekar/University of Illinois, Urbana Champaign, Bassem Andrawes/University of Illinois, Urbana Champaign
Analytical Solutions for Flexural Design of Hybrid Reinforced Concrete (20-04064)
barzin Mobasher/Arizona State University School of Sustainable Engineering and the Built Environment, Yiming Yao/Arizona State University School of Sustainable Engineering and the Built Environment, Anling Li/Arizona State University School of Sustainable Engineering and the Built Environment, Devansh Patel/Arizona State University School of Sustainable Engineering and the Built Environment, Chidchanok Pleesudjai/Arizona State University School of Sustainable Engineering and the Built Environment
Estimating Prestress Losses Using Joint Openings on an Approach Unit of the Varina-Enon Bridge (20-03776)
Carin Roberts-Wollmann/Virginia Polytechnic Institute and State University, Seth Lindley/Virginia Polytechnic Institute and State University, Ioannis Koutromanos/Virginia Polytechnic Institute and State University
Influence of Improved Durability with a Ductile Fiber-Reinforced Concrete on the Resilience of a Reinforced Concrete Bridge (20-05924)
Hanmin Wang/University at Buffalo, Ravi Ranade/University at Buffalo, Pinar Okumus/University at Buffalo

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1245

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 202A
Using Contractor Test Results in Agency Acceptance Decisions While Meeting 23 CFR 637B Requirements
Dennis Dvorak, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Quality Assurance Management

FHWA revised 23 CFR 637B in 1995 to allow state highway agencies (SHA's) to use contractor tests in the acceptance decision. Since that time more than thirty SHA's have implemented the change. The drivers behind using contractor tests in the acceptance decision, challenges it has created, and techniques to conform to the CFR requirements will be presented.

Requirements When Using Contractor Data in Agency Acceptance Decisions (P20-20041)
Adam Hand/University of Nevada, Reno
Best Practices for Validating Contractor Data Used in Agency Acceptance Decisions (P20-20070)
Adam Hand/University of Nevada, Reno
State DOT Implementation for Validation of Contractor Test Results Using F- and T-Tests (P20-20039)
Barry Paye/Wisconsin Department of Transportation, Aaron Coenen/Federal Highway Administration (FHWA)
South Mountain Freeway: An Example in Evaluating Owner's Risk Approaches Using F- and T-Tests to Validate Contractor's Test Results (P20-20040)
Jesus Sandoval-Gil/Arizona Department of Transportation, Weng Tam/Tam Consulting Services LLC

1246

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 201
Advancements in Asphalt Pavement Construction Density
Amanda Gilliland, The Transtec Group, Inc., presiding
Sponsored By Standing Committee on Asphalt Pavement Construction and Rehabilitation

Improving Durability of Asphalt Pavements in Louisiana Through Increased In-Place Field Density (20-04737)
Moses Akentuna/Louisiana State University, Louay Mohammad/Louisiana State University, Minkyum Kim/Louisiana State University, Samuel Cooper/Louisiana State University, Samuel Cooper, Jr./Louisiana State University
Optimizing In-Place Density Through Improved Density Specifications (20-00482)
Timothy Aschenbrener/Federal Highway Administration (FHWA), Nam Tran/Federal Highway Administration (FHWA)
Coreless Asphalt Pavement Compaction Assessment: MnDOT Case Studies (20-05719)
Kyle Hoegh/Minnesota Department of Transportation, Trevor Steiner/Minnesota Department of Transportation, Eyoab Zegeye Teshale/Minnesota Department of Transportation, Shongtao Dai/Minnesota Department of Transportation
Development of Real-Time Density Monitoring Procedure During Asphalt Concrete Pavement Compaction Using Ground Penetrating Radar (20-00637)
Siqi Wang/University of Illinois, Urbana Champaign, Imad Al-Qadi/University of Illinois, Urbana Champaign

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 209B
Smart Paths to Minority/Women/Disadvantaged Business Enterprises Growth
Ruth Byrd-Smith, No Organization, presiding
Michelle Flamer, City of Philadelphia, presiding
Sponsored By Standing Committee on Disadvantaged Business Enterprises

A panel of seasoned practitioners will discuss measures to assist Minority, Women-Owned, and Disadvantaged Business Enterprises in overcoming barriers that make it difficult to obtain work on public transportation contracts. The session will focus on training, building capacity, individualized technical assistance, relationship-building, and sustainability.

Panel Discussion (P20-21230)
Christopher McCabe/Charlson Barber McCabe & Denmark, Donald Williams/Weatherspoon & Williams, LLC, Audrey Murrell/University of Pittsburgh Honors College, Stephanie Turnman/Always Busy Consulting, LLC

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 209C
Measuring and Analyses of Moisture During Stiffness and Strength Testing
John Siekmeier, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Engineering Behavior of Unsaturated Geomaterials

Measuring moisture and modeling its effects during stiffness and strength testing has been steadily increasing and used to optimize the design and performance of pavement foundations and other structures. This session includes moisture instrumentation and analyses during stiffness and strength testing of unsaturated unbound geomaterials.

Rapid Determination of the Influence of Moisture and Density on Mechanistic Parameters of Compacted Geomaterials Using Modified Iowa K Test (20-01868)
Cheng Li/Ministry of Transport Research Institute of Highway, Shengting Li/Ministry of Transport Research Institute of Highway, David White/Ministry of Transport Research Institute of Highway, Junxing Zheng/Ministry of Transport Research Institute of Highway, Xuhao Wang/Ministry of Transport Research Institute of Highway, Xiangjing Yu/Ministry of Transport Research Institute of Highway
Water Vapor Migration in Subgrade Soils in Arid and Semi-Arid Areas: Approach to the "Covering Effects" (20-02628)
Feifei Liu/Chang'an University, Xuesong Mao/Chang'an University, Yingying Li/Chang'an University, Cheng Xu/Chang'an University, Jianxun Zhang/Chang'an University
Effect of Moisture Content on the Shakedown Limits of Base Course Materials (20-03988)
Munir Nazzal/University of Cincinnati, Louay Mohammad/University of Cincinnati
A Modified State Surface Approach to Study the Unsaturated Soil Hysteresis Behavior (20-05528)
Beshoy Riad/Missouri University of Science and Technology, Xiong Zhang/Missouri University of Science and Technology

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 204B
Characterizing Unbound Base Materials
Cristian Druta, VTTI, presiding
Sponsored By Standing Committee on Aggregates

Construction Quality Control for Unbound Base Reclaimed Asphalt Aggregate Using Light Weight Deflectometer (20-00180)
Emre Akmaz/George Mason University, Saad Ullah/George Mason University, Burak Tanyu/George Mason University, Erol Guler/George Mason University
Resilient Modulus Prediction Models for Aggregate Base and Sub-Base Materials (20-02680)
S M Robinur Mohshin Chowdhury/Tennessee Department of Transportation, Emad Kassem/Tennessee Department of Transportation, Fouad Bayomy/Tennessee Department of Transportation

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Advanced Characterization of Unbound Granular Materials for Pavement Structural Design in Egypt (20-02764)
Ahmed El-Ashwah/Fayoum University Faculty of Engineering, Eman Mousa/Fayoum University Faculty of Engineering, Sherif El-Badawy/Fayoum University Faculty of Engineering, Mostafa AboHashema/Fayoum University Faculty of Engineering
Determination of Design Resilient Modulus of Unbound Materials for Rehabilitation in M-E Design (20-05337)
(Jey) Jeyakaran Thavathurairaja/University of Nevada, Reno, Adam Hand/University of Nevada, Reno, Murugaiyah Piratheepan/University of Nevada, Reno, Peter E. Sebaaly/University of Nevada, Reno, Elie Hajj/University of Nevada, Reno

1250

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Salon C
Intelligent Transportation Systems: State of the Industry 2020
Gregory Krueger, HNTB Corporation, presiding
Sponsored By Standing Committee on Intelligent Transportation Systems

This annual session convenes influential ITS government and industry leaders to share their perspective on ITS and their plans for the coming years.

Panel Discussion (P20-21583)

Panelist #1 (P20-21584)
Daniele Cazzari/SAS
USDOT Panelist (P20-21585)

ITSAmerica Panelist (P20-21586)

AASHTO Panelist (P20-21587)

1251

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Salon A
Planning-Level Adjustments for Connected and Automated Vehicles in the Highway Capacity Manual, 6th Edition
Tom Creasey, Caliper Corporation, presiding
Sponsored By Standing Committee on Highway Capacity and Quality of Service

This session will focus on the pooled-fund research sponsored by the Oregon DOT to provide planning-level capacity adjustments for connected and automated vehicles (CAVs), as well as additional ongoing and planed research to determine procedural changes in the Highway Capacity Manual to accommodate CAVs.

Highway Capacity for Mixed Traffic with CAVs (P20-21487)
Xiao-Yun Lu/University of California, Berkeley
CoEXist: Highway Capacity Implications for the Coexistence of Conventional and Automated Vehicles in Europe (P20-21488)
Jochen Lohmiller/PTV Group
Planning-Level Adjustments for CAVs in the Highway Capacity Manual: Summary of Current Research (P20-214 89)
Bastian Schroeder/Kittelson & Associates, Inc. (KAI)

1252

Traffic Control Devices Challenge: Connected and Autonomous Innovations for Improving Work Zone Safety—Hybrid Session
Paul Carlson, Road Infrastructure, Inc., presiding
Sponsored By Standing Committee on Traffic Control Devices

The TCDC is geared toward high school, college, and university students with an interest in transportation and an understanding of traffic control devices. The challenge was created in partnership between the Transportation Research Board and ATSSA with a goal of promoting innovation to stimulate ideas regarding traffic control devices -- with a goal to improve safety on the nation's roadways. This year's problem statement is "Connected and Autonomous Innovations for Improving Work Zone Safety."

An Integrated Work Zone Safety System for Connected and Automated Vehicles (P20-21356)
Cecilia Kadeha/Florida International University, Angela Kitali/Florida International University
"Connected" Temporary Traffic Control Devices (P20-21357)
Travis Larson/Oregon State University, Cameron Bennett/Oregon State University, Dylan Horne/Oregon State University, Joe Neils/Oregon State University, Amy Wyman/Oregon State University
Active Connected Work Zone Variable Speed Limit Warning System (P20-21358)
Nusayba Megat-Johari/Michigan State University
Smart Speed Limiter for Improved Safety in Work Zone Areas (P20-21359)
Nischal Gupta/Michigan State University
3D Work Zone Safety System: Deter, Detect, and Defense (P20-21360)
Chennan Xue/Auburn University
Crash Preventive Cell Phone Holder (P20-21361)
Meekyung Lee/University of Minnesota
Application of Auditory Signals to Improve Work Zone Safety (P20-21362)
Nikitha Sridhar/Auburn High School, Michael Zhou/Auburn High School

1253

Up to Speed: Safety and Operational Effects of Road Design
Zachary Bugg, Kittelson & Associates, Inc. (KAI), presiding
Sponsored By Standing Committee on Operational Effects of Geometrics

Field Experiment of Auxiliary Overtaking Lane Operation on the Four-Lane Expressway Section in Japan (20-00402)
TATSUO HAYAKAWA/Central Nippon Expressway Company Limited, Hiroyuki Konda/Central Nippon Expressway Company Limited, Takashi Ishida/Central Nippon Expressway Company Limited, Yasuhiro Nonaka/Central Nippon Expressway Company Limited, Hideki Nakamura/Central Nippon Expressway Company Limited
The Effect of the Geometric Turning Radius on Vehicle Speeds at Urban Non-Signalized Intersections as a Safety Indicator (20-02363)
Yousteena Bocktor/McGill University Faculty of Engineering, Bismarck Ledezma-Navarro/McGill University Faculty of Engineering, Luis Miranda-Moreno/McGill University Faculty of Engineering
Vehicle Speeds on Rural Four-Lane Highway Curves: A Cross-Sectional Study (20-02986)
Michael Pratt/Texas A&M University, College Station, Srinivas Geedipally/Texas A&M University, College Station, Minh Le/Texas A&M University, College Station
Effects of Operating Speed and Traffic Flow on Severe and Fatal Crashes Using the usRAP Methodology and Field Data Verification (20-05384)
Fahmid Hossain/University of Utah, Juan Medina/University of Utah

1254

Electric Vehicle Fleet Conversion and Operations Management Challenges and Next Steps
Marie Venner, Venner Consulting, presiding
Sponsored By Standing Committee on Maintenance and Operations Management

DOTs and transit agencies are now transitioning to electric vehicles, and east coast utilities are paying for school districts to upgrade to e-buses so they can use the buses for Vehicle to Grid (V2G) peak shaving. What are the technical challenges in DOTs finding appropriate vehicles? In developing charging and fueling strategies that fit within their physical confines? With transit, e-buses are becoming standard but depot charging, en-route charging, and grid connections remain challenging. What are the financial implications in migrating from traditional fuels to Zero Emission fuels? This session will explore how that is going and strategies employed in making the transition including new ways DOTs are paying for maintenance.

LA Metro's Migration to EVs (P20-21049)
Steven Schupak/Los Angeles County Metropolitan Transportation Authority
WSDOT's Fleet Transition, Incorporation of EV Sedans, Pickups, and Ferries (P20-21051)
Karin Landsberg/Washington State Department of Transportation
Challenges Infrastructure Is Delivering to Transit (P20-21052)
Roland Cordero/Foothill Transit
California's Transition to EVs (P20-21054)
Lisa Kunzman/California Department of Transportation (CALTRANS)

1255

FHWA Long-Term Bridge Performance Program
Shrinivas Bhide, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Structures Maintenance

This session provide an overview of the Long-Term Bridge Performance (LTBP) Program.

Welcome from the Federal Highway Administration (P20-21625)
Hari Kalla/Federal Highway Administration (FHWA)
LTBP Program Updates (P20-21626)
Jean Nehme/Federal Highway Administration (FHWA)
Increase in Data Collection Activities (P20-21627)
Robert Zobel/Federal Highway Administration (FHWA)
New Bridge Deck Condition Forecasting Models (P20-21628)
Jean Nehme/Federal Highway Administration (FHWA), Heng Liu/National Academies of Sciences, Engineering, and Medicine, Raka Goyal/NRC Research Associateship
InfoBridge™ in Research and Education (P20-21629)
Basak Aldemir-Bektas/Minnesota State University
Closing Remarks (P20-21630)
Jean Nehme/Federal Highway Administration (FHWA)
InfoBridge™: What's New (P20-21631)
Jean Nehme/Federal Highway Administration (FHWA)

1256

Advances in Inspection and Planning for Marking and Sign Materials
Carmine Dwyer, Applied Research Associates, Inc. (ARA), presiding
Chieh (Ross) Wang, Oak Ridge National Laboratory, presiding
Sponsored By Standing Committee on Signing and Marking Materials

(continued)

Investigating Potential Benefits and Applicability of Wider Longitudinal Pavement Markings for Applications in Canada (20-00970)

Mohamed Hussein/McMaster University, Tarek Sayed/McMaster University, Karim El-Basyouny/McMaster University, Paul de Leur/McMaster University

Waterborne Traffic Paint Durability: Utilization of Transverse Test Decks and Laboratory Testing to Indentify Laboratory Testing Correlated to Real-Life Paint Durability (20-04984)

Eric Greyson/Dow, Tom Winterberg/Dow, Jocelyn White/Dow, Mark Pratt/Dow, Manoj Jogi/Dow

Delineator Impact Durability New Standard Development and Testing Evaluation (20-05074)

Nathan Schulz/Texas A&M Transportation Institute, Dusty Arrington/Texas A&M Transportation Institute, Paul Gentry/Texas A&M Transportation Institute, Hesham Ali/Texas A&M Transportation Institute

Impacts of Glass Bead Refractive Index and Measurement Geometry on Pavement Marking Retroreflectivity (20-05257)

Adam Pike/Texas A&M Transportation Institute, Songjukta Datta/Texas A&M Transportation Institute

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1257

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 203
The Science of Snowfighting
Zhanping You, Michigan Technological University, presiding
Sponsored By Standing Committee on Winter Maintenance

Chemical Frost Protection of Road Surfaces: A Laboratory Investigation (20-00583)

Janne Siren Fjærestad/Norwegian University of Science and Technology (NTNU), Alex Klein-Paste/Norwegian University of Science and Technology (NTNU), Johan Wåhlin/Norwegian University of Science and Technology (NTNU)

Ice Penetration with Sodium Formate: The Effect of Temperature and Pre-Wetting (20-00147)

Mateusz Trzaskos/Norwegian University of Science and Technology (NTNU), Alex Klein-Paste/Norwegian University of Science and Technology (NTNU)

Stability and Metastability of Mixed Chloride Brines to Precipitation (20-00039)

Robert Koefod/Cargill Salt Group

Winter Maintenance Field Evaluation of Salt Brine Applications (20-03892)

Boris Claros/University of Wisconsin, Madison, Madhav Chitturi/University of Wisconsin, Madison, Andrea Bill/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison

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1258

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 207B
What's Old Is New Again: Five Decades of the National Environmental Policy Act (NEPA) Efficiency and Effectiveness Initiatives
Jomar Maldonado, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Environmental Issues in Transportation Law, Standing Committee on Environmental Analysis in Transportation

From the very beginning after the adoption of the National Environmental Policy Act (NEPA) in January 1, 1970, every Administration has pursued opportunities to improve efficiency and effectiveness of environmental reviews. Some of these initiatives resurface every few years. Examples include establishing timetables for environmental reviews, setting page limits, guidance on the preparation of environmental assessments, and exploring ways to use categorical exclusions more efficiently. In this panel current and past Council on Environmental Quality policymakers will look back at some of the initiatives taken over the years and provide an assessment of the success of the initiatives and their challenges.

Panel Discussion (P20-21307)
Edward Boling/Council on Environmental Quality, Horst Greczmiel/Retired, Nicolas Yost/Consultant

1259

Taxis, Wealth, Speed, and Active Commuters: Informing Safety with Diverse Data Sources
Kimberly Eccles, VHB, presiding
Sponsored By Standing Committee on Safety Data, Analysis and Evaluation

Determining the Effect of Wealth on Crash Frequency in Pennsylvania (20-00268)
Rebeka Yocum/Pennsylvania State University, Vikash Gayah/Pennsylvania State University
Investigating the Impact of Road Network Patterns on Active Commuters' Safety (20-03276)
Salah Koleilat/Ain Shams University, Ahmed Osama/Ain Shams University, Tarek Sayed/Ain Shams University
Discrepancy Analysis of Four Cohorts of Taxi Speeding Recidivist Using GPS Trajectory Data (20-05352)
Yue Zhou/Southwest Jiaotong University, Xinguo Jiang/Southwest Jiaotong University, Chuanyun Fu/Southwest
Jiaotong University, Haiyue Liu/Southwest Jiaotong University, Hui Liu/Southwest Jiaotong University, Yahaya Mahama/
Southwest Jiaotong University, Yingfei Fan/Southwest Jiaotong University
**Evaluation of Association Between Observed Driving Speeds and the Occurrence of Crashes Using
Naturalistic Driving Study Data (20-05691)**
John Ivan/University of Connecticut, Yaohua Zhang/University of Connecticut, Nalini Ravishanker/University of
Connecticut, Carol Tan/University of Connecticut, Yusuf Mohamedshah/University of Connecticut, Charles Fay/Universit
y of Connecticut

1260

Using Data to Model Crashes, Design Enforcement, and Improve Safety
Grady Carrick, Enforcement Engineering, Inc., presiding
Sponsored By Standing Committee on Traffic Law Enforcement

**Does Periodic Law Enforcement Enhance the Effectiveness of Speed Feedback Sign?: A Case Study in Pima
County, Arizona (20-03114)**
Abolfazl Karimpour/NRC Research Associateship, Robert Kluger/NRC Research Associateship, Chenhui Liu/NRC
Research Associateship, Yao-Jan Wu/NRC Research Associateship
Evaluating Police-Caused Crashes (20-02256)
Isabelle Frankel/Kansas State University, Jia Liang/Kansas State University, Eric Fitzsimmons/Kansas State University,
Gregory Newmark/Kansas State University
**Linking Geospatial Crash and Citation Data to Optimize the Deployment of Enforcement Resources in Speed
Management (20-05266)**
Alyssa Ryan/University of Massachusetts, Amherst, Mitchell Page/University of Massachusetts, Amherst, Eleni
Christofa/University of Massachusetts, Amherst, Cole Fitzpatrick/University of Massachusetts, Amherst, Michael
Knodler/University of Massachusetts, Amherst
**Using Crowdsourced Data to Improve Models of Traffic Crash Propensity: Tennessee Highway Patrol Case
Study (20-04343)**
Dan Flynn/Volpe National Transportation Systems Center, Michelle Gilmore/Volpe National Transportation Systems
Center, J. Patrick Dolan/Volpe National Transportation Systems Center, Paul Teicher/Volpe National Transportation
Systems Center, Erika Sudderth/Volpe National Transportation Systems Center

1261

Pedestrian Interactions with Other Road Users
Kevin Manaugh ANF10, McGill University, presiding
Sponsored By Standing Committee on Pedestrians

**Analyzing the Receptivity of Vulnerable Road Users When Crossing Roads with the Presence of Autonomous
Vehicles (20-01684)**
Tarek Hassan/Tongji University, Xuesong Wang/Tongji University, Xiaoyan Xu/Tongji University, Bowen Cai/Tongji
University, David S. Hurwitz/Tongji University, Mohammed Quddus/Tongji University

(continued)

Prediction of Pedestrian Crossing Intentions at Intersections Based on LSTM Recurrent Neural Network (20-04 800)
Shile Zhang/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Pei Li/University of Central Florida

An Observational Study of Pedestrian and Cyclist Interactions at Intersections in Vancouver, British Columbia and Montréal, Québec (20-00331)
Kate Hosford/Simon Fraser University, Marie-Soleil Cloutier/Simon Fraser University, Meghan Winters/Simon Fraser University

Measuring Driver Compliance at Enhanced Pedestrian Crossings (20-00104)
Grant Schultz/Brigham Young University, Pablo Galvez de Leon/Brigham Young University, Kiavash Shahandashti/Brigham Young University, Robert Chamberlin/Brigham Young University

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1262

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 150A
2nd Annual Innovation in Transit Performance Measurement Challenge
Rachel Dungca, Metro Transit, Minneapolis-St. Paul, presiding
Sponsored By Standing Committee on Transit Management and Performance, Subcommittee on Information on Transformative Trends in Transit Data

Interested in transit data and how it can be used to communicate results? Join us as this year's submitters present their innovative approaches to analyzing, visualizing, and communicating transit data to our distinguished judges.Judges:Kara Vuicich, AICP?Account Executive (Swiftly)Elizabeth Presutti, AICP | Chief Executive Officer, DART, Des Moines Area Regional Transit Authority Stephanie Lotshaw | Program Director, Transit Center

Transit Signal Priority Dashboard (P20-21822)
Hoki Tse/Metro Transit, Minneapolis-St. Paul
Customer Survey Visualization App (P20-21824)
Brandon Whited/Metro Transit, Minneapolis-St. Paul
Bus Equity Visualization Tool (P20-21825)
Jaime McKay/Maryland Transit Administration
Non-Revenue Fleet Dashboard (P20-21826)
Ruby Lee/Washington Metropolitan Area Transit Authority
Road Network Assignment Tool (P20-21827)
Jacob Fox/TransLink
Strategic Initiatives 3% Challenge Dashboard (P20-21828)
Sherry Prasad/Washington Metropolitan Area Transit Authority
Bus Crowding Explorer (P20-21829)
Violet Lingenfelter/Northeastern University
Collision Map (P20-21830)
Paulina Ruiz/Foothill Transit

1263   CM (1.75)

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 147A
Engagement, Equity, and Experiments in Transit Planning: Lightning Talks
Veronica Davis, Nspiregreen, LLC, presiding
Sponsored By Standing Committee on Public Transportation Planning and Development

This session offers a selection of works on equity, engagement, and experiments in transit planning. Presenters will provide lightning talks (few minute presentations) on their work. This lightning talk session is a companion session with a similarly titled poster session where attendees can engage in interaction with presenters/authors.

Lightning Talk: Fair Accessibility: Operationalizing the Distributional Effects of Policy Interventions (P20-20738)
Isak Rubensson/KTH Royal Institute of Technology, Yusak Susilo/University of Natural Resources and Life Sciences, Oded Cats/Delft University of Technology

(continued)

Lightning Talk: Accessibility Matters: Exploring the Determinants of Public Transport Mode Share Across Income Groups in Canadian Cities (P20-20742)
Boer Cui/McGill University, Geneviève Boisjoly/Ecole Polytechnique de Montreal, Luis F. Miranda-Moreno/McGill University, Ahmed El-Geneidy/McGill University

Lightning Talk: The Network Gap Score: A Screening Tool to Identify Transit Servable Travel Gaps at a Regional Level (P20-20743)
Sarah Moran/Delaware Valley Regional Planning Commission, Gregory Krykewycz/Delaware Valley Regional Planning Commission

Lightning Talk: Transit and Homelessness: Addressing the Homelessness Crisis (P20-20744)
Jeremy Steele/San Jose State University, Hilary Nixon/San Jose State University

Lightning Talk: Access to Transit?: Validating Local Transit Accessibility Measures Using Transit Ridership (P20-20745)
Sarah Bree/University of Saskatchewan, Daniel Fuller/Memorial University of Newfoundland, Ehab Diab/University of Saskatchewan

Lightning Talk: Planning for Autonomous Vehicles: How Selected Cities Are Prospectively Addressing Road Congestion, Parking Requirements, Transit Connections, and Municipal Revenue (P20-20749)
Marcel Moran/University of California, Berkeley, Daniel Chatman/University of California, Berkeley

Lightning Talk: Beyond Title VI: How Transit Agencies Plan for Equity (P20-20750)
Torrey Lyons/University of North Carolina, Chapel Hill

Lightning Talk: Representing Public Transportation Providers in Metropolitan Planning (P20-20751)
Gian-Claudia Sciara/University of Texas, Austin, Md. Rahman/University of Texas, Austin, Rydell Walthall/University of Texas, Austin

Lightning Talk: Scaling Up Innovative Participatory Design for Public Transportation Planning: Lessons from Experiments in the Global South (P20-20752)
P. Christopher Zegras/Massachusetts Institute of Technology (MIT), Jonathan Leape/Massachusetts Institute of Technology (MIT), Juan Carrasco/Universidad de Concepcion, Cristian Navas/InterAmerican Development Bank, Christo Venter/University of Pretoria, Erik Vergel-Tovar/Universidad del Rosario

Lightning Talk: An Analysis of Perceptions of Civic Engagement Technologies in Transportation Planning (P20-20753)
Kate Beck/University of California, Berkeley

1264

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 144A
Wider Impacts of Light Rail on Noise, the Economy, and Safety
Graham Currie, Monash University, presiding
Sponsored By Standing Committee on Light Rail Transit, Standing Committee on Transportation-Related Noise and Vibration

This session explores light rail and streetcar wider impacts on firstly the labour market and housing affordability, a long term assessment of safety then explores research on noise impacts and approaches to deal with this issue.

The Impacts of Light Rail Transit on Labor Participation and Housing Affordability in the United States: A Longitudinal Analysis Using Propensity Score Matching (20-00136)
Keuntae Kim/University of Utah, Keunhyun Park/University of Utah, Arthur Nelson/University of Utah

A Longitudinal Analysis of Light Rail and Streetcar Safety in the United States (20-00323)
Abubakr Ziedan/University of Tennessee, Candace E. Brakewood/University of Tennessee

Public Transportation and Noise Assessment: A Multi-Level Analysis of Light Rail Train Stations Amenities (20-04813)
Yalcin Yildirim/University of Texas at Arlington College of Architecture Planning and Public Affairs, Diane Allen/University of Texas at Arlington College of Architecture Planning and Public Affairs

Reducing Light Rail Train Noise Using an Advanced Rail Grinding Strategy (20-05841)
Shankar Rajaram/Sound Transit

1265

The Future of North American Freight Rail Transportation
Mark Burton, University of Tennessee, Knoxville, presiding
Sponsored By Standing Committee on Freight Rail Transportation

The Future of North American Freight Railroad Transportation (P20-20705)
Ian Jefferies/Association of American Railroads (AAR), Chuck Baker/American Short Line and Regional Rail Association, Michael O'Malley/The Railway Supply Institute, Inc., Robert Benedict/American Fuel & Petrochemical Manufacturers, Ross Corthell/National Industrial Transportation League (NITL)

1266

Remote Sensing Techniques for Track Condition and Performance
Dimitris Rizos, University of South Carolina, presiding
Sponsored By Standing Committee on Railroad Track Structure System Design

Non-Contacting Rail Neutral Temperature and Stress Measurements (P20-20973)
Katelyn Knopf/University of South Carolina
Satellite Radar Imagery for Detection and Monitoring of Geohazards: Three Case Studies (20-04123)
Sumanth Byrraju/University of South Carolina, Dimitris Rizos/University of South Carolina, Yu Qian/University of South Carolina
Drone-Based Track Safety Inspection Using AI-Assisted Change Detection (P20-21710)
Cameron Stuart/Federal Railroad Administration (FRA), Jeff Henderson/Noble Drone Services, LLC

1267

Automated Shuttles and Other Transportation Innovations in Military Communities
Corey Hull, Southern Georgia Regional Commission, presiding
Sponsored By Standing Committee on Military Transportation, Transportation in Military Communities Joint Subcommittee of ADA20, AT035, AP055

Planning an Autonomous Vehicle Pilot in the Northern Virginia Region: Successes and Challenges (P20-20815)
Peggy Tadej/Northern Virginia Regional Commission (NVRC)
Research Findings from Autonomous Vehicle Pilot at Joint Base Myer-Henderson Hall (P20-20818)
James Allen/U.S. Army Corps of Engineers (USACE)
Regional Planning and Implmentation Considerations for Autonomous Vehicles (P20-20819)
Corey Hull/Southern Georgia Regional Commission
Automated Shuttles and Other Transportation Innovations: State of the Practice (P20-21331)
Katie Lamoureux/Volpe National Transportation Systems Center

1268

Pipeline Solutions in the Changing North American Energy Landscape
David Willauer, Cambridge Systematics, Inc., presiding
Sponsored By Standing Committee on Transportation of Hazardous Materials, Subcommittee on the Transport of Energy Products

 Transportation infrastructure in North America is under increasing pressure to transport petroleum products as a result of the recent energy production boom. Pipelines provide a low cost solution to the need for energy related transportation services, but pipeline construction requires long-term commitments and faces permitting challenges. This session will feature public and private sector subject matter experts from industry associations and state transportation departments who will present several state and interstate pipeline solutions in petroleum production regions.

(continued)

Fuel and Petrochemical Supply Chains: Policies Impacting Development and Permitting (P20-20061)
Robert Benedict/American Fuel & Petrochemical Manufacturers
The Role of Liquid Pipelines and Capacity Expansion Issues (P20-20062)
Andrew Black/Association of Oil Pipelines (AOPL)
Natural Gas Pipelines: Challenges of Permitting Predictability (P20-20063)
Tony Straquadine/The INGAA Foundation, Inc.
Developing Saltwater Pipeline Facilities to Support Oil and Gas Production (P20-20064)
Beverly West/Texas Department of Transportation

1269

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 144C
Impact of Tariffs and Supply Chain Realignment on Intermodal Terminals
Nathan Huynh, University of South Carolina, presiding
Sponsored By Standing Committee on Intermodal Freight Terminal Design and Operations

This panel session discusses the impact of tariffs on intermodal terminals.

Interchange Challenges for the Mazar e Sharif to Herat Railway (P20-20860)
Robin Carruthers/The World Bank
Development Impacts of Cross-Border Intermodal Rail Facilities in Central Asia (P20-20862)
Nathan Hutson/University of North Texas
Intramodal Infrastructure Investment Sharing Mechanisms for BRI Participant States: Lessons from TEN-T (P20-20864)
Maximilian Bauernfeind/Austrian Ministry for Transport, Innovation and Technology
Inland Ports: Lessons Learned (P20-20866)
Frank Harder/The Tioga Group, Inc.

1270   CM (1.75)

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, 143A
How to Do More with Less: State Innovations to Stretch Funding
Laurie Cullen, VHB, presiding
Sponsored By Standing Committee on Intergovernmental Relations in Aviation, Standing Committee on Aviation System Planning, Standing Committee on Aviation Economics and Forecasting

Funding continues to be a critical issue affecting airports and aviation facilities. Many state agencies have developed innovative approaches to stretch available funding or deliver new mechanisms to assist airports and aviation facilities with infrastructure needs that remain unmet. Four states will discuss their unique approaches to aviation funding challenges and the outcomes of the programs that have been implemented. An overview of innovative approaches and outcomes will provide methods to be considered when facing the preservation and expansion of aviation infrastructure with funding constraints. Topics will include creative airport project planning to stretch CIP funds in Alaska, an innovative approach to GA airport terminal buildings and equipment purchase in Massachusetts, grouping the design and construction of pavement projects to save money in Texas and two programs in Wyoming – an innovative and efficient approach to stabilize air service and a comprehensive approach that employs asset management and group procurement strategies to efficiently utilize available funding and maximize pavement life.

Creative Project Planning and Implementation to Stretch CIP Funds in Alaska (P20-20656)
Verne Skagerberg/Alaska Department of Transportation and Public Facilities
Aviation Funding Challenges and Opportunities at General Aviation Airports: A MassDOT Perspective (P20-20657)
Thomas Mahoney/Massachusetts Department of Transportation
Grouping Pavement Maintenance Projects to Save Money: A Lessons Learned from TxDOT (P20-20658)
Greg Miller/Texas Department of Transportation
WYDOT Programs Utilizing Economies of Scale to Maximize Return on Investment (P20-20659)
Brian Olsen/Wyoming Department of Transportation

1271

Innovations in Airport Ground Access: Practical Application of Proven or Emerging Technologies to Address Current Issues
Ellis Kim, Sam Schwartz Consulting, presiding
Sponsored By Standing Committee on Airport Terminals and Ground Access

Identifying and Developing an Action Plan to Improve Airport Ground Transportation Across a Statewide Aviation System (P20-20056)
Jim Halley, III, A.A.E., ACE/Florida Department of Transportation
Boston Logan Airport Ground Access HOV Promotion and Vehicle Trip Reduction Strategy (P20-20057)
Christopher Grillo/Massachusetts Port Authority
PANYNJ: Changes in Mobility: How They Are Affecting Current PA Airport Redevelopment Programs (P20-2006 0)
Steven Demetropoulos/Port Authority of NY & NJ

1272

Research in Marine and Inland Waterway Transportation
Joseph Crabtree, Kentucky Transportation Center, presiding
Sponsored By Standing Committee on Inland Water Transportation, Standing Committee on Ports and Channels

This session features presentations on state of the art and practice on marine ports and inland waterways management and performance measurement.

Do Inland Waterway Freight Transportation Systems Need a Performance Measurement and Management System?: A Scan of State DOT Practices in the United States (20-05791)
Nahid Parvez Farazi/University of Illinois, Chicago, Bo Zou/University of Illinois, Chicago, P.S. Sriraj/University of Illinois, Chicago
Utilizing Agent-Based Modeling to Evaluate Operational Impacts of an Incident and Possible Alternatives on U. S. Waterways (20-04352)
Janey Camp/Vanderbilt University, Katherine Nelson/Vanderbilt University, Craig Philip/Vanderbilt University, Miguel Moravec/Vanderbilt University, Douglas Scheffler/Vanderbilt University, Paul Johnson/Vanderbilt University
Strategic Port Management by Consolidating Container Terminals (20-04859)
GeunSub Kim/New Jersey City University, EunSu Lee/New Jersey City University, BoKyoung Kim/New Jersey City University
Waterway Resiliency Measures Using AIS Data: A Case Study of the Houston Ship Channel (20-02314)
Sepideh Zohoori/Lamar University, Masood Jafari Kang/Lamar University, Maryam Hamidi/Lamar University

1273

Laying a Foundation for Advanced Transportation Technology
Finch Fulton, Office of the Secretary of Transportation (OST), presiding
Sponsored By Executive Committee

The USDOT is working on several fronts to thoughtfully manage the deployment of automation technology in the transportation space. This session will introduce attendees to USDOT senior officials who are leading the DOT's automation technology initiatives. Attendees will hear about the USDOT's views on how it is managing advances in transportation technologies and what to expect next.

Panel Discussion (P20-21661)
Diana Furchtgott-Roth/Office of the Secretary of Transportation (OST), Jay Merkle/Federal Aviation Administration (FAA), Jonathan Morrison/National Highway Traffic Safety Administration (NHTSA)

<u>Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A</u>
Dwight David Eisenhower Transportation Fellowship Program Poster Session, Part 2 (Part 1, Session 1138; Part 3, Session 1551)
Sponsored By Section - Research and Education

<u>Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A</u>
Sweet Sixteen: State DOT High Value Research Projects
Anne Freeman, Washington State Department of Transportation, presiding
Cynthia Smith, Mississippi Department of Transportation, presiding
Sponsored By Standing Committee on Conduct of Research

The AASHTO Research Advisory Committee (RAC) each year asks states to identify and document recently completed "high-value" research projects. This poster session contains all of the research projects that have been identified and selected as high-value. RAC also publishes an annual compilation of all these projects in a document entitled: "Research Impacts: Better – Faster – Cheaper"?. The document provides substantial value to states. It is a great resource to DOTs as quick reference to HVR projects, and helps eliminate or reduce duplication of research.

Connecticut Pedestrian Safety Guide (P20-20526) - B322
Eric Jackson/University of Connecticut
New Protocol for Accepting Overcoating Paint on Steel (P20-20529) - B323
Perumalsamy N Balaguru/Rutgers, The State University of New Jersey
Vermont Agency of Transportation Employee Retention and Knowledge Management Study (P20-20530) - B324
Glenn McRae/University of Vermont
Performance of Adhesive and Cementitious Anchorage Systems (P20-20531) - B325
Scott Civjan/University of Massachusetts, Amherst
Rapid and Non-Invasive Assessment of the Slope Stability Slide Along I-40 Near Ozark, Arizona, Using Geophysical Methods (P20-20532) - B326
Salman Rahimi/University of Arkansas, Fayetteville
HR Data Tool: A Modular System to Assist GDOT Human Resource Planning and Decision (P20-20533) - B327
Binh Bui/Georgia Department of Transportation
Development of Wrong-Way Driving Countermeasure Implementation Plan (P20-20534) - B328
Priyanka Alluri/Florida International University
Implementation of the U.S. Geological Survey's StreamStats Application for SCDOT (P20-20536) - B329
Jimmy Clark/USGS South Atlantic Water Science Center (SAWSC)
Ultrasonic Imaging for Concrete Infrastructure Condition Assessment and Quality Assurance (P20-20538) - B332
John Popovics/University of Illinois, Urbana Champaign, Jeffery Roesler/University of Illinois at Urbana-Champaign
Alternative Bridge Repair Method Saves Time and Money (P20-20539) - B333
Kevin Western/Minnesota Department of Transportation
Software for Load Distribution on Low-Fill Box Culverts (P20-20540) - B334
David Meggers/Kansas Department of Transportation
Economic Impact of Public Ports in Missouri (P20-20541) - B335
Paula Dowell/Cambridge Systematics, Inc., Katharine Kirk/Cambridge Systematics, Inc.
Evaluation of High Early Strength Concrete for Connection of Precast Elements in Accelerated Bridge Construction (P20-20542) - B336
Arya Ebrahimpour/Idaho State University
Solar Energy Program (P20-20543) - B337
David Hadwiger/New Mexico Department of Transportation
Exploring Rapid Repair Methods for Embankment Slope Failure (P20-20544) - B338
Shelley Pridgen/Texas Department of Transportation
Simplified SPT Performance-Based Assessment of Liquefaction and Effects (P20-20545) - B339
Kevin Franke/Brigham Young University
New England Connected Automated Vehicles (P20-20546) - B344
Chris Chaffee/AECOM

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Safety Concepts for Workers from an OSHA Perspective (P20-20547) - B345
Gabriel Dadi/Kentucky Transportation Center
The Sidepath Intersection and Crossing Treatment Guide (P20-20548) - B330
Michael Townley/Michigan Department of Transportation
Prioritization of Wildlife–Vehicle Conflict in Nevada (P20-20549) - B346
Ken Chambers/Nevada Department of Transportation
Gusset-less Truss Connection Model (P20-20550) - B347
Philip Brogan/New Hampshire Department of Transportation
Compatibility Testing of Supplemental Fall Protection Devices on NCDOT Bridges (P20-20553) - B348
Alex Albert/North Carolina State University, Carlos Zuluaga/North Carolina State University
Virtual Reality Implementation for Public Engagement (P20-20805) - B320
Brian Worrel/Iowa Department of Transportation
UHPC for Bridge Deck Overlays (P20-20806) - B321
Brian Worrel/Iowa Department of Transportation
Investigation of Prefabricated Steel-Truss Bridge Deck Systems (P20-20556) - B349
Damon Fick/Montana State University
Development of Secondary Route Bridge Design Plan Guide Drawings (P20-20555) - B331
Michael Townley/Michigan Department of Transportation

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Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Evaluating Various Aspects of the Conduct of Research
Shenghua Wu, University of South Alabama, presiding
Sponsored By Standing Committee on Conduct of Research

 This poster session brings together several studies that evaluate various aspects of the conducting of research including transportation technologies, reproducing research experiments, and accessibility.

A Literature Review on Accessibility Using Bibliometric Analysis and Complex Network Analysis Techniques, 2000–2018 (20-01342) - B341
Yuji Shi/Jiangsu University, Chao Sun/Jiangsu University, Peng Jing/Jiangsu University
Reasons, Challenges, and Some Tools for Doing Reproducible Research in Transportation Research (20-01427) - B340
Zuduo Zheng/University of Queensland
Evaluating the Development of Transport Technologies in European Research and Innovation Projects Between 2007–2018 (20-03693) - B342
Konstantinos Gkoumas/European Commission, Mitchell van Balen/European Commission, Anastasios Tsakalidis/European Commission, Ferenc Pekar/European Commission

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Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Advances in Travel Survey Methods
Rebekah Straub Anderson, Ohio Department of Transportation, presiding
Sponsored By Standing Committee on Travel Survey Methods

 This session focuses on new advancements in travel survey methods, including the use of big data to infer both individual and aggregate travel patterns, web-survey design, and travel time reliability.

Evaluation of Activity Location Recognition from Cellular Phone Data Using Hierarchical Clustering and Oscillation Correction Methods (20-00833) - B374
Fei Yang/Southwest Jiaotong University, Haihang Jiang/Southwest Jiaotong University, Yue Huang/Southwest Jiaotong University, Xu Chen/Southwest Jiaotong University, Zhenxing Yao/Southwest Jiaotong University
Assessing the Potential of Cellular Signaling Data to Generate Dynamic Travel Patterns: A Comparative Study with Travel Survey Data (20-04125) - B375
Mariem Fekih/Universiteit Hasselt, Tom Bellemens/Universiteit Hasselt, Angelo Furno/Universiteit Hasselt, Loïc Bonnetain/Universiteit Hasselt, Patrick Bonnel/Universiteit Hasselt, Zbigniew Smoreda/Universiteit Hasselt, Stéphane Galland/Universiteit Hasselt

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Tensor-Based OD Matrix Completion (20-03000) - B376

Hanxuan Dong/Southeast University, Fan Ding/Southeast University, Huachun Tan/Southeast University, Yuankai Wu/Southeast University, Qin Li/Southeast University, Bin Ran/Southeast University

Understanding Google Location History as a Tool for Travel Diary Data Acquisition (20-04910) - B377

Dillan Cools/Concordia University, Scott McCallum/Concordia University, Daniel Rainham/Concordia University, Nathan Taylor/Concordia University, Zachary Patterson/Concordia University

California's I-80 Smart Corridor: Before-After Analysis of Travel-Time Reliability Indicators Versus User-Survey Response Data (20-05297) - B378

Cornelius Nuworsoo/California Polytechnic State University, San Luis Obispo, Fardiur Rahman/California Polytechnic State University, San Luis Obispo, Anurag Pande/California Polytechnic State University, San Luis Obispo, Travis Low/California Polytechnic State University, San Luis Obispo, Robert Bertini/California Polytechnic State University, San Luis Obispo

An Inductive Experimental Approach to Developing a Web-Based Travel Survey Builder: Developing a Guideline to Design an Efficient Web-Survey Platform (20-00460) - B379

Brittany Chung/University of Toronto, Siva Srikukenthiran/University of Toronto, Eric Miller/University of Toronto, Khandker Nurul Habib/University of Toronto

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Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

Advances in Artificial Intelligence Applications in Transportation and Road Infrastructure, Part 2 (Part 1, Session 1211)

Yunlong Zhang, Texas A&M University, presiding
Sponsored By Standing Committee on Artificial Intelligence and Advanced Computing Applications

Applications of state of the art machine learning techniques such as deep neural nets, reinforcement learning, convolution neural networks for traffic monitoring, traffic prediction, travel behavior, mode choice, real-time congestion monitoring, driver behavior, developing and assessing technologies for Connected and Autonomous Vehicles.

Integrated Inverse Herfindahl-Hirschman Index, Compromise Programming, and ε-Constraint Method for Multi-Criteria Transportation Investment Decision Making (20-02253) - B373

Tung Truong/Illinois Institute of Technology, Ji Zhang/Illinois Institute of Technology, Zongzhi Li/Illinois Institute of Technology, Lu Wang/Illinois Institute of Technology

Predicting Crashes by Applying Machine Learning on New Sources of Driver Behavior Data (20-02335) - B389

Gareth Robins/Portland State University, Jason C. Anderson/Portland State University, Sal Hernandez/Portland State University

Modern Convolutional Neural Networks for Rebar Detection in Bridge Deck GPR B-Scans on Mobile and Embedded Systems (20-02447) - B388

Pouria Asadi/University of Rhode Island, Mayrai Gindy/University of Rhode Island, Marco Alvarez/University of Rhode Island, Alireza Asadi/University of Rhode Island

MT-LinAdapt: A Human-Centric, Machine Learning–Based Individual Drivers' Route Choice Model for Personalized Route Recommendations (20-02497) - B387

Bingrong Sun/Tongji University, Lin Gong/Tongji University, Jisup Shim/Tongji University, Kitae Jang/Tongji University, Byungkyu Brian Park/Tongji University, Hongning Wang/Tongji University, Jia Hu/Tongji University

Graph Markov Network for Traffic Forecasting with Missing Data (20-02694) - B386

Zhiyong Cui/University of Washington, Longfei Lin/University of Washington, Ziyuan Pu/University of Washington, Yinhai Wang/University of Washington

A Smart, Efficient, and Reliable Parking Surveillance System with Edge Artificial Intelligence on IoT Devices (20-02716) - B385

Ruimin Ke/University of Washington, Yifan Zhuang/University of Washington, Ziyuan Pu/University of Washington, Yinhai Wang/University of Washington

End-to-End Vision-Based Adaptive Cruise Control Using Deep Reinforcement Learning (20-02725) - B384

Zhensong Wei/University of California, Riverside, Yu Jiang/University of California, Riverside, Xishun Liao/University of California, Riverside, Xuewei Qi/University of California, Riverside, Ziran Wang/University of California, Riverside, Guoyuan Wu/University of California, Riverside, Peng Hao/University of California, Riverside, Matthew Barth/University of California, Riverside

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Vehicle Re-Identification with Image Processing and Car-Following Model Using Multiple Surveillance Cameras from Urban Arterials (20-02741) - B383

Zhongxia Xiong/Beihang University, Ziying Yao/Beihang University, Xinkai Wu/Beihang University, Ming Li/Beihang University

Decentralized Multi-Agent Coordination in Connected and Autonomous Vehicle Routing (20-02749) - B382

Alireza Mostafizi/Oregon State University, Matthew Frantz/Oregon State University, Haizhong Wang/Oregon State University

Learning to Identify Critical Link Combinations of Roadway System Through Network Embedding (20-02819) - B381

Tingting Zhao/University of Maryland, College Park, Di Zhuang/University of Maryland, College Park, Yu Zhang/University of Maryland, College Park

A Deep Recurrent Neural Network Framework for Vehicle Trajectory Reconstruction Using Automatic License Plate Recognition Data (20-02909) - B380

Yinpu Wang/No Organization, Leilei Zhu/No Organization, Jishun Ou/No Organization, Zhenbo Lu/No Organization, Jingxin Xia/No Organization

Spatiotemporal Regularized Factorization for Traffic Data Imputation (20-03099) - B399

Lulu Tan/McGill University, Xudong Wang/McGill University, Luis Miranda-Moreno/McGill University, Aurélie Labbe/McGill University, Lijun Sun/McGill University

Short-Term Prediction of Demand for Ridehailing Services: A Deep-Learning Approach: UBERNET (20-03136) - B398

long chen/University of Glasgow, Piyushimita Thakuriah/University of Glasgow, Konstantinos Ampountolas/University of Glasgow

Vehice Trajectory Reconstruction for Single Intersection with Multiple Cameras Using Image-Based Vehicle Detection, Tracking, and Re-Identification (20-03142) - B397

Zhongxia Xiong/Beihang University, Ziying Yao/Beihang University, Xinkai Wu/Beihang University, Ming Li/Beihang University

A Double Deep Q Network-Based Variable Speed Limit Control to Reduce Travel Time at Freeway Bottlenecks (20-03149) - B396

Zemian Ke/Southeast University, Zhibin Li/Southeast University, Pan Liu/Southeast University, Yong Liu/Southeast University

Deep-Reinforcement, Learning-Based Ramp Metering Strategy with Image-Input Convolutional Neural Network (20-03163) - B395

Shenghong Dai/University of Wisconsin, Madison, Changyan Fan/University of Wisconsin, Madison, Mofeng Yang/University of Wisconsin, Madison, Zhibin Li/University of Wisconsin, Madison, Yuxuan Hou/University of Wisconsin, Madison

Snowplow Truck Performance Assessment and Feature Importance Analysis Using Machine Learning Techniques (20-03293) - B394

Zhiyan Yi/University of Utah, Xiaoyue Cathy Liu/University of Utah, Ran Wei/University of Utah, Tony Grubesic/University of Utah

Transportation Mode Detection by Using Smartphones and Smartwatches with Machine Learning (20-03451) - B393

Raed Hasan/Western Michigan University, Hafez Irshaid/Western Michigan University, Sangwoo Lee/Western Michigan University, Jun-Seok Oh/Western Michigan University

Hybrid Reinforcement Learning for Multi-Sensor-Based Connected Eco-Driving at Signalized Intersections (20-03479) - B392

Zhengwei Bai/Beijing Jiaotong University, Peng Hao/Beijing Jiaotong University, Matthew Barth/Beijing Jiaotong University

Study into Central Lane Marking Classification and Degradation Measurement of Retroreflective Area Using CNNs (20-03526) - B391

Michael Brogan/Reflective Measurement Systems, James Mahon/Reflective Measurement Systems

Traffic State Reconstruction Using Deep Convolutional Neural Networks (20-03790) - B390

Ouafa Benkraouda/New York University - Abu Dhabi Campus, Bilal Thonnam Thodi/New York University - Abu Dhabi Campus, Hwasoo Yeo/New York University - Abu Dhabi Campus, Monica Menendez/New York University - Abu Dhabi Campus, Saif Jabari/New York University - Abu Dhabi Campus

Vehicular Energy Use Prediction Using Recurrent Neural Networks with Probe Trajectory Data (20-04015) - B409

Jonathan Waddell/Wayne State University, Stephen Remias/Wayne State University, Jacob Holden/Wayne State University, Henry Fournier/Wayne State University, Mark Brown/Wayne State University

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Development of an AI-Based Modeling Framework for Traffic Incident Detection (20-04205) - B408

Zhenyu Wang/Old Dominion University, Hong Yang/Old Dominion University, Mecit Cetin/Old Dominion University, Zhitong Huang/Old Dominion University, Sudhakar Nallamothu/Old Dominion University, Peter Huang/Old Dominion University

Using Conditional Generative Adversarial Nets and Heat Maps with Simulation Accelerated Training to Predict the Spatio-Temporal Impacts of Highway Incidents (20-04220) - B407

Zirui (Raymond) Huang/University of Arizona, Ali Arian/University of Arizona, Yuqiu (Rachael) Yuan/University of Arizona , Yi-Chang Chiu/University of Arizona

Social Media Text Analysis Using Multi-Kernel Convolution Neural Network for Ridehailing Service Assessment (20-04234) - B406

Anna Philips/University of Texas, Arlington, Farah Naz/University of Texas, Arlington, Kyung Hyun/University of Texas, Arlington, Vivek Patel/University of Texas, Arlington, Gordon Zhang/University of Texas, Arlington, Won Hwa Kim/University of Texas, Arlington

A Deep-Learning Model Case Study: An Application in I-580 Express Lane Traffic Forecasting (20-04280) - B405

Nassim Sohaee/University of Texas, Dallas, Farzad Karami/University of Texas, Dallas, Shahram Bohluli/University of Texas, Dallas, Chao Huang/University of Texas, Dallas

Managing Traffic Demand Under Stochastic Demand: A Reinforcement Learning Framework (20-04393) - B404

Pinchao Zhang/Carnegie Mellon University, Fei Fang/Carnegie Mellon University, Sean Qian/Carnegie Mellon University

Intellectual Traffic Flow Optimization Using Variable Speed Limits (20-04394) - B403

Juanwu Lu/Tongji University, Yu Tang/Tongji University

Distilling Black Box Travel Mode Choice Model for Behavioral Interpretation (20-04395) - B402

Xilei Zhao/University of Florida, Zhengze Zhou/University of Florida, Xiang Yan/University of Florida, Pascal Van Hentenryck/University of Florida

Estimating Hourly Traffic Volumes Using Artificial Neural Network with Additional Inputs of Automatic Traffic Recorders (20-04404) - B401

Sara Zahedian/University of Maryland, College Park, Przemyslaw Sekula/University of Maryland, College Park, Amir Nohekhan/University of Maryland, College Park, Zachary Vander Laan/University of Maryland, College Park

A Bi-Direction, Spatial-Temporal Network for Traffic Prediction with Multi-Source Data (20-04449) - B400

Tuo Sun/Tongji University, Chenwei Yang/Tongji University, Ke Han/Tongji University, Wanjing Ma/Tongji University, Fan Zhang/Tongji University

-Deep-Learning Enabled Long-Term Traffic Speed Prediction Using Historical Traffic Speed and Predicted Weather (20-04497) - B419

Shuo Wang/Iowa State University, Subhadipto Poddar/Iowa State University, Pranamesh Chakraborty/Iowa State University, Anuj Sharma/Iowa State University, Skylar Knickerbocker/Iowa State University, Neal Hawkins/Iowa State University

Image Processing Technique with Gaussian Mixture Models for Enhancing Length-Based and Axle-Based Vehicle Classification (20-04834) - B418

Heng Wei/University of Cincinnati, Hedayat Abrishami/University of Cincinnati, Zhuo Yao/University of Cincinnati

Vehicle Trajectory Reconstruction for Urban Arterial Under Low-Penetration Connected and Autonomous Vehicle Environment (20-05025) - B417

Juyuan Yin/Tongji University School of Transportation Engineering, Xuejian Chen/Tongji University School of Transportation Engineering, Jian Sun/Tongji University School of Transportation Engineering

Detecting Traffic Anomalies Using a Vision-Based System (20-05232) - B416

Peng Jin/University of Missouri, Xiaofan Shu/University of Missouri, Vishal Mandal/University of Missouri, Yaw Adu-Gyamfi/University of Missouri

Two-Stream Multi-Channel Convolutional Neural Network for Multi-Lane Traffic Speed Prediction Considering Traffic Volume Impact (20-05410) - B415

Ruimin Ke/University of Washington, Wan Li/University of Washington, Zhiyong Cui/University of Washington, Yinhai Wang/University of Washington

Driving Anger Recognition Based on Convolutional Neural Network (20-05490) - B414

Bowen Cai/Tongji University, Xuxin Zhang/Tongji University, Xuesong Wang/Tongji University

A Deep-Learning Framework for Freeway Speed Prediction Under Adverse Weather Conditions (20-05495) - B413

Abdullah Shabarek/New Jersey Institute of Technology, Steven Chien/New Jersey Institute of Technology, Soubhi Hadri/New Jersey Institute of Technology

A Q Learning-Based Coordination of Variable Speed Limit and Hard Shoulder Running to Reduce Corridor Travel Time at Freeway Bottlenecks (20-05599) - B412

Weiyi Zhou/University of Maryland, Mofeng Yang/University of Maryland, Minha Lee/University of Maryland, Lei Zhang/University of Maryland

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A Deep-Learning Algorithm to Extract Traffic Signs from Point Cloud Data (20-05608) - B411

Maged Gouda/University of Alberta, Karim El-Basyouny/University of Alberta, Alexander Epp/University of Alberta

Model Predictive Control Method for Connected Vehicle Platoon Under Switching Communication Topology (20-05634) - B410

Pangwei Wang/North China University of Technology, Hui Deng/North China University of Technology, Li Wang/North China University of Technology, Mingfang Zhang/North China University of Technology

Drone-Based Vehicle Identification: An Empirical Study of Convolutional Neural Network Performance (20-05663) - B429

Samuel Hislop-Lynch/University of Queensland, SangHyung Ahn/University of Queensland, Jiwon Kim/University of Queensland

Transportation Artificial Intelligence Platform for Traffic Forecasting (20-05698) - B428

Zhiyong Cui/University of Washington, Mingjian Fu/University of Washington, Meixin Zhu/University of Washington, Xuegang Ban/University of Washington, Yinhai Wang/University of Washington

A Deep-Reinforcement Learning Agent with Varying Actions Strategy for Solving the Eco Approach and Departure Problem at Signalized Intersections (20-04447) - B427

Saleh Mousa/Booz Allen Hamilton, Inc., Sherif Ishak/Booz Allen Hamilton, Inc., Ragab Mousa/Booz Allen Hamilton, Inc., Julius Codjoe/Booz Allen Hamilton, Inc., Mohammed Elhenawy/Booz Allen Hamilton, Inc.

A Machine Learning Approach for Predicting Positions of Vehicles Operating with Weak Lane Discipline Using Newly Developed Extended Trajectory Data (20-03727) - B426

Narayana Raju/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Gaurang Joshi/Sardar Vallabhbhai National Institute of Technology, Surat

A Graph Regularized Matrix Decomposition for Missing Traffic Data Imputation (20-04891) - B425

Tianyang HAN/The University of Tokyo, Takashi Oguchi/The University of Tokyo, Shiyi Liu/The University of Tokyo

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Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
New Challenges in Transportation Data Analysis
Grigorios Fountas, Edinburgh Napier University, presiding
Sponsored By Standing Committee on Statistical Methods

Gaussian Mixture Models Meet Econometric Models (20-00667) - B350

Georges Sfeir/American University of Beirut, Maya Abou-Zeid/American University of Beirut, Filipe Rodrigues/American University of Beirut, Francisco Pereira/American University of Beirut, Isam Kaysi/American University of Beirut

Multi-Task Learning Deep Neural Network to Combine Revealed and Stated Preference Data (20-01056) - B351

Shenhao Wang/Massachusetts Institute of Technology (MIT), Qing Yi Wang/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT)

Bayesian Supervised Learning and Latent Class Analysis of Dynamic Ridesharing Behavior via Probabilistic Tensor Factorization (20-01151) - B352

Zheng Zhu/Hong Kong University of Science and Technology, Lijun Sun/Hong Kong University of Science and Technology, Xiqun (Michael) Chen/Hong Kong University of Science and Technology, Hai Yang/Hong Kong University of Science and Technology

Mixed-Frequency Traffic Safety Data Interpretations: A Bayesian Vector Autoregression Approach (20-01310) - B363

Zhenning Li/University of Hawai'i at Manoa, Hao Yu/University of Hawai'i at Manoa, Guohui Zhang/University of Hawai'i at Manoa, David Ma/University of Hawai'i at Manoa, Jun Wang/University of Hawai'i at Manoa

Are Intersections in Proximity to Schools Safer Than Other Intersections?: A Heterogeneous Endogenous Econometric Model for Pedestrian Safety (20-01357) - B353

Shahram Heydari/University of Southampton, Luis Miranda-Moreno/University of Southampton

Predicting Travel Speeds for the Next Four Hours (20-01805) - B354

Christopher Bentley/DATA61, Hoang Nguyen/DATA61, Chen Cai/DATA61

Driver Injury Severity Prediction Using Highway Single-Vehicle Crash Data: A Fusion Convolutional Neural Network Approach (20-02587) - B364

Hao Yu/University of Hawai'i, Manoa, Zhenning Li/University of Hawai'i, Manoa, Runze Yuan/University of Hawai'i, Manoa, Guohui Zhang/University of Hawai'i, Manoa, David Ma/University of Hawai'i, Manoa

Apollo: A Flexible and Powerful Free Open-Source R Package for Choice Modeling (20-02921) - B355

David Palma/University of Leeds, Stephane Hess/University of Leeds

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A Ranked Ordered Logit Model to Analyze Relative Crash Risk by Number of Vehicles Involved (20-03180) - B35 6

Mohamed Osman/University of Memphis, Rajesh Paleti/University of Memphis, Sabyasachee Mishra/University of Memphis

Travel Distance and Land Use: Application of a Generalized Box-Cox Model with Conditional Spatial Lag Dependence (20-00280) - B357

Jason Hawkins/University of Toronto, Khandker Nurul Habib/University of Toronto

Exploring Non-Linearity in Traffic Flow Data: Comparison of Highways and Urban Roads (20-03904) - B358

Bidisha Ghosh/Trinity College, Dublin, Bidroha Basu/Trinity College, Dublin

Accounting for Unobserved Heterogeneity in Crash Frequency Analysis: A Correlated Random Parameters Approach with Heterogeneity in Means (20-03923) - B359

Xiaoyan Huo/Harbin Institute of Technology - Weihai, Junqiang Leng/Harbin Institute of Technology - Weihai, Qinzhong Hou/Harbin Institute of Technology - Weihai, Hao Yang/Harbin Institute of Technology - Weihai

Macro-Level Collision Prediction Using Geographically Weighted Negative Binomial Regression (20-04418) - B3 65

Seun Oluwajana/York University, Peter Park/York University, Thais Rodrigues/York University

Intersection Crash Analysis Using Multiple Membership Multi-Level Modeling (20-04915) - B366

Ho-Chul Park/York University, Peter Park/York University, Seungho Yang/York University, Dong-Kyu Kim/York University

Assessing and Characterizing Spatial Interaction Between Household Types Using Spatial Multi-Nomial Logit Models (20-05526) - B367

Mohamed Khachman/Ecole Polytechnique de Montreal, Catherine Morency/Ecole Polytechnique de Montreal, Francesco Ciari/Ecole Polytechnique de Montreal

Distribution Analysis and Multimodality of Highway Speed Measurements (20-05784) - B368

Ilker Karaca/Iowa State University, Koray Ozcan/Iowa State University, Anuj Sharma/Iowa State University

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Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

General and Emerging Pavement Design Practices
Sponsored By Standing Committee on General and Emerging Pavement Design

Study the Effect of Polyolefin-Aramid Fibers on PA Mixture (20-00110) - A100

Daniel Castro-Fresno/Universidad de Cantabria, Carlos Slebi-Acevedo/Universidad de Cantabria, Anik Gupta/Universidad de Cantabria, Pedro Lastra-Gonzáez./Universidad de Cantabria, Juan Ruge-Cardenas/Universidad de Cantabria

Evaluation of Fiber Grid Reinforced Asphalt Concrete Based on Reflection Cracking Resistance and Life-Cycle Cost Analysis (20-00811) - A101

Dae-Wook Park/Kunsan National University, Allistair Tam/Kunsan National University, Bruce Aplicano/Kunsan National University, Jo-Soon Kim/Kunsan National University

Microfiber-Reinforced Internally Cured Concrete for Pavement Applications: Lab and Full-Scaled Slab Testing Programs (20-00841) - A102

Thanachart Subgranon/University of Florida, Hung-Wen Chung/University of Florida, Yahui Wang/University of Florida, Harvey DeFord/University of Florida, Mang Tia/University of Florida

In Situ Performance Evaluation of Lightweight Cellular Concrete Through Instrumentation and Post-Construction Testing (20-01402) - A103

Abimbola Oyeyi/University of Waterloo, Frank Mi-Way Ni/University of Waterloo, Guangyuan Zhao/University of Waterloo, Susan Tighe/University of Waterloo

Calibration of MEPDG (Pavement ME Design) Software for the Conditions of the Kingdom of Saudi Arabia (20-01467) - A104

M. Emin Kutay/Michigan State University, Ibrahim Aldubabe/Michigan State University, Hussain U. Bahia/Michigan State University, Khaled Galal/Michigan State University, Abdulhadi Al-Shafi/Michigan State University, Abdullah Al-Shiha/Michigan State University, Ayed Al-Shehri/Michigan State University

Developing an Automated Technique to Calibrate the AASHTOWare Pavement ME Design Software (20-03850) - A105

Shuvo Islam/Kansas State University, Avishek Bose/Kansas State University, Christopher Jones/Kansas State University, Mustaque Hossain/Kansas State University, Cristopher Vahl/Kansas State University

Analytic Pavement Modeling with a Fragmented Layer (20-04038) - A106

Eyal Levenberg/Technical University of Denmark, Asmus Skar/Technical University of Denmark

(continued)

Analysis of Iowa Pavement Performance Predictions Using Satellite-Based and Ground-Based Climate Data (20-04818) - A107

Leela Sai Praveen Gopisetti/Michigan State University, Halil Ceylan/Michigan State University, Bora Cetin/Michigan State University, Sunghwan Kim/Michigan State University

Evaluating the Impact of Thickness and Interface Bonding on Overlay Slippage Under Braking Vehicles Using 3D FEM (20-05177) - A108

Aliasghar Dormohammadi/Applied Research Associates, Inc. (ARA), Vivek Tandon/Applied Research Associates, Inc. (ARA), Angel Rodarto/Applied Research Associates, Inc. (ARA)

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Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

Advancements in Alternative Project Delivery

Jorge Rueda-Benavides, Auburn University, presiding

Sponsored By Standing Committee on Project Delivery Methods

Alignment Between Project Goals and Evaluation Criteria in Best-Value Procurement (20-03492) - A134

Maria Calahorra Jimenez/University of Colorado, Boulder, Cristina Torres-Machi/University of Colorado, Boulder, Keith R. Molenaar/University of Colorado, Boulder, Alondra Chamorro/University of Colorado, Boulder, Luis Fernando Alarcon/University of Colorado, Boulder

How Multi-Party Agreements Have Been Adapted In Response to Disaster Recovery In New Zealand (20-04918) - A136

Jacobus Van der Walt/University of Canterbury College, Eric Scheepbouwer/University of Canterbury College, Phil Barutha/University of Canterbury College

Exploring Progressive Design-Build/Best-Value Delivery Method in Highway Construction: Maryland I-270 Case Study (20-04913) - A132

Douglas Alleman/University of Colorado, Boulder, Dan Tran/University of Colorado, Boulder

Bi-Level Multi-Objective Optimization of Urban Road Project Scheduling Considering Contract Bundling (20-02209) - A137

Mohammad Miralinaghi/Purdue University, Mahmood T. Tabesh/Purdue University, Sania E. Seilabi/Purdue University, Yu-Ting Hsu/Purdue University, Samuel Labi/Purdue University, Jon D. Fricker/Purdue University

Probabilistic Cost-Based Project Selection Framework for IDIQ Contracting (20-04523) - A131

Jorge Rueda-Benavides/Auburn University, Douglas Gransberg/Auburn University, Cesar Mayorga/Auburn University, Brendon Gardner/Auburn University

Information Exchange in the Procurement Process of Design-Build Transportation Projects: Digging into the What, When, Who, and How (20-03546) - A135

Maria Calahorra/University of Colorado, Boulder, Cristina Torres-Machi/University of Colorado, Boulder, Keith R. Molenaar/University of Colorado, Boulder

Development of a Design-Build Alternative Technical Concept Management System (20-03690) - A138

Austin Purgason/South Carolina Department of Transportation, James Mattox/South Carolina Department of Transportation

Evaluation of Parametric Cost Estimating Models as Part of a Three-Stage Plan for Conceptual and Feasibility Cost Estimating in Public Highway Project Portfolios (20-00975) - A139

Nigel Blampied/San Jose State University

Analysis of Alternative Delivery Methods on Small Highway Construction Projects (20-05712) - A133

Douglas Alleman/University of Colorado, Boulder, Arthur Antoine/University of Colorado, Boulder, M. Scott Stanford/University of Colorado, Boulder

Risk Management Strategies in Design-Build Projects with Significant Geotechnical Risks: Cases from a State Agency (20-05379) - A130

Ziyad Elkhatib/California State Polytechnic University, Pomona, Ghada Gad/California State Polytechnic University, Pomona, Douglas Gransberg/California State Polytechnic University, Pomona

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Geotechnical and Geohazard State of Practice: Analysis, Mitigation, and Management
Ty Ortiz, Colorado Department of Transportation, presiding
Sponsored By Standing Committee on Engineering Geology, Standing Committee on Geotechnical Site Characterization

Geotechnical and Geological Engineering State of Practices poster session highlighting rockfall mitigation, landslide management, slope stability, geotechnical subsurface density measurements and karst topography

Probabilistic Design of Slope Stabilization Using Piles Considering Multiple Failure Modes (20-00930) - A112
Yizhe Xu/Tongji University, Biao Hu/Tongji University, Zhe Luo/Tongji University
Hybrid Design Approaches for Anchored Wire Meshes: Toward a Displacement-Based Design (20-02304) - A113
Andrea Galli/Officnie Maccaferri SPa, Marco Deana/Officnie Maccaferri SPa
Vulnerability Analysis of the Road Network on Oahu Under Landslide Susceptibility (20-02333) - A110
Qian Zhang/University of Hawai'i at Manoa, Hao Yu/University of Hawai'i at Manoa, Zhenning Li/University of Hawai'i at Manoa, Guohui Zhang/University of Hawai'i at Manoa, David Ma/University of Hawai'i at Manoa
Safety Prediction Model for Reinforced Highway Slope Using Machine Learning Method (20-02821) - A111
Asif Ahmed/SUNY Poly, Mohammad Sadik Khan/SUNY Poly, Sahadat Hossain/SUNY Poly, Tural Sadigov/SUNY Poly, Prabesh Bhandari/SUNY Poly
Estimation of Subgrade Density Using Ground Penetrating Radar (20-04324) - A115
Ahmad Abdelmawla/University of Georgia, S. Sonny Kim/University of Georgia
Electrical Resistivity Imaging and Seismic Full Waveform Inversion for Characterization of a Karst Site (20-0368 8) - A114
Michael Kiernan/Auburn University, Dan Jackson/Auburn University, J. Anderson/Auburn University, Kaye Davis/Auburn University, Brannon McDonald/Auburn University, Jack Montgomery/Auburn University

Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Recent Work on Bridge Management and Testing and Evaluation of Bridges
Joshua Steelman, University of Nebraska, Lincoln, presiding
Sponsored By Standing Committee on Bridge Management, Standing Committee on Testing and Evaluation of Transportation Structures

This poster session includes manuscripts on bridge management, and testing and evaluation of transportation structures. The session is organized by AHD35 and co-sponsored by AFF40 committees.

Simulation-Based Bridge Network Maintenance Budget Planning Using Latin Hypercube Sampling (20-02165) - A116
Stefanos Politis/University of Texas, Austin, Zhanmin Zhang/University of Texas, Austin, Zhe Han/University of Texas, Austin, John Hasenbein/University of Texas, Austin, Miguel Arellano/University of Texas, Austin
Network-Level Markov Chain-Based Bridge Performance Prediction Models That Consider the Effects of Maintenance and Rehabilitation (20-04509) - A117
Feiyue Wang/Texas A&M University, College Station, Cheng-Chun Lee/Texas A&M University, College Station, Nasir Gharaibeh/Texas A&M University, College Station, Eun Sug Park/Texas A&M University, College Station
Condition Assessment Protocol of Vertical Lift Truss Bridges Under the Lift Induced Excitations Using Artificial Neural Network and Analytical Model (20-04560) - A118
Maryam Mashayekhi/University of New Hampshire, Erin Santini-Bell/University of New Hampshire
Element-Based, Multi-Objective Optimization Methodology Supporting a Transportation Asset Management Framework for Bridge Planning and Programming (20-05408) - A119
Karim Naji/University of New Hampshire, Erin Santini-Bell/University of New Hampshire, Robert Zobel/University of New Hampshire
Comparison Between a Linear Regression and an Artificial Neural Network Model to Detect and Localize Damage in the Powder Mill Bridge (20-02834) - A127
Kathryn Kaspar/University of New Hampshire, Erin Santini-Bell/University of New Hampshire, Marek Petrik/University of New Hampshire

(continued)

Design of Smart Bridges for Smart Cities: A New Structural Design Paradigm (20-03230) - A128
Jason Aldaz/University of New Mexico, Fernando Moreu/University of New Mexico
Machine Learning–Based Evaluation of Impact-Echo Data (20-05600) - A129
Daniel Algernon/Swiss Association for Technical Inspections (SVTI/ASIT), Sascha Feistkorn/Swiss Association for Technical Inspections (SVTI/ASIT), Christopher Ferraro/Swiss Association for Technical Inspections (SVTI/ASIT), Dennis Hiltunen/Swiss Association for Technical Inspections (SVTI/ASIT), Michael Scherrer/Swiss Association for Technical Inspections (SVTI/ASIT)

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Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Transportation Safety Management from Start to Finish
Frank Gross, VHB, presiding
Susan Herbel, SBH Consult, presiding
Stephanie Malinoff, University of Minnesota, Twin Cities, presiding
Sponsored By Standing Committee on Transportation Safety Management Systems

More research on safety management from a comprehensive, systems approach is desirable. Transportation Safety Management: Start to Finish is a poster session where you can interact one-on-one with the authors to discuss specific aspects of safety management.

Integrated Regional Transportation Model–Network-Based Collision Prediction Model Framework (20-01034) - A146
Ali Farhan/University of Calgary, Lina Kattan/University of Calgary, Richard Tay/University of Calgary
Hierarchical Analysis of Traffic Violations and Crashes: A Macroscopic Safety Analysis (20-01355) - A147
Jaeyoung Lee/Central South University, Mohamed Abdel-Aty/Central South University, Xiaoqi Zhai/Central South University, Huang Helai/Central South University
Development and Application of a Roadway Safety Data Integrator Tool for Highway Safety Information System Data (20-01983) - A148
Seyedehsan Dadvar/Morgan State University, Young-Jae Lee/Morgan State University, Hyeon-Shic Shin/Morgan State University
Implementing Vision Zero: A Proactive Methodology for Building Communities for Kids (20-02218) - A154
Wesley Marshall/University of Colorado, Denver, Nicholas Ferenchak/University of Colorado, Denver
Investigate Factors Affecting Driver Injury Severity in Snow-Related Rural Single-Vehicle Crashes (20-02847) - A160
Runze Yuan/University of Hawai'i, Manoa, Hao Yu/University of Hawai'i, Manoa, Zhenning Li/University of Hawai'i, Manoa, Guohui Zhang/University of Hawai'i, Manoa, David Ma/University of Hawai'i, Manoa
The Problem of, and a Possible Solution to, Comparison Site Selection in Scheme Evaluation (20-02863) - A149
Joe Matthews/Newcastle University, Lee Fawcett/Newcastle University, Neil Thorpe/Newcastle University, Nicola Hewett/Newcastle University, Karsten Kremer/Newcastle University
Meso-Level Hot Spot Identification for Suburban Arterials (20-02889) - A171
Xuesong Wang/Tongji University, Yingying Pei/Tongji University, Jinghui Yuan/Tongji University
Macro-Level Traffic Safety Analysis and Model Updating in Shanghai, China (20-02893) - A172
Minming Yang/Tongji University, Xuesong Wang/Tongji University, Meigen Xue/Tongji University
Record Linkage of Crashes with Injuries and Medical Cost: A Case Study of Puerto Rico (20-03374) - A150
Josie Bianchi/Recinto Universitario de Mayaguez Universidad de Puerto Rico, Didier Valdés/Recinto Universitario de Mayaguez Universidad de Puerto Rico, Héctor Colón/Recinto Universitario de Mayaguez Universidad de Puerto Rico
Cross-Comparison and Objective-Based Crash Tree Development and Analysis for Small Counties in Florida (20-03791) - A151
Roozbeh Rahmani/University of Florida, Nithin Agarwal/University of Florida, Sivaramakrishnan Srinivasan/University of Florida, Ilir Bejleri/University of Florida, Xingjing Xu/University of Florida, Jia Fang/University of Florida
Improving Driver's Education Regarding Wrong-Way Driving Incidents (20-04157) - A152
Mohammad Jalayer/Rowan University, Kevin Takacs/Rowan University, Jason Roberts/Rowan University
Emergency Response Times for Fatal Motor Vehicle Crashes, 1975–2017 (20-04196) - A155
Maria Cruz/University of New Mexico, Nicholas Ferenchak/University of New Mexico
Vehicle Occupants and Driver Behavior: An Assessment of Vulnerable User Groups (20-04603) - A153
Michael Martin/Texas A&M Transportation Institute, Lisa Green/Texas A&M Transportation Institute, Byron Chigoy/Texas A&M Transportation Institute, Eva Shipp/Texas A&M Transportation Institute, Rahul Mars/Texas A&M Transportation Institute

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Investigating Factors That Contributed to the Large Reduction and Subsequent Increase in Roadway Fatalities in the United States Between 2005 and 2016 (20-04761) - A170

Tahmida Hossain Shimu/HDR, Dominique Lord/HDR, Srinivas Geedipally/HDR, Lingtao Wu/HDR, Robert Wunderlich/HDR

Relationship Between Road Safety Pillars and the WHO Member States Mortality Rate: A Study Applying Structural Equation Models (20-04917) - A156

Caio Torres/Universidade Federal do Ceara, Xavier Vanessa/Universidade Federal do Ceara, Flávio José Cunto/Universidade Federal do Ceara

School Bus Routing to Allow Later School Start Times (20-04939) - A157

Rana Eslamifard/University of Massachusetts, Amherst, Eric Gonzales/University of Massachusetts, Amherst

Assessing the Accuracy of "Serious Injury" Reporting with the Implementation of the New MMUCC KABCO Definition (20-05134) - A158

Beau Burdett/University of Wisconsin, Madison, Zhixia Li/University of Wisconsin, Madison, Andrea Bill/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison

Road Safety Focusing Events (20-05231) - A159

Ryan Archibald/University of Colorado, Denver, Wesley Marshall/University of Colorado, Denver

A Deep Reinforcement Learning-Based Intelligent Intervention Planning Framework for Real-Time Proactive Road Safety Management (20-05301) - A161

Ananya Roy/The University of Tokyo, Yasunori Muromachi/The University of Tokyo, Moinul Hossain/The University of Tokyo

Are Uninsured Drivers Less Likely to Request Emergency Medical Services After a Crash? (20-05447) - A162

Qifan Nie/University of Alabama, Xing Fu/University of Alabama, Xiaobing Li/University of Alabama, Jun Liu/University of Alabama

A Linear Poisson Autoregressive Model for Analyzing Dynamic Fatal Traffic Accident Data (20-05512) - A167

Yue Zhang/Tongji University, Yajie Zou/Tongji University, Lingtao Wu/Tongji University

Systemic Strategy to Mitigate Intersection Left Turn Crashes: A Regional Analysis Methodology (20-05787) - A168

Margaret Herrera/Maricopa Association of Governments

The 85 Percent Solution: A Historical Look at Crowdsourcing Speed Limits and the Question of Safety (20-05268) - A169

Brian Taylor/University of California, Los Angeles, Yu Hong Hwang/University of California, Los Angeles

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Monday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

New Trends in Research on Human Factors and Vehicle User Characteristics
Shan Bao, University of Michigan, Transportation Research Institute, presiding
Sponsored By Standing Committee on Vehicle User Characteristics

Understanding the Safety Implications of Location-Based Augmented Reality Mobile Apps: Perception, Attitude, and App Usage Behavior (20-00362) - A181

Yuntao Guo/University of Hawaii, Shubham Agrawal/University of Hawaii, Srinivas Peeta/University of Hawaii, Irina Benedyk/University of Hawaii

Investigating the Long- and Short-Term Driving Characteristics and Incorporating Them into Car-Following Models (20-00505) - A183

Xiaoyun Chen/Tongji University School of Transportation Engineering, Jian Sun/Tongji University School of Transportation Engineering, Zian Ma/Tongji University School of Transportation Engineering, Jie Sun/Tongji University School of Transportation Engineering, Zuduo Zheng/Tongji University School of Transportation Engineering

Investigating Indecision Zone Boundaries for Mixed Traffic Conditions: Using Machine Learning Method (20-00813) - A184

Bharat Pathivada/Indian Institute of Technology, Bombay, Vedagiri Perumal/Indian Institute of Technology, Bombay

Predicting Driving Distraction Patterns in Different Road Classes Using Support Vector Machine (20-00881) - A185

Samira Ahangari/Morgan State University, Mansoureh Jeihani/Morgan State University, Md Rahman/Morgan State University, Abdollah Dehzangi/Morgan State University

Identifying Drivers' Perception-Reaction Time in Car-Following Processes via Two Different Methods Using Vehicle Trajectory Data (20-01064) - A187

Dan Wu/Central South University

(continued)

Driver Visual Errors in Automobile Crashes at Four-Way Intersections (20-01474) - A188

Robyn Brinckerhoff/Exponent, Caroline Crump/Exponent, Rachel Jonas/Exponent, Audra Krake/Exponent, Christina Cloninger/Exponent, David Cades/Exponent, Douglas Young/Exponent

Improving Xgboost Driving Distraction Detection Algorithm Based on Lane Keeping Performance with Different Temporal Windows (20-01564) - A182

Ziyao Zhou/Tongji University, Chen Chai/Tongji University, Xuxin Zhang/Tongji University, Xuesong Wang/Tongji University, Wenhui Lei/Tongji University

Driving Behavior Evaluation Incorporating Context Awareness by Machine Learning (20-01688) - A189

Qingwen Xue/Tongji University, Jian Lu/Tongji University, Ke Wang/Tongji University

Driver Identification Using 1-D Convolutional Neural Networks with Vehicular CAN Signals (20-01857) - A194

Hongyu Hu/Jilin University, Jiarui Liu/Jilin University, Pin Wang/Jilin University, Ching-Yao Chan/Jilin University

Examining Dependencies Between Real-World Driving Behaviors and Driving Stress: Harnessing CAN-Bus and Biometric Health Data for Proactive Safety Management (20-02078) - A190

Behram Wali/Massachusetts Institute of Technology (MIT), Sebastiano Milardo/Massachusetts Institute of Technology (MIT), Umberto Fugiglando/Massachusetts Institute of Technology (MIT), Paolo Santi/Massachusetts Institute of Technology (MIT), Carlo Ratti/Massachusetts Institute of Technology (MIT)

Driving Impairments and Duration of Distractions: Assessing Crash Risk by Harnessing Microscopic Naturalistic Driving Data (20-02286) - A196

Ramin Arvin/University of Tennessee, Knoxville, Asad Khattak/University of Tennessee, Knoxville

Distracted by "Distracted Pedestrians"? (20-02368) - A192

Kelcie Ralph/Rutgers University Edward J. Bloustein School of Planning and Public Policy, Ian Girardeau/Rutgers University Edward J. Bloustein School of Planning and Public Policy

An On-Road Driving Test of Cognitive Distraction: Characteristics of Drivers' Visual Behavior (20-02501) - A195

Yanli Ma/Harbin Institute of Technology, Shouming Qi/Harbin Institute of Technology, Guan Lian/Harbin Institute of Technology, Jieyu Zhu/Harbin Institute of Technology, Ching-Yao Chan/Harbin Institute of Technology, Yaping Zhang/Harbin Institute of Technology

Measurement and Prediction of Driver Trust in Automated Vehicle Technologies: An Application of Hand Position Transition Probability Matrix (20-02615) - A193

Shan Bao/University of Michigan, Transportation Research Institute, Bo Yu/University of Michigan, Transportation Research Institute, John Sullivan/University of Michigan, Transportation Research Institute, Mike Flannagan/University of Michigan, Transportation Research Institute

Analysis of Professional Drivers While Text Reading and Prediction of Driving Behavior Using Cluster Modeling (20-02845) - A198

Panos Prevedouros/University of Hawaii, Eftihia Nathanail/University of Hawaii, Md. Mintu Miah/University of Hawaii, Rafaela Barros/University of Hawaii

A Comprehensive Analysis of Distracted Driving Using a Driving Simulator (20-03589) - A186

Samira Ahangari/Morgan State University, Mansoureh Jeihani/Morgan State University, Behrouz Salahshour/Morgan State University, Martin Ndegwa/Morgan State University

Predicting Driving Behavior by Lifestyle Factors: A Structural Equation Modeling Approach (20-03679) - A200

Shahab Dabirinejad/Iran University of Science and Technology, Ali Tavakoli Kashani/Iran University of Science and Technology, Trond Nordfjærn/Iran University of Science and Technology, Ali Afshar/Iran University of Science and Technology

Influencing Factors of Drivers' Hazard Perception Under Plateau Environment: Experiment and Modeling (20-03700) - A201

Jiayun Zhu/Southeast University, Fei Chen/Southeast University, Yunlong Zhang/Southeast University, Wu Bo/Southeast University, Xinyan Wang/Southeast University, Ping Zhang/Southeast University, Zengan Wang/Southeast University, Fei Hu/Southeast University, Maoning Zhong/Southeast University

Driver Characterization for Microsimulation Modeling Through Empirical Observations (20-03951) - A202

Aikaterini Anesiadou/European Commission, Michail Makridis/European Commission, Georgios Fontaras/European Commission, Biagio Ciuffo/European Commission, Konstantinos Mattas/European Commission

Ethical Decision Making Behind the Wheel: A Driving Simulator Study (20-04180) - A203

Siby Samuel/University of Waterloo, Sarah Yahoodik/University of Waterloo, Yusuke Yamani/University of Waterloo, Krishna Valluru/University of Waterloo, Donald Fisher/University of Waterloo

Impact of Urban Undersea Tunnel Longitudinal Slope on the Visual Characteristics of Drivers (20-04272) - A217

Shoushuo Wang/Wuhan University of Technology, Zhigang Du/Wuhan University of Technology, Fangtong Jiao/Wuhan University of Technology, Libo Yang/Wuhan University of Technology, Yudan Ni/Wuhan University of Technology

Car-Following Modeling Incorporating Driving Memory Based on Autoencoder and Long Short-Term Memory Neural Networks (20-04323) - A206

Pengcheng Fan/Tongji University, Jingqiu Guo/Tongji University, Haifeng Zhao/Tongji University, Jing Li/Tongji University

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Impact of Driver Characteristics on Headway Selection and Free-Flow Speed at Work Zones by Utilizing Naturalistic Driving Study Data (20-04517) - A207

Dan Xu/Auburn University, Huaguo Zhou/Auburn University, Chennan Xue/Auburn University

Development of Data-Driven Lane-Changing Driving Behavior for Automated Vehicles with Inverse Reinforcement Learning (20-04545) - A208

Nassim Motamedidehkordi/Parsons

Examining Driver Distraction as a Function of Driving Speed: An Observational Study Using Disruptive Technology and Naturalistic Data (20-04594) - A180

Kentaro Iio/No Organization, Xiaoyu Guo/No Organization, Dominique Lord/No Organization

Behavior-Based V2I Application at Signalized Intersections Using Neural Networks (20-04745) - A209

Mostafa Tawfeek/Ain Shams University

Understanding Drivers' Latent Hazard Anticipation in Partially Automated Vehicle Systems (20-04862) - A204

Siby Samuel/University of Waterloo, Yusuke Yamani/University of Waterloo, Rajiv Nair/University of Waterloo, Ravi Agrawal/University of Waterloo, Donald Fisher/University of Waterloo

Searching for Relationships Between Self-Reported Familiarity and Road Safety Based on Surveys with Geographic Variability (20-04927) - A210

Paolo Intini/Politecnico di Bari, Nicola Berloco/Politecnico di Bari, Pasquale Colonna/Politecnico di Bari, Damiano De Gennaro/Politecnico di Bari, Vittorio Ranieri/Politecnico di Bari, Eirin Ryeng/Politecnico di Bari

An Unsupervised Learning Method for Abnormal Driving Behavior Recognition Based on LSTM (20-05176) - A213

Yongfeng Ma/Southeast University, Zeyang Li/Southeast University, Kun Tang/Southeast University, Shuyan Chen/Southeast University, Ziyu Zhang/Southeast University

Determining Perception-Reaction Time for Different Spacings and Types of Lead Vehicle–Based on Driver's Perception Threshold (20-05200) - A211

Chris Lee/University of Windsor, Umair Durrani/University of Windsor, Dhwani Shah/University of Windsor

Analysis of Driving Style in Different Task Stages for Full-Duty Online Carhailing Drivers (20-05244) - A214

Yongfeng Ma/Southeast University, Wenlu Li/Southeast University, Kun Tang/Southeast University, Ziyu Zhang/Southeast University, Shuyan Chen/Southeast University

Reckless Driving Behavior Recognition Using Facial Expression Data from a Naturalistic Driving Study (20-05293) - A216

Yongfeng Ma/Southeast University, Qian Zhu/Southeast University, Hongcheng Meng/Southeast University, Yingjiu Pan/Southeast University, Shuyan Chen/Southeast University

Classification of "SAF-ECO" Driving Behavior Using Multiple Logistic Regression Model (20-05314) - A212

Xiaohua Zhao/Beijing University of Technology, Chang Liu/Beijing University of Technology, Yiping Wu/Beijing University of Technology, Ying Yao/Beijing University of Technology, Xin Chang/Beijing University of Technology, Yuelong Su/Beijing University of Technology

Integration of Automated Vehicles in Mixed Traffic: Evaluating Changes in Operational Performance of Following Vehicles (20-05504) - A197

Iman Mahdinia/University of Tennessee, Knoxville, Amin Mohammadnazar/University of Tennessee, Knoxville, Asad Khattak/University of Tennessee, Knoxville

Impact of Cognitive Distractions on Drivers' Hazard Anticipation and Hazard Mitigation Behavior in Vehicle–Bicycle Conflict Situations (20-05565) - A205

Yalda Ebadi/University of Massachusetts, Amherst, Ganesh Pai/University of Massachusetts, Amherst, Siby Samuel/University of Massachusetts, Amherst, Donald Fisher/University of Massachusetts, Amherst

Non-Parametric, Multi-Variate Adaptive Regression Splines Models for Investigating Lane-Changing Gap Acceptance Behavior Utilizing SHRP2 Naturalistic Driving Data (20-05567) - A191

Anik Das/Federal Highway Administration (FHWA), Md Nasim Khan/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)

Car-Following Reaction Delay Analysis Based on Stratified Cox Model (20-05625) - A218

yanning zhang/Tongji University, Zhongyin Guo/Tongji University, Gao Kun/Tongji University

Investigating the Associations Among Belief in a Just World, Driving Anger, and Aggressive Driving Behavior (20-05674) - A215

Yongfeng Ma/Southeast University, Hongcheng Meng/Southeast University, Qian Zhu/Southeast University, Shuyan Chen/Southeast University, Ya'nan Yu/Southeast University

Subjective Fatigue and Driving Performance in the Tibetan Plateau (20-06079) - A219

Shuwei Zhang/Tongji University, Zhongyin Guo/Tongji University

Critical Transportation Infrastructure Protection
Alice Alipour ABR10, Iowa State University, presiding
Meghann Valeo, MMV Consulting, LLC, presiding
Sponsored By Standing Committee on Critical Transportation Infrastructure Protection, Subcommittee on Critical Transport System Protection Analysis, Integration and Operations Planning and Management, Subcommittee on Physical Security, Subcommittee on Training, Education & Technology Transfer, Subcommittee on Cyber Security, Subcommittee on 2018 Transportation Resilience

This is a Poster Session for ABR10, including papers reviewed by the committee.

Assessing Temporal Resilience of Transportation Systems: A Systems-Based Hierarchical Bayesian Network Model (20-00217) - B430
Junqing Tang/Eidgenossische Technische Hochschule Zurich, Hans Heinimann/Eidgenossische Technische Hochschule Zurich, Ke Han/Eidgenossische Technische Hochschule Zurich

Analyzing Cyberattack Effects on Connected Autonomous Vehicles Using a Cooperative Intelligent Driver Model (20-00250) - B431
Pengcheng Wang/Rensselaer Polytechnic Institute (RPI), Xiaozheng He/Rensselaer Polytechnic Institute (RPI), Xinkai Wu/Rensselaer Polytechnic Institute (RPI), Guizhen Yu/Rensselaer Polytechnic Institute (RPI)

A Two-Stage Stochastic Model for Optimized Mitigation and Recovery of Bridge Network with Final Goal of Resilience (20-00934) - B432
Alice Alipour ABR10/Iowa State University, Ning Zhang/Iowa State University

Identifying Critical Hurricane Shelters and Alternatives in Case of Interdiction: A Case Study in Southeast Florida (20-01197) - B433
Onur Alisan/Middle East Technical University, Mahyar Ghorbanzadeh/Middle East Technical University, Mehmet Ulak/Middle East Technical University, Ayberk Kocatepe/Middle East Technical University, Eren Ozguven/Middle East Technical University, Mark Horner/Middle East Technical University, Wenrui Huang/Middle East Technical University

Developing Citywide Hurricane Risk Maps Using Real-Life Data on Infrastructure, Vegetation, and Weather: A GIS-Based Case Study in Northwest Florida (20-02043) - B434
Mingyang Chen/Florida State University, Alican Karaer/Florida State University, Eren Ozguven/Florida State University, Tarek Abichou/Florida State University, Reza Arghandeh/Florida State University, Jaap Nienhius/Florida State University

A Post-Disaster Decision Framework for Bridge Repair Prioritization to Improve Road Network Resilience (20-02124) - B435
Eric Merschman/University of Alabama in Huntsville, Mehrnaz Doustmohammadi/University of Alabama in Huntsville, Abdullahi Salman/University of Alabama in Huntsville, Michael Anderson/University of Alabama in Huntsville

Falsified Vehicle Trajectory Identification by Anomaly Detection in a Connected Vehicle Environment (20-02329) - B436
Shihong Huang/University of Michigan, Ann Arbor, Wai Wong/University of Michigan, Ann Arbor, Henry Liu/University of Michigan, Ann Arbor, Yiheng Feng/University of Michigan, Ann Arbor

A Simulation-Based Resource Allocation Framework for Optimal Resilience in Interdependent Infrastructure Networks (20-02355) - B437
Jingran Sun/University of Texas, Austin, Srijith Balakrishnan/University of Texas, Austin, Zhanmin Zhang/University of Texas, Austin

Vulnerability Analysis of Urban Rail Transit Network by Considering the Station Track Layout and Passenger Behavior (20-02496) - B440
Taoyuan Yang/Beijing Jiaotong University, Peng Zhao/Beijing Jiaotong University, Xiangming Yao/Beijing Jiaotong University

A Methodological Framework for Improving Infrastructure Network Resilience Using Agent-Based Modeling and Reinforcement Learning (20-02547) - B438
Jingran Sun/University of Texas, Austin, Zhanmin Zhang/University of Texas, Austin

Travel Behavior Under Terrorist Attack Bluff (20-02611) - B441
Alireza Ermagun/Mississippi State University, Kaveh Bakhsh Kelarestaghi/Mississippi State University, Kevin Heaslip/Mississippi State University

Dynamic Assessment of Road Network Vulnerability Based on Cell Transmission Model (20-02612) - B442
Xie Binglei/Harbin Institute of Technology, Sun Yu/Harbin Institute of Technology, Wang Shan/Harbin Institute of Technology

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A Mathematical Model for the Temporal and Spatial Spread of Stuxnet-Style Autonomous Vehicle Malware (20-02924) - B443

Yong Hoon Kim/University of Windsor, Haesung Ahn/University of Windsor

Quantifying the Impacts of Cybersecurity Vulnerabilities in a Connected and Automated Vehicle Application (20-03076) - B444

Zulqarnain H. Khattak/Oak Ridge National Laboratory, Brian L. Smith/Oak Ridge National Laboratory, Michael D. Fontaine/Oak Ridge National Laboratory

A Procedure for the Evaluation of the Resilience of Transportation Systems (20-03194) - B445

CAMILA LEOBONS/Military Institute of Engineering, Vânia Campos/Military Institute of Engineering, Renata Bandeira/Military Institute of Engineering

Transport Network Resilience Analysis Using Crowdsourced Data (20-03211) - B446

Tingting Zhang/research center for integrated transport innovation, Chence Niu/research center for integrated transport innovation, Divya Nair/research center for integrated transport innovation, Vinayak Dixit/research center for integrated transport innovation

Dynamic Weighted Resilience Metrics of Transport Networks: An Approach to Quantify the Impact of Disruptions on Traffic Conditions (20-03943) - B447

Elise Henry/IFSTTAR , Angelo Furno/IFSTTAR , Nour-Eddin El Faouzi/IFSTTAR

Increasing Resilience of Critical Infrastructure Networks Through Strategic Location of Microgrids: A Case Study of Hurricane Maria in Puerto Rico (20-04270) - B448

Felipe Aros-Vera/Ohio University, Shayne Gillian/Ohio University, Austin Rehmar/Ohio University, Landon Rehmar/Ohio University

Cybersecurity in Public Transpiration: A Taxonomy (20-05234) - B450

Kevin Dennis/University of South Florida, Maxat Alibayev/University of South Florida, Sean Barbeau/University of South Florida, Jay Ligatti/University of South Florida

A Practice-Ready Metric for Identification of Critical Links in Road Networks (20-05458) - B451

Amir Almotahari/SUNY College, Stony Brook, Anil Yazici/SUNY College, Stony Brook

Assessment of Transportation System Vulnerabilities to Tidal Flooding in Honolulu, Hawaii (20-04118) - B452

Suwan Shen/University of Hawai'i at Manoa, Karl Kim/University of Hawai'i at Manoa

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<u>Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 151B</u>
How Smart Cities Manage Knowledge
Alexander Linthicum, OST-R/Volpe Center, presiding
Sponsored By Task Force on Knowledge Management, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Technology Transfer

 Smart cities attempt to modernize delivery of public services, management of public assets, and enhancement of public safety by adopting cutting-edge technology, data analytics, communications, and problem-solving techniques. Beyond technology adoption, public agencies' and their partners' ability to aggregate knowledge from experience , and to learn from one another under complex and uncertain conditions may be a key determinant of which cities successfully transform themselves. This session features smart cities researchers and practitioners who will share their experiences applying knowledge management within the complex and time-sensitive environments of smart cities.

Knowledge Management for Change and Uncertainty (P20-20627)
Kristie Chin/University of Texas, Austin
Smart Lessons Learned for Knowledge Management, Collaboration, and Transfer for Regional Multi-Jurisdiction Smart Networks: City of Detroit and Macomb County Experience (P20-20629)
Tony Geara/City of Detroit Department of Public Works, Oladayo Akinyemi/City of Detroit Department of Public Works, John Abraham/Macomb County Department of Roads
The Application of Knowledge Management in Tampa's Smart City Program (P20-20637)
Vik Bhide/City of Tampa

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Let's Connect the Dots: Linking Management Practices to Respond to Complex New Challenges
David Vautin, Metropolitan Transportation Commission (MTC), presiding
Sponsored By Standing Committee on Performance Management, Standing Committee on Strategic Management, Standing Committee on Management and Productivity, Standing Committee on Transportation Asset Management, Subcommittee on Risk and Resilience Assessment and Planning

Transportation agencies have matured significantly over the past decade through the advancement of practices in transportation asset management, performance management,and the use of risk management and assessments. However, transportation agencies understand there is a need to integrate these management practices to help them bring the pieces together to answer tough questions like how to achieve the best possible results with limited resources and under specific threats and how to integrate these three management practices into the decision-making processes. This session will offer a lightening round from different perspectives who are integrating management practices , followed by a very interactive participant/panel discussion!

How MNDOT Integrates Risk into Daily Practices (P20-20135)
Deanna Belden/Minnesota Department of Transportation
Using Integrated Management Practices at Atlanta Airport (P20-20136)
Craig Omundsen/Jacobs Engineering Group
Integrating Risk and Performance Management into the Long-Range Plan for the Chicago Metropolitan Region (P20-20335)
Elizabeth Schuh/Chicago Metropolitan Agency for Planning (CMAP)

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Transportation Equity from the Director's Perspective
Steven Higashide, TransitCenter, Inc., presiding
Sponsored By Standing Committee on Transportation Issues in Major Cities , Standing Committee on Strategic Management, Standing Committee on Environmental Justice in Transportation , Standing Committee on Public Involvement in Transportation

Directors of Transportation for major urban areas present their views on the challenges of achieving equitable transportation outcomes for the people in their cities and regions.

District of Columbia Transportation Equity (P20-21722)
Jeff Marootian/District Department of Transportation
Equity and Inclusion in Portland Transportation (P20-21723)
Irene Marion/Portland Bureau of Transportation
New York City and Transportation Equity (P20-21781)
Polly Trottenberg/New York City Department of Transportation
City of Minneapolis Equity Programs and Needs (P20-21884)
Danielle Elkins/City of Minneapolis

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Making Autonomous Vehicles Accessible for All
Julie Babinard, The World Bank, presiding
Sponsored By Standing Committee on Accessible Transportation and Mobility

Autonomous vehicles are a promising technological step in improving transportation options for all persons, including seniors and persons with disabilities. However, as this technology develops there is a need to identify and address potential barriers to accessibility of vehicles, including accommodations for mobility devices, interfaces with passengers, and other measures needed for passenger assistance. This session will provide presentations of research in accessibility of autonomous vehicles in both public transit and general transportation applications, including focus group research, testing of vehicles, and evaluation of service.

Mobility Issues of People with Disabilities and the Potential of Autonomous Vehicle Transportation: Findings from Focus Group Studies (20-00293)
Jinuk Hwang/Texas A&M Transportation Institute, Wei Li/Texas A&M Transportation Institute, Laura Stough/Texas A&M Transportation Institute, Chanam Lee/Texas A&M Transportation Institute, Katie Turnbull/Texas A&M Transportation Institute
How Will Elderly Populations Use Automated Vehicles?: Assessing the Role of AVs in Overcoming Perceived Mobility Barriers (20-00806)
Koen Faber/Universiteit Utrecht, Dea van Lierop/Universiteit Utrecht
Accelerating Mobility for All: Analysis of Focus Group Feedback from Persons with Disabilities Following Autonomous Vehicle Rides (20-03650)
Cecilia Feeley/Rutgers, The State University of New Jersey, Andrea Lubin/Rutgers, The State University of New Jersey, Alain Kornhauser/Rutgers, The State University of New Jersey, Jinuk Hwang/Rutgers, The State University of New Jersey, Brian Tobin/Rutgers, The State University of New Jersey
A Case Study Evaluating the Performance of an Autonomous Electric Shuttle Modified for Wheelchair Access (20-05479)
Johan Fanas Rojas/Western Michigan University, Kamolnat Tabattanon/Western Michigan University, Nick Goberville/Western Michigan University, Nicholas Sandhu/Western Michigan University, Mitchel Keil/Western Michigan University, Clive D'Souza/Western Michigan University, Zachary Asher/Western Michigan University

1290

Incorporating the Opioid Epidemic into Highway Safety Planning
Margo Hill, Eastern Washington University, presiding
Sponsored By Standing Committee on Native American Transportation Issues, Subcommittee on Tribal Safety Issues

In 2015, American Indians/Alaska Natives (AI/AN) had the highest drug overdose death rates of any population in the United States (Mack et al. 2017). The opioid crisis for Native populations arises from interrelated societal practices and federal Indian law and policies. The US government tends to view opioids as a problem to be addressed through law enforcement and healthcare, but a more holistic view reveals that opioids addiction is symptomatic of more systemic deficiencies and suffering in the lives of individuals. We examine the sectors of the opioid epidemic and the factors that increase the complexity of the opioid distribution system among native populations that further limits the utility of targeted risk-based interventions. This session will discuss how rural communities and tribes can incorporate Opioid risk-based interventions into Highway Safety Planning.

Drug and Alcohol Prevention (P20-21867)
Margo Hill/Eastern Washington University
The Role of Resilience in the Opioid Epidemic (P20-21868)
Igor Linkov/U.S. Army Corps of Engineers (USACE)

Visualization Lightning Talks
Kevin Gilson, WSP, presiding
Sponsored By Standing Committee on Visualization in Transportation

A series of short presentations covering innovations and new technologies for Visualization in Transportation . The session will include talks on all aspects of visualization including System Performance, BIM for Infrastructure, Data Visualization and Visual Analytics, Simulators and Real-time interactive tools like Virtual Reality and Augmented Reality . The Talks will be limited to 3-5 minutes to keep the session fast paced and lively.

Inspire Action through Story – How visualization improved decision making (P20-21890)
Frank Broen/Teach America Corporation
Data Analytics: Vehicle Detection and Visualization (P20-21891)
Majed Al-Ghandour/North Carolina Department of Transportation
Evolution of a Self-Service Dashboard for SHSP Support in Louisiana (P20-21892)
Skylar Knickerbocker/Iowa State University
Incorporating Operating Speed in Statistical Road Safety Modeling: An Interactive Risk Assessment Tool (P20-21893)
Subasish Das/Texas A&M Transportation Institute
Interactive Decision Support Tools for Roadside Vegetation Control: Products from NCHRP Projects (P20-21894)
Subasish Das/Texas A&M Transportation Institute
Self-Service Dashboards for SHSP Support (P20-21895)
David Whitchurch/Louisiana State University
Interactive Infographics for Behavioral Outreach (P20-21896)
Nicholaus Hutchinson/Louisiana State University
Visualization using the National Household Travel Survey (P20-21897)
Talha Muhammad/KPMG LLP
A Web-based Visual Analytics Platform for OD Data Exploration (P20-21898)
Qingyu Ma/Old Dominion University
Visualization of Real-time Energy Performance Metrics on a Smart Corridor in a Digital Twin Environment (P20-21899)
Angshuman Guin/Georgia Institute of Technology (Georgia Tech)
National Cooperative Highway Research Program (NCHRP) Project 17-87 (P20-21906)
Yihang Sui/Kittelson & Associates, Inc. (KAI)
Understanding new mobility services through visualization of recent household travel diaries (P20-21907)
Benjamin Stabler/RSG
Integrating BIM and GIS (P20-21908)
Karen Weiss/Autodesk, Inc.
Using Visualization to Identify the Best Approach to Open a Work-Related Lane Closure (P20-21909)
Slobodan Gutesa/GPI Inc
Interstate Highway Sampling Visualization Tool (P20-21910)
Pedro Serigos/Wood Environment & Infrastructure Solutions, Inc.
Integrating LiDAR, BIM, VR and 3D Printing to Improve Atlanta's Hartfield Airport (P20-21911)
Mark Yedlin/Greenman-Pedersen, Inc. (GPI)
Using 4D Visualization to Compare Actual vs. Planned Construction Progress (P20-21912)
Mark Yedlin/Greenman-Pedersen, Inc. (GPI)
Visuals to Strategically Plan for a Statewide Bicycle Network (P20-21913)
Brittany Gernhard/High Street Consulting Group, LLC
VissimAR – Augmented Reality for Traffic Simulation and Data Visualization (P20-21914)
Bhanu Kala/PTV Group
Traffic Signal Performance Measures Visualization Leveraging Trip and Trajectory Data (P20-21915)
Michael Pack/University of Maryland, College Park
Multi-modal, State-wide, real-time Ops Performance Interactive Dashboards (P20-21916)
Michael Pack/University of Maryland, College Park

1293 CM (1.75)

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 156
Engagement in Unexpected Places
Robyn Austin, King County Government, presiding
Sponsored By Standing Committee on Public Involvement in Transportation

Innovation in public participation tools and techniques can come from a variety of sources. This session includes three informative presentations on a visual tool, a collaborative technique, and the measurement of performance.

Utilizing an Interprofessional Community Advisory Board: A Case Study to Inform Best Practices in Community -Engaged Research for Transportation Equity and Social Inclusion (20-01286)
Courtney Cronley/The University of Tennessee, Vivian Miller/The University of Tennessee, Noelle Fields/The University of Tennessee, Stephen Mattingly/The University of Tennessee, Melinda Kitchens/The University of Tennessee
Effect of Infographic Flyers on Public Understanding and Attitude to Transportation Project Planning (20-05697)
Shintaro Terabe/Tokyo University of Science, Yui Sumitomo/Tokyo University of Science, Kosuke Tanaka/Tokyo University of Science, Hideki Yaginuma/Tokyo University of Science, Nan Kang/Tokyo University of Science
Using Performance Measures to Strengthen Public Involvement in Identifying Targeted Transportation Investments: The Campbell County, Virginia, Experience (20-00245)
Amy O'Leary/Virginia Department of Transportation, John Miller/Virginia Department of Transportation, Rick Youngblood /Virginia Department of Transportation, David Cook/Virginia Department of Transportation, Shelley Bogue/Virginia Department of Transportation, Tanya Denckla Cobb/Virginia Department of Transportation

1294

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 146B
Sharing Economy and Its Impacts
Khandker Nurul Habib, University of Toronto, presiding
Sponsored By Standing Committee on Traveler Behavior and Values

MaaS Economics: Should We Fight Car Ownership with Subscriptions to Alternative Modes? (20-01168)
Daniel Horcher/Imperial College London, Daniel Graham/Imperial College London
Is Uber Poaching Taxi Customers?: A Study of User Profiles (20-00105)
Gozde Ozonder/University of Toronto, Eric Miller/University of Toronto
Transformation of Ridehailing in New York City: A Quantitative Assessment (20-03437)
Bibhas Kumar Dey/University of Central Florida, Naveen Eluru/University of Central Florida, Karthik Konduri/University of Central Florida
Modeling the Evolution of Ridehailing Adoption and Usage: A Case Study of the Puget Sound Region (20-02430)
Felipe Dias/University of Texas, Austin, Taehooie Kim/University of Texas, Austin, Chandra Bhat/University of Texas, Austin, Ram Pendyala/University of Texas, Austin, William Lam/University of Texas, Austin, Abdul Pinjari/University of Texas, Austin, Karthik Srinivasan/University of Texas, Austin, Gitakrishnan Ramadurai/University of Texas, Austin
Impacts of Income Generation Potential on Vehicle Ownership Decisions: A National Simulation of Sharing Economy and Automation Effects (20-02532)
Monique Stinson/University of Illinois, Chicago, Abolfazl (Kouros) Mohammadian/University of Illinois, Chicago, Bo Zou/ University of Illinois, Chicago

1295

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 145A
Analysis of Shared or Autonomous Mobility Systems
Martin Milkovits, Cambridge Systematics, Inc., presiding
Sponsored By Standing Committee on Transportation Planning Applications

This session will feature recent efforts to incorporate the emerging modes of autonomous vehicles and shared on demand transportation into transportation planning analyses.

(continued)

Impact of Autonomous Vehicles on Households' Residential Location Choices in Triangle Regional Area of North Carolina (20-02522)
Md. Mehedi Hasnat/North Carolina State University, Eleni Bardaka/North Carolina State University
Ridematching and Vehicle Routing for On-Demand Mobility Services with Ridesharing and Transfer Options (20-03792)
Sepide Lotfi/Southern Methodist University, Khaled Abdelghany/Southern Methodist University
MAAS and DRT: Practical Implementation in Traditional Forecasting Models (20-05587)
Pedro Camargo/AequilibraE, Erin Pammenter/AequilibraE, Aliasgar Inayathusein/AequilibraE
Results of the First Large-Scale Survey of TNC Users in the Bay Area (20-05618)
Christopher Coy/RSG Inc, Elizabeth Greene/RSG Inc, Mark Bradley/RSG Inc
Incorporating Autonomous Vehicles in the Traditional Four-Step Model: A Case Study in Dallas-Fort Worth (20-06005)
Felipe Dias/University of Texas, Natalia Ruiz-Juri/University of Texas, Gopindra S. Nair/University of Texas, Chandra Bhat/University of Texas, Arash Mirzaei/University of Texas

1296

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 140A
Creative Mitigation in the Section 106 and Public Involvement Process
Erica Schneider, Ohio Department of Transportation, presiding
Sponsored By Standing Committee on Historic and Archeological Preservation in Transportation, Standing Committee on Public Involvement in Transportation, Standing Committee on Environmental Analysis in Transportation

Communicating Effectively to Inform the Public: Creative Mitigation Efforts of the Kentucky Transportation Cabinet (P20-20504)
Carl Shields/Kentucky Transportation Cabinet
Bridging the Mighty Red: Creative Mitigation for Replacement of Oklahoma and Texas Historic Transportation Structures (P20-20505)
Scott Sundermeyer/Oklahoma Department of Transportation
Saving the Cantini Mosaics: Consulting Parties and the I-579 CAP Project (P20-20506)
David Anthony/Pennsylvania Department of Transportation

1297

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 146A
Light Duty Vehicle Energy Efficiency Gains Through New Operational Approaches and Technologies
Rebecca Dodder, U.S. Environmental Protection Agency (EPA), presiding
Sponsored By Standing Committee on Transportation Energy, Standing Committee on Alternative Transportation Fuels and Technologies

Effects of On-Demand Ridesharing on Vehicle Ownership, Travel, Energy, and Environmental Outcomes in the United States (20-01972)
Jacob Ward/U.S. Department of Energy (DOE), Jeremy Michalek/U.S. Department of Energy (DOE), Inês Azevedo/U.S. Department of Energy (DOE), Constantine Samaras/U.S. Department of Energy (DOE)
Quantifying the Impacts of Hybrid Vehicle Technologies on Fuel Economy and Electrification (20-02419)
Shiqi(Shawn) Ou/Oak Ridge National Laboratory, David Gohlke/Oak Ridge National Laboratory, Zhenhong Lin/Oak Ridge National Laboratory, Fei Xie/Oak Ridge National Laboratory
Mobility and Energy Consumption Impacts of Cooperative Adaptive Cruise Control Vehicle Strings on an Urban Freeway Corridor (20-04132)
Hao Liu/University of California, Berkeley, Xiao-Yun Lu/University of California, Berkeley, Steven Shladover/University of California, Berkeley
From Shifting Gears to Changing Modes: The Motivations and Efficiency Impacts of Driver-Induced Mode Changes (20-05245)
Chaitanya Vaishnavi Karanam/University of California, Davis, Claire Sugihara/University of California, Davis, Katrina Sutton/University of California, Davis, Seshadri Srinivasa Raghavan/University of California, Davis, Gil Tal/University of California, Davis
A Stochastic Model of Driving Energy Intensity for Analysis and Optimization of Safe Driving Range in Shared Automated Electric Vehicles (20-05612)
Karim Hamza/Toyota Motor North America, Kang-Ching Chu/Toyota Motor North America

1298

Nuts and Bolts: How Planning Processes Prepare Communities for Transportation and Land Use Challenges
Louis Merlin, Florida Atlantic University, presiding
Sponsored By Standing Committee on Transportation and Land Development

Presentations on planning processes and planning capacity for livable communities, context-sensitive solutions, multimodal access, and smart mobility.

Won't You Be My [Transit-Friendly] Neighbor[hood]?: Analyzing High-Propensity Users in Transit-Friendly Neighborhoods in Greater Los Angeles and the Bay Area (20-02553)
Julene Paul/University of California, Los Angeles, Brian Taylor/University of California, Los Angeles, Evelyn Blumenberg/University of California, Los Angeles
MPO Transportation Funding for Livable Communities: A Review of National MPO Programs (20-02703)
Amanda Dillon/University of California, Los Angeles, Reid Ewing/University of California, Los Angeles, Fariba Siddiq/University of California, Los Angeles, Fatemeh Kiani/University of California, Los Angeles
Assessing Community Readiness for Smart Mobility: Development of an Assessment Tool and Case Study Application (20-03643)
Janey Camp/Vanderbilt University, Craig Philip/Vanderbilt University, Aaron Niederman/Vanderbilt University, Susan Marlow/Vanderbilt University, Peter Westerholm/Vanderbilt University, Yeatland Wong/Vanderbilt University
Almost Automating the Planner: Florida Department of Transportation's Approach to Understanding Places Through Context Classification (20-04405)
Margaret Kent/Kittelson & Associates, Inc. (KAI), Jean Parlow/Kittelson & Associates, Inc. (KAI), Deborah Chesna/Kittelson & Associates, Inc. (KAI), DeWayne Carver/Kittelson & Associates, Inc. (KAI), Patty Hurd/Kittelson & Associates, Inc. (KAI), Jane Lim-Yap/Kittelson & Associates, Inc. (KAI)
Pedestrian, Bicycle, and Multimodal Strategies That Advance Access to All: A Local Practitioner's Perspectives and Experiences (20-05500)
huiliang liu/City of Aurora, Mac Callison/City of Aurora, Tom Worker-Braddock/City of Aurora

1299

16th Dialogue with Leaders in the Design and Construction of Transportation Facilities
Mark Reno, Quincy Engineering, Inc., presiding
Thomas Kazmierowski, Golder Associates Inc., presiding
Rebecca McDaniel, Purdue University, presiding
Sponsored By Design and Construction Group, Section - Construction, Section - Asphalt Materials

Each year two sections within the Design and Construction Group honor distinguished nationally recognized individuals with a career-length record of TRB activity. Honorees are given the opportunity to present overviews of their technical area and prospects for the future in a special session. The 2020 Annual Meeting Speical Session is sponsored by the Design and Construction Group's Construction and Asphalt Materials Sections.

Introduction of the Session (P20-20189)
Mark Reno/Quincy Engineering, Inc.
Introduction of Collette Holt (P20-20190)
Thomas Kazmierowski/Golder Associates Inc.
Breaking Down Barriers and Creating Inclusion: How the Disadvantaged Business Enterprise Program Has Strengthened the Construction Industry (P20-20191)
Colette Holt/Colette Holt & Associates
Introduction of E. Ray Brown (P20-20192)
Rebecca McDaniel/Purdue University
Some Issues with the Percent Within Limits Approach for Controlling Quality of Asphalt Pavement Materials and Construction (P20-20193)
E Brown/Retired

1300

Fiber Optic Cables and Small Cell Nodes in the Highway Right of Way: Lessons Learned
Cesar Quiroga, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Utilities

Can You Hear Me Now?: TxDOT's Wireless Siting Program (P20-21170)
Beverly West/Texas Department of Transportation
Generation of Revenue for State DOTs from Communication Utilities in the Public Right of Way (P20-21171)
Edgar Kraus/Texas A&M Transportation Institute
Small Cell in the Right of Way: DelDOT's Approach (P20-21172)
Eric Cimo/Delaware Department of Transportation

1301

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 202B
Long-Term Pavement Performance (LTPP) Program
Deborah Walker, Federal Highway Administration (FHWA), presiding
Sponsored By Section - Pavements, Standing Committee on Pavement Condition Evaluation, Standing Committee on Pavement Structural Modeling and Evaluation, Section - Asphalt Materials, Section - Concrete Materials

Welcome from the Federal Highway Administration (P20-21636)
Hari Kalla/Federal Highway Administration (FHWA)
LTPP Program Updates (P20-21141)
Jean Nehme/Federal Highway Administration (FHWA)
LTPP Transverse Profile Measuring System (P20-21142)
Larry Wiser/Federal Highway Administration (FHWA)
Other Pavement Data Sets Hosted by LTPP InfoPave™ (P20-21143)
Yan "Jane" Jiang/Federal Highway Administration (FHWA), Benjamin Worel/Minnesota Department of Transportation
Closing Remarks (P20-21147)
Jean Nehme/Federal Highway Administration (FHWA)
LTPP Forensic Evaluations: Early Days to Present (P20-21604)
Gonzalo Rada/Wood Environment & Infrastructure Solutions, Inc., Mustafa Mohamedali/Washington State Department of Transportation
Use of LTPP Data to Develop AI-Based Pavement Roughness Prediction Models (P20-21605)
Halil Ceylan/Iowa State University, Nazik Citir/Iowa State University, Sunghwan Kim/Iowa State University

1302

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 208
Innovations in Sustainable Pavement Systems
Gerardo Flintsch, Virginia Polytechnic Institute and State University, presiding
Filippo Giustozzi, RMIT University, presiding
Sponsored By Standing Committee on General and Emerging Pavement Design, Subcommittee on Sustainable Pavements

The session will provide attendees with a deep understanding of recent advances, challenges, and regulations around Sustainable Pavements in 2020.

Integration of Life-Cycle Assessment into Pavement Design and Planning (20-04643)
Milena Rangelov/Turner-Fairbank Highway Research Center, Federal Highway Administration, Heather Dylla/Turner-Fairbank Highway Research Center, Federal Highway Administration, Nadarajah Sivaneswaran/Turner-Fairbank Highway Research Center, Federal Highway Administration, John Davies/Turner-Fairbank Highway Research Center, Federal Highway Administration
Comparisons of Pavement Preservation Schedules Using a Life-Cycle Assessment Tool (20-00835)
QINGWEN ZHOU/University of Illinois at Urbana-Champaign, Egemen Okte/University of Illinois at Urbana-Champaign, Hasan Ozer/University of Illinois at Urbana-Champaign, Imad Al-Qadi/University of Illinois at Urbana-Champaign

(continued)

Incorporating Flood Hazards into Pavement Sustainability Assessment (20-02947)
Jessica Achebe/University of Waterloo, Oluremi Oyediji/University of Waterloo, Rebecca Saari/University of Waterloo, Susan Tighe/University of Waterloo, Filzar Nasir/University of Waterloo
Potential Contribution of Deflection-Induced Fuel Consumption to U.S. Greenhouse Gas Emissions (20-04933)
Hessam Azarijafari/Massachusetts Institute of Technology (MIT), Jeremy Gregory/Massachusetts Institute of Technology (MIT), Randolph Kirchain/Massachusetts Institute of Technology (MIT)

1303

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 204C
Effects of Fatigue and Corrosion on Steel Girder Bridges
William Collins, University of Kansas, presiding
Sponsored By Standing Committee on Steel Bridges, Standing Committee on Bridge Management

 This session includes papers related to the effects of fatigue and the effects of corrosion on the performance of steel girder bridges.

WIM-Based Fatigue Damage Assessment (20-02946)
Olga Iatsko/Finley Engineering Group, Anjan Ramesh Babu/Finley Engineering Group, Michael Stallings/Finley Engineering Group, Andrzej Nowak/Finley Engineering Group
Web Stability of Deteriorated Deep Steel I-Girders with Unstiffened Webs (20-05328)
Alireza Mohammadi/WSP, Walid Najjar/WSP
Accelerated Repair of Corroded Steel Bridge Girders with Ultra-High Performance Concrete (20-04073)
Kevin McMullen/US Military Academy, Arash Zaghi/US Military Academy
Truck Platooning to Minimize Load-Induced Fatigue in Steel Girder Bridges (20-05643)
Thales Couto Braguim/Rutgers, The State University of New Jersey, New Brunswick, Peng Lou/Rutgers, The State University of New Jersey, New Brunswick, Hani Nassif/Rutgers, The State University of New Jersey, New Brunswick

1304

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 209A
Bridge Load Rating
Christina Freeman, Florida Department of Transportation, presiding
David Yang, Lehigh University, presiding
Sponsored By Standing Committee on Testing and Evaluation of Transportation Structures, Standing Committee on Bridge Management

Steel Bridge Load Rating Impacts Due to Autonomous Truck Platoons (20-00455)
Rita Tohme/Texas A&M Transportation Institute, Matthew Yarnold/Texas A&M Transportation Institute
Multiple Regression Model for Load Rating of Reinforced Concrete Bridges (20-04542)
Edgardo Ruiz/US Army Engineer Research and Development Center, Seamus Freyne/US Army Engineer Research and Development Center
Load Rating Using Load Testing: Introducing the New Bridge Load Testing E-Circular (P20-20290)
Eva Lantsoght/Universidad San Francisco de Quito
Integration of Artificial Neural Networks in Bridge Load Rating and Case Study Application (20-05766)
Francisco Garcia/University of Nebraska, Lincoln, Juan Perez Garfías/University of Nebraska, Lincoln, Fayaz Sofi/University of Nebraska, Lincoln, Joshua Steelman/University of Nebraska, Lincoln

1305

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 201
Developments in Concrete Materials Research
Paul Tennis, Portland Cement Association, presiding
Sponsored By Standing Committee on Concrete Materials and Placement Techniques

Effect of Exposure Conditions and Internal Curing on Pore Water Potential Development in Cement-Based Materials (20-05459)
Payam Vosoughi/Terracon Consultants, Peter Taylor/Terracon Consultants, Robert Horton/Terracon Consultants, Meysam Najimi/Terracon Consultants

(continued)

Use of Bagasse Ash as a Partial Replacement of Cement in Concrete in Pavement Applications (20-00350)
Sujata Subedi/Louisiana State University, Gabriel Arce/Louisiana State University, Marwa Hassan/Louisiana State University, Michelle Barbato/Louisiana State University, Maria Teresa Gutierrez-Wing/Louisiana State University, Nitin Kumar/Louisiana State University

Use of Coarse Recycled Concrete Aggregate in Ternary Blended Portland Cement Concrete (20-03442)
Seth Wagner/Rowan University, Gabrielle Wickizer/Rowan University, Douglas Cleary/Rowan University, Gilson Lomboy/Rowan University, Danielle Kennedy/Rowan University, Benjamin Watts/Rowan University, Peter Bly/Rowan University

Quantifying Early-Age Concrete Mechanical Properties and Curing Conditions Utilizing an Automated System (20-04122)
Benjamin Arras/University of Texas, El Paso

1306

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 204A
Young Geotechnical Professionals in Transportation
Anand Puppala, Texas A&M University, presiding
Jerry DiMaggio, Applied Research Associates, Inc. (ARA), presiding
Sponsored By Section - Geotechnical Engineering, Standing Committee on Transportation Earthworks, Standing Committee on Geotechnical Instrumentation and Modeling, Standing Committee on Foundations of Bridges and Other Structures, Standing Committee on Subsurface Soil-Structure Interaction, Standing Committee on Subsurface Drainage , Standing Committee on Geosynthetics, Standing Committee on Stabilization of Geomaterials and Recycled Materials

This event will showcase many of the young members of various committees of AFS00 Geotechnical Engineering and each speaker will present a brief overview of their work and how they are contributing to geotechnical engineering section and how they can receive more mentorship in the coming years. Section chair will invite committee chairs and other well established names in the field to come and attend and provide feedback to the attendees. This is our first attempt and we hope this will help in nurturing our young professionals to become more active with TRB in the coming years.

Corrosion Potential of Aggregate Backfill in MSE Walls (P20-20917)
Stacey Kulesza/Kansas State University
A Novel Approach of Monitoring Infrastructure Asset Condition Using Aerial Sensors (P20-20915)
Surya Sarat Chandra Congress/Texas A&M University
Pile Setup in Soft Clayey Soil of Louisiana, Alabama, and Mississippi (P20-21006)
Md. Nafiul Haque/Ardaman and Associates, Inc.
Evidence-Based Computational Solutions for Infrastructure Industry Challenges (P20-21007)
Negin Yousefpour/Arup USA
Analyzation of Wicking Geotextile to Dehydrate Road Embankments (P20-21008)
Chuang Lin/Missouri University of Science and Technology
Permeable Low-Density Cellular Concrete (P20-21009)
Sami Safi/Aerix Industries
Use of Modified Moisture Barrier for Better Transportation Infrastructure (P20-21010)
Asif Ahmed/SUNY Poly
Application of Geocells in Pavement Infrastructure Built on Expansive Subgrades (P20-21011)
Aritra Banerjee/University of Texas, Arlington
Implementation of Lightweight Deflectometer for Compaction Quality Assurance (P20-21497)
Zahra Afsharikia/Wood Technical Consulting Solutions

1307

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 203
Impact of Weather on Traffic Speed and Volume
Tae J. Kwon, University of Alberta, presiding
Sponsored By Standing Committee on Surface Transportation Weather, Standing Committee on Highway Traffic Monitoring

Incorporating Weather Impacts on Traffic Demand for Real-Time Traffic State Prediction (20-03092)
Eunhye Kim/Northwestern University, Hani Mahmassani/Northwestern University

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Exploring the Impact of Inclement Weather on Freeway Daily Traffic Volume (20-04757)
Amjad Dehman/Universiteit Hasselt, Tom Brijs/Universiteit Hasselt, Alexander Drakopoulos/Universiteit Hasselt
In-Depth Investigation of Driver Speed Selection Behavior in Adverse Weather Using SHRP2 Naturalistic Driving Study Data: Non-Parametric Association Rules Mining and Parametric Ordinal Logistic Regression Approach (20-05790)
Md Nasim Khan/Federal Highway Administration (FHWA), Anik Das/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)
Extreme Gradient Boosting for the Development of Weather-Aware, Short-Term Speed Prediction Models (20-06100)
Mustafa Attallah/Saint Louis University, Jalil Kianfar/Saint Louis University, Yadong Wang/Saint Louis University

1308

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Salon C
Issues Affecting Public Acceptance of Automated Vehicles
Jane Lappin, Toyota Research Institute, Inc., presiding
Sponsored By Standing Committee on Vehicle-Highway Automation

Technology Hype Versus Reality (P20-21517)
Kristin Kolodge/J.D. Powers
Navigating Our Automated Mobility Futures: Results from Public Forums in the United States and Abroad (P20-21518)
Mahmud Farooque/Arizona State University
Public Acceptance and the Role of Law: A UK Perspective (P20-21519)
Jessica Uguccioni/Law Commission of England and Wales
Public Preferences, Data, and Theory in Algorithm Design (P20-21520)
Nicholas Evans/University of Massachusetts, Lowell
The Long Ride: Our Necessary, Fact-Based Journey Together Toward Mobility's Future (P20-21521)
Brad Stertz/Audi of America

1309

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 102A
Technology Assisting to Make Better Work Zones
Scott Tison, NCSU-ITRE, presiding
Sponsored By Standing Committee on Work Zone Traffic Control

In-Vehicle Work Zone Notification System for Connected Vehicles (20-04022)
Niraj Altekar/University of Arizona, Debashis Das/University of Arizona, K. Larry Head/University of Arizona, Sherilyn Keaton/University of Arizona, Faisal Saleem/University of Arizona, Steve Kalina/University of Arizona, Adam Carreon/University of Arizona, Donald Cunningham/University of Arizona, Tomas Guerra/University of Arizona
Work Zone Activity Real-Time Data Collection Mobile Application Development and Testing (20-04480)
Farzaneh Azadi/University of Missouri, Columbia, Yaw Adu-Gyamfi/University of Missouri, Columbia, Carlos Sun/University of Missouri, Columbia, Praveen Edara/University of Missouri, Columbia
Signal Timing Optimization for One-Lane Operation on Two-Lane Highway Work Zones (20-04114)
Hongjae Jeon/University of Illinois, Urbana Champaign, Rahim Benekohal/University of Illinois, Urbana Champaign
Forecasting Work Zone Mobility: A Machine Learning Approach Using Probe Vehicle Data (20-05412)
Mohsen Kamyab/Wayne State University College of Engineering, Stephen Remias/Wayne State University College of Engineering, Erfan Najmi/Wayne State University College of Engineering, Sanaz Rabinia Haratbar/Wayne State University College of Engineering, Jonathan Waddell/Wayne State University College of Engineering

1310

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 101
Risk and Reward: New Ideas and Insights on Intersection and Interchange Design
Sanhita Lahiri, Virginia Department of Transportation, presiding
Sponsored By Standing Committee on Operational Effects of Geometrics

(continued)

Improving Traffic Operations at Service Interchanges Using the New Offset Diamond Design (20-00082)
AmirArsalan Mehrara Molan/California Polytechnic State University, San Luis Obispo, Joseph Hummer/California Polytechnic State University, San Luis Obispo

Beyond CAP-X: Combinations of Alternative Intersections That Might Be Worth a Look (20-03615)
Joseph Hummer/North Carolina Department of Transportation

Modeling the Risk of Wrong-Way Driving at the Exit Ramp Terminals of Partial Cloverleaf Interchanges (20-04510)
Md Atiquzzaman/Johnson, Mirmiran & Thompson, Inc, Huaguo Zhou/Johnson, Mirmiran & Thompson, Inc

Evaluating Pedestrians and Bicyclists Accommodations at Continuous Flow Intersections (20-05358)
Ishtiak Ahmed/North Carolina State University, Sahi Gadiparthi/North Carolina State University, Shannon Warchol/North Carolina State University, Christopher Cunningham/North Carolina State University, Nagui Rouphail/North Carolina State University

1311

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 204B
Applications of Advanced Technologies in Highway Maintenance
Rob Zilay, Dye Management Group, Inc., presiding
Sponsored By Standing Committee on Maintenance and Operations Management

This session focuses on the use of technologies, including autonomous vehicles, to assist in modern and future highway maintenance.

An Improved Deep-Learning Network Based on YOLO Framework for Automated Detection of Spilled Loads on Freeways (20-00710)
Siqi Zhou/Beihang University, Xu Wei/Beihang University, Jiachen Liu/Beihang University, Zixin Ye/Beihang University, Feng Li/Beihang University, Yuchuan Du/Beihang University

Field Testing and Evaluation of Leader–Follower Autonomous Truck Mounted Attenuator Vehicle System for Work Zone Maintenance (20-03648)
Qing Tang/Missouri University of Science and Technology, Yanqiu Cheng/Missouri University of Science and Technology, Xianbiao Hu/Missouri University of Science and Technology, Chenxi Chen/Missouri University of Science and Technology, Yang Song/Missouri University of Science and Technology

A Live Curve Sign Inventory for Meeting MUTCD Requirement Using Low-Cost Smartphone and Deep-Learning Technologies (20-05531)
Yichang(James) Tsai/Georgia Institute of Technology (Georgia Tech), Nicolas Six/Georgia Institute of Technology (Georgia Tech), Andrew Heath/Georgia Institute of Technology (Georgia Tech), Binh Bui/Georgia Institute of Technology (Georgia Tech)

Quantification of Traffic Impact by Leader-Follower Autonomous Truck Mounted Attenuator Vehicle System for Work Zone Maintenance (20-06014)
Qing Tang/Missouri University of Science and Technology, Yanqiu Cheng/Missouri University of Science and Technology, Xianbiao Hu/Missouri University of Science and Technology

1312

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 206
Thin Hot-Mixed Asphalt Overlays for Preservation
Todd Thomas, Asphalt Materials, Inc., presiding
Sponsored By Standing Committee on Pavement Preservation

This lecturn session includes three highly rated papers. Two are about hot mixed asphalt thin overlays for preservation. One deals with crack mitigation above cement treated base.

Laboratory Cracking Performance Evaluation of SM-4.75 Asphalt Mixtures (20-03960)
Harikrishnan Nair/Virginia Transportation Research Council, Aksel Seitllari/Virginia Transportation Research Council, Kevin McGhee/Virginia Transportation Research Council

Evaluating the Impact of Hot Mix Asphalt Mixture Properties on the Laboratory Performance of Specialty Hot Mix Asphalt Overlay Mixtures Used in New Jersey (20-04410)
Andrae Francois/Rowan University, Ayman Ali/Rowan University, Yusuf Mehta/Rowan University

(continued)

Performance Evaluation of Reflective Crack Mitigation Techniques for Soil-Cement Bases (20-05341)
Mohammad Bhuyan/University of Louisiana, Lafayette, Mohammad Khattak/University of Louisiana, Lafayette

1313

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 202A
The Influence of Civil Rights and Anti-Discrimination Laws in Shaping Our Transportation Systems
Dorval Carter, Chicago Transit Authority, presiding
Sponsored By Standing Committee on Transportation Law

Transportation systems influence how and where we move about, socialize, live and work, and grew economically. However, prior to the passage of the Civil Rights Act, transportation planning and development decisions were often made with little regard to the significance of their adverse impacts to social, environmental, structural and economic conditions and prospectives. FHWA Office of Civil Rights experts will discuss how today's anti-discrimination laws influence transportation systems in order to minimize adverse impacts, and ensure access to roads and places, and business and employment opportunities.

Panel Discussion (P20-21072)
Martha Kenley/Federal Highway Administration (FHWA), Nichole Mcwhorter/Federal Highway Administration (FHWA), Sharon Field/Federal Highway Administration (FHWA)

1314   CM (1.75)

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 207B
Best Practices for Handling and Responding Before, During, and After a Cyber Attack or Data Breach
Bruce Smith, Apperson Crump PLC, presiding
Sponsored By Standing Committee on Emerging Technology Law, Standing Committee on Transit and Intermodal Transportation Law

Government agencies at the federal, state and local level are daily subjected to cyberattacks motivated by reasons including financial gain, disruption of public services, and terrorism from both Internal Threats and External Threats. Before The Cyberattack or Data Breach, the Agency must examine how it vets its people, including third party contractors and IT professionals (Internal Threats). The Agency must implement techniques to identify and address the wide and ever changing range of "Bad Guys" (External Threats). During the Data Breach, the Agency's response, a critical part of its Emergency Preparedness/Emergency Response protocol, includes notifying effected persons of the data breach. Measures to assure the Agency's customers that personal and confidential information accessible to the Agency is secure must be in place. After the Cyber-Attack or Data Breach, some cyber-attacks may require the Agency to procure new or updated equipment or software, provide additional training, update the entity's Security/Cyber Security protocols, and implement corrective measures for customers whose data has been compromised. The presenters are front-line experts from law enforcement and government agencies who daily defend against cyberattacks, investigate the cause and source of data breaches, and prosecute those that perpetrate cyberattacks and data breaches.

Panel Discussion (P20-21635)
David Martin/Federal Bureau of Investigation (FBI), Kyle Malo/Washington Metropolitan Area Transit Authority, Kelce Wilson/North Texas InfraGard Members Alliance

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 209B
Risky Business?: Design Flexibility, Practical Design, and Complete Streets: Best Practices for Balancing Transportation Design Needs and Reducing Tort Liability
Monica Aleman-Smoot, Texas Department of Transportation, presiding
Sponsored By Standing Committee on Tort Liability and Risk Management

 The 2018 AASHTO Policy on Geometric Design of Highways and Streets promotes continued efforts to embrace appropriate flexible and practical design concepts to encourage sustainable and cost effective road designs . The concept of Complete Streets encompasses many approaches to planning, designing, and operating roadways and rights of way with all users in mind to make the transportation network safer and more efficient . This panel discussion will address tort liability and risk management implications and best practices for agencies seeking to balance transportation design needs.

Panel Discussion (P20-21071)
Terri Parker/Missouri Department of Transportation, Jeanne Scherer/California Department of Transportation (CALTRANS)

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Salon B
Safety Management in a World of Connected and Automated Vehicles—Hybrid Session
Frank Gross, VHB, presiding
Sponsored By Standing Committee on Transportation Safety Management Systems

Connected and automated vehicles are quickly advancing and are expected to have disruptive impacts on transportation safety in the coming years. This session will cover a variety of topics on connected and automated vehicles with a focus on the implications for transportation safety management. Using ahybrid approach, each speaker will have approximately 5 minutes to provide an overview of their research and results. This will be followed immediately by a postersession where you can interact with the speakers for more details about any aspect of their research.

Safety Assessment of Highly Automated Driving Systems: A New Framework (20-01530)
Shuo Feng/University of Michigan, Transportation Research Institute, Yiheng Feng/University of Michigan, Transportation Research Institute, Xintao Yan/University of Michigan, Transportation Research Institute, Shengyin Shen/University of Michigan, Transportation Research Institute, Yifeng Wang/University of Michigan, Transportation Research Institute, Can Yang/University of Michigan, Transportation Research Institute, Yi Zhang/University of Michigan, Transportation Research Institute, Henry Liu/University of Michigan, Transportation Research Institute
Harnessing Big Data Generated by Connected Vehicles to Monitor Safety Performance: Application of Geographically Weighted Negative Binomial Regression (20-02457)
Ramin Arvin/University of Tennessee, Knoxville, Asad Khattak/University of Tennessee, Knoxville
Traffic Collisions Involving Autonomous Vehicles in California: Bayesian Model–Based Clustering (20-05173)
Subasish Das/Texas A&M Transportation Institute, Anandi Dutta/Texas A&M Transportation Institute, Ioannis Tsapakis/Texas A&M Transportation Institute
Safety Benefit Analysis of Connected and Automated Vehicle Technologies Based on Meta-Analysis (20-00285)
Hao Zhong/Tongji University, Ling Wang/Tongji University, Mohamed Abdel-Aty/Tongji University, Wanjing Ma/Tongji University, Juneyoung Park/Tongji University
Application of Connected and Automated Vehicles in a Large-Scale Network by Considering V2V and V2I Technology (20-03349)
Mdhasibur Rahman/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida
An Analysis of the Efficiency and Safety of Signalized Intersections Under Conditions of Autonomous Vehicle Mixed Flows (20-03409)
Ang Pan/Nagoya Daigaku, Xin Zhang/Nagoya Daigaku, Hideki Nakamura/Nagoya Daigaku, Wael Alhajyaseen/Nagoya Daigaku
Crash Themes in Automated Vehicles: A Topic Modeling Analysis of the California Department of Motor Vehicles Automated Vehicle Crash Database (20-05062)
Hananeh Alambeigi/Texas A&M University, College Station, Anthony McDonald/Texas A&M University, College Station, Srinivas Tankasala/Texas A&M University, College Station

(continued)

Heinrich's Triangle, Heavy-Tailed Distributions, and Autonomous Vehicle Safety (20-05778)
Amitai Bin-Nun/SAFE, Anthony Panasci/SAFE, Radboud Tebbens/SAFE

1317

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 102B
At-Risk Vehicle Operators: Research and Practice for Novice and Experienced Drivers
Despina Stavrinos, University of Alabama at Birmingham, presiding
Sponsored By Standing Committee on Operator Education and Regulation

This session will feature research focused on at risk drivers and appropriate theories, education, and practice associated with these drivers. While many of these papers are focused on novice or teen drivers, there are some that consider at risk drivers of all ages.

The Effect of Extending Graduated Driver Licensing to Older Novice Drivers in Indiana (20-00208)
Yudan Wang/North Carolina Agricultural and Technical State University, Robert Foss/North Carolina Agricultural and Technical State University, Arthur Goodwin/North Carolina Agricultural and Technical State University, Allison Curry/North Carolina Agricultural and Technical State University, Brian Tefft/North Carolina Agricultural and Technical State University

Changes in Adolescent Driving Behaviors After Concussion (20-01211)
Catherine McDonald/University of Pennsylvania School of Nursing, Christina Master/University of Pennsylvania School of Nursing, Eileen Storey/University of Pennsylvania School of Nursing, Madeline Gonzalez/University of Pennsylvania School of Nursing, Divya Jain/University of Pennsylvania School of Nursing, Kristy Arbogast/University of Pennsylvania School of Nursing

Assessment of Risk Levels Among Teen Drivers (20-02101)
Pnina Gershon/Massachusetts Institute of Technology (MIT), Chunming Zhu/Massachusetts Institute of Technology (MIT), Johnathon Ehsani/Massachusetts Institute of Technology (MIT), Charlie Klauer/Massachusetts Institute of Technology (MIT), Tom Dingus/Massachusetts Institute of Technology (MIT), Bruce Simons-Morton/Massachusetts Institute of Technology (MIT)

A Proposed Framework for Identifying and Predicting Operator Errors When Using Advanced Vehicle Technologies (20-05514)
Anuj Pradhan/University of Massachusetts, Amherst, Ganesh Pai/University of Massachusetts, Amherst, Jaydeep Radadiya/University of Massachusetts, Amherst, Michael Knodler/University of Massachusetts, Amherst, Cole Fitzpatrick/University of Massachusetts, Amherst, William Horrey/University of Massachusetts, Amherst

1318

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 103A
Occupant Protection in Rural Communities
Kimberly Vachal, North Dakota State University, presiding
Sponsored By Standing Committee on Occupant Protection

This session addresses motor vehicle occupant protection in rural communities through presentations covering measurement issues, spatial effects, Indian lands and other geographic areas, and the impact of county-level enforcement. Rural urban differences are noted for child passengers, drivers and adult passengers

Rural and Urban Differences in Child Passenger–Vehicle Occupant Deaths in the United States, 2014–2017 (P20-20169)
Erin Sauber-Schatz/Centers for Disease Control and Prevention (CDC)

Observed Seat Belt Use on the Colville Indian Reservation in Washington State (P20-20170)
Staci Hoff/Washington Traffic Safety Commission (WTSC)

What Is the Impact Provided by the Presence of Additional Safety Belt Enforcement to Driver Safety Belt Use? (20-05321)
Lusanni Acosta-Rodriguez/Western Michigan University, Valerian Kwigizile/Western Michigan University, Jun-Seok Oh/Western Michigan University, Timothy Gates/Western Michigan University

Factors Influencing Seat Belt Non-Use: Incorporating Spatial Effects (20-02539)
Amin Mohamadi Hezaveh/North Carolina Department of Transportation, Christopher Cherry/North Carolina Department of Transportation, Trond Nordfjærn/North Carolina Department of Transportation

1319

Retrospective on the Capital Investment Grants Program: Predicted Versus Actual Outcomes on Capital Costs and Ridership
Felicia James, Federal Transit Administration (FTA), presiding
Sponsored By Public Transportation Group

This session, organized by the Federal Transit Administration (FTA), will present a comparison of predicted vs. actual outcomes for recently completed projects in FTA's Capital Investment Grants program. The presentation will focus on two areas pertinent to Capital Investment Grant projects: capital-cost estimates and ridership forecasts. The session will present the recent projects' predicted vs. actual data, compare outcomes to older studies, and identify steps FTA has taken to improve the reliability of predictions during project development.

Presentation (P20-21690)
Felicia James/Federal Transit Administration (FTA)
Presentation (P20-21691)
James Ryan/Federal Transit Administration (FTA)

1320

Visualizing, Comparing, Monitoring, and Measuring: Emerging Transit Data Techniques
Catherine Lawson, University at Albany State University of New York, presiding
Sponsored By Public Transportation Group, Subcommittee on Information on Transformative Trends in Transit Data

Transit agencies and researchers are making great strides maximizing the uses of their various types of transit data. This session presents new techniques and analysis including General Transit Feed Specification (GTFS) visualizations, transit/Bikeshare data spatial-temporal comparisons, subway train position monitoring, and Automatic Vehicle Location (AVL) time-budgets for measuring speed and reliability.

Automated Train Identification and Train Position Monitoring at New York City Transit (20-00993)
Shay Lehmann/New York City Transit Authority, Alla Reddy/New York City Transit Authority, Chan Samsundar/New York City Transit Authority, Tuan Huynh/New York City Transit Authority
Visualizing Public Transit System Operation with GTFS Data (20-01054)
Postsavee Prommaharaj/University of Calgary, Santi Phithakkitnukoon/University of Calgary, Merkebe Demissie/University of Calgary, Lina Kattan/University of Calgary, Carlo Ratti/University of Calgary
Investigating Complementary and Competitive Relationships Between Bikeshare Service and Public Transit: A Spatial-Temporal Framework (20-04740)
Ying Song/University of Minnesota, Twin Cities, Yuchuan Huang/University of Minnesota, Twin Cities
Diagnosing Obstacles to Speed and Reliability with High-Resolution AVL Data: Bus Time Budgets (20-05077)
Eric Lind/Metro Transit, Minneapolis-St. Paul, Joseph Reid/Metro Transit, Minneapolis-St. Paul

1321 CM (1.75)

Connecting New Modeling Techniques to Urban Rail Operations
Saeid Saidi, University of Calgary, presiding
Wendy Jia, The World Bank, presiding
Sponsored By Standing Committee on Rail Transit Systems

Fine-tuned operations analysis is critical for transit managers as they work to optimize system capacity and resource efficiency. These leading-edge papers highlight proven techniques and tools for operations modeling in rail transit networks. Case studies include rail network performance analysis; modeling of passenger delays and wait times; alternative services in the case of rail network disruptions; and dynamic scheduling in urban transit networks.

Network Performance Model for Urban Rail Systems (20-04530)
Baichuan Mo/Monash University, Zhenliang Ma/Monash University, Haris Koutsopoulos/Monash University, Jinhua Zhao/Monash University

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Day-to-day and Seasonal Regularity of Network Passenger Delay for Metro Networks (20-01153)
Panchamy Krishnakumari/Delft University of Technology, Oded Cats/Delft University of Technology, Hans Van Lint/Delft University of Technology
Advanced Technologies and Dynamic Scheduling in Urban Transit Networks (P20-20978)
Yousef Kimiagar/Hatch
Estimating Passenger Wait Times on Urban Metro Systems via Semiparametric Mixed Methods (20-00711)
Ramandeep Singh/Imperial College London, Daniel Graham/Imperial College London, Richard Anderson/Imperial College London
The Symbiosis Between Subway Disruption and a Surge in Ridehailing Trips in Toronto: Finding the Subway Disruption Regimes of Switching Subway to Uber (20-00882)
Jason Hawkins/University of Toronto, Khandker Nurul Habib/University of Toronto

1322

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 143C
Next-Generation Train Control in North America: Evolution or Revolution?
Jeffrey Schultz, David Evans and Associates, Inc., presiding
Sponsored By Standing Committee on Railroad Operating Technologies, Standing Committee on Freight Rail Transportation

"Advanced" PTC systems, systems that perform functionality beyond the scope required in the Rail Safety Improvement Act (RSIA) of 2008, employ technologies that enable vital, stand-alone operation without requiring underlying, traditional railroad signaling technologies. These systems may; support moving block operations, interact with highway-rail grade crossings, and provide increased network capacity. As the the implementation of safety overlay PTC systems is nearing, the migration path to deployment of Advanced PTC systems is coming into focus. This session will focus on the migration path(s) from safety-overlay PTC systems to Advanced PTC systems, including the technological, logistical, operational, and economic challenges.

Improving Railway Operational Efficiency with Moving Blocks, Train Fleeting, and Alternative Single-Track Configurations (20-00258)
Adrian Diaz de Rivera/University of Illinois, Urbana Champaign, Tyler Dick/University of Illinois, Urbana Champaign, Leonel Evans/University of Illinois, Urbana Champaign
European Rail Research and Innovation for Next-Generation Traffic Management Systems (P20-21708)
Carlo M. Borghini/Shift2Rail
Update on AAR's Train Control, Communications, and Operating Committee (P20-21709)
Michael Newcomb/Union Pacific Railroad Company
Federal Railroad Administration Update (P20-21733)
Jared Withers/Federal Railroad Administration (FRA)

1323

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 149
Improving Track Maintenance Efficiency: Reducing Reactive Maintenance
Hamed Kashani, HyGround/Loram, presiding
Sponsored By Standing Committee on Railway Maintenance

Improving track maintenance efficiency to reduce unplanned or reactive maintenance will require both improved maintenance methods and means to specify the proper maintenance. Inspection and diagnostic techniques along with management methods will be introduced that support improvee efficiency of track maintenance. Finally, an analysis of maintenance methods is presented to illustrate options for improving maintenance methods.

From Condition-Based Maintenance Planning to Life-Cycle Management of Railway Track (20-02306)
Johannes Neuhold/Graz University of Technology, Matthias Landgraf/Graz University of Technology, Stefan Marschnig/Graz University of Technology, Peter Veit/Graz University of Technology
Assessing and Extending Track Quality Index for Novel Measurement Techniques in Railway (20-01958)
Tzu-Hao Yan/ETH Zurich, Francesco Corman/ETH Zurich
An Analysis of Railway Track Behavior Based on Distributed Optical Fibre Acoustic Sensing (20-03125)
David Milne/University of Southampton, Ali Masoudi/University of Southampton, Edgar Ferro/University of Southampton, Geoff Watson/University of Southampton, Louis Le Pen/University of Southampton

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Improving Ballasted Track Maintenance Using the Discrete Element Method (P20-20873)
Jean-Francois Ferellec/SNCF

1324

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 150A
Freight Systems and Marine Transportation Work in Progress—Hybrid Session
Nimish Dharmadhikari, INCOG, presiding
Nicholas Kehoe, Toxcel, LLC, presiding
Sponsored By Freight Systems Group, Marine Group

Learn from freight and marine systems young members. Then help them innovate! In this hybrid session, five young members will present 5-minute lightning talks describing successes and challenges with ongoing projects. Afterward, other young members will be available to present posters on additional projects. Attendees will learn new approaches to research and have many opportunities to share their expertise with colleagues to help overcome project challenges.

Lightning Talk: Data-Driven Design of Last-Mile Urban Logistics Solutions to Address E-Commerce Growth (P2 0-20227)
Andre Romano Alho/Singapore-MIT Alliance
Lightning Talk: Personalities of Disaster Management: Data-Driven Approaches to Quantifying Resilience and Behavioral Uncertainty in Response to Natural Hazards (P20-20228)
Paul Johnson/Vanderbilt University
Lightning Talk: Energy Efficient Logistics in the Albany-New York City Corridor (P20-20229)
Julia Coutinho Amaral/Rensselaer Polytechnic Institute (RPI)
Lightning Talk: The Home Delivery Dilemma in New York City: Planning for the City or Planning for the Borough? (P20-20230)
Carla Tejada/City College of New York
Lightning Talk: Enhancing Truck Activity Monitoring Through the Integration of Bluetooth and Inductive Loop Signature Data (P20-20231)
Yiqiao Li/University of California, Irvine
Poster: Cracking the Freight Data Nut: Characterization and Analysis of the Center City Inbound and Outbound Vehicle Volumes from Cordon Counts (P20-20233)
Gabriela del Carmen Giron Valderrama/University of Washington
Poster: Applying an Auction Theory Framework to the Berth Scheduling Problem (P20-20234)
Dimitrios Giampouranis/University of Memphis
Poster: Container Terminal and Liner Shipping Companies Cooperation and Competition by Means of Capacity Utilization (P20-20235)
Karlis Pujats/University of Memphis
Poster: Advances in Vessel Schedule Recovery: Modeling Liner Shipping Routes with Emission Control Areas (P20-20236)
Maxim Dulebenets/Florida A&M University-Florida State University College of Engineering

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1325

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 147B
From Horses to Robots and Cyber: A Century of Military Transportation Progress
James Allen, U.S. Army Corps of Engineers (USACE), presiding
Sponsored By Standing Committee on Military Transportation

This panel will review the past 100 years of military transportation progress from horses to robots and cyber. The expert panel includes insights from the context of military transportation history, current global transportation and supply chain logistics challenges at the strategic level from a senior service college perspective, review of contemporary robotics and autonomous vehicle technologies for air, land and sea applications; and transitioning to the future of cybersecurity and its impact on transportation.

Looking Back: 100 Years of Military Transportation: World War I to Present (P20-20551)
Alisha Hamel/U.S. Army Transportation Museum
Today's Challenges: Strategic Challenges for Global Military Transportation and Supply Chains (P20-20557)
Allison Bennett Irion/Argonne National Laboratory

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Today's Technologies: Robotics and Autonomous Vehicles for Air, Land, and Sea (P20-20560)
Alberto Lacaze/Robotic Research, LLC
Transitioning to the Future: Paradigm Shifts for Future Transportation and Cybersecurity (P20-20562)
Imes Chiu/U.S. Army Corps of Engineers (USACE)

1326

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 144C
Advances in Intermodal Freight Terminal Design and Operations
Evangelos Kaisar, Florida Atlantic University, presiding
Sponsored By Standing Committee on Intermodal Freight Terminal Design and Operations

Distribution Organization Optimization for Inbound China Railway Express at Alataw Pass Railway Station (20-00142)
Wenqian Liu/Beijing Jiaotong University, Xiaoning Zhu/Beijing Jiaotong University, Li Wang/Beijing Jiaotong University
A Planning-Level Transshipment Cost Model for Evaluating Intermodal Terminal Configuration and Transport Modes (20-00318)
Dirk Bruckmann/Rhine-Waal University of Applied Sciences
Modeling the Truck Appointment System as a Multi-Player Game (20-03496)
Mohammad Torkjazi/University of South Carolina, Nathan Huynh/University of South Carolina, Ali Asadabadi/University of South Carolina
A Simulation Study for Evaluating Rail Terminals in a Container Port Using Lean Railroading: A Case Study (20-03527)
Moein Sadeghi/Iran University of Science and Technology, Morteza Bagheri/Iran University of Science and Technology, Mir Pishvaee/Iran University of Science and Technology

1327 CM (1.75)

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, 143A
Policy Impacts of New Entrants into the National Airspace System
Clayton Stambaugh, Illinois Department of Transportation, presiding
Sponsored By Standing Committee on Intergovernmental Relations in Aviation, Standing Committee on Airfield and Airspace Capacity and Delay, Standing Committee on Aviation Security and Emergency Management

From commercial space vehicles to unmanned aerial systems (UAS), future urban air mobility and regulatory changes, the national airspace system (NAS) is being impacted by a range of demands all impacting existing and future policy. Each demand has unique impacts to airports and other aviation stakeholders, whether it's to businesses and communities affected by the new technology, regulation or policy such as South Florida's temporary flight restrictions, new opportunities for access by passengers, or the interaction between new and emerging equipment such as traditional fixed-wing aircraft, advances is propulsion, space vehicles, vertical takeoff (VTOL) aircraft, or UAS. Demands and impacts will be presented to draw parallels and differences as well as scenario planning in what might be done to properly integrate new entrants into the NAS.

Intergovernmental Coordination of Temporary Flight Restrictions in South Florida (P20-20639)
Mary Ellen Eagan/HMMH
How Urban Air Mobility Will Impact the Future (P20-20640)
Paul Wheeler/Utah Department of Transportation
Intergovernmental Coordination of Airspace Policy and Capacity for Commercial Space Operations (P20-20644)
Mark Bontrager/Space Florida
New Entrants, Same Airspace: Accommodating Future Technologies (P20-20874)
Phil Zager/Booz Allen Hamilton, Inc.
Impact of Increasing Activity on Other Users (e.g., Airports) (P20-21176)
Kevin Crombie/Advanced Sciences and Technologies

1328

Biometrics for Port Security: Where Are We?
Christian Salmon, Western New England University, presiding
Sponsored By Standing Committee on Aviation Security and Emergency Management, Standing Committee on Intergovernmental Relations in Aviation, Standing Committee on Airport Terminals and Ground Access

Facial recognition and other biometrics technologies have experience a rapid growth of capabilities, decreasing costs, and number of vendors producing hardware and software for commercial use. There is an obvious attractiveness of leveraging these technologies for security and efficiency of port operations, however there are equally obvious challenges associate with the deployment of these technologies, be it social/political or technical in nature.

History of Biometric Technologies and Capabilities (P20-20498)
Duane Habeck/Integrated Decision Engineering Analysis, Inc.
Industry Perspective on Uses, Benefits, and Limitations (P20-20499)
Edward Bushman/E Bushman Consulting
Data Security and System Ability (P20-20502)
David Kipp/Burns Engineering, Inc.
Facial Recognition Case Study: Miami International Airport (P20-21820)
Maurice Jenkins/Miami International Airport
Facial Recognition Performance Statistics (P20-21883)
Patrick Grother/National Institute of Standards and Technology

1329

Infrastructure Policy in 2020 and Beyond
Jannine Miller, U.S. Department of Transportation, presiding
Sponsored By Executive Committee

This session will be a roundtable discussion with senior officials about the USDOT Secretary's priorities for 2020 and beyond. Focus will include DOT's Rural Initiative; work on Opportunity Zones; permitting reform; and railroad grade crossing safety. This session will also allow attendees to hear the Administration's perspective on surface transportation reauthorization.

Panel Discussion (P20-21662)
Dan DeBono/U.S. Department of Transportation, K. Jane Williams/Federal Transit Administration (FTA), Nicole Nason/ Federal Highway Administration (FHWA)

1330

Review of the Implementation of the SHRP 2 Safety and Roadway Information Data Bases: Results to Date and a Look to the Future
King Gee, American Association of State Highway and Transportation Officials, presiding
Sponsored By Oversight Committee for Use and Oversight of SHRP 2 Safety Data, Phase I

This session is a wrap-up of the SHRP 2 Safety Data Implementation period administered by TRB -- 2015-2020 and a look to the future. Speakers will cover the essential background of the SHRP 2 Saety Data Program, comments by the curators of the data base, examples of how state DOTs have used the data, and results and publications to date. FHWA will report on what comes next.

Background on the NDS and RID Data (P20-20107)
David Plazak/Transportation Research Board
Key Findings and Publications from the SHRP2 NDS Program (P20-20105)
Miguel Perez/Virginia Polytechnic Institute and State University
Key Lessons Learned from the Roadway Information Database (P20-20117)
Omar Smadi/Iowa State University

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An Example of How a State DOT Has Changed Business Practices (P20-20125)
John Milton/Washington State Department of Transportation
Preview of Phase 2: Organization, Main Features, and How to Access the Data (P20-20131)
Charles Fay/Federal Highway Administration (FHWA)

1331

Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Transportation Demand Management Research Topics
Frank Mongioi, ICF, presiding
Sponsored By Standing Committee on Transportation Demand Management

Modeling the Introduction of Incentives to Encourage a Reduction in Private Car Use in Dublin, Ireland (20-00968) - A100
Páraic Carroll/University College Dublin, Brian Caulfield/University College Dublin, Aoife Ahern/University College Dublin
On the Relationship Between Activity Pattern Complexity and Car Use: A Structural Equation Modeling Approach (20-01030) - A101
Francesco Viti/Universite du Luxembourg, François Sprumont/Universite du Luxembourg, Ariane Scheffer/Universite du Luxembourg
U.S. 180 Winter Congestion Management Strategies (20-01278) - A102
Suresh Raghavendra/AECOM
Social Carpool Behavior Analysis Using Data from Incentive-Based Demand Management Platform (20-02983) - A103
Ali Arian/Metropia Inc., Vassilis Papayannoulis/Metropia Inc., Yi-Chang Chiu/Metropia Inc., Chih-Wei Hsieh/Metropia Inc
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Managing Traffic with Raffles (20-01914) - A104
Pinchao Zhang/Carnegie Mellon University, Sean Qian/Carnegie Mellon University
Exploring Public Perceptions of Tradable Credits for Congestion Management: A Focus Group Study (20-01897) - A106
Lizet Krabbenborg/Delft University of Technology, Niek Mouter/Delft University of Technology, Eric Molin/Delft University of Technology, Jan Anne Annema/Delft University of Technology, Bert van Wee/Delft University of Technology
Smart Mobility, Smart Campus: A Framework for Integrating Transportation Services at a Major Trip Generator (20-02113) - A107
Shamsi Trisha/University of Wisconsin, Milwaukee, Jie Yu/University of Wisconsin, Milwaukee, Zihao Jin/University of Wisconsin, Milwaukee, Xinyu Liu/University of Wisconsin, Milwaukee
Travel-Time Competitiveness Between Transit and Car: Is the Glass Half Full or Half Empty? (20-00988) - A108
Marcelo Altieri/Universidade do Porto Faculdade de Engenharia, Cecília Silva/Universidade do Porto Faculdade de Engenharia, Shintaro Terabe/Universidade do Porto Faculdade de Engenharia
Driver Perceptions on Taxi Sharing and Dynamic Pricing in Taxi Services: Evidence from Athens, Greece (20-03716) - A109
Christina Milioti/National Technical University of Athens (NTUA), Konstantinos Kepaptsoglou/National Technical University of Athens (NTUA), Konstantinos Kouretas/National Technical University of Athens (NTUA), Eleni Vlahogianni/National Technical University of Athens (NTUA)
Improving School Travel Plan Effectiveness Through Enhanced Diagnostic Tools (20-04553) - A110
Stavroula Deligianni/Loughborough University, Alkis Papadoulis/Loughborough University, Fredrik Monsuur/Loughborough University, Mohammed Quddus/Loughborough University, Marcus Enoch/Loughborough University

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Information and Communications Technologies, Smartphones, Activity Patterns, and Travel Choices
Farzad Alemi, University of California, Davis, presiding
Sponsored By Standing Committee on Effects of Information and Communication Technologies (ICT) on Travel Choices

Evaluating the Influence of Information Provision on Route Choice Preferences of Road Users: Application of a Regret Minimization Approach (20-00589) - A111
Naveen Chandra Iraganaboina/Queensland University of Technology, Tanmoy Bhowmik/Queensland University of Technology, Shamsunnahar Yasmin/Queensland University of Technology, Naveen Eluru/Queensland University of Technology, Mohamed Abdel-Aty/Queensland University of Technology

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Heterogenous Effects of Multi-Tasking in Autonomous Vehicles on Residential Location Choice Behavior (20-01441) - A118

Ryusei Kakujo/Hiroshima University, Makoto Chikaraishi/Hiroshima University, Akimasa Fujiwara/Hiroshima University

Can Shared Rides Reduce Motorized Traffic?: The Case of Jetty in Mexico City (20-01644) - A119

Alejandro Tirachini/Universidad de Chile Facultad de Ciencias Fisicas y Matematicas, Emmanouil (Manos) Chaniotakis/Universidad de Chile Facultad de Ciencias Fisicas y Matematicas, Mohamed Abouelela/Universidad de Chile Facultad de Ciencias Fisicas y Matematicas, Constantinos Antoniou/Universidad de Chile Facultad de Ciencias Fisicas y Matematicas

Social Media Effects on Sustainable Mobility Opinion Diffusion: Implications for Behavior Change (20-01821) - A120

Elisa Borowski/Northwestern University, Ying Chen/Northwestern University, Hani Mahmassani/Northwestern University

Mobility Behavior of On-Demand Ridehailing Service Users (20-01911) - A121

Jiechao Zhang/University of Central Florida, Samiul Hasan/University of Central Florida, Xuedong Yan/University of Central Florida

Associating Ridesourcing with Road Safety Outcomes: Insights from Austin, Texas (20-01946) - A122

Eleftheria Kontou/University of Illinois at Urbana-Champaign, Noreen McDonald/University of Illinois at Urbana-Champaign

Synergistic Effects of Telecommuting and the Built Environment on Sustainable Travel: A Machine Learning Approach (20-02079) - A123

Kailai Wang/University of California, Davis

Impact of Smartphone Applications on Daily Travel (20-02091) - A112

Shaila Jamal/McMaster University, Muhammad Habib/McMaster University

The Effects of Time to Green Apps on Safety at Signalized Intersections: A Driver Perception Study (20-02129) - A124

Pedro Adorno-Maldonado/University of Florida, Sivaramakrishnan Srinivasan/University of Florida

Engagement in Online Activities While Traveling by Train: An Application of the MDCEV Model (20-02164) - A125

Chiara Calastri/University of Leeds, Jacek Pawlak/University of Leeds, Richard Batley/University of Leeds

ICT, Time Use, and Personal Networks: Evidence of Their Role on Daily Activity-Travel and Fragmentation Patterns in the Weekly Cycle (20-02170) - A126

Maximiliano Lizana/Universidad de Concepcion, Juan Carrasco/Universidad de Concepcion, Rodrigo Victoriano/Universidad de Concepcion

The Impact of Shared Mobility Options on Travel Demand (20-02264) - A127

Feiyang Sun/University of Washington, Anne Moudon/University of Washington, Qing Shen/University of Washington, Xuegang Ban/University of Washington, Brian Lee/University of Washington

Effects of Transport Network Companies on the Reallocation of Travel Demand: The Case of Bogota, Colombia (20-02330) - A128

Daniel Oviedo/Inter-American Development Bank, Daniel Perez/Inter-American Development Bank, Isabel Granada/Inter-American Development Bank

Does the Use of Smartphones Affect Discretionary Trips?: An Analysis of Smartphone Use Data from Halifax, Nova Scotia (20-02429) - A113

Shaila Jamal/McMaster University, K. Bruce Newbold/McMaster University, Muhammad Habib/McMaster University

Multi-Driver Repositioning via Incentive Design: A Mean Field Multi-Agent Reinforcement Learning Approach (20-02719) - A129

Zhenyu Shou/Columbia University, Xuan Di/Columbia University

Applicability of Mobility-as-a-Service in Tourism Reflecting Trip Sequence: Tour-Based Mode Choice Perspective (20-02967) - A130

Eui-Jin Kim/Seoul National University, Youngseo Kim/Seoul National University, Sunghoon Jang/Seoul National University, Dong-Kyu Kim/Seoul National University

Modeling Stated Preference for Travelers' Responses to Rerouting Advice: A Comparison of Machine Learning and Discrete Choice Models (20-02977) - A131

Arezoo Samimi Abianeh/Texas A&M University, Mark Burris/Texas A&M University, Wei Li/Texas A&M University, Alireza Talebpour/Texas A&M University, Kumares Sinha/Texas A&M University

Estimating Travel Routes of Subway Passengers Using Smartcard and Train Log Data (20-03669) - A132

Eun Lee/Seoul National University College of Engineering, Inmook Lee/Seoul National University College of Engineering, Seung-Young Kho/Seoul National University College of Engineering, Dong-Kyu Kim/Seoul National University College of Engineering, Shin-Hyung Cho/Seoul National University College of Engineering

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Modification of Travel Behavior by E-Commerce?: Capturing Relevant Factors by an Adapted Survey Approach Based on Previous Research (20-03975) - A133
Lisa Boenisch/Karlsruhe Institute of Technology, Sascha von Behren/Karlsruhe Institute of Technology, Bastian Chlond/Karlsruhe Institute of Technology, Peter Vortisch/Karlsruhe Institute of Technology

Travel-Time Use in Crowded Trains: Analyses with Discrete-Continuous Choices of Commuters in Tokyo, Japan (20-04417) - A134
Varun Varghese/Hiroshima University, Makoto Chikaraishi/Hiroshima University, Hironori Kato/Hiroshima University

Experiments on Reputation Rating Systems for Online Mobility Services (20-04989) - A135
Roger Chen/University of Hawai'i at Manoa, Ying Chen/University of Hawai'i at Manoa, Guocheng Jiang/University of Hawai'i at Manoa

Impact of Smartphone Applications on Trip Routing (20-05194) - A136
Rebecca Kiriazes/Georgia Institute of Technology (Georgia Tech), Kari Watkins/Georgia Institute of Technology (Georgia Tech), Angshuman Guin/Georgia Institute of Technology (Georgia Tech), Michael Hunter/Georgia Institute of Technology (Georgia Tech)

A Survey of Deadheading Miles from Ridehailing Services in U.S. Cities (20-05258) - A137
Kang-Ching Chu/Toyota Motor North America, Kenneth Laberteaux/Toyota Motor North America, Karim Hamza/Toyota Motor North America

Artificial Intelligence Embedded On-Board Machine Vision System to Support Vehicle to Infrastructure (20-05585) - A138
Enes Karaaslan/Connected Wise LLC

Impacts of Mode Dependency on Ridehailing Decisions (20-05917) - A139
Hamidreza Asgari/Florida International University, Ghazaleh Azimi/Florida International University, Alireza Rahimi/Florida International University, Xia Jin/Florida International University

Diffusion Network Analysis of Public Attitude Toward Shared Bicycles Strategies Using Social Media Data (20-06102) - A149
Xiaohong Chen/Tongji University, Qian Ye/Tongji University, Hua Zhang/Tongji University, Junjie Cai/Tongji University, Kaan Ozbay/Tongji University

Who Wants to Share?: Exploring the Factors That Affect the Frequency of Use of Ridehailing and the Adoption of Shared Ridehailing in California (20-05916) - A116
Jai Malik/University of California, Davis, Farzad Alemi/University of California, Davis, Giovanni Circella/University of California, Davis

Adoption of Ridehailing in the United States: Evidence from the 2017 NHTS (20-05114) - A115
Hongwei Dong/California State University, Fresno, Giovanni Circella/California State University, Fresno

Variable-Capacity Operations with Modular Transits for Shared-Use Corridors (20-03573) - A117
Xiaowei Shi/University of South Florida, Zhiwei Chen/University of South Florida, Mingyang Pei/University of South Florida, Xiaopeng (Shaw) Li/University of South Florida

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Travel Modeling Poster Session
Francisco Pereira, Danmarks Tekniske Universitet, presiding
Sponsored By Standing Committee on Transportation Demand Forecasting

Analysis of Transit Users' Response Behavior in Case of Unplanned Service Disruptions (20-05432) - A140
Ehsan Rahimi/University of Illinois, Chicago, Ali Shamshiripour/University of Illinois, Chicago, Ramin Shabanpour/University of Illinois, Chicago, Abolfazl (Kouros) Mohammadian/University of Illinois, Chicago, Joshua Auld/University of Illinois, Chicago

A Framework for Leveraging Emerging Data to Understand Impacts of Abnormal Events on Collective and Individual Travel Patterns (20-02116) - A143
Feilong Wang/University of Washington, Xiangyang Guan/University of Washington, Cynthia Chen/University of Washington

The End of Travel Time Matrices?: Or Why We Should Use Individual Travel Times (20-02914) - A147
Nico Kuehnel/Technische Universitat Munchen, Dominik Ziemke/Technische Universitat Munchen, Rolf Moeckel/Technische Universitat Munchen, Kai Nagel/Technische Universitat Munchen

Transport Networking Companies Demand and Flow Estimation: A Case Study of New York City (20-05497) - A148
Bibhas Kumar Dey/University of Central Florida, Naveen Eluru/University of Central Florida

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Residual Neural Network Learning Approach for Behavior Choice Modeling (20-00862) - A150

Melvin Wong/Ryerson University, Bilal Farooq/Ryerson University

On Investigating the Potential Effects of Autonomous Vehicle Use on Home/Work Relocations and Commute Times (20-01831) - A151

Michael Moore/University of Texas, Austin, Patrícia Lavieri/University of Texas, Austin, Felipe Dias/University of Texas, Austin, Chandra Bhat/University of Texas, Austin

Modeling Ridesourcing Trip Generation: Chicago Case Study (20-02642) - A152

Arash Ghaffar/University of California, Irvine, Suman Mitra/University of California, Irvine, Michael Hyland/University of California, Irvine

Investigating Modality Styles in the Era of Mobility-on-Demand Services: A Multiple Discrete-Continuous Approach (20-03011) - A142

Ali Shamshiripour/University of Illinois, Chicago, Ehsan Rahimi/University of Illinois, Chicago, Ramin Shabanpour/University of Illinois, Chicago, Abolfazl (Kouros) Mohammadian/University of Illinois, Chicago

Accounting for Dynamic Effects on Household Car Ownership in the United Kingdom (20-04315) - A153

Rafael Maldonado-Hinarejos/Imperial College London, Aruna Sivakumar/Imperial College London, John Polak/Imperial College London

Simulating Social Processes: An Interdisciplinary Approach to Integrate Social Relationships into Destination Choice Modeling (20-03955) - A154

Maike Puhe/Karlsruhe Institute of Technology (KIT), Lars Briem/Karlsruhe Institute of Technology (KIT), Peter Vortisch/Karlsruhe Institute of Technology (KIT)

Exploring the Role of Perceptual Factors in the Adoption of Autonomous Vehicles (20-02689) - A141

Ramin Shabanpour/University of Illinois, Chicago, Nima Golshani/University of Illinois, Chicago, Abolfazl (Kouros) Mohammadian/University of Illinois, Chicago

How Does Toronto Transit Treat the Post-Secondary Students for Discretionary Trips in the City?: A Choice Model-Based Analysis of Accessibility by Transit in Toronto (20-00724) - A155

Patrick Loa/University of Toronto, Khandker Nurul Habib/University of Toronto

On the Role of Land Use and Transit Network Attributes Influencing the Relationship Between Public Transit and Ridehailing Service Usages in Toronto (20-02832) - A156

Patrick Loa/University of Toronto, Sanjana Hossain/University of Toronto, Khandker Nurul Habib/University of Toronto

Comparison of Statistical and Machine Learning Methods to Understand and Predict Travel Mode Choice: A Methodological Approach (20-02711) - A157

Patricio Salas/Universidad de Concepción, Rodrigo De la Fuente/Universidad de Concepción, Sebastian Astroza/Universidad de Concepción

Advanced Multidimensional Sequence Alignment Method for Activity-Based Travel Pattern Similarity Identification (20-03210) - A158

Chenxi Liu/University of Washington, Hao Yang/University of Washington, Pengpeng Xu/University of Washington, Xin Fu/University of Washington, Yinhai Wang/University of Washington

Integration of Departure Time Choice Modeling and Dynamic Origin-Destination Demand Estimation in a Large-Scale Network (20-00848) - A159

Sajjad Shafiei/Commonwealth Scientific and Industrial Research Organisation, Meead Saberi/Commonwealth Scientific and Industrial Research Organisation, Hai Vu/Commonwealth Scientific and Industrial Research Organisation

Incorporating Psychophysiological Indicators into Transportation Choice Modeling (20-01001) - A160

Marisol Castro/CIS Asociados Consultores en Transporte S.A., Angelo Guevara/CIS Asociados Consultores en Transporte S.A., Angel Jimenez-Molina/CIS Asociados Consultores en Transporte S.A.

A Recurrent Graph Convolutional Neural Network for Network-wide, Short-Term Metro Ridership Prediction (20-01058) - A161

Jie Bao/Nanjing University, Zhao Yang/Nanjing University, Xiaomeng Shi/Nanjing University, wenbo zhang/Nanjing University

Relaxation-Discretization Algorithm for Spatially Constrained Secondary Location Assignment (20-01108) - A162

Sebastian Hörl/ETHZ - Swiss Federal Institute of Technology, Kay Axhausen/ETHZ - Swiss Federal Institute of Technology

Effects of Built Environment and Weather on Demands for Transportation Network Companies: An Analysis of Historical Uber Data in Toronto (20-01157) - A145

Md Sami Hasnine/University of Toronto, Jason Hawkins/University of Toronto, Khandker Nurul Habib/University of Toronto

A Vehicle Ownership (Car Shedding) Model as a Pre-Step of Travel Demand Modeling (20-02556) - A167

Sadegh Sabouri/University of Utah, Guang Tian/University of Utah, Reid Ewing/University of Utah, Keunhyun Park/University of Utah

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An Online Updating Method for Time-Varying Preference Learning (20-02712) - A144

Xi Zhu/University of Washington, Jingshuo Feng/University of Washington, Shuai Huang/University of Washington, Cynthia Chen/University of Washington

The Influence of Tour Structure on Long-Distance Travel (20-03187) - A168

Mitchell Fisher/Auburn University, Jeffrey LaMondia/Auburn University

Forecasting E-Scooter Competition with Direct and Access Trips by Mode and Distance in New York City (20-05106) - A169

Mina Lee/New York University Tandon School of Engineering, Joseph Chow/New York University Tandon School of Engineering, Gyugeun Yoon/New York University Tandon School of Engineering, Yueshuai He/New York University Tandon School of Engineering

Calibrating Activity-Based Model Systems Using Time-Dependent Count Data (20-05803) - A170

Siyu Chen/Massachusetts Institute of Technology (MIT), Arun Akkinepally/Massachusetts Institute of Technology (MIT), Ravi Seshadri/Massachusetts Institute of Technology (MIT), Yusuke Hara/Massachusetts Institute of Technology (MIT), Simon Oh/Massachusetts Institute of Technology (MIT), Moshe Ben-Akiva/Massachusetts Institute of Technology (MIT)

Modeling of Mode Choice and Vehicle Allocation Within an Activity-Based, Shorter-Term Decisions Simulator (20-05192) - A114

Nazmul Arefin Khan/Dalhousie University, Muhammad Habib/Dalhousie University

Impact of Weather, Activities and Service Disruptions on Transportation Demand (20-00728) - A146

Simon Lepage/Ecole Polytechnique de Montreal, Catherine Morency/Ecole Polytechnique de Montreal

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NCHRP IDEA Poster Session
Sponsored By Design and Construction Group

Project 190: Self-De-Icing LED Signals: Implementation Activities (P20-20146) - A241

Hongyi Cai/University of Kansas, Steven Schrock/University of Kansas, Eric Fitzsimmons/Kansas State University

TRB's NCHRP IDEA Program: Sponsoring Innovation in Highway Transportation (P20-20150) - A240

Inam Jawed/Transportation Research Board

Project 191: Testing of In-Service Bridges Using Automated Ultrasonic Testing Methods (P20-20151) - A242

Shane Boone/BDI Bridge Diagnostics, Inc., Jeffrey Cohen/BDI Bridge Diagnostics, Inc., Phillip Sauser/U.S. Army Corps of Engineers (USACE)

Project 192: Field Application of MICP via Biosimulation to Stabilize Expansive Subgrades (P20-20152) - A243

Bhaskar Chittoori/Boise State University, Anish Pathak/Boise State University, Malcolm Burbank/Boise State University

Project 195: Use of the IDEAL Cracking Test for QC/QA: Practical Issues and Solutions (P20-20153) - A244

Fujie Zhou/Texas A&M Transportation Institute

Project 198: Developing a Prototype for Obtaining Turning Movement Counts from Radar-Based Vehicle Detection Systems (P20-20154) - A245

Kelvin Santiago-Chapparro/University of Wisconsin, Madison, Madhav Chitturi/University of Wisconsin, Madison, Andrea Bill/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison

Project 200: Microbial Bio-Mineralization Surface Erosion Control Treatments Along Highways Compared to Other Technologies (P20-20155) - A246

Tasha Hodges/South Dakota School of Mines and Technology, Bret Lingwall/South Dakota School of Mines and Technology

Project 203: SaferCushion (P20-20156) - A247

Dean Sicking/University of Alabama, Birmingham, Kevin Schrum/University of Alabama, Birmingham, Blake Feltman/University of Alabama, Birmingham, Joseph Schwertz/University of Alabama, Birmingham, Kent Walls/University of Alabama, Birmingham, Steve Thompson/University of Alabama, Birmingham

Project 212: Development of a Non-Gating Guardrail Terminal (P20-20157) - A248

Dean Sicking/University of Alabama, Birmingham, Kevin Schrum/University of Alabama, Birmingham, Blake Feltman/University of Alabama, Birmingham, Joseph Schwertz/University of Alabama, Birmingham, Kent Walls/University of Alabama, Birmingham, Steve Thompson/University of Alabama, Birmingham

Project 204: Biomimetic Ice-Binding Polymers for Transportation Applications (P20-20158) - A249

Shane Frazier/University of Colorado, Boulder, Wil Srubar III/University of Colorado, Boulder

Project 206: Rule-Based Automated Safety Monitoring for Work Zone Safety (P20-20159) - B440

Kyungki Kim/University of Nebraska, Lincoln, Omprakash Gnawali/University of Houston, Lu Gao/University of Houston, Fengxiang Qiao/Texas Southern University

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Project 207: MILDGLASS GFRP Strand for Resilient Mild Prestressed Concrete (P20-20171) - B441
Antonio Nanni/University of Miami, Marco Rossini/University of Miami

Project 209: A Deep Learning–Based System to Automatically Collect Data About Sidewalks and Crosswalks Development of the Prototype System (P20-20172) - B443
Yuanyuan Zhang/University of Southern Mississippi, Joseph Luttrell IV/University of Southern Mississippi, Chaoyang Zhang/University of Southern Mississippi

Project 213: SEAHIVE: An Ecofriendly Modular Shoreline Protection System Experimentally Designed for High-Energy Tidal Flow (P20-20173) - B442
Seyedmohammadreza Ghiasian/University of Miami, Marco Rossini/University of Miami, Antonio Nanni/University of Miami, Prannoy Suraneni/University of Miami, Landolf Rhode-Barbarigos/University of Miami, Joel Amendolara/University of Miami, Brian Haus/University of Miami, Kathleen Sullivan Sealey/University of Miami, Steven Nolan/Florida Department of Transportation

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Pavement Analysis and Design Using Full-Scale Accelerated Pavement Testing
Benjamin Bowers, Auburn University, presiding
Sponsored By Standing Committee on Full-Scale Accelerated Pavement Testing

All for One: Centralized Optimization of Truck Platoons to Improve Pavement Sustainability (20-00601) - B450
Osman Erman Gungor/University of Illinois, Urbana Champaign, Imad Al-Qadi/University of Illinois, Urbana Champaign

Asphalt Concrete (AC) Modulus Reduction Process at Various AC Depths in Accelerated Pavement Testing (20-02513) - B451
Yi Li/University of Illinois, Urbana Champaign, Jiahao Li/University of Illinois, Urbana Champaign, Huailei Cheng/University of Illinois, Urbana Champaign, Liping Liu/University of Illinois, Urbana Champaign, Lijun Sun/University of Illinois, Urbana Champaign

Investigation of Pavement Responses Using Multi-Depth Deflectometer (20-02664) - B452
Shahbaz Khan/Memorial University of Newfoundland, M N Nagabhushana/Memorial University of Newfoundland, Kamal Hossain/Memorial University of Newfoundland, Devesh Tiwari/Memorial University of Newfoundland

Full-Scale Evaluation of Relatively Thin Airfield Pavements (20-05710) - B453
W. Jeremy Robinson/U.S. Army Corps of Engineers (USACE), Jeb Tingle/U.S. Army Corps of Engineers (USACE), Carlos Gonzalez/U.S. Army Corps of Engineers (USACE)

Performance Testing of Alternative Dowel Bar Systems Using an Accelerated Loading Facility (20-05938) - B454
Katherine Chmay/University of Pittsburgh, Julie Marie Vandenbossche/University of Pittsburgh

In Situ Measurement and Numerical Investigation on the Failure Behavior in Permeable Pavement Material (20-04644) - B455
Guoyang Lu/Harbin Institute of Technology, Haopeng Wang/Harbin Institute of Technology, Pengfei Liu/Harbin Institute of Technology, Yuqing Zhang/Harbin Institute of Technology, Dawei Wang/Harbin Institute of Technology, Markus Oeser/Harbin Institute of Technology

Validation of the Pavement Mechanical Responses Under Moving Loads Using SmartRock Sensors (20-04738) - B456
Cheng Zhang/Pennsylvania State University University Park : Penn State, Bin Shi/Pennsylvania State University University Park : Penn State, Shihui Shen/Pennsylvania State University University Park : Penn State, Hai Huang/Pennsylvania State University University Park : Penn State

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Pavement Surface Characteristics
Christina Plati, National Technical University of Athens (NTUA), presiding
LaDonna Rowden, Illinois Department of Transportation, presiding
Sponsored By Standing Committee on Pavement Surface Properties and Vehicle Interaction

Laboratory High-Speed Testing of Tire–Pavement Noise (20-03510) - A250
Sen Han/Chang'an University, Biao Peng/Chang'an University, L. Chu/Chang'an University, Tien Fwa/Chang'an University

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Evaluation of the Effects of Different Pavement Surface Profile Characteristics on Tire and Vehicle Rolling Resistance Using 3D Finite Element Modeling (20-03910) - A252
Shabnam Rajaei/PSI-Intertek, karim chatti/PSI-Intertek

Friction-Based Safety Performance Functions for the West Virginia Division of Highways Roadway Network (20-06122) - A253
Gerardo Flintsch/Virginia Polytechnic Institute and State University, Ryland Musick/Virginia Polytechnic Institute and State University

Determination of Safe Vehicle Speeds on Wet Horizontal Pavement Curves (20-00959) - A251
Jia Peng/Chang'an University, L. Chu/Chang'an University, Tien Fwa/Chang'an University

A 3D Thermomechanical Tire–Pavement Interaction Model for Evaluation of Pavement Skid Resistance (20-03784) - A254
Kumar Anupam/Delft University of Technology, Tianchi Tang/Delft University of Technology, Cor Kasbergen/Delft University of Technology, Tom Scarpas/Delft University of Technology, Sandra Erkens/Delft University of Technology

Influence of Skid Resistance on Microscopic Simulated Vehicular Conflicts (20-04353) - A255
Renan Maia/Federal University of Ceará, Sued Costa/Federal University of Ceará, Flávio José Cunto/Federal University of Ceará, Verônica Castelo Branco/Federal University of Ceará

Benefit-Cost Ratio of Providing Minimum Pavement Friction Levels to a Roadway Network (20-05140) - A256
Oscar Daniel Galvis Arce/University of Texas, Austin, Zhanmin Zhang/University of Texas, Austin

Assessment of a Pilot Bridge Ride Specification for the Wisconsin Department of Transportation (20-00176) - A257
Hiba Jalloul/University of Wisconsin, Madison, Gary Whited/University of Wisconsin, Madison, Deb Bischoff/University of Wisconsin, Madison

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Concrete Bridges and Underground and Railway Structures
Hussam Fallaha, Florida Department of Transportation, presiding
Sponsored By Standing Committee on Concrete Bridges, Standing Committee on Tunnels and Underground Structures, Standing Committee on Seismic Design and Performance of Bridges

Experimental Investigation of Longitudinal Closure Joint Using 90-Degree Hooked Bars in Modular Bridge Construction (20-03326) - B444
Azadeh Jaberi/Washington State Department of Transportation, Alireza Valikhani/Washington State Department of Transportation, Atorod Azizinamini/Washington State Department of Transportation

Stochastic Thermal Demand and Resulting Capacity Loss of Concrete Tunnel Liners Subjected to Vehicle Fires (20-05797) - B446
Qi Guo/Lehigh University, Aerik Carlton/Lehigh University, Spencer Quiel/Lehigh University, Clay Naito/Lehigh University

Seismic Impact on Train Stations (20-00623) - B449
Michael Vera/City College of New York

Key Technical Issues and Challenges of Qiongzhou Strait Tunnel in China (20-04751) - B447
Xi Jiang/Tongji University, Likuan Dong/Tongji University, Xuehui Zhang/Tongji University, Dilu Xu/Tongji University, Rui Xiao/Tongji University, Yun Bai/Tongji University

Influence of Tunnel Ring Joint on Train-Induced Vibrations from Subway Shield-Driven Tunnels in a Homogeneous Half-Space (20-00083) - B448
Chao He/McMaster University, Shunhua Zhou/McMaster University, Peijun Guo/McMaster University

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Safety Data, Analysis, and Evaluation, Act I: GPS, Naturalistic Driving, Toll, and Other Emerging Data Sources (Act II, Session 1339; Act III, Session 1340; Act IV, Session 1356)
Xiao Qin, University of Wisconsin, Milwaukee, presiding
Sponsored By Standing Committee on Safety Data, Analysis and Evaluation

Speed Distribution and Safety Effects of License Plate Recognition: Analysis Combining Crash and Toll Record Data in Hunan Province, China (20-00659) - B351
Zeming Yu/Central South University, Hanchu Zhou/Central South University, Huang Helai/Central South University

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The Joint Effect of Weather and Lighting Conditions on Injury Severities of Single-Vehicle Accidents (20-01221) - B352

Grigorios Fountas/Edinburgh Napier University, Achille Fonzone/Edinburgh Napier University, Niaz Gharavi/Edinburgh Napier University, Tom Rye/Edinburgh Napier University

Relating Traffic Flow to Crashes Using Massive GPS Data: Smartphones and Usage-Based Insurance Data Agree (20-01391) - B369

Joshua Stipancic/HEC Montreal, Etienne Racine/HEC Montreal, Aurélie Labbe/HEC Montreal, Nicolas Saunier/HEC Montreal, Luis Miranda-Moreno/HEC Montreal

Assessing the Validity of the Representativeness Assumption Among Not-at-Fault Driver via National Representative Field Observation Survey (20-01849) - B353

Sijun Shen/Research Institute at Nationwide Childrens Hospital, Caitlin Pope/Research Institute at Nationwide Childrens Hospital, Motao Zhu/Research Institute at Nationwide Childrens Hospital

Understanding Speeding Behavior from Naturalistic Driving Data: Applying Classification-Based Association Mining (20-03307) - B354

Xiaoqiang Kong/Texas A&M University, College Station, Subasish Das/Texas A&M University, College Station, Kartikeya Jha/Texas A&M University, College Station, Yunlong Zhang/Texas A&M University, College Station

Driver Behavior Indices Derived from Large GPS Vehicle Fleet Telematics Data as Surrogate Safety Measures in a Metropolitan City (20-03476) - B355

Patrick Alrassy/Columbia University, Andrew W. Smyth/Columbia University

Determination of Risky Driving Behavior Criteria Using GPS data (20-04670) - B356

Chen Chen/Beijing University of Technology, Xiaohua Zhao/Beijing University of Technology, Jian Rong/Beijing University of Technology, Zhenlong Li/Beijing University of Technology

A Practical Approach to Macro-Level Safety Data Integration and Crash Prediction Model Development (20-05284) - B357

Ian Hamilton/VHB, Thanh Le/VHB, Craig Lyon/VHB, Richard Porter/VHB

Predicting Crash/Near-Crash Situations Resulted from Distracted Driving Using SHRP2 Naturalistic Driving Study Data (20-05404) - B358

Md Atiquzzaman/Johnson, Mirmiran & Thompson, Inc, Jorge Rueda-Benavides/Johnson, Mirmiran & Thompson, Inc, Huaguo Zhou/Johnson, Mirmiran & Thompson, Inc, Beijia Zhang/Johnson, Mirmiran & Thompson, Inc

Using Real-Time Weather Data to Assess Crash Likelihood on Snow Fence–Affected Mountainous Freeway Segments (20-05708) - B359

Thomas Peel/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)

Assessment of Crash Location Accuracy in Electronic Crash Reporting Systems (20-05894) - B363

Adika Iqbal/Clemson University, Wayne Sarasua/Clemson University, Jennifer Ogle/Clemson University, Kweku Brown/Clemson University, Afshin Famili/Clemson University, William Davis/Clemson University, Saurabh Basnet/Clemson University, Devesh Kumar/Clemson University

Initial Validation of the Driver Behavior Questionnaire Using SHRP2 Questionnaire Data (20-06087) - B364

Vindhya Venkatraman/Battelle, Christian Richard/Battelle, Joonbum Lee/Battelle

Investigation of Reaction Times and Deceleration Rates During Crash and Near-Crash Events Using Naturalistic Driving Data (20-00906) - B365

Peter Savolainen/Michigan State University, Qiuqi Cai/Michigan State University

The Effect of Risk Propensity on the Crash Risk: Evidence from Lottery Sales and Fatal Crashes in Texas (20-01851) - B366

Jin Roc Lv/Texas A&M Transportation Institute, Emma Schultz/Texas A&M Transportation Institute, Hongmin Zhou/Texas A&M Transportation Institute

Rethinking Highway Safety Analysis by Leveraging Crowdsourced Waze Data (20-03622) - B367

Xiao Li/Texas A&M University, Bahar Dadashova/Texas A&M University, Shawn Turner/Texas A&M University, Daniel Goldberg/Texas A&M University

Data and System Architecture Improvements for Statewide Crash Mapping and Analysis (20-05109) - B368

Tianyi Chen/University of Wisconsin, Madison, Haotian Shi/University of Wisconsin, Madison, Glenn Vorhes/University of Wisconsin, Madison, Steven Parker/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison

Safety Data, Analysis, and Evaluation, Act II: Deep Learning, Induced Exposure, and Other Sophisticated Methods (Act I, Session 1338; Act III, Session 1340; Act IV, Session 1356)
Raghavan Srinivasan, University of North Carolina, Chapel Hill, presiding
Sponsored By Standing Committee on Safety Data, Analysis and Evaluation

Investigation of Contributing Factors to Drivers' Risk of Crash Involvement at Interchanges Using Quasi-Induced Exposure and Logistic Regression Approach (20-00144) - B407
xin gu/Southeast University, Mohamed Abdel-Aty/Southeast University, Jaeyoung Lee/Southeast University, Qiaojun Xiang/Southeast University

Modeling Animal–Vehicle Collision Counts Across Large Networks Using a Hierarchical Model with Dirichlet Process (20-00235) - B394
Zili Li/University of Texas, Austin, Kara Kockelman/University of Texas, Austin

Assessment of Statistical Methodologies for Crash Prediction by Severity (20-00467) - B410
Kai Wang/University of Connecticut, Tanmoy Bhowmik/University of Connecticut, Shanshan Zhao/University of Connecticut, Naveen Eluru/University of Connecticut, Eric Jackson/University of Connecticut

A System Dynamics Approach for Assessing the Impacts of Autonomous Vehicles on Collision Frequency (20-01070) - B395
Ali Farhan/University of Calgary, Lina Kattan/University of Calgary, Nigel Waters/University of Calgary, Richard Tay/University of Calgary

Multi-Scale Approaches to Cope with Scale Effect Issues in Macroscopic Safety Analysis (20-01110) - B408
Xiaoqi Zhai/Central South University, N.N. Sze/Central South University, Jaeyoung Lee/Central South University, Huang Helai/Central South University, Chunyang Han/Central South University

Injury Severity Analysis of Crashes in Korean Freeway Tunnels: An Application of an Ordered Probit Model (20-01155) - B396
Younshik Chung/Yeungnam University, Jong-Jin Kim/Yeungnam University

Modeling Crash Severity by Considering Risk Indicators of Driver and Roadway: A Bayesian Network Approach (20-01580) - B412
Yanchao Song/Southeast University, Siyuan Kou/Southeast University, Chen Wang/Southeast University

Investigation of Crash Precursors of Collision Type and Crash Severity in the Framework of Three-Phase Traffic Flow Theory (20-01906) - B392
Mei Zhang/school of transportation, southeast university, Chengcheng Xu/school of transportation, southeast university, Pan Liu/school of transportation, southeast university, Zhibin Li/school of transportation, southeast university

A Penalized-Likelihood Approach to Characterizing Bridge-Related Crashes in New Jersey (20-02123) - B397
Mohammad Jalayer/Rowan University, Mahdi Pour-Rouholamin/Rowan University, Deep Patel/Rowan University, Subasish Das/Rowan University, Hooman Parvardeh/Rowan University

A Simulation Analysis to Study the Temporal and Spatial Aggregations of Safety Data Sets with Excess Zero Observations (20-02285) - B398
Mohammadali Shirazi/University of Maine, Srinivas Geedipally/University of Maine, Dominique Lord/University of Maine

Multi-Level Analysis of Road Accident Frequency: The Impact of the Road Category (20-02317) - B400
Maen Ghadi/Budapest University of Technology and Economics

Comparison of Pattern Recognition–Based Hot Spot Identification Methods Based on Simulation (20-02761) - B401
Jiajian Lu/University of California, Berkeley, Aditya Medury/University of California, Berkeley, Offer Grembek/University of California, Berkeley

Applying a Deep-Learning Method to Balance Data for Real-Time Crash Prediction on Expressways (20-02940) - B409
Qing Cai/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Jinghui Yuan/University of Central Florida, Jaeyoung Lee/University of Central Florida, Yina Wu/University of Central Florida

Crash Prediction for Freeway Work Zones in Real Time: A Comparison Between Conventional Neural Network and Binary Logistic Regression Model (20-03224) - B399
Junhua Wang/Tongji university, college of transportation engineering, Hao Song/Tongji university, college of transportation engineering, Ting Fu/Tongji university, college of transportation engineering, Molly Behan/Tongji university, college of transportation engineering

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Using Empirical Traffic Trajectory Data for Crash Risk Evaluation Under Three-Phase Traffic Theory Framework (20-03472) - B393

Tong Liu/Southeast University, Meng Li/Southeast University, Zhibin Li/Southeast University, Chengjie Jin/Southeast University

Predicting Crash Frequency for Urban Expressway Considering Collision Types Using Negative Binomial Regression Model (20-03662) - B413

Hui Zhang/Wuhan University, Siyao Li/Wuhan University, Chaozhong Wu/Wuhan University, Yafen Wang/Wuhan University, Wei Zhou/Wuhan University

Application of the Poisson-Tweedie Distribution in Analyzing Crash Frequency Data (20-03782) - B402

Dibakar Saha/Florida Atlantic University, Priyanka Alluri/Florida Atlantic University, Eric Dumbaugh/Florida Atlantic University, Albert Gan/Florida Atlantic University

Sensitivity to Prior Specification When Evaluating Road Safety Countermeasures (20-03883) - B403

Lee Fawcett/Newcastle University, Nicola Hewett/Newcastle University, Neil Thorpe/Newcastle University, Joseph Matthews/Newcastle University, Karsten Kremer/Newcastle University

Assessment of the Impacts of Volume Completeness and Spatial and Temporal Correlation on Hourly Freeway Crash Prediction Models (20-03909) - B404

Nancy Dutta/Gorove/Slade Associates, Inc., Michael D. Fontaine/Gorove/Slade Associates, Inc.

Applying Deep Learning to Detect Traffic Accidents in Real Time Using Spatio-Temporal Sequential Data (20-04120) - B405

Amir Bahador Parsa/University of Illinois, Chicago, Rishabh Chauhan/University of Illinois, Chicago, Homa Taghipour/University of Illinois, Chicago, Sybil Derrible/University of Illinois, Chicago, Abolfazl (Kouros) Mohammadian/University of Illinois, Chicago

Driver Relative Risk Evaluation Based on Data Envelopment Analysis (20-04298) - B406

Hanrun Tang/Southeast University, Yongjun Shen/Southeast University, Yongfeng Ma/Southeast University

Incorporating Demographic Proportions into Crash Count Models by Quasi-Induced-Exposure Method (20-04597) - B411

Sadia Sharmin/University of Connecticut, John Ivan/University of Connecticut, Shanshan Zhao/University of Connecticut, Kai Wang/University of Connecticut, Md Julfiker Hossain/University of Connecticut, Nalini Ravishanker/University of Connecticut, Eric Jackson/University of Connecticut

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Safety Data, Analysis, and Evaluation, Act III: Time to Collision, Conflicts, and Other Safety Surrogates (Act I, Session 1338; Act II, Session 1339; Act IV, Session 1356)

Nicolas Saunier, Ecole Polytechnique de Montreal, presiding

Sponsored By Standing Committee on Safety Data, Analysis and Evaluation

Are Collision and Crossing Course Surrogate Safety Indicators Transferable?: A Probability-Based Approach Using Extreme Value Theory (20-00691) - B373

Attila Borsos/Széchenyi István University, Haneen Farah/Széchenyi István University, Aliaksei Laureshyn/Széchenyi István University, Marjan Hagenzieker/Széchenyi István University

Long Short-Term Memory Networks-Based Framework for Traffic Crash Detection with Traffic Data (20-00870) - B374

Feifeng JIANG/City University of Hong Kong, Kwok Kit Richard YUEN/City University of Hong Kong, Eric Wai Ming Lee/City University of Hong Kong

Estimating the Expected Number of Crashes with Traffic Conflicts Observed in Naturalistic Driving Studies (20-01358) - B375

Andrew Tarko/Purdue University, Cristhian Lizarazo Jimenez/Purdue University

Road Traffic Safety Risk Estimation Method Based on Vehicle On-Board Diagnostic Data (20-02105) - B376

Xiaoyu Cai/Chongqing Jiaotong University, Cailin Lei/Chongqing Jiaotong University, Bo Peng/Chongqing Jiaotong University, Xiaoyong Tang/Chongqing Jiaotong University, Zhigang Gao/Chongqing Jiaotong University

Time-to-Collision–Based Crash Risk Model Incorporating the Effect of Vehicle Weight (20-02474) - B380

Ying Wang/Tongji University, Huizhao Tu/Tongji University, N.N. Sze/Tongji University

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Real-Time Prediction of Hard-Braking Behavior When Following: A Hybrid SVM-Based Method (20-02682) - B38 1

Shan Bao/University of Michigan, Transportation Research Institute, Yaqiong Zhang/University of Michigan, Transportation Research Institute, Bo Yu/University of Michigan, Transportation Research Institute, Yiheng Feng/University of Michigan, Transportation Research Institute, Yifeng Wang/University of Michigan, Transportation Research Institute, Can Yang/University of Michigan, Transportation Research Institute

A Deep-Learning Approach for Freeway Secondary Crash Prediction Using High-Resolution Loop Detector Data (20-02700) - B391

Ling Deng/Southeast University, Chengcheng Xu/Southeast University, Pan Liu/Southeast University

Empirical Approach for Identifying Potential Rear-End Collisions Using Trajectory Data (20-03089) - B382

Narayana Raju/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Said Easa/Sardar Vallabhbhai National Institute of Technology, Surat, Gaurang Joshi/Sardar Vallabhbhai National Institute of Technology, Surat

Corridor-Level, Real-Time Crash Risk Prediction Using Spatial-Temporal LSTM (20-03166) - B383

Jinghui Yuan/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Lishengsa Yue/University of Central Florida, Yaobang Gong/University of Central Florida

Identification of Aggressive Driver Using Collision Surrogate and Imbalanced Class Boosting Algorithms (20-03 236) - B384

Ke Wang/Tongji University

Do Stop Signs Improve Safety for All Road Users?: A Before-After Study on Stop-Controlled Intersections Using Video Trajectory and Surrogate Methods (20-03499) - B379

Bismarck Ledezma-Navarro/McGill University, Luis Miranda-Moreno/McGill University, Nicolas Saunier/McGill University, Ting Fu/McGill University, Aurélie Labbe/McGill University

Crash Prediction Based on Vehicle Kinematics Profile Similarity (20-04962) - B385

Osama Osman/University of Tennessee, Chattanooga, Mustafa Hajij/University of Tennessee, Chattanooga

Estimation of Freeway Traffic Safety Utilizing Disturbance Metrics Based on Trajectory Data (20-04969) - B386

Leila Azizi/Florida International University, Mohammed Hadi/Florida International University, Tao Wang/Florida International University, Mohsen Kamrani/Florida International University

Investigating the Relationship Between Freeway Rear-End Crash Rates and Macroscopically Modeled Reaction Time (20-05020) - B387

Ishtiak Ahmed/North Carolina State University, Billy Williams/North Carolina State University, Shoaib Samandar/North Carolina State University, Gyounghoon Chun/North Carolina State University

An Open-Source Minimal Microsimulation Tool for Safety Analysis (20-06071) - B377

Lionel Nebot Janvier/Ecole Polytechnique de Montreal, Nicolas Saunier/Ecole Polytechnique de Montreal

Correlation Analysis of Traffic Conflicts and Driving Behaviors at Interchange Diverging Areas (20-00229) - B38 8

Minqi Hu/Southeast University, Qiaojun Xiang/Southeast University, Zhanji Zheng/Southeast University, Xuhua Zhang/Southeast University, Yan Li/Southeast University

Longitudinal Safety Evaluation of Regular Vehicle and Connected and Automated Vehicle via In-Depth Analysis of Trajectory Data (20-00665) - B389

Ye Li/Central South University, Qing Cai/Central South University, Zhibin Chen/Central South University

A Surrogate Video-Based Safety Methodology for Diagnosis and Evaluation of Pedestrian Safety Low-Cost Countermeasures: The Case of Cochabamba, Bolivia (20-03490) - B378

Lynn Scholl/Inter-American Development Bank, Mohamed Elagaty/Inter-American Development Bank, Bismarck Ledezma-Navarro/Inter-American Development Bank, Edgar Zamora/Inter-American Development Bank, Luis Miranda-Moreno/Inter-American Development Bank

A Comprehensive Framework for Determining the Optimal Sample Size for Conflict-Based Traffic Safety Analysis (20-02239) - B390

Jessica May Ting Keung/University of Waterloo, Chris Bachmann/University of Waterloo, Ting Fu/University of Waterloo, Liping Fu/University of Waterloo

Truck and Bus Safety Research
Robert Scopatz, VHB, presiding
Sponsored By Standing Committee on Truck and Bus Safety

This is the ANB70 selected papers poster session. It includes presentations of research on truck and bus safety, safety modeling, human behavior, and vehicle-specific safety technology.

Gender Differences in Commercial Driver Safety (20-01672) - B300
Rebecca Brewster/American Transportation Research Institute (ATRI), Dan Murray/American Transportation Research Institute (ATRI), Sarah Saltzman/American Transportation Research Institute (ATRI)

Analysis of Safety Climate and Individual Factors Affecting Bus Drivers' Crash Involvement Using a Two-Level Logit Model (20-01674) - B301
Ruirui Li/Tongji University, Xuesong Wang/Tongji University, Xueming Ma/Tongji University, Chu Zhou/Tongji University, Chen Chai/Tongji University, Mohammed Quddus/Tongji University

Analyzing Injury Severity of Large Truck Crashes Using a Partial Proportional Odds Model: A Case Study in Texas (20-02168) - B302
Pengfei Liu/Texas Southern University, Yi Qi/Texas Southern University

Prediction Model of Commercial Motor Vehicle Crash Severity in Maryland: Applying Support Vector Machine Classification (20-02955) - B303
Samira Ahangari/Morgan State University, Mansoureh Jeihani/Morgan State University, Amirreza Nickkar/Morgan State University, Celeste Chavis/Morgan State University, Montrae Jones/Morgan State University

Distraction of Connected Vehicle Human–Machine Interface for Truck Drivers (20-02454) - B310
Guangchuan Yang/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA), Biraj Subedi/Federal Highway Administration (FHWA)

Evaluating the Effects of Connected Vehicle Weather and Work Zone Warnings on Truck Drivers' Workload and Distraction Using Eye Glance Behavior (20-03728) - B311
Omar Raddaoui/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)

Uncovering Deep Structure of Determinants in Large Truck Fatal Crashes (20-04592) - B304
Subasish Das/Texas A&M Transportation Institute, Mouyid Islam/Texas A&M Transportation Institute, Anandi Dutta/Texas A&M Transportation Institute, Tahmida Hossain Shimu/Texas A&M Transportation Institute

Injury Severity Analysis of Truck-Involved Crashes Under Different Weather Conditions (20-00597) - B305
Majbah Uddin/Oak Ridge National Laboratory, Nathan Huynh/Oak Ridge National Laboratory

More Freight Vehicle Crashes on City Streets: Why and to What Extent?: A Case Study in Dallas-Fort Worth, Texas (20-01011) - B306
Sanggyun Kang/The Korea Transport Institute (KOTI)

Could Driver Fatigue Level Be Predicted by Considering the Concurrent Effects of Circadian Rhythm and Driving Schedule? (20-05064) - B307
Qi Zhang/Wuhan University, Chaozhong Wu/Wuhan University, Hui Zhang/Wuhan University, Yifan Sun/Wuhan University, Xin Li/Wuhan University

Reducing Unsafe Truck Driver Behavior on Interstate Freight Corridors Through DOT and Law Enforcement Collaboration (20-05270) - B308
Jason C. Anderson/Portland State University, Sal Hernandez/Portland State University, Doug Hedlund/Portland State University

Weekday and Weekend Instability Analysis of the Factors Affecting Injury Severities in Crashes Involving Large Trucks (20-04251) - B309
Ali Behnood/Purdue University

"You Neither Sleep Well Nor Drive Cautiously": Direct and Indirect Effects of Sleepiness on Crash Risk Using Structural Equation Modeling (20-01273) - B312
Zhaleh Shams/Iran University of Science and Technology, Milad Mehdizadeh/Iran University of Science and Technology, Hamed Khani Sanij/Iran University of Science and Technology

Truck Driver Survey: Assessment of Needs and Preferences for Wrong-Way Driving Countermeasures at Freeway Ramp Terminals (20-04102) - B313
Yukun Song/Auburn University, Huaguo Zhou/Auburn University, Qing Chang/Auburn University

Exploring the Impact of Sleep Patterns on Driving Behaviors of Heavy-Duty Truck Drivers (20-05287) - B314
Yongfeng Ma/Southeast University, Qian Yan/Southeast University, Xiaobo Dong/Southeast University, Chenxiao Zhang/Southeast University, Yingjiu Pan/Southeast University

Current Research in User Information Systems
Bryan Katz, Toxcel, LLC, presiding
Sponsored By Standing Committee on User Information Systems

Wearable Devices as Vibration Warning for Forward Collision Warning System: An Analysis of Location Effect (20-00421) - B315
Jibo He/Tsinghua University Department of Psychology, Janet Hu/Tsinghua University Department of Psychology, Hongdi Xu/Tsinghua University Department of Psychology, Tianyun Ma/Tsinghua University Department of Psychology, Ao Zhu/Tsinghua University Department of Psychology

Multi-Objective Training of Automated Vehicle with Pedestrian Interactions in Urban Environments (20-00701) - B316
Rafael Vasquez/Ryerson University, Bilal Farooq/Ryerson University

The Influence of Creative Advertisements in Bus Rear-End Safety Campaign (20-00938) - B317
Boya Dai/Texas A&M Transportation Institute, Joan Hudson/Texas A&M Transportation Institute, Eun Sug Park/Texas A&M Transportation Institute, Chris Simek/Texas A&M Transportation Institute

Federated Simulator Study of External Communication Displays for Connected Truck Platoons (20-00973) - B318
Michael Schoelz/University of Missouri, Columbia, Carlos Sun/University of Missouri, Columbia, Zhu Qing/University of Missouri, Columbia, Praveen Edara/University of Missouri, Columbia

Data-Driven Scenarios for AD/ADAS Validation (20-01009) - B319
Laurette Guyonvarch/LAB Renault PSA, Thierry Hermitte/LAB Renault PSA, Erwan Lecuyer/LAB Renault PSA, Antoine Saulgrain/LAB Renault PSA, Reakka Krishakumar/LAB Renault PSA, Véronique Herve/LAB Renault PSA, Philippe Lesire/LAB Renault PSA, Henri Chajmowicz/LAB Renault PSA, Gildas Thilolon/LAB Renault PSA, Stephane Buffat/LAB Renault PSA

Modeling Commercial Vehicle Drivers' Acceptance of Forward Collision Warning System (20-01302) - B320
Yueru Xu/Southeast University, Wei Huang/Southeast University, Zhirui Ye/Southeast University, Chao Wang/Southeast University

Driver Behavior Modeling Using Game Engine: A Learning-Based Approach (20-02376) - B321
Ziran Wang/Toyota Motor North America, Xishun Liao/Toyota Motor North America, Chao Wang/Toyota Motor North America, Guoyuan Wu/Toyota Motor North America, Kanok Boriboonsomsin/Toyota Motor North America, Matthew Barth/Toyota Motor North America, Kyungtae Han/Toyota Motor North America, BaekGyu Kim/Toyota Motor North America, Prashant Tiwari/Toyota Motor North America

Factors Affecting Drivers' Response to Variable Message Signs in Dynamic Lane Assignment Application Using Artificial Neural Networks (20-02765) - B322
Majed Al-Ghandour/North Carolina Department of Transportation, Khaled Assi/North Carolina Department of Transportation, Nedal Ratrout/North Carolina Department of Transportation

Quantifying the Influence of Visual Road Information on the Driver's Speed Choice to Promote Self-Explaining Road (20-03392) - B323
Yuting Qin/Tongji University, Yuren Chen/Tongji University, Kunhui Lin/Tongji University

A Vehicle to Pedestrian Interaction System for Autonomous Vehicles Using a Road Surface Projection (20-03436) - B324
Felix Roemer/TUMCREATE, Davide Boeker/TUMCREATE, Viet Anh Le Cong/TUMCREATE, Aybike Ongel/TUMCREATE

Lessons Learned from the Large-Scale Application of Driver Feedback Signs in an Urban City (20-03743) - B326
Mingjian Wu/University of Alberta, Karim El-Basyouny/University of Alberta, Tae J. Kwon/University of Alberta

External Interface of Automated Driving Systems: Communication and Interaction with Pedestrians (20-03984) - B327
Sanaz Motamedi/University of Florida, Pei Wang/University of Florida, Teresa Bajo/University of Florida, Shouming Qi/University of Florida, David Whitney/University of Florida, Ching-Yao Chan/University of Florida

Effectiveness of Augmented Reality Warnings on Driving Performance Approaching Pedestrian Crossings: A Driving Simulator Study (20-04128) - B328
Alessandro Calvi/Roma Tre University, Fabrizio D'Amico/Roma Tre University, Chiara Ferrante/Roma Tre University, Luca Bianchini Ciampoli/Roma Tre University

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Perceptions of Automated Driver Assistance Systems (ADAS): Using Text Mining to Uncover Insights from Drivers with Real-World ADAS Experience (20-04179) - B330

Fangda Zhang/University of Massachusetts, Amherst, Luca Russo/University of Massachusetts, Amherst, Steven Landry/University of Massachusetts, Amherst, Priya Sharma/University of Massachusetts, Amherst, Shannon Roberts/ University of Massachusetts, Amherst, Bobbie Seppelt/University of Massachusetts, Amherst, Bryan Reimer/University of Massachusetts, Amherst

Safety Evaluation of Fog Warning System in Connected Vehicle Environment Based on Sample Entropy (20-04565) - B336

Xiaohua Zhao/Beijing University of Technology, Yufei Chen/Beijing University of Technology, Jia Li/Beijing University of Technology, Haijian Li/Beijing University of Technology, Yunlong Zhang/Beijing University of Technology, Qiang Fu/Beijing University of Technology

On-Road and In-Vehicle Delivery of Non-Safety-Related Messages: How Information Source and Presentation Format Impact Driver' Processing of Logo Signs and Hazard Response (20-04712) - B329

Yulin Deng/North Carolina State University, Stephen Cauffman/North Carolina State University, Mei Ying Lau/North Carolina State University, Ebony Johnson/North Carolina State University, Azhagan Avr/North Carolina State University, Christopher Cunningham/North Carolina State University, David Kaber/North Carolina State University, Jing Feng/North Carolina State University

Analysis of Drivers' Acceptance of Cooperative Vehicle-Infrastructure System Based on an Extended Technology Acceptance Model (20-04845) - B337

Zhenlong Li/Beijing University of Technology, Guanyang Xing/Beijing University of Technology, Jia Li/Beijing University of Technology, Xiaohua Zhao/Beijing University of Technology, Haijian Li/Beijing University of Technology

Forecasting Aggressive Driving in a Connected Vehicle Environment Through Unsupervised Learning (20-04850) - B332

Ethan Zhang/University of Michigan, Ann Arbor, Neda Masoud/University of Michigan, Ann Arbor, Wei Zhang/University of Michigan, Ann Arbor, Rajesh Malhan/University of Michigan, Ann Arbor

Experimental Research on the Effectiveness of Navigation Prompt Messages Based on Driving Simulation: A Case Study (20-05032) - B333

Liping Yang/Beijing University of Technology, Yang Bian/Beijing University of Technology, Xiaohua Zhao/Beijing University of Technology, Jianming Ma/Beijing University of Technology, Yiping Wu/Beijing University of Technology, Xin Chang/Beijing University of Technology, Xiaoming Liu/Beijing University of Technology

Advanced Warning System for Safer Interaction Between Vehicles and Vulnerable Road Users (20-05471) - B335

Hiba Nassereddine/University of Wisconsin, Madison, Kelvin Santiago-Chapparro/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison

The TEORT Problem: Finding a Path to a Solution for Modern In-Vehicle HMIs (20-05607) - B331

Bruce Mehler/Massachusetts Institute of Technology (MIT), Linda Angell/Massachusetts Institute of Technology (MIT), Bobbie Seppelt/Massachusetts Institute of Technology (MIT), Sean Seaman/Massachusetts Institute of Technology (MIT), Bryan Reimer/Massachusetts Institute of Technology (MIT)

Safety Effects of Fog Warning Technics in CVIS on Driving Behavior Based on a Driving Simulator (20-05770) - B338

Jia Li/Beijing University of Technology, Xiaohua Zhao/Beijing University of Technology, Yufei Chen/Beijing University of Technology

Experimental Research on the Effectiveness of Two Message Prompt Modes: Navigation and Traffic Guide Sign System (20-05843) - B334

Yang Bian/Beijing University of Technology, Jie Yu/Beijing University of Technology, Yiping Wu/Beijing University of Technology, Xiaohua Zhao/Beijing University of Technology, Xin Chang/Beijing University of Technology, Liping Yang/Beijing University of Technology

How Connected Vehicle Technology Influence Driving Performance, Traffic Safety, and Ecodriving Behavior: A Case of an Extra-Long Tunnel Scenario (20-06048) - B339

Xin Chang/Beijing University of Technology, Haijian Li/Beijing University of Technology, Jian Rong/Beijing University of Technology, Yiping Wu/Beijing University of Technology, Xiaohua Zhao/Beijing University of Technology, Jianghui Wen/ Beijing University of Technology

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Advances in Safety: ITS, ADAS, CAV, and Traffic Engineering Solutions
Faaiqa Shaw, Georgia Institute of Technology (Georgia Tech), presiding
Sponsored By Standing Committee on Simulation and Measurement of Vehicle and Operator Performance

Reaction Time to Yellow Traffic Light for Manual and Autonomous Vehicle. A Comparative Driving Simulator Study (20-04322) - B340
Riccardo Rossi/University of Padova, Massimiliano Gastaldi/University of Padova, Federico Orsini/University of Padova, Giulia De Cet/University of Padova, Claudio Meneguzzer/University of Padova
Discretionary Lane-Changing Decisions for Connected and Automated Vehicles Based on Fuzzy Logic (20-04206) - B341
Agustin Guerra/University of Kansas, Mohamadamin Asgharzadeh/University of Kansas, Alexandra Kondyli/University of Kansas
The Use of Emerging Virtual Reality Technology in Road Safety Analysis: The Hook-Turn Case (20-03823) - B342
Taeho Oh/Monash University, Yanping Xu/Monash University, Zhibin Li/Monash University, Inhi Kim/Monash University
Safety Evaluation of Responsibility-Sensitive Safety on Autonomous Vehicles in Cut-in Scenarios (20-02926) - B345
Shuang Liu/Tongji University, Xuesong Wang/Tongji University, Xiaoyan Xu/Tongji University
Calibration and Evaluation of Responsibility-Sensitive Safety Model on Autonomous Car-Following Maneuvers Using Naturalistic Driving Study Data (20-02896) - B346
Xiaoyan Xu/Tongji University, Xuesong Wang/Tongji University, Xiangbin Wu/Tongji University
Smallest Acceptable Sample Size Estimation in Coefficient Estimation and Accuracy Prediction (20-02736) - B347
Bowen Cai/Tongji University, Xuesong Wang/Tongji University, Xiaohan Yang/Tongji University
The Effect of Motion System on Driver Performance in Simulated Driving (20-02638) - B348
Xuesong Wang/Tongji University, Xinchen Ye/Tongji University, Xiaomeng Wang/Tongji University
A Vision-Based Crash Detection Framework for Mixed Traffic Flow Environment Considering Low-Visibility Condition (20-01578) - B343
Yulu Dai/Southeast University, Chen Wang/Southeast University, Yifei Geng/Southeast University
Investigating Rear-End Collision Avoidance Behavior and Safety on Freeways Under Varied Foggy Weather Conditions: A Study Using Advanced Driving Simulator (20-01527) - B344
Qiangqiang Shangguan/Tongji university, college of transportation engineering, Ting Fu/Tongji university, college of transportation engineering, Shuo Liu/Tongji university, college of transportation engineering
Research on the Relation of Acceleration-Speed Parameter Thresholds (20-00831) - B349
Zihe Lin/Beijing University of Technology, Chenjing Zhou/Beijing University of Technology, Jian Rong/Beijing University of Technology, Zhangbin Weng/Beijing University of Technology, Jianming Ma/Beijing University of Technology
Traffic Safety and Operational Benefits of Connected and Automated Vehicle (CAV) on Expressways: Application of Real-World Validated CAV Data (20-00261) - B350
Md Sharikur Rahman/HDR, Mohamed Abdel-Aty/HDR, Yina Wu/HDR

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Engagement, Equity, and Experiments in Transit Planning
Kelly Bertolaccini, University of Queensland, presiding
Sponsored By Standing Committee on Public Transportation Planning and Development

This session offers a selection of works on equity, engagement, and experiments in transit planning. This poster session is a companion session to a similarly titled lightning talk lectern session.

Fair Accessibility: Operationalizing the Distributional Effects of Policy Interventions (20-00381) - A220
Isak Rubensson/KTH Royal Institute of Technology, Yusak Susilo/KTH Royal Institute of Technology, Oded Cats/KTH Royal Institute of Technology

(continued)

Accessibility Matters: Exploring the Determinants of Public Transport Mode Share Across Income Groups in Canadian Cities (20-00463) - A230

Boer Cui/McGill University, Geneviève Boisjoly/McGill University, Luis Miranda-Moreno/McGill University, Ahmed El-Geneidy/McGill University

The Network Gap Score: A Screening Tool to Identify Transit Servable Travel Gaps at a Regional Level (20-00783) - A231

Sarah Moran/Delaware Valley Regional Planning Commission, Gregory Krykewycz/Delaware Valley Regional Planning Commission

Transit and Homelessness: Addressing the Homelessness Crisis (20-01343) - A232

Jeremy Steele/San Jose State University, Hilary Nixon/San Jose State University

Access to Transit?: Validating Local Transit Accessibility Measures Using Transit Ridership (20-01552) - A233

Sarah Bree/University of Saskatchewan, Daniel Fuller/University of Saskatchewan, Ehab Diab/University of Saskatchewan

Evaluation of Public Transport–Based Accessibility to Health Facilities Considering Spatial Heterogeneity (20-01571) - A234

Wenxiang Li/Tongji University, Ye Li/Tongji University, Haopeng Deng/Tongji University

Planning for Autonomous Vehicles: How Selected Cities Are Prospectively Addressing Road Congestion, Parking Requirements, Transit Connections, and Municipal Revenue (20-02436) - A235

Marcel Moran/University of California, Berkeley, Daniel Chatman/University of California, Berkeley

Beyond Title VI: How Transit Agencies Plan for Equity (20-03050) - A236

Torrey Lyons/University of North Carolina, Chapel Hill

Representing Public Transportation Providers in the Metropolitan Planning (20-03193) - A237

Gian-Claudia Sciara/University of Texas, Austin, Md. Rahman/University of Texas, Austin, Rydell Walthall/University of Texas, Austin

Scaling Up Innovative Participatory Design for Public Transportation Planning: Lessons from Experiments in the Global South (20-04216) - A238

P. Christopher Zegras/Massachusetts Institute of Technology (MIT), Jonathan Leape/Massachusetts Institute of Technology (MIT), Juan Carrasco/Massachusetts Institute of Technology (MIT), Cristian Navas/Massachusetts Institute of Technology (MIT), Christo Venter/Massachusetts Institute of Technology (MIT), Erik Vergel-Tovar/Massachusetts Institute of Technology (MIT)

An Analysis of Perceptions of Civic Engagement Technologies in Transportation Planning (20-04427) - A239

Kate Beck/University of California, Berkeley

ACRP Student Research: Impacts of Shared Automated Vehicles on Airport Access and Operations with Opportunities for Revenue Recovery: A Case Study of Austin, Texas (20-01920) - A228

Krishna Murthy Gurumurthy/University of Texas, Austin, Kara Kockelman/University of Texas, Austin

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Young Professional Research in Aviation

Alexander Chambers, Ricondo and Associates, Inc., presiding

Sponsored By Aviation Group, Young Members Council - Aviation, Standing Committee on Environmental Impacts of Aviation, Standing Committee on Airfield and Airspace Capacity and Delay

ACRP Student Research: Investigation of Piezoelectric Energy Harvesting Potential at Airport for Green Energy Solutions (20-01944) - A210

Jingnan Zhao/Rutgers, The State University of New Jersey, Hao Wang/Rutgers, The State University of New Jersey

ACRP Student Research: BIM Implementation Framework for Smart Airport Life-Cycle Management (20-01921) - A211

Basak Keskin/Syracuse University, Baris Salman/Syracuse University

Environmentally Tuning Airfield Asphalt Pavements Using Phase Change Materials (P20-20829) - A212

Miguel Montoya/Purdue University

Identifying Fuel Resistance of Modified Asphalt Mixtures for Airfield Flexible Pavements (P20-20830) - A213

Mohammed Ziaur Rahaman/University of Wisconsin, Madison, Yuan Zhang/University of Wisconsin, Madison

Developing an Anisotropic Material for EMAS Usage (P20-20831) - A214

Elvis Castillo-Camarena/University of Arkansas, Fayetteville

Exploration of Performance-Based Specifications for Airfield Asphalt Mixtures (P20-20832) - A215

Danial Mirzaiyanrajeh/University of New Hampshire

(continued)

Forecasting Air Travel Demand: A Comparison Between TAF Model and ARIMA Model (P20-20833) - A225
Md Mahmud Hasan Mamun/South Carolina State University
DV8: Interactive Aviation Data Visualization and Analysis Framework (P20-20834) - A224
Yifan Song/Ohio State University, Keyang Yu/Ohio State University
Travel-Time Saving and Value of Time for Future Users of Urban Air Mobility Through the Experience of Mobility Companies in Chicago (P20-20835) - A223
Haleh Ale Ahmad/Northwestern University
An Environmental Taxation Impact on the Brazilian Domestic Air Transport (P20-20836) - A222
Carolina Barbosa Resende/Iowa State University
Predicting the Likelihood and Intensity of Airport Ground Delay Programs: An Econometric Analysis (P20-20837) - A221
BORTIORKOR NII TSUI ALABI/Purdue University

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Current Issues in Aviation
David Ballard, GRA, Incorporated, presiding
John Fischer, Consulting Services, presiding
Sponsored By Aviation Group, Standing Committee on Aviation System Planning, Standing Committee on Environmental Impacts of Aviation, Standing Committee on Aviation Economics and Forecasting, Standing Committee on Airport Terminals and Ground Access, Standing Committee on Airfield and Airspace Capacity and Delay, Standing Committee on Aviation Security and Emergency Management

Get to Know the Aviation Group Committees (P20-20267) - A180
David Ballard/GRA, Incorporated
Air Taxi Skyport Location Problem for Airport Access (20-00206) - A201
Srushti Rath/New York University Tandon School of Engineering, Joseph Chow/New York University Tandon School of Engineering
Multi-Criteria Analysis for the Assessment of Future Transport Systems. A Case Study of Urban Air Mobility in Upper Bavaria, Germany (20-03167) - A190
Christelle Al Haddad/Technical University of Munich, Mengying Fu/Technical University of Munich, Anna Straubinger/Technical University of Munich, Kay Ploetner/Technical University of Munich, Constantinos Antoniou/Technical University of Munich
Optimal Vertihub Locations for Large-Scale Intermodal Passenger Drone Service (20-03410) - A186
Sebastian Gutmann/Bavarian Road Administration, Christoph Maget/Bavarian Road Administration, Klaus Bogenberger/Bavarian Road Administration
Model Calibration and Forecasts of Air Travel Demand with Categorized Household Socioeconomic Attributes (20-03855) - A187
Jung In Kim/Hanyang University, Ikki Kim/Hanyang University, Jaeyeob Shim/Hanyang University, Hansol Yoo/Hanyang University, Sangjun Park/Hanyang University
System Design of eVTOL On-Demand Service for Urban Air Mobility (20-04213) - A188
Zhiqiang Wu/University of South Florida, Yu Zhang/University of South Florida
Modeling External Effect of Passenger Drones in Reducing Road Traffic–Related Energy (20-06008) - A189
Zhenhong Lin/Oak Ridge National Laboratory, Fei Xie/Oak Ridge National Laboratory, Shiqi(Shawn) Ou/Oak Ridge National Laboratory
Use of ADS-B Helicopter Data in Air Quality Studies: Proof of Concept with BOEM 2017 Gulf of Mexico Emission Inventory (20-00454) - A199
Richard Billings/Eastern Research Group, Inc., Roger Chang/Eastern Research Group, Inc., Heather Perez/Eastern Research Group, Inc., Darcy Wilson/Eastern Research Group, Inc., Holli Ensz/Eastern Research Group, Inc.
A Primer on Aircraft Induced Clouds and Their Global Warming Mitigation Options (20-04687) - A198
Lance Sherry/George Mason University, Terrence Thompson/George Mason University
Evaluation of CO2 Emission from Aircraft within the LTO Cycle: A Case Study of Bandaranaike International Airport, Sri Lanka (20-05051) - A197
D.M.M.S. Dissanayaka/University of Moratuwa, Varuna Adikariwattage/University of Moratuwa, H.R. Pasindu/University of Moratuwa
An Empirical Method for Estimation of Aircraft Fuel Consumption on Ground Operations (20-06065) - A196
Han-joong Kim/Korea Aerospace University, Hojong Baik/Korea Aerospace University

(continued)

An Assessment of Some Pros and Cons to Airport Growth (20-00983) - A217

Milan Janic/Delft University of Technology, Milan Janić/Delft University of Technology

Identifying the Early Adopters of Flying Cars: Who Is Willing to Pay for and Use Them? (20-01140) - A200

Ugur Eker/Edinburgh Napier University, Grigorios Fountas/Edinburgh Napier University, Panagiotis Anastasopoulos/Edinburgh Napier University

A Data-Driven Operational Model for Traffic at Dallas/Fort Worth International Airport (20-01444) - A183

Monte Lunacek/National Renewable Energy Laboratory (NREL), Lindy Williams/National Renewable Energy Laboratory (NREL), Joseph Severino/National Renewable Energy Laboratory (NREL), Karen Ficenec/National Renewable Energy Laboratory (NREL), Juliette Ugirumurera/National Renewable Energy Laboratory (NREL), Matthew Eash/National Renewable Energy Laboratory (NREL), Yanbo Ge/National Renewable Energy Laboratory (NREL), Caleb Phillips/National Renewable Energy Laboratory (NREL)

Online Database of Airport Incentives for Large, Medium, Small, and Non-Hub Airports (20-03848) - A181

Justin Rex/Georgia Institute of Technology (Georgia Tech), David Ballard/Georgia Institute of Technology (Georgia Tech), Laurie Garrow/Georgia Institute of Technology (Georgia Tech), Russell Mills/Georgia Institute of Technology (Georgia Tech), David Weingart/Georgia Institute of Technology (Georgia Tech)

Long-Term Airfreight Growth and Spatial Patterns of Economic Development Near U.S. Airports (20-04368) - A195

Hui Jeong Ha/Ohio State University, Amber Woodburn McNair/Ohio State University

Critical Review of Wake Turbulence Mitigation Concepts for Capacity Impact (20-01433) - A194

Julio Roa/California State University, Fresno, Tamas Kolos-Lakatos/California State University, Fresno, Antonio Trani/California State University, Fresno

Analysis Framework to Classify Connectivity for Slot Uncoordinated Tourist Airports (20-01988) - A193

MARIA SARTZETAKI/Democritus University of Thrace, DIMITRIOS DIMITRIOU/Democritus University of Thrace, ARISTI KARAGKOUNI/Democritus University of Thrace

Evaluating Operational Benefits of the Arrival Management System Based on Radar Tracks: A Case Study in a Chinese Airport (20-04144) - A184

Songwei Liu/Nanjing University of Aeronautics and Astronautics, Junfeng Zhang/Nanjing University of Aeronautics and Astronautics, Haipeng Guo/Nanjing University of Aeronautics and Astronautics, Dong Sui/Nanjing University of Aeronautics and Astronautics, Rong Hu/Nanjing University of Aeronautics and Astronautics

Scheduling Landing Aircraft with Multiple Objectives Under Continuous Descent Operation (20-05228) - A185

Pengli Zhao/Nanjing University of Aeronautics and Astronautics, Junfeng Zhang/Nanjing University of Aeronautics and Astronautics, Songwei Liu/Nanjing University of Aeronautics and Astronautics, Dong SUI/Nanjing University of Aeronautics and Astronautics, Rong Hu/Nanjing University of Aeronautics and Astronautics

Unified Traffic Management for Urban Surface and Air Mobility (20-05319) - A202

Nikola Mitrovic/Siemens Mobility, Aleksandar Stevanovic/Siemens Mobility, Fedja Netjasov/Siemens Mobility

Deep Adaptive Learning for Safe and Efficient Navigation of Pedestrian Dynamics: Airport Evacuation (20-02081) - A192

Nigel Pugh/North Carolina Agricultural and Technical State University, Pierrot Derjany/North Carolina Agricultural and Technical State University, Hyoshin Park/North Carolina Agricultural and Technical State University, Srish Namalie/North Carolina Agricultural and Technical State University, Dahai Liu/North Carolina Agricultural and Technical State University

Investigating the Content of Social Media Posts for Informing Emergency Planning and Management of Active Shooting Events: A Case Study of the 2017 Fort Lauderdale Airport Shooting (20-03306) - A203

Georgia Bateman/Imperial College London, Hassan Abdel Haleem/Imperial College London, Arnab Majumdar/Imperial College London

Investigation of the European Airport System Robustness Against Infectious Deseases Spreading Through the Airline Network: Results from Extensive Stress Tests (20-04436) - A204

Paraskevas Nikolaou/University of Cyprus, Loukas Dimitriou/University of Cyprus

Effects of Ridehailing Services on Airport Parking Demand (20-00213) - A205

Zia Wadud/University of Leeds

Modeling Travel Mode Choices Near Transportation Hubs: The Case of Dallas/Fort Worth Airport Using Revealed Survey Data (20-00753) - A182

H. M. Abdul Aziz/Kansas State University, Xiaodan Xu/Kansas State University, Yanbo Ge/Kansas State University, Michael Hilliard/Kansas State University, Caleb Phillips/Kansas State University

Pooling Transportation Network Company Rides to the Airport to Reduce Curbside Congestion (20-00784) - A206

Karina Hermawan/Singapore-MIT Alliance for Research and Technology, Amelia Regan/Singapore-MIT Alliance for Research and Technology

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Ground Transportation at Airports: Ridehailing Uptake and Travel Shifts to Test Mode Choice Modeling Assumptions (20-02276) - A207

Alejandro Henao/National Renewable Energy Laboratory (NREL), Joshua Sperling/National Renewable Energy Laboratory (NREL), Stanley Young/National Renewable Energy Laboratory (NREL)

Detection of Conflicts Between ADS-B-Equipped Aircraft and Unmanned Aerial Systems (20-00139) - A208

John Mott/Purdue University, Zachary Marshall/Purdue University, Mark Vandehey/Purdue University, Mike May/Purdue University, Darcy Bullock/Purdue University

Design of Hospital Delivery Networks Using Unmanned Aerial Vehicles (20-04241) - A209

Alejandra Otero/Imperial College London, Jose Javier Escribano Macias/Imperial College London, Panagiotis Angeloudis/Imperial College London

A Method for Selecting Strategic Deployment Opportunities for Unmanned Aircraft Systems (20-04016) - A216

Sarah Hubbard/Purdue University, Bryan Hubbard/Purdue University

Development Strategies of Airport Rail Links: A Case Study in the Tokyo Metropolitan Area, Japan (20-00810) - A191

Takayoshi Tsuchiya/The University of Tokyo, Naoki Okunobo/The University of Tokyo, Hironori Kato/The University of Tokyo

Joint Choice Model for Airport Passengers' Travel Mode and Departure Time Based on Agent Theory (20-00978) - A226

Danwen Bao/Nanjing University

Modeling Mode Choice of Air Passengers' Ground Access to Brisbane Airport (20-04838) - A227

Md Mosabbir Pasha/University of Queensland, Mark Hickman/University of Queensland, Carlo Prato/University of Queensland

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Monday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Highway Capacity Manual Interrupted Flow
Christopher Kinzel, HDR, presiding
Sponsored By Standing Committee on Highway Capacity and Quality of Service

Technical papers related to Interrupted Flow Methods in the Highway Capacity Manual

Adjustment Model of Saturation Flow Rate for Continuous Flow Intersections (20-00080) - B420

Jing Zhao/University of Shanghai for Science and Technology, Xing Gao/University of Shanghai for Science and Technology, Meng Wang/University of Shanghai for Science and Technology

New Approach for Estimation of PCU Values for Urban Roads Under Mixed Traffic Conditions (20-00096) - B421

Jithin Raj/Indian Institute of Technology, Bombay, Vedagiri Perumal/Indian Institute of Technology, Bombay, K.V. Rao/Indian Institute of Technology, Bombay

A Developed Methodology for Determining Gravel Roads' Level of Service: A Case Study of Wyoming (20-00368) - B422

Omar Albatayneh/University of Wyoming, Ahmed Farid/University of Wyoming, Khaled Ksaibati/University of Wyoming

New Developments in TWSC Procedures and Recommendations for a Future Version of the Highway Capacity Manual (20-00533) - B423

Ning Wu/Ruhr University, Bochum, Werner Brilon/Ruhr University, Bochum

Finite Mixture Distribution Method to Model Vehicle Headways at Port Collection-Distribution Roads (20-00954) - B424

Xiafan Gan/Shanghai Maritime University, Jinxian Weng/Shanghai Maritime University, Jinbao Luo/Shanghai Maritime University

Modifying Highway Capacity Manual Methodology for Inclusion of Flashing-Yellow-Arrow Delay and Suppression (20-01283) - B425

Dan Cook/HDR

Quantification of Congestion: Comparison of Traditional and Crowdsourced Traffic Data (20-01518) - B426

Matthew Cen/University of New South Wales, Kasun Wijarayatna/University of New South Wales, Vinayak Dixit/University of New South Wales

Evaluation of Travelers' Perception of Urban Road Level of Service Under Mixed Traffic Conditions (20-02128) - B427

Jithin Raj/Indian Institute of Technology, Bombay, Vedagiri Perumal/Indian Institute of Technology, Bombay

(continued)

Defining and Analyzing Forceful Gap Behavior at Unsignalized Intersection: A Case Study (20-02176) - B428

Mukti Advani/Central Road Research Institute (CSIR), Neelam Gupta/Central Road Research Institute (CSIR), S. Velmurugan/Central Road Research Institute (CSIR), Erramppalli Madhu/Central Road Research Institute (CSIR), Satish Chandra/Central Road Research Institute (CSIR)

Capacity Modeling of Permitted Left Turn Signalized Intersections with Probabilistic Priority (20-02244) - B429

Daobin Wang/Institute for Transportation Research and Education (ITRE), Guangchuan Yang/Institute for Transportation Research and Education (ITRE), Zong Tian/Institute for Transportation Research and Education (ITRE), Wei Liu/Institute for Transportation Research and Education (ITRE)

Structural Equation Modeling for Level of Service at Toll Plazas Under Mixed Traffic Conditions (20-03514) - B431

Yogeshwar Navandar/Sardar Vallabhbhai National Institute of Technology, Surat, D. Patel/Sardar Vallabhbhai National Institute of Technology, Surat, Ashish Dhamaniya/Sardar Vallabhbhai National Institute of Technology, Surat, S. Velmurugan/Sardar Vallabhbhai National Institute of Technology, Surat

Modeling Traffic Flows on Urban Arterials Considering the Downstream Influence (20-03742) - B432

Hong Zhu/Nagoya University, Hideki Nakamura/Nagoya University, Wael Alhajyaseen/Nagoya University, Miho Iryo-Asano/Nagoya University

Free Flow Capacity and Queue Discharge Rate: Long-Term Changes (20-03753) - B433

Victor Knoop/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

Calibrating the Highway Capacity Manual Estimated Travel-Time Distribution on Urban Streets (20-05262) - B434

Ernest Tufuor/University of Nebraska, Lincoln, Laurence Rilett/University of Nebraska, Lincoln, Li Zhao/University of Nebraska, Lincoln

An Analysis of Breakdown Conditions at Alternative Intersections (20-05322) - B435

Liran Chen/New Jersey Institute of Technology, Janice Daniel/New Jersey Institute of Technology

The Influence of Curb Parking on Traffic Capacity at Intersection (20-05724) - B436

Qi Zhao/North China University of Technology, Yuxuan Zhan/North China University of Technology, Li Wang/North China University of Technology, Jiaqing Yan/North China University of Technology

Development of a Capacity Reduction Model for Arterial Work Zones (20-05773) - B437

Juwoon Baek/North Carolina State University, Billy Williams/North Carolina State University, Nagui Rouphail/North Carolina State University

Analysis of Component Errors in the Highway Capacity Manual Travel Time Reliability Estimations for Urban Streets (20-05780) - B438

Ernest Tufuor/University of Nebraska, Lincoln, Laurence Rilett/University of Nebraska, Lincoln

Vehicle Acceleration Modeling in Simulation (20-02498) - B430

Seckin Ozkul/University of Florida, Shirin Noei/University of Florida, Scott Washburn/University of Florida

Thomas B. Deen Distinguished Lecture and Presentation of Awards
Sponsored By Technical Activities Council

Deen Lecture The 2020 recipient of the Thomas B. Deen Distinguished Lectureship is Sarah Jo Peterson, author of TRB's Centennial book The Transportation Research Board, 1920-2020: Everyone Interested is Invited. Dr. Peterson was selected to deliver the Deen Lecture because of her unique understanding of the roots that have made TRB successful. Her lecture is titled "TRB's Technical Activities Committees: The Significance of Their History." Technical Activities Division Paper Awards Pyke Johnson Award (Planning and Environment) Evelyn Blumenberg, Andrew Shouten, Miriam Pinski, and Martin Wachs, University of Southern California, Los Angeles: Physical Accessibility and Employment among Older Adults in California Transportation Research Record: Journal of the Transportation Research Board, Volume 2673, Issue 12 D. Grant Mickle Award (Operations and Preservation):Michael Hunter and Angshuman Guin, Georgia Institute of Technology; James Anderson, AECOM; and Sung Jum Park, Jacobs Engineering: Operating Performance of Diverging Diamond Interchanges Transportation Research Record: Journal of the Transportation Research Board, Volume 2673, Issue 12 William W. Millar Award (Public Transportation): Cecilia Feeley, Rutgers University: Validation of the Paratransit Skills Assessment for Paratransit Travel and Mobility of Adults on the Autism Spectrum Transportation Research Record: Journal of the Transportation Research Board, Volume 2673, Issue 5 John C. Vance Award (Legal Resources):Tammy E. Trimble, Virginia Tech Transportation Institute; Lisa Loftus-Otway, The University of Texas at Austin; and Susanna L. Gallun, Susanna Gallun Consulting: NCHRP Web-Only Document 253, Vol. 1: Legal Landscape John C. Vance Award (Legal Resources):Tammy E. Trimble and Jason Wagner, Virginia Tech Transporation Institute; Wendy Wagner and Lisa Loftus-Otway, The Univeristy of Texas at Austin; Betty L. Serian and Brad Mallory, Betty Serian and Associates ; Sam G. Morrisey and Glenn Havinoviski, Iteris; and Richard Bishop and Pete Gould, Bishop Consulting: NCHRP Web-Only Document 253: Implications of Connected and Automated Driving Systems, Vol. 3: Legal Modification Prioritization and Harmonization Analysis Patricia F. Waller Award (Safety and Systems Users): Wesley J. Kumfer, Libby Thomas, Laura Sandt, and Bo Lan, Highway Safety Research Center, University of North Carolina: Midblock Pedestrian Crash Predictions in a Systemic, Risk-Based Pedestrian Safety Process Transportation Research Record: Journal of the Transportation Research Board, Volume 2673, Issue 12 K. B. Woods Award (Design and Construction):Xin Xu, Chenxi Yuan, Yuxi Zhang, Hubo Cai, Dulcy M. Abraham, and Mark D. Bowman, Purdue University: Ontology-Based Knowledge Management System for Digital Highway Construction Inspection Transportation Research Record: Journal of the Transportation Research Board, Volume 2673, Issue 1 Charley V. Wootan Award (Policy and Organization):Marianne J.W.A. Vanderschuren, Sekadi R. Phayane, and Alison Gwynne-Evans, University of Cape Town, South Africa: Perceptions of Gender, Mobility, and Personal Safety: South Africa Moving Forward Transportation Research Record: Journal of the Transportation Research Board, Volume 2673, Issue 12 Fred Burggraf Awards (Young Researchers) Operations and Preservation Group: Yalda Rahmati, Mohammadreza Khajeh Hosseini, Alireza Talebpour, Benjamin Swain, and Christopher Nelson, Texas A&M University: Influence of Autonomous Vehicles on Car-Following Behavior of Human Drivers Transportation Research Record: Journal of the Transportation Research Board, Volume 2673, Issue 12 Design and Construction:Keren Xu, Jorge Rueda-Benavides, and Karthik Chowdary Pakalapati, Auburn University: Development of a Hot-Mix Asphalt Location Cost Index for the Alabama Department of Transportation Transportation Research Record: Journal of the Transportation Research Board, Volume 2673, Issue 3 Public Transportation:Jill Elizabeth Shinn, KPFF Consulting Engineers; and Carole Turley Voulgaris, California Polytechnic State University: Ridership Ramp-Up?; Initial Ridership Variation on New Rail Transit Projects Transportation Research Record: Journal of the Transportation Research Board, Volume 2673, Issue 10 Blue Ribbon Committee Awards Identifying and Advancing Ideas for Research Urban Freight Transportation Committee(AT025)(Freight Systems Group) chaired by William Eisele, Texas A&M Transportation Institute,for demonstrating leadership and forging successful partnerships to identify, develop, and disseminate urban freight transporation research to advance TRB's Critical Issue (Goods Movement) in Transporation 2019. Attracting and Preparing the Next Generation of Professionals and Scholars in TRB Operations and Preservation Group Young Members Subcommittee (AH000(1)), (Operations and Preservation Group), co-chaired by Leila Hajibabai, North Carolina State University; and Chieh (Ross) Wang, Oak Ridge National Laboratory, for engaging young members in TRB standing committee activities through social and professional activities. Moving Research Ideas into Transportation Practice Geometric Design Committee (AFB10)(Design and Construction Group, Design Section) chaired by Hermanus Steyn, Kittelson and Associates, Inc. and Operational Effects of Geometrics Committee (AHB65) (Operations and Preservation Group, Operations Section) chaired by Jeffrey Shaw, Federal Highway Administration, for applying perormance-based design by incorporating design, operations, and safety to implement multimodal transportation projects. Contributing to Improving the Management and Operation of TRB Committees Transporatation Education and Training Committee (ABG20)(Policy and Organization Group, Research and Education Section) co-chaired by Victoria Beale, Ohio Department of Transportation; and Diana Long, Appalachian Transportation Institute, for strengthening committee results through member selection.

Welcome and Introduction (P20-21620)
Neil Pedersen/Transportation Research Board

(continued)

Tecchnical Activities Council Awards (P20-21621)
Hyun-A Park/Spy Pond Partners, LLC
Introduction of the Deen Lecturer (P20-21622)
Vicki Arroyo/Georgetown University
2020 Deen Lecture: TRB's Technical Activiites Committees: The Signficance of Their History (P20-21623)
Sarah Jo Peterson/23 Urban Strategies, LLC
Closing (P20-21624)
Neil Pedersen/Transportation Research Board

Monday, 06:00 p.m. - 07:30 p.m., Convention Center, Ballroom South Pre-Function A
Aviation Caucus
David Ballard, GRA, Incorporated, presiding
Sponsored By Aviation Group, Standing Committee on Intergovernmental Relations in Aviation, Standing Committee on Aviation System Planning, Standing Committee on Environmental Impacts of Aviation, Standing Committee on Aviation Economics and Forecasting, Standing Committee on Airport Terminals and Ground Access, Standing Committee on Airfield and Airspace Capacity and Delay, Standing Committee on Aircraft/Airport Compatibility, Standing Committee on Light Commercial and General Aviation, Standing Committee on Aviation Security and Emergency Management

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Monday, 06:00 p.m. - 07:30 p.m., Convention Center, 145A
Planning and Operations of Multimodal Transportation Networks
Zhiyuan Liu, Southeast University, presiding
Sponsored By Standing Committee on Transportation Network Modeling

Resilience of Urban Street Network Configurations Under Low Demands (20-00932)
Zhengyao Yu/Pennsylvania State University, Vikash Gayah/Pennsylvania State University
Adaptive Park-and-Ride Choice on Time-Dependent Stochastic Multimodal Transportation Network (20-00999)
Alireza Khani/University of Minnesota, Twin Cities, Pramesh Kumar/University of Minnesota, Twin Cities
Balancing School Bus Routes by Balancing Route Durations and Number of Trips Assigned to Each Route (20-01511)
Ali Shafahi/University of Maryland, Zhongxiang Wang/University of Maryland, Ali Haghani/University of Maryland
Performance Evaluation of a Mixed-Use BRT/AV Lane (20-01825)
Xiangdong Chen/Tsinghua University, Meng Li/Tsinghua University, Xi Lin/Tsinghua University, Fang He/Tsinghua University
Exploring Insignificant OD Pairs: A Compressed Sensing Model for OD Demand Estimation (20-02374)
Jingxing Wang/University of Washington, Shu Lu/University of Washington, Xuegang Ban/University of Washington
Pedestrian Guideway Design Under Continuous Traffic Equilibrium: A Topology Optimization Approach (20-02916)
Xiaojia Zhang/University of Illinois, Urbana Champaign, Weichen Li/University of Illinois, Urbana Champaign, Yanfeng Ouyang/University of Illinois, Urbana Champaign
A Generalized Hub-Based Multimodal Network Equilibrium: A Case of Actual-Size Multimodal Network (20-03711)
Yifei Cai/Southeast University, Jun Chen/Southeast University, Jiao Ye/Southeast University
Reinforcement Learning-Based Sequential Transit Route Design Under Demand Uncertainty (20-05112)
Gyugeun Yoon/New York University Tandon School of Engineering, Joseph Chow/New York University Tandon School of Engineering
On the Impact of Fleet-Optimal Vehicle Routing in Transportation Networks (20-01166)
Matthew Battifarano/Carnegie Mellon University, Sean Qian/Carnegie Mellon University

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Real-World Deployment of Connected Vehicles: Challenges and Lessons Learned
George Villarreal, Texas Department of Transportation, presiding
Sponsored By Standing Committee on Intelligent Transportation Systems

Multiple Connected Vehicle Pilots (CV Pilots) have been deployed across the country in an effort to not only deploy CV technology, but also to test, and operationalize cutting-edge mobile and roadside technologies and enable multiple connected vehicle applications. These innovative technologies are using the 5.9GHz spectrum to save lives, improve personal mobility, enhance economic productivity, reduce negative environmental impacts, and transform public agency operations.This session will share the lessons learned, challenges and best practices for deploying at-scale connected vehicle technologies to benefit other potential deployers. The session will also outline the need to preserve the 5.9GHz spectrum from interference. Topics include: developing and implementing over-the-air (OTA) update capabilities, installing and testing thousands of in-vehicle and roadside devices, and determining antenna placement supporting tractor-trailer CV applications.

Panel Discussion (P20-21482)

New York City CV Pilot (P20-21483)
Mohamad Talas/New York City Department of Transportation
5.9 GHz for Vehicle Applications (P20-21484)
Cordell Schachter/New York City Department of Transportation
Tampa CV Pilot (P20-21485)
Robert Frey/Tampa-Hillsborough County Expressway
Wyoming CV Pilot (P20-21486)
Deepak Gopalakrishna/ICF International Inc

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Pedestrian Hybrid Beacons and Enhanced Crosswalk Signage
Michael Knodler, University of Massachusetts, Amherst, presiding
Sponsored By Standing Committee on Traffic Control Devices

Quantifying Mobility Impact of Pedestrian Hybrid Beacon Signal on Arterial Traffic: A Case Study in Tucson, Arizona (20-02740)
Yang Liang/University of Arizona, Xiaoqing Zeng/University of Arizona, Xiaofeng Li/University of Arizona, Adrian Cottam/University of Arizona, Yao-Jan Wu/University of Arizona
Pedestrian Safety at Pedestrian Hybrid Beacons: Results of a Large-Scale Study in Arizona (20-00185)
Kay Fitzpatrick/Texas A&M Transportation Institute, Eun Sug Park/Texas A&M Transportation Institute, Michael Cynecki/Texas A&M Transportation Institute, Michael Pratt/Texas A&M Transportation Institute, Michelle Beckley/Texas A&M Transportation Institute
How Well Do Pedestrian Hybrid Beacons Operate on Higher-Speed Roads? (20-00186)
Kay Fitzpatrick/Texas A&M Transportation Institute, Michael Cynecki/Texas A&M Transportation Institute, Michael Pratt/Texas A&M Transportation Institute, Michelle Beckley/Texas A&M Transportation Institute
How Do LED-Embedded Pedestrian Crossing Signs Compare to RRFBs and PHBs? (20-05180)
Emira Rista/Texas A&M Transportation Institute, Kay Fitzpatrick/Texas A&M Transportation Institute

<u>Monday, 06:00 p.m. - 07:30 p.m., Convention Center, Salon B</u>
What Is Novel and Innovative in Novice and Experienced Driver Behavior Research—Hybrid Session
Christine Watson, National Highway Traffic Safety Administration (NHTSA), presiding
Michelle Reyes, University of Iowa, presiding
Sponsored By Standing Committee on Operator Education and Regulation

This session will be a hybrid session where the session will be divided into presentation/poster presentation. At the beginning of the session, each presenter will have three minutes to present the highlights of their paper. This will be followed by poster presentations where audience members can have one-on-one discussions with the author(s). Audience members are encouraged to arrive early for the presentation portion of this session.

Deterring Distraction and Risky Driving Behavior Among Teens Using a Smartphone App: Characterization and Impact (20-00503)
Sirajum Munira/Texas A&M University, Russell Henk/Texas A&M University
Can Virtual Reality (VR) Enhance Driver Education?: An Evaluation of the Effectiveness of a VR-Based Young Driver Education Resource (20-01137)
Neale Kinnear/Transport Research Laboratory, Ltd. (TRL), Sritika Chowdhury/Transport Research Laboratory, Ltd. (TRL), Shaun Helman/Transport Research Laboratory, Ltd. (TRL)
Magnitude of Handheld Phone Use While Driving in a National Usage-Based Auto Insurance Program Measured with a Smartphone Application (20-02076)
M. Kit Delgado/University of Pennsylvania Perelman School of Medicine, Scott Halpern/University of Pennsylvania Perelman School of Medicine, Flaura Winston/University of Pennsylvania Perelman School of Medicine, Aria Xiong/University of Pennsylvania Perelman School of Medicine, Jessie Hemmons/University of Pennsylvania Perelman School of Medicine, Dina Abdel-Rahman/University of Pennsylvania Perelman School of Medicine, William Everett/University of Pennsylvania Perelman School of Medicine, Kristen Gaba/University of Pennsylvania Perelman School of Medicine, Ben Kotrc/University of Pennsylvania Perelman School of Medicine, Emma Radford/University of Pennsylvania Perelman School of Medicine, Rafi Finegold/University of Pennsylvania Perelman School of Medicine, Catherine McDonald/University of Pennsylvania Perelman School of Medicine
Support for Distracted Driving Laws: An Analysis of Adolescent Drivers from the Traffic Safety Culture Index from 2011–2017 (20-02082)
Caitlin Pope/University of Kentucky, Ann Nwosu/University of Kentucky, Toni Rudisill/University of Kentucky, Motao Zhu/University of Kentucky
Vehicle Owners' Perceptions and Experience with Driver Support Features (20-02154)
Gayatri Ankem/VTTI, Alexandria Noble/VTTI, Melissa Miles/VTTI, Charlie Klauer/VTTI
An Examination of Teen Drivers' Car-Following Behavior When Compared to Adult Drivers (20-02492)
Shan Bao/University of Michigan, Transportation Research Institute, Ling Wu/University of Michigan, Transportation Research Institute, Bo Yu/University of Michigan, Transportation Research Institute
Utilizing Quasi-Induced Exposure Methodology to Identify High-Risk Young Driver Populations (20-03138)
Allison Curry/Children's Hospital of Philadelphia, Kristina Metzger/Children's Hospital of Philadelphia, Nina Joyce/Children's Hospital of Philadelphia, Robert Foss/Children's Hospital of Philadelphia
Exploring the Dimensions of Driving Instruction Through Naturalistic Observation of Formal Practical Lessons with Learner Drivers (20-03417)
Natalie Watson-Brown/University of the Sunshine Coast, Bridie Scott-Parker/University of the Sunshine Coast, Teresa Senserrick/University of the Sunshine Coast
Skin Conductance Responses of Novice and Experienced Young Drivers During a Driving Hazard Perception Task (20-03509)
Theresa Chirles/Johns Hopkins University, Johnathon Ehsani/Johns Hopkins University, Karen Seymour/Johns Hopkins University
Driving Styles Among Drivers with Developmental Disabilities (20-04815)
Austin Svancara/University of Alabama at Birmingham, Melanie Albright/University of Alabama at Birmingham, Sam Marcrum/University of Alabama at Birmingham, Haley Bishop/University of Alabama at Birmingham, Benjamin McManus/University of Alabama at Birmingham, Despina Stavrinos/University of Alabama at Birmingham

Monday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A
New Ideas for Emergency Evacuations
R. Michael Robinson, Old Dominion University, presiding
Pamela Murray-Tuite, Clemson University, presiding
Sponsored By Standing Committee on Emergency Evacuations

Taking the Freeway: Inferring Evacuee Route Selection from Survey Data (20-03329) - A100
Daeyeol Chang/University of Missouri, Praveen Edara/University of Missouri, Pamela Murray-Tuite/University of Missouri, Joseph Trainor/University of Missouri, Kostas Triantis/University of Missouri

Simulating Passenger Evacuation Under Fire Emergency in Railway Station Using Wifi-Bluetooth Scanners (20-05116) - A106
Amir Hossein Salarian/Iran University of Science and Technology, Aida Mashhadizadeh/Iran University of Science and Technology, Morteza Bagheri/Iran University of Science and Technology

Exploiting Passively Collected Mobile Device Location Data to Study Disaster Evacuation Behavior: A Case Study of Hurricane Irma (20-05597) - A107
Aref Darzi/University of Maryland, College Park, Hannah Younes/University of Maryland, College Park, Sepehr Ghader/University of Maryland, College Park, Lei Zhang/University of Maryland, College Park

Wildfire Awareness, Departure Time, Mode Choice, and Emergency Communication: Decision Making in the 2018 Camp Fire Evacuation (20-03429) - A108
Sarah Grajdura/University of California, Davis, Xiaodong Qian/University of California, Davis, Deb Niemeier/University of California, Davis

Exploring Different Behavioral Factors During Evacuation in Response to Wildfire Events: An Agent-Based Approach (20-03702) - A109
Mohammad Rayeedul Kalam Siam/Oregon State University, Haizhong Wang/Oregon State University

Integrating Social Factors into Transportation-Focused Disaster Preparedness Research (20-02399) - A110
Katherine Idziorek/University of Washington, Cynthia Chen/University of Washington, Daniel Abramson/University of Washington

The Density-Speed-Based Mesoscopic Model for Evacuation Simulations (20-00423) - A111
Meng Shi/City University of Hong Kong, Eric Wai Ming Lee/City University of Hong Kong, Yi Ma/City University of Hong Kong, Ruifeng Cao/City University of Hong Kong

Impact of Manual Traffic Control on Evacuation Time Estimates (20-04759) - A102
Scott Parr/Embry Riddle Aeronautical University, Nelida Herrera/Embry Riddle Aeronautical University, Brian Wolshon/Embry Riddle Aeronautical University, Todd Smith/Embry Riddle Aeronautical University

Effect of Regret-Based Route Choice on the Traffic Equilibrium for Emergency Evacuation (20-04991) - A112
Ze Wang/Zhejiang University, Haiqiang Yang/Zhejiang University

Developing Real-Time Evacuation Planning for Extreme Storm Events: A Case Study in New Jersey (20-02890) - A113
Mohammad Jalayer/Rowan University, Golam Rabbani Fahad/Rowan University, Rouzbeh Nazari/Rowan University

Planning for City Tourist Evacuation Routes: Collecting and Providing Information (20-03168) - A114
Guy Wachtel/Bar Ilan University, Jan-Dirk Schmoecker/Bar Ilan University, Yuhan Gao/Bar Ilan University, Oren Nahum/Bar Ilan University, Yuval Hadas/Bar Ilan University

Do Information Uncertainty and Social Network Contribute to Shadow Evacuation and Non-Compliance Behavior (20-04397) - A101
Lu Ling/Purdue University, Pamela Murray-Tuite/Purdue University, Seungyoon Lee/Purdue University, Yue "Gurt" Ge/Purdue University, Satish Ukkusuri/Purdue University

The Role of Social Networks and Day-to-Day Sharing Activity on Hurricane Evacuation Decision Consistency and Shared Evacuation Capacity (20-01819) - A115
Md Ashraf Ahmed/Florida International University, Arif Mohaimin Sadri/Florida International University, Mohammed Hadi/Florida International University

Mass Evacuation Planning: Determination of Evacuation Routes Through Traffic Microsimulations (20-05786) - A104
Muhammad Habib/Dalhousie University, MD Jahedul Alam/Dalhousie University, Julien Lacroix/Dalhousie University, Alexander Morgenthaler/Dalhousie University

Evaluating Shelter Locations for Mass Evacuation: A Multiple Criteria Evaluation Based on Flood Risk and Traffic Microsimulation Modeling (20-06095) - A105
Muhammad Habib/Dalhousie University, MD Jahedul Alam/Dalhousie University, Emilie Pothier/Dalhousie University

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Sensitivity of Evacuation Time Estimates to Population (20-05445) - A103

Nelida Herrera/Arcadis US Inc., Todd Smith/Arcadis US Inc., Scott Parr/Arcadis US Inc., Brian Wolshon/Arcadis US Inc.

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Emergency Responders

Scott Parr, Embry Riddle Aeronautical University, presiding

Sponsored By Standing Committee on Emergency Evacuations, Joint Subcommittee on Emergency Response of ABR30, ANB10, ANB40, and AHB10, Standing Committee on Regional Transportation Systems Management and Operations, Standing Committee on Traffic Law Enforcement, Standing Committee on Transportation Safety Management Systems

Requirements Gathering Through Focus Groups for a Real-Time Emergency Communication System for Hazmat Incidents (20-03226) - A122

Sharon Medcalf/University of Nebraska, Medical Center, Matthew Hale/University of Nebraska, Medical Center, Chandran Achutan/University of Nebraska, Medical Center, Aaron Yoder/University of Nebraska, Medical Center, Stanley Shearer/University of Nebraska, Medical Center, Ann Fruhling/University of Nebraska, Medical Center

A Framework to Link Crashes to Emergency Medical Service Runs and Trauma Admissions for Improved Highway Safety Monitoring and Crash Outcome Assessment (20-03659) - A117

Aryan Hosseinzadeh/University of Louisville, Abolfazl Karimpour/University of Louisville, Robert Kluger/University of Louisville, Raymond Orthober/University of Louisville

Ambulance Location Optimization Incorporating O-D Travel Time Variability: A Case Study of Delhi (20-04786) - A121

Shayesta Wajid/Indian Institute of Technology, Delhi, N. Nezamuddin/Indian Institute of Technology, Delhi, Avinash Unnikrishnan/Indian Institute of Technology, Delhi

DRONETIM: Dynamic Routing of Unmanned-Aerial and Emergency Team Incident Management (20-02283) - A12 3

Justice Darko/North Carolina Agricultural and Technical State University, Yaa Acquaah/North Carolina Agricultural and Technical State University, Larkin Folsom/North Carolina Agricultural and Technical State University, Hyoshin Park/Nort h Carolina Agricultural and Technical State University, Andrew Alden/North Carolina Agricultural and Technical State University

Integrating Transportation Data with Emergency Medical Service Records to Improve Triage Decision of High-R isk Trauma Patients (20-05675) - A124

Chenfeng Xiong/University of Maryland, College Park, Zixi Wang/University of Maryland, College Park, Mofeng Yang/Un iversity of Maryland, College Park, Rosemary Kozar/University of Maryland, College Park, Lei Zhang/University of Maryland, College Park

Development of a Drone Network for Traffic Incident Response (20-05465) - A125

Tienan Li/University of Massachusetts, Lowell, Danjue Chen/University of Massachusetts, Lowell, Yuanchang Xie/Unive rsity of Massachusetts, Lowell, Charlie Schweik/University of Massachusetts, Lowell, Aaron Friedman/University of Massachusetts, Lowell, Ruben Flores-Marzan/University of Massachusetts, Lowell

Do Road Rangers Help in Preventing Secondary Crashes? (20-05829) - A126

Jimoku Salum/University of North Florida, Thobias Sando/University of North Florida, Priyanka Alluri/University of North Florida, Angela Kitali/University of North Florida

Capacity Building of Emergency Medical Services (EMS) in Low- and Middle-Income Countries Using Taxi-EMS Systems: A Case Study in Delhi, India (20-03840) - A120

Vipul Mishra/Indian Institute of Technology, Delhi, Richa Ahuja/Indian Institute of Technology, Delhi, N. Nezamuddin/Indi an Institute of Technology, Delhi, Geetam Tiwari/Indian Institute of Technology, Delhi

Impacts of Augmenting Heliports with School Playgrounds on Air Medical Transport Time (20-03882) - A127

Soyoung Jung/Dongyang University, Xiao Qin/Dongyang University

Connected Vehicle Technology to Protect the Safety of Highway Patrol Troopers: Training Framework and Lessons Learned from the Wyoming Connected Vehicle Pilot (20-04232) - A128

Biraj Subedi/Federal Highway Administration (FHWA), Sherif Gaweesh/Federal Highway Administration (FHWA), Guangchuan Yang/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)

Connected and Autonomous Vehicles Effects on Emergency Response Times (20-04468) - A118

Reginald Souleyrette/University of Kentucky, Austin Obenauf/University of Kentucky, Robert Kluger/University of Kentucky

Infrastructure-Vehicle Cooperative Automation
Jia Hu, Tongji University, presiding
Sponsored By Standing Committee on Vehicle-Highway Automation

Smooth Switching Control-Based CACC by Considering Dynamic Information Flow Topology (20-00832) - B392
Anye Zhou/Georgia Institute of Technology (Georgia Tech), Siyuan Gong/Georgia Institute of Technology (Georgia Tech), Chaojie Wang/Georgia Institute of Technology (Georgia Tech), Srinivas Peeta/Georgia Institute of Technology (Georgia Tech)

Coordinating Vehicle Platoons for Highway Bottleneck Decongestion and Throughput Improvement (20-01387) - B406
Mladen Čičić/KTH Royal Institute of Technology, Li Jin/KTH Royal Institute of Technology, Karl Henrik Johansson/KTH Royal Institute of Technology

A Real-Time Deployable Model Predictive Control-Based Cooperative Platooning Approach for Connected and Autonomous Vehicles (20-01691) - B393
Jian Wang/Ningbo University, Siyuan Gong/Ningbo University, Srinivas Peeta/Ningbo University, Lili Lu/Ningbo University

Human-in-the-Platoon Cooperative Adaptive Cruise Control (20-01887) - B394
Yiming Zhang/Tongji University, Zhizhou Wu/Tongji University, Yu Zhang/Tongji University, Zhiying Shang/Tongji University, Jia Hu/Tongji University

Cooperative Platooning Algorithms for Connected Vehicles (20-01889) - B395
Karim Fadhloun/Virginia Polytechnic Institute and State University, Youssef Bichiou/Virginia Polytechnic Institute and State University, Hesham Rakha/Virginia Polytechnic Institute and State University

Structured Quadratic Q-Network for Learning Continuous Control for Autonomous Vehicles (20-02002) - B396
Pin Wang/University of California, Berkeley, Hanhan Li/University of California, Berkeley, Ching-Yao Chan/University of California, Berkeley

Effectiveness of Cooperative Adaptive Cruise Control with Unconnected Vehicle in Edge Cases (20-02337) - B397
Megan Campbell/University of Virginia, Francisco Torres-Herrera/University of Virginia, Noemi Avila/University of Virginia, Zheng Chen/University of Virginia, Byungkyu Brian Park/University of Virginia

A Generic Simulation Platform for Cooperative Adaptive Cruise Control Under Partially Connected and Automated Environment (20-02651) - B398
Jintao Lai/Tongji University, Jia Hu/Tongji University, Lian Cui/Tongji University, Zheng Chen/Tongji University, Haobin Zhao/Tongji University, Xiaoguang Yang/Tongji University

Optimizing Reservation-Based Intersection Control of Autonomous Vehicles: A Mixed Integer Linear Programming Approach (20-03140) - B399
Muting Ma/University of Louisville, Zhixia Li/University of Louisville

Microscopic Right-of-Way Trading Mechanism for Cooperative Decision Making: A Ramp Merging Example (20-03179) - B407
Zhanbo Sun/Southwest Jiaotong University, Tianyu Huang/Southwest Jiaotong University, Ziye Qin/Southwest Jiaotong University, Ziyan Gao/Southwest Jiaotong University

SCoPTO: Signalized Corridor Management with Vehicle Platooning and Trajectory Optimization Under Connected and Automated Environment (20-03474) - B401
Yi Guo/University of Cincinnati, Jiaqi Ma/University of Cincinnati

Improving Traffic Sign Learning Near Ramps: An Autonomous Vehicle Application (20-03544) - B408
Zhenhua Zhang/State University of New York (SUNY), Leon Stenneth/State University of New York (SUNY), Xiyuan Liu/State University of New York (SUNY)

A Cooperative Control Model in Connected and Automated Vehicles Environment: Using Artificial Potential Field Theory (20-03844) - B402
Ziwei Yi/Southeast University, linheng Li/Southeast University, Xu Qu/Southeast University, Yang Hong/Southeast University, Peipei Mao/Southeast University, Bin Ran/Southeast University

Empirical Study on the Properties of Adaptive Cruise Control Systems and How They Can Impact Traffic Flow and String Stability (20-03887) - B403
Michail Makridis/European Commission, Konstantinos Mattas/European Commission, Biagio Ciuffo/European Commission, Fabrizio Re/European Commission, Akos Kriston/European Commission, Fabrizio Minarini/European Commission, Greger Rognelund/European Commission

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Research on Decision-Making Model of Left Turn Behavior for Autonomous Vehicles at Urban Intersection Based on Conflict Resolution (20-03921) - B390

Xuemei Chen/Beijing Institute of Technology, Mengxi Li/Beijing Institute of Technology, Pin Wang/Beijing Institute of Technology, Zijia Wang/Beijing Institute of Technology, Yangjiaxin Ou/Beijing Institute of Technology

Vehicle Trajectory Specification in Presence of Traffic Lights with Known or Uncertain Switching Times (20-04155) - B409

Panagiotis Typaldos/Technical University of Crete, Ioanna Kalogianni/Technical University of Crete, Kyriakos Mountakis/Technical University of Crete, Ioannis Papamichail/Technical University of Crete, Markos Papageorgiou/Technical University of Crete

Multi-Vehicle Trajectory Optimization for Cooperative Adaptive Cruise Control Platoon Formation (20-04227) - B404

Qinzheng Wang/University of Utah, Xianfeng Yang/University of Utah, Zhitong Huang/University of Utah, Yun Yuan/University of Utah

Populating SAE J2735 Message Confidence Values for Traffic Signal Transitions Along a Signalized Corridor (20-04533) - B391

Jijo Mathew/Purdue University, Howell Li/Purdue University, Darcy Bullock/Purdue University

A CV-CACC Algorithm to Divide and Reform Connected Vehicle Platoons at Signalized Intersections to Improve Traffic Throughput and Safety (20-03285) - B400

Tony Qiu/University of Alberta, Yuwei Bie/University of Alberta

CACC Systems with Compensation of Communication Delay: Control Design, Stability Analysis, and Traffic Flow Implications (20-04890) - B405

Yu Zhang/Delft University of Technology, Yu Bai/Delft University of Technology, Jia Hu/Delft University of Technology, Meng Wang/Delft University of Technology

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Monday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A
Modeling, Simulation, Analysis, and Evaluation of Connected and Automated Vehicle Applications
Guoyuan Wu, University of California, Riverside, presiding
Sponsored By Standing Committee on Vehicle-Highway Automation

An Empirical Analysis to Assess the Operational Design Domain of a Lane Keeping System Combining Objective and Subjective Risk Measures (20-00182) - B424

Haneen Farah/Delft University of Technology, Shubham Bhusari/Delft University of Technology, Paul van Gent/Delft University of Technology, Freddy Antony Mullakkal Babu/Delft University of Technology, Peter Morsink/Delft University of Technology, Riender Happee/Delft University of Technology, Bart van Arem/Delft University of Technology

Impact of Automated Highway Autopilot on the Performance and Safety of Weaving Sections (20-00183) - B410

Marieke van der Tuin/Delft University of Technology, Haneen Farah/Delft University of Technology, Gonçalo Correia/Delft University of Technology

Impacts of Automated Truck Platooning on the Performance of Mixed Traffic Conditions on Freeways (20-00979) - B411

Lee Seolyoung/Hanyang University, Cheol Oh/Hanyang University

Simulation-Based Connected and Automated Vehicle Models on Highway Sections: A Literature Review (20-01003) - B427

Wooseok Do/McGill University, Omid Rouhani/McGill University, Luis Miranda-Moreno/McGill University

Evaluating Traffic Efficiency and Safety by Varying Truck Platoon Characteristics in a Critical Traffic Situation (20-01282) - B412

Timo Faber/Delft University of Technology, Salil Sharma/Delft University of Technology, Maaike Snelder/Delft University of Technology, Gerdien Klunder/Delft University of Technology, Lóránt Tavasszy/Delft University of Technology, Hans Van Lint/Delft University of Technology

A Conflict-Free Network Routing Algorithm for Automated Vehicle (20-01642) - B429

Yunlong An/Tsinghua University, Fang He/Tsinghua University, Xi Lin/Tsinghua University, Haolin Yang/Tsinghua University, Meng Li/Tsinghua University

Influence of Lane Policies on Freeway Traffic Mixed with Manual and Connected and Autonomous Vehicles (20-01817) - B413

Weijie Yu/Southeast University, Xuedong Hua/Southeast University, Wei Wang/Southeast University, Di Miao/Southeast University

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Situation Aware, Left Turning Connected and Automated Vehicle Operation at Signalized Intersections (20-02400) - B414

Sakib Khan/University of California, Berkeley, Mashrur Chowdhury/University of California, Berkeley

Establishing Safe Operating Speeds for Autonomous Vehicles on the Automated Skyway Express in Jacksonville, Florida (20-02469) - B425

Andrew Loken/University of Nebraska, Lincoln, Joshua Steelman/University of Nebraska, Lincoln, Scott Rosenbaugh/University of Nebraska, Lincoln, Ronald Faller/University of Nebraska, Lincoln

A Human-Like Lane-Changing Trajectory Planning Model for Automated Vehicles Based on an Improved Safety-Sensitive LSTM-NN Model (20-02855) - B419

Da Yang/Southwest Jiaotong University, Qifan Zhou/Southwest Jiaotong University, Yue Shen/Southwest Jiaotong University, Mingqiang Xiong/Southwest Jiaotong University, Lihua Xu/Southwest Jiaotong University

An Approach to Optimize the Safety–Efficiency Trade-Off of Automated Vehicle Car Following (20-02894) - B420

Xiaobo Liu/Transpo Group; SUNY New Paltz, Danqi Shen/Transpo Group; SUNY New Paltz, Lijuan Lai/Transpo Group; SUNY New Paltz, Scott Le Vine/Transpo Group; SUNY New Paltz

Modeling the Safety Impact of Connected and Autonomous Vehicles in Simulation and Statistics: Platoon Size, Sensor Error, and Path Choice (20-03073) - B415

Alkis Papadoulis/Loughborough University, Mohammed Quddus/Loughborough University, Maria-Ioanna Imprialou/Loughborough University

Evaluation and Optimization of Responsibility-Sensitive Safety Model on Autonomous Car-Following Maneuvers (20-03741) - B416

Chen Chai/Tongji University, Xianming Zeng/Tongji University, Xiangbin Wu/Tongji University, Xuesong Wang/Tongji University

Merging in Mixed Traffic of Connected and Automated Vehicles and Conventional Vehicles: A Model Predictive Control Framework (20-03885) - B421

Mohammad Karimi/Concordia University, Claudio Roncoli/Concordia University, Ciprian Alecsandru/Concordia University, Markos Papageorgiou/Concordia University

Traffic Efficiency and Safety Impacts of Autonomous Vehicle Aggressiveness (20-04052) - B417

Songpo Li/Duke University, Dev Seth/Duke University, Mary Cummings/Duke University

Multi-Player Dynamic Game–Based Automatic Lane-Changing Decision Model Under Mixed Autonomous Vehicle and Human-Driven Vehicle Environment (20-04177) - B422

Yuewen Yu/Southwest Jiaotong University, Shikun Liu/Southwest Jiaotong University, Jing Jin/Southwest Jiaotong University, Xia Luo/Southwest Jiaotong University, Mengxue Wang/Southwest Jiaotong University

The Performance Test of Autonomous Vehicle LiDAR Sensors Under Different Weather Conditions (20-04898) - B428

Li Tang/University at Buffalo, Yunpeng Shi/University at Buffalo, Qing He/University at Buffalo, Adel Sadek/University at Buffalo, Chunming Qiao/University at Buffalo

Driver Behavior at a Freeway Merge in Mixed Traffic of Conventional and Connected and Autonomous Vehicles (20-05365) - B423

Sneha Chityala/HNTB Corporation, John O. Sobanjo/HNTB Corporation, Eren Ozguven/HNTB Corporation, Thobias Sando/HNTB Corporation, Richard Twumasi-Boakye/HNTB Corporation

Impacts of Freeway Acceleration Lane Lengths on Aging Driver Merging Maneuvers in a Connected Vehicle Environment (20-05882) - B418

Flavius Matata/University of North Florida, Festo Mjogolo/University of North Florida, Lina Lwambagaza/University of North Florida, Thobias Sando/University of North Florida, Doreen Kobelo/University of North Florida, Maxim Dulebenets/University of North Florida

Simulation Exploration of the Potential of Connected Vehicles in Mitigating Secondary Crashes (20-05883) - B426

Mike Soloka/University of North Florida, Hendry Imani/University of North Florida, Thobias Sando/University of North Florida, Priyanka Alluri/University of North Florida

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Monday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A
Toward Adoption of Vehicle-Highway Automation
Yeganeh Hayeri, Stevens Institute of Technology, presiding
Sponsored By Standing Committee on Vehicle-Highway Automation

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Feature-Variant Clustering Methods for Tolling Zone Definition and Their Impact on Distance-Based Toll Optimization (20-02988) - B445

Antonis Lentzakis/Singapore-MIT Alliance, Ravi Seshadri/Singapore-MIT Alliance, Arun Akkinepally/Singapore-MIT Alliance, Vinh-An Vu/Singapore-MIT Alliance, Moshe Ben-Akiva/Singapore-MIT Alliance

Vehicle–Bicycle Encounters Analysis to Improve Autonomous Emergency Braking Systems Based on Naturalistic Driving Study Data (20-02540) - B442

Yanli Bao/Tongji University, Xuesong Wang/Tongji University, Andrew Tarko/Tongji University, Cristhian Lizarazo Jimenez/Tongji University, Vamsi Krishna Bandaru/Tongji University

Perceptions and Attitudes Toward the Deployment of Autonomous and Connected Vehicles: Insights from Las Vegas, Nevada (20-01092) - B433

Sarah Dennis/Queensland University of Technology, Alexander Paz/Queensland University of Technology, Joanna Wadsworth/Queensland University of Technology, Tan Yigitcanlar/Queensland University of Technology

Analyzing On-Road Automated Vehicle Disengagements Over Time and by Manufacturers (20-04895) - B439

Alexandra Boggs/University of Tennessee, Knoxville, Ramin Arvin/University of Tennessee, Knoxville, Asad Khattak/University of Tennessee, Knoxville

Aptitudes for Regulating Autonomous Vehicles: A Survey of Municipal Officials (20-00288) - B430

Annie Hudson/Massachusetts Institute of Technology (MIT), Yonah Freemark/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT)

Autonomous Vehicle Impacts on Traffic: Model Contrast for Two Cities (20-00048) - B444

Derek Hungness/North Dakota State University, Raj Bridgelall/North Dakota State University

There's No One Behind the Wheel: Assessing How Automated Vehicles Are Defined in the Literature (20-00598) - B431

Koen Faber/Universiteit Utrecht, Dea van Lierop/Universiteit Utrecht, Dick Ettema/Universiteit Utrecht

Attitudes Toward Privately-Owned and Shared Autonomous Vehicles (20-00616) - B432

Sicheng Wang/Rutgers, The State University of New Jersey, Zhiqiu Jiang/Rutgers, The State University of New Jersey, Robert Noland/Rutgers, The State University of New Jersey, Andrew Mondschein/Rutgers, The State University of New Jersey

Roadmap for Incorporating Autonomy and Connectivity: Modeling Mobility Impacts in Simulation (20-02523) - B436

Shoaib Samandar/North Carolina State University, Soumya Sharma/North Carolina State University, Nagui Rouphail/North Carolina State University, Eleni Bardaka/North Carolina State University, Billy Williams/North Carolina State University, George List/North Carolina State University

User Willingness to Delegate Conventional Driving to Autonomous Driving System Under Different Contexts (20-03441) - B437

Diwas Thapa/University of Memphis, Vit Gabrhel/University of Memphis, Sabyasachee Mishra/University of Memphis, Mohamed Osman/University of Memphis, Mihalis Golias/University of Memphis, Dariana Havlíčková/University of Memphis, Petr Zámečník/University of Memphis

Investment in Innovative Technology Versus Traditional Infrastructure Improvements: A Preliminary Analysis of CAV Implementation for Network Bottleneck Removal in Maryland (20-04152) - B443

Eirini Kastrouni/University of Maryland, College Park, Carlos Carrion/University of Maryland, College Park, Lei Zhang/University of Maryland, College Park

A Structural Equation Modeling for Analyzing Public Acceptance of Autonomous Vehicle in Korea (20-05535) - B440

Kyuok Kim/The Korea Transport Institute (KOTI), sun cho/The Korea Transport Institute (KOTI)

A Gray Consistency Optical Flow Algorithm Based on Mask-R-CNN and Spatial Fitter for Velocity Calculation (20-05300) - B446

Xuemei Chen/Beijing Institute of Technology, Yangjiaxin Ou/Beijing Institute of Technology, Mengxi Li/Beijing Institute of Technology, Zijia Wang/Beijing Institute of Technology

Adaptive Testing Scenario Library Generation for Connected and Automated Vehicles (20-01534) - B434

Shuo Feng/University of Michigan, Transportation Research Institute, Yiheng Feng/University of Michigan, Transportation Research Institute, Haowei Sun/University of Michigan, Transportation Research Institute, Yi Zhang/University of Michigan, Transportation Research Institute, Henry Liu/University of Michigan, Transportation Research Institute

Challenges for the Remote Operation of Vehicles (20-05779) - B441

Noah Goodall/Virginia Department of Transportation

Stated Acceptance and Behavioral Responses of Drivers Toward Innovative Connected Vehicle Applications (20-03720) - B438

Weixia Li/Tsinghua University, Guoyuan Wu/Tsinghua University, Danya Yao/Tsinghua University, Yi Zhang/Tsinghua University, Kanok Boriboonsomsin/Tsinghua University, Matthew Barth/Tsinghua University

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Exploring the Who, What, Where, When, and Why of Automated Vehicle Disengagements (20-01865) - B435

Alexandra Boggs/University of Tennessee, Knoxville, Ramin Arvin/University of Tennessee, Knoxville, Asad Khattak/University of Tennessee, Knoxville

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Monday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A
**Safety Data, Analysis, and Evaluation, Act IV: Rollover, Trucks, Wildlife, and Other Crash Circumstances
Explored (Act I, Session 1338; Act II, Session 1339; Act III, Session 1340)**
Karim El-Basyouny, University of Alberta, presiding
Sponsored By Standing Committee on Safety Data, Analysis and Evaluation

2017 Fatal Rollover Crashes in the United States (20-00333) - B300
Susan Paulus/Lakeside Engineers, LLC
Examining Drivers` Injury Severity of Two-Vehicle Crashes Between Passenger Cars and Light Motor Trucks (20-00392) - B301
Jia Yang/Toyota Transportation Research Institute, Peng Ren/Toyota Transportation Research Institute, Ryosuke Ando/Toyota Transportation Research Institute
Associations Between Regional Variation in Self-Reported Psychological Characteristics and Automobile Fatality Rates (20-00506) - B302
Dustin Wood/Alabama Transportation Institute, Praveena Penmetsa/Alabama Transportation Institute, Emmanuel Adanu/Alabama Transportation Institute, Peter Rentfrow/Alabama Transportation Institute, Peter Harms/Alabama Transportation Institute, Samuel Gosling/Alabama Transportation Institute, Jeff Potter/Alabama Transportation Institute
Analysis and Modeling of Ramp-Related Crashes in Tennessee (20-00951) - B319
Cam'Ron Mckinney/Tennessee State University, Christian Mbuya/Tennessee State University, Deo Chimba/Tennessee State University, Suleiman Swai/Tennessee State University
Injury Severity Effects of an Active Traffic Management System Using Bayesian Modeling (20-01893) - B303
Zulqarnain H. Khattak/Oak Ridge National Laboratory, Michael D. Fontaine/Oak Ridge National Laboratory
Toward Reducing the Number of Crashes During Hurricane Evacuation: Assessing the Potential Safety Impact of Adaptive Cruise Control Systems (20-01922) - B304
Rezaur Rahman/University of Central Florida, Samiul Hasan/University of Central Florida, Mohamed Zaki/University of Central Florida
Single-Vehicle Truck Accidents: An Analysis of Injury Severity in the Context of Developing Countries (20-02482) - B305
Ehsan Rahimi/University of Illinois, Chicago, Ali Shamshiripour/University of Illinois, Chicago, Amir Samimi/University of Illinois, Chicago, Abolfazl (Kouros) Mohammadian/University of Illinois, Chicago
Assessing the Variation of Curbside Safety at the City Block Level (20-02756) - B306
Aditya Medury/University of California, Berkeley, Dimitris Vlachogiannis/University of California, Berkeley, Offer Grembek/University of California, Berkeley
Lane Change Risk Modeling and Vehicle Trajectory Optimization at Highway Diversion Area (20-02778) - B307
Qi Lin/Southeast University, Chengcheng Xu/Southeast University, Pan Liu/Southeast University
Investigating the Severity of Crashes from the NAIS Database in China Using Structural Equation Modeling (20-02801) - B308
Zijian Ding/Southeast University, Chengcheng Xu/Southeast University, Qikang Zheng/Southeast University, Yuxuan Wang/Southeast University
Evaluation of the Relationship Between Driving Speed and Crashes on Urban and Suburban Arterials (20-03906) - B318
Jessica Hutton/Burns & McDonnell, Daniel Cook/Burns & McDonnell, Joseph Grotheer/Burns & McDonnell, Michel Conn/Burns & McDonnell
Severity Analysis of Wildlife–Vehicle Crashes Using Generalized Structural Equation Modeling (20-03930) - B309
Iman Gharraie/University of Saskatchewan, Emanuele Sacchi/University of Saskatchewan
Differences in Crash/Near-Crash Risk by Types of Distraction: A Comparison of Trends Between Freeways and Two-Lane Highways Using Naturalistic Driving Data (20-03977) - B310
Anshu Bamney/Michigan State University, Nusayba Megat-Johari/Michigan State University, Trevor Kirsch/Michigan State University, Peter Savolainen/Michigan State University
Evaluation of Strategies to Mitigate Culvert-Involved Crashes (20-03980) - B311
Hitesh Chawla/Michigan State University, Megat-Usamah Megat-Johari/Michigan State University, Peter Savolainen/Michigan State University, Christopher Day/Michigan State University

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How Is Injury Severity Affected by Driver Errors: A Crash Data–Based Investigation (20-04054) - B312
Mohammad Razaur Shaon/University of Wisconsin, Milwaukee, Xiao Qin/University of Wisconsin, Milwaukee

Examining the Underlying Exposures of Hit-and-Run and Non-Hit-and-Run Crashes (20-04254) - B313
Guopeng Zhang/Southwest Jiaotong University, Yingfei Fan/Southwest Jiaotong University, Xiang Li/Southwest Jiaotong University, Wei Bai/Southwest Jiaotong University, Mengmeng Wei/Southwest Jiaotong University, Xinguo Jiang/Southwest Jiaotong University

Impact of Demographics of All Drivers on the Highest Driver Injury Severity in Multi-Vehicle Crashes of Rural Two-Lane Roads in California (20-04801) - B314
Md Julfiker Hossain/University of Connecticut, John Ivan/University of Connecticut, Shanshan Zhao/University of Connecticut, Kai Wang/University of Connecticut, Sadia Sharmin/University of Connecticut, Nalini Ravishanker/University of Connecticut, Eric Jackson/University of Connecticut

Exploring Temporal Distribution of Crash Counts in California (20-04949) - B315
Wen Cheng/California State Polytechnic University, Pomona, Mankirat Singh/California State Polytechnic University, Pomona, Edward Clay/California State Polytechnic University, Pomona, Jerry Kwong/California State Polytechnic University, Pomona, Menglu Cao/California State Polytechnic University, Pomona, Yihua Li/California State Polytechnic University, Pomona

Effect of Speed Reductions on Collisions: A Controlled Before-and-After Study in Quebec, Canada (20-05054) - B316
Marie-Soleil Cloutier/INRS-Urbanisation Culture Societe, Ugo Lachapelle/INRS-Urbanisation Culture Societe

Analysis of Wrong-Way Driving Crash Severity on Arterials (20-05220) - B317
Cecilia Kadeha/Florida International University, Henrick Haule/Florida International University, MD Sultan Ali/Florida International University, Priyanka Alluri/Florida International University, Raj Ponnaluri/Florida International University

Investigation of Injury Severities in Single-Vehicle Crashes in North Carolina Using Mixed Logit Models (20-05705) - B322
Mohammad Jalayer/Rowan University, Carlos Roque/Rowan University

Effect of Reducing and Enforcing Speed Limits in Selected Arterial Roads in Bogota (20-05723) - B323
Jose Segundo Lopez Valderrama/World Resources Institute, David Perez-Barbosa/World Resources Institute, Natalia Lleras/World Resources Institute, Darío Hidalgo/World Resources Institute, Claudia Adriazola-Steil/World Resources Institute

Factors Contributing to Single-Vehicle and Multiple-Vehicle Crashes on Express Lane Facilities (20-06060) - B320
Angela Kitali/Florida International University, Emmanuel Kidando/Florida International University, Boniphace Kutela/Florida International University, Cecilia Kadeha/Florida International University, Priyanka Alluri/Florida International University, Thobias Sando/Florida International University

A Comprehensive Examination of Highway Secondary Crash Risk Factors (20-02138) - B324
Ming Lee/Florida International University, Armana Huq/Florida International University, Xia Jin/Florida International University

Examination of Factors Affecting Injury Severity in Crashes Occurring on Interstate Freeways by Vehicle Type: Analysis of the Arizona Megaregion (20-02652) - B321
Cristopher Aguilar/Northern Arizona University, Emmanuel James/Northern Arizona University, Brendan Russo/Northern Arizona University, Edward Smaglik/Northern Arizona University

1357

Monday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A
Intersection Safety in Focus
George Yannis, National Technical University of Athens (NTUA), presiding
Sponsored By Standing Committee on Safety Data, Analysis and Evaluation

Rural Intersection-Related Crashes and Injury Severities in Tennessee (20-00955) - B369
Dominique Wallace/Tennessee State University, Tinotenda Jonga/Tennessee State University, Deo Chimba/Tennessee State University, Suleiman Swai/Tennessee State University

Analyzing the Traffic Circles as They Pertain to Crash Severity (20-00957) - B368
KeAnna Dakwa/Tennessee State University, Ethan Messimore/Tennessee State University, Deo Chimba/Tennessee State University, Suleiman Swai/Tennessee State University

A Before-After Evaluation of Left Turn Lane Extension: Considering Injury Severity and Collision Type (20-01409) - B367
Yanyong Guo/University of British Columbia, Tarek Sayed/University of British Columbia

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Cycle-by-Cycle Crash Risk Analysis at Signalized Intersections by Considering Shockwave Characteristics (20-01626) - B366

Jinghui Yuan/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Lishengsa Yue/University of Central Florida, Qing Cai/University of Central Florida

Comparison of State-of-the-Art Observational Before-After Analysis Methods in Traffic Safety: A Case Study of the Red Light Running Program in New Jersey (20-01888) - B365

Di Yang/New York University, Kun Xie/New York University, Kaan Ozbay/New York University, Hong Yang/New York University, Bekir Bartin/New York University, Chuan Xu/New York University, Abhinav Bhattacharyya/New York University

Influencing Factors for Right Turn Lane Crash Frequency from Multi-Source Data Sets (20-02070) - B364

Lu Ling/Purdue University, wenbo zhang/Purdue University, Jie Bao/Purdue University, Satish Ukkusuri/Purdue University

Estimate of the Safety Effect of All-Way Stop Control Conversion: A Case Study in Washington, D.C. (20-03859) - B363

Zuxuan Deng/District Department of Transportation, Sergiy Kyrychenko/District Department of Transportation, Taylor Lee/District Department of Transportation, Richard Retting/District Department of Transportation

Post-Encroachment, Time-Based Risk Characterization at Un-Signalized T-Intersections Operating Under Mixed Traffic Conditions (20-04461) - B373

Jaydip Goyani/Sardar Vallabhbhai National Institute of Technology, Surat, Nishant Pawar/Sardar Vallabhbhai National Institute of Technology, Surat, Ninad Gore/Sardar Vallabhbhai National Institute of Technology, Surat, Manish Jain/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat

Vulnerability Assessment of Urban Intersections Apropos of Incident Impact on Road Network and Identification of Critical Intersections: A Case Study of Kolkata City (20-04503) - B374

Kaniska Ghosh/Indian Institute of Technology, Kharagpur, Bhargab Maitra/Indian Institute of Technology, Kharagpur

Evaluating Crash Type Likelihood at Various Traffic Control Devices: A Multi-Nomial Logistic Regression Approach Using HSIS Data (20-04710) - B375

Alyssa Ryan/University of Massachusetts, Amherst, Michael Knodler/University of Massachusetts, Amherst

Examining Driver Injury Severity in Left Turn Crashes Using Hierarchical Ordered Probit Models (20-04782) - B377

Zhao Zhang/University of Utah, Runan Yang/University of Utah, Glenn Blackwelder/University of Utah, Xianfeng Yang/University of Utah

A Comparison Between SSAM and Real-Time Safety Models in Predicting Field-Measured Conflicts at Signalized Intersections (20-00438) - B378

Mohamed Essa/The University of British Columbia, Tarek Sayed/The University of British Columbia

Understanding the Safety Impact of Protected Intersections Design Elements: A Driving Simulation Approach (20-05955) - B376

Aikaterini Deliali/University of Massachusetts, Amherst, Nicholas Campbell/University of Massachusetts, Amherst, Michael Knodler/University of Massachusetts, Amherst, Eleni Christofa/University of Massachusetts, Amherst

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Monday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A

Focus on Pedestrian and Bicycle Safety
Ward Vanlaar, Traffic Injury Research Foundation, presiding
Sponsored By Standing Committee on Safety Data, Analysis and Evaluation

In-Depth Approach for Identifying Crash Causation Patterns and Its Implications for the Development of Active Pedestrian Safety Systems (20-01440) - B330

Lishengsa Yue/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Yina Wu/University of Central Florida, Ou Zheng/University of Central Florida

Impact of Right Turn Channelization on Pedestrian Safety at Signalized Intersections (20-01525) - B331

Ting Fu/Tongji university, college of transportation engineering, Chaozhe Jiang/Tongji university, college of transportation engineering, Rui Qiu/Tongji university, college of transportation engineering, Liping Fu/Tongji university, college of transportation engineering, Binglei Xiong/Tongji university, college of transportation engineering, Zhengyang Lu/Tongji university, college of transportation engineering

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Development of Multinomial and Ordinal Logistic Models for Bicyclist and Pedestrian Crashes Across Divisions 13 and 14 of North Carolina (20-02263) - B332

Yaa Acquaah/North Carolina Agricultural and Technical State University, John Vine-Hodge/North Carolina Agricultural and Technical State University, Hyoshin Park/North Carolina Agricultural and Technical State University

Pedestrian Collisions with Bicyclist: Emotion Mining Using YouTube Data (20-02468) - B333

Subasish Das/Texas A&M Transportation Institute, Xiaoqiang Kong/Texas A&M Transportation Institute, Ruihong Wang/Texas A&M Transportation Institute, Ahmadreza Mahmoudzadeh/Texas A&M Transportation Institute

Exploring Factors Influencing Injury Severity of Accidents Between Motor Vehicles and Non-Motor Vehicles Using Generalized Ordered Logit Model (20-03424) - B334

Tong Zhu/Chang'an University, Changshuai Wang/Chang'an University, Hongtai Yang/Chang'an University

Pedestrian Safety Analysis at Urban Midblock Sections Under Mixed Traffic Conditions Using Time to Collision as Surrogate Safety Measure (20-03513) - B335

Hareshkumar Golakiya/Sardar Vallabhbhai National Institute of Technology, Surat, Ashish Dhamaniya/Sardar Vallabhbhai National Institute of Technology, Surat

Traffic Safety Countermeasures: Considering Impacts on Pedestrian and Bicyclist Safety (20-04754) - B339

Darren Torbic/MRIGlobal, Dan Cook/MRIGlobal, Jessica Hutton/MRIGlobal

Identifying High-Risk Locations to Address Pedestrian Safety Issues (20-04899) - B336

Srinivas Geedipally/Texas A&M Transportation Institute, Minh Le/Texas A&M Transportation Institute, Kay Fitzpatrick/Texas A&M Transportation Institute, Raul Avelar/Texas A&M Transportation Institute

An Exploratory Parameter Sensitivity Analysis of Bicycle–Vehicle Conflicts Using the Surrogate Safety Assessment Model (20-05024) - B359

Brendan Russo/Northern Arizona University, David Lemcke/Northern Arizona University, Emmanuel James/Northern Arizona University, Edward Smaglik/Northern Arizona University, Yi Wang/Northern Arizona University, Chris Monsere/Northern Arizona University

Pedestrian Fatal Crash Location Analysis in Ohio Using ESDA Techniques (20-05107) - B337

Rebekka Apardian/University of Toledo, Bhuiyan Alam/University of Toledo

Analysis of Factors Affecting the Injury Severity in E-Bike with Vehicle Crashes in Taiwan (20-05153) - B338

Ming-heng Wang/Taiwan Police College, Steven Schrock/Taiwan Police College

Understanding Factors Influencing Aging Pedestrian Fatalities Using Bayesian Networks (20-05172) - B340

Jason Owens/Florida A&M University, Doreen Kobelo/Florida A&M University, Luciano Lalika/Florida A&M University, Thobias Sando/Florida A&M University, Angela Kitali/Florida A&M University

Comparison of Non-Motorist Injury Severities in Rural and Urban Areas in Florida (20-05619) - B341

Rakesh Rangaswamy/University of South Florida, Elzbieta Bialkowska-Jelinska/University of South Florida, Cong Chen/University of South Florida, Pei-Sung Lin/University of South Florida, Athanasios Theofilatos/University of South Florida

Modeling Pedestrian Injury Severity in Dhaka, Bangladesh (20-05645) - B342

Mahmudur Fatmi/University of British Columbia, Okanagan, Bijoy Saha/University of British Columbia, Okanagan, Md. Mizanur Rahman/University of British Columbia, Okanagan

Spatio-Temporal Analysis of Collision Frequency and Injury Severity Involving Unconventional Modes, Pedestrians, and Transit in Dhaka, Bangladesh (20-05847) - B343

Bijoy Saha/University of British Columbia, Okanagan, Mahmudur Fatmi/University of British Columbia, Okanagan, Md. Mizanur Rahman/University of British Columbia, Okanagan

Pedestrian Crashes, Demographics, and Land Uses: Insights from Integrated Geo-Location Data (20-00388) - B344

Rui Guo/University of Florida, Zhiqiang Wu/University of Florida, Yu Zhang/University of Florida, Pei-Sung Lin/University of Florida, Zhenyu Wang/University of Florida

How and What Factors Influence the Injury Severity in Single-Bicycle Crashes (20-01934) - B345

Marcus Skyum Myhrmann/Danmarks Tekniske Universitet, Kira Janstrup/Danmarks Tekniske Universitet, Mette Møller/Danmarks Tekniske Universitet, Stefan Mabit/Danmarks Tekniske Universitet

U.S. Fatal Pedestrian Crash Hot Spot Locations and Characteristics (20-02402) - B346

Robert Schneider/University of Wisconsin, Milwaukee, Rebecca Sanders/University of Wisconsin, Milwaukee, Frank Proulx/University of Wisconsin, Milwaukee

Investigation of Safety in Numbers for Pedestrians and Bicyclists at a Macroscopic Level with Various Exposure Variables (20-03549) - B349

Jaeyoung Lee/Central South University, Mohamed Abdel-Aty/Central South University, Qing Cai/Central South University

Does Walkable and Bikeable Mean Safe for Walking and Cycling? (20-03773) - B350

Ahmed Osama/Ain Shams University, Maria Albitar/Ain Shams University, Tarek Sayed/Ain Shams University, Alexander Bigazzi/Ain Shams University

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Regional Bicycle Safety Analysis in the Maricopa Region Based on Crash Report Review (20-04215) - B351

Mohammad Saad Shaheed/Maricopa Association of Governments, Randy Dittberner/Maricopa Association of Governments

Wisconsin Pedestrian Crashes, 2008–2017 (20-04507) - B352

Chris McCahill/University of Wisconsin, Madison, Mark Bennett/University of Wisconsin, Madison

Is Bicycling Getting Safer for Adults?: Age-Specific Bicycle Fatality Rates from Four Exposure Metrics, 1985–2017 (20-05462) - B353

Nicholas Ferenchak/University of New Mexico, Wesley Marshall/University of New Mexico

Modeling Vehicle–Pedestrian Interactions Using a Non-Probabilistic Regression Approach (20-05550) - B354

Hiba Nassereddine/University of Wisconsin, Madison, Kelvin Santiago-Chapparro/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison

Exploring the Pedestrian and Bicycle Crash Risk in Highway Intersections: Systemic Approach Applied in the Twin Cities Metro Area (20-05628) - B355

Tao Tao/University of Minnesota

Toward Vision Zero for Cyclists: New Insights and Methods for Assessing Bicycle Crash Severity (20-05700) - B356

Steven Lavrenz/Wayne State University, Kerrick Hood/Wayne State University, Stephen Remias/Wayne State University

Far from Zero: U.S. Pedestrian Fatality Trends, 1977–2016 (20-05733) - B347

Robert Schneider/University of Wisconsin, Milwaukee

Characteristics and Circumstances of Injuries Related to the Use of Scooters and Other "Personal Transportation Devices" as Indicated by U.S. National Emergency Room Data (20-05846) - B357

Kevin Fang/Sonoma State University

Pedestrian Safety Analysis of Urban Intersections in Kolkata, India, Using a Combined Proactive and Reactive Approach (20-05873) - B358

Dipanjan Mukherjee/The World Bank, Sudeshna Mitra/The World Bank

Pedestrian Fatalities in Darkness: What Do We Know and What Can Be Done? (20-06009) - B348

Rebecca Sanders/Arizona State University, Robert Schneider/Arizona State University, Frank Proulx/Arizona State University

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1484

Monday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A

Through the Looking Glass of Gender Issues: Mobility Challenges Across the World
Dawn Hood, University of Minnesota, Twin Cities, presiding
Sponsored By Standing Committee on Women's Issues in Transportation

Do Stated Customer Preferences Depend on the Expected Perceptions of Others?: Evidence from the #MeToo Scandal (20-00714) - A130

Laila AIT BIHI OUALI/Imperial College London, Daniel Graham/Imperial College London

Observing Gendered Interdependent Mobility Barriers Using an Ethnographic Approach (20-01859) - A131

Paola Jirón/Universidad de Concepcion, Juan Carrasco/Universidad de Concepcion

Risk, Personality, Cost, or Household Tasks?: Hypothesis Testing of Gender Differences in Plug-in Electric Vehicle Interest (20-02814) - A132

K. Sydny Fujita/Lawrence Berkeley National Laboratory, Hung-Chia Yang/Lawrence Berkeley National Laboratory, Margaret Taylor/Lawrence Berkeley National Laboratory, C. Anna Spurlock/Lawrence Berkeley National Laboratory

Gender Differences on the Influence of Personal Values on Attitudes, Intentions, and Actual Cycling and Walking (20-03124) - A133

Lidón Mars/Universitat Politecnica de Valencia, Tomas Ruiz/Universitat Politecnica de Valencia, Rosa Arroyo/Universitat Politecnica de Valencia

Do Mobility-Related Gender Differences Vary Across Countries?: Comparing France, Germany, and the United States (20-03698) - A134

Clotilde Minster/The World Bank, Jimmy Armoogum/The World Bank, Stacey Bricka/The World Bank

Exploring Gender Effects on Electric Vehicle Charging Behavior: Preference or Inequity? (20-05393) - A135

Noam Baharav/University of California, Davis, Debapriya Chakraborty/University of California, Davis, Gil Tal/University of California, Davis

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Perceived Service Quality of Public Buses in Dhaka City Through the Lens of Female Commuters (20-05792) - A 136

Tanzila Islam/Islamic University of Technology (IUT), Moinul Hossain/Islamic University of Technology (IUT), Dewan Mahboob Hossain/Islamic University of Technology (IUT)

Gender Differences in Daily Mobility Behaviors Among Workers (20-01522) - A137

Nathalie Havet/Universite Claude Bernard Lyon 1, Caroline Bayart/Universite Claude Bernard Lyon 1, Patrick Bonnel/Universite Claude Bernard Lyon 1

40 Years of Women's Issues in Transportation: A Systematic Literature Review (20-06017) - A138

Alireza Ermagun/Mississippi State University, Saeed Jamalzadeh/Mississippi State University

1359

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 146C
Our Aging Population and Its Implication on Transportation: Annual Trends Session
Hyun-A Park, Spy Pond Partners, LLC, presiding
Sponsored By Technical Activities Council

As our population ages, the transportation system faces significant challenges. Seniors need access to affordable and appropriate transportation options to maintain their health and quality of life. Meeting seniors' mobility needs while minimizing safety risks is challenging. Diversity among seniors makes the development of sound policies and initiatives complicated.This session will examine the trends in our aging population and the implication for our transportation system. The session will present current aging trends and the trends of age-related transportation issues. A panel of distinguished transportation professionals will share their perspectives on these trends and their views with regard to transportation and aging.

Panel Discussion (P20-21169)
Margaret Melinda McGrath/Mississippi Department of Transportation, Nathaniel Ford/Jacksonville Transportation Authority, Diane Gutierrez-Scaccetti/New Jersey Department of Transportation, Michael Ableson/Arrival Automotive - North America
Aging and Transportation Trends (P20-21833)
Patricia Hu/OST-R/Bureau of Transportation Statistics

1360

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 152A
Applying Organizational Management Practices to Transportation Agencies
Jason Bittner, Applied Research Associates, Inc. (ARA), presiding
Sponsored By Standing Committee on Management and Productivity

During this session, leaders and managers at transportation agencies and industry partners will share practices on how they continually improve productivity and performance though the application of organizational management innovations and technologies. Panelist will describe effective organizational models, leadership structures, and competencies used to monitor, respond to and implement organizational management practices. Panelist will also share leading practices in the application of process/quality improvement tools and practices.

Aligning Organizational Structure with Strategic Direction in Transportation Agencies (20-04266)
Alex Hanson/Sam Schwartz, Michael Flynn/Sam Schwartz
Using Tools and Technologies to Change the Way DOTs Do Business (BIM Focus) (P20-20828)
Philip Bell/Applied Research Associates, Inc. (ARA)
Lessons from the NCHRP Essential Capability for the Future Transportation Agency Study (P20-21678)
Lori Richter/Spy Pond Partners, LLC
Building a Culture of Innovation at State Transportation Agenceis (P20-21679)
Joe Crossett/High Street Consulting Group, LLC
Transforming Organizational Cultures (P20-21680)
Charlene McArthur/Idaho Transportation Department

1361

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 152B
Making the Business Case for Asset Management
Timothy Henkel, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Transportation Asset Management

Making the business case for transportation asset management (TAM) seems simple enough yet many agencies and asset managers find it difficult to put TAM into practice. TAM is a process to deliver the best transportation system performance with available resources. It can be difficult even for mature transportation agencies to find the right balance to put TAMP practices and principles into action. This session will make the business case for asset management through example agency practices that demonstrate improved efficiency, effectiveness, accountability, and coordination, reduced risk exposure, and more benefit from each dollar invested.

Asset Management in Practice: The Transit Experience (P20-20630)
Laura Zale/Southeastern Pennsylvania Transportation Authority
Return on Investment in Transportation Asset Management Systems and Practices (P20-20491)
William Robert/Spy Pond Partners, LLC
Asset Management in Practice: Caltrans' Performance-Based Approach (P20-20633)
Michael Johnson/California Department of Transportation (CALTRANS)
Successes and Challenges of Implementing a Multimodal Asset Management Program at the Maryland DOT (P20-20489)
Daniel Favarulo/Maryland Department of Transportation

1362

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 154
Next-Generation Parking
Rachel Weinberger, Weinberger & Associates, presiding
Sponsored By Standing Committee on Transportation Demand Management

New approaches to managing parking--including urban parking lots, curbside, and residential parking--are presented in this session.

Testing Curbside Management Strategies to Mitigate the Impacts of Ridehailing Services on Traffic (20-05344)
Andisheh Ranjbari/University of Washington, Jose Machado/University of Washington, Giacomo Dalla Chiara/University of Washington, Don MacKenzie/University of Washington, Anne Goodchild/University of Washington
A Framework for Optimal Allocation of Curbside Space (20-02907)
You Kong/Southwest Jiaotong University, Scott Le Vine/Southwest Jiaotong University, Alejandro Henao/Southwest Jiaotong University, Stanley Young/Southwest Jiaotong University
Linking Residential Parking to Automobile Transportation Impact Outcomes at a Development Level (20-00911)
Kristina Currans/University of Arizona, Gabriella Abou-Zeid/University of Arizona, Nicole Iroz-Elardo/University of Arizona
Parking Resource Allocation Optimization Based on Travel Destination Data (20-01617)
Haonan Guo/Beijing Jiaotong University, Xuedong Yan/Beijing Jiaotong University, Yun Wang/Beijing Jiaotong University, Yu Zhou/Beijing Jiaotong University, Yunlin Guan/Beijing Jiaotong University, Yan Huang/Beijing Jiaotong University

1363

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 149
Insights, Inclusions, and Impact: Highlights from the 2019 Conference on Women's Issues in Transportation
Asha Weinstein Agrawal, San Jose State University, presiding
Sponsored By Standing Committee on Women's Issues in Transportation

The 6th International Conference on Women's Issues in Transportation was held in September, 2019. This session will feature presentations from the conference to spotlight and explore policies, actions, and outcomes for women and others facing gender-based disparity in transportation.

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The History of the WIiT Conferences (P20-21851)
Sandra Rosenbloom/University of Texas, Austin
How Far Have We Come? (P20-21850)
Nancy McGuckin/Travel Behavior Associates
Moving Forward: A Young Scholar's Perspective (P20-21849)
Alyssa Ryan/University of Massachusetts, Amherst
Reducing Harassment and Violence Against Women (P20-21852)
Shari Schaftlein/Federal Highway Administration (FHWA)

1364

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 150B
Dwight David Eisenhower Transportation Fellowship Program Research Showcase, Part 1 (Part 2, Session 1434)
Sponsored By Section - Research and Education

1365

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 151B
Following the Data Chain: Enabling Good Practices in Data-Driven Transport
Zachary Patterson, Concordia University, presiding
Sponsored By Task Force on Data Privacy, Security and Protection Policy

 In this panel session, we explore ererging issues around the use of new forms of data for transportation purposes, focused on areas of the 'data chain' including:Collection: What considerations are emerging as we explore new methods for data collection – including privacy, ethics and representation?Access: What practices are needed to ensure that open-access data are appropriately sourced and defined, and that levels of access are appropriate to the data being shared?Use: What practices are emerging around the use of new forms of data, and how may these change as new data protection guidance emerges?Protection: How can and should data be protected along the data chain given a multiplicity of actors and uses?

1366

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 151A
Evacuations in Short-Notice and No-Notice Scenarios
Arif Mohaimin Sadri, Florida International University, presiding
Sponsored By Standing Committee on Emergency Evacuations

A Revealed Preference Methodology to Evaluate Regret Minimization with Challenging Choice Sets: A Wildfire Evacuation Case Study (20-00177)
Stephen Wong/University of California, Berkeley, Caspar Chorus/University of California, Berkeley, Susan Shaheen/University of California, Berkeley, Joan Walker/University of California, Berkeley
An Agent-Based Model of Short-Notice Tsunami Evacuation in Waikiki, Hawaii (20-01394)
Karl Kim/HDOT/STP, Farnaz Kaviari/HDOT/STP, Pradip Pant/HDOT/STP, Eric Yamashita/HDOT/STP
An Interdisciplinary Agent-Based Tsunami Risk Assessment Model: Novel Approximation of FN Diagram (20-02738)
Chen Chen/Oregon State University, Alireza Mostafizi/Oregon State University, Haizhong Wang/Oregon State University, Daniel Cox/Oregon State University
Mode Choice During No-Notice Emergency Events (20-04140)
Nima Golshani/Georgia Institute of Technology (Georgia Tech), Ramin Shabanpour/Georgia Institute of Technology (Georgia Tech), Abolfazl (Kouros) Mohammadian/Georgia Institute of Technology (Georgia Tech), Joshua Auld/Georgia Institute of Technology (Georgia Tech), Hubert Ley/Georgia Institute of Technology (Georgia Tech)
Household Intended Evacuation Transportation Behavior to Earthquake and Tsunami Hazard in a Cascadia Subduction Zone City (20-03710)
Chen Chen/Oregon State University, Alexandra Buylova/Oregon State University, Cadell Chand/Oregon State University, Haizhong Wang/Oregon State University, Lori Cramer/Oregon State University, Daniel Cox/Oregon State University

1367 CM (1.75)

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 146B
Understanding the Implications of E-Bikes and Considerations for Bicycling in the Rural Context
Roxanne Bash, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Transportation Needs of National Parks and Public Lands

This session will present research and practical application considerations on the topic of bicycling in the rural context and the implications of E-bikes.

Considering the Implications of E-Bikes on Bureau of Land Management Managed Lands (P20-20690)
David Jeppesen/U.S. Department of the Interior (DOI)
Research and Planning for Internal Use of E-Bikes at the Potomac River National Wildlife Refuge Complex (P20-20691)
Naomi Fireman/Western Transportation Institute (WTI)
Drivers' Behavior When Passing Bicyclists Along Rural Recreational Routes (20-04046)
Ahmed Al-Kaisy/Montana State University, David Relph/Montana State University, Rebecca Gleason/Montana State University
Analysis of Overtaking Maneuvers to Cycling Groups on Two-Lane Rural Roads Using Objective and Subjective Risk (20-00529)
GRISELDA LÓPEZ/Universitat Politècnica de València, Pérez-Zuriaga Ana María/Universitat Politècnica de València, Sara Moll/Universitat Politècnica de València, Alfredo Garcia/Universitat Politècnica de València
Meta-Regression of Electric Bicycle Mode Substitution for Driving, Public Transit, Conventional Cycling, and Walking (20-02467)
Alexander Bigazzi/University of British Columbia, Kevin Wong/University of British Columbia

1368 CM (1.75)

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 156
Making the Grade: Municipal Planning Organizations Using Data to Prioritize Investments
J. Matthew Carpenter, Sacramento Area Council of Governments, presiding
Sponsored By Standing Committee on Transportation Programming and Investment Decision-Making

Innovative MPOs are becoming increasingly performance-based in how they select projects and prioritize investments. The three best practices included in the panel will provide insights into new tools and methods that are cost-effective and work well with policy boards comprised of elected officials.

Rational Choices Using Performance-Based Planning and Programming (P20-20809)
Beth Alden/Hillsborough MPO
Connecting the 2050 Plan to the TIP (P20-20810)
James Winters/Northwestern Indiana Regional Planning Commission
Project Prioritization Made Simple (P20-20811)
Allan Fye/Northern Virginia Transportation Commission

1369

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 145A
Machine Learning in the Travel Demand Forecasting Context: A Discussion
Patricia Mokhtarian, Georgia Institute of Technology (Georgia Tech), presiding
Sponsored By Standing Committee on Transportation Demand Forecasting

This session will present a paper on the important step of looking beyond predictive accuracy when assessing the suitability of machine learning in the travel demand forecasting context along with analysis and critique by a panel of discussants

Assessment of Machine Learning Methods Versus Logit Models for Travel Modeling in Practice (20-01485)
Gaurav Vyas/INRO, Peter Vovsha/INRO

(continued)

Responses from Machine Learning Professionals (P20-20794)
Timothy Brathwaite/Lyft, Inc., Marta Gonzalez/University of California, Berkeley, Alexei Pozdnoukhov/University of California, Berkeley

1370

Train Noise and Vibration Reduction at the Source: Recent Success Stories at Rail Transit Properties
Jason Ross, VHB, presiding
Sponsored By Standing Committee on Transportation-Related Noise and Vibration, Standing Committee on Light Rail Transit

Influence of Rail Hardness on Long-Term Track Condition, Corrugation Development, and Rolling Noise Emissions (P20-20990)
Briony Croft/SLR Consulting (Canada) Ltd.
Dramatic Effects of Soft Soils on Vibration Propagation (P20-20991)
Keith Yoerg/ATS Consulting
Use of Commuter Rail Vibration to Predict Future Light Rail Vibration (P20-20992)
Derek Warty/Wilson Ihrig
Forecasting Urban Rail Transit Vehicle Interior Noise and Its Applications in the Optimization of Railway Alignment Design (20-04473)
Yifeng Wang/University at Buffalo, Ping Wang/University at Buffalo, Jianli Cong/University at Buffalo, Zihan Li/University at Buffalo, Qing He/University at Buffalo

1371 CM (1.75)

Electrification of Heavy Duty Trucks for Short and Long Haul Applications
Timothy Lipman, University of California, Berkeley, presiding
Sponsored By Standing Committee on Alternative Transportation Fuels and Technologies, Standing Committee on Transportation Energy

This session will focus on the latest developments for Class 8 heavy-duty truck electrification for shorter and longer haul duty cycles. Participants will learn about truck characteristics, infrastructure requirements, emissions considerations, and policy aspects.

Feasibility of Operating Heavy-Duty Battery Electric Truck Fleet in Drayage Application (20-05824)
Shams Tanvir/Center for Environmental Research & Technology, Fuad Un-Noor/Center for Environmental Research & Technology, Kanok Boriboonsomsin/Center for Environmental Research & Technology, Zhiming Gao/Center for Environmental Research & Technology
Which Heavy-Duty ZEV Drivetrains Are "Winners"?: Simulating Competition and Adoption of Short- and Long-Haul Trucks in British Columbia, Canada (20-02805)
Seyedmojtaba Lajevardi/University of Victoria, Jonn Axsen/University of Victoria, Curran Crawford/University of Victoria
Analysis of Advanced Battery-Electric Long Haul Trucks: Batteries, Performance, and Economics (P20-20632)
Lewis Fulton/University of California, Davis
Long-Haul Battery Electric Trucks Are Technically Feasible and Economically Compelling (P20-21088)
Amol Phadke/Lawrence Berkeley National Laboratory

1372

Transformation Technologies, Market Shares, and Economic Outcomes
Sharada Vadali, Economic Insights and Research, presiding
Sponsored By Standing Committee on Transportation and Economic Development

Transport Network Companies and Reallocation of Motorpark: Evidence from Colombia (20-02339)
Daniel Perez/Inter-American Development Bank, Isabel Granada/Inter-American Development Bank, Mateo Uribe-Castro/Inter-American Development Bank

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Do Personalized Economic Incentives Work in Promoting Shared Mobility?: Examining Customer Churn Using a Time-Varying Cox Model (20-01338)
Songhua Hu/University of Maryland, College Park, Peng Chen/University of Maryland, College Park, Xiaohong Chen/University of Maryland, College Park

Analyzing the Shift in Travel Modes' Market Shares with the Deployment of Autonomous Vehicle Technology (20-02918)
Moein Khaloei/University of Washington, Andisheh Ranjbari/University of Washington, Don MacKenzie/University of Washington

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1373

Various Facets of Context Sensitive Solutions: Performance, Implementation, and Opportunities
Faisal Hameed, EXP, presiding
Sponsored By Section - Design, Subcommittee on Context Sensitive Solutions

The lectren session will include presentations on various facets of Context Sensitive Design/Solutions (CSS) and the experience with implementing CSS practices, there performance, and various challenges and opportunities.

How's That Diet Working?: A Synthesis of Studies Since the Road Diet Informational Guide (20-02385)
Peter Ohlms/Virginia Department of Transportation, Lance Dougald/Virginia Department of Transportation

A Context-Sensitive Solution in Allston Balancing the Needs of Engineers, Abutters, Operators, and Travelers (20-03533)
Matthew Ciborowski/Arup USA, Jessica Galbo Maul/Arup USA, Keri Pyke/Arup USA

Complete Streets: Promises and Proof (20-03614)
Samuel Jordan/University of Memphis, Stephanie Ivey/University of Memphis

Design for Sustainability in Saudi Arabia (P20-21665)
Mohammed Al Suhibani/Saudi Arabia Ministry of Municipal and Rural Affairs, Michael Jelen/AECOM

1374

Safety Effects of Geometric Design Elements and Site Conditions
John Milton, Washington State Department of Transportation, presiding
Sponsored By Standing Committee on Geometric Design

Safety Effects of Geometric Design Criteria: Horizontal Curve Reliability Index (20-00436)
Scott Himes/VHB, Eric Donnell/VHB

Determining Skid Resistance Needs on Horizontal Curves for Different Levels of Precipitation (20-03804)
Srinivas Geedipally/Texas A&M Transportation Institute, Subasish Das/Texas A&M Transportation Institute, Michael Pratt/Texas A&M Transportation Institute, Dominique Lord/Texas A&M Transportation Institute

Impact of Geometric Design Elements on Wrong-Way Driving Incidents at Unsignalized Partial Cloverleaf Interchange Terminal (20-04983)
Qing Chang/Auburn University, Huaguo Zhou/Auburn University, Yukun Song/Auburn University, Md Atiquzzaman/Auburn University

Left Turn Lane Offset: Research Synthesis and Review of Existing Guidelines (20-04248)
Yu Song/University of Wisconsin, Madison, Madhav Chitturi/University of Wisconsin, Madison, William Bremer/University of Wisconsin, Madison, Andrea Bill/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison

1375

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 204A
Taking It to the Streets: Strategies for Protecting the Public Realm of Urban Thoroughfares
Craig Churchward, HDR, presiding
Sponsored By Standing Committee on Landscape and Environmental Design

This session will focus on protecting open spaces, streets and sidewalks from those that would use a vehicle as a weapon by implementing street and sidewalks design strategies that integrate security design with CPTED, utilizing sustainable design concepts. The panel will present numerous case study examples.

Design—or Design Retrofit—of Public Spaces for Security and Safety Without Compromising the Public Realm (P20-20288)
Len Hopper/Weintraub Diaz
Infrastructure Protection (P20-20328)

Understanding Security Design Challenges Faced by Designers of Public Spaces (P20-20332)
Robert Peck/Gensler
Security for U.S. Parks: Lessons Learned at the U.S. Park Police (P20-20333)
Mark Adamchik/U.S. National Park Service

1376

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 209A
Treatment of Highway Stormwater Runoff
Seth Brown, Storm and Stream Solutions, LLC, presiding
Sponsored By Standing Committee on Stormwater

This session will explore current research, emerging treatment technologies, and case studies of treatment controls in urban areas. Attendees will learn about current stormwater runoff treatment approaches and lessons learned. The first paper will review initial results of a study on compost filter blankets. The second paper will describe the benefits of treating stormwater with biochar. The final paper will describe the challenges and successes of designing and operating BMPs in Washington DC.

Preliminary Data on Vegetated Compost Blankets as Highway Stormwater Control Measures (P20-20050)
Allen Davis/University of Maryland, College Park, ahmet aydilek/University of Maryland, College Park, Erica Forgione/University of Maryland, College Park
Enhancement of Stormwater Infiltration, Water Retention, Nutrient Removal, and Plant Growth in Bioretention Media Through Biochar Amendment (P20-20051)
Paul Imhoff/University of Delaware
Practical Lessons Learned on Design and Implementation of BMPs in the Right of Way (P20-20052)
Steve Saari/District Department of Energy and Environment
The Transportation Stormwater Best Management Practice Database: 36,000-Foot Summary: How This Effort Can Help You and Your Agency (P20-20055)
Eric Strecker/Independent Consultant

1377

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 208
Parameters and Methods for Asphalt Pavement Design
Leslie McCarthy, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Design and Rehabilitation of Asphalt Pavements

Fatigue-Based Structural Layer Coefficient of High Polymer-Modified Asphalt Mixtures (20-00315)
Jhony Habbouche/Virginia Transportation Research Council, Elie Hajj/Virginia Transportation Research Council, Peter E. Sebaaly/Virginia Transportation Research Council, Adam Hand/Virginia Transportation Research Council

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A Generalized Methodology to Develop Mechanistically Informed Asphalt Mixture Layer Coefficients for AASHTO 1993 Pavement Design Approach (20-04546)
Rasool Nemati/University of New Hampshire, Eshan Dave/University of New Hampshire, Jo Sias/University of New Hampshire

Performance Evaluation of Hot Mix and Warm Mix Asphalt Overlay Layers Based on Field Measurements and Finite Element Viscoelastic Simulations (20-03873)
Hossein Alimohammadi/Iowa State University, Junxing Zheng/Iowa State University, Ashley Buss/Iowa State University, Vernon Schaefer/Iowa State University, Christopher Williams/Iowa State University, Guangfan Zheng/Iowa State University

Relationship Between Backcalculated and Estimated Asphalt Concrete Dynamic Modulus with Respect to FWD Load and Temperature (20-05209)
Nathan Bech/University of Pittsburgh, Julie Marie Vandenbossche/University of Pittsburgh

1378

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 202B
Accelerated Bridge Construction Connections Between Substructure Elements: Innovative Details
Ahmad Abu-Hawash, Iowa Department of Transportation, presiding
Mary Lou Ralls Newman, Ralls Newman, LLC, presiding
Sponsored By Section - Structures, Subcommittee on Accelerated Bridge Construction, Standing Committee on General Structures, Standing Committee on Steel Bridges, Standing Committee on Concrete Bridges, Standing Committee on Seismic Design and Performance of Bridges, Section - Construction, Standing Committee on Construction of Bridges and Structures

Prefabrication of bridge substructures offers significant time savings for onsite construction of bridges . Connections between prefabricated caps and columns, columns and footings, and footings and foundations become the critical links to good long-term performance of these substructures. This session discusses design details, ABC guide specification requirements, and latest research for prefabricated substructure connections.

An Outdoor Test of a Prefabricated Column-Pile Cap-Pile System Under Combined Vertical and Lateral Loads (20-03453)
Zhao Cheng/Southeast University, Sri Sritharan/Southeast University, Jeramy Ashlock/Southeast University

Comparison of Seismic Performance of Two Types of Pocket Connections for RC Bridge Column Base Hinges (20-03993)
Jared Jones/University of Nevada, Reno, Elmira Shoushtari/University of Nevada, Reno, Mehdi Saiidi/University of Nevada, Reno, Ahmad Itani/University of Nevada, Reno

Cyclic Test of Concrete Bridge Column Utilizing UHPC Shell (20-01989)
Nerma Caluk/Florida International University, Islam Mantawy/Florida International University, Atorod Azizinamini/Florida International University

Introduction to Substructure Connection Details, ABC Guide Specification Requirements, and Latest Research (P20-20697)
Michael Culmo/CME Associates, Inc.

1379

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 206
Building a Foundation for the Future Through Innovative Construction Research
Susan Bogus, University of New Mexico, presiding
Sponsored By Standing Committee on Construction Management

This session explores advances in construction management over the past century that came about through research innovation. Some construction practices, such as those related to safety and productivity seem fairly well advanced, but still benefit from research efforts. Other practices, such as building information modeling and e-ticketing are still seeing great advancements through ongoing research. Advances in construction management that have come from AFH10 committee research will be presented through an expert panel of speakers. These speakers will address the past, present, and future of construction management research as we move into the next century.

Managing Uncertainty in Design and Construction (P20-21062)
Keith R. Molenaar/University of Colorado, Boulder

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Construction Management from the View of Various Seats (Owner, Consultant, and Contractor) (P20-21063)
Debra Brisk/DRB Consulting, LLC
Construction Management Research: The Past to the Present (P20-21064)
Stuart Anderson/Texas A&M University
The Future Pathways of Information and Transportation Construction Management (P20-21065)
Jagannath Mallela/WSP

1380

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 203
Aligning DOT Resources to Achieve Effective Long-Term Asset Management and Operation Contracts
Anthony Sparkling, Purdue University, presiding
Sponsored By Standing Committee on Project Delivery Methods

Long-tern asset management requires DOTs to realigning a variety of resources to achieve the objectives required by enabling legislation. This session will include presentations on how three types of resources are aligned. The first are resources necessary to meet environmental commitments in P3 and DB projects. The second focuses on a methodology for prioritizing resources across different asset classes and the third looks at leveraging intangible assets for transferring institutional knowledge as human resources move within the organization.

Successful Practices for Environmental Commitments in Public–Private Partnerships and Design-Build Contracts (P20-21717)
Adrienne Heller/WSP
Cross-Asset Project-Level Prioritization Model Using Multi-Attribute Utility Theory (P20-21718)
Jorge Rueda-Benavides/Auburn University
Leveraging Intangible Assets: A Management Strategy for State Departments of Transportation (P20-21719)
Anthony Sparkling/Purdue University

1381

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 201
High Recycled Asphalt Pavement Contents in Asphalt Mixtures, Part 2: Agency Approaches (Part 1, Session 1176)
Nathan Morian, Nevada Department of Transportation, presiding
Sponsored By Standing Committee on Non-Binder Components of Asphalt Mixtures, Standing Committee on Critical Issues and Emerging Technologies in Asphalt

Georgia Department of Transportation's Approach to Using Recycled Asphalt Pavement (P20-20402)
Sheila Hines/NOVA Engineering
Assessing the Impact of High RAP Contents on Pavement Performance in Idaho (P20-20403)
Deb Mishra/Oklahoma State University
Addressing High RAP Contents Through Balanced Mix Design (P20-20404)
Stacey Diefenderfer/Virginia Transportation Research Council
Ohio DOT's Experience with RAS (P20-21400)
Eric Biehl/Ohio Department of Transportation

1382

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 202A
Characterization of Moisture Damage in Asphalt Mixtures
Zahid Hossain, Arkansas State University, presiding
Sponsored By Standing Committee on Surface Requirements of Asphalt Mixtures

Combined Effects of Oxidation, Moisture, and Freeze-Thaw on Asphalt Mixtures (20-05383)
Rabeea Bazuhair/Mississippi State University, Isaac Howard/Mississippi State University, William Middleton/Mississippi State University, Walter Jordan/Mississippi State University, Ben Cox/Mississippi State University

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Comparing the Moisture Susceptibility of Four Bio-Modified Bitumen Experimentally and Theoretically (20-03024)

Shahrzad Hosseinnezhad/Arizona State University, Sheyda Shakiba/Arizona State University, Masoumeh Mousavi/Arizona State University, Stacey Louie/Arizona State University, Ellie Fini/Arizona State University

Development of the Adhesive and Cohesive Moisture Damage Models for Asphalt Concrete (20-01072)

Mona Nobakht/Fugro, Derun Zhang/Fugro, Maryam Sakhaeifar/Fugro, Robert Lytton/Fugro

Experimental Investigation on Performance Deterioration of Asphalt Mixture Under Freeze-Thaw Cycles (20-00571)

Minda Ren/Tongji University, Lin Cong/Tongji University, Jiachen Shi/Tongji University, Guihong Guo/Tongji University

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1383

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 207B

Innovations in Concrete Materials and Testing

Nicole Dufalla, PNA Construction Technologies, Inc., presiding

Sponsored By Standing Committee on Properties of Concrete

Predicting Long-Term Coefficient of Thermal Expansion of Paving Concrete (20-01395)

Gauhar Sabih/No Organization, Rafi Tarefder/No Organization

The Performance of Impure Calcined Clay as a Pozzolan in Concrete (20-04926)

Khashayar Jafari/Pennsylvania State University University Park : Penn State, Farshad Rajabipour/Pennsylvania State University University Park : Penn State

Influence of Bridge Fires on the Material Properties of Concrete and Steel (20-03899)

Dan Huang/Purdue University, Tom Bradt/Purdue University, Tzu-Chun Tseng/Purdue University, Sijia Wang/Purdue University, Jan Olek/Purdue University, Amit Varma/Purdue University, Christopher Williams/Purdue University, Tommy Nantung/Purdue University

Ultra-High Performance Concrete Shear Keys in Concrete Bridge Superstructures (20-04930)

Elsy Flores/New Mexico State University, Craig Newtson/New Mexico State University, Jordan Varbel/New Mexico State University, William Toledo/New Mexico State University, Brad Weldon/New Mexico State University

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1384

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 209B

Integration of Remote Sensing Techniques and Classical Instrumentation

Anthony Simmonds, Geokon, Inc., presiding

Sponsored By Standing Committee on Geotechnical Instrumentation and Modeling, Standing Committee on Engineering Geology

The primary objective of this session is to highlight the relationship of transportation infrastructure measurements obtained by remote sensing techniques with those taken using traditional geotechnical/structural instrumentation. Scholars, academics, and industry practitioners discuss how such an integrated monitoring approach would benefit the design, performance and operation of the transportation infrastructure.

Levee System Displacement Monitoring (P20-20184)

Victoria G. Bennett/Rensselaer Polytechnic Institute (RPI)

Remote Terrain Strength for Mobility Characterization (P20-20185)

Thomas Oommen/Michigan Technological University

Surface Deformation Monitoring Using Radar Satellites (P20-20186)

Edward Hoppe/Virginia Department of Transportation

Infrastructure Inspection: Complimenting Traditional Methods with Aerial Remote Sensing (P20-20188)

Surya Sarat Chandra Congress/Texas A&M University, Anand Puppala/Texas A&M University

Knowledge, Control, and Emergency Monitoring of Geotechnical and Structural Assets (P20-20187)

Paolo Mazzanti/University of La Sapienza Roma

1385

Bridge Pile Design, Analysis, and Performance
Sharid Amiri, California Department of Transportation (CALTRANS), presiding
Sponsored By Standing Committee on Foundations of Bridges and Other Structures

Load transfer analysis for bridge foundation, LRFD, live load test on bridge and its impact on the foundation. and CPT based design attributes of bridge pile foundation are discussed.

Load-Transfer Analysis of the Enlarged Base Piles (20-00371)
Biao Hu/Tongji University, Zhe Luo/Tongji University
Calibrated Static Analysis Methods and Reliability-Based Resistance Factors for LRFD of Steel H-Piles Driven in Rock-Based IGMs (20-01408)
Pramila Adhikari/University of Wyoming, Kam Weng Ng/University of Wyoming, Yrgalem Gebreslasie/University of Wyoming, haun Wulff/University of Wyoming
Prediction of Pile Rebound Using CPT-Based Soil Behavior Type Charts (20-03888)
HADEEL DEKHN/AL-MUSTAQBAL UNIVERSITY COLLEGE, Edward Kalajian/AL-MUSTAQBAL UNIVERSITY COLLEGE, Paul Cosentino/AL-MUSTAQBAL UNIVERSITY COLLEGE, Fauzi Jarushi/AL-MUSTAQBAL UNIVERSITY COLLEGE
Live Load Test on the Sagamore Parkway Bridge Over the Wabash River (20-04938)
Fei Han/Purdue University, Mehdi Marashi/Purdue University, Monica Prezzi/Purdue University, Rodrigo Salgado/Purdue University, Timothy Wells/Purdue University, Mir Zaheer/Purdue University

1386

Preparing for Connected and Automated Vehicles: Results from EU - U.S. Research Collaboration
Rachel James, Federal Highway Administration (FHWA), presiding
Wolfgang Backhaus, Rupprecht Consult, presiding
Sponsored By Standing Committee on Vehicle-Highway Automation, Standing Committee on Traffic Flow Theory and Characteristics, Standing Committee on International Cooperation

In early 2018, an agreement was signed between research contractors for the USDOT and the European Commission to "twin" three projects on the topic of developing connected and automated vehicle (CAV) driving behavior models and assessing their impact on the traffic stream. This special session will detail the twinning agreement, the developed CAV driving behavior logic and applications, the EU and U.S. case studies, and a planning framework towards automation-readiness.

United States–European Union Twinning Process (P20-21104)
Brian Cronin/Federal Highway Administration (FHWA)
Twinned Project Structures and Objectives: Similarities and Differences (P20-21105)
Rachel James/Federal Highway Administration (FHWA), Wolfgang Backhaus/Rupprecht Consult
Modeling Automation: Framework and Specific Operational Models (P20-21106)

CAV Model Framework to Incorporate Transportation Supply and Demand Effects (P20-21107)
Hani Mahmassani/Northwestern University
United States: Stakeholder-Driven Selection of Freeway Connected Automation Concepts to Model (P20-21108)
Steven Shladover/University of California, Berkeley
European Union: Defining Representative Driving Logics and Urban Operational Scenarios to Model (P20-21109)
Johan Olstam/Swedish National Road and Transport Research Institute
Results: Impacts of Automation on Traffic Flow (P20-21110)

European Union: Automation-Ready Traffic Flow Modeling and Impact Assessment in European Cities (P20-21111)
Jochen Lohmiller/PTV Group
United States: I-66 Virginia Case Study of Connected Automation Impacts (P20-21112)
Jiaqi Ma/University of Cincinnati

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United States: SR-99 California Case Study of Cooperative Adaptive Cruise Control Impacts (P20-21113)
Hao Liu/University of California, Berkeley
Modeling Impact of Automation on Travel Demand (P20-21114)
Markus Friedrich/University of Stuttgart
Automation-Ready Framework (P20-21115)
Wolfgang Backhaus/Rupprecht Consult
Q&A (P20-21116)

1387

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 101
Forecasting Methods for Managed Lanes in the Future
Richard Baker, WSP, presiding
Murali Ramanujam, Santa Clara Valley Transportation Authority, presiding
Dan Lamers, North Central Texas Council of Governments, presiding
Carlos Campo, WSP, presiding
Sponsored By Standing Committee on Managed Lanes, Standing Committee on Congestion Pricing

The effectiveness of managed lanes relies on the desire and ability of drivers to change travel behavior as a result of knowledge of travel conditions. This potential for changing travel behavior makes forecasting demand difficult . This is especially true when corridors operate under mixed proportions of connected/autonomous (CAV). Availability of more collected data can make forecasting easier, but under interim conditions with varying levels of CAV penetration present , forecasting can be difficult. This session will explore the realm of forecasting behavior and traffic conditions in managed lanes and how data can be used in those forecasts to plan and operate corridors.

Strategic Planning of Dedicated Autonomous Vehicle Lanes and Autonomous Vehicle/Toll Lanes in Transportation Networks (20-01758)
Zhaocai Liu/Utah State University, Ziqi Song/Utah State University, Yi He/Utah State University
Multiple Uses of Big Data for Model Validation and Express Lanes Traffic Forecasts (20-05117)
Venkat Sarvepalli/AECOM, Barbara Davis/AECOM
Estimating Door-to-Door Travel Time Savings Provided by Managed Lanes Using Shortest Path Algorithms (20-06120)
Chia-Huai "Chris" Chang/AECOM, Hanyan Li/AECOM, Yuanbo Wang/AECOM, Yingping Zhao/AECOM, Randall Guensler/AECOM
Pricing Schemes for High-Occupancy Toll Lanes Considering the Departure Time User Equilibrium (20-06128)
Xuting Wang/University of California, Irvine, Wenlong Jin/University of California, Irvine

1388

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 102A
Speed Feedback Signs, Curve Warning Treatments, and the History/Future of Traffic Control Devices
Timothy Gates, Michigan State University, presiding
Sponsored By Standing Committee on Traffic Control Devices

Dynamic Speed Feedback Signs Are Effective in Reducing Driver Speeds: A Meta-Analysis (20-00038)
Dan Flynn/Volpe National Transportation Systems Center, Andrew Breck/Volpe National Transportation Systems Center , Olivia Gillham/Volpe National Transportation Systems Center, Randolph Atkins/Volpe National Transportation Systems Center, Donald Fisher/Volpe National Transportation Systems Center
Evaluation of Sequential Dynamic Chevron Warning Systems on Rural Two-Lane Curves (20-00118)
Shauna Hallmark/Iowa State University, Amrita Goswamy/Iowa State University, Theresa Litteral/Iowa State University, Neal Hawkins/Iowa State University, Omar Smadi/Iowa State University, Skylar Knickerbocker/Iowa State University
Evaluation of Alternative Messages and Sign Locations on Driver Response to a Dynamic Speed Feedback Sign on a Freeway Interchange Ramp (20-03981)
Timothy Gates/Michigan State University, Anthony Ingle/Michigan State University, Peter Savolainen/Michigan State University
A Century of Traffic Control Devices and What Lies Beyond (P20-21401)
Gene Hawkins/Texas A&M University, Paul Carlson/Road Infrastructure, Inc.

1389

Current Topics in Equipment and Fleet Management
Sponsored By Standing Committee on Maintenance Equipment

 Presentation of current research and topics in equipment and fleet management

Equipment Life-Cycle Cost Analysis Tool for Local Agencies (20-01498)
Hamed Alikhani/Texas A&M University, College Station, H. David Jeong/Texas A&M University, College Station, Jennifer Shane/Texas A&M University, College Station, Kevin Scheibe/Texas A&M University, College Station, Sree Nilakanta/Texas A&M University, College Station
Best Practices for Efficient Parts Management to Maintain Fleet Assets (20-03112)
Golam Sarwar/AgileAssets, Inc.
Assessment of Near-Cab Air Quality for Non-Road Diesel Equipment (20-04478)
Phil Lewis/Texas A&M University, Sherif El Khouly/Texas A&M University
Utilization Prediction of Highway Fleet Equipment (20-05706)
Mehrdad Tajalli/North Carolina State University, Amir Mirheli/North Carolina State University, Ali Hajbabaie/North Carolina State University, Leila Hajibabai/North Carolina State University

1390

Federal Motor Carrier Safety Administration's Safety Activities and Priorities
Kelly Regal, Federal Motor Carrier Safety Administration (FMCSA), presiding
Sponsored By Standing Committee on Truck and Bus Safety

Keynote Address: FMCSA Safety Priorities for 2020 (P20-21578)
James Mullen/Federal Motor Carrier Safety Administration (FMCSA)
Trends in Commercial Motor Vehicle Safety (P20-21579)
John Van Steenburg/Federal Motor Carrier Safety Administration (FMCSA)
Enforcement Update (P20-21580)
Joseph DeLorenzo/Federal Motor Carrier Safety Administration (FMCSA)
Automated CMV Policy Update (P20-21581)
Larry Minor/Federal Motor Carrier Safety Administration (FMCSA)
Current and Upcoming FMCSA Research Activities (P20-21582)
Kelly Regal/Federal Motor Carrier Safety Administration (FMCSA)

1391

Roundabout Implementation: A Look at Noteworthy Practices
Mark Johnson, MTJ Roundabout Engineering, presiding
Sponsored By Standing Committee on Roundabouts

Roundabouts have taken the US by storm and with that surge comes the confirmation that roundabouts save lives. Roundabouts have been a game changer for improving safety and operations at intersections but still require proactive and factual education. This session will provide an opportunity to learn more about compact roundabouts, roundabout lighting, public engagement and how roundabouts are a key player in vision zero and safe system initiatives.

Public Engagement of Roundabout Projects in the Era of Social Media (P20-20932)
Tamara Greenwell/Washington State Department of Transportation
Roundabouts in the United States: An International Comparison of Policies, Illuminance Requirements, and Costs (20-00829)
Franklin Gbologah/Georgia Institute of Technology (Georgia Tech), Simon Berrebi/Georgia Institute of Technology (Georgia Tech), Angshuman Guin/Georgia Institute of Technology (Georgia Tech), Michael Rodgers/Georgia Institute of Technology (Georgia Tech)

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Safety Effectiveness Evaluation of Rural Roundabout Conversions at Predominantly Skewed Intersections in South Carolina (20-06029)
Fengjiao ZOU/Clemson University, Jennifer Ogle/Clemson University
Mini Roundabout Peer Exchange Highlights (P20-20934)
Mark McCulloch/Washtenaw County Road Commission, Brian Walsh/Washington State Department of Transportation, Jeffrey Shaw/Federal Highway Administration (FHWA)
Impact of Roundabouts on the Road to Zero and Safe System Approach to Design (P20-20935)
Mark Doctor/Federal Highway Administration (FHWA), Hillary Isebrands/Federal Highway Administration (FHWA)

1392

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 103B
Driver Behavior: Methods for Data Collection and Analysis
Erika Miller, Colorado State University, presiding
Sponsored By Standing Committee on Vehicle User Characteristics

Monitoring and Notifying Harsh and Smooth Driving Events to Improve Road Safety (20-04153)
Riccardo Rossi/University of Padova, Mariaelena Tagliabue/University of Padova, Massimiliano Gastaldi/University of Padova, Giulia De Cet/University of Padova, Francesca Freuli/University of Padova, Federico Orsini/University of Padova, Leandro Di Stasi/University of Padova, Giulio Vidotto/University of Padova
Assessing a Model of Personality–Attitudes–Behavior in a Sample of Overtaking Drivers in Two-Lane, Two-Way Rural Roads (20-00124)
Ali Tavakoli Kashani/Iran University of Science and Technology, Mahdi Sokouni Ravasani/Iran University of Science and Technology, Mohammad Mehdi Besharati/Iran University of Science and Technology, Ali Afshar/Iran University of Science and Technology
Implications of Crashes Involving Roadway Objects for Machine Vision–Based Driving Systems (20-04821)
Yingfeng Li/Virginia Polytechnic Institute and State University, Haiyan Hao/Virginia Polytechnic Institute and State University, Ronald Gibbons/Virginia Polytechnic Institute and State University, Alejandra Medina/Virginia Polytechnic Institute and State University
Analysis and Modeling of Right Turn Vehicle Interactive Behavior Under the Impact of Pedestrians at Mixed-Flow Intersections (20-02152)
Runhan Zhang/Tongji University, Xueqi Che/Tongji University, Keping Li/Tongji University
The Role of Drivers' Social Interactions in Their Driving Behavior: Empirical Evidence and Implications for Traffic Flow (20-02292)
Sevin Mohammadi/University of Tennessee, Knoxville, Ramin Arvin/University of Tennessee, Knoxville, Asad Khattak/University of Tennessee, Knoxville, Subhadeep Chakraborty/University of Tennessee, Knoxville

1393

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 103A
Measuring the Pedestrian Environment
Sirisha Kothuri, Portland State University, presiding
Sponsored By Standing Committee on Pedestrians

The Power of User Perception on Pedestrian Quality of Service (20-03578)
Alvaro Rodriguez-Valencia/Universidad de Los Andes, German Barrero/Universidad de Los Andes, Hernan Ortiz Ramirez/Universidad de Los Andes, Jose Vallejo-Borda/Universidad de Los Andes
Forecasting the Quality of Service of Bogotá's Sidewalks from Pedestrian Perceptions: An Ordered Probit MIMIC Approach (20-02371)
Jose Vallejo-Borda/Universidad de Los Andes, Hernan Ortiz Ramirez/Universidad de Los Andes, Alvaro Rodriguez-Valencia/Universidad de Los Andes, Ricardo Hurtubia/Universidad de Los Andes, Juan Ortúzar/Universidad de Los Andes
Developing Place-Based Thresholds for Objectively Measured Environmental Features to Support Physical Activity (20-01742)
Behram Wali/Massachusetts Institute of Technology (MIT), Jim Chapman/Massachusetts Institute of Technology (MIT), Lawrence Frank/Massachusetts Institute of Technology (MIT)
Selection of Attributes for Pedestrian Level of Service Measures: A Screening Tool (20-04648)
Dipanjan Nag/Indian Institute of Technology, Kharagpur, Arkopal Goswami/Indian Institute of Technology, Kharagpur, Joy Sen/Indian Institute of Technology, Kharagpur

1394

Bicycling Toward Equity: Opportunities, Barriers, and Policies for Vulnerable Groups
Raktim Mitra, Ryerson University, presiding
Sponsored By Standing Committee on Bicycle Transportation

Adaptive Bikeshare: Expanding Bikeshare to People with Disabilities and Older Adults (20-02040)
John MacArthur/Portland State University, Nathan McNeil/Portland State University, Austin Cummings/Portland State University, Joseph Broach/Portland State University
Bicycling and Bikeshare Among Women of Color in Three U.S. Cities: Barriers and Opportunities (20-03786)
Jennifer Dill/Portland State University, Nathan McNeil/Portland State University, John MacArthur/Portland State University, Joseph Broach/Portland State University
The Pursuit of Cycling Equity: A Review of Canadian Cycling Plans (20-04172)
Alexandra Doran/McGill University, Ahmed El-Geneidy/McGill University, Kevin Manaugh ANF10/McGill University
Analyzing Equity in 10 of the Largest Bikeshare Systems in the United States (P20-20963)
Charles Brown/Alan M. Voorhees Transportation Center

1395

Safety and Security in Rail Transit
Lisa Staes, USF Center for Urban Transportation Research, presiding
Sponsored By Task Force on Transit Safety and Security

This session wil present research on safety after a train breakdown, configuration of security check facilities, and cybersecurity..

Multimodal Evacuation After Subway Breakdown: A Modeling Framework and Mode Choice Behavior (20-04582)
Jian Li/Tongji University, Xinyuan Wang/Tongji University
Dynamic Configuration of Security Check Facilities in Subway Stations (20-05441)
Zhonghua Wei/Beijing University of Technology, Jingxuan Liang/Beijing University of Technology, Shi Qiu/Beijing University of Technology, Guangyao Bi/Beijing University of Technology, Shaofan Wang/Beijing University of Technology
Cybersecurity Vulnerabilities in Mobile Fare Payment Applications: A Case Study (20-04867)
Kevin Dennis/University of South Florida, Maxat Alibayev/University of South Florida, Sean Barbeau/University of South Florida, Jay Ligatti/University of South Florida

1396

Attitudes Toward Emerging and Existing Public Transportation Services
Candace E. Brakewood, University of Tennessee, Knoxville, presiding
Sponsored By Standing Committee on Public Transportation Marketing and Fare Policy

This session will consider the many factors that affect passenger attitudes toward public transportation services , with an emphasis on new and emerging technologies. Important questions will be discussed, including the following: What factors affect use of autonomous buses? How much are users willing to pay for mobility as a service (MaaS)? And how can we use large data sources to better understand transit passenger attitudes, particularly when riders complain?

How Much of Which Mode?: Using Revealed Preference Data to Design MaaS Plans (20-02220)
Daniel Reck/ETH Zurich, Kay Axhausen/ETH Zurich
Temporal Elements of Expectation and Perception in Adopting Autonomous Buses Services: Evidences from Stockholm (20-01248)
Jia Guo/Kungliga Tekniska Hogskolan, Yusak Susilo/Kungliga Tekniska Hogskolan, Anna Pernestål/Kungliga Tekniska Hogskolan
People's Attitudes Toward Autonomous Vehicles and Transit in Small Urban Areas (20-05269)
Yu Song/University of Wisconsin, Madison, Madhav Chitturi/University of Wisconsin, Madison, Chris McCahill/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison

(continued)

Is the Customer Always Right?: Analyzing Bus Rider Complaints and Linking Them to Real-World Operations Data in Portland, Oregon (20-03126)

Madalena Harreman-Fernandes/McGill University, Ehab Diab/McGill University, Boer Cui/McGill University, James DeWeese/McGill University, Miles Crumley/McGill University, Ahmed El-Geneidy/McGill University

1397

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 147B
Designed to Attract: Transit Access and Inclusion
Zipporah Yamamoto, Los Angeles County Metropolitan Transportation Authority, presiding
Sponsored By Standing Committee on Passenger Intermodal Facilities, Art and Design Excellence in Transportation Subcommittee, AP045(1), Standing Committee on Light Rail Transit

Good design contributes to a good travel experience. Come explore the topic and ask questions of our experts!

Arts, Culture, and Transportation: A Creative Placemaking Field Scan (P20-20813)
Ben Stone/Smart Growth America
Catchment If You Can: The Effect of Station Entrance and Exit Locations on Accessibility (20-00567)
Bahman Lahoorpoor/The University of Sydney, David Levinson/The University of Sydney
How Attractive Are Public Transport Interchanges to Sustainable Mobility Users? (20-03957)
Giannis Adamos/University of Thessaly, Eftihia Nathanail/University of Thessaly

1398

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 147A
Passenger Service Parameters: Domestic and Abroad
Matthew Burke, Griffith University, presiding
Sponsored By Standing Committee on Ferry Transportation

Water Transit in Guangzhou: A Comparison of System Characteristics with International Peers (20-01450)
Matthew Burke/Griffith University, Lizhu Dai/Griffith University, Abraham Leung/Griffith University
Marrying Marine Technology with Public Transportation: The Sydney Experience (P20-21135)
Robin Sandell/Sandell Consulting
Washington State Ferries 2040 Long-Range Plan and Next Steps (P20-21137)
Raymond Deardorf/Washington State Department of Transportation
Establishing Level of Service for Ferry System Planning (P20-21138)
Cassandra Durkin/KPFF Consulting Engineers

1399

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 144C
Future Train Control Technologies
Adrian Hellman, OST-R/Volpe Center, presiding
Sponsored By Standing Committee on Railroad Operating Technologies

Prevention of End-of-Track Collisions in Passenger Terminals via Positive Train Control: Benefit-Cost Analysis and Operational Impact Assessment (20-04977)
Zhipeng Zhang/Rutgers, The State University of New Jersey, Xiang Liu/Rutgers, The State University of New Jersey, Keith Holt/Rutgers, The State University of New Jersey
Investigating Market Potentials and Operational Scenarios of Virtual Coupling Railway Signaling (20-03521)
Joelle Aoun/Delft University of Technology, Egidio Quaglietta/Delft University of Technology, Rob Goverde/Delft University of Technology
A Comparative Capacity Analysis of Virtual Coupling Railway Operations (20-00620)
Egidio Quaglietta/Delft University of Technology, Rob Goverde/Delft University of Technology
Optimal Energy Speed Profile of Medium-Speed Maglev Trains Integrating the Power Supply System and Train Control System (20-01425)
Qingying Lai/Beijing Jiaotong University, Jun Liu/Beijing Jiaotong University, Ali Haghani/Beijing Jiaotong University, Lingyun Meng/Beijing Jiaotong University, Yihui Wang/Beijing Jiaotong University

1400

Emerging Technology in Transit Special Trackwork
Steven Abramopaulos, HNTB Corporation, presiding
Sponsored By Standing Committee on Rail Transit Infrastructure

Transit Special Trackwork 101 (P20-21703)
Tommy Lee/voestalpine Railway Systems Nortrak
Transit Special Trackwork: The Sequel (P20-21704)
Tommy Lee/voestalpine Railway Systems Nortrak
Construction and Maintenance Issues with Turnouts (P20-21705)
John Zuspan/Track Guy Consultants

1401

Freight Day, Part 1: How E-Commerce Is Disrupting Supply Chains, Freight Activity, and the U.S. Economy (Part 2, Session 1472; Part 3, Session 1549; Part 4, Session 1617)
Denise Kearns, U.S. Environmental Protection Agency (EPA), presiding
Chien Sze, U.S. Environmental Protection Agency (EPA), presiding
Sponsored By Freight Systems Group, Marine Group

In this panel, ATRI will present recent findings on how rapid growth in e-commerce is disrupting traditional freight services. Wayfair, a leading online retailer, will discuss challenges in scaling a transportation and logistics network capable of efficiently meeting the escalating demand for home delivery of large, oversized home products. CBRE, a commercial real estate firm, will discuss how traditional and online retailers are investing in industrial zones by expanding warehouses, repurposing shuttered malls, and renovating smaller fulfillment facilities located in city centers and on the urban fringe. UPS will address how it's managing the highly competitive e-commerce market by offering consumers and businesses faster deliveries, greater visibility and access to a broad range of delivery options. The New York City Department of Transportation Freight Mobility unit will present on its Smart Truck Management Plan and review strategies its using to improve efficiencies, safety and sustainability in the city's last-mile freight delivery system, including new pilots and innovative approaches aimed at strengthening freight management and partnerships across NYC. The panel includes an interactive question and answer opportunity.

Panelist (P20-21043)
Dan Murray/American Transportation Research Institute (ATRI)
Panelist (P20-21045)
David Egan/CBRE
Panelist (P20-21133)
Sean Flaherty/United Parcel Service (UPS)
Panelist (P20-21134)
Diniece Mendes/New York City Department of Transportation
Panelist (P20-21434)
Esther Mangan/Wayfair Inc.

1402   **CM** (1.75)

Urban Freight and Urban Form
Gabriela del Carmen Giron Valderrama, University of Washington, presiding
Sponsored By Standing Committee on Urban Freight Transportation, Standing Committee on Transportation Issues in Major Cities

A Method to Empirically Investigate the Effect of Parking Availability on Commercial Vehicles Travel Times in Urban Areas (20-05481)
Giacomo Dalla Chiara/University of Washington, Anne Goodchild/University of Washington

(continued)

Shopping, Freight Deliveries, and Urban Form (20-01106)
Genevieve Giuliano/University of Southern California, Sanggyun Kang/University of Southern California, Quan Yuan/University of Southern California
Predicting Commercial Vehicle Parking Duration by Imputing Missing Data Using Generative Adversarial Multiple Imputation Networks (20-00493)
Raymond Low/Singapore University of Technology and Design, Zeynep Tekler/Singapore University of Technology and Design, Lynette Cheah/Singapore University of Technology and Design
Planning Methodology for Loading/Unloading Bays in Congested Urban Areas: A Case Study in Querétaro City, México (20-00631)
Jorge Ochoa/Universidad Autonoma de Queretaro, Eduardo Betanzo-Quezada/Universidad Autonoma de Queretaro

1403

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 143A
Unmanned Systems and Their Operational and Environmental Impacts
Pamela Cohn, Ascension Global, presiding
Sponsored By Standing Committee on Environmental Impacts of Aviation, Subcommittee on Unmanned Aircraft Systems (UAS)

Weather Needs and Applications for UAS/UAM Operations (P20-20269)
Joel Siegel/Booz Allen Hamilton, Inc.
UAS for Rail Maintenance and BVLOS (P20-20272)
Todd Graetz/BNSF Railway
Legal and Regulatory Implications of UAS/UAM in the Airport Environment (P20-20274)
Lisa Ellman/Hogan Lovells US LLP
Future of Drones and Transportation (P20-20275)
Rohit Goyal/Uber Technologies, Inc.
Drones for Environmental Analysis (P20-20279)
LeiLani Paugh/North Carolina Department of Transportation

1404

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 143B
Resilient Airport Systems
Yu Zhang, University of South Florida, presiding
Sponsored By Standing Committee on Airfield and Airspace Capacity and Delay

Atmospheric Pressure Calibration to Improve Accuracy of Transponder-Based Aircraft Operations Counting Technology at Non-Towered Airports (20-00887)
John Mott/Purdue University, Chuyang Yang/Purdue University, Darcy Bullock/Purdue University
UAS-Based Methodology for Measuring Glide Slope Angles of Airport Precision Approach Path Indicators (20-02240)
Yi Chun Lin/Purdue University, Seyyed Hasheminasab/Purdue University, John Bullock/Purdue University, Deborah Horton/Purdue University, Adam Baxmeyer/Purdue University, Ayman Habib/Purdue University, Darcy Bullock/Purdue University
Count Models to Represent the Impacts of Weather and Infrastructure on Flight Disruptions (20-03959)
Sabrena Jahan Ohi/University of Alberta, Amy Kim/University of Alberta
A Machine Learning Approach for Flight Departure Delay Prediction and Analysis (20-05102)
Dr. Ehsan Esmaeilzadeh/MITRE Corporation, Sajad Mokhtarimousavi/MITRE Corporation

1405

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, 144A
Forecasting Safety in Maritime Shipping
Tracey Mayhew, Paul Hall Center for Maritime Training & Education, presiding
Sponsored By Standing Committee on Marine Safety and Human Factors

Weather Routing in Maritime Shipping: A Review and Future Outlook (20-02853)
Thalis Zis/Technical University of Denmark, Harilaos Psaraftis/Technical University of Denmark

(continued)

A Multi-Ship Safety Distance Model for Convoy Operation in Ice-Covered Waters (20-00279)

Wei Cao/Wuhan University of Technology, Di Zhang/Wuhan University of Technology, Mingyang Zhang/Wuhan University of Technology, Chi Zhang/Wuhan University of Technology, Tengfei Wang/Wuhan University of Technology

Exploring the Impact of Timely Reminding on Maritime Unsafe Acts (20-04261)

Dong Xu/Shanghai Maritime University, Ying Wang/Shanghai Maritime University

Forecasting U.S. Maritime Incidents Using the Grey-Markov Model (20-01493)

Fatima Zouhair/U.S. Coast Guard (USCG), Jerome Kerby/U.S. Coast Guard (USCG)

1406

<u>Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A</u>

Climate Change and Natural Hazards

Robert Graff, Delaware Valley Regional Planning Commission, presiding

Sponsored By Special Task Force on Climate Change and Energy

Poster session for Special Task Force on Climate Change and Energy.

Integration of ENSO Hazards Risk Assessment into Transportation Systems Planning (20-00099) - A126

Karl Kim/University of Hawai'i at Manoa, Rashed Chowdhury/University of Hawai'i at Manoa, Pradip Pant/University of Hawai'i at Manoa, Eric Yamashita/University of Hawai'i at Manoa

Designing a Climate-Ready Coastal Road (20-00380) - A127

Jo Sias/JFK Environmental Services LLC, Jayne Knott/JFK Environmental Services LLC, Jennifer Jacobs/JFK Environmental Services LLC, Paul Kirshen/JFK Environmental Services LLC, Eshan Dave/JFK Environmental Services LLC

Performance Evaluation of Public Transit Systems Under Extreme Weather Events: Does Organizational Adaptive Capacity Matter? (20-00614) - A128

Fengxiu Zhang/Arizona State University

Predicting and Visualizing Flood Risk in Subway Tunnels (20-02023) - A129

Dmitrijs Obolevics/Arup USA, Dominic Herkes/Arup USA, Camille Tigner/Arup USA

Transportation Infrastructure Resilience Overview in Coastal Areas Due to Sea-Level Rise and Climate Change: Impacts, Challenges, and Proactive Solutions (20-01275) - A130

Joshua Burroughs/University of Hawai'i at Manoa, Guohui Zhang/University of Hawai'i at Manoa, David Ma/University of Hawai'i at Manoa

Evaluation and Prediction of Transportation Resilience Under Extreme Weather Events: A Novel Sequence to Sequence Deep-Learning Approach (20-01715) - A131

Hongwei Wang/Shanghai Jiao Tong University, Zhongren Peng/Shanghai Jiao Tong University, Yuan Meng/Shanghai Jiao Tong University, Tianlong Wu/Shanghai Jiao Tong University, Weili Sun/Shanghai Jiao Tong University, Qing-Chang Lu/Shanghai Jiao Tong University

Incorporating Climate Change Considerations into a State Transportation Agency: The Caltrans Experience (20-02211) - A132

Reza Navai/WSP, Tracey Frost/WSP, Michael Flood/WSP, Michael Meyer/WSP

Understanding Thermal Impact of Roads on Permafrost Using Normalized Spectral Entropy (20-03817) - A133

Chi Zhang/Chang'an University, Hong Zhang/Chang'an University

Hurricane Wind and Storm Surge Effects on Coastal Bridges Under a Changing Climate (20-04086) - A134

Reda Snaiki/University at Buffalo, Teng Wu/University at Buffalo, Andrew Whittaker/University at Buffalo, Joseph Atkinson/University at Buffalo

Data Predictive Approach to Estimate Nuisance Flooding Impacts on Roadway Networks: A Case Study of Norfolk, Virginia (20-04345) - A135

Shraddha Praharaj/University of Virginia, T. Donna Chen/University of Virginia, Madhur Behl/University of Virginia

Application of Dynamic Adaptive Planning and Risk-Adjusted Decision Trees to Capture the Value of Flexibility in Resilience and Transportation Planning (20-04462) - A136

Prerna Singh/Georgia Institute of Technology (Georgia Tech), Baabak Ashuri/Georgia Institute of Technology (Georgia Tech), Adjo Amekudzi-Kennedy/Georgia Institute of Technology (Georgia Tech)

Urban Goods Movement and Local Climate Action Plans: Assessing Strategies to Reduce Greenhouse Gas Emissions from Urban Freight Transportation (20-00354) - A137

Andrew Goetz/University of Denver, Serena Alexander/University of Denver

1407

Workforce Development Challenges and Solutions
Mario Cools, University of Liège, presiding
Sponsored By Standing Committee on Transportation Education and Training

Workforce Development Needs and Objectives of Today's Transportation Engineering Professional: Regional Perspectives from the Pacific Northwest (20-00912) - A101
Kevin Chang/University of Idaho, Benjamin Lutz/University of Idaho, Shane Brown/University of Idaho
Workforce Development Needs of Aspiring Adaptation Professionals (20-02728) - A102
Jonathan Dowds/University of Vermont
A Markov Decision Process–Based Hint Generation Mechanism for Transportation Education (20-02854) - A103
Homa Khosravian/University of Illinois, Urbana Champaign, Alireza Talebpour/University of Illinois, Urbana Champaign
Impact of Evolving Course Operational Changes on Student Outcomes in Transportation Engineering (20-0479 6) - A104
Edward Smaglik/Northern Arizona University, David Lemcke/Northern Arizona University, Emmanuel James/Northern Arizona University, Brendan Russo/Northern Arizona University, John Tingerthal/Northern Arizona University
Tracking Outcomes in the National Summer Transportation Institute Program: An Interview-Based Inquiry (20-0 5060) - A105
Glenn McRae/University of Vermont

1408

Advances in Traffic Monitoring
Yao-Jan Wu, University of Arizona, presiding
Sponsored By Standing Committee on Highway Traffic Monitoring, Subcommittee on Weigh-in-Motion

This poster session contains papers that describe advances and innovations in monitoring passenger vehicle and truck traffic.

Vehicle Classification System Using Dual-Laser Based Measurement Device (20-00777) - A107
Derong Mai/Shenzhen University, Fangjian Yang/Shenzhen University, Chuang Han/Shenzhen University, Zhenxiang Xie/Shenzhen University
Domain Adaptation for Vehicle Detection in Traffic Surveillance Images from Daytime to Nighttime (20-01554) - A108
li jinlong/Cleveland State University, Zhigang Xu/Cleveland State University, Hongkai Yu/Cleveland State University, Lan Fu/Cleveland State University, Xuesong Zhou/Cleveland State University
A Probabilistic Model for Traffic Volume Reconstruction Based on Data Fusion (20-01866) - A109
Yan Zhao/University of Michigan, Ann Arbor, Xintao Yan/University of Michigan, Ann Arbor, Henry Liu/University of Michigan, Ann Arbor
Light-Duty Vehicle Travel Detection from Large-Scale Multimodal Wearable GPS Data Using One-Class Novelty Detection Method (20-01962) - A110
Lei Zhu/National Renewable Energy Laboratory (NREL), Brennan Borlaug/National Renewable Energy Laboratory (NR EL), Lei Lin/National Renewable Energy Laboratory (NREL), Jacob Holden/National Renewable Energy Laboratory (NR EL), Jeffrey Gonder/National Renewable Energy Laboratory (NREL)
A Case Study of Approach Delay and Travel-Time Estimation Using Bluetooth Technology (20-02085) - A111
Golam Sarwar/AgileAssets, Inc.
Vehicle Counting System Using Deep Learning and Multi-Object Tracking Methods (20-03362) - A112
Haoxiang Liang/Chang'an University, Huansheng Song/Chang'an University, Huaiyu Li/Chang'an University, Zhe Dai/Ch ang'an University
Decision-Support Tool to Evaluate Options for Implementing a Short-Duration Classification Count Program (2 0-04247) - A113
Puteri Paramita/University of Manitoba, Markus Fast/University of Manitoba, Giuseppe Grande/University of Manitoba, Jonathan Regehr/University of Manitoba

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Individual Vehicle Trajectory-Based Traffic Volume Prediction on Urban Roads with License Plate Recognition Data (20-04385) - A114

Weijie Yu/Southeast University, Yifeng Ren/Southeast University, Jiajie Zhang/Southeast University, Yubo Sun/Southeast University, Zhibin Li/Southeast University

Freeway Traffic Speed Estimation in Traffic Monitoring Systems Using a Hybrid Machine Learning Approach (20-04421) - A115

Zhao Zhang/University of Utah, Xianfeng Yang/University of Utah, Haibo Kuang/University of Utah, Peng Jia/University of Utah

Transferability of a Machine Learning–Based Model of Hourly Traffic Volume Estimation: A Florida and New Hampshire Case Study (20-04442) - A116

Przemyslaw Sekula/University of Maryland, College Park, Zachary Vander Laan/University of Maryland, College Park, Kaveh Farokhi Sadabadi/University of Maryland, College Park, Krzysztof Kania/University of Maryland, College Park

Average Annual Daily Traffic Estimation by Mobile Device Footprint Cardinality (20-04744) - A117

Kentaro Iio/No Organization, Dominique Lord/No Organization, Yunlong Zhang/No Organization

Evaluating Third-Party Data for Statewide Traffic Volume Estimation (20-04951) - A118

Joseph Broach/Portland State University, Josh Roll/Portland State University

Multi-Stage Algorithm for Detection-Error Identification Based on the Detector Station Type (20-05342) - A119

Bahar Azin/University of Utah, Xianfeng Yang/University of Utah, Kelly Njord/University of Utah

A Data Fusion Framework for Traffic Volume Reconstruction from Low-Rank Structures (20-05764) - A120

Yan Zhao/University of Michigan, Ann Arbor, Xintao Yan/University of Michigan, Ann Arbor, Henry Liu/University of Michigan, Ann Arbor

Innovative Vehicle Weigh Station Strategies with Weigh-in-Motion in Brazil (20-01339) - A121

Leonardo Guerson/Federal University of Santa Catarina, Nauber do Nascimento/Federal University of Santa Catarina, Valter Tani/Federal University of Santa Catarina, Amir Valente/Federal University of Santa Catarina

Assessment of Factors Impacting Measurement Accuracy for High-Quality WIM Sites in the LTPP Database (20-03944) - A122

Syed Haider/Michigan State University, Muhammad Munum Masud/Michigan State University, Olga Selezneva/Michigan State University, Dean Wolf/Michigan State University

What Pavement Designers Should Know About the Consistency of WIM Measurements Over Time (20-06040) - A123

Syed Haider/Michigan State University, Muhammad Munum Masud/Michigan State University, Olga Selezneva/Michigan State University, Dean Wolf/Michigan State University

Truck Tonnage Estimation Using Weigh-in-Motion Data in Florida (20-05754) - A124

Taraneh Ardalan/Florida Atlantic University, Dan Liu/Florida Atlantic University, Evangelos Kaisar/Florida Atlantic University, Monica Zhong/Florida Atlantic University, Frank Tabatabaee/Florida Atlantic University

Moving Array Traffic Probes (20-00448)

Blake Davis/The University of Sydney, Ang Ji/The University of Sydney, Bichen Liu/The University of Sydney, David Levinson/The University of Sydney

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1409

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Innovative Research and Applications for Freight Data Collection and Analysis

Mario Monsreal, Texas A&M University Transportation Institute, presiding

Sponsored By Standing Committee on Freight Transportation Data

Characterizing the Movement of Freight Trucks Using Passive GPS Data: A Case Study in the Calgary Region of Canada (20-01352) - A253

Ashok Kinjarapu/University of Calgary Schulich School of Engineering, Merkebe Demissie/University of Calgary Schulich School of Engineering, Lina Kattan/University of Calgary Schulich School of Engineering, Robert Duckworth/University of Calgary Schulich School of Engineering

Representative Truck Activity Patterns from Anonymous Mobile Sensor Data (20-01372) - A252

Taslima Akter/University of Arkansas, Fayetteville, Sarah Hernandez/University of Arkansas, Fayetteville

A Data-Driven Opportunity Identification Engine for Collaborative Freight Logistics Based on a Trailer Capacity Graph (20-01811) - A251

Jianlin Luan/Imperial College London, Nicolo' Daina/Imperial College London, Kristian Reinau/Imperial College London, Aruna Sivakumar/Imperial College London, John Polak/Imperial College London

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Big Loads, Big Challenges, Big Data: Exploring Oversize/Overweight Flows and Crashes (20-02407) - A250

Blake Moris/Kansas State University, Jia Liang/Kansas State University, Eric Fitzsimmons/Kansas State University, Gregory Newmark/Kansas State University

A GPS-Based Shipment Survey Assisted by Machine Learning Algorithms: Survey Design, Survey Platform, and Case Study (20-05066) - A254

Peiyu Jing/Massachusetts Institute of Technology (MIT), Kyungsoo Jeong/Massachusetts Institute of Technology (MIT), Linlin You/Massachusetts Institute of Technology (MIT), Jinping Guan/Massachusetts Institute of Technology (MIT), Lynette Cheah/Massachusetts Institute of Technology (MIT), Fang Zhao/Massachusetts Institute of Technology (MIT), Moshe Ben-Akiva/Massachusetts Institute of Technology (MIT)

Dynamic Pricing via a Web-Based Platform for Commercial Vehicles (20-05288) - A255

Ioanna Pagoni/University of the Aegean, Athena Tsirimpa/University of the Aegean, Amalia Polydoropoulou/University of the Aegean, Ioannis Tsouros/University of the Aegean, André Ramos/University of the Aegean, George Proios/University of the Aegean

Research, Development, and Application of Alternative Methods to Estimating Freight Analysis Framework Out-of-Scope Commodity Flows (20-04080) - A256

Christopher Lindsey/Cambridge Systematics, Inc., Krishnan Viswanathan/Cambridge Systematics, Inc., Birat Pandey/Cambridge Systematics, Inc.

1410

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Logistics for Disaster Response, Business Continuity, and Humanitarian Aid

Anne Strauss-Wieder, North Jersey Transportation Planning Authority, presiding
Steven Polunsky, Alabama Transportation Institute, presiding
Sponsored By Standing Committee on the Logistics of Disaster Response and Business Continuity

Quantitative Simulation of Tunnel Functionality Loss Due to Fire Events (20-04548) - A167

Sandeep Khetwal/Colorado School of Mines, Shiling Pei/Colorado School of Mines, Marte Gutierrez/Colorado School of Mines, Stephen Harelson/Colorado School of Mines

Modeling the Influence of Online Social Media Information on Post-Disaster Mobility Decisions (20-01191) - A168

Takahiro Yabe/Purdue University, Satish Ukkusuri/Purdue University, P. Suresh Rao/Purdue University

A Partially Observable Markov Decision Process for Dynamic Post-Disaster Debris Clearance Problem with a Positioning of Clearance Equipment Items Strategy (20-01299) - A169

Hamid R. Sayarshad, PhD/Cornell University, Xinpi Du/Cornell University, H. Oliver Gao/Cornell University

Site Selection Methodology for Emergency Centers in Silk Road Based on Compatibility with Asian Highway Network Using the AHP and ArcGIS: A Case Study of the Republic of Iran (20-02224) - A177

Hamid Mirzahossein/Imam Khomeini International University, Maryam Sedghi/Imam Khomeini International University, Hossein Motevalli Habibi/Imam Khomeini International University, Farhang Jalali/Imam Khomeini International University

Zoning Cities for Relief Transport in Disaster Management (20-03361) - A178

Saeed Asadi Bagloee/University of Melbourne, Majid Sarvi/University of Melbourne

Best Practices on Emergency Logistics Topics (20-01657) - A179

Georgia Aifadopoulou/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Chrysostomos Mylonas/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Alexandros Dolianitis/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Charis Chalkiadakis/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Dimitris Tzanis/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Evangelos Mitsakis/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Evangelos Katsaros/Centre for Research and Technology Hellas - Hellenic Institute of Transport

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Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Current Issues in Environmental Analysis in Transportation

Martin Palmer, Washington State Department of Transportation, presiding
Sponsored By Standing Committee on Environmental Analysis in Transportation

ADC10 Environmental Analysis in Transportation Committee Poster (P20-20569) - A153

Martin Palmer/Washington State Department of Transportation, Meredith Morgan/WSP

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The Environmental Resources of AASHTO's Center for Environmental Excellence (P20-20580) - A154

Sofie Rhoads/American Association of State Highway and Transportation Officials, Melissa Savage/American Association of State Highway and Transportation Officials

Operationalizing Induced Travel Research (20-06001) - A155

Jamey Volker/University of California, Davis, Amy Lee/University of California, Davis, Susan Handy/University of California, Davis

Advancing NEPA Transportation Impact Analysis (P20-20581) - A156

Beth Zgoda/ICF, Lorna Parkins/Michael Baker International, Inc., Ronald Milam/Fehr & Peers

$1.7B Project Gets from NOI to ROD in 23 Months: Hunts Point Interstate Access Improvement Project (P20-20583) - A157

Lawrence Smith, James Heeren/Dewberry

NEPA @ TDOT Training for TDOT Engineers and Non-NEPA Technical Staff (P20-20587) - A158

Tammy Sellers/Tennessee Department of Transportation, Nancy Skinner/WSP

Applying NCHRP 25-25 Task 109: Successful Practices for Environmental Commitments in Public–Private Partnerships and Design-Build Contracts (P20-20588) - A159

Lawrence Pesesky/WSP, Adrienne Heller/WSP

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Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Current Issues in Transportation and Air Quality

Douglas Eisinger, Sonoma Technology, Inc., presiding

Sponsored By Standing Committee on Transportation and Air Quality

High-Resolution Mapping of Traffic Congestion and Vehicle Emissions: Exploiting Intelligent Transportation System Data (20-00199) - A190

Yifan Wen/Tsinghua University, Shaojun Zhang/Tsinghua University, Ye Wu/Tsinghua University

Carbon Dioxide Emission Estimation for Urban Buses at Different Road Locations (20-00370) - A200

Yingjiu Pan/Purdue University, Fengxiang Qiao/Purdue University, Kun Tang/Purdue University, Shuyan Chen/Purdue University, Satish Ukkusuri/Purdue University

Drivers of New Light-Duty Vehicle Fleet Fuel Economy in Saudi Arabia (20-00519) - A191

Tamara Sheldon/KAPSARC, Rubal Dua/KAPSARC

Clean Up the Air by Modal Shift: Assessment of the Rail-Water-Port Integrated System Planning in Shenzhen, China (20-00605) - A192

Jingran Zhang/Tsinghua University, Shuanghui Bao/Tsinghua University, Xiaomeng Wu/Tsinghua University, Shaojun Zhang/Tsinghua University, Ye Wu/Tsinghua University

Carbon Dioxide and Fossil Fuel Driven Transportation in the São Paulo Metropolitan Region (20-00606) - A193

Pedro Pérez-Martínez/Universidade Estadual de Campinas, Regina Maura Miranda/Universidade Estadual de Campinas, Maria de Fatima Andrade/Universidade Estadual de Campinas

Estimating the Impact of Green Light Optimized Speed Advisory on Exhaust Emissions Through the Integration of VISSIM and Moves (20-00731) - A194

Hasan Karabag/Florida State University, Mehmet Ulak/Florida State University, Festo Mjogolo/Florida State University, Emmanuel Kidando/Florida State University, Eren Ozguven/Florida State University, Thobias Sando/Florida State University, Ren Moses/Florida State University

Environmental Impacts of Extreme Fast Charging (20-01170) - A195

Alan Jenn/Institute of Transportation Studies (ITS), Kyle Clark-Sutton/Institute of Transportation Studies (ITS), Michael Gallaher/Institute of Transportation Studies (ITS), Jeffrey Petrusa/Institute of Transportation Studies (ITS)

Comparison of Marginal and Average Emission Factors for Passenger Transportation Modes (20-01271) - A196

Alexander Bigazzi/University of British Columbia

Energy Consumption Modeling in the Presence of Uncertainty (20-01312) - A197

Chiara Fiori/University of Naples Federico II, Vittorio Marzano/University of Naples Federico II, Vincenzo Punzo/University of Naples Federico II, Marcello Montanino/University of Naples Federico II

The Impact of Activity-Based Mobility Pattern on Assessing Fine-Grained Traffic-Induced Air Pollution Exposure (20-01359) - A223

Yizheng Wu/Beijing Jiaotong University, Guohua Song/Beijing Jiaotong University

AERMOD for Near-Road Pollutant Dispersion: Sensitivity to Source and Dispersion-Related Parameters (20-01404) - A198

Mohammad Hashem Askariyeh/Texas A&M University, College Station, Joe Zietsman/Texas A&M University, College Station

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Using Distributed Air Sensor Network to Investigate the Spatiotemporal Patterns in PM2.5 Concentrations (20-01558) - A233

Rong Cao/Shanghai Jiao Tong University, Bai Li/Shanghai Jiao Tong University, Zhanyong Wang/Shanghai Jiao Tong University, Zhongren Peng/Shanghai Jiao Tong University, Shikang Tao/Shanghai Jiao Tong University, Shengrong Lou/Shanghai Jiao Tong University

Reducing Network-wide Emissions Through Perimeter Control at City Gates (20-01677) - A199

Deepak Ingole/IFSTTAR , Guilhem Mariotte/IFSTTAR , Ludovic Leclercq/IFSTTAR

Streamlined Data Processing for Region-wide Applications of Line Source Dispersion Modeling via Distributed Computing (20-01774) - A225

Daejin Kim/Georgia Institute of Technology (Georgia Tech), Haobing Liu/Georgia Institute of Technology (Georgia Tech), Xiaodan Xu/Georgia Institute of Technology (Georgia Tech), Hongyu Lu/Georgia Institute of Technology (Georgia Tech), Roger Wayson/Georgia Institute of Technology (Georgia Tech), Michael Rodgers/Georgia Institute of Technology (Georgia Tech), Randall Guensler/Georgia Institute of Technology (Georgia Tech)

Data-Driven Approach to Capture the Association Between Local Truck Movements and Near-Road Black Carbon Concentrations Using Mobile Measurements (20-01802) - A228

Junshi Xu/University of Toronto, An Wang/University of Toronto, Ran Tu/University of Toronto, Marc Saleh/University of Toronto, Nicole Schmidt/University of Toronto, Marianne Hatzopoulou/University of Toronto

Regional Prediction of Ground-Level Ozone in Air Quality Monitoring Network Using a Hybrid Sequence-to-Sequence Deep-Learning Approach (20-01874) - A231

Hongwei Wang/Shanghai Jiao Tong University, Xiaobing Li/Shanghai Jiao Tong University, Dongsheng Wang/Shanghai Jiao Tong University, Juanhao Zhao/Shanghai Jiao Tong University, Hong-di He/Shanghai Jiao Tong University, Zhongren Peng/Shanghai Jiao Tong University

Characterization of Traffic-Related Pollutant Distribution Patterns in Urban Residential Areas with an Elevated Expressway (20-01877) - A232

Kaifa Lu/Shanghai Jiao Tong University, Zhongren Peng/Shanghai Jiao Tong University, Hong-Di He/Shanghai Jiao Tong University, Mazimba Mazimba/Shanghai Jiao Tong University, Tanvir MR-Ashik/Shanghai Jiao Tong University, Yue-Ping Jia/Shanghai Jiao Tong University, Xin Liu/Shanghai Jiao Tong University, Tie Zheng/Shanghai Jiao Tong University

Early Findings from Field Trials of "Eco-Drive" for Heavy-Duty Trucks (20-01910) - A201

Aravind Kailas/Volvo Group North America, Pascal Amar/Volvo Group North America, Kanok Boriboonsomsin/Volvo Group North America, Ziran Wang/Volvo Group North America, Yuan Pu-Hsu/Volvo Group North America, Alexander Vu/Volvo Group North America, Francisco Caballero/Volvo Group North America, Peng Hao/Volvo Group North America, Guoyuan Wu/Volvo Group North America, Eddie Garmon/Volvo Group North America, Sandeep Tanugula/Volvo Group North America, Matthew Barth/Volvo Group North America

Multi-Objective Eco-Routing in a Distributed Traffic Management Framework with a Case Study of Downtown Toronto (20-02010) - A229

Shadi Djavadian/Ryerson University, Lama Alfaseeh/Ryerson University, Ran Tu/Ryerson University, Bilal Farooq/Ryerson University, Marianne Hatzopoulou/Ryerson University

A Deep-Learning Approach to Real-Time CO Concentration Prediction at Signalized Intersections (20-02090) - A236

Yuxuan Wang/Southeast University, Chengcheng Xu/Southeast University, Pan Liu/Southeast University, Chang Peng/Southeast University, Jiaming Wu/Southeast University

Estimating Vehicle Emissions Based on Traffic Assignment Analysis Combined with Vehicle Inspection Data on Vehicle Kilometers Traveled (20-02158) - A202

Hansol Yoo/Hanyang University, Ikki Kim/Hanyang University, Taehoon Lee/Hanyang University

A Comparative Analysis of the Vehicular Emissions Generated as a Result of Different Intersection Controls (20-02349) - A203

Molly Behan/McGill University Faculty of Engineering, Ehsan Moradi/McGill University Faculty of Engineering, Luis Miranda-Moreno/McGill University Faculty of Engineering

Application of Big Data for Modeling the Fuel Consumption of Large Fleets of Vehicles Under Real Driving Conditions (20-02550) - A204

Federico Perrotta/AECOM Ltd, Tony Parry/AECOM Ltd, Luis C. Neves/AECOM Ltd, Mohammad Mesgarpour/AECOM Ltd

Investigating the Effect of Road Network Topological Characteristics on Air Pollutant Concentration by Spatial Regression Analysis (20-02578) - A237

Chengcheng Xu/school of transportation, southeast university, Mingyue Lei/school of transportation, southeast university, Rui Gan/school of transportation, southeast university

Characterizing Vertical Distribution Patterns of Low Tropospheric Pm2.5 in Wintertime Using a Hexacopter Platform in Shanghai, China (20-02713) - A205

Ruifeng Song/Shanghai Jiao Tong University

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Real-Time, Near-Road Pedestrian Exposure to Midday Air Pollution of Three Micro-Environments in Downtown Seattle: Lessons from the Application of a Personal Sensor (20-03309) - A206

Boyang Sa/University of Washington, C.-H. Bae/University of Washington

Dynamic System Optimum Considering Human Exposure to Vehicular Emissions (20-03420) - A207

Yu Tan/Southwest Jiaotong University, Rui Ma/Southwest Jiaotong University, Zhanbo Sun/Southwest Jiaotong University

Hybrid-Electric Passenger Car Energy Utilization and Emissions: Relationships for Real-World Driving Conditions That Account for Road Grade (20-03458) - A208

Mitchell Robinson/University of Vermont, Britt Holmén/University of Vermont

Emission Estimations Along First or Last-Mile Freight Connectors (20-03608) - A209

Deo Chimba/Tennessee State University, Tinotenda Jonga/Tennessee State University, Suleiman Swai/Tennessee State University

Study on Idling Time Distribution of Vehicle in Urban Streets Based on Location Information (20-03634) - A211

Yang Cao/Tongji University, Yuntao Chang/Tongji University, Bin Su/Tongji University

Eco-Trajectory Planning Considering Cut-in Intention for Hybrid Electric Connected Vehicles (20-04420) - A212

Yiheng Feng/University of Michigan, Transportation Research Institute, Zhen Yang/University of Michigan, Transportation Research Institute, Mohammad Reza Amini/University of Michigan, Transportation Research Institute, Qiuhao Hu/University of Michigan, Transportation Research Institute, Jing Sun/University of Michigan, Transportation Research Institute

Measuring Temporal and Spatial Exposure of Urban Cyclists to Air Pollutants Using an Instrumented Bike (20-04516) - A227

Kaitlyn Schaffer/Georgia Institute of Technology (Georgia Tech), April Gadsby/Georgia Institute of Technology (Georgia Tech), Sarah Jane Lowentritt/Georgia Institute of Technology (Georgia Tech), Christopher Le Dantec/Georgia Institute of Technology (Georgia Tech), Michael Rodgers/Georgia Institute of Technology (Georgia Tech), Kari Watkins/Georgia Institute of Technology (Georgia Tech)

Application of a Generic Calibration Guidance to Assess the Precision of Vissim to Generate Real-World Vehicle Activity and Reliable Emissions Estimates (20-04671) - A213

Georges Bou-Saab/Arcadis, Archana Venkatachalapathy/Arcadis, Shauna Hallmark/Arcadis, Omar Smadi/Arcadis, Diane Xiao/Arcadis, Chris Hutchinson/Arcadis

Near-Road Air Quality Data Exploration: Assessment of Impact of Traffic, Meteorology, and Background Concentration (20-04672) - A234

Suriya Vallamsundar/Texas A&M Transportation Institute, Rohit Jaikumar/Texas A&M Transportation Institute, Reza Farzaneh/Texas A&M Transportation Institute, Mohammad Askariyeh/Texas A&M Transportation Institute

Investigating Carbon Monoxide Spatial Patterns Over Urban Roadways Using Sensor-Equipped Transit Buses: Required Sample Sizes for Repeated Passes and Associations with Traffic Volumes (20-04739) - A214

Mark McCord/Ohio State University, Rabi Mishalani/Ohio State University, Andrew May/Ohio State University, Yangyang Zou/Ohio State University

Comparing Driving Cycle Development Methods Based on Markov Chains (20-04780) - A215

Frédérique Roy/Ecole Polytechnique de Montreal, Catherine Morency/Ecole Polytechnique de Montreal

Optimizing Commute Plans to Minimize Transportation Emissions of Multiple Businesses (20-04948) - A216

Shahryar Monghasemi/University of Colorado, Denver, Moatassem Abdallah/University of Colorado, Denver, Aly Tawfik/University of Colorado, Denver, Caroline Clevenger/University of Colorado, Denver

Emissions in Urban Environment: A Comprehensive Urban Transport Network and Emission Modeling System for Halifax, Canada (20-05005) - A217

Pauline Bela/Dalhousie University, Muhammad Habib/Dalhousie University, Alexander Morgenthaler/Dalhousie University

The Performance of Visible Light-Driven Photocatalytic Pavement in Reduction of Motor Vehicles Exhaust Gas (20-05246) - A210

Zhuoying Jiang/Case Western Reserve University, Xiong Yu/Case Western Reserve University

Using Vehicle Telematics Data to Characterize Drayage Heavy-Duty Truck Idling (20-05292) - A235

Reza Farzaneh/Texas A&M Transportation Institute, Jeremy Johnson/Texas A&M Transportation Institute, Rohit Jaikumar/Texas A&M Transportation Institute, Tara Ramani/Texas A&M Transportation Institute, Josias Zietsman/Texas A&M Transportation Institute

Identification of Vehicle Load Based on Power Characteristics of Heavy-Duty Trucks for Emission Estimation (20-05610) - A222

Xin Wang/Beijing Jiaotong University, Guohua Song/Beijing Jiaotong University, Yizheng Wu/Beijing Jiaotong University, Zhiqiang Zhai/Beijing Jiaotong University, Lei Yu/Beijing Jiaotong University

Time-Based Analysis and Prediction of Roadside Air Quality Using Deep-Learning Method (20-05711) - A230

Dongsheng Wang/Shanghai Jiao Tong University, Chao Li/Shanghai Jiao Tong University, Zhongren Peng/Shanghai Jiao Tong University, Hongwei Wang/Shanghai Jiao Tong University, Juanhao Zhao/Shanghai Jiao Tong University

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Assessing Emission Flow Pattern from a Single Cruising Vehicle Using Computational Fluid Dynamics Numerical Simulation and Wind Tunnel Experiment (20-05789) - A218
Xueqing Shi/Shanghai Jiao Tong University, Jian Sun/Shanghai Jiao Tong University, Zhonghua Zhao/Shanghai Jiao Tong University, Ying Zhang/Shanghai Jiao Tong University

Impact of Highway Managed Lane-Pricing Strategies on Ozone-Related Vehicle Exhaust Emissions: A Case Study on Houston Katy Freeway Managed Lane (20-05802) - A224
Jianbang Du/Texas Southern University, Fengxiang Qiao/Texas Southern University, Lei Yu/Texas Southern University

Development of a Simplified Model of Speed-Specific VSP Distribution Based on Vehicle Weight for Fuel Consumption Estimates (20-05903) - A221
Zeyu Zhang/Beijing Jiaotong University, Guohua Song/Beijing Jiaotong University, Jiaoyang Chen/Beijing Jiaotong University, Zhiqiang Zhai/Beijing Jiaotong University, Lei Yu/Beijing Jiaotong University

Sensitivity Analysis of Emissions Estimation When Cluster Analysis Is Used to Trim Machine Vision Traffic Data (20-05994) - A226
Hongyu Lu/Georgia Institute of Technology (Georgia Tech), Haobing Liu/Georgia Institute of Technology (Georgia Tech), Angshuman Guin/Georgia Institute of Technology (Georgia Tech), Michael Rodgers/Georgia Institute of Technology (Georgia Tech), Randall Guensler/Georgia Institute of Technology (Georgia Tech)

Estimating the Contribution of On-Road Mobile Vehicles to the Near-Road Air Pollutant Concentrations at a Highway Intersection (20-06135) - A219
Daniel Lee/Central State University, Ramanitharan Kandiah/Central State University, Krishnakumar Nedunuri/Central State University

Reducing Fuel Consumption and Emissions at Freeway Merge by Metering Its On-Ramp (20-01388) - A238
Mingyuan Yang/University of California, Berkeley, Xingan (David) Kan/University of California, Berkeley, Xiao-Yun Lu/University of California, Berkeley

Estimation of Hourly Traffic Flows from Floating Car Data for Vehicle Emission Estimation (20-02879) - A220
Yun Jiang/Beijing Jiaotong University, Guohua Song/Beijing Jiaotong University, Zufen Li/Beijing Jiaotong University, Zhiqiang Zhai/Beijing Jiaotong University, Zeyu Zhang/Beijing Jiaotong University, Lei Yu/Beijing Jiaotong University

Evaluating Environmental and Safety Impact Using Microsimulations: Experimental Findings with VISSIM and TransModeler (20-03086) - A239
Zhijin Song/Tongji University, Huizi Wang/Tongji University, Jian Sun/Tongji University, Ye Tian/Tongji University

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Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Current Issues in Ecology and Transportation
Daniel Smith, University of Central Florida, presiding
Sponsored By Standing Committee on Ecology and Transportation

Linking Unpaved Road Improvements to Human and Environmental Health Benefits (P20-20844) - A148
Bethany Kunz/U.S. Geological Survey

Ecological Approach to Infrastructure Development (P20-20847) - A147
Mary Grace Lewandowski/East-West Gateway Council of Governments, Jennifer Reiman/East-West Gateway COG

Federal Lands Wildlife–Vehicle Collision Data Coordination Project (P20-20848) - A146
Robert Ament/Western Transportation Institute (WTI)

Ecological Effects of Federal Highway Design Standards: A Network-Level Look at Habitat Fragmentation, Road Classification, and Historic Construction Practices (P20-20853) - A145
EO White/Rutgers University Edward J. Bloustein School of Planning and Public Policy

Winning for Wildlife (P20-20854) - A144
Renee Callahan/Center for Large Landscape Conservation

The Use of Fiber-Reinforced Polymers in Wildlife–Vehicle Collision Mitigating Infrastructure (P20-20855) - A143
Matthew Bell/Montana State University

Systematically Avoiding Violations/Promoting Stewardship at DOTs (P20-20859) - A142
Gary McVoy/McVoy Associates, LLC

ADC30: Standing Committee on Ecology and Transportation (P20-20863) - A141
Daniel Smith/University of Central Florida

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Current Issues in Historic and Archeological Preservation in Transportation
Lindsey Allen, Johnson Mirmiran and Thompson, presiding
Sponsored By Standing Committee on Historic and Archeological Preservation in Transportation

Historic Properties and the Federal Railroad Administration (P20-20321) - A187
amanda ciampolillo/Federal Railroad Administration (FRA)
Bridging the Mighty Red: Creative Mitigation That Crosses State Lines (P20-20322) - A180
Emily Pettis/Mead and Hunt, Inc., Scott Sundermeyer/Oklahoma Department of Transportation
Tackling Mega Disasters and Streamlining Section 106: Helping Puerto Rico Move Forward in the Wake of Hurricanes Irma and Maria (P20-20323) - A181
Lauran Switzer/ICF, Melissa Cascella/ICF, Richard Starzak/ICF
Past Meets Future: Social Media Programmatic Mitigation for Post-1945 Bridges (P20-20324) - A182
Susan Lassell/ICF
Coordinating Unique Design-Build Projects: How to Establish Communication and Coordination Protocols (P20-20325) - A183
Blake Crosby/VRX, Inc.
To Put It in Context: The Utility and Shelf-Life of Historic Contexts (P20-20326) - A184
Teresa Lotti/Georgia Department of Transportation
Water Over the Bridge: Climate Change, Transportation Planning, and Addressing Cultural Resource Management Issues (P20-20327) - A185
January Tavel/ICF, Tait Elder/ICF
A Review of 19 States' Section 106 Programmatic Agreements with the FHWA (P20-20329) - A186
Jasmine Jones-Bynes/Georgia Institute of Technology (Georgia Tech)
Teaching the Past for the Sake of the Future (P20-20330) - A170
Erica Schneider/Ohio Department of Transportation
Restitution and Preservation of Istiklal Street Culvert (20-00045) - A172
Niyazi Özgür Bezgin/Istanbul University, Cerrahpaşa

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Current Issues in Resource Conservation and Recovery
Steven Eget, Dewberry, presiding
Sponsored By Standing Committee on Resource Conservation and Recovery

ADC60 Committee on Resource Conservation and Recovery (P20-20913) - A160
Cyrus Parker/North Carolina Department of Transportation
A Systematic Approach to Estimate GWP from Pavement Vehicle Interaction Using Canadian LTPP Data (20-05886) - A161
Md Rakibul Alam/Memorial University of Newfoundland, Kamal Hossain/Memorial University of Newfoundland, Carlos Bazan/Memorial University of Newfoundland
Strategies to Reduce the Environmental Impact of Asphalt Mixtures Containing Recycled Materials (20-03593) - A150
Alex Sutherland/Oregon State University, Erdem Coleri/Oregon State University
Multimodal Characterization and Testing of Heat-Reflective Coatings to Mitigate the Urban Heat Island (20-03550) - A162
Molly Vitale-Sullivan/Boise State University, Yang Lu/Boise State University, Aidin Golrokh/Boise State University
A Piezoeletric-Based Harvester Proposal for Energy Micro-Generation from Road Traffic (20-02379) - A152
Lucas Heller/Universidade Federal do Rio Grande do Sul, Lélio Teixeira Brito/Universidade Federal do Rio Grande do Sul
Research on the Magnetization Properties of Pavement Materials and Energy Loss Impact on Wireless Power Transmission (20-00612) - A151
Xuan Sun/Beihang University, yuhang chen/Beihang University, Jinyan Feng/Beihang University, Feng Li/Beihang University

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Pavement Condition Evaluation
Gervas Wambura, JMT, Inc., presiding
Sponsored By Standing Committee on Pavement Condition Evaluation

This event will feature a whole host of exciting issues concerning Pavement Condition Evaluation. It includes new spins on traditional pavement condition evaluation techniques and also new techniques to perform the evaluation.

A Study on the Effect of the Type of Performance Indicator on Pavement Performance Models Developed Using Machine Learning: The Case of Pavement Condition Index and International Roughness Index (20-00729) - B331
S. Madeh Piryonesi/University of Toronto, Tamer El-Diraby/University of Toronto
Identifying Asphalt Pavement Transverse Cracking Through Vibration Data of a Moving Vehicle (20-01277) - B332
Shishi Zhou/Tongji University, Qun Yang/Tongji University
Training and Testing of Smartphone-Based Pavement Condition Estimation Models Using 3D Pavement Data (20-01902) - B328
Anirban Chatterjee/Georgia Institute of Technology (Georgia Tech), Yichang(James) Tsai/Georgia Institute of Technology (Georgia Tech)
Automated Pavement Crack Detection and Segmentation Based on Two-Step Convolutional Neural Network (20-01912) - B334
Jingwei Liu/Monash University, Xu Yang/Monash University, Stephen Lau/Monash University, Xin Wang/Monash University, Cheng-Siong Lee/Monash University
Three-Dimensional Feature Detection Method of Pavement Surface Deformation Distress Based on Mobile LiDAR Data (20-03213) - B336
Siyu Wei/Tongji University, Ning Pan/Tongji University, Jinsong Yue/Tongji University, Yuchuan Du/Tongji University
Quantitative Assessment of the Pavement Modulus and Surface Crack Using the Rayleigh Wave Dispersion Curve (20-03301) - B337
Xue Wang/Tongji University, Shihui Shen/Tongji University, Hai Huang/Tongji University, Zhixiang Zhang/Tongji University
Modeling the Accuracy of Airfield Pavement Deterioration Forecasts: Empirical Results Based on PCI Data (20-03462) - B338
Benjamin Knost/Ohio State University, Rabi Mishalani/Ohio State University
Slippery Pavement Detection Based on Deep Learning and Connected Vehicle Data (20-04328) - B330
Jiajie Hu/Case Western Reserve University, Ming-chun Huang/Case Western Reserve University, Xiong Yu/Case Western Reserve University
A Deep Neural Networks Approach for Pixel-Level Runway Pavement Crack Segmentation Using Drone-Captured Images (20-04374) - B339
Liming Jiang/University of Massachusetts, Lowell, Yuanchang Xie/University of Massachusetts, Lowell, Tianzhu Ren/University of Massachusetts, Lowell
Doctor, Is My Concrete Pavement Terminal or in Need of CPR? (20-04979) - B329
Georgene Geary/GGfGA Engineering, LLC, Yichang Tsai/GGfGA Engineering, LLC
Automated Rutting Abnormality Detection on 3D Asphalt Pavement Surfaces Using a Template Based on Disease Seeds (20-05363) - B333
Hong Lang/Tongji University School of Transportation Engineering, Yuexin Lou/Tongji University School of Transportation Engineering, Yichuan Peng/Tongji University School of Transportation Engineering, Jian Lu/Tongji University School of Transportation Engineering, Shengdi Chen/Tongji University School of Transportation Engineering
Deterioration Assessment of Highway Pavement Using Bayesian Survival Models (20-05394) - B327
Sylvester Inkoom/Florida State University, John Sobanjo/Florida State University, Eric Chicken/Florida State University, Debajyoti Sinha/Florida State University, Xufeng Niu/Florida State University
Adaptively Automatic Detection and Segmentation of Pavement Crack Based on Convolutional Neural Networks and Image Normalization (20-05455) - B326
Hanyu Deng/Southeast University, Xingyu Gu/Southeast University, Xiangcheng Meng/Southeast University, Qiao Dong/Southeast University, Jia Liang/Southeast University, Tianjie Zhang/Southeast University
PID: A New Benchmark Data Set to Classify and Densify Pavement Distresses (20-05477) - B325
Hamed Majidifard/University of Missouri, Columbia, Peng Jin/University of Missouri, Columbia, Yaw Adu-Gyamfi/University of Missouri, Columbia, William Buttlar/University of Missouri, Columbia

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Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Advancements in Bridge Construction
Chiara Rosignoli, WSP, presiding
Sponsored By Standing Committee on Construction of Bridges and Structures

Estimation of Preliminary Engineering Efforts of Bridge Replacement Projects: Exploring a Quantitative and Qualitative Mixed Approach (20-04871) - B304
Felipe Araya/University of Texas, Austin, Kasey Faust/University of Texas, Austin, Nabeel Khwaja/University of Texas, Austin, William O'Brien/University of Texas, Austin, Xiaopeng Liang/University of Texas, Austin, Mohamed Bur/University of Texas, Austin
Field Performance of Low-Cracking Concretes for the Closure Pours and Overlays of Bridge Decks (20-02846) - B305
H. Celik Ozyildirim/Virginia Department of Transportation, Harikrishnan Nair/Virginia Department of Transportation, Mary Sharifi/Virginia Department of Transportation

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Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
In-Place Asphalt Pavement Recycling and Interface Bond
Ben Cox, U.S. Army Corps of Engineers (USACE), presiding
Sponsored By Standing Committee on Asphalt Pavement Construction and Rehabilitation

Development and Assessment of Rapid Tests for Construction of Asphalt-Treated Cold Recycled Pavements (20-04124) - B311
Brian Diefenderfer/Virginia Transportation Research Council, ilker Boz/Virginia Transportation Research Council, Jhony Habbouche/Virginia Transportation Research Council, David Jones/Virginia Transportation Research Council, Adam Hand/Virginia Transportation Research Council
Review of Agency Pavement Recycling Construction Specifications (20-04696) - B312
Benjamin Bowers/Auburn University, Brian Diefenderfer/Auburn University, David Allain/Auburn University
Milling Induced Stresses in Asphalt Pavements (20-01678) - B315
Kaoutar Diouri/Worcester Polytechnic Institute, Rajae Bousselham/Worcester Polytechnic Institute, Anirban De/Worcester Polytechnic Institute, Tahar El-Korchi/Worcester Polytechnic Institute, Rajib Mallick/Worcester Polytechnic Institute
Economic and Environmental Cost Analysis of Cold In-Place Recycling (20-04023) - B314
Dan Offenbacker/Rowan University, Ahmed Saidi/Rowan University, Ayman Ali/Rowan University, Yusuf Mehta/Rowan University, Christopher DeCarlo/Rowan University, Wade Lein/Rowan University
Application of Intelligent Compaction Method for Quality and Process Control of Cold In-Place Recycling Pavements (20-03564) - B313
Eyoab Zegeye Teshale/Minnesota Department of Transportation, Rebecca Embacher/Minnesota Department of Transportation, John Siekmeier/Minnesota Department of Transportation, David Rettner/Minnesota Department of Transportation
Investigation of Tack Coat Bond Damage Mechanism in Asphalt Surfaced Pavements Under Dynamic Truck Loads (20-04872) - B310
Mostafa Estaji/Oregon State University, Erdem Coleri/Oregon State University, Blaine Wruck/Oregon State University

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Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Advances in Intelligent Transportation Systems, Traffic Management Applications, and Strategies
Sponsored By Standing Committee on Intelligent Transportation Systems

Avoiding Deductive Disclosure from Aggregated Basic Safety Messages (20-05472) - B340
Sharika Hegde/Carnegie Mellon University, Aaron Greenwood/Carnegie Mellon University, Alexander Frye/Carnegie Mellon University
A Bi-Level Programming Model for the Optimal Lane Reservation Problem (20-05494) - B341
Yinghao Chen/Southeast University, Qixiu Cheng/Southeast University, Zhiyuan Liu/Southeast University
System-Level Reliability Analysis of Cooperative Driving for Intersection Collision Avoidance (20-01073) - B342
Zhizhou Wu/Tongji University, Xin Zeng/Tongji University

(continued)

Data Processing Methods for Real-Time Travel-Time Information: Use of Dedicted Short-Range Communications Probes on Suburban Arterial (20-00053) - B343

Jinhwan Jang/Korea Institute of Civil Engineering and Building Technology (KICT)

Field Evaluation of Cooperative Adaptive Cruise Control with Unconnected Vehicle in the Loop (20-04007) - B344

Daegyu Lee/Korea Advanced Institute of Science and Technology (KAIST), Seungwook Lee/Korea Advanced Institute of Science and Technology (KAIST), Zheng Chen/Korea Advanced Institute of Science and Technology (KAIST), David Shim/Korea Advanced Institute of Science and Technology (KAIST), Byungkyu Brian Park/Korea Advanced Institute of Science and Technology (KAIST)

Improving Traffic Operation at Distant Downstream Bottlenecks Using Deep Q Network-Based Ramp Metering (20-03181) - B345

Si Zheng/Southeast University, Zemian Ke/Southeast University, Zhibin Li/Southeast University, Pan Liu/Southeast University, Jiaming Wu/Southeast University

Online Fleet Management Operations for On-Demand Capacitated Ridesharing Systems (20-03156) - B346

Zahra Ghandeharioun/ETH Zurich, Anastasios Kouvelas/ETH Zurich

Grey Systems-Based Traffic Queue Length Prediction Models for Adaptive Traffic Signal Control Systems (20-05156) - B347

Gurcan Comert/Clemson University, Zadid Khan/Clemson University, Mizanur Rahman/Clemson University, Mashrur Chowdhury/Clemson University

LiDAR-Based Mapping of Underground Parking Lots for Intelligent Vehicle Localization and Navigation (20-06056) - B348

Qianwen Tao/Wuhan University, Kai Yuan/Wuhan University, Zhaozheng Hu/Wuhan University, Xianglong Wang/Wuhan University, Gang Huang/Wuhan University

DASCOS: Dynamic Area-wide Signal Control Optimization System Using Trajectory Data (20-03418) - B349

Jianfeng Zheng/Didi Chuxing LLC, Henry Liu/Didi Chuxing LLC

SAVETRAX: A Semi-Automated Image-Processing Based Vehicle Trajectory Extractor (20-04425) - B350

Suvin Padinjare Venthuruthiyil/Indian Institute of Technology, Guwahati, Mallikarjuna Chunchu/Indian Institute of Technology, Guwahati

Modeling and Simulation of Dynamic Lane Reversal Using Cell Transmission Model (20-03364) - B351

Wenxin Li/Tongji University, Huizhuo Zhang/Tongji University, Wei Tang/Tongji University, Yedi Yang/Tongji University, Ye Tian/Tongji University

A Scaled-Vehicle-in-the-Loop Test Platform for Cooperative Vehicle-Infrastructure System (20-04276) - B352

Zixuan Chen/Tongji University, Wanjing Ma/Tongji University, Chunhui Yu/Tongji University, Yutong Li/Tongji University, Hongge Zhu/Tongji University

Improving Arterial Operations Using Cooperative Adaptive 2 Cruise Control (20-03352) - B353

Xingan (David) Kan/Florida Atlantic University, Alexander Skabardonis/Florida Atlantic University, Hao Liu/Florida Atlantic University

Optimizing Base Station Layout of Ultra Wide Band–Based High-Precision Localization System (20-04040) - B354

Xiaotao Feng/Tongji University, Chenwei Wang/Tongji University, Shengchuan Jiang/Tongji University, Yuchuan Du/Tongji University

Application of Intelligent Transportation Systems to Reduce Wrong-Way Driving Crashes: A Review of Case Studies (20-03032) - B355

Mohammad Jalayer/Rowan University, Md Atiquzzaman/Rowan University, Mahdi Pour-Rouholamin/Rowan University, Huaguo Zhou/Rowan University

Instantaneous Risk Estimation Model for Lane Change Using Vehicle Trajectory Data (20-01187) - B357

Huiying Wen/South China University of Technology, Jiabin Wu/South China University of Technology, Weiwei Qi/South China University of Technology, Yuchen Duan/South China University of Technology

Intersection SPaT Estimation by Means of Single-Source Connected Vehicle Data (20-02772) - B358

Majid Rostami Shahrbabaki/Universitat der Bundeswehr, Munchen, Klaus Bogenberger/Universitat der Bundeswehr, Munchen, Ali Akbar Safavi/Universitat der Bundeswehr, Munchen, Armaghan Moemeni/Universitat der Bundeswehr, Munchen

A Neural-Kalman Filtering Approach for Vehicle Count Estimates on Signalized Roadways Using Probe Vehicle Data (20-00595) - B364

Mohammad Aljamal/Virginia Polytechnic Institute and State University, Hossam Abdelghaffar/Virginia Polytechnic Institute and State University, Hesham Rakha/Virginia Polytechnic Institute and State University

Trajectory Design for Autonomous Modular Vehicle Docking Operations (20-00604) - B363

qianwen Li/University of South Florida, Xiaopeng (Shaw) Li/University of South Florida

(continued)

Rear-End Collision Warning Method of Connected Automated Vehicles Based on the Safety Probability by Keeping the Real-Time Safety Distance (20-00781) - B359

Jianghui Wen/Wuhan University, Zhenxing Yao/Wuhan University, Ruiyu Zhang/Wuhan University, Chaozhong Wu/Wuhan University

Efficient Subspace Clustering for Road Traffic Pattern and Anomaly Analysis (20-01664) - B365

Zengxiang Lei/Purdue University, Xinwu Qian/Purdue University, Satish Ukkusuri/Purdue University

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1421

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Multimodal Traffic Signal Control and Field Evaluations

Sponsored By Standing Committee on Traffic Signal Systems

Online Multimodal Traffic Signal Priority Scheduling at Signalized Intersections Based on the Phase-Time Network Models (20-01078) - B390

Farzana Chowdhury/University of Texas, Arlington, Peirong (Slade) Wang/University of Texas, Arlington, Pengfei (Taylor) Li/University of Texas, Arlington

A Program for Multimodal Traffic Signal Timing Optimization in Urban Street Networks (20-02356) - B393

SMA Bin Al Islam/North Carolina State University, Ali Hajbabaie/North Carolina State University

Determining Optimum Transit Signal Priority Implementation Locations on a Network (20-03295) - B395

Murat Bayrak/Pennsylvania State University, S. Ilgin Guler/Pennsylvania State University

Exploring the Performance of Different Intersection Control Types Based on Delay and Capacity for an Isolated Intersection (20-03366) - B399

Ali Danesh/Tongji University, Wanjing Ma/Tongji University, Ling Wang/Tongji University, Xiaolong Ma/Tongji University, Ali Gholami/Tongji University

Field Evaluation of Connected Vehicle–Based Transit Signal Priority System Under Two Different Signal Base Plans (20-04044) - B394

Qinzheng Wang/University of Utah, Xianfeng Yang/University of Utah, Blaine Laenard/University of Utah, Jamie Mackey/University of Utah

Evaluation of Adaptive Signal Control Technologies in Florida (20-04456) - B397

Pruthvi Manjunatha/University of Florida, Xi Duan/University of Florida, Marian Ankomah/University of Florida, Lily Elefteriadou/University of Florida, Sivaramakrishnan Srinivasan/University of Florida, Raj Ponnaluri/University of Florida

Adaptive Traffic Control Deployments in the United States: Insights from a New Database and Filtering Tool (20-05240) - B398

Nemanja Dobrota/University of Pittsburgh, Aleksandar Stevanovic/University of Pittsburgh, Nikola Mitrovic/University of Pittsburgh

Design of Multimodal Signal Progression Along an Arterial with Bus Dedicated Lanes (20-05368) - B391

Hyeonmi Kim/University of Maryland, College Park, Yao Cheng/University of Maryland, College Park, Gang-Len Chang/University of Maryland, College Park

Impacts of Detector Configuration on Performance Measurement and Signal Operations (20-05436) - B396

A. M. Tahsin Emtenan/Iowa State University, Christopher Day/Iowa State University

Cooperative Bus-Holding Transit Signal Priority Strategy in Connected and Automated Vehicles Environment (20-06021) - B392

Awad Abdelhalim/Virginia Polytechnic Institute and State University, Montasir Abbas/Virginia Polytechnic Institute and State University

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1423

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Traffic Control Device Research

Paul Carlson, Road Infrastructure, Inc., presiding

Sponsored By Standing Committee on Traffic Control Devices

Traffic Safety Effects of Uniform and Differential Speed Limits on Rural Freeways (20-02446) - B380

Raul Pineda-Mendez/Purdue University, Qiming Guo/Purdue University, Andrew Tarko/Purdue University

Stakeholder Feedback on Traffic Control Device Needs to Support AV Deployment (20-02662) - B381

Paul Carlson/Road Infrastructure, Inc., Abdul Zineddin/Road Infrastructure, Inc., Deepak Gopalakrishna/Road Infrastructure, Inc.

(continued)

"Shunt Traffic": Impact of Compromised Dynamic Message Signs on Route Divergence (20-02781) - B382

Alireza Ermagun/Mississippi State University, Kaveh Bakhsh Kelarestaghi/Mississippi State University, Kevin Heaslip/Mississippi State University

Sign Occlusion Impacts of Truck Platooning (20-03814) - B383

Ibrahim Alsghan/King Fahd University of Petroleum and Minerals, Madhav Chitturi/King Fahd University of Petroleum and Minerals, David Noyce/King Fahd University of Petroleum and Minerals

Atlas Analysis of the Impact of Transition Form of Yellow Light Signal on Driving Behavior (20-04337) - B384

Haoran Zheng/Wuhan University of Technology, Yaqin Qin/Wuhan University of Technology, Zhigang Du/Wuhan University of Technology

Developing Efficiency Attributes for Right Turn Flashing Yellow Arrow on Impeding Through and Opposing Left Phases Using a Multi-Nomial Logit Model (20-04610) - B385

Mohammed Alfawzan/University of Central Florida, Hatem Abou-Senna/University of Central Florida, Essam Radwan/University of Central Florida, Tanmoy Bhowmik/University of Central Florida, Naveen Eluru/University of Central Florida, Salma El Zayat/University of Central Florida

Analysis of Drivers' Performance at Different Information Levels of Traffic Signs Using Eye Movements Data (20-05730) - B386

Chi Tian/Purdue University, Xingzhou Guo/Purdue University, Yunfeng Chen/Purdue University, Junan Shen/Purdue University, Weinan Gao/Purdue University, Jyoti Das/Purdue University, Sultana Quader Tania/Purdue University

Duration of Yellow Lights at Signalized Intersections Considering the Stochastic Characteristics of Drivers: A Monte Carlo Simulation Approach (20-01816) - B387

Ze-hao Jiang/Tongji University, Xiaoguang Yang/Tongji University, Fang-kai Wang/Tongji University, Tao Wang/Tongji University

Developing Signal Warrants for Restricted Crossing U-Turn Intersections (20-03737) - B388

Justice Appiah/Virginia Transportation Research Council

Evaluation of the Detectability of Pavement Marking Tape by Machine Vision Systems (20-05818) - B389

Timothy Barrette/Texas A&M Transportation Institute, Adam Pike/Texas A&M Transportation Institute

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1424

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Research on Highway-Rail Grade Crossings
Aemal Khattak, University of Nebraska, Lincoln, presiding
Sponsored By Standing Committee on Highway/Rail Grade Crossings

Statistical Screening of Rail Crossing–Related Crashes and Injury Severities in Tennessee (20-00948) - B440

Kahlil Andrews/Tennessee State University, Deo Chimba/Tennessee State University, Suleiman Swai/Tennessee State University

Weather (Not Light Levels) Is Responsible for Seasonal Variation in Level Crossing Accidents (20-04880) - B441

Steven Henderson/Transportation Safety Board of Canada, Anthony Millen/Transportation Safety Board of Canada, Christina Rudin-Brown/Transportation Safety Board of Canada

Innovative Data Collection and Analysis of Pedestrian Trespassing Along Railroad Right-of-Ways in North Carolina (20-05255) - B443

Sarah Searcy/Institute for Transportation Research and Education (ITRE), Christopher Vaughan/Institute for Transportation Research and Education (ITRE), Daniel Coble/Institute for Transportation Research and Education (ITRE), Christopher Cunningham/Institute for Transportation Research and Education (ITRE)

Target Detection Algorithms for High-Speed Railway Intrusion (20-02627) - B444

Xingwei Jia/Beijing Jiaotong University, Zhengyu Xie/Beijing Jiaotong University, Yong Qin/Beijing Jiaotong University, Limin Jia/Beijing Jiaotong University

Crossing the Line?: Involuntary and Deliberate Road User Non-Compliance at Congested Railway Crossings (20-02013) - B445

Gregoire Larue/Queensland University of Technology, Anjum Naweed/Queensland University of Technology

Understanding Violation Behaviors at Highway-Rail Grade Crossings Using Drivers' Estimate Anxiety in the Decision-Making Process (20-04403) - B446

Li Zhao/University of Nebraska, Lincoln, Laurence Rilett/University of Nebraska, Lincoln

(continued)

Design, Implementation, and Assessment of a Multimodal Cooperative ITS Safety System at Level-Crossings (20-03783) - B447

Neofytos Boufidis/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Josep Maria Salanova Grau/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Georgia Aifadopoulou/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Panagiotis Tzenos/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Thanasis Tolikas/Centre for Research and Technology Hellas - Hellenic Institute of Transport

Evaluation of a Low-Cost Countermeasure to Prevent Incorrect Turns at Highway-Rail Grade Crossings (20-05006) - B448

Abhijit Vasili/University of South Florida, Zhenyu Wang/University of South Florida, Pei-Sung Lin/University of South Florida, Rui Guo/University of South Florida, Runan Yang/University of South Florida, Edith Wong/University of South Florida

Revisiting Crash Fatality Classification for Modeling Highway-Rail Grade Crossings Crashes Severity (20-05680) - B442

Christian Mbuya/Texas A&M Transportation Institute, Emmanuel Kidando/Texas A&M Transportation Institute, Angela Kitali/Texas A&M Transportation Institute, Neema Langa/Texas A&M Transportation Institute, Boniphace Kutela/Texas A&M Transportation Institute

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1425

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Structures Maintenance
George Hearn, University of Colorado, Boulder, presiding
Sponsored By Standing Committee on Structures Maintenance

Bond Strength and Chloride Resistance of Epoxy and Concrete Overlays (20-00449) - B300
Katelyn Freeseman/Iowa State University, Kejin Wang/Iowa State University, Yuxiang Tan/Iowa State University

Qualifying Commercial Rapid Repair Media for Partial Depth Bridge Decks Repairs in Utah (20-01290) - B301
Ali Banaei Pour/University of Kansas, Robert Thomas/University of Kansas, Marc Maguire/University of Kansas, Andrew Sorensen/University of Kansas

Magnetic-Based Technique in Detecting Corrosion Damage in Internal Post-Tensioned Tendons (20-04182) - B302
Hoda Azari/GENEX Systems, Seung-Kyoung Lee/GENEX Systems, Toshiyuki Moriya/GENEX Systems, Sadegh Shams/GENEX Systems

Development of Robotic Non-Destructive Testing of Steel Corrosion of Prestressed Concrete Bridge Girders Using Magnetic Flux Leakage System (20-04619) - B303
Hoda Azari/GENEX Systems, Al Ghorbanpoor/GENEX Systems, Sadegh Shams/GENEX Systems

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Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Best Presentations from Annual Interuniversity Symposium on Infrastructure Management 2019
Hao Wang, Rutgers, The State University of New Jersey, presiding
Sponsored By Standing Committee on Bridge Management, Standing Committee on Transportation Asset Management, Standing Committee on Pavement Management Systems

Best Presentations from the Annual Interuniversity Symposium on Infrastructure Management – These posters are the five best presentations from the student organized and student run 2019 AISIM.

Bridge Resilience: A Framework for Bridge Management Against Climate Change Hazards (P20-20570) - B320
Dominic Wirkijowski/Rutgers, The State University of New Jersey

Enhanced Safety Performance Function for Highway Segments in Oklahoma (P20-20571) - B321
Wenying Yu/Oklahoma State University

Develop Probabilistic Seismic Hazard Scenarios (P20-20572) - B322
Nafiseh Soleimani/University of Delaware

Electrified Roads for Sustainable Infrastructure: Opportunities and Challenges (P20-20573) - B323
Laura Soares/Rutgers, The State University of New Jersey

(continued)

Condition Modeling of Cast-in-Place Concrete Liners for Highway Tunnels Across the United States (P20-21408) - B324

Mohamed S. Yamany/Purdue University

1427

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Approaches to Modeling Visibility and Safety Effects
John Bullough, Rensselaer Polytechnic Institute (RPI), presiding
Sponsored By Standing Committee on Visibility

A wealth of information related to driving safety is being made available through technological developments in sensors , cameras and data analytics. The papers in this session illustrate valuable methods for accessing and interpreting these data as they relate to driver visibility.

Visibility Prediction Models Based on Elevation (20-02466) - B373
Ajinkya Mane/University of North Carolina, Charlotte, Srinivas Pulugurtha/University of North Carolina, Charlotte, Venkata Duddu/University of North Carolina, Charlotte, Christopher Godfrey/University of North Carolina, Charlotte

A New Video Camera–Based Road Visiometer System (20-00232) - B374
JL Wang/Institute of Urban Meteorology,China Meteorological Administration,Beijing,China, Xulin Liu/Institute of Urban Meteorology,China Meteorological Administration,Beijing,China, Zhibin Yu/Institute of Urban Meteorology,China Meteorological Administration,Beijing,China

A Machine Learning–Based Diagnosis of Lighting Patterns Contributing to Nighttime Crash Severity on Roadway Corridors (20-05641) - B375
Mingchen Li/University of South Florida, Zhenyu Wang/University of South Florida, Pei-Sung Lin/University of South Florida, Runan Yang/University of South Florida, Abhijit Vasili/University of South Florida, Edith Wong/University of South Florida

Fog Detection Based on Images with Neural Network Using TensorFlow Utilizing the SHRP2 Naturalistic Driving Study Data (20-05532) - B376
Md Nasim Khan/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)

Warning Light Flash Frequency as a Method for Visual Communication to Drivers (20-02768) - B377
Nicholas Skinner/Rensselaer Polytechnic Institute (RPI), Timothy LaPlumm/Rensselaer Polytechnic Institute (RPI), John Bullough/Rensselaer Polytechnic Institute (RPI)

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Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Rail Safety IDEA Program
Velvet Basemera-Fitzpatrick, Transportation Research Board, presiding
Sponsored By Rail Group

Rail Safety IDEA 36: On-Board, High-Bandwidth Fiber Optic Sensing System for Broken Rail Detection (P20-211 82) - B451
Richard Black/Intelligent Fiber Optic Systems, Homi Fatemi/Intelligent Fiber Optic Systems

Rail Safety IDEA 37: Measuring Behavior of Railroad Bridges Under Revenue Traffic Using Lasers and Unmanned Aerial Vehicles for Safer Operations: Implementation (P20-21183) - B452
Fernando Moreu/University of New Mexico

Rail Safety IDEA 38: Fatigue Life Extension of Thermite Welds by Porosity Minimization (P20-21184) - B453
Francisco Robles Hernandez/University of Houston

Rail Safety IDEA 41: Vibration-Based Longitudinal Rail Stress Estimation Exploiting Contactless Measurement and Machine Learning (P20-21185) - B454
John Popovics/University of Illinois, Urbana Champaign

Rail Safety IDEA 42: Railroad Tunnel Inspections for Maintenamce and Replacement Prioritization Using Untethered Ground Penetrating Radar and LiDAR Capable Unmanned Aerial Vehicles (P20-21278) - B455
Michael Scott/ADOJAM, LLC, Girija Subramaniam/Forcing Function LLC, John Padukiewicz/ADOJAM, LLC

Rail Safety Innovations Deserving Exploratory Analysis Program (P20-21410) - B450
Velvet Basemera-Fitzpatrick/Transportation Research Board

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Research in Rail Rolling Stock and Motive Power
Davidson Ward, FMW Solutions LLC, presiding
Sponsored By Standing Committee on Rail Rolling Stock and Motive Power

Toward Prognostic and Health Management of Train Wheels in the Chinese Industry (20-00224) - A240
Qizhang Luo/Central South University, Tiantian Wang/Central South University, Yaru Gu/Central South University, Guohua Wu/Central South University
Joint Depot Location, Capacity, and Rolling Stock Scheduling Optimization with Maintenance Requirements (2 0-02166) - A241
Qingwei Zhong/Southwest Jiaotong University, Richard Lusby/Southwest Jiaotong University, Jesper Larsen/Southwest Jiaotong University, Yongxiang Zhang/Southwest Jiaotong University, Qiyuan Peng/Southwest Jiaotong University
Evaluating Wheelset Health Status of Rail Transit Vehicles: An Approach for Synthesis of Wear Mechanism and Data-Driven Analysis (20-03465) - A242
Wei Zhu/Ningbo University, Xin Xiao/Ningbo University, Di Yan/Ningbo University, Zhaodong Huang/Ningbo University, Yang Li/Ningbo University
A Fault Diagnosis Method of the CTCS-3 On-Board Equipment Based on Imbalanced Text Mining (20-02243) - A 243
Lijuan Shi/Tongji University, Ang Li/Tongji University, Liquan Chen/Tongji University
A Lamb Wave-Based Structural Health Monitoring System for High-Speed Train Car Body (20-00223) - A244
Tiantian Wang/Central South University, Guohua Wu/Central South University, Qizhang Luo/Central South University
Fault Diagnosis of Traction Converter for High-Speed Trains Based on Long Short-Term Memory Network (20-0 1843) - A245
Fuzhao Chen/Beijing Jiaotong University, Limin Jia/Beijing Jiaotong University, Yong Qin/Beijing Jiaotong University, Honghui Dong/Beijing Jiaotong University

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Railroad Safety and Incident Analysis Methods
Jo Strang, American Short Line and Regional Railroad Assn, presiding
David Moore, OST-R/Volpe Center, presiding
Sponsored By Standing Committee on Railroad Operational Safety

Research topics in railroad safety and incident analysis methods.

Safety Analysis of End-of-Track Collisions in Passenger Stations via Systems-Theoretic Accident Modeling and Processes (20-04978) - B456
Zhipeng Zhang/Rutgers, The State University of New Jersey, Xiang Liu/Rutgers, The State University of New Jersey
Application of Fault Tree Analysis and Swiss Cheese Model to the Overspeed Derailment of Puyuma Train in Yilan, Taiwan (20-01589) - B457
Jyh-Cherng Jong/National Taiwan University, Yung-Cheng Lai/National Taiwan University, Cheng-Chung Young/National Taiwan University, Yu-Fu Chen/National Taiwan University

Tuesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Current Research in Freight Transportation Economics and Regulation
David Clarke, University of Tennessee, Knoxville, presiding
Sponsored By Standing Committee on Freight Transportation Economics and Regulation

Nationwide Freight Mode Choice Modeling Using Confidential Data Sets (2012 CFS Microdata, Waybill, Here) (20-01611) - A249
Jose Holguin-Veras/Rensselaer Polytechnic Institute (RPI), Shama Campbell/Rensselaer Polytechnic Institute (RPI), Lokesh Kalahasthi/Rensselaer Polytechnic Institute (RPI)

(continued)

Study on Differential Pricing and Train Operation Decision of Railway Freight Transport Under Competitive Conditions (20-02051) - A258
Xiaoqing Zhang/Beijing Jiaotong University, Jin Zeng/Beijing Jiaotong University

Evaluation of the Emission Reduction Strategies in Maritime Liner Shipping Using Evolutionary Game Theory (20-03400) - A248
Dung-Ying Lin/National Cheng Kung University, Ching-Chih Chang/National Cheng Kung University, Chieh-Ju Juan/National Cheng Kung University

Development of a "Fair" Marketplace for On-Demand Capacity Matching (20-04075) - A259
Georgia Aifadopoulou/Centre for Research and Technology Hellas - Hellenic Institute of Transport, ioannis mallidis/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Dimitrios Vlachos/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Eleftherios Iakovou/Centre for Research and Technology Hellas - Hellenic Institute of Transport, Josep Maria Salanova Grau/Centre for Research and Technology Hellas - Hellenic Institute of Transport

Evaluating the Economic Impacts of Large Truck Crash Reduction with Input-Output Analysis (20-04494) - A247
Salwa Anam/Florida International University, Ming Lee/Florida International University, Xia Jin/Florida International University

Expenditure-Based Segmentation of Freight Travel Markets: Identifying the Determinants of Freight Transport Expenditure and Profiling the Target Markets (20-05810) - A246
Agnivesh Puliyappatta/Birla Institute of Technology and Science, Bandhan Majumdar/Birla Institute of Technology and Science, Prasanta Sahu/Birla Institute of Technology and Science

Tuesday, 09:00 a.m. - 04:00 p.m., Convention Center, Hall D&E
Exhibits
Sponsored By Technical Activities Council

Plan to visit the nearly 200 exhibits, including the TRB booth, showcasing the many transportation-related products and services. View the floor plan and interactively search for exhibiting organizations on the Mobile App . Between sessions, food concessions are available in the Exhibit Hall.Located in the exhibit hall, theSolutions Showcasetheaters will feature presentations from exhibiting and patron organizations on the goods, services, and solutions they provide. Presentations begin every half hour during exhibit hours, and are 30 minutes in length. Presentations that start on the hour are in Theater #1 (booth #1239). Those that start on the half hour are in the Theater #2(booth #1234). For a list of presentations, see the mobile app (available in early December) or the onsite printed program.

Tuesday, 09:30 a.m. - 03:30 p.m., Convention Center, Exhibit Hall D Theaters
Solutions Showcase Theater
Sponsored By Technical Activities Council

Located in the exhibit hall, the Solutions Showcase theater (booth 1237) features presentations from exhibiting and patron organizations on the goods, services, and solutions they provide.

1291

Celebrating Transportation Research on Film: What the Cutting Edge in 1970 Means for the Future
Gregory Slater, Maryland State Highway Administration, presiding
Sponsored By Standing Committee on Transportation History

The Highway Research Board commissioned a remarkable film celebrating the cutting edge in transportation research for its 50th anniversary. Narrated by Rod Serling of Twilight Zone fame, the film showcases the use of computer technologies for everything from road simulations to routing demand-responsive buses. Crash tests, new guard rail designs, and even holographic signs promote safety. An extended sequence in Watts, Los Angeles examines the impacts of highways on African-American communities. After showing Research: The Common Denominator (26 minutes), the panel and audience will share what the cutting edge in 1970 means for transportation, and transportation research, in the future.

Introduction to the Film (P20-20291)
Sarah Jo Peterson/23 Urban Strategies, LLC
Panelist (P20-20292)
Jacquelyn DuPont-Walker/Los Angeles County Metropolitan Transportation Authority
Panelist (P20-20293)
Dan Albert/No Organization
Panelist (P20-20294)
Richard Ezike/The Urban Institute

1432

Fitting It All in: Urban Transportation Challenges
Frederick Dock, P & D Consulting, presiding
Sponsored By Standing Committee on Transportation Issues in Major Cities

This session takes on the challenges presented by changing and competing demands for street and curb space in the complex urban environment and explores new methods for identifying historically and evolving underserved markets to ensure equity in transportation services and access. The role of politics in both areas is also highlighted.

People-Focused and Near-Term Public Transit Performance Analysis (20-01722)
Alex Karner/University of Texas, Austin
Curbside Reimagined: Repurposing the District's Curbside Dynamically in the Networked Mobility Age (20-054 33)
Benito Perez/District Department of Transportation, David Lipscomb/District Department of Transportation, Benjamin Eskin/District Department of Transportation, Emilda Gwerengwe/District Department of Transportation
Implementing Cycling Infrastructure in a Politicized Space: Lessons from Toronto, Canada (20-00353)
Adam Wilson/Ryerson University, Raktim Mitra/Ryerson University
Behavioral Response to Discounted Fares for Low-Income Transit Riders in Boston (20-03488)
Jeffrey Rosenblum/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT), Mariana Arcaya/Massachusetts Institute of Technology (MIT), Justin Steil/Massachusetts Institute of Technology (MIT), P. Christopher Zegras/Massachusetts Institute of Technology (MIT)
Chasing the American Dream: How Everyday Travel Plays a Role in Immigrants' Integration into Society (20-01 546)
Manish Shirgaokar/University of Colorado, Denver, Erin Nobler/University of Colorado, Denver

1433

Enabling Environments for Accessible Transport
Todd Hansen, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Accessible Transportation and Mobility

Accessibility in pedestrian environments and spaces is key to ensuring equal opportunity to transportation options needed to make trips. Environments to get to transportation include sidewalks, curb ramps, crosswalks, bus stops, and other infrastructure elements in the complete trip chain. Accessible design is needed for pedestrians to use available transportation opportunities, whether connecting to public transit, using private transportation, or walking from place to place. This session with provide presentations on research learning about universal design, travel experiences, accessible streetscapes, and bus stop infrastructure to improve transportation for all users.

The Connection Between Investments in Bus Stops, Ridership, and ADA Accessibility (20-03069)
Ja Young Kim/University of Utah, Keith Bartholomew/University of Utah, Arlie Adkins/University of Utah, Divya Chandrasekhar/University of Utah
Transport and Universal Design: Where Are We Now? (20-04099)
Rosalia Camporeale/Lund University, Per-Olof Hedvall/Lund University, Anders Wretstrand/Lund University
Mapping Travel Experiences: Toward a New Methodological Approach to Measure Universal Accessibility in Public Transport in Latin American (20-05029)
Darío Hidalgo/WRI Ross Center, Camilo Urbano/WRI Ross Center, Claudio Olivares/WRI Ross Center, Natalia Tinjaca /WRI Ross Center, Jose Perez/WRI Ross Center, Carlos Pardo/WRI Ross Center, Manuel Rodriguez Porcel/WRI Ross Center, Isabel Granada/WRI Ross Center, Cristian Navas/WRI Ross Center, Claudia Glen/WRI Ross Center, Camila Ramos/WRI Ross Center, Maria Gutierrez/WRI Ross Center, Lauramaria Pedraza/WRI Ross Center
Design, Development, and Evaluation of a Curb Ramp Inspection System (20-06139)
Jacob Meadows/University of Pittsburgh, Megan D'Innocenzo/University of Pittsburgh, Jonathan Pearlman/University of Pittsburgh

1434

Dwight David Eisenhower Transportation Fellowship Program Research Showcase, Part 2 (Part 1, Session 1364)
Sponsored By Section - Research and Education

1435

Benefits of Data Integration in Safety Decision Making
Nancy Lefler, UNC Highway Safety Research Center, presiding
Sponsored By Standing Committee on Statewide Transportation Data and Information Systems, Roadway Safety Data

 There has been work in recent years for incorporating data sources beyond the traditional roadway and traffic data with crash data for more robust analysis. However obtaining and integrating these data can be time consuming, laborious, and require stringent data agreements leaving one to wonder, why bother? The purpose of this session will be to focus on the benefits of data integration for various data sources (hospital, injury, land use, etc), what can be learned, and what you can do when you can turn these data into information for decision making. It aims to answer the "why bother" with real world examples of how integrating data can lead to increased understanding of the underlying issues, can be used to help shape policy, and implement solutions that might have not otherwise been considered to improve safety.

Health and Transportation Data Linkage in North Carolina (P20-20363)
Katherine Harmon/University of North Carolina
Applications of Linked Data in Illinois (P20-20364)
Mehdi Nassirpour/Illinois Department of Transportation
Benefits of Using GIS for Safety Data Linkage (P20-20365)
Ian Hamilton/VHB

1436

Mode-Specific Traffic Monitoring Solutions with Lessons for All Modes
Jonathan Regehr, University of Manitoba, presiding
Sponsored By Standing Committee on Highway Traffic Monitoring, Subcommittee on Travel Time Speed and Reliability, Subcommittee on Bicycle and Pedestrian Data

This session presents technological and methodological innovations that have been applied to a particular traffic mode, but which generate broad findings and lessons applicable to traffic monitoring challenges in any mode. The presentations examine the use of new technologies, the application of crowd-sourced and real-time data, and the challenges of classification and selecting count locations.

Evaluating Advancements in Bluetooth Technology for Travel Time and Segment Speed Studies (20-03551)
Drew Cotten/Louisiana Transportation Research Center (LTRC), Julius Codjoe/Louisiana Transportation Research Center (LTRC), Matthew Loker/Louisiana Transportation Research Center (LTRC)
Estimation of Average Annual Daily Bicycle Counts Using Crowdsourced Strava Data (20-02372)
Bahar Dadashova/Texas A&M Transportation Institute, Greg Griffin/Texas A&M Transportation Institute, Subasish Das/Texas A&M Transportation Institute, Shawn Turner/Texas A&M Transportation Institute, Bonnie Sherman/Texas A&M Transportation Institute
An Exploratory Analysis of Real-Time E-Scooter Trip Data in Washington, D.C. (20-03018)
Zhenpeng Zou/University of Maryland, College Park, Hannah Younes/University of Maryland, College Park, Sevgi Erdogan/University of Maryland, College Park, Jiahui Wu/University of Maryland, College Park
Validating the Estimation of Vehicle Axle-Class from Vehicle Length Data and Quantifying the Effect of Calibration to Local Data (20-05805)
Raul Avelar/Texas A&M Transportation Institute, Sruthi Ashraf/Texas A&M Transportation Institute, Russell Lewis/Texas A&M Transportation Institute
Prioritizing Pedestrian and Bicyclist Count Locations for Volume Estimation (20-05196)
Jessica Schoner/Toole Design, Frank Proulx/Toole Design, Brian Almdale/Toole Design, Katherine Knapp de Orvañanos/Toole Design

1437

Building Information Modeling for Infrastructure: National Strategic Roadmap Strategies for Implementation
Lance Parve, Wisconsin Department of Transportation, presiding
Sponsored By Standing Committee on Visualization in Transportation, Standing Committee on Geographic Information Science and Applications, Standing Committee on Utilities, Standing Committee on Geospatial Data Acquisition Technologies, Standing Committee on Emerging Design and Construction Technologies

Building information modeling (BIM) for infrastructure has emerged and matured to transform the way Transportation and Civil Infrastructure Agencies, Consultants, and Contractors plan, design and construct projects and maintain, operate and manage life-cycle assets. This Session of Lightning Talks and Panels provides roadmap strategies for implementation from FHWA, DOTs, SMEs and industry leaders involving BIM deployment: (1) Project Delivery Design and Construction; and (2) Asset Management Maintenance; Operations and Programming.

Current State of Practice and Implementation: BIM for Design-Construction and Asset Management (P20-20966)
Lance Parve/Wisconsin Department of Transportation, Morgan Kessler/Federal Highway Administration (FHWA), William Pratt/Connecticut Department of Transportation
BIM for Roads, Structures, Utilities, Traffic, Survey, and UAS/LiDAR/AR/VR/AI (P20-20967)
Michael Kennerly/Iowa Department of Transportation, Brian Kozy/Federal Highway Administration (FHWA), Cesar Quiroga/Texas A&M Transportation Institute, Charles Hixon/EDGE-Global Technology Solutions, Adrien Patané/Trimble Inc.
Outlook for CAD-BIM-GIS and IFC Standards (P20-20968)
Connie Yew/Federal Highway Administration (FHWA), George Lukes/Utah Department of Transportation, Philip Bell/Applied Research Associates, Inc. (ARA), Jagannath Mallela/WSP

1438

Restoring and Sustaining Communities After a Disruptive Event Through Public and Private Partnerships:
Effective Practices from the Front Lines

Diana Herriman, FEMA, presiding

Sponsored By Standing Committee on the Logistics of Disaster Response and Business Continuity, Subcommittee for Resilience Communications, Joint Subcommittee on Resilience and Sustainability Cooperation of ABR 00, ABR10, ABR 20, ABR30, and A0020T, Standing Committee on Critical Transportation Infrastructure Protection

Up to 60 percent of local businesses can fail in the initial years after a disaster. Community continuity, similar to business continuity, looks at effective practices to sustain communities and local economies after a disruptive event occurs. Hear from experts who have been on the front lines.

Supply Chain Resiliency for Communities (P20-20028)
Gene Shearer/FEMA
Supply Chain Resilience Efforts (P20-20029)
Nick Peake/FEMA
Case Studies on Mitigating the Impacts on Local Economies (P20-20030)
Forbes Tompkins/The Pew Charitable Trusts Flood-Prepared Communities Initiative
Alliance for National and Community Resilience (P20-21734)
Ryan Colker/Alliance for National and Community Resilience

1439   CM (1.75)

Planning at a Crossroads

John Kaliski, Cambridge Systematics, Inc., presiding

Sponsored By Standing Committee on Statewide Multimodal Transportation Planning

The future of transportation planning is evolving rapidly as TRB enters its centennial year . How has long- range planning for state departments of transportation, metropolitan planning organizations, transit providers, and other agencies changed during the past few decades? And what will long-range planning look like in the future as agencies navigate changing demographics, economics, and technologies and address emerging issues like resilience, equity, and sustainability? How can TRB best support agencies during this time of change? Come join a lively discussion of industry leaders.

TRB Perspective (P20-20692)
Neil Pedersen/Transportation Research Board
ADA10 Perspective (P20-20693)
Jerri Bohard/Oregon Department of Transportation
State DOT Perspective (P20-20694)
Scott Bennett/Arkansas Department of Transportation
State DOT Perspective (P20-20695)
Leslie Richards/Southeastern Pennsylvania Transportation Authority
MPO Perspective (P20-20696)
Ashby Johnson/Capital Area Metropolitan Planning Organization (CAMPO)

1440 CM (1.75)

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 156
Communicating with John and Jane Q. Public About Transportation Funding
Pamela Lebeaux, WSP, presiding
Terri Parker, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Public Involvement in Transportation

This session features communications strategies and techniques of the winner and the three runner-up submittals to the annual Communicating with John & Jane Q. Public Competition managed by the TRB Committee on Public Involvement (ADA60).

Back to Basics: How a Love for Oregon Roads Leads to the Understanding of Transportation Funding (P20-205 65)
Michelle Godfrey
Equitable Public Engagement: Participatory Budgeting for Transportation Funds (P20-20566)
Jennifer Godzeno/Participatory Budgeting Project
Preparing to Launch Utah's Road Usage Charge Program (P20-20567)
Eileen Barron/Utah Department of Transportation
Multi-Funding Sources and Building Support (P20-20568)
Jennifer Schultz/HNTB Corporation

1441

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 145A
Adoption of Emerging Mobility Services and Other Disruptive Technologies: An International Perspective
Giovanni Circella, University of California, Davis, presiding
Samuel Zimmerman, The World Bank, presiding
Sponsored By Standing Committee on Effects of Information and Communication Technologies (ICT) on Travel Choices , Section - Travel Analysis Methods, Standing Committee on Traveler Behavior and Values, Standing Committee on Transportation Network Modeling, Standing Committee on Transportation in the Developing Countries, Public Transportation Group, Standing Committee on Emerging and Innovative Public Transport and Technologies

Emerging Mobility Services and Disruptive Technologies: An International Perspective (P20-20964)
Susan Shaheen/University of California, Berkeley
Strategy and Innovation for Bus Reforms in Developing Countries (P20-21525)
Camila Rodriguez/The World Bank
The Impacts of Platform-Based Shared Mobility on Sustainable Urban Transport in Latin American Cities (P20-2 1526)
Lynn Scholl/Inter-American Development Bank
How Large Cities in Latin America Are Dealing with Micromobility Operations (P20-21527)
Dario Hidalgo/World Resources Institute (WRI)
Micromobility: Safety and Regulatory Issues in Europe (P20-21528)
Philippe Crist/International Transport Forum
The Role of Technology in Making Informal Public Transport More Efficient and Customer-Friendly in Africa (P2 0-21572)
Edward Beukes/The World Bank

1442

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 146A
Recent Developments Relative to Analyzing and Controlling Traffic Noise
Adam Alexander, Gannett Fleming Inc., presiding
Sponsored By Standing Committee on Transportation-Related Noise and Vibration

Acoustic Modeling of Meteorological Effects on Roadway Noise (20-03289)
Roger Wayson/AECOM Technology Corp, Kenneth Kaliski/AECOM Technology Corp

(continued)

Analysis of the Feasibility of Noise Wall Overhang Designs (20-03881)
Benjamin Sperry/Ohio University, Karel Cubick/Ohio University, Blake Staley/Ohio University, Issam Khoury/Ohio University, Ahmadudin Burhani/Ohio University, Justin Bradley/Ohio University
Results of the 10-Year Arizona Quiet Pavement Pilot Program (20-05113)
Paul Donavan/Illingworth & Rodkin, Inc., Carrie Janello/Illingworth & Rodkin, Inc.
Tire-Pavement Noise Generation Versus Pavement Type and Aggregate Size (20-06141)
Michael Staiano/Staiano Engineering, Inc.
Breaking Tall Barriers: An Alternative Approach to Reducing Traffic Noise Impacts with Inexpensive Short Noise Barriers (20-06148)
Bruce Rymer/California Department of Transportation (CALTRANS)

1443   CM (1.75)

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 140A
Emerging Issues with Per- and Polyfluoroalkyl Substances (PFAS) and Other Organic Contaminants in Transportation, Part 2 (Part 1, Session 1169)
Stephanie Monette, New Hampshire Department of Transportation, presiding
Sponsored By Standing Committee on Resource Conservation and Recovery, Standing Committee on Geo-Environmental Processes, Standing Committee on Culverts, Buried Bridges, and Hydraulic Structures, Standing Committee on Environmental Impacts of Aviation

Participants will learn about cost recovery methods for the remediation of PFAS contaminated soil encountered on transportation projects. Participants will also learn about the fast changing PFAS regulations and guidance at both the state and federal level. And finally, participants will learn about the latest research related to how organic contaminants, such as benzene and tetrachloroethlene, interact with concrete drainage pipe and how to harden these pipes to prevent contaminant migration

Factors Affecting Multiphase Benzene Breakthrough Drainage Concrete Pipe In Unsaturated Subsurface Profile (20-04981)
Zahra Faeli/North Carolina State University, Sultan Alhomair/North Carolina State University, Payam Hosseini/North Carolina State University, Mohammed Gabr/North Carolina State University, Mohammad Pour-Ghaz/North Carolina State University, Cyrus Parker/North Carolina State University
Assessment of Hardening Practices to Mitigate Contaminant Breakthrough Subsurface Concrete Pipes (20-05189)
Sultan Alhomair/North Carolina State University, Zahra Faeli/North Carolina State University, Payam Hosseini/North Carolina State University, Mohammed Gabr/North Carolina State University, Mohammad Pour-Ghaz/North Carolina State University, Cyrus Parker/North Carolina State University
Update on Federal and State PFAS Regulations (P20-21394)
Nathan Hagelin/Wood Environment & Infrastructure Solutions, Inc.
Cost Recovery from PFAS Contaminant Remediation on Transportation Projects (P20-21395)
Richard Head/SL Environmental Law Group PC

1444

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 140B
Labor Market Outcomes, Agglomeration, and Transportation Investments
Sponsored By Standing Committee on Transportation and Economic Development

A Rapid Road to Employment?: The Impacts of a Bus Rapid Transit System in Lima (20-02542)
Lynn Scholl/Inter-American Development Bank, Daniel Martinez/Inter-American Development Bank, Oscar Mitnik/Inter-American Development Bank, Daniel Oviedo Hernandez/Inter-American Development Bank, Patricia Yanez/Inter-American Development Bank
The Effects of Transit and Compactness on Regional Economic Outcomes (20-02757)
Torrey Lyons/University of North Carolina, Chapel Hill, Reid Ewing/University of North Carolina, Chapel Hill
An Occupational Competitiveness Analysis of the U.S. Transportation and Logistics Cluster (20-00019)
Indraneel Kumar/Purdue University, Lionel Beaulieu/Purdue University, Andrey Zhalnin/Purdue University, Chun Song/Purdue University
Impacts of Transit and Walking Amenities on Robust Local Knowledge Economy (20-03246)
Ahoura Zandiatashbar/University of Illinois, Chicago, Shima Hamidi/University of Illinois, Chicago

(continued)

Workers Wanted: Changing Employee Accessibility with Industrial Development: A Case Study of Foxconn (20-00599)
Sai Sun/University of Wisconsin, Milwaukee, Lingqian Hu/University of Wisconsin, Milwaukee

1445

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 203
Innovations in Bridge Hydraulics
Brinton Swift, Kiewit Engineering Company, presiding
Sponsored By Standing Committee on Hydrology and Hydraulics, Standing Committee on Stormwater

Hydraulic Interdependence Between Bridges Along a River Corridor (20-02423)
Matthew Trueheart/University of Vermont, Mandar Dewoolkar/University of Vermont, Donna Rizzo/University of Vermont, Dryver Huston/University of Vermont, Arne Bomblies/University of Vermont
Development of a Bridge and Culvert Sensitivity Index (20-03414)
Chris Van Dyke/University of Kentucky, Tasnuba Jerin/University of Kentucky, Nancy Albright/University of Kentucky, Benjamin Blandford/University of Kentucky
What's Hiding In Your Hydraulic Design Data?: The Benefits of Analyzing Hydraulic Design Data (20-00931)
Stephen Benedict/AECOM, Thomas Knight/AECOM
Applying NBI, HEC-RAS, and GIS for Assessment of Flood Zonation and Land Cover Exposures to Floods: Case Studies of Bridges in Alabama (20-04656)
Pooja Preetha/University of Alabama, Huntsville, Niloufar Shirani-bidabadi/University of Alabama, Huntsville, Ashraf Al-Hamdan/University of Alabama, Huntsville, Michael Anderson/University of Alabama, Huntsville

1446

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 209A
Pavement Management Planning Treatment Strategies
Zhongren Wang, California Department of Transportation (CALTRANS), presiding
Sponsored By Standing Committee on Pavement Management Systems

Influence of Treatment Strategies on Performance-Based Planning for Pavement Networks: A Case Study of Iowa's Interstate System (20-01089)
Fengdi Guo/Massachusetts Institute of Technology (MIT), Jeremy Gregory/Massachusetts Institute of Technology (MIT), Randolph Kirchain/Massachusetts Institute of Technology (MIT)
Strategic Development of a Multiple Facility Pavement Capital Improvement Plan (20-03542)
Abbas Kachwalla/AECOM, Amir Arshadi/AECOM, Michael Papakostas/AECOM
Cost-Effectiveness of Performing Field Investigation for Rehabilitation Design (20-03834)
Fahim Ahmed/No Organization, Jesse Thompson/No Organization, Dahae Kim/No Organization, Eric Carroll/No Organization, Nathan Huynh/No Organization
Pavements Maintenance Planning for Large-Scale Networks Using a New Meta-Heuristic Algorithm (20-06142)
Hamed Naseri/Amirkabir University of Technology, Amirhossein Fani/Amirkabir University of Technology, Amir Golroo/Amirkabir University of Technology

1447

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 207B
Impact of External Factors on Asphalt Pavement Design and Performance
Daba Gedafa, University of North Dakota, presiding
Sponsored By Standing Committee on Design and Rehabilitation of Asphalt Pavements

Impact of Flooding on the Service Life of Inundated Flexible Pavements (20-01652)
Mona Nobakht/Fugro, Charles Gurganus/Fugro, Ah Young Seo/Fugro, Jolanda Prozzi/Fugro
Effect of High-Temperature Gradients on Top-Down Fatigue Cracking: Temperature Measurements with Depth and Physical Evidence (20-05892)
Adrian Archilla/University of Hawaii

(continued)

Effects of Aging on Asphalt Mixture and Pavement Performance (20-02529)
Nooralhuda Saleh/North Carolina State University, Behrooz Keshavarzi/North Carolina State University, Farhad Yousefi Rad/North Carolina State University, Douglas Mocelin/North Carolina State University, Michael Elwardany/North Carolina State University, Cassie Castorena/North Carolina State University, B. Shane Underwood/North Carolina State University, Youngsoo Kim/North Carolina State University

Effect of Speed Bump on Pavement Condition (20-04774)
Boris Goenaga/North Carolina State University, B. Shane Underwood/North Carolina State University, Luis Fuentes/North Carolina State University

1448

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 208
Structural Evaluation Using Non-Destructive Testing
Nenad Gucunski, Rutgers, The State University of New Jersey, presiding
James Long, Pennsylvania Department of Conservation and Natural Resources, presiding
Sponsored By Standing Committee on Testing and Evaluation of Transportation Structures

Reinforced Concrete Damage Identification Through Fusion of Multimodal Non-Destructive Testing Data (20-01431)
Brian Pailes/Vector Corrosion Services

Post-Repair, Full-Field, Non-Destructive Evaluation of Mecklenburg Bridge (20-02142)
Mehrdad Shafiei Dizaji/University of Virginia, Devin Harris/University of Virginia, Bernard Kassner/University of Virginia, Jeffrey Hill/University of Virginia

Change Analysis of Bridge Spatial Geometry Forms Based on 3D Point Cloud Model (20-03360)
Hongwei Zhang/Southeast University, Ying Shi/Southeast University, Wen Xiong/Southeast University, Pingbo Tang/Southeast University

Development of Frequency Domain Synthetic Aperture Focusing Technique for Orthotropic Media for Ultrasonic Array System (20-04192)
Hungjoo Kwon/Texas A&M Transportation Institute, Stefan Hurlebaus/Texas A&M Transportation Institute

1449

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 206
Advances in Transportation Construction Management
H. David Jeong, Texas A&M University, presiding
Sponsored By Standing Committee on Construction Management

The session is concerned with new methods, research, implementation of research results, current practices and issues related to the management of construction for all types of transportation facilities and to the integration of the philosophy of construction management in planning, design, and long-term performance of projects for the purpose of achieving scope, cost, schedule and other project performance objectives

Demand-Driven Mobility Management: Modifying Lane Closure Schedules Using Continuous Monitoring Technology (20-01407)
Eduardo Rodriguez Miranda/Utah Department of Transportation

Risk Assessment of Underground and Elevated Metro Projects from Clients' and Contractors' Perspective (20-01718)
Omkar Karmarkar/Indian Institute of Technology, Bombay, Shivram G. Krishnan/Indian Institute of Technology, Bombay, Venkata S. Delhi/Indian Institute of Technology, Bombay, Nagendra Velaga/Indian Institute of Technology, Bombay

Evaluation of E-Construction Inspection Technology (20-03060)
Tyson Rupnow/Louisiana Department of Transportation and Development, Mary Leah Coco/Louisiana Department of Transportation and Development, Julian Yamaura/Louisiana Department of Transportation and Development

A Protocol to Assess the Impact of Crude Oil Price Fluctuations on Future Asphalt Prices (20-05704)
Kaylyn Cardinal/Auburn University, Mohamed Khalafalla/Auburn University, Jorge Rueda-Benavides/Auburn University

1450

Use of Fiber in Asphalt Mixtures
Raul Velasquez, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Non-Binder Components of Asphalt Mixtures

Laboratory Investigation of the Performance Evaluation of Fiber Modified Asphalt Mixes in Cold Regions (20-03 927)
Luis Alberto Perca Callomamani/University of Alberta, Leila Hashemian/University of Alberta, Katrina Sha/University of Alberta
Assessment of the Impact of Fiber Types on the Performance of Fiber-Reinforced Hot Mix Asphalt (20-04561)
Ahmad Alfalah/Rowan University, Daniel Offenbacker/Rowan University, Ayman Ali/Rowan University, Christopher DeCarlo/Rowan University, Wade Lein/Rowan University, Yusuf Mehta/Rowan University, Mohamed Elshaer/Rowan University
Laboratory Assessment of Fracture Resistance of Modified Mixtures with Synthetic Fibers (20-04269)
Freddie Salado/Virginia Tech Transportation Institute, Gerardo Flintsch/Virginia Tech Transportation Institute, Brian Diefenderfer/Virginia Tech Transportation Institute, Jose Ramon Marcobal/Virginia Tech Transportation Institute
Fracture Behavior Analysis of Fiber Reinforced Asphalt Concrete Under Indirect Tension Test Using Acoustic Emission and Digital Image Correlation (20-01594)
Yubo Jiao/Beijing University of Technology, Lidong Zhang/Beijing University of Technology, Meng Guo/Beijing University of Technology, Yao Zhang/Beijing University of Technology, Hengji Zhang/Beijing University of Technology

1451

Toward More Durable and Functional Open-Graded Surface Layers
Edith Arambula Mercado, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Surface Requirements of Asphalt Mixtures

This session presents advancements in the use of materials, design and technology related to Porous Friction Courses (PG) -also known as Porous Asphalt (PA) or Open Graded Friction Courses (OGFC)- both in the US as well as in other parts of the world.

Recent Advancements in the Use of Open-Graded Friction Courses in Florida (P20-20083)
Howard Moseley/Florida Department of Transportation
A Review of NCAT Research on Open-Graded Friction Course Layers (P20-20081)
Randy West/National Center for Asphalt Technology (NCAT)
Porous Asphalt in the Netherlands: Current State and Future Challenges (P20-20082)
Aikaterini Varveri/Delft University of Technology
Toward Sustainable Porous Asphalt Surfacings in New Zealand (P20-20084)
Irina Holleran/University of Auckland
OGFC in South Carolina: Experience and Evolution (P20-20196)
Bradley Putman/Clemson University

1452

Seasonal Climatic Effects on Transportation Infrastructure, Part 1 (Part 2, Session 1595)
David Orr, Cornell Local Roads Program, presiding
Sponsored By Standing Committee on Seasonal Climatic Effects on Transportation Infrastructure

Seasonal Climatic Effects on Transportaton Infrastructure - Part 2 examines infrastructure changes to moisture extreams and effects on freezing

Network-Level Risk Evaluation of Unbound Pavement Foundation Layers to Extreme Weather Events Using Remote Sensing (20-03628)
Joe Rosalez/California State University, Los Angeles, Sonya Lopez/California State University, Los Angeles, Mehran Mazari/California State University, Los Angeles

(continued)

Characterizing Influence of Water Access Condition During Freezing on Resilient Behavior of Base Course Materials (20-04062)

Lin Li/Nanjing Forestry University, Jenny Liu/Nanjing Forestry University, Xiong Zhang/Nanjing Forestry University, Steve Saboundjian/Nanjing Forestry University, Peng Li/Nanjing Forestry University

Poroelastic Modeling of Pore Pressure Development in Unbound Pavement Bases (20-05276)

Zhe Wan/University of Pittsburgh, Lucio De Salles/University of Pittsburgh, Lev Khazanovich/University of Pittsburgh

Microstructure-Based Random FEM Model for the Freezing Effects in Soils and Cold Region Retaining Walls (20-05487)

Shaoyang Dong/Case Western Reserve University, Xiong Yu/Case Western Reserve University

1453

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 204A

Bridge Approach Repair and Mitigation Measures

Bret Lingwall, South Dakota School of Mines and Technology, presiding
Daniel Alzamora, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Transportation Earthworks, Standing Committee on Geotechnical Instrumentation and Modeling, Standing Committee on Foundations of Bridges and Other Structures, Standing Committee on Geosynthetics

Bridge approach embankments continue to present problems for highway departments. Post-construction settlements from failure to adhere to waiting periods, improper compaction of embankment materials, poor quality fills, failure to follow specifications, and the use of integral abutments can cause approach settlement. Preventive measures to address these issues will be discussed.

Bump at Approach Slab: Underlying Factors Causing Them and Solutions Studied in Texas (P20-20077)

Anand Puppala/Texas A&M University, Surya Sarat Chandra Congress/Texas A&M University, Tejo Bheemasetti/South Dakota School of Mines and Technology

Treatment of End Bent Backfills Using Geotextile Reinforcement and Elastic Inclusion (P20-20078)

Daryl Greer/Kentucky Transportation Cabinet

I77 Approach Slab Leveling (P20-20079)

Justin Anderson/GeoStabilization International

US68 Bridge Embankment Settlement (P20-20080)

craig klusman/AECOM, Blake Jones/Kentucky Transportation Cabinet, Joseph Hauber/Geotechnology, Inc.

1454

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 209C

Numerical Studies and Best Practices for Corrugated Metal Culverts and Buried Bridges

Ian Moore, Queen's University, presiding
Sponsored By Standing Committee on Subsurface Soil-Structure Interaction, Standing Committee on Culverts, Buried Bridges, and Hydraulic Structures, Subcommittee on Buried Bridges, Subcommittee on Resilient and Sustainable Buried Structures

This session's focus is divided into two areas: numerical studies of buried metal corrugated culverts (buried bridges), and finally best practices for aluminium culverts. There will be 4 presenations One presentation will adddress equations for seismic design og corrugated metal culverts, the second will address 3 D modelling of metal culvert with cut invert simulating bottom deteriorated culvert, followed by structural performance of corrugated metal culvert with deteriorated bottom paved with concrete and 4th presentation will elaborate on best practices for use of aluminium culverts .

Closed-Form Equations for Seismic Design of Corrugated Metal Culverts and Buried Bridges (20-03626)

Robert Keene/Simpson Gumpertz & Heger, Inc., Jesse Beaver/Simpson Gumpertz & Heger, Inc.

3D Finite Element Modeling of a Corrugated Metal Pipe with Cut Invert in a Soil Box Test (20-04843)

Hiramani Chimauriya/University of Texas, Arlington, Samrat Raut/University of Texas, Arlington, Xinbao Yu/University of Texas, Arlington, Mohammad Najafi/University of Texas, Arlington

Structural Performance of Deteriorated Metal Culverts Rehabilitated Through Invert Concrete Paving (20-00047)

Teruhisa Masada/Ohio University, Abdul Fekrat/Ohio University, John Hurd/Ohio University

(continued)

Establishing Best Practices for Aluminum Culvert Use in Wisconsin (20-05216)
Brent Bass/Simpson Gumpertz & Heger, Inc., Jesse Beaver/Simpson Gumpertz & Heger, Inc.

1455

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 202B
Using Artificial Intelligence to Unlock the Hidden Value of Asset Management Data: Transforming Data into Advanced Decision Making
Adrian Burde, Leidos, Inc., presiding
William Varnedoe, The Kercher Group, Inc., presiding
Sponsored By Operations and Preservation Group, Policy and Organization Group, Design and Construction Group, Standing Committee on Maintenance and Operations Management

Recent advances in Artificial Intelligence and statistical learning have the potential to unveil the deep correlations and patterns hidden in large scale data set to produce new insights and knowledge. The type of transportation problems that can be solved with AI largely depends on the type of available data and how the data has been collected and stored . Many state highway agencies are accumulating vast amounts of data in various forms and formats. This lack of uniformity hinders the potential offered by most AI applications . The presentations in this session show the challenges and opportunities of using AI to solve transportation problems .

Panel Discussion: Transforming Data into Advanced Decision Making (P20-21613)
Fernando Moreu/University of New Mexico, Francisco Benitez/University of Sevilla, Omidreza Shoghli/University of North Carolina, Charlotte, Zhuo Chen/University of Utah

1456

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Salon C
Assuring the Safety of Highly Automated Vehicles
Steven Shladover, University of California, Berkeley, presiding
Sponsored By Standing Committee on Vehicle-Highway Automation

UL 4600 Safety Standard for Autonomous Vehicles (P20-21522)
Philip Koopman/Carnegie Mellon University
SAKURA Project: Current Status and Next Steps Toward Harmonized Automated Driving Safety Assurance (P20-21523)
Jacobo Antona-Makoshi/Japan Automobile Research Institute
Databases for Safety Assurance of Automated Driving: Final Results of the PEGASUS Project and an Introduction to the V&V Methods Project (P20-21524)
Adrian Zlocki/fka GmbH
Leveraging Real-World Data to Independently Assess (and Regulate) the Safety of Automated Driving Systems (P20-21757)
Jennifer Carter/SmartDrive Systems

1457

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 101
Connected and Automated Vehicle Technologies Changing the Way Managed Lanes Operate
Dan Lamers, North Central Texas Council of Governments, presiding
Darren Henderson, WSP, presiding
Sponsored By Standing Committee on Managed Lanes

Managed lanes already show operational benefits in freeway corridors through traffic management techniques in an iterative sequence of data collection, data processing and information publishing. However, with the increased proportion of connected and autonomous vehicles (CAVs) into the vehicle mix, with less reliance on human decisions, CAVs can transform corridor efficiency by making real-time adjustments to operations that maximize whatever the road operator chooses, whether that be to maximize throughput, minimize delay, provide stable revenue, and a host of others. This session will explore how CAV technology can impact corridor operations and safety , including in interim conditions, where CAVs in various proportions operate .

(continued)

A Discussion of Implementing the Dedicated Lanes for Connected and Autonomous Vehicles on Freeway (20-04068)

Shanglu He/Nanjing University of Science and Technology, Fan Ding/Nanjing University of Science and Technology, Weifeng Zhou/Nanjing University of Science and Technology

Managed Lane Strategies for the Mixed Traffic with Connected and Automated Vehicles Using a Reinforcement Learning Approach (20-04798)

Jingqiu Guo/Tongji University, Yangzexi Liu/Tongji University, Yibing Wang/Tongji University

Safety and Operational Impact of Connected Vehicles' Lane Configuration Design on Freeway Facilities with Managed Toll Lanes (20-05543)

Moatz Saad/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Yina Wu/University of Central Florida, Md Sharikur Rahman/University of Central Florida

Performance Analyses of Information-Based Managed Lane Choice Decisions in a Connected Vehicle Environment (20-05739)

Xiaoyu Guo/Texas A&M Transportation Institute, Yongxin Peng/Texas A&M Transportation Institute, Sruthi Ashraf/Texas A&M Transportation Institute, Mark Burris/Texas A&M Transportation Institute

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1458

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 102A
Macroscopic Traffic Flow Modeling and Control
S. Ilgin Guler, Pennsylvania State University, presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

Lane Detection and Lane Changing Phenomena Identification with Data from a Swarm of Drones (20-01415)

Emmanouil Barmpounakis/Ecole Polytechnique Federale de Lausanne, Guillaume Sauvin/Ecole Polytechnique Federale de Lausanne, Nikolas Geroliminis/Ecole Polytechnique Federale de Lausanne

Extended Fundamental Diagrams (20-02127)

Peter Wagner/DLR - German Aerospace Center, Ronald Nippold/DLR - German Aerospace Center, Johannes Grötsch/DLR - German Aerospace Center

Improving Traffic Flow Efficiency at Motorway Lane Drops by Influencing Lateral Flows (20-03507)

Hari Hara Sharan Nagalur Subraveti/Delft University of Technology, Victor Knoop/Delft University of Technology, Bart van Arem/Delft University of Technology

Traffic Flow Breakdown Prediction Using Machine Learning Approaches (20-03736)

Monika Filipovska/Northwestern University, Hani Mahmassani/Northwestern University

Estimation of the Change in Cumulative Flow Over Probe Trajectories Using Detector Data (20-04375)

Paul van Erp/Delft University of Technology, Victor Knoop/Delft University of Technology, Erik-Sander Smits/Delft University of Technology, Chris Tampere/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

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1459

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 204C
Network-Level Modeling for Bridge Management
Paul Thompson, Paul D Thompson, presiding
Sponsored By Standing Committee on Bridge Management

A series of presentations on network-level bridge management models. The manuscripts used various models based on statistical, economical and operations research concepts.

Predictive Group Maintenance Model for Multi-System, Multi-Component Networks of Bridges (20-04277)

Georgios Hadjidemetriou/University of Cambridge, Xiang Xie/University of Cambridge, Ajith Parlikad/University of Cambridge

Element-Based Life-Cycle Improvement Module for Bridge Planning and Programming (20-05414)

Karim Naji/University of New Hampshire, Erin Santini-Bell/University of New Hampshire

Integrating Economic and Utility Concepts for a Comprehensive Bridge Valuation Model (20-05545)

Trinh Hoang/University of Texas, Austin, Zhe Han/University of Texas, Austin, Zhanmin Zhang/University of Texas, Austin

Structural Health Monitoring: Introducing TRB e-Circular on SHM (P20-20460)

Peter Vanderzee/LifeSpan Technologies

1460

Polymer Overlays and High Friction Surfaces
Michael Sprinkel, Virginia Department of Transportation, presiding
Sponsored By Standing Committee on Polymer Concretes, Adhesives, and Sealers

The session includes presentations on high friction surface treatments and the mechanical properties of polymer concrete used in overlays.

Study on Pavement Performance of Polyurethane Mixture for Thin Overlay (20-02007)
Fan Yang/Tongji University, Lin Cong/Tongji University, Jiachen Shi/Tongji University, Guihong Guo/Tongji University, Minda Ren/Tongji University
Effects of Nitrile Rubber-Modified Polyamide Curing Agent Content on the Mechanical Properties and Fracture Mechanism of a Cold Mixed Epoxy Resin Thin Layer on Asphalt Pavement (20-03677)
gongying ding/Hohai University, Xin Yu/Hohai University, Jingjing Si/Hohai University, Fuqiang Dong/Hohai University, Ning Li/Hohai University, Junyan Wang/Hohai University
Development of High-Friction Surface Treatment Prescreening Protocols and an Alternative Friction Application (20-04185)
Thomas Bennert/Rutgers, The State University of New Jersey, Robert Blight/Rutgers, The State University of New Jersey, Vahid Ganji/Rutgers, The State University of New Jersey, Drew Tulanowski/Rutgers, The State University of New Jersey, Susan Gresavage/Rutgers, The State University of New Jersey
An Extended Understanding of Early Distresses and Their Mechanisms in High-Friction Surface Treatment (20-04646)
Fulu Wei/Indiana Department of Transportation, Shuo Li/Indiana Department of Transportation, Bowen Guan/Indiana Department of Transportation, Ce Wang/Indiana Department of Transportation, Jie Shan/Indiana Department of Transportation

1461

Risk Assessment and Management
April Greenhouse Weaver, Metropolitan Transit Authority of Harris County, presiding
Sponsored By Standing Committee on Contract Law

Risk is a factor in projects of all sizes, affecting such vital issues as whether to undertake a project, allocating risk among parties, pricing risks efficiently, and contract administration. This panel will discuss the lifecycle of risk assessment and management for public works projects, starting with the identification and allocation of risks, contractual considerations to embody the owner's desired risk sharing, how a risk profile affects funding, price estimates, and contingencies, and finally, enforcement of risk sharing provisions. The panel will walk through the process of developing a risk matrix, how that risk profile factors into the project's delivery method, contract drafting considerations, and project administration.

Panel Discussion (P20-21081)
Caitlin Ghoshal/WSP, Christine Ryan/Nossaman LLP, Jaclyn Hartman/Maryland Department of Transportation

1462

Relationships Between Mobility and Health Disparities
Vanya Jones, Johns Hopkins University, presiding
Sponsored By Standing Committee on Safe Mobility of Older Persons

Rideshare Services: Addressing Unmet Transportation Needs for Older Adults (P20-21332)
Alycia Bayne/NORC at the University of Chicago
Older Minority and Non-Minority Adult Driver Performance on Cognitive-Based Tests and Getting Around Town (P20-21333)
Vanya Jones/Johns Hopkins University

(continued)

Transportation and Mobility Concerns for Our Diverse Older Adult Population (P20-21334)
Alyssa Ann Gamaldo/Pennsylvania State University

1463

Federal Motor Carrier Safety Administration's Research Activities and Priorities
Kelly Regal, Federal Motor Carrier Safety Administration (FMCSA), presiding
Sponsored By Standing Committee on Truck and Bus Safety

Industry Research Initiatives (P20-21573)
Rebecca Brewster/American Transportation Research Institute (ATRI)
Motor Carrier Safety Data Visualizations via Tableau (P20-21574)
Olu Ajayi/Federal Motor Carrier Safety Administration (FMCSA), Scott Valentine/Federal Motor Carrier Safety Administration (FMCSA)
Small Business Innovation Research: Fatigue Monitoring and Blockchain (P20-21575)
Theresa Hallquist/Federal Motor Carrier Safety Administration (FMCSA)
Automated Vehicle Activities (P20-21576)
Nicole Michel/Federal Motor Carrier Safety Administration (FMCSA)
Closing Remarks (P20-21577)
Jonathan Mueller/Federal Motor Carrier Safety Administration (FMCSA)

1464

Modeling Using Behaviors from Naturalistic, Field, and Simulator Studies
George Park, Systems Technology, Inc., presiding
Sponsored By Standing Committee on Simulation and Measurement of Vehicle and Operator Performance

How Do Environmental Factors Affect Driver's Gaze Direction and Head Movements?: A Long-Term Naturalistic Driving Study (20-05274)
Arash Tavakoli/University of Virginia, Arsalan Heydarian/University of Virginia, Vahid Balali/University of Virginia
Drivers' Saccade Characteristics in Curves of Extra-Long Urban Underwater Tunnels (20-04006)
Fangtong Jiao/Wuhan University of Technology, Zhigang Du/Wuhan University of Technology, Shoushuo Wang/Wuhan University of Technology, Yudan Ni/Wuhan University of Technology, Rui He/Wuhan University of Technology
Consistency Analysis of Drivers Car-Following Behaviors (20-02771)
Xuesong Wang/Tongji University, Dingming Qin/Tongji University, Cristhian Lizarazo Jimenez/Tongji University, Andrew Tarko/Tongji University
Enhancing Distraction Prediction Model Performance Using Random Forest Classifier (20-01497)
Samira Ahangari/Morgan State University, Mansoureh Jeihani/Morgan State University, Md Rahman/Morgan State University, Abdollah Dehzangi/Morgan State University
Reliability-Based Design for Passing Maneuvers Based on Observational Data (20-00386)
Udai Hassein/Ryerson University

1465

Where the Rubber Meets the Road: Critical Evaluation of Bikeway Rating Methods and Cyclist Typologies
Michael Lowry, University of Idaho, presiding
Sponsored By Standing Committee on Bicycle Transportation

An Empirical Reappraisal of the Level of Traffic Stress Framework (20-00525)
Laura Cabral/Toole Design, Amy Kim/Toole Design
Validation of Bicycle Level of Traffic Stress and Perceived Safety: A Study of Children in Denver (20-03407)
Nicholas Ferenchak/University of New Mexico, Wesley Marshall/University of New Mexico
The Role of Attitudes in Perceptions of Bicycle Facilities: A Latent-Class Regression Approach (20-02895)
Calvin Clark/Georgia Institute of Technology (Georgia Tech), Patricia Mokhtarian/Georgia Institute of Technology (Georgia Tech), Giovanni Circella/Georgia Institute of Technology (Georgia Tech), Kari Watkins/Georgia Institute of Technology (Georgia Tech)

(continued)

A Grounded Theory Approach to Understanding Bicyclists Interactions on Unprotected Facilities: A Proof of Concept from Munich, Germany (20-03585)
Cat Silva/Technical University of Munich, Kelly Clifton/Technical University of Munich, Rolf Moeckel/Technical University of Munich

User-Rated Comfort and Preference of Separated Bike Lane Intersection Designs (20-04222)
Chris Monsere/Portland State University, Nathan McNeil/Portland State University, Rebecca Sanders/Portland State University

1466

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 145B
Public Transit Innovation: Past, Present, and Future
Vincent Valdes, Federal Transit Administration (FTA), presiding
Sponsored By Public Transportation Group

Join FTA's Acting Administrator, K. Jane Williams, for a session organized by the Federal Transit Adminstration (FTA) highlighting the transformative impact of innovation in public transportation from the perspective of leaders in industry and government. This session will spotlight key innovative technologies fostered by the FTA and adopted by the public transportation industry, along with policy innovations that are shaping the way public transportation is planned, constructed, and provided today. The session will also explore creative scenarios for public transportation service provision in the future.

Presentation (P20-21683)
K. Jane Williams/Federal Transit Administration (FTA)
Presentation (P20-21684)
Vincent Valdes/Federal Transit Administration (FTA)
Presentation (P20-21685)
Gary Thomas/Dallas Area Rapid Transit (DART)
Presentation (P20-21686)
Tina Quigley/Virgin Trains USA
Presentation (P20-21687)
David Schneider/Federal Transit Administration (FTA)
Presentation (P20-21688)
Gwo-Wei Torng/Federal Transit Administration (FTA)
Presentation (P20-21689)
Adam Schildge/Federal Transit Administration (FTA)

1467

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 146C
Rail Transit Quality of Service: Evaluating Passenger Satisfaction
Victoria Perk, USF Center for Urban Transportation Research, presiding
Sponsored By Standing Committee on Transit Capacity and Quality of Service

The Transit Capacity and Quality of Service Manual (3rd edition, TCRP Report 165) provides a quality of service framework from the passenger and transit provider points of view based on aspects of transit availability (frequency, service span, and access) and transit comfort and convenience (passenger loads, reliability, and travel time). This session includes four papers that provide international perspectives of transit quality of service factors. Specifically, the papers examine passenger satisfaction on rail transit systems in India, Ethiopia, Iran, and the United Kingdom.

Prioritizing Metro Service Quality Attributes to Facilitate Transit Agency Interventions Leading to Enhanced Commuter Experience: TOPSIS Ranking and Importance Satisfaction Analysis Methods (20-03152)
Bandhan Majumdar/Birla Institute of Technology & Science, Pilani - Hyderabad Campus, Dilum Dissanayake/Birla Institute of Technology & Science, Pilani - Hyderabad Campus, Avanindra Rajput/Birla Institute of Technology & Science, Pilani - Hyderabad Campus, Yong Saw/Birla Institute of Technology & Science, Pilani - Hyderabad Campus, Prasanta Sahu/Birla Institute of Technology & Science, Pilani - Hyderabad Campus

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Users' Satisfaction with Public Transportation Performance: The Case of Addis Ababa Light Rail Transit (20-00 065)
Mintesnot Woldeamanuel/California State University, Northbridge, Berhanu Woldetensae/California State University, Northbridge

Trip Satisfaction of Metro Passengers: A Sequenced Ordered Logit Model Considering Latent Variables (20-043 10)
Tara Saeidi/Amirkabir University of Technology, Mahmoud Mesbah/Amirkabir University of Technology, Meeghat Habibian/Amirkabir University of Technology

Investigating Passenger Satisfaction Toward Metro Infrastructures, Facilities, and Services: How Does Satisfaction Vary in Relation to Sociodemographic and Travel-Related Factors? (20-04632)
Yong Saw/Newcastle University, Dilum Dissanayake/Newcastle University, Fazilatulaili Ali/Newcastle University, Thusal Bentotage/Newcastle University

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1468

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 143C
Improving Paratransit Services
Jie Yu, University of Wisconsin, Milwaukee, presiding
Sponsored By Standing Committee on Paratransit

Presentations related to analysis and modeling of paratransit operations.

Adjusting Dwell Time for Paratransit Services (20-03178)
Camille Garnier/Ecole Polytechnique de Montreal, Martin Trepanier/Ecole Polytechnique de Montreal, Catherine Morency/Ecole Polytechnique de Montreal

Predicting Trip Cancellations and No-Shows in Paratransit Operations (20-04031)
Fernando Acosta Pérez/University of Puerto Rico, Mayaguez, Gabriel Rodríguez Ortiz/University of Puerto Rico, Mayaguez, Everson Rodríguez Muñiz/University of Puerto Rico, Mayaguez, Fernando Ortiz Sacarello/University of Puerto Rico, Mayaguez, Jee Eun Kang/University of Puerto Rico, Mayaguez, Daniel Rodriguez-Roman/University of Puerto Rico, Mayaguez

Stable Dial-a-Ride Formulation with Users' Preferences (20-04472)
Xiaotong DONG/University of New South Wales, David Rey/University of New South Wales, S. Travis Waller/University of New South Wales

A New Methodology to Optimize Coordination of Paratransit Services and TNCs (20-05299)
Charalampos Sipetas/University of Massachusetts, Amherst, Eric Gonzales/University of Massachusetts, Amherst

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1469

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 147A
Risk in Shipbuilding and Passenger Services
Noel Comeaux, HDR, presiding
Sponsored By Standing Committee on Ferry Transportation

Certification of an All-Electric Floating Classroom (P20-21187)
Suzanne Leahy/Friends of Pleasant Bay

New Starts: The Importance of Assessing Financial Risk and Business Planning (P20-21188)
Tim Payne/Nelson\Nygaard

What Are the Risks in Passenger Ferry Services? (P20-21385)
Noel Comeaux/HDR

Actionable Weather Predictions for Ferry Operators: Reporting on Something New (P20-21409)
Roberta Weisbrod/Worldwide Ferry Safety Association

1470

Next-Generation Corridor Equipment Pool Committee: 10 Years of Progress
John Madden, Erdman Anthony and Associates, presiding
Sponsored By Standing Committee on Rail Rolling Stock and Motive Power

There has been a decade of progress since the Next Generation Equipment Committee ("NGEC") was established in 2010 under the 2008 PRIIA Act. One key goal of the NGEC was to standardize the acquisition, financing, and design of passenger rail equipment in the U.S. This session provides a look back at 10 years of progress from the perspective of key leaders at all levels: the NGEC committee, federal, state, and industry.

NGEC Goals and Policies (P20-20730)
Eric Curtit/Missouri Department of Transportation
NGEC Technical Subcommittee and Specification Development (P20-20731)
Charles King/National Railroad Passenger Corporation (Amtrak)
States' Role (P20-20732)
John Oimoen/Illinois Department of Transportation
Federal Role (P20-20733)
Jeffrey Gordon/Federal Railroad Administration (FRA)
Industry Role (P20-20734)
Larry Salci/Larry Salci Consulting Services

1471

Passenger Rail Human Factors and Operational Safety
Jared Young, OST-R/Volpe Center, presiding
Chen-Yu Lin, University of Illinois, Urbana Champaign, presiding
Sponsored By Standing Committee on Railroad Operational Safety

Research topics in passenger rail human factors and operational safety.

Effect of Automatic Train Protection Technologies on Railroad Accident Prevention (20-05208)
Chen-Yu Lin/University of Illinois, Urbana Champaign, Bryan Sooter/University of Illinois, Urbana Champaign, Christopher Barkan/University of Illinois, Urbana Champaign
Subway Driver Behavior Recognition Based on CNN and Time Series Diagram (20-00264)
Huang Shize/Tongji University, Lingyu Yang/Tongji University, Wei Chen/Tongji University, Ting Tao/Tongji University
Research on Duty Driver Workload Under Urban Railway Transit Driverless Train Operation (20-04263)
Yuan-chun Huang/Shanghai University of Engineering and Science, Lanpeng Li/Shanghai University of Engineering and Science, Zhi-gang Liu/Shanghai University of Engineering and Science
Rethinking the Management Practices of Shinkansen Safety (20-00981)
Nikhil Bugalia/The University of Tokyo, Yu Maemura/The University of Tokyo, Kazumasa Ozawa/The University of Tokyo

1472 CM (1.75)

Freight Day, Part 2: Sustainable and Efficient Solutions for Last Mile Distribution (Part 1, Session 1401; Part 3, Session 1549; Part 4, Session 1617)
Bilge Atasoy, Delft University of Technology, presiding
Sponsored By Freight Systems Group, Standing Committee on Urban Freight Transportation, Marine Group

This session will focus on rapidly growing innovations and challenges in business-to-consumer deliveries in cities . Last-mile distribution keeps increasing with new demands from e-commerce consumers and service innovations. This generates new issues in cities, including road safety, traffic heterogeneity, more fragmented delivery patterns, and the development of urban warehouses in city centers. The session will discuss potential solutions include virtual/physical consolidation of deliveries, collaborative logistics, use of sustainable alternatives, better governance and freight planning. The session will also describe emerging models of delivery services, provide new research findings, and compare different situations and solutions.

Recent Trends in Last-Mile Logistics Around the World (P20-20878)
Laetitia Dablanc/IFSTTAR
Using Mobile Sensing and Analytics to Deliver the Goods (P20-20879)
Moshe Ben-Akiva/Massachusetts Institute of Technology (MIT)
Last-Mile Distribution in New York City: Solutions from Stakeholders (P20-20880)
Michael Replogle/New York City Department of Transportation
Geospatial Analytics in Last-Mile Operations (P20-21028)
Daniel Merchan/Amazon.com
Urban Vehicles and Solutions to Improve the Last Mile (P20-21042)
Tim Weaver/Chanje

1473

Impact of Increased Protectionism on the Globalization of Supply Chains
Mario Iacobacci, Deloitte, presiding
Sponsored By Standing Committee on Freight Transportation Economics and Regulation

Panel Discussion (P20-21853)
Emily Sanchez/American Chemistry Council (CHEMTREC), Patrick Thompson/IHS Markit, Michele Ruta/The World Bank, Patricia Buckley/Deloitte
Trade Policy Implications for the U.S. Chemical Industry (P20-21854)
Emily Sanchez/American Chemistry Council (CHEMTREC)
Policy Uncertainty, Trade, and Global Value Chains: Some Facts, Many Questions (P20-21855)
Michele Ruta/The World Bank
Value-Added Trade Measures (P20-21856)
Patricia Buckley/Deloitte

1474

Methods for Assessing Alternative Delivery Approaches
Erica Wygonik, RSG, presiding
Sponsored By Standing Committee on Freight Transportation Planning and Logistics

Urban Rail Service Design for Collaborative Passenger and Freight Transport (20-01365)
Zhujun Li/Beijing Jiaotong University, Amer Shalaby/Beijing Jiaotong University, Matthew Roorda/Beijing Jiaotong University, Baohua Mao/Beijing Jiaotong University
Electric Vehicle Traveling Salesman Problem with Drone (20-01548)
Tengkuo Zhu/University of Texas, Austin, Stephen Boyles/University of Texas, Austin, Avinash Unnikrishnan/University of Texas, Austin

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Analytic Approximations of Realistic Tour Distances: Case Studies for Deliveries by Robots and Drones (20-036 19)
Youngmin Choi/University of Maryland, College Park, Paul Schonfeld/University of Maryland, College Park
Deep Learning–Based Crowdshipping Delivery Production Forecasting (20-05636)
Hui Shen/University of Illinois, Chicago, Jane Lin/University of Illinois, Chicago

1475

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 147B
Before, During, and After "The Big One(s)": Unified Support to Civil Authorities
John Fasching, Logistics Management Institute (LMI), presiding
Sponsored By Standing Committee on Military Transportation

An exceptional panel of experts, with recent "boots-on-the-ground" experience and strategic-thru-tactical perspectives, discuss unified support to civil authorities in response to catastrophic natural disasters; in the contexts of planning, modernization and readiness. Discussion Areas: the New Madrid Seismic Zone and Category-5s versus islands/coastlin es. Panelists: Colonel Bradley Eungard, Strategic Mobility Division Chief, Headquarters Department of the Army Directorate for Logistics; Mr. Dannon Penn, Deputy Administrator, Response Directorate, Federal Emergency Management Agency, U.S. Dept. of Homeland Security; Dan Harder, P.E., Research Civil Engineer, Airfields and Pavements Branch, U.S. Army Engineer Research and Development Center.

Panelist 1 (P20-21192)
Kristian Rogers/Crowley Maritime Corporation
Panelist 2 (P20-21193)
Daniel Harder/U.S. Army Corps of Engineers (USACE)
Panelist 3 (P20-21194)
Damon Penn/Federal Emergency Management Agency

1476   CM (1.75)

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, 143A
Performance Measures for State Aviation Agencies and Systems
Regan Schnug, Kimley-Horn and Associates, Inc., presiding
Sponsored By Standing Committee on Aviation System Planning

In a time where state aviation agencies are asked to do more with less, it's becoming ever increasingly important that resources (time, funding, staff) are utilized efficiently. To do this, many agencies are relying more and more on performance measures to demonstrate value and ensure optimum performance with limited resources. Please join us for this session where we'll discuss the latest ACRP research on state aviation performance measures and hear from states firsthand how they develop and utilize measures within their aviation systems, divisions, and beyond.

Utilizing System Plan Performance Measures: A Michigan Case Study (P20-20282)
Bryan Budds/Michigan Department of Transportation
Using Performance Measures to Continuously Evaluate Florida's Aviation System and Support the Overarching Implementation of the Florida Transportation Plan (P20-20283)
Jim Halley, III, A.A.E., ACE/Florida Department of Transportation
Measuring Success: How States Are Using Performance Measures (P20-20284)
Stephanie Ward/Mead and Hunt, Inc.

1477

Innovations in Airport Terminals: Practical Application of Proven or Emerging Technologies to Address Current Issues
I. Richmond Nettey, Kent State University, presiding
Sponsored By Standing Committee on Airport Terminals and Ground Access

In 2018, some 1.0115 billion airline passengers used airport terminals in the U.S. This represented 4.8% more than the previous record high of 965.4 million airline passengers in 2017, and an 8.5% growth over two years (bts.dot.gov). Globally, the number of airline passengers exceeded four billion for the first time in 2017 (iata.gov). Employees as well as "meeters and greeters" at airports, who exceed several million, also use airport terminals. Demand for airline service and the associated use of airport terminals, is expected to grow. This session discusses how innovations in airport terminals, in the form of practical application of proven or emerging technologies, address challenges associated with increased demand for terminals.

Lights, Camera, and the Transformational Journey (P20-20237)
Christopher Blasie/Collins Aerospace
The Effects of Servicescape and Atmosphere on Experiential Value and Patronage Intention of the Airport Lounge: A Taiwanese International Airline as an Example (20-00469)
KAI CHIEH HU/Soochow University, Kai-Chieh Chia/Soochow University, Mingying Lu/Soochow University, Wei-Shun Chang/Soochow University
ACRP Student Research: Evaluation of Airport Wayfinding Accessibility with the Use of a Wheelchair Simulator (20-01924)
Zhu Qing/Georgia Institute of Technology (Georgia Tech), Carlos Sun/Georgia Institute of Technology (Georgia Tech), Joseph Reneker/Georgia Institute of Technology (Georgia Tech)
Impacts of New Technologies and Processes on Passenger Flow in Airport Terminals (P20-20977)
Aarshabh Misra/ARUP

1478

State DOT CEO Roundtable: Making the Right Investment: Strategic Management of State DOT Assets
Victoria Sheehan, New Hampshire Department of Transportation, presiding
Sponsored By Executive Committee

The physical infrastructure for transportation continues to age while the system as a whole becomes more intertwined and complex. As infrastructure owners and operators, State DOTs are optimizing existing assets and making investment decisions that result in the lowest lifecycle cost. This session will examine how state DOTs are using a performance-based and data-driven framework to make strategic and outcome-oriented decisions in managing their critical transportation assets.

Panel Discussion (P20-21633)
Julie Lorenz/Kansas Department of Transportation, Diane Gutierrez-Scaccetti/New Jersey Department of Transportation, Carlos Braceras/Utah Department of Transportation, Roger Millar/Washington State Department of Transportation

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Energy Ideathon
Eleftheria Kontou, University of Illinois at Urbana-Champaign, presiding
Sponsored By Young Members Council (YMC), Standing Committee on Transportation Energy, Standing Committee on Alternative Transportation Fuels and Technologies, Young Members Council - Planning and Evironment

This session brings together students, scholars, and practitioners to showcase their solutions/answers to critical problems and challenges in the transportation energy field. Topics of interest would include: Urban and Rural Transportation Energy Savings, Sustainable Mobility Systems, Transportation Electrification Challenges, Pathways to Alternative Transportation Fuels. The Energy Ideathon's objective is to engage young transportation scholars and practitioners in the development of new ideas for achieving transportation sustainability. This event is expected to generate innovative ideas to tackle difficult problems related to research and practice in the fields of alternative transportation fuels, energy, and transportation.

Energy-Optimal Operation of Connected Automated Plug-in Hybrid Electric Vehicles (P20-21198) - B373
A M Ishtiaque Mahbub/University of Delaware
A Robust Decision-Making Approach to Assess Pathways for U.S. Passenger Transport Decarbonization Under Uncertainty (P20-21199) - B374
Abdullah Alarfaj/Carnegie Mellon University
Transitioning to Zero-Emission Bus Fleets: Challenges and Lessons Learned from the U.S. Implementations (P 20-21200) - B375
Aikaterini Deliali/University of Massachusetts, Amherst
Modeling the Dynamic Benefits and Costs of Technology-Forcing ZEV Mandates in the Presence of CAFE/GHG Standards (P20-21201) - B376
Arthur Yip/Carnegie Mellon University
Modeling Interactions Between Automaker-Focused Climate Policies: The Case of a Vehicle Emissions Standard and ZEV Mandate (P20-21202) - B380
Chandan Bhardwaj/Simon Fraser University
The Future of Airports: Long-Term Energy Challenges (P20-21203) - B381
Gael Le Bris/WSP
Fleet Optimization for Autonomous, Electric, and Conventional Vehicles in Private and Shared Mobility Systems to Serve a Multi-Class User Transportation Network (P20-21204) - B382
Harprinderjot Singh/Michigan State University
Solar-Electric Buses for a University Campus Transport System (P20-21205) - B383
Konstantinos Kepaptsoglou/National Technical University of Athens (NTUA)
An Econometric Model System for Urban Energy Consumption: A Model of Energy Mix and Consumption by Use Type (P20-21206) - B384
Naveen Chandra Iraganaboina/University of Central Florida
Dynamic Wireless Charging for Electric Vehicles: Technology Overview and Impact on Emissions (P20-21207) - B385
Theodora Konstantinou/Purdue University
Utility-Transit Nexus: Leveraging Intelligently Charged Electrified Transit to Support a Renewable Energy Grid (P20-21208) - B386
Tyler Wellik/University of Texas, Austin

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Transportation Management and Governance in the Age of Disruption
Margaret-Avis Akofio-Sowah, WSP, presiding
Janille Smith-Colin, Southern Methodist University, presiding
Sponsored By Standing Committee on Strategic Management

Transit in Flex: Examining Service Fragmentation of App-Based, On-Demand Transit Services (20-00557) - A247
Thomas Skuzinski/University of Texas, Arlington, David Weinreich/University of Texas, Arlington, Shima Hamidi/University of Texas, Arlington

(continued)

Measuring Institutional Barriers to Integrated Regional Public Transit and Institutional Support for Cross-Jurisdictional Transit Service (20-01300) - A248

David Weinreich/University of Texas, Arlington, Thomas Skuzinski/University of Texas, Arlington, Shima Hamidi/University of Texas, Arlington

Governance for Emerging Autonomous Driving Development in China (20-01997) - A249

Qiuju Xue/State Key Laboratory of Rail Traffic Control and Safety, Meng Xu/State Key Laboratory of Rail Traffic Control and Safety, Caroline Mullen/State Key Laboratory of Rail Traffic Control and Safety

Regional Impacts of Autonomous Vehicles on Transportation Network Demand: A Case Study of the Triangle Region, North Carolina (20-02514) - A250

Md. Mehedi Hasnat/North Carolina State University, Eleni Bardaka/North Carolina State University, George List/North Carolina State University, Nagui Rouphail/North Carolina State University, Billy Williams/North Carolina State University

Designing a Process to Identify, Evaluate, and Fund Pilot Programs at Sound Transit (20-05772) - A251

Anurag Komanduri/Cambridge Systematics, Inc., Abby Chazanow/Cambridge Systematics, Inc., Jonathan Overman/Cambridge Systematics, Inc., Michelle Bina/Cambridge Systematics, Inc., Michael Berman/Cambridge Systematics, Inc.

Including Engineering Ethics for Decision Making About Automated Mobility (20-02359) - A252

Allanté Whitmore/Carnegie Mellon University, Chris Hendrickson/Carnegie Mellon University, Scott Matthews/Carnegie Mellon University, Gabrielle Wong-Parodi/Carnegie Mellon University, Constantine Samaras/Carnegie Mellon University

Impact of Vehicle Automation and Electric Propulsion on Production Costs for Mobility Services Worldwide (20-02734) - A253

Henrik Becker/ETH Zurich, Felix Becker/ETH Zurich, Ryosuke Abe/ETH Zurich, Shlomo Bekhor/ETH Zurich, Prawira Belgiawan/ETH Zurich, Junia Compostella/ETH Zurich, Emilio Frazzoli/ETH Zurich, Lewis Fulton/ETH Zurich, Davi Bicudo/ETH Zurich, Krishna Murthy Gurumurthy/ETH Zurich, David Hensher/ETH Zurich, Johan Joubert/ETH Zurich, Kara Kockelman/ETH Zurich, Lars Kröger/ETH Zurich, Scott LeVine/ETH Zurich, Jai Malik/ETH Zurich, Katarzyna Marczuk/ETH Zurich, Reza Nasution/ETH Zurich, Jeppe Rich/ETH Zurich, Andrea Carrone/ETH Zurich, Danqi Shen/ETH Zurich, Yoram Shiftan/ETH Zurich, Alejandro Tirachini/ETH Zurich, Yale Wong/ETH Zurich, Mengmeng Zhang/ETH Zurich, Patrick Bösch/ETH Zurich, Kay Axhausen/ETH Zurich

Multi-Layer Business Model to Assess Sustainability of Flexible Mobility on Demand Services (20-03810) - A254

Michela Le Pira/University of Catania, Nadia Giuffrida/University of Catania, Inturri Giuseppe/University of Catania, Matteo Ignaccolo/University of Catania

Big Data and Transportation Safety: Connecting the Dots (20-05376) - A255

Subasish Das/Texas A&M Transportation Institute, Greg Griffin/Texas A&M Transportation Institute

Enhancing the Capacity of State Transportation Agencies to Improve Transportation System Resilience (20-04559) - A256

Chris Dorney/WSP, Michael Flood/WSP, Paula Hammond/WSP, Michael Meyer/WSP, Rawlings Miller/WSP

Exploring Best Practice for Municipal E-Scooter Policy in the United States (20-05849) - A257

Matt Kawashima/University of San Francisco, William Riggs/University of San Francisco

Investigating Critical Factors for Locations of Future Intercity Passenger Rail Maintenance (20-06136) - A258

Alejandro Uribe/California State University, Long Beach, Mehran Rahmani/California State University, Long Beach, Shailesh Chandra/California State University, Long Beach

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Management and Productivity Research Highlights
Michael Nesbitt, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Management and Productivity

Unexpected Bus Operator Absence and Extraboard Scheduling: An MBTA Case Study (20-02707) - B450

Qing Yi Wang/Massachusetts Institute of Technology (MIT), Haris Koutsopoulos/Massachusetts Institute of Technology (MIT), Nigel Wilson/Massachusetts Institute of Technology (MIT)

What Drives the Bus Drivers' Job Satisfaction? (20-04265) - B451

Yeongmin Kwon/Korea Advanced Institute of Science and Technology (KAIST), Jihye Byun/Korea Advanced Institute of Science and Technology (KAIST)

Investigation of the Challenges and Their Best Practices for Post-Disaster Reconstruction Safety: Educational Approach for Construction Hazards (20-05161) - B452

Elnaz Safapour/University of Texas, Arlington, Sharareh (Sherri) Kermanshachi/University of Texas, Arlington

(continued)

Direct and Indirect Employment Generated from Highway Construction in India (20-05243) - B453
Vinod Vasudevan/University of Alaska, Anchorage, Sudhir Misra/University of Alaska, Anchorage, Tanika Chakraborty/University of Alaska, Anchorage, Prasanna Behera/University of Alaska, Anchorage, Ayushman Bhatt/University of Alaska, Anchorage, Babni Lal/University of Alaska, Anchorage

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Case Studies in Technology Transfer
Deepak Raghunathan, ICF, presiding
Sponsored By Standing Committee on Technology Transfer, Standing Committee on Transportation Education and Training

 See examples of technology transfer in action.

Automated Vehicle Demonstrations in Ohio (P20-20857) - B446
Cynthia Jones/Ohio Department of Transportation, Jeff Kupko/Michael Baker International, Inc.
E-Ticketing for Asphalt Delivery (P20-20843) - B447
Korby Seward/North Dakota Department of Transportation
Evaluating the North Carolina Department of Transportation's Research Program and Implementation Efforts (20-04664) - B448
Curtis Bradley/North Carolina Department of Transportation
Identifying Barriers to the Potential Implementation of Road Safety Good Practices in Africa (20-01629) - B437
Brayan Gonzalez-Hernandez/University of Rome "La Sapienza", Eleonora Meta/University of Rome "La Sapienza", Luca Persia/University of Rome "La Sapienza", Davide Usami/University of Rome "La Sapienza", João Cardoso/University of Rome "La Sapienza"
Intelligent Construction Technologies for Hot Mix Asphalt Paving: New Technology Adoption in North Dakota (P20-20842) - B438
Amy Beise/North Dakota Department of Transportation, Curtis Dunn/North Dakota Department of Transportation

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Moving Forward and Advancing Society with Transportation Libraries, Information, and Data
Kendra Levine, University of California, Berkeley, presiding
Sponsored By Standing Committee on Library and Information Science for Transportation

The TRB Standing Committee on Library and Information Science for Transportation (LIST) ABG40 is soliciting submissions for posters on a wide range of topics demonstrating innovative approaches in transportation information, data and libraries. Topics could include responding to new requirements for public access and open data mandates; innovative tools or practices for sharing transportation information and data; text and data mining of transportation research; cutting-edge library and information management tools; digitizing collections; evaluating and implementing digital library tools; repurposing library spaces; and trends in special librarianship that help transportation libraries be more innovative.

WSDOT Library Digitization Initiative: Capturing our History to Inform Our Future (P20-20647) - B435
Kathy Szolomayer/Washington State Department of Transportation, Michel Wendt/Washington State Department of Transportation
The Transportation Research Thesaurus: We're Having a Pool Party and You're Invited! (P20-20649) - B436
Janet Daly/Transportation Research Board, Sam Saffer/Transportation Research Board
Preserving the Past: Historical Collections in the National Transportation Library's Repository and Open Science Access Portal (P20-20651) - B440
Mary Moulton/OST-R/Bureau of Transportation Statistics, Shawn Montgomery/National Transportation Library
Data Management Strategies for the National Transportation Data Archive: Dealing with Legacy Data (P20-20652) - B430
Jesse Long/OST-R/Bureau of Transportation Statistics, Leighton Christiansen/OST-R/Bureau of Transportation Statistics
Rescuing Legacy Transportation Data (P20-20654) - B441
Lisa Curtin/University of Tennessee, Knoxville, Mary Moulton/OST-R/Bureau of Transportation Statistics

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Digitization of U.S. Department of Transportation News (P20-20655) - B442

Steven Meyer/University of North Carolina, Greensboro, Mary Moulton/OST-R/Bureau of Transportation Statistics

Free to Read or Paywall Prisoner: Accessing Digital Transportation Journal Articles (P20-20660) - B431

Bobbi deMontigny/Montana Department of Transportation, Leighton Christiansen/OST-R/Bureau of Transportation Statistics

National Transportation Knowledge Network Update (P20-20661) - B444

Bob Sweet/National Transportation Library, Samantha Strain/OST-R/Bureau of Transportation Statistics

Building a National Transportation Data Preservation Network Workshop (P20-20662) - B432

Leighton Christiansen/OST-R/Bureau of Transportation Statistics, Charles Ducker/Office of the Secretary of Transportation (OST), Hilary Nixon/San Jose State University, Steven Polunsky/Alabama Transportation Institute, Lisa Kay Schweyer/Carnegie Mellon University, Michael Witt, Kendra Levine/University of California, Berkeley

Visualizing National Transportation Library Repository Metrics (P20-20663) - B445

Aileen Nolan

Communicating Effectively with the Transportation Community About ROSA P Submission Requirements for Accessible Documents Under the Final Federal Rule for the ICT Refresh Under Section 508 (P20-20664) - B443

Judith Salter, Samantha Strain, Mary Moulton/OST-R/Bureau of Transportation Statistics

Framework of a Job Lexicon for Future Transportation Workforce (P20-20668) - B433

Anandi Dutta/Ohio State University, Subasish Das/Texas A&M Transportation Institute

Co-Author Networks in Transportation Research: Findings from TRID Data (P20-20670) - B434

Subasish Das/Texas A&M Transportation Institute, Ruihong Wang/Texas A&M University System

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Current Issues in Transportation Energy

Paul Leiby, Oak Ridge National Laboratory, presiding

Sponsored By Standing Committee on Transportation Energy

Electric Vehicle Integration: Will National Grid Electricity Generation Mix Meet the UK Emission Targets? (20-00140) - A192

Kathryn Logan/University of Aberdeen, John Nelson/University of Aberdeen, Astley Hastings/University of Aberdeen

Multimodality and CO2 Emissions: A Relationship Moderated by Distance (20-00195) - A195

Eva Heinen/University of Leeds, Giulio Mattioli/University of Leeds

Racetracks, Rebates, and Retrofits: An Exploration of Several American Cities' Policies to Facilitate Electric Vehicle Purchase and Usage (20-00196) - A196

Ankur Jain/Center for Transportation Equity, Decisions and Dollars, James Wood/Center for Transportation Equity, Decisions and Dollars

Framing Greenhouse Gas Emissions on the Environmental Protection Agency's New Vehicle Labels to Increase Willingness to Pay (20-00527) - A193

Ricardo Daziano/Ecole Polytechnique de Montreal, E. Owen Waygood/Ecole Polytechnique de Montreal, Zachary Patterson/Ecole Polytechnique de Montreal, Matthew Feinberg/Ecole Polytechnique de Montreal, Bobin Wang/Ecole Polytechnique de Montreal

Which Low-Carbon Transport Policies Are Most Effective?: A Review of "Best Practices" for the Case of Metro Vancouver (20-00530) - A167

Jonn Axsen/Simon Fraser University, Michael Wolinetz/Simon Fraser University

Effectiveness of China's Plug-in Electric Vehicle Subsidy (20-00575) - A194

Tamara Sheldon/KAPSARC, Rubal Dua/KAPSARC

Public Support for Supply-Focused Policies in the Transport Sector: Vehicle Emissions, Low-Carbon Fuel, and ZEV Standards in Canada and California (20-00998) - A168

Zoe Long/Simon Fraser University, Jonn Axsen/Simon Fraser University, Shelby Kitt/Simon Fraser University

What Have We Learned About a Zero-Emissions Vehicle Mandate?: A Literature Review and Critical Research Agenda (20-01129) - A162

Jonn Axsen/Simon Fraser University, Scott Hardman/Simon Fraser University, Alan Jenn/Simon Fraser University

Modeling the Long-Term Effects of Low-Carbon Regulation on Automakers and Technology Adoption: The Case of a ZEV Mandate in Canada (20-01577) - A150

Chandan Bhardwaj/Simon Fraser University, Jonn Axsen/Simon Fraser University

Least-Cost Technologies for Different Transportation Segments: A Sensitivity Analysis (20-02287) - A184

David Gohlke/Argonne National Laboratory, Ranjit Desai/Argonne National Laboratory, Matteo Muratori/Argonne National Laboratory

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A Robust Decision-Making Approach to Assess Pathways for U.S. Passenger Transport Decarbonization Under Uncertainty (20-02294) - A191

Abdullah Alarfaj/Carnegie Mellon University, Michael Griffin/Carnegie Mellon University, Constantine Samaras/Carnegie Mellon University

Impacts of En-Route Decisions Within a Connected Vehicle Environment on Network-wide Traffic Operation and Fuel Consumption Under Various Incident Scenarios (20-02655) - A197

Arezoo Samimi Abianeh/Texas A&M University, Mark Burris/Texas A&M University, Alireza Talebpour/Texas A&M University, Kumares Sinha/Texas A&M University

National Energy Impact Analysis of Electrified Ridehailing Mobility (20-02872) - A189

Zicheng Bi/Argonne National Laboratory, Yan Zhou/Argonne National Laboratory, Fei Xie/Argonne National Laboratory, Zhenhong Lin/Argonne National Laboratory, Eric Wood/Argonne National Laboratory, DongYeon Lee/Argonne National Laboratory

Climate and Health Impacts of Long-Haul Truck Electrification in the United States (20-03003) - A198

Fan Tong/Lawrence Berkeley National Laboratory, Derek Wolfson/Lawrence Berkeley National Laboratory, Maximilian Auffhammer/Lawrence Berkeley National Laboratory, Corinne Scown/Lawrence Berkeley National Laboratory

Investigating Virginians' Heterogeneous Preferences for Electric Vehicles: Uncovering Policy Implications via a Comparison of Choice Modeling Methods (20-03033) - A188

Wenjian Jia/University of Virginia, T. Donna Chen/University of Virginia

Long-Term Vehicle Speed Prediction via Traffic Data Mining for Improved Energy Efficiency of Connected Electric Vehicles (20-04175) - A190

Mohammad Reza Amini/University of Michigan, Ann Arbor, Yiheng Feng/University of Michigan, Ann Arbor, Zhen Yang/University of Michigan, Ann Arbor, Ilya Kolmanovsky/University of Michigan, Ann Arbor, Jing Sun/University of Michigan, Ann Arbor

Driving and Restraining Forces for Reducing Transportation Greenhouse Gas Emissions: Sharing Oregon's Experiences (20-05086) - A199

Amanda Pietz/Oregon Department of Transportation, Tara Weidner/Oregon Department of Transportation

Reducing Greenhouse Gas Emissions from Long-Distance Travel Business: How Far Can We Go? (20-05122) - A161

Ruohan Li/University of Texas, Austin, Kara Kockelman/University of Texas, Austin, Jooyong Lee/University of Texas, Austin

Impact of Countermeasures After Subsidy Policy Abolishment on Electric Vehicle Adoption (20-05317) - A181

Tianwei Lu/Beijing Jiaotong University, Enjian Yao/Beijing Jiaotong University, Fanglei Jin/Beijing Jiaotong University

Oregon's Clean Fuels Program: A Review and Status Update (20-05727) - A185

Julie Witcover/University of California, Davis, Colin Murphy/University of California, Davis

Household Mobility, Energy, and Electric Vehicle Typology for New York State (20-02808) - A182

Alana Wilson/National Renewable Energy Laboratory (NREL), Clement Rames/National Renewable Energy Laboratory (NREL), Daniel Zimny-Schmitt/National Renewable Energy Laboratory (NREL), Carolina Neri/National Renewable Energy Laboratory (NREL), Joshua Sperling/National Renewable Energy Laboratory (NREL), Patricia Romero-Lankao/National Renewable Energy Laboratory (NREL)

Impact of Pavement Roughness on Fuel Consumption for a Range of Vehicle Types (20-03322) - A180

Muluneh Sime/Nevada Automotive Test Center, Gary Bailey/Nevada Automotive Test Center, Elie Hajj/Nevada Automotive Test Center, Rami Chkaiban/Nevada Automotive Test Center

Systematic Evaluation of A Multi-Lane Green Driving Algorithm at Mixed Connected Environment (20-04874) - A183

Hao Yang/McMaster University, Kentaro Oguchi/McMaster University

A New Fuel Consumption Model Considering Vehicle's Speed, Acceleration, and Jerk (20-06125) - A171

Licheng Zhang/Chang'an University, Xiangmo Zhao/Chang'an University, Asad Khattak/Chang'an University

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Current Issues in Alternative Transportation Fuels and Technologies
Timothy Lipman, University of California, Berkeley, presiding
Sponsored By Standing Committee on Alternative Transportation Fuels and Technologies

How Much Recharging and Refueling Infrastructure Is Needed for Zero-Emissions Vehicles?: Simulating Sales in the Case of Canada (20-00181) - A158

Amy Miele/Simon Fraser University, Jonn Axsen/Simon Fraser University, Michael Wolinetz/Simon Fraser University, Elicia Maine/Simon Fraser University, Zoe Long/Simon Fraser University

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Americans' Plans for Acquiring and Using Electric, Shared, and Self-Driving Vehicles (20-00543) - A160
Neil Quarles/University of Texas, Austin, Kara Kockelman/University of Texas, Austin

Electric Vehicle Charging Optimization to Minimize Marginal Greenhouse Gas Emissions (20-00740) - A128
Ran Tu/University of Toronto, Yijun Gai/University of Toronto, Bilal Farooq/University of Toronto, Marianne Hatzopoulou/University of Toronto

Are Individuals' Stated Preferences for Electric Vehicles Consistent with Real-World Adoption Patterns?: A Case Study in Virginia (20-00868) - A187
Wenjian Jia/University of Virginia, T. Donna Chen/University of Virginia

Emissions Benefits of Electric Vehicles in Uber and Lyft Services (20-01230) - A155
Alan Jenn/Institute of Transportation Studies (ITS)

Exploring the Effect of Battery Capacity on Electric Vehicle Sharing Programs Using a Simulation Approach (20-01335) - A129
Songhua Hu/University of Maryland, College Park, Peng Chen/University of Maryland, College Park, Chi Xie/University of Maryland, College Park, Xiaohong Chen/University of Maryland, College Park

Optimal Charging Infrastructure Planning for Commercial Electric Vehicles with Stationary Spatial Demand Distribution (20-01337) - A130
Xinwu Qian/Purdue University, Jiawei Xue/Purdue University, Stanislav Sobolevsky/Purdue University, Chao Yang/Purdue University, Satish Ukkusuri/Purdue University

Electrification of Vehicle Miles Traveled Within the Household Context (20-01346) - A157
Ahmet Mandev/Chalmers tekniska hogskola, Frances Sprei/Chalmers tekniska hogskola, Gil Tal/Chalmers tekniska hogskola

A Framework to Analyze the Requirements of a Multi-Port, Megawatt-Level Charging Station for Heavy-Duty Electric Vehicles (20-01428) - A139
Partha Mishra/National Renewable Energy Laboratory (NREL), Eric Miller/National Renewable Energy Laboratory (NREL), Shivam Gupta/National Renewable Energy Laboratory (NREL), Shriram Santhanagopalan/National Renewable Energy Laboratory (NREL), Kevin Bennion/National Renewable Energy Laboratory (NREL), Andrew Meintz/National Renewable Energy Laboratory (NREL), Kevin Walkowicz/National Renewable Energy Laboratory (NREL)

Synthetic Control Methods for Estimating the Effect of Purchase Incentives on Battery Electric Vehicles Sales in Georgia (20-01550) - A123
Haobing Liu/Georgia Institute of Technology (Georgia Tech), Hanyan Li/Georgia Institute of Technology (Georgia Tech), Xiaodan Xu/Georgia Institute of Technology (Georgia Tech), Michael Rodgers/Georgia Institute of Technology (Georgia Tech), Randall Guensler/Georgia Institute of Technology (Georgia Tech)

A Sensitivity Analysis of Electric Vehicle Energy Efficiency, Driving Range, and Operating Cost Using Regional-Level Household Daily Travel Patterns (20-01680) - A124
Xiaodan Xu/Texas A&M Transportation Institute, Haobing Liu/Texas A&M Transportation Institute, Michael Rodgers/Texas A&M Transportation Institute, Randall Guensler/Texas A&M Transportation Institute

An Integrated Optimization Platform for Spatial-Temporal Modeling of Electric Vehicles Charging Infrastructure (20-01777) - A154
Xinwei Li/University of California, Davis, Alan Jenn/University of California, Davis

Adoption of Added and Traded Plug-in Electric Vehicles with an Emphasis on the Role of Charging Equipment and Perceptual Concerns (20-01788) - A138
Fatemeh Nazari/University of Texas, Rio Grande Valley, Abolfazl (Kouros) Mohammadian/University of Texas, Rio Grande Valley, Tom Stephens/University of Texas, Rio Grande Valley

Design and Operation of a Mobile Charging System (20-01829) - A137
Peng Tang/Tsinghua University, Fang He/Tsinghua University, Xi Lin/Tsinghua University, Meng Li/Tsinghua University

Leveraging Big Data and Charging Coordination for Effective Taxi Fleet Electrification: A Case Study of Shenzhen, China (20-01845) - A153
Gordon Bauer/University of California, Berkeley, Cheng Zheng/University of California, Berkeley, Susan Shaheen/University of California, Berkeley, Daniel Kammen/University of California, Berkeley

Decrease Emissions or Increase Electric Miles?: The Case of Plug-in Electric Vehicles and Household Travel (20-01898) - A169
Seshadri Srinivasa Raghavan/University of California, Davis, Gil Tal/University of California, Davis

Assessing Battery Electric Vehicle Energy Consumption Performance: The Effects of Driving Style, Road Infrastructure, Weather and Traffic Intensity (20-02036) - A135
Alex Donkers/Technische Universiteit Eindhoven, Dujuan Yang/Technische Universiteit Eindhoven, Miloš Viktorović/Technische Universiteit Eindhoven

Optimizing Workplace Charging Facility Deployment and Smart Charging Strategies (20-02071) - A178
Shengyin Li/Oak Ridge National Laboratory, Fei Xie/Oak Ridge National Laboratory, Yongxi Huang/Oak Ridge National Laboratory, Zhenhong Lin/Oak Ridge National Laboratory, Changzheng Liu/Oak Ridge National Laboratory

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Evaluating National Hydrogen Refueling Infrastructure Requirement and Economic Competitiveness of Fuel Cell Electric Long-Haul Trucks (20-02072) - A177

Nawei Liu/Oak Ridge National Laboratory, Zhenhong Lin/Oak Ridge National Laboratory, Fei Xie/Oak Ridge National Laboratory, Mingzhou Jin/Oak Ridge National Laboratory

Recharging Options to Improve the Economics of Electrified Fleet Ecosystem: A Case Study of Battery Swapping Deployment in the Taxi Industry (20-02083) - A134

I-Yun Lisa Hsieh/Massachusetts Institute of Technology (MIT), Ashley Nunes/Massachusetts Institute of Technology (MIT), Menghsuan Sam Pan/Massachusetts Institute of Technology (MIT), William Green/Massachusetts Institute of Technology (MIT)

The Proclivity of Commercial Transportation Sector to Adopt Alternative Fuel Vehicles in the Future: Application of Machine Learning Methods (20-02109) - A170

Numan Ahmad/Massachusetts Institute of Technology (MIT), Behram Wali/Massachusetts Institute of Technology (MIT), Asad Khattak/Massachusetts Institute of Technology (MIT)

Modeling Electric Vehicle Energy Demand and Regional Electricity Generation Dispatch for New England and New York (20-02149) - A133

Sarah Howerter/University of Vermont, Jonathan Dowds/University of Vermont, Paul Hines/University of Vermont, Lisa Aultman-Hall/University of Vermont

Are Consumers Considering Buying an Electric Vehicle?: A Case Study of Sacramento (20-02210) - A132

Scott Hardman/University of California, Davis, Kenneth Kurani/University of California, Davis

Plug-in Hybrid or Hybrid?: Exploring Reasons Why Some Consumers Do Not Charge Their Plug-in Hybrids (20-02321) - A151

Debapriya Chakraborty/University of California, Davis, Scott Hardman/University of California, Davis, Gil Tal/University of California, Davis

A Framework for Assessing Fleet-wide Transit Bus Energy Consumption with Alternative Fuels (20-02410) - A125

Hanyan Li/Georgia Institute of Technology (Georgia Tech), Haobing Liu/Georgia Institute of Technology (Georgia Tech), Xiaodan Xu/Georgia Institute of Technology (Georgia Tech), Yuanbo Wang/Georgia Institute of Technology (Georgia Tech), Michael Rodgers/Georgia Institute of Technology (Georgia Tech), Randall Guensler/Georgia Institute of Technology (Georgia Tech)

Optimal Ridehailing Fleets Electrify More, Modify Operations, and Reduce Emissions When Air Emissions Costs Are Internalized (20-02477) - A131

Matthew Bruchon/Carnegie Mellon University, Jeremy Michalek/Carnegie Mellon University, Inês Azevedo/Carnegie Mellon University

Environmental Impacts of Various Heavy-Duty Natural Gas Vehicles Incentivized in California (20-02521) - A126

Junhyeong Park/University of California, Irvine, Craig Rindt/University of California, Irvine, Stephen Ritchie/University of California, Irvine

Modeling Battery Electric Vehicle Owners' Decisions on Vehicle Choice for Long-Distance Trips (20-02720) - A120

Yanbo Ge/National Renewable Energy Laboratory (NREL), Don MacKenzie/National Renewable Energy Laboratory (NREL)

Integrated Design of Wireless Charging Facilities of Electric Vehicles in Electricity and Transportation Networks (20-02755) - A141

Xiasen Wang/University of Washington, Xin Wang/University of Washington

Who Drives an Electric Vehicle?: Influential Factors Related to the Adoption of PHEVs and BEVs in California (20-02784) - A142

Hiroyuki Iseki/University of Maryland

Plug-in Hybrid Electric Vehicle Utility Factors: Why Observed Electrification Performance Differs from SAE J2841 Expectations? (20-02891) - A159

Seshadri Srinivasa Raghavan/University of California, Davis, Dahlia Garas/University of California, Davis, Gil Tal/University of California, Davis

Real-World Patterns of Hybrid and Electric Vehicle Driving in the United States (20-02972) - A143

David Keith/Massachusetts Institute of Technology (MIT), Sapna Kumari/Massachusetts Institute of Technology (MIT), Steven Gehrke/Massachusetts Institute of Technology (MIT), Timothy Reardon/Massachusetts Institute of Technology (MIT)

Charging Behavior Modeling of Battery Electric Vehicles on Long-Distance Trips (20-02989) - A121

Yanbo Ge/National Renewable Energy Laboratory (NREL), Don MacKenzie/National Renewable Energy Laboratory (NREL)

Charged Up: The Effect of Charging Infrastructure on the Uptake of Electric Vehicles (20-03087) - A144

Stephan Sommer/RWI, Colin Vance/RWI

Management of EV Fast-Charging Stations: Dynamic Pricing Scheme Based on Station Queues with State-Dependent Arrivals (20-03203) - A145

Dingtong Yang/University of California, Irvine, Navjyoth Sarma/University of California, Irvine, Michael Hyland/University of California, Irvine, R. Jayakrishnan/University of California, Irvine

System of Systems Model for Electrical Vehicle Charging Infrastructure Deployment in Transportation Networks (20-03245) - A146

Chao Lei/University of Illinois, Urbana Champaign, Liqun Lu/University of Illinois, Urbana Champaign, Yanfeng Ouyang/University of Illinois, Urbana Champaign

A Methodology for Calculating eVMT in PHEVs Based on Second-by-Second Logged Data (20-03310) - A156

Christopher Nitta/University of California, Davis, Chaitanya Vaishnavi Karanam/University of California, Davis, Matthew Favetti/University of California, Davis, Gil Tal/University of California, Davis

Factors Influencing Alternative Fuel Adoption Decisions in Heavy-Duty Vehicle Fleets in California (20-03425) - A127

Youngeun Bae/University of California, Irvine, Suman Mitra/University of California, Irvine, Craig Rindt/University of California, Irvine, Stephen Ritchie/University of California, Irvine

Detecting Behavioral Failures in Emerging Electric Vehicle Infrastructure Using Supervised Text Classification Algorithms (20-03461) - A147

Sooji Ha/Georgia Institute of Technology (Georgia Tech), Daniel Marchetto/Georgia Institute of Technology (Georgia Tech), Mary Burke/Georgia Institute of Technology (Georgia Tech), Omar Isaac Asensio/Georgia Institute of Technology (Georgia Tech)

Large-Scale Automated Electric Ridehailing Substantially Improves the Grid-Integration Opportunity of Electric Vehicles (20-03493) - A152

Colin Sheppard/Lawrence Berkeley National Laboratory, Alan Jenn/Lawrence Berkeley National Laboratory, Gordon Bauer/Lawrence Berkeley National Laboratory, Jeffery Greenblatt/Lawrence Berkeley National Laboratory, Brian Gerke/Lawrence Berkeley National Laboratory

Electric Vehicle Routing with Time-Dependent Stochastic Information (20-04061) - A148

Xinran Li/Southeast University, Wei Wang/Southeast University, Haoxuan Kan/Southeast University, Xuedong Hua/Southeast University

What Vehicles Are Electric Vehicles Replacing and Why?: Findings from California's Clean Vehicle Rebate Project (20-04994) - A149

Nick Pallonetti/Center for Sustainable Energy, Brett Williams/Center for Sustainable Energy

An Agent-Based Modeling Framework to Forecast Electric Vehicle Infrastructure Utilization and Planning (20-05737) - A122

Chintan Pathak/University of Washington, Don MacKenzie/University of Washington

Eco-Predictive Control of Electric Vehicles (20-00377) - A172

Hesham Rakha/Virginia Polytechnic Institute and State University, Kyoungho Ahn/Virginia Polytechnic Institute and State University, Sangjun Park/Virginia Polytechnic Institute and State University

Utilization of Dedicated Electric Vehicle Plug-in Charging Stations in a College Campus Environment (20-01465) - A140

Jijo Mathew/Purdue University, Deborah Horton/Purdue University, Darcy Bullock/Purdue University

Electric Vehicle Charger Placement Optimization in Michigan: Considering Monthly Traffic Demand and Battery Performance Variations (20-03328) - A186

Fatemeh Fakhrmoosavi/Michigan State University, Mohammadreza Kavianipour/Michigan State University, MohammadHossein (sam) Shojaei/Michigan State University, Ali Zockaie/Michigan State University, Mehrnaz Ghamami/Michigan State University, Joy Wang/Michigan State University, Robert Jackson/Michigan State University

Hydrogen Refueling Station Consideration in California: How Driving Experience Matters (20-04476) - A136

Aimee Krafft/University of Nevada, Reno, Scott Kelley/University of Nevada, Reno, Michael Kuby/University of Nevada, Reno, Oscar Lopez Jaramillo/University of Nevada, Reno, Rhian Stotts/University of Nevada, Reno

Agent-Based Modeling for Electrified Ridesourcing Services (20-05530) - A179

Zhaomiao Guo/Argonne National Laboratory, Jeffrey Huang/Argonne National Laboratory, Yan Zhou/Argonne National Laboratory, Charles Macal/Argonne National Laboratory

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Select Posters on Basic Research and Emerging Technologies Related to Concrete
John Kevern, University of Missouri, Kansas City, presiding
Sponsored By Standing Committee on Basic Research and Emerging Technologies Related to Concrete

This poster session contains a variety of presentations submitted to AFN 10 Basic Research and Emerging Technologies Related to Concrete.

Self-Healing Acceleration and Interface Optimization of Steel Deck Pavement with MgO and SAP (20-01660) - B400
Shuyin Wu/Southeast University, Jun Yang/Southeast University, Ruochong Yang/Southeast University, Jipeng Zhu/Southeast University

Enhanced Photocatalytic Decomposition of NO on Portland Cement Concrete Pavement Using Nano-TiO2 Suspension (20-02334) - B402
Chen Chen/Auburn University, Boming Tang/Auburn University, Xuejuan Cao/Auburn University, Fan Gu/Auburn University

Shrinkage Behavior of Glass Powder-Metakaolin-Based Geopolymer Under Different Relative Humidity Conditions (20-03040) - B397
Ruizhe Si/Michigan Technological University, Qingli Dai/Michigan Technological University, Jiaqing Wang/Michigan Technological University, Shuaicheng Guo/Michigan Technological University, Yunxiang Ma/Michigan Technological University

A Comparative Study on the Influence of C-S-H Nanoparticle-Based and Traditional Accelerators on the Early-Age Properties of Portland Cementitious Systems (20-04654) - B396
Abdul Basit Peerzada/Clemson University, Prasad Rangaraju/Clemson University

Case Studies on Performance Evaluation of High-Performance Concrete Based on a Combined Approach of Field and Laboratory Evaluation (20-05774) - B403
Anol Mukhopadhyay/Texas A&M Transportation Institute, Pravin Saraswatula/Texas A&M Transportation Institute, Krishneswar Ramineni/Texas A&M Transportation Institute

Effect of Reduced Mixing Time on Fresh, Mechanical, and Microstructural Behavior of Class C Fly Ash Based Alkali Activated Paste, Mortar, and Concrete (20-06112) - B404
Mohamed ElGawady/Missouri University of Science and Technology, Md. Mashfiqul Islam/Missouri University of Science and Technology, Ahmed Gheni/Missouri University of Science and Technology

Influence of Meta-Kaolin on Properties of 3D Printable Cementitious Mixture for Application in Additive Manufacturing (20-04846) - B395
Haripriya Nekkanti/Clemson University, Prasad Rangaraju/Clemson University, Harish Konduru/Clemson University

Use of Rice Husk Ash in Flowable Fill Concrete (20-05466) - B398
Kazi Islam/Arkansas State University, Zahid Hossain/Arkansas State University, Alan Meadors/Arkansas State University

Influence of Plasma-Treated Carbon Nanotubes on the Electric Resistance of Their Cement Mortars (20-02562) - B401
Min Sun/Suzhou University of Science and Technology, Zhendong Li/Suzhou University of Science and Technology, Junan Shen/Suzhou University of Science and Technology, Yangyang Liu/Suzhou University of Science and Technology

Hybrid Alkaline Fly Ash Concretes: Comparing Its Carbon Footprint with Portland Cement Concrete Through Deterministic Estimations and Stochastic Simulations (20-02095) - B399
Marcelo Gonzalez/Pontificia Universidad Catolica de Chile, Alejandro Rios/Pontificia Universidad Catolica de Chile, Leonardo Brescia-Norambuena/Pontificia Universidad Catolica de Chile, Carlos Montes/Pontificia Universidad Catolica de Chile, Gabriel Azua/Pontificia Universidad Catolica de Chile, Juan Arellano/Pontificia Universidad Catolica de Chile

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Properties of Porous Concrete, Engineered Cementitious Composites, and Piezoelectric Sensing Techniques
Norbert Delatte, Oklahoma State University, presiding
Sponsored By Standing Committee on Properties of Concrete

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Evaluation of the Effects of Engineered Cementitious Composites Plasticity on Rigid Pavement Performance (20-00972) - B411

Hassan Noorvand/Louisiana State University, Gabriel Arce/Louisiana State University, Marwa Hassan/Louisiana State University

Field Implementation of Using Piezoelectric Sensor-Based Sensing Technique for In Situ Concrete Compressive Strength Evaluation (20-00688) - B412

YEN-FANG Su/Purdue University, Guangshuai Han/Purdue University, Tommy Nantung/Purdue University, Na Lu/Purdue University

Mechanical Performance of Porous Concrete Including Slag Aggregate Through Laboratory Evaluation and Numerical Simulation (20-01117) - B410

Guotong Wang/Southeast University, Qiao Dong/Southeast University, Jiawei Yuan/Southeast University, Junfeng Ren/Southeast University, Tianjie Zhang/Southeast University

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

What's New with Alkali-Silica Reactivity, Early-Age Shrinkage, and Cracking Mechanism

Robert Spragg, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Durability of Concrete

This poster session will highlight presentations on new alkali-silica reactivity (ASR) tests and discussion of existing ASR tests, as well as early-age cracking and other cracking mechanisms.

Laboratory Assessment of a Self-Healing System for Mitigating Early-Age Shrinkage of Cementitious Composites (20-03487) - B391

Jialuo He/Washington State University, Xianming Shi/Washington State University

Spalling in Continuously Reinforced Concrete Pavement in Texas (20-05330) - B393

PANGIL CHOI/Texas Department of Transportation, Lochana Poudyal/Texas Department of Transportation, Fouzieh Rouzmehr/Texas Department of Transportation, Moon Won/Texas Department of Transportation

Reliability of Miniature Concrete Prism Test in Assessing Alkali-Silica Reactivity of Aggregates Compared to Concrete Prism Test and Accelerated Mortar Bar Test (20-05759) - B394

Harish Konduru/Clemson University, Prasad Rangaraju/Clemson University, Omar Amer/Clemson University

Durable High Early Strength Concrete via Internal Curing Approach Using Saturated Lightweight and Recycled Concrete Aggregates (20-04640) - B390

Faisal Qadri/Kansas State University, Christopher Jones/Kansas State University, Coltin Wichtner/Kansas State University

Alkali-Silica Reaction: Divergence Between Performance in the Field and Laboratory Test Results (20-01495) - B392

Jussara Tanesi/SES Group & Associates, LLC, Thanos Drimalas/SES Group & Associates, LLC, Krishna Chopperla/SES Group & Associates, LLC, Mengesha Beyene/SES Group & Associates, LLC, Jason Ideker/SES Group & Associates, LLC, Haejin Kim/SES Group & Associates, LLC, Luca Montanari/SES Group & Associates, LLC, Ahmad Ardani/SES Group & Associates, LLC

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Concrete Materials Advances

Paul Tennis, Portland Cement Association, presiding
Sponsored By Standing Committee on Concrete Materials and Placement Techniques

Grey Target Optimization and Mechanism of Superabsorbent Polymers and Basalt Fibers Modified Concrete (20-01062) - B406

Zhenghua Lyu/Chang'an University, Aiqin Shen/Chang'an University, Weina Meng/Chang'an University, Yinchuan Guo/Chang'an University, Shixiu Mo/Chang'an University

Correlating Laboratory and Field Compaction Levels to Achieve Optimum In Situ Mechanical Properties for Pervious Concrete Pavements (20-00316) - B408

Othman AlShareedah/Washington State University, Md Mostofa Haider/Washington State University, Somayeh Nassiri/Washington State University

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Influence of Various SCMs on Fresh Electrical Resistivity and Computation of Setting Time (20-00115) - B407

Pratanu Ghosh/California State University, Fullerton, Rajthilak Ganesan/California State University, Fullerton

Materials Characterization on Extended Life Concrete Bridge Decks Utilizing Internal Curing to Reduce Cracking (20-01853) - B405

Xuhao Wang/Chang'an University, Peter Taylor/Chang'an University, Cheng Li/Chang'an University, Zexin Liu/Chang'an University

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Effect of Weather on Driver Behavior

Mario Cools, University of Liège, presiding
Sponsored By Standing Committee on Surface Transportation Weather

Driver Speed Behavior and Short-Term Speed Prediction Using Naturalistic Driving Data in Rainy Weather Conditions (20-03272) - B414

Ali Ghasemzadeh/University of Wyoming, Mohamed Ahmed/University of Wyoming

Flooding-Related Traffic Crashes: Findings from Association Rules (20-04708) - B415

Subasish Das/Texas A&M Transportation Institute, Xiaoduan Sun/Texas A&M Transportation Institute, Sarvesh Goel/Texas A&M Transportation Institute, Ming Sun/Texas A&M Transportation Institute, M. Ashifur Rahman/Texas A&M Transportation Institute, Isha Narsaria/Texas A&M Transportation Institute

Real-Time Snowy Weather Detection Based on Machine Vision and Vehicle Kinematics: A Non-Parametric Data Fusion Analysis Protocol (20-04776) - B416

Elhashemi Ali/Federal Highway Administration (FHWA), Md Nasim Khan/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)

Assessing the Effect of Rainfall and Visibility Conditions on Road Traffic Travel-Time Reliability (20-05230) - B413

Sonu Mathew/University of North Carolina, Charlotte, Srinivas Pulugurtha/University of North Carolina, Charlotte

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Recent Applications of Connected and Automated Vehicles

Sponsored By Standing Committee on Intelligent Transportation Systems

Conflict Zone Detection for Autonomous Construction Vehicles (20-00160) - B301

Jiali Fu/Linköping University, Jan Åslund/Linköping University, Markus Rombach/Linköping University, Ted Samuelsson/Linköping University, Erik Uhlin/Linköping University

Operational Evaluation of Effectiveness of Connected Vehicle Smartphone Technology on a Signalized Corridor: Field Test (20-03304) - B300

Festo Mjogolo/University of North Florida, Thobias Sando/University of North Florida

Dynamic Queue Prediction at Signalized Intersections with Fusing Sensory Information and Connected Vehicles (20-03254) - B302

Fei Ye/University of California, Riverside, Peng Hao/University of California, Riverside, Guoyuan Wu/University of California, Riverside, Kanok Boriboonsomsin/University of California, Riverside, Zhiming Gao/University of California, Riverside, Tim LaClair/University of California, Riverside, Matthew Barth/University of California, Riverside

Evasion Planning for Autonomous Intersections Based on Optimized Conflict Point Control Formulation (20-02868) - B303

Di Kang/University of Minnesota, Twin Cities, Zhexian Li/University of Minnesota, Twin Cities, Michael Levin/University of Minnesota, Twin Cities

A Lagrangian-Based Signal Timing and Trajectory Optimization in a Mix of Self-Driving and Human-Driven Vehicles (20-02742) - B304

Mehrdad Tajalli/North Carolina State University, Ali Hajbabaie/North Carolina State University

Cooperative Ramp Merging with Vehicle-to-Cloud Communications: A Field Experiment (20-02696) - B305

Xishun Liao/University of California, Riverside, David Oswald/University of California, Riverside, Ziran Wang/University of California, Riverside, Guoyuan Wu/University of California, Riverside, Kanok Boriboonsomsin/University of California, Riverside, Matthew Barth/University of California, Riverside, Kyuntae Han/University of California, Riverside, BaekGyu Kim/University of California, Riverside, Prashant Tiwari/University of California, Riverside

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Cooperative Jam Absorption Driving Strategy on Multi-Lane Highways to Mitigate Oscillations (20-02804) - B306

Meng Li/Southeast University, Zhibin Li/Southeast University, Ling Zhao/Southeast University, Yang Zhou/Southeast University

Integration of Limited Connected Vehicles and Aggregated Floating Car Data in Existing Traffic Actuated Signal Control Based on Extended Kalman Filter (20-03908) - B314

Baris Cogan/Technische Universitat Munchen, Eftychios Papapanagiotou/Technische Universitat Munchen, Tobias Schendzielorz/Technische Universitat Munchen, Busch Fritz/Technische Universitat Munchen, Sasan Amini/Technische Universitat Munchen

Safely and Effectively Communicating Non-Connected Vehicle Information to Connected Vehicles (20-05665) - B307

Hiba Nassereddine/University of Wisconsin, Madison, Kelvin Santiago-Chapparro/University of Wisconsin, Madison, Jon Riehl/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison

Constructing Spatio-Temporal Driving Volatility Profiles for Connected and Automated Vehicles in Existing Highway Networks (20-02594) - B308

Xing Fu/University of Alabama, Qifan Nie/University of Alabama, Jun Liu/University of Alabama, Asad Khattak/University of Alabama, Alex Hainen/University of Alabama, Shashi Nambisan/University of Alabama

Reading Vehicular Messages from Smart Road Signs: A Novel Method to Support Vehicle-to-Infrastructure in Rural Settings (20-05651) - B309

Burak Sen/University of Central Florida, Enes Karaaslan/University of Central Florida, Haluk Laman/University of Central Florida, Tolga Ercan/University of Central Florida, James Pol/University of Central Florida

Trajectory Optimization of Connected and Automated Vehicles at Roundabouts (20-03454) - B310

Rasool Mohebifard/North Carolina State University, Ali Hajbabaie/North Carolina State University

Consumer Preferences for Automation, Electrification, and Carsharing (20-02345) - B312

Asad Khattak/University of Tennessee, Numan Ahmad/University of Tennessee, Behram Wali/University of Tennessee

Automated Vehicles Merging at Highway On-Ramps Enhanced by Connectivity with Infrastructure: Safety, Mobility, and Fuel Consumption Impacts (20-02104) - B313

Jackeline Rios-Torres/Oak Ridge National Laboratory, Jihun Han/Oak Ridge National Laboratory, Ramin Arvin/Oak Ridge National Laboratory, Asad Khattak/Oak Ridge National Laboratory

Using RTCM Corrections in a Consumer-Grade, Lane-Level Positioning System for Connected Vehicles (20-03095) - B315

Nigel Williams/University of California, Riverside, Alexander Vu/University of California, Riverside, Guoyuan Wu/University of California, Riverside, Matthew Barth/University of California, Riverside, Kun Zhou/University of California, Riverside

Trajectory Planning for Connected and Automated Vehicles at Isolated Signalized Intersections Under Mixed Traffic Environment (20-01923) - B316

Chengyuan Ma/Tongji University, Chunhui Yu/Tongji University, Hailun Liang/Tongji University, Xiaoguang Yang/Tongji University

Connected and Automated Vehicle–Enabled Lane Control Application in a Mixed Traffic Environment: Impact on Operations and Safety (20-01900) - B317

Zulqarnain H. Khattak/Oak Ridge National Laboratory, Brian L. Smith/Oak Ridge National Laboratory, Michael D. Fontaine/Oak Ridge National Laboratory, Jiaqi Ma/Oak Ridge National Laboratory, Asad Khattak/Oak Ridge National Laboratory

Chang-Hu's Optimal Motion Planning Framework for Cooperative Automation: Mathematical Formulation, Solution, and Applications (20-01883) - B318

Yu Zhang/Tongji University, Yu Bai/Tongji University, Jia Hu/Tongji University, Meng Wang/Tongji University

Vehicle Trajectory Reconstruction Under Partially Connected Vehicle Environment (20-03824) - B319

Ruochen Hao/Tongji University, Chunhui Yu/Tongji University, Wanjing Ma/Tongji University, Ling Wang/Tongji University, Xiaodong Zhu/Tongji University

Trajectory Planning for Connected and Automated Vehicles: Cruising and Platooning in Mixed Traffic (20-03920) - B320

Xiangguo Liu/University of Michigan, Ann Arbor, Guangchen Zhao/University of Michigan, Ann Arbor, Neda Masoud/University of Michigan, Ann Arbor, Qi Zhu/University of Michigan, Ann Arbor

Platoon-Based Collaborative Intersection Control for Connected Automated Vehicles (20-00520) - B323

Jian Gong/Southeast University, Jianhua Guo/Southeast University, Jinde Cao/Southeast University, Yun Wei/Southeast University, Wei Huang/Southeast University

Traffic Safety Impacts of Dedicated Lanes for Connected Vehicle Platooning on Expressways (20-01094) - B322

Md Sharikur Rahman/HDR, Mohamed Abdel-Aty/HDR

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Score-Based Traffic Network Management in Connected Vehicle Environment: A Modeling Framework and Simulation Experiments (20-03263) - B321

Moahd Alghuson/Southern Methodist University, Khaled Abdelghany/Southern Methodist University, Ahmed Hassan/Southern Methodist University

Assessing the Impact of Connected Vehicle Technology on Rural Work Zone Safety During Fog Weather Conditions: A Microsimulation Modeling Approach (20-05482) - B311

Eric Adomah/Federal Highway Administration (FHWA), Guangchuan Yang/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Traffic Signal Control with Connected Automated Vehicle or Trajectory Data
Sponsored By Standing Committee on Traffic Signal Systems

Traffic Signal Control Optimization in a Connected Vehicle Environment Considering Pedestrians (20-00295) - B 332

Xiao (Joyce) Liang/Pennsylvania State University, S. Ilgin Guler/Pennsylvania State University, Vikash Gayah/Pennsylvania State University

Cycle-Based Traffic Volume Estimation Using Sampled Vehicle Trajectory Data: Singular Value Thresholding Method (20-01223) - B335

Keshuang Tang/Tongji University, Jiarong Yao/Tongji University, Chaopeng Tan/Tongji University, Jian Sun/Tongji University

A Method for Distributed Control of Intersection Networks Leveraging I2I Communications and Inter-Signal Negotiations (20-01231) - B327

Russell Graves/University of Tennessee, Knoxville, H M Abdul Aziz/University of Tennessee, Knoxville, Subhadeep Chakraborty/University of Tennessee, Knoxville

Integrated Traffic Signal and Vehicle Trajectory Control in a Mixed Traffic Condition (20-01378) - B328

Zhen Yang/University of Michigan, Transportation Research Institute, Yiheng Feng/University of Michigan, Transportation Research Institute, Henry Liu/University of Michigan, Transportation Research Institute

Adaptive Person-Based Signal Control System in Isolated Connected Vehicle Junction (20-01720) - B326

Zongyuan Wu/University of Southampton Faculty of Engineering and Physical Sciences, Ben Waterson/University of Southampton Faculty of Engineering and Physical Sciences, Bani Anvari/University of Southampton Faculty of Engineering and Physical Sciences

Cut Through Traffic to Catch Green Light: Eco Approach with Overtake Capability (20-01748) - B334

Zihan Zhang/Tongji University, Jia Hu/Tongji University, Xin Li/Tongji University, Haibo Kuang/Tongji University, Xu Zhao/Tongji University, Peng Jia/Tongji University

Cyber Vulnerability Analysis for Connected Vehicle Based Traffic Signal Control Systems (20-02213) - B338

Shihong Huang/University of Michigan, Ann Arbor, Wai Wong/University of Michigan, Ann Arbor, Qi Chen/University of Michigan, Ann Arbor, Morley Mao/University of Michigan, Ann Arbor, Henry Liu/University of Michigan, Ann Arbor, Yiheng Feng/University of Michigan, Ann Arbor

Optimizing Arterial Coordination Using Trajectory Data (20-02837) - B336

Minjun Liu/Didi Chuxing LLC, Jianfeng Zheng/Didi Chuxing LLC

Efficient Network-wide Signal Coordination with Multiple Cycle Lengths and Trajectory Data (20-03137) - B329

Roger Lloret-Batlle/DiDi Chuxing, Zihao Wang/DiDi Chuxing, Minjun Liu/DiDi Chuxing, Jianfeng Zheng/DiDi Chuxing, Henry Liu/DiDi Chuxing

A New Signal Phase for Vehicle Group–Based Trajectory and Signal-Timing Optimization in Mixed Connected and Automated Vehicle Environments (20-03419) - B325

Ramin Niroumand/North Carolina State University, Mehrdad Tajalli/North Carolina State University, Leila Hajibabai/North Carolina State University, Ali Hajbabaie/North Carolina State University

Signal Control Priority Operations in Connected Vehicle Environment (20-03800) - B333

Milan Zlatkovic/University of Wyoming, Zorica Cvijovic/University of Wyoming, Aleksandar Stevanovic/University of Wyoming, Yu Song/University of Wyoming

Queue-Based Headway Distribution Models at Signal Controlled Intersection Under Mixed Traffic (20-04316) - B 337

Satyajit Mondal/Indian Institute of Technology (BHU) Varanasi, Ankit Gupta/Indian Institute of Technology (BHU) Varanasi

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Replicating Advanced Detection Using Low Ping Frequency Probe Vehicle Trajectory Data to Optimize Signal Progression (20-04500) - B339

Jonathan Waddell/Wayne State University, Stephen Remias/Wayne State University, Jenna Kirsch/Wayne State University, Mohsen Kamyab/Wayne State University

Estimating Signal Timing of Actuated Signal Control Using Pattern Recognition Under Connected Vehicle Environment (20-04827) - B330

Ruochen Hao/Tongji University, Wanjing Ma/Tongji University, Ling Wang/Tongji University, Chunhui Yu/Tongji University, Xiaolong Ma/Tongji University

Dynamic Multi-Path Signal Progression Control Based on Connected Vehicle Technology (20-05011) - B331

Qinzheng Wang/University of Utah, Xianfeng Yang/University of Utah, Jia Hu/University of Utah, Yongjie Lin/University of Utah

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Case Studies in Performance-Based Analysis of Geometric Design
Geoffrey Millen, WSP Canada, presiding
Sponsored By Standing Committee on Operational Effects of Geometrics

Supporting North Dakota's Vision Zero Plan with a Data-Driven Programmatic Assessment Tool (P20-21209) - B 340

Tariq Shihadah/Jacobs

Establishing Safety-Based, Real-Time Speed Limits (P20-21210) - B341

Jake Kononov/DiExSys, LLC, Rich Sarchet/DiExSys, LLC

I-71 Widening Between Gemini Parkway and I-270 (P20-21211) - B342

Kendra Schenk/Burgess and Niple, Inc., Brian Toombs/Burgess and Niple, Inc.

Hard Shoulder Running Along I-670 (P20-21212) - B343

Kendra Schenk/Burgess and Niple, Inc., Brian Toombs/Burgess and Niple, Inc.

Google Street View Roadway Geometric Inventory: A Case Study for Advancing Performance-Based Design (P20-21213) - B344

Subasish Das/Texas A&M Transportation Institute, M. Ashifur Rahman/University of Louisiana, Lafayette

Quantitative Road Safety Assessment of Complex Interchange Alternatives (P20-21214) - B345

Damir Bjelica/WSP Canada, Geoffrey Millen/WSP Canada

I-265 and I-64 Interchange Reconstruction: Value Added and Shortcomings: IHSDM Analysis (P20-21215) - B346

Sai Sravya Polavarapu/Parsons, Tyler Bosshardt/Parsons

Performance-Based Practical Design on a Systemic Level (P20-21216) - B350

Lee Gibbs/SRF Consulting Group

Safety and Operational Alternative Analysis for SR 42 Widening in Georgia (P20-21217) - B351

Scott Himes/VHB, David Pickworth/VHB

US-31 at I-94 Connection Alternative Analysis (P20-21218) - B352

Ellen Nightingale/HNTB Corporation

Project Prioritization Through HSM Application (P20-21219) - B353

Timothy Abel/Pennoni Associates, Inc.

Highway Improvement Alternatives Evaluation Using HSM and Texas Safety Performance Functions (P20-21220) - B354

Dante Perez-Bravo/Atkins, Joseph Shalkowski/Atkins, Abraham Yarney/Atkins

Demonstrating the Use of Performance-Based Analysis to Leverage Planning Resources (P20-21221) - B355

Ida Van Schalkwyk/Washington State Department of Transportation

Impact of Contiguous Elements on Road Safety Under Heterogeneous Traffic Flow (P20-21222) - B356

Praveen Vayalamkuzhi/University of California, Berkeley, Aditya Medury/University of California, Berkeley, Offer Grembek/University of California, Berkeley, Veeraragavan Amirthalingam/Indian Institute of Technology, Madras

US 41: Safety Driven Project Scoping (P20-21223) - B347

Sai Sravya Polavarapu/Parsons, Tyler Bosshardt/Parsons

Investigating the Relationship Between Safety and Reliability Outcomes with Multi-Variate Models and LiDAR Data: A Case Study of Horizontal Curves with Insufficient Sight Distance (P20-21224) - B348

Amr Shalkamy/University of Alberta, Karim El-Basyouny/University of Alberta

Interchange Safety Comparisons Using the Interactive Highway Safety Design Module Case Study: US 30 Reconstruction Program for PennDOT District 6-0 in Chester County, Pennsylvania (P20-21225) - B349

Nicole Kline-Elsier/McMahon Associates, Inc., Steven Fellin/Pennsylvania Department of Transportation

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A Systematic Approach for Segmentation in Highway Safety Management: Issues and Challenges (P20-21226) - B357

Praveen Vayalamkuzhi/University of California, Berkeley, Aditya Medury/University of California, Berkeley, Offer Grembek/University of California, Berkeley, Venky Shankar/Texas Tech University

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Practical Advancements in Winter Maintenance
Tae J. Kwon, University of Alberta, presiding
Sponsored By Standing Committee on Winter Maintenance

Optimizing Snowplow Routes Using All-New Perspectives: Road Users and Winter Road Maintenance Operators (20-02494) - B417
Shuoyan Xu/University of Alberta, Tae J. Kwon/University of Alberta
A Smart Salting System That Incorporates Road Managers' Judgments into an Automated Process Toward Safe, Efficient Winter Road Maintenance and Management (20-03354) - B418
Tomonori Ohiro/Nexco-Engineering Hokkaido Co.,Ltd., Toru Hagiwara/Nexco-Engineering Hokkaido Co.,Ltd., Kiyoshi Takakura/Nexco-Engineering Hokkaido Co.,Ltd., Hiromi Nakamura/Nexco-Engineering Hokkaido Co.,Ltd., Yasushi Hanatsuka/Nexco-Engineering Hokkaido Co.,Ltd.
Bride Deck De-Icing with Geothermal Energy Pile: An Innovative Strategy to Expand Feasibilities for Different U .S. Regions (20-05097) - B419
Chanjuan Han/Case Western Reserve University, Xiong Yu/Case Western Reserve University
Optimizing Maintenance Facility Locations in Minnesota (20-04340) - B423
William Holik/Texas A&M Transportation Institute, Paul Anderson/Texas A&M Transportation Institute
Standards-Based Testing and Performance Evaluation of Highway Salt and Sand Spreader Systems (20-04525) - B424
Wilderich White/University of California, Davis, Ty Lasky/University of California, Davis
Comparing the Safety and Mobility Benefits of Alternative Winter Road Maintenance Standards (20-03865) - B42 5
Yizhou Cai/University of Waterloo, Chris Bachmann/University of Waterloo, Liping Fu/University of Waterloo, Taimur Usman/University of Waterloo
A Case Study of Snowdrift Trapping Efficiency of a Living Snow Fence Determined from a Transverse Measurement of Snow Depth Profiles (20-03278) - B426
Toshimitsu Sakurai/Civil Engineering Research Institute for Cold Region, Wataru Takahashi/Civil Engineering Research Institute for Cold Region, Manabu Kaneko/Civil Engineering Research Institute for Cold Region, Hirotaka Takechi/Civil Engineering Research Institute for Cold Region, Joji Takahashi/Civil Engineering Research Institute for Cold Region, Yasuhiko Ito/Civil Engineering Research Institute for Cold Region, Masaru Matsuzawa/Civil Engineering Research Institute for Cold Region
De-Icing Application of Snow and Ice Control Chemicals: Side-by-Side Field Comparison (20-04988) - B427
William Lawson/Texas Tech University, Ken Rainwater/Texas Tech University, James Surles/Texas Tech University, W. Jackson/Texas Tech University
Investigation on De-Icing Property of Steel Wool Fiber Reinforced Asphalt Mixture by Induction Heating (20-031 04) - B428
Rui Xiong/Chang'an University, Kehong Li/Chang'an University, Fang Yang/Chang'an University
Dashboards for Real-Time Monitoring of Winter Operations Activities and After-Action Assessment (20-04235) - B429
Jairaj Desai/Purdue University, Jijo Mathew/Purdue University, Woosung Kim/Purdue University, Mingmin Liu/Purdue University, Howell Li/Purdue University, Jeffrey Brooks/Purdue University, Darcy Bullock/Purdue University

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Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Current Research in Railroad Track Structure System Design
J. Riley Edwards, University of Illinois, Urbana Champaign, presiding
Sponsored By Standing Committee on Railroad Track Structure System Design

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Effects of Mixed Traffic Patterns and Ballast Support Conditions on Track Performance Investigated Through Discrete Element Modeling (20-04621) - A226

Bin Feng/University of Illinois, Urbana Champaign, Zhongyi Liu/University of Illinois, Urbana Champaign, Erol Tutumluer /University of Illinois, Urbana Champaign

Experimental Investigation of the Modal Response of a Rail Span During and After Wheel Passage (20-04589) - A223

Korkut Kaynardag/University of Texas, Austin, Giuseppe Battaglia/University of Texas, Austin, Chi Yang/University of Texas, Austin, Salvatore Salamone/University of Texas, Austin

Analysis of the Effects of Bogie Axle Spacing on Effective Track Stiffness and Dynamic Impact Forces Due to Track Roughness (20-04451) - A224

Erdem BALCI/Istanbul University, Cerrahpaşa, Niyazi Özgür Bezgin/Istanbul University, Cerrahpaşa, Mohamed Wehbi/Istanbul University, Cerrahpaşa

Monitoring and Modeling of Railway Structures of the High-Speed Line BPL with Asphalt Concrete Underlayment (20-03165) - A222

Diana Khairallah/IFSTTAR Site de Nantes, Olivier Chupin/IFSTTAR Site de Nantes, Juliette Blanc/IFSTTAR Site de Nantes, Pierre Hornych/IFSTTAR Site de Nantes, Jean Michel Piau/IFSTTAR Site de Nantes, Diego Ramirez Cardona/IFSTTAR Site de Nantes, Alain Ducreau/IFSTTAR Site de Nantes, Frederic Savin/IFSTTAR Site de Nantes

Applications and Comparisons of the Estimates of Bezgin-Kolukırık Equations for Dynamic Impact Forces Due to Wheel Flats with Estimates of Numerical Analyses and Instrumented Track Measurements (20-02591) - A225

Niyazi Özgür Bezgin/Istanbul University, Cerrahpaşa

Numerical Study of the Effect of Indentation Patterns in Prestressed Concrete Prisms Using High-Performance Computing (20-00561) - A227

Cy Riding/Western New England University, Moochul Shin/Western New England University, JaeHyuk Kwack/Western New England University, ChangHoon Lee/Western New England University

Designs, Application, and Performances of Asphalt/Bituminous Trackbeds in European, Asian, and African Countries (20-00294) - A221

Diego Ramirez Cardona/Eiffage, Hervé Di Benedetto/Eiffage, Cedric Sauzeat/Eiffage, Nicolas Calon/Eiffage, Jerry Rose/Eiffage

Research on Construction Risk Early Warning of High-Speed Railway in Hard and Dangerous Mountainous Areas Based on Extension Theory (20-00055) - A228

Junxiang XU/Southwest Jiaotong University, Jin ZHANG/Southwest Jiaotong University

Mechanical Characteristics and Failure Mode of Asphalt Concrete for Railway Substructure Based on In Situ Tests (20-03282) - A220

Qinghong FU/Southeast University, Xianhua CHEN/Southeast University, Degou CAI/Southeast University, Liangwei LOU/Southeast University, Tao DONG/Southeast University

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1500

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Current Research in Rail Transit Infrastructure
Chun-Hsing Ho, Northern Arizona University, presiding
Sponsored By Standing Committee on Rail Transit Infrastructure

Quantification of Rail Transit Investments with Appropriate Measures and Metrics (20-03835) - A216
Ravi Mazin/California State University, Long Beach, Shailesh Chandra/California State University, Long Beach
What Causes the Excessive Metro Tunnel Settlement?: A Case Study (20-04004) - A217
Zhiyao Tian/Tongji University, Quanmei Gong/Tongji University, Honggui Di/Tongji University
A Train Scheduling Method to Reduce Substation Energy Consumption and Peak Power of Metro Transit System (20-02577) - A218
Bo Jin/Southwest Jiaotong University, Xiaoyun Feng/Southwest Jiaotong University, Qingyuan Wang/Southwest Jiaotong University, Pengfei Sun/Southwest Jiaotong University, Qian Fang/Southwest Jiaotong University
The Effect of Rail Pad Stiffness on Vehicle-Track Dynamical Interaction Excited by Rail Corrugation in Metro (20-00499) - A219
Xiaolin Song/Southwest Jiaotong University, Yu Qian/Southwest Jiaotong University, Kaiyun Wang/Southwest Jiaotong University, Pengfei Liu/Southwest Jiaotong University

Improving Track Performance, Inspection, and the Effectiveness of Programmed Maintenance
Theodore Sussmann, OST-R/Volpe Center, presiding
Sponsored By Standing Committee on Railway Maintenance

A Coupled Discrete/Continuous Method to Evaluate Track Transition Zone Stiffness Under Different Countermeasures (20-00324) - A200
Can Shi/Southwest Jiaotong University, Chunfa Zhao/Southwest Jiaotong University, Yunlong Guo/Southwest Jiaotong University, Lei Xu/Southwest Jiaotong University, Xu Zhang/Southwest Jiaotong University

Evaluation of Mechanical Properties and Life-Cycle Cost of Cement Asphalt Mortat for Fouled Ballast Stabilization (20-00432) - A210
Dae-Wook Park/Kunsan National University, Tri Le/Kunsan National University, Jung-Woo Seo/Kunsan National University, Tam Phan/Kunsan National University

Mechanical Property Deterioration of the Prefabricated Concrete Slab in Mixed Passenger and Freight Railway Tracks (20-00602) - A212
Juanjuan Ren/Southwest Jiaotong University, Shijie Deng/Southwest Jiaotong University, Haolan Li/Southwest Jiaotong University, Ji Wang/Southwest Jiaotong University

The Impact of Cumulative Tonnes on Track Failures: An Empirical Approach (20-01048) - A209
Kristofer Odolinski/Statens Vag och Transportforkningsinstitut

A Comparative Study of Shear Behavior of Railway Ballast Based on Large-Scale Direct Shear, Direct Simple Shear, and Triaxial Tests (20-01535) - A207
Mohammad Mahdavi Kharanaghi/Texas A&M University, College Station, Jean-Louis Briaud/Texas A&M University, College Station

Investigation on Mud Pumping in Ballastless High-Speed Railway and Its Remediation with Chemical Grouting (20-01549) - A213
Zhangbo WAN/Zhejiang University, Shuhao LI/Zhejiang University, Xuecheng Bian/Zhejiang University

Assessing the Potential for Asphalt/Ballast Trackbed Systems to Improve Performance (P20-20976) - A211
Louis Le Pen/University of Southampton, David Milne/University of Southampton, Geoff Watson/University of Southampton, Taufan Abadi/University of Southampton, Edgar Ferro/University of Southampton

Nuclear Magnetic Resonance: Trackbed Moisture Mapping System (P20-21005) - A208
David Walsh/Vista Clara, Asger Eriksen, Hugh B. Thompson, II/Federal Railroad Administration (FRA), Theodore Sussmann/OST-R/Volpe Center

Signal Feature Extraction and Combination to Enhance the Detection and Localization of Railroad Track Irregularities (20-01973) - A201
Bhavana Bhardwaj/North Dakota State University, Raj Bridgelall/North Dakota State University, Pan Lu/North Dakota State University, Mr. Neeraj Dhingra/North Dakota State University

Approximate Bayesian Computation for Railway Track Geometry Modeling (20-02248) - A202
Grace Ashley/University of Delaware, Nii Attoh-Okine/University of Delaware

A Data-Driven Service Failure Prediction Approach for Heavy Haul Rail Lines (20-02350) - A203
Faeze Ghofrani/University at Buffalo, Hongyue Sun/University at Buffalo, Qing He/University at Buffalo

Study of an Innovative Method for Track Geometry Inspection Using a Mobile Inspection System (20-02979) - A 204
Haoyu Wang/Fugro, Jos Berkers/Fugro, Nick van den Hurk/Fugro

Research on the Dynamic Influence of the Fastener Stiffness of the Non-Ballasted Track (20-03170) - A214
Dan Liu/Chang'an University, Trong-vuong Truong/Chang'an University, Chengguang Su/Chang'an University

Track Geometry Analysis and Preliminary Design Verification of the Extreme Long-Span Railway Bridge Based on the Virtual Track Inspection Method (20-03339) - A206
Tianci Gao/University at Buffalo, Ping Wang/University at Buffalo, Cuiping Yang/University at Buffalo, Jianhui Wang/University at Buffalo, Kanghua Yang/University at Buffalo, Qing He/University at Buffalo

Enhancing Railway Maintenance Safety Using Open-Source Computer Vision (20-04350) - A215
Donghee Shin/Korea National University of Transportation, Jangwon Jin/Korea National University of Transportation, Jooyoung Kim/Korea National University of Transportation

A Multi-Domain Assessment Approach for Track Maintenance and Renewal (P20-21702) - A229
Amine Dhemaied/SNCF

Research in Maritime Transportation
Cassia Galvao, Texas A&M University, Galveston, presiding
Sponsored By Standing Committee on Ports and Channels

This poster session will showcase research in maritime transportation

Balancing Risk with Optimal Capacity Utilization via Supply Chain Discounts in Ro-Ro Shipping (20-02100) - A241
Thalis Zis/Technical University of Denmark
Fraud Detection of Bulk Cargo Theft in Seaport Using Bayesian Network (20-04693) - A242
Rongjia Song/Beijing Jiaotong University, Lei Huang/Beijing Jiaotong University, Weiping Cui/Beijing Jiaotong University, María Óskarsdóttir/Beijing Jiaotong University, Jan Vanthienen/Beijing Jiaotong University

Accelerating the Velocity of Marine Transportation and Port Technologies: Moving Freight Faster and More Transparently, Reliably, and Safely
Matthew Chambers, OST-R/Bureau of Transportation Statistics, presiding
Sponsored By Standing Committee on Ports and Channels, Marine Group, Subcommittee on Port Digitalization, Subcommittee on Port Performance

This poster session is designed to highlight technologies in intermodal and maritime transportation, as well as port and terminal operations. Our objective is to share and discuss research findings as well as case studies that identify best practices, innovative techniques, state of the art, practices to improve port operations, automation, efficiency, emissions control, navigation, planning, productivity, reliability, safety and security, and transparency.

Smart Ports in Industry 4.0: Toward Future Marine and Port Technologies Opportunities and Challenges (P20-20612) - A230
Mahdi Safa/Sam Houston State University
Connecting the Dots Between Marketing and Port Development Characteristics: A Multi-Case Content Analysis of Major U.S. Ports (P20-20614) - A231
Dora de Melo/Texas A&M University
Enhancing Accessibility and Usability of Automatic Identification System Data (P20-20616) - A232
Supriti Ghosh/Maritime Administration (MARAD)
A Data-Driven Strategy for Identifying Dock Characteristics at U.S. Ports (P20-20617) - A233
Katie Lientz/U.S. Department of Transportation
An Evaluation of Variables, Data Sets, and Risk Indexing Methodologies for Properly Evaluating Risk on Waterways in the United States (P20-20618) - A234
Jonathan Hsieh/U.S. Coast Guard (USCG)
Research on Wuhan Port–City Relationship and Traffic Planning Issues (P20-20619) - A235
Houzhong Chen/Wuhan University of Technology
Connect2SmallPorts: A European Union Project on Digitalizing Small Ports of the South Baltic Region (P20-20620) - A236
Mahwish Anwar/Blekinge Institute of Technology
Methodologies for Improving the Efficiency and Effectiveness of Inland Waterways (P20-20622) - A237
Bilge Atasoy/Delft University of Technology
Container Terminal and Liner Shipping Companies Cooperation and Competition by Means of Capacity Utilization (P20-20624) - A238
Karlis Pujats/University of Memphis
Automatic Identification System Analysis Package: Expanding Navigation Mission Readiness for the U.S. Army Corps of Engineers (P20-20625) - A239
Katherine Chambers/U.S. Army Corps of Engineers (USACE)
Port Futures in the Physical Internet (P20-20626) - A240
Patrick Fahim/Delft University of Technology

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Research in Marine Environment
Thalis Zis, Technical University of Denmark, presiding
Sponsored By Standing Committee on Marine Environment

**Analysis on the Competition Strategy Between a Pair of Seaports Under Carbon Emission Constraints (20-0236
0) - A243**
Qinglan Huang/Southwest Jiaotong University, Mi Gan/Southwest Jiaotong University, Ronghui Xie/Southwest Jiaotong
University

Tuesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Maritime Vessel Safety
Jennifer Lincoln, National Institute for Occupational Safety and Health, presiding
Sponsored By Standing Committee on Marine Safety and Human Factors

**Analysis of Tugboat Activities Based on Automatic Identification System Data: A Case Study of Tianjin Port (20-
00732) - A244**
Shukai Chen/National University of Singapore, Feng Wang/National University of Singapore, Xiaoyang Wei/National
University of Singapore, Zhijia Tan/National University of Singapore, Hua Wang/National University of Singapore
Relationship Between Overconfidence and Risky Behavior in Ship Crew (20-01992) - A245
Ying Wang/Shanghai Maritime University, Xin Shi/Shanghai Maritime University, Dong Xu/Shanghai Maritime University

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 147B
Leading the Way in Transport Decarbonization
Marie Venner, Venner Consulting, presiding
Sponsored By Standing Committee on International Cooperation, Special Task Force on Climate Change and Energy

Updated climate models now tell us that we could be facing 7 C average global warming this century on the business as
usual path, with our continued increases in fossil fuel emissions. There are other healthier, happier, and more
responsible paths forward though, and ways that transport can be part of the discussions and transitions underway.
This session will explore best practices and how we get to decarbonisation much more rapidly, in line with what science
says is necessary.

European Green Deal Policy and Its Transport Related Aspects (P20-21789)
Claire Depre/European Commission
Zero Emissions Roadmap 2028 2.0 (P20-21790)
Seleta Reynolds/City of Los Angeles Department of Transportation
**Norway, Europe's Leading Market for Electric Vehicles and Movement Towards Only Electric Domestic
Aviation by 2040, e-Ferries, and Car-Free Oslo by 2030 (P20-21791)**
Erik Figenbaum/Institute of Transport Economics
**Strategic Policy Study on Co-Control of Air Pollution and Carbon Emissions for China's Transportation (P20-21
792)**
Guohua Song/Beijing Jiaotong University
**What Does Net Zero Mean for National, Regional, and Local Transport?: Perspectives and Action in the United
Kingdom (P20-21793)**
Siobhan Campbell/United Kingdom Department for Transport, Greg Marsden/University of Leeds
Rapid Decarbonization Strategies in Transport: Getting to the Global Goals (P20-21794)
Jari Kauppila/International Transport Forum

1507

The Six-Minute Pitch: A Transportation Startup Challenge
Shana Johnson, Foursquare Integrated Transportation Planning, presiding
Sponsored By Young Members Council (YMC)

6-Minute Judges Panel (P20-21089)
David Zipper/Harvard University, Sean O'Sullivan/SOSV, Gabe Klein/Fontinalis Partners
Populus (P20-21800)
Regina Clewlow/Populus
Zygg (P20-21802)
Kevin McLaughlin/Zygg
iEngineering (P20-21803)
Nima Kargah-Ostadi/iEngineering Corporation

1508

An Economic Perspective of Autonomous Technologies and Ridesharing Systems
Sabyasachee Mishra, University of Memphis, presiding
Sponsored By Standing Committee on Transportation Economics

A Methodology for Estimating the Cost per Mile of Personal Cars and Ridesharing (20-01926)
Amy Smith/Uber Technologies, Inc., Juan Argote/Uber Technologies, Inc.
Assessing the Economic Impacts of Labor and Leisure Time in Autonomous Vehicles (20-02673)
Edward Robson/University of New South Wales, Sisi Jian/University of New South Wales, Vinayak Dixit/University of New South Wales, Taha Rashidi/University of New South Wales
Examining Cost Aspects of Shared Autonomous Vehicles as Mobility-as-a-Service (20-04282)
Saipraneeth Devunuri/Texas A&M University, College Station, Ankit Jhamb/Texas A&M University, College Station, Mark Burris/Texas A&M University, College Station, Hao Pang/Texas A&M University, College Station
How Will Automated Vehicles Change Your Travel Patterns?: Analyzing Mode Choices in a Home-to-Home Tour-Based Model (20-05991)
Parastoo Jabbari/University of Washington, Andisheh Ranjbari/University of Washington, Don MacKenzie/University of Washington

1509

Tribal Transportation Safety Data Collection and Analysis
Elissa Goughnour, VHB, presiding
Sponsored By Standing Committee on Native American Transportation Issues, Subcommittee on Tribal Safety Issues, Roadway Safety Data

Transportation data collection and analysis is a vital function to effectively manage a wide range of infrastructure. The data are used to justify the need for resources and assess the performance of the system relative to plans. Tribal transportation programs and their data environment have recently been examined by the U.S. Office of Government Accountability and been the subject of reporting requirements by Congress in the FAST Act. Improved coordination and collaboration with state and local transportation authorities that overlap tribal transportation systems can create an opportunity for new data analysis and place tribes on somewhat equal footing with their neighbors in describing transportation needs from a data perspective.

Systemic Analysis for the Tohono O'odham Nation (P20-21775)
Frank Gross/VHB, Jeffrey Gooch/VHB
Tribal Safety Fund and Roadway Departure (P20-21778)
Adam Larsen/Federal Highway Administration (FHWA)
Tribal Road Safety Data Collection Project in California (P20-21780)
David Ragland/Safe Transportation Research and Education Center

1510

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 154
Transportation Safety Analysis in Developing Countries
Rafael Aldrete, Texas A&M Transportation Institute, presiding
David Salgado, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Transportation in the Developing Countries

What Motivates the Driver to Comply with Guidance Information at Signalized Intersections?: An Empirical Study of China Based on Multiple-Indicator, Multiple-Cause Model and Latent Class Analysis (20-03858)
Xiaomei Zhang/Beijing Jiaotong University, Xumei Chen/Beijing Jiaotong University, Aihua Fan/Beijing Jiaotong University, Lei Yu/Beijing Jiaotong University
Reducing Road Crash Severities in Namibia: An Analysis of Some Risk Factors (20-01529)
Emmanuel Kofi Adanu/University of Alabama, Steven Jones/University of Alabama, Kenneth Odero/University of Alabama
Safety Benefits of Converting Signalized Intersection to Roundabout in Heterogeneous Traffic (20-05874)
B Swain/Indian Institute of Technology, Delhi, N. Nezamuddin/Indian Institute of Technology, Delhi, Anurag Pande/Indian Institute of Technology, Delhi
A Comprehensive Study of Risk Factors for Fatal Pedestrian Crashes in Urban Setup in a Developing Country (20-04886)
Dipanjan Mukherjee/The World Bank, Sudeshna Mitra/The World Bank

1511

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 150B
Autonomous Vehicle and Unmanned Aerial Systems Education and Training: The Future Is Now
Victoria Beale, Ohio Department of Transportation, presiding
Diana Long, Appalachian Transportation Institute, presiding
Sponsored By Standing Committee on Transportation Education and Training, Task Force on Knowledge Management, Standing Committee on Management and Productivity, Standing Committee on Technology Transfer, Standing Committee on Low-Volume Roads, Standing Committee on Maintenance and Operations Management, Standing Committee on Structures Maintenance, Subcommittee on Unmanned Aircraft Systems (UAS), Subcommittee on Geospatial Data Acquisition Using Small Unmanned Aerial Systems

Benefits and the Future Workforce in Drone Technology (20-04471)
Quenton Greggs/Texas Southern University, Tasjah Hall/Texas Southern University, Gwendolyn Goodwin/Texas Southern University
Automated Vehicles: Examining the Proving Grounds (20-06138)
Teidra Darrett/Texas Southern University, Gwendolyn Goodwin/Texas Southern University, McKenzie Jones-Channel/Texas Southern University
Unmanned Aerial System Education and Training: A Case Study (P20-20840)
Dr. Andrew Shepherd/Sinclair Community College
UV UAS Team Training Program Case Studies (P20-21560)
Emma Estabrook/University of Vermont

1512

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 152B
Advances in the Use of Smartphones for the Collection of Travel Surveys
Jimmy Armoogum, Univ Gustave Eiffel, presiding
Sponsored By Standing Committee on Travel Survey Methods

Smartphones have been used to conduct travel surveys since 2013 and have fast become the preferred mode of data collection. This session highlights the latest advancements in their use.

Lessons from a Large-Scale Experiment on the Use of Smartphone Apps to Collect Travel Diary Data: The "City Logger" for the Greater Golden Horseshoe Area (20-00078)
Ahmadreza Faghih Imani/Imperial College London, Chris Harding/Imperial College London, Siva Srikukenthiran/Imperial College London, Eric Miller/Imperial College London, Khandker Nurul Habib/Imperial College London

(continued)

Are We There Yet?: Assessing Smartphone Apps as Full-Fledged Tools for Activity-Travel Surveys (20-00202)
Chris Harding/Imperial College London, Ahmadreza Faghih Imani/Imperial College London, Siva Srikukenthiran/Imperial College London, Eric Miller/Imperial College London, Khandker Nurul Habib/Imperial College London
Fully Integrating Smartphone Apps into Household Travel Surveys (20-04446)
Marcelo Simas/WESTAT, Inc., Jeremy Wilhelm/WESTAT, Inc., Laura Wilson/WESTAT, Inc., Anthony Fucci/WESTAT, Inc., Alexander Cates/WESTAT, Inc.
EM-EVAL: An Evaluation Procedure for Smartphone-Based Travel Diaries (20-05198)
K. Shankari/University of California, Berkeley, Hari Venugopalan/University of California, Berkeley, David Culler/University of California, Berkeley, Randy Katz/University of California, Berkeley
Identification of Activity Locations Using Personal Trajectory Data Collected Through a Smartphone Travel Survey App (20-02813)
junda HUANG/Wuhan University of Technology, Ming Zhong/Wuhan University of Technology, Shaobo Liu/Wuhan University of Technology, Bo Deng/Wuhan University of Technology, Jiangtao Sun/Wuhan University of Technology, Xiaofeng Ma/Wuhan University of Technology, Matthew Muresan/Wuhan University of Technology

1513

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 151B
Leveraging the Power of Machine Learning for Safer Roads
Osama Osman, University of Tennessee, Chattanooga, presiding
Sponsored By Standing Committee on Artificial Intelligence and Advanced Computing Applications

Machine learning techniques have successfully been used to improve traffic safety and reduce crash rates . This session presents recent work on the application of innovative machine learning techniques for detection of lane changing maneuvers and distracted behavior, prediction of real time crash risk, and optimization of traffic safety conditions.

Detecting Phone-Related Pedestrian Distracted Behaviors via a Two-Branch Convolutional Neural Network (20-01067)
Humberto Saenz/Cleveland State University, Hongkai Yu/Cleveland State University, Lingtao Wu/Cleveland State University, Xuesong Zhou/Cleveland State University
Prediction of Lane-Changing Maneuvers with Automatic Labeling and Deep Learning (20-04520)
Christos Katrakazas/Technische Universitat Munchen, Vishal Mahajan/Technische Universitat Munchen, Constantinos Antoniou/Technische Universitat Munchen
Detection of Lane Change Maneuvers Using the SHRP2 Naturalistic Driving Study Data: A Machine Learning Approach (20-05662)
Anik Das/Federal Highway Administration (FHWA), Md Nasim Khan/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)
Utilising Generative Adversarial Network to Address Imbalanced Data Issue in Real-Time Crash Risk Prediction (20-02029)
Cheuk Ki Man/Loughborough University, Mohammed Quddus/Loughborough University, Athanasios Theofilatos/Loughborough University, Rongjie Yu/Loughborough University, Maria-Ioanna Imprialou/Loughborough University
A Deep Reinforcement Learning-Based Vehicle Driving Strategy to Optimize Traffic Safety in Traffic Oscillations (20-05977)
Meng Li/Southeast University, Zhibin Li/Southeast University, Chengcheng Xu/Southeast University, Tong Liu/Southeast University

1514

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 144A
Innovations in Data Collection, Analysis, and Fusion to Address Persistent Freight Data Gaps
Stephanie Finch, The Port Authority of New York and New Jersey, presiding
Sponsored By Standing Committee on Freight Transportation Data

This session will highlight recent research in data science and data fusion applications to capture freight data elements that have consistently been challenging to measure. Presentations will address new or improved methods to estimate truck empty and loaded trips, truck stop by purpose, and disaggregate multi-modal commodity flows.

(continued)

Multi-Commodity Port Throughput from Truck GPS and Lock Performance Data Fusion (20-01953)
Magdalena Asborno/University of Arkansas, Fayetteville, Sarah Hernandez/University of Arkansas, Fayetteville, Taslima Akter/University of Arkansas, Fayetteville
Empty Platform Semi-Trailer Classification Using Side-Fire LiDAR Data for Supporting Freight Analysis and Planning (20-02006)
Olcay Sahin/Old Dominion University, Mecit Cetin/Old Dominion University, Ilyas Ustun/Old Dominion University
Imputation of Truck Rest Stop Events from GPS Data with a Continuous Hidden Markov Model (20-01873)
Mehdi Taghavi/University of Queensland, Elnaz Irannezhad/University of Queensland, Carlo Prato/University of Queensland
Identifying Freight Delivery Stops from GPS Data (20-04290)
Jose Holguin-Veras/Rensselaer Polytechnic Institute (RPI), Trilce Encarnacion/Rensselaer Polytechnic Institute (RPI), Sofia Perez-Guzman/Rensselaer Polytechnic Institute (RPI), Xia (Sarah) Yang/Rensselaer Polytechnic Institute (RPI)

1515

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 144B
Developing an Innovative and Transformational Strategy for the Connected Truck Extended Ecosystem
John Barton, HNTB Corporation, presiding
Eugene Conti, The Conti Group LLC, presiding
Sponsored By Standing Committee on Freight Transportation Data, Standing Committee on Performance Management, Standing Committee on Statewide Transportation Data and Information Systems, Standing Committee on Highway Traffic Monitoring, Standing Committee on Information Systems and Technology, Standing Committee on Truck and Bus Safety, Standing Committee on Freight Transportation Planning and Logistics, Standing Committee on Truck Size and Weight, Standing Committee on Trucking Industry Research

 The session will provide thought leadership and discuss a collaborative and strategic partnership of best -in-class transportation connected vehicle subject matter experts, researchers, and DOT and port executives to drive development of a freight operation network that connects trucks/freight with DOTs…from point of origin to destination…via an integrated placemat of end-to-end solutions. The discussion will include an integrated V2X approach for sharing data with connected commercial vehicles that will deliver multi-modal information at the granular level to tell the full story. Key areas of focus for Connected Truck Ecosystem are built around key performance indicators of safety , mobility, efficiency and reliability.

A State DOT Perspective (P20-20615)
Gregory Byres/Arizona Department of Transportation
A Port Authority Perspective (P20-20650)
Edward McCarthy/Georgia Ports Authority
Trucking Industry Research Perspective (P20-20523)
Dan Murray/American Transportation Research Institute (ATRI)
University Research Perspective (P20-20524)
Allan Rutter/Texas A&M Transportation Institute
Technology Perspective (P20-20525)
Keith Wine/Intelligent Imaging Systems, Inc./ Drivewyze (Meritage Point Consulting, LLP)

1516

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 152A
Emerging Issues in Supply Chain Risk and Resilience
Igor Linkov, U.S. Army Corps of Engineers (USACE), presiding
Silvana Croope, University of Alabama, presiding
Sponsored By Standing Committee on the Logistics of Disaster Response and Business Continuity, Joint Subcommittee on Resilience and Sustainability Cooperation of ABR00, ABR10, ABR20, ABR30, and A0020T, Standing Committee on Critical Transportation Infrastructure Protection, Joint Subcommittee on Supply Chain Resilience of ABR20 and ABR10

Transportation and the Supply Chain of Opioids in Native Communities (P20-20032)
Margo Hill/Eastern Washington University
Disrupting Adversarial Supply Chains (P20-20033)
Margaret Kurth/U.S. Army Corps of Engineers (USACE)

(continued)

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Illicit Supply Network Transport (P20-21795)
Nicholas Magliocca/University of Alabama
Supply Chain Cybersecurity: Critical Element for Resilience (P20-21796)
Celia Paulsen/National Institute of Standards and Technology

1517

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 156
Traditional Travel Behavior Analysis
Srinath Ravulaparthy, Oak Ridge National Laboratory, presiding
Sponsored By Standing Committee on Traveler Behavior and Values

The Resiliency of a Transit System: Passengers' Waiting Tolerance During an Unplanned Service Disruption in Chicago (20-02588)
Ehsan Rahimi/University of Illinois, Chicago, Ali Shamshiripour/University of Illinois, Chicago, Ramin Shabanpour/University of Illinois, Chicago, Abolfazl (Kouros) Mohammadian/University of Illinois, Chicago, Joshua Auld/University of Illinois, Chicago
Time, Space, Money, and Social Interaction: Classifying People's Mobility Strategies Through Four Key Dimensions (20-00394)
Rodrigo Victoriano/Universidad de Concepcion, Antonio Paez/Universidad de Concepcion, Juan Carrasco/Universidad de Concepcion
Are Millennials Really All That Different Than Generation X?: Analysis of Factors Contributing to Differences in Vehicle Miles of Travel (20-02693)
Denise Capasso da Silva/University of Texas, Austin, Sebastian Astroza/University of Texas, Austin, Irfan Batur/University of Texas, Austin, Sara Khoeini/University of Texas, Austin, Tassio Magassy/University of Texas, Austin, Ram Pendyala/University of Texas, Austin, Chandra Bhat/University of Texas, Austin
Investigating Travel-Time Satisfaction and Actual Versus Ideal Commute Times: A Path Analysis Approach (20-01177)
Prasanna Humagain/Utah State University, Patrick Singleton/Utah State University
An Integrated Model of Activity-Travel Behavior and Subjective Well-Being (20-03447)
Sara Khoeini/Arizona State University, Denise Capasso da Silva/Arizona State University, Shivam Sharda/Arizona State University, Tassio Magassy/Arizona State University, Ram Pendyala/Arizona State University

1518

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 145A
Travel Modeling for New Applications
Tierra Bills, Wayne State University, presiding
Sponsored By Standing Committee on Transportation Demand Forecasting

Development of an Integrated Model System of Transport and Residential Energy Consumption (20-04452)
Shivam Sharda/Arizona State University, Taehooie Kim/Arizona State University, Sara Khoeini/Arizona State University, Irfan Batur/Arizona State University, Ram Pendyala/Arizona State University
A Model of Deadheading Trips and Pickup Locations for Ridehailing Service Vehicles (20-03091)
Gopindra Sivakumar Nair/University of Texas, Austin, Chandra Bhat/University of Texas, Austin, Irfan Batur/University of Texas, Austin, Ram Pendyala/University of Texas, Austin, William Lam/University of Texas, Austin
Discussants (P20-20897)
Don MacKenzie/University of Washington, Khandker Nurul Habib/University of Toronto, Gregory Erhardt/University of Kentucky
Deriving Daily Activity Schedules from Dynamic, Purpose-Dependent Origin-Destination Matrices (20-01954)
Haris Ballis/University of Cyprus, Loukas Dimitriou/University of Cyprus

1519   CM (1.75)

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 146B
Transportation Accessibility Planning
Sarah Binkowski, HNTB Corporation, presiding
Sponsored By Standing Committee on Transportation Planning Applications

This session will demonstrate various ways people are incorporating accessibility measures into transportation planning
.

Primal and Dual Access (20-00212)
Mengying Cui/The University of Sydney, David Levinson/The University of Sydney
A Framework for Assessing Public Transport Equity Through Local and Regional Accessibility (20-01392)
Charles Michaud/Ecole Polytechnique de Montreal, Catherine Morency/Ecole Polytechnique de Montreal, Geneviève Boisjoly/Ecole Polytechnique de Montreal
How Close to Reality Are They: A Comparison of Traditionally Calculated Accessibility Measures with Real-World, Origin-Destination Data (20-01430)
Phil Lasley/Texas A&M Transportation Institute, Shuang Guo/Texas A&M Transportation Institute, Madison Graham/Texas A&M Transportation Institute, Yongxin Peng/Texas A&M Transportation Institute
Dynamic Modal Accessibility Gap: Measurement and Application Using Travel Routes Data from Shanghai, China (20-02271)
Jinping Guan/No Organization, Qing Shen/No Organization, Ying He/No Organization, Kai Zhang/No Organization
Accessibility in Practice: A Case Study of 20-Minute Tempe (20-03029)
David King/Arizona State University School of Geographical Sciences and Urban Planning, Denise Capasso da Silva/Arizona State University School of Geographical Sciences and Urban Planning, Shea Lemar/Arizona State University School of Geographical Sciences and Urban Planning

1520

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 146A
More Mobility with Less Vehicle Miles Traveled: An Expert Panel on Ridematching in the Ridehailing Sector
Steven Cliff, California Air Resources Board (CARB), presiding
Sponsored By Section - Environment and Energy, Standing Committee on Alternative Transportation Fuels and Technologies, Standing Committee on Transportation and Sustainability, Standing Committee on Effects of Information and Communication Technologies (ICT) on Travel Choices, Standing Committee on Transportation Energy, Standing Committee on Transportation and Air Quality

The California Clean Miles Standard Regulation and the Role of Pooled Rides (P20-20764)
Jennifer Gress/California Air Resources Board (CARB)
Our Roads Are Getting More Crowded, But Are Our Vehicles? (P20-20765)
Ronald Milam/Fehr & Peers
How to Make On-Demand Public Transit and Pooled Rides Actually Work (P20-20766)
Andrei Greenawalt/Via
Pooling Is the Answer?! (P20-20767)
Daniel Sperling/University of California, Davis

1521   CM (1.75)

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 140A
One Federal Decision: Updated Information and Example Work
Martin Palmer, Washington State Department of Transportation, presiding
Sponsored By Standing Committee on Environmental Analysis in Transportation, Standing Committee on Historic and Archeological Preservation in Transportation

This session will describe the requirements of EO 13807 as well as subsequent policies to accomplish the Order's mandate. Presentations will highlight practices used to facilitate the goals of EO 13807 from the perspective of the technical consultant, agency decision-maker, and project proponent.

(continued)

What Will It Take to Meet the Requirements/Food for Thought/Best Practice Examples (P20-20787)
Diane Nulton/HDR
Legal Perspectives and Emerging Issues (P20-20999)
David McCray/Beveridge and Diamond, PC
Examples of OFD in Action on Historic Properties and Archaeological Sites (P20-21000)
David Clarke/Federal Highway Administration (FHWA)
What EO13807 (OFD) Is and Says (P20-21013)
Anne Rowe/Federal Highway Administration (FHWA), Megan Cogburn/Federal Highway Administration (FHWA)

1522

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 140B
Big City, Turn on My Phone and Set Me Free: Exploring the Influences on and Influence of Ridesharing in Major Cities
Kristina Currans, University of Arizona, presiding
Sponsored By Standing Committee on Transportation and Land Development

Presentations in this section explore the user behavior, land use influences, equity of services, and company activities on ridesharing demand in major cities.

Exploring the Influence of Built Environment on Uber Demand (20-03025)
Sadegh Sabouri/University of Utah, Keunhyun Park/University of Utah, Amy Smith/University of Utah, Guang Tian/University of Utah, Reid Ewing/University of Utah
Estimating and Comparing the Equity Level of Traditional and E-hailing Taxi Services During Peak Hours: A Study of New York City (20-05594)
Renbin Pan/Southwest Jiaotong University, Hongtai Yang/Southwest Jiaotong University, Kun Xie/Southwest Jiaotong University, Yi Wen/Southwest Jiaotong University
Uber Service Area Expansion in Three Major American Cities (20-01367)
Steven Gehrke/Northern Arizona University
Ridesourcing Behavior Profiles: Application of K-Prototype Analysis on Large-Scale data from Chicago, Illinois (20-04990)
Jason Soria/Northwestern University, Ying Chen/Northwestern University, Amanda Stathopoulos/Northwestern University
A Comprehensive Investigation into Ridesourcing Company Activities in Toronto (20-02679)
Raphael Dumas/City of Toronto, Chenchong Zhu/City of Toronto, Jesse Coleman/City of Toronto, Rick Liu/City of Toronto, Ho Man Natalie Chan/City of Toronto, Aakash Harpalani/City of Toronto
Adoption of Exclusive and Pooled TNC Services in Singapore and the United States (20-05130)
Joanna Moody/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT)

1523

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 202A
Design of Barriers for Containment of Trucks
Wade Odell, Texas Department of Transportation, presiding
Sponsored By Standing Committee on Roadside Safety Design, Standing Committee on General Structures

Development and Testing of a Test Level 4 Concrete Bridge Rail and Deck Overhang (20-06150)
Scott Rosenbaugh/University of Nebraska, Lincoln, Jennifer Rasmussen/University of Nebraska, Lincoln, Ronald Faller/University of Nebraska, Lincoln
Development of a Test Level 4, Side-Mounted, Steel-Tube Bridge Rail (20-06151)
Jennifer Rasmussen/University of Nebraska, Lincoln, Scott Rosenbaugh/University of Nebraska, Lincoln, Ronald Faller/University of Nebraska, Lincoln, Bob Bielenberg/University of Nebraska, Lincoln, Joshua Steelman/University of Nebraska, Lincoln, Oscar Pena/University of Nebraska, Lincoln, Pascual Mauricio/University of Nebraska, Lincoln
Design and Full-Scale Testing of New Mash TI-4 Alaska 2-Tube Bridge Rail (20-05602)
William Williams/Texas A&M University Transportation Institute, Sana Moran/Texas A&M University Transportation Institute, Elmer Marx/Texas A&M University Transportation Institute

(continued)

Development and Testing of Structurally Independent Foundations for High-Speed Containment Concrete Barrier (20-05561)

James Kovar/Texas A&M Transportation Institute, Nauman Sheikh/Texas A&M Transportation Institute, Roger Bligh/Texas A&M Transportation Institute, Taya Retterer/Texas A&M Transportation Institute, Jon Ries/Texas A&M Transportation Institute

1524

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 201
New Directions in Hydraulic and Scour Designs
John Hunt, Ayres Associates, presiding
Sponsored By Standing Committee on Hydrology and Hydraulics, Standing Committee on Stormwater

The FHWA Scour Program (P20-20718)
Joe Krolak/Federal Highway Administration (FHWA), Paul Sharp/Federal Highway Administration (FHWA)
3D CFD Scour Calculations (P20-20720)
Kornel Kerenyi/Federal Highway Administration (FHWA), Marta Sitek/Argonne National Laboratory
FHWA HEC-25: Update to Highways in the Coastal Environment (P20-20722)
Scott Douglass/South Coast Engineers, Brian Beucler/Federal Highway Administration (FHWA)

1525

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 207A
New Horizons in Pavement Condition Evaluation
Nathan Bech, ARRB Group, presiding
Sponsored By Standing Committee on Pavement Condition Evaluation

The session will target new horizons in pavement condition evaluation including examining crack detection using machine learning, pavement texture through finite element analysis, determination of water filled ruts, and evaluation of pavement texture.

The Construction of Three-Dimensional Model of Pavement Texture Used for Finite Element Analysis (20-00476)
Shihao Dong/Chang'an University, Sen Han/Chang'an University, Yuanyuan Yin/Chang'an University, Mengmei Liu/Chang'an University, Wanyan Ren/Chang'an University
Using Three-Dimensional Laser Scanning Technology to Evaluate the Asphalt Pavement Mean Texture Depth (20-01266)
Jia Liang/Southeast University, Xingyu Gu/Southeast University, Xiaoyu Zhang/Southeast University
A Comprehensive Review and Comparison of Machine Learning–Based Crack Detection (20-02885)
Yung-An Hsieh/Georgia Institute of Technology (Georgia Tech), Yichang(James) Tsai/Georgia Institute of Technology (Georgia Tech)
Quantitative Analysis on Macrotexture of Asphalt Concrete Pavement Surface Based on 3D Data (20-02060)
Ju Huyan/University of Waterloo, Wei Li/University of Waterloo, Susan Tighe/University of Waterloo, Zhaoyuan Sun/University of Waterloo, Hongchao Sun/University of Waterloo

1526

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 202B
Innovative Practices in Construction Quality Management
Mohamed Nimeri, King County International Airport, presiding
Sponsored By Standing Committee on Quality Assurance Management

Public transportation agencies are responsible for delivering a safe, reliable and efficient transportation system, often with insufficient funding levels. Consequently, it is critical that investments in system preservation and rehabilitation produce facilities with acceptable long-term performance. The construction industry has sometimes lagged behind other industries with regards to quality management. This session will highlight innovative approaches to quality management by several leaders in construction quality.

(continued)

Achieving a Quality Culture Through Policy, People, and Metrics (P20-20471)
Chad Dorgan/McCarthy Building Companies
Key Elements of Owner Requirements That Lead to Quality Projects (P20-20469)
Scott West/Granite Construction
Contractor Process Control to Achieve First-Time Quality (P20-20470)
William McNamara/Granite Construction, Inc.
Driving and Supporting a Corporate-wide Quality Culture (P20-21181)
Kate Edwards/The Whiting-Turner Contracting Company

1527

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 206
Enhancing Productivity in Bridge Fabrication and Construction
David Brodowski, TrueTech Bridge, presiding
Sponsored By Standing Committee on Construction of Bridges and Structures, Standing Committee on Fabrication and Inspection of Metal Structures

BIM Workflows: From Analysis to Fabrication (P20-20942)
David Loughery/ALLPLAN, A Nemetschek Company
How Tech Companies Plan and Support BIM (P20-20944)

Streamlining the Fabrication Process: The Impact of the BIM for Bridges and Structures Pooled Fund Study (P20-20945)
Connor Christian/HDR
Using BIM to Build Bridges in Utah (P20-20947)
Colby Christensen/HDR

1528

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 204C
Roller Compacted Concrete Pavement: From the State of the Art to the State of the Practice
Matthew Singel, Cement Council of Texas, presiding
Sponsored By Standing Committee on Concrete Pavement Construction and Rehabilitation, Subcommittee on Design and Construction of Roller Compacted Concrete Pavements

First Roller Compacted Concrete Pavement in Louisiana (20-04489)
Moinul Mahdi/Louisiana Transportation Research Center (LTRC), Tyson Rupnow/Louisiana Transportation Research Center (LTRC), Zhong Wu/Louisiana Transportation Research Center (LTRC), Jared Veazey/Louisiana Transportation Research Center (LTRC)
Analysis of Curing Situations on Roller-Compacted Concrete Pavements: A Case Study (20-05637)
Alireza Joshaghani/Texas A&M University, Dan Zollinger/Texas A&M University
Contractor's Perspective on the First RCC Roadway in Louisiana (P20-21450)
Tim Maune/Rollcon
Evolution of Roller Compacted Concrete Curing (P20-21451)
Will Gray/AG Peltz

1529

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 203
Phased Array Ultrasonic Testing of Transportation Structures: Recent Research and Implementations
Ronald Medlock, High Steel Structures, LLC, presiding
Sponsored By Standing Committee on Fabrication and Inspection of Metal Structures, Standing Committee on Steel Bridges, Standing Committee on Construction of Bridges and Structures

Recent research and application of Phased Array Ultrasonic Testing (PAUT) are presented to highlight the results of these uses, identify the issues related to use, and provide guidelines on its use and recommendation for further studies.

Phased Array: A Paradigm Shift (P20-20004)
Nicholas Shrawder/Pennsylvania Department of Transportation

(continued)

Update on the FHWA's Phased Array Full Matrix Capture/Total Focusing Method Research (P20-20005)
Hoda Azari/Turner-Fairbank Highway Research Center, Federal Highway Administration, Russell Kok/GENEX Systems
Reliability of Flaw Detection Using PAUT (P20-20006)
Phillip Sauser/U.S. Army Corps of Engineers (USACE)
Highlighted PAUT Research Findings from NCHRP Report 908 (P20-20007)
Curtis Schroeder/Wiss, Janney, Elstner Associates

1530

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 209A
Practical Insights in Administering USDOT's Disadvantaged Business Program
Marc Pentino, Office of the Secretary of Transportation (OST), presiding
Sponsored By Standing Committee on Disadvantaged Business Enterprises

A panel of USDOT DBE program professionals will share insights on current and emerging trends. Attendees will be afforded the opportunity to share their thoughts during the interactive session.

Panel Discussion (P20-21306)
Charles James/Office of the Secretary of Transportation (OST), Marcus H England/Federal Aviation Administration (FAA), Scheryl Portee/Federal Transit Administration (FTA)

1531

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 204A
Advances and Lessons from the Field
George Machan, Landslide Technology, presiding
Sponsored By Standing Committee on Soil and Rock Properties

A podium session to describe advances and lessons learned from the field.

Modified Standard Penetration Test for Drilled Shaft Design in Weak Fine-Grained Rocks (20-01999)
Timothy Stark/University of Illinois, Urbana Champaign, James Long/University of Illinois, Urbana Champaign, Ahmed Baghdady/University of Illinois, Urbana Champaign, Abdolreza Osouli/University of Illinois, Urbana Champaign, Heather Shoup/University of Illinois, Urbana Champaign, Michael Short/University of Illinois, Urbana Champaign
A New Low-Activity Nuclear Density Gauge for Soil Compaction Measurements (20-04747)
Linus Dep/Troxler Electronic Laboratories, Inc., Robert Troxler/Troxler Electronic Laboratories, Inc., James Sawyer/Troxler Electronic Laboratories, Inc., Sumuna Mwimba/Troxler Electronic Laboratories, Inc.
Material Parameters for Modeling of the Eisenhower-Johnson Memorial Tunnels (20-04909)
Gauen Alexander/Colorado School of Mines, Marte Gutierrez/Colorado School of Mines, Ashton Krajnovich/Colorado School of Mines, Stephen Harelson/Colorado School of Mines
A Photogrammetry-Based Method to Determine the Absolute Volume of Soil Specimen During Triaxial Testing (20-05553)
Sara Fayek/Missouri University of Science and Technology, Xiaolong Xia/Missouri University of Science and Technology, Lin Li/Missouri University of Science and Technology, Xiong Zhang/Missouri University of Science and Technology

1532

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 209B
Improving Performance of Transportation Materials Using Innovative Additives
Xiaochao Tang, Widener University, presiding
Burak Tanyu, George Mason University, presiding
Sponsored By Standing Committee on Geo-Environmental Processes

Organo-Silane, Hydrophobicity, and the Freeze-Thaw Performance of Subgrade Soils (20-02189)
Masrur Mahedi/Iowa State University, Sajjad Satvati/Iowa State University, Bora Cetin/Iowa State University, John Daniels/Iowa State University

(continued)

Recycled Concrete Aggregates and Fly Ash Based Geopolymer Mixtures as Sustainable Soil Stabilized Road Base and Sub-Base Material (20-05571)

Daniel Odion/University of Louisiana, Lafayette, Mohammad Khattak/University of Louisiana, Lafayette, Sk Rahman/University of Louisiana, Lafayette

Evaluation of Glass Powder-Based Geopolymer Stabilized Road Bases Containing Recycled Waste Glass Aggregate (20-05621)

Rui Xiao/University of Tennessee, Knoxville, Pawel Polaczyk/University of Tennessee, Knoxville, Miaomiao Zhang/University of Tennessee, Knoxville, Xi Jiang/University of Tennessee, Knoxville, Yiyuan Zhang/University of Tennessee, Knoxville, Wei Hu/University of Tennessee, Knoxville, Baoshan Huang/University of Tennessee, Knoxville

Use of Municipal Sewage Sludge Ash as Supplementary Cementitious Materials and Effects of Adding Silica Fumes (20-05878)

Xiaochao Tang/Widener University, Ian Nordfors/Widener University, Matthew Howren/Widener University

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1533

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 209C

Aggregate Morphology: Measurement, Modeling, and Meaning

Andrew Dawson, University of Nottingham, presiding

Sponsored By Standing Committee on Aggregates

The shape and surface characteristics of crushed stones have major impacts on the response of the materials that they form - whether unbound granular layers, asphaltic concrete or Portland concrete. The papers being presented will explore the means by which the particle characteristics can be measured, replicated in models and their impact assessed.

Characterization of Aggregate Angularity in the Frequency Domain (20-01423)

Jorge Prozzi/University of Texas, Austin, Hongbin Xu/University of Texas, Austin

Laboratory Evaluation of Aggregate Friction and Texture Properties (20-03569)

Emmanuel Fernando/Texas A&M Transportation Institute, Edith Arambula Mercado/Texas A&M Transportation Institute, Sheng Hu/Texas A&M Transportation Institute, Bill Crockford/Texas A&M Transportation Institute

Determination of Aggregate Morphological Indices Through Photogrammetry (20-04409)

Hande Isik Ozturk/Middle East Technical University, Isfandiyar Rashidzade/Middle East Technical University

Automated Segmentation and Morphological Analyses of Stockpile Aggregate Images Using Deep Convolutional Neural Networks (20-05087)

Haohang Huang/University of Illinois, Urbana Champaign, Jiayi Luo/University of Illinois, Urbana Champaign, Erol Tutumluer/University of Illinois, Urbana Champaign, John Hart/University of Illinois, Urbana Champaign, Andrew Stolba/University of Illinois, Urbana Champaign

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1534

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 101

Modeling Work Zone Attributes

Susan Paulus, Lakeside Engineers, LLC, presiding

Sponsored By Standing Committee on Work Zone Traffic Control

A Comparison of Attributes Influencing Work Zone Crash Severity (20-04341)

Rebekka Apardian/University of Toledo

Probabilistic Speed-Flow Models in Highway Construction Work Zones (20-06106)

Jinxian Weng/Shanghai Maritime University

Estimating Road User Costs for Work Zones in Data-Limited or Time-Constrained Environments (20-00836)

Randy Machemehl/University of Texas, Austin, Natalia Zuniga-Garcia/University of Texas, Austin, Nabeel Khwaja/University of Texas, Austin, Kristopher Pruner/University of Texas, Austin, Mengyu Fu/University of Texas, Austin

Development of a Monte Carlo Simulation-Based Procedure for Calculating Complete Rehabilitation Project Impact Costs (20-02139)

Mitchell Fisher/Auburn University, Jeffrey LaMondia/Auburn University

1535

Enhancing Highway-Rail Grade Crossing Safety
Aemal Khattak, University of Nebraska, Lincoln, presiding
Sponsored By Standing Committee on Highway/Rail Grade Crossings

Characterization of Pedestrian and Cyclist Trespassing Behavior at Railway Crossings Using a Train Detection and Video Monitoring System (20-00481)
Jeannette Montufar/MORR Transportation Consulting Ltd., Rob Poapst/MORR Transportation Consulting Ltd., Stephen Chapman/MORR Transportation Consulting Ltd., Neil Ternowetsky/MORR Transportation Consulting Ltd., Richard Zavergiu/MORR Transportation Consulting Ltd.
Level Crossing Safety Impact Assessments for Vehicle and Pedestrian Crossings (20-04048)
Shane Turner/Abley Transportation Consultants Ltd., Eddie Cook/Abley Transportation Consultants Ltd., Shaun Bosher/Abley Transportation Consultants Ltd.
Pedestrian Detection in the Rail Right-of-Way Using Machine Learning and Computer Vision (20-04707)
Azhagan Avr/North Carolina State University, Christopher Cunningham/North Carolina State University, Christopher Vaughan/North Carolina State University, Daniel Coble/North Carolina State University
An Optimization Approach for the Selection of Countermeasures to Improve Safety at the Highway-Rail Grade Crossings in Florida (20-00382)
Masoud Kavoosi/Florida A&M University-Florida State University College of Engineering, Maxim Dulebenets/Florida A&M University-Florida State University College of Engineering, Junayed Pasha/Florida A&M University-Florida State University College of Engineering, Olumide Abioye/Florida A&M University-Florida State University College of Engineering, Ren Moses/Florida A&M University-Florida State University College of Engineering, John Sobanjo/Florida A&M University-Florida State University College of Engineering, Eren Ozguven/Florida A&M University-Florida State University College of Engineering

1536

Impact of Connected/Autonomous Vehicles on Roadway Maintenance Operations
Gregory Duncan, Applied Pavement Technology, Inc., presiding
Sponsored By Standing Committee on Maintenance and Operations Personnel, Standing Committee on Vehicle-Highway Automation, Standing Committee on Maintenance and Operations Management

Connected and Autonomous Vehicle (CAV) technology heavily depends on "reading the road." Research initiatives are underway as to how roadway assets such as traffic control signs, markings, signals, guardrail, computing and communications systems, and ancillary devices can facilitate CAV operations. As the presence and condition of roadway features is vital to the safe and reliable functioning of CAVs, state and local transportation agencies, with constrained budgets and workforces, must strategically plan and prepare now for the potentially increased maintenance needs demanded by CAV. Of specific interest is the result from the NCHRP 14-42 project survey of transportation agencies and OEMs on these issues.

Connected and Automated Vehicle Impacts on Highway Agency Maintenance Programs (P20-21036)
Paul Carlson/Road Infrastructure, Inc., Jonathan Markt/HDR
Connected and Automated Vehicle Impacts on Maintenance and Workforce Needs: Survey of the State of the Practice (P20-21037)
Omar Smadi/Iowa State University, Shauna Hallmark/Iowa State University

1537

Microsurfacing and Slurry Systems for Pavement Preservation
Travis Walbeck, National Center for Asphalt Technology (NCAT), presiding
Sponsored By Standing Committee on Pavement Preservation

This lecturn session contains four papers related to micro surfacing and slurry systems for pavement preservation. It includes impact of aggregate packing as well as an aggregate loss methodology.

(continued)

Cost-Effectiveness and Optimal Timing of Microsurfacing in Asphalt Concrete Overlays (20-03016)
Momen Mousa/Louisiana State University, Mostafa Elseifi/Louisiana State University, Mohammad Zobair Ibne Bashar/Louisiana State University, Zhongjie Zhang/Louisiana State University, Kevin Gaspard/Louisiana State University
The Use of an Aggregate Loss Test in Assessing the Curing Characteristics and Determining Trafficking Time of Slurry Seals and Microsurfacing Seal Mixtures (20-03411)
Petrina Johannes/University of Namibia, Hussain U. Bahia/University of Namibia
Effect of Aggregate Packing and Zeta Potential to the Performance of Slurry Surfacing Incorporating BOFS (20-03718)
Aulia Rachman/National Cheng Kung University, Shih-Hsien Yang/National Cheng Kung University, Ellie Fini/National Cheng Kung University
Accelerated Testing Procedure for Evaluating Moisture Induced Raveling and Emulsion-Filler Compatibility for Slurry Seals and Microsurfacing Seal Mixes (20-04333)
Petrina Johannes/University of Namibia, Hussain U. Bahia/University of Namibia

1538

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 207B
Homeless Encampments in Rights of Way Are Nothing New, Part 1 (Part 2, Session 1604)
William James, Tennessee Attorney General, presiding
Sponsored By Standing Committee on Eminent Domain and Land Use, Standing Committee on Transportation Law

Homeless encampments in rights of way are a growing challenge because of the dangers inherent in unregulated human encroachment near transportation facilities, as well as the illegal activities encampments frequently beget. Environmental concerns involving health, sanitation, and hazardous substances associated with such encampments must also be addressed. Part 1. This presentation will explore the origins and challenges of homeless encampments in right of way, and identify legal and practical obstacles and resources available to address them.

Panel Discussion (P20-21082)
Danielle Constant/Jennings, Strouss & Salmon, Samantha Juneau/Minnesota Department of Transportation, Christopher Kramer/Jennings, Strouss & Salmon

1539

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Salon B
National Transportation Safety Board Accident Investigations
Carl Schultheisz, National Transportation Safety Board (NTSB), presiding
Kristin Poland, National Transportation Safety Board (NTSB), presiding
Sponsored By Section - Safety

Bicycle Safety on U.S. Roadways: Crash Risks and Countermeasures (P20-21094)
Ivan Cheung/National Transportation Safety Board (NTSB)
Pedestrian Bridge Collapse in Miami, Florida: Design, Materials, and Construction (P20-21095)
Adrienne Lamm/National Transportation Safety Board (NTSB)
Recorded Data on Automated Vehicle Systems: Uber Test Vehicle and Other Crashes (P20-21096)
Ensar Becic/National Transportation Safety Board (NTSB)
Maneuvering Characteristics Augmentation System: Safety Assessment Process on the 737 Max (P20-21097)
Dana Schulze/National Transportation Safety Board (NTSB)

1540

Rear Seat Occupant Safety Issues in Passenger Vehicles
Maria Vegega, Road Safety Consulting, presiding
Charles Vits, IMMI, presiding
Sponsored By Standing Committee on Occupant Protection

This session addresses issues in rear seat motor vehicle safety in adults riding in passenger vehicles. An update is provided on rear seat belt use, seatbelt laws and seatbelt use in front vs rear seated passengers, and identifying seat belt non-use hot zones. Vehicle factors and vehicle structural integrity with potential to impact rear seat passenger safety maybe considered. The NTSB will present lessons learned from the NTSB stretch limousine crash that resulted in 17 rear-seat passenger deaths.

Belt Use in Rear Seats: Where Do We Stand (or Sit)? (P20-20165)
James Hedlund/Highway Safety North
Occupant Protection for Limousine Passengers: NTSB Investigation of the Schoharie, New York, Stretch Limousine Crash (P20-20168)
Thomas Barth/National Transportation Safety Board (NTSB)
Seat Belt Laws and Seat Belt Use Among Front- and Rear-Seat Vehicle Occupants in Fatal Crashes in the United States (20-04302)
Kwaku Boakye/Arcadis US Inc., Shashi Nambisan/Arcadis US Inc.
Identifying Seat Belt Non-Use Hot Zones (20-05282)
Amin Mohamadi Hezaveh/North Carolina Department of Transportation, Christopher Cherry/North Carolina Department of Transportation

1541

Cannabis: Understanding the Legalities, Attitudes, Economics, and Scientific Challenges
Eduardo Romano, Pacific Institute for Research and Evaluation, presiding
Tara Casanova Powell, Association of Traffic Safety Information Professionals, presiding
Sponsored By Standing Committee on Alcohol, Other Drugs, and Transportation

This session will discuss rapidly evolving challenges associated with cannabis and drug-impaired driving. The workshop will discuss the current Canadian legal framework for cannabis, how changes in social norms impact the use of cannabis by teenagers, the ever changing market for cannabis products; and recent concerns surrounding the safety of CBD use among drivers.

Cannabis and Driving: A Systematic Review of Issues, Impacts, and Alignment with the Canadian Legal Framework (20-05988)
Muhammad Habib/Dalhousie University, Alexander Glista/Dalhousie University
Social Norms and Cannabis Use Among Adolescents and Young Adults (P20-20884)
Bruce Simons-Morton/National Institute of Child Health and Human Development
Characteristics of the Marijuana Market in the United States and Canada (P20-20886)
William Wieczorek/Research Institute on Addictions
Cannabis and Driving Impairment: It's Not Just THC (P20-20887)
Mark Johnson/Pacific Institute for Research and Evaluation

1542

New Research in Human Factors and Vehicle Automation
Rino Brouwer, Rijkswaterstaat, presiding
Sponsored By Standing Committee on Vehicle User Characteristics

(continued)

Driver Take-Over Performance and Monitoring Behavior with Driving Automation at System-Limit Versus System-Malfunction Failures (20-04214)

Chelsea DeGuzman/University of Toronto, Samantha Hopkins/University of Toronto, Birsen Donmez/University of Toronto

The Impact of Key Human Factors on Safe Transport Automation: Experiences from Different Transport Modes (20-00306)

Eleonora Papadimitriou/Delft University of Technology, Juan Aguinaga Tello/Delft University of Technology, Wouter Daamen/Delft University of Technology, Max Lomba Vrouenraets/Delft University of Technology, Chantal Schneider/Delft University of Technology, Annebel ten Broeke/Delft University of Technology

Establishing Face and Content Validity of a Survey to Assess Users' Perceptions of Automated Vehicles (20-04294)

Justin Mason/University of Florida, Sherrilene Classen/University of Florida, James Wersal/University of Florida, Virginia Sisiopiku/University of Florida

Take-Over Performance by Novice and Experienced Drivers in Level 3 Automation (20-05478)

Facheng Chen/Beihang University, Guangquan Lu/Beihang University, Qingfeng Lin/Beihang University, Junda Zhai/Beihang University

Conversation in Automated Vehicles: Does Relation Between Driver and Passenger Affect Driver Fatigue and Driving Performance? (20-06006)

Jieun Lee/University of Tsukuba, Toshiaki Hirano/University of Tsukuba, Makoto Itoh/University of Tsukuba

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1543

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 102A
Assessing Driver Visibility Through Human Factors Investigations
Andrea Bill, University of Wisconsin, Madison, presiding
Sponsored By Standing Committee on Visibility

Driving is a complex task that depends upon vision in many important ways. The papers in this session describe studies of drivers' responses to visual information along the roadway environment.

Analysis of Colored Variable Message Signs for Visibility and Comprehensibility (20-00060)

Kristin Kersavage/Pennsylvania State University, S. Ilgin Guler/Pennsylvania State University, Martin Pietrucha/Pennsylvania State University

Effectiveness Evaluation and Parameter Setting of Active-Luminous Road Traffic Markings on Highway at Night Based on the Driving Simulator (20-00845)

Bencheng Zhu/Tongji University, Zhongyin Guo/Tongji University, Cancan Song/Tongji University

An Experimental Analysis of Drivers' Visual Perception of Variable Message Signs (20-02238)

Gianfranco Fancello/Universita degli Studi Di Cagliari, Claudia Pinna/Universita degli Studi Di Cagliari, Patrizia Serra/Universita degli Studi Di Cagliari

Human Factors Assessment of Pavement Marking Retroreflectivity in Simulated Rain and Dry Conditions (20-05983)

Timothy Barrette/Texas A&M Transportation Institute, Adam Pike/Texas A&M Transportation Institute

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1544   CM (1.75)

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 145B
First Mile/Last Mile: Transit Access Explorations
Matt Miller, Metro Analytics, presiding
Sponsored By Standing Committee on Public Transportation Planning and Development

This session gathers papers that touch on a wide variety of public transit access topics.

Built Environment Criteria for Polycentric Developments: To Reduce Vehicle Use and Increase Walking and Transit Use (20-00407)

Keunhyun Park/Utah State University, Reid Ewing/Utah State University, Sadegh Sabouri/Utah State University, Dong-ah Choi/Utah State University, Shima Hamidi/Utah State University, Guang Tian/Utah State University

Exploring the Effects of the Built Environment on Two Transfer Modes for Metros: Dockless Bikesharing and Taxis (20-01959)

Jiaqi Chen/Tongji University, Yixin Li/Tongji University, Ying Ni/Tongji University

(continued)

Spatial Characteristics of Transit-Integrated Ridesourcing Trips and Their Competitiveness with Transit and Walking Alternatives (20-02232)
Jacob Terry/University of Waterloo, Chris Bachmann/University of Waterloo
Assessing Physical Activity Achievement by Using Transit (20-04605)
Judith Mageau-Béland/Ecole Polytechnique de Montreal, Catherine Morency/Ecole Polytechnique de Montreal
Use of Shared Automated Vehicles for First-Mile, Last-Mile Service: Microsimulation of Rail-Transit Connections in Austin, Texas (20-05811)
Yantao Huang/University of Texas, Austin, Kara Kockelman/University of Texas, Austin, Venu Garikapati/University of Texas, Austin, Lei Zhu/University of Texas, Austin, Stanley Young/University of Texas, Austin

1545   CM (1.75)

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 150A
Optimizing Responses to Urban Rail Disruptions
Jason Mumford, AECOM, presiding
Wendy Jia, The World Bank, presiding
Sponsored By Standing Committee on Rail Transit Systems

Successful urban rail operations depend on the understanding of operational bottlenecks and appropriate responses to disruptions and delays in the system. This session highlights several leading papers in the field of disruptions and delays analysis in rail transit systems; operations strategies for service disruption; simulation tools to evaluate bottleneck mitigation strategies; and real-time rescheduling after disturbances.

An Algorithm for Tracing Train Delays to Incident Causes (20-00874)
Anne Halvorsen/New York City Transit, Darian Jefferson/New York City Transit, Timon Stasko/New York City Transit, Alla Reddy/New York City Transit
Evaluation of Subway Bottleneck Mitigation Strategies Using Microscopic Agent-Based Simulation (20-05406)
Jiali Zhou/Northeastern University, Haris Koutsopoulos/Northeastern University, Saeid Saidi/Northeastern University
Operations Strategies for Service Disruptions on Singapore Metro (P20-20980)
Michael Harrison/SBS Transit
An Exact Method for Real-Time Rescheduling After Disturbances in Metro Lines (20-00233)
Konstantinos Gkiotsalitis/University of Twente, Oded Cats/University of Twente, Oskar Eikenbroek/University of Twente
From Delay to Disruption: The Impact of Service Degradation on Public Transport Networks (20-01967)
Alessio Marra/ETH Zurich, Francesco Corman/ETH Zurich

1546

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 147A
Autonomous Vehicles, Drones, Robots, and Home Delivery
Sabreena Anowar, University of Missouri, Columbia, presiding
Sponsored By Standing Committee on Freight Transportation Planning and Logistics

May Autonomous Vehicles Transform Freight and Logistics (20-01321)
El Mehdi Aboulkacem/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, François Combes/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux
Acceptance of Alternative Home Delivery Strategies in the United States (20-02480)
Joshua Schmid/Rensselaer Polytechnic Institute (RPI), Xiaokun (Cara) Wang/Rensselaer Polytechnic Institute (RPI), Jose Holguin-Veras/Rensselaer Polytechnic Institute (RPI)
Saving the NHS: A Case Study Evaluation of Drones and Cargo Cycles for Surgery-to-Hospital Pathology Logistics in Southampton, United Kingdom (20-04349)
Amy Moore/Oak Ridge National Laboratory, Tom Cherrett/Oak Ridge National Laboratory
Can Autonomous Delivery Robots Reduce Last-Mile Energy Consumption and CO2 Emissions? (20-05617)
Dylan Jennings/Portland State University, Miguel Figliozzi/Portland State University

1547

<u>Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 143A</u>
The Social Side of Sustainability: How Airports Promote Safe, Healthy, and Vibrant Communities
Corey Johnson, C&S Companies, presiding
Sponsored By Standing Committee on Environmental Impacts of Aviation, Young Members Council - Aviation

Use of Rating Systems and Reporting Systems at San Diego International Airport (P20-20207)
Beth Breitenbach/Haley & Aldrich, Inc.
Vulnerability to Forced Labor in Airports (P20-20214)
Davina Durgana/The Minderoo Foundation
Social and Economic Topics Emerging from Sustainability (P20-20215)
Carol Lurie/VHB
Climate Change and Aviation (P20-20217)
Clifford Mitchell/State of Maryland

1548

<u>Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, 143B</u>
Improving Airfield Pavement Condition/Rating and Corresponding Costs
Ralph Wessels, Century West Engineering, presiding
Sponsored By Standing Committee on Aircraft/Airport Compatibility

Theoretical Socio-Enviro-Financial Cost Analysis of Equivalent Flexible Aircraft Pavement Structures (20-00341)
Greg White/University of the Sunshine Coast, Georgia Kelly/University of the Sunshine Coast, Helen Fairweather/University of the Sunshine Coast, Ali Jamshidi/University of the Sunshine Coast
Temperature-Based Criteria for Opening Newly Laid Repaired Asphalt Pavement Sections to Aircraft Traffic (20-00889)
Lei He/Chang'an University, L. Chu/Chang'an University, Tien Fwa/Chang'an University
Comparison Analysis of Airfield Pavement Condition Indexes Using FAA PAVEAIR Database (20-03884)
Lukai Guo/Rutgers, The State University of New Jersey, Hao Wang/Rutgers, The State University of New Jersey, Jeffrey Gagnon/Rutgers, The State University of New Jersey
A New Standard- and Thresholds-Based Preventive Maintenance: Decision-Making Optimization for Composite Pavement for Runway (20-04105)
Jianming Ling/Tongji University, ZHENJI WU/Tongji University, Shifu LIU/Tongji University, Penghui LI/Tongji University, Jiake ZHANG/Tongji University
Preliminary Design of Airfield Pavements for T5 Changi East Project, Singapore International Airport (P20-20373)
George Nowak/Hatch

1549

<u>Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Ballroom C</u>
Freight Day, Part 3: Port Automation: The Coming of the Fourth Industrial Revolution (Part 1, Session 1401; Part 2, Session 1472; Part 4, Session 1617)
Avin Sharma, Port of Los Angeles, presiding
Sponsored By Marine Group, Freight Systems Group, Standing Committee on Intermodal Freight Transport, Standing Committee on Intermodal Freight Terminal Design and Operations, Standing Committee on Ports and Channels

Container terminal automation and semi-automation has received much attention in the trade press, usually with a focus on the technology rather than on the challenges facing ports, terminal managers, labor , and drayage operators. The industry veterans on this panel will describe the varying automation and semi-automation strategies, the management changes that must occur, the implications for tomorrow's workforce as well as today's, and the effects on port trucking and terminal turn times.

Automation: The State of the Art and the Craft (P20-21014)
Thomas Ward/WSP

(continued)

Port Automation from a Labor Perspective (P20-21016)
Ray Familathe/ILWU Local 13
Automation and Port Drayage (P20-21017)
Weston LaBar/Harbor Trucking Association

1550

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Ballroom B
State DOT CEO Roundtable: Toward Zero Deaths: State DOTs Renewing Focus on a National Public Health Crisis
Patrick McKenna, Missouri Department of Transportation, presiding
Sponsored By Executive Committee

Ensuring safety of our surface transportation system remains the foremost priority for each state DOT. The 36,750 lives lost on our roadways and work zones in 2018 is wholly and totally unacceptable, and the recent data shows increases in non-motorized fatalities and crashes. This session will examine state DOTs actions to address transportation-related deaths and injuries by raising public awareness, utilizing life-saving technological advancements, and deploying innovative designs to safely accommodate all travelers.

Panel Discussion (P20-21634)
Michael Tooley/Montana Department of Transportation, Brian Ness/Idaho Transportation Department, Marie Therese Dominguez/New York State Department of Transportation, Shawn Wilson/Louisiana Department of Transportation and Development, Toks Omishakin/California Department of Transportation (CALTRANS)

1482

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Transportation Asset Management in Action
Richard Boadi, Wood Environment & Infrastructure Solutions, Inc., presiding
Sponsored By Standing Committee on Transportation Asset Management, Standing Committee on Strategic Management

Using Resilience in Risk-Based Asset Management Plans (20-01610) - A250
Sue McNeil/University of Delaware, YuanChi Liu/University of Delaware
Development of a Risk Assessment Module for Bridge Management Systems in New Jersey (20-04953) - A251
Graziano Fiorillo/Rutgers, The State University of New Jersey, Hani Nassif/Rutgers, The State University of New Jersey
Database Design and Integration Framework for Risk Management for State Highway Agencies (20-02971) - A252
Inya Nlenanya/Iowa State University, Omar Smadi/Iowa State University
Quantitative Risk Analysis for Pavement Assets: A General Framework (20-01438) - A253
Ahmad Alhasan/Applied Research Associates, Inc. (ARA), Omar Smadi/Applied Research Associates, Inc. (ARA), Yazan Abukhalil/Applied Research Associates, Inc. (ARA)
Optimization- and Simulation-Based Individualized Airfield Pavement Maintenance Recommendations to Reduce Total Cost of Ownership for the U.S. Air Force (20-03312) - A254
Thomas Synovec/Mississippi State University, Isaac Howard/Mississippi State University
Integrating In-Vehicle and Handheld RFID Readers for Developing Traffic Signage Inventory Management System in Rural and Urban Environments (20-03386) - A255
Wenzhe Chen/University of Vermont, Joshua Childs/University of Vermont, Saraf Ray/University of Vermont, Byung Lee/University of Vermont, Tian Xia/University of Vermont
ASSISTME-LCCA: Advanced Software for Statewide Integrated Sustainable Transportation Monitoring and Evaluation for Performing Project- and Network-Level Life-Cycle Cost Analysis (20-04077) - A256
Jingqin Gao/New York University Tandon School of Engineering, Kaan Ozbay/New York University Tandon School of Engineering, Hani Nassif/New York University Tandon School of Engineering, Kamal Khayat/New York University Tandon School of Engineering, Sami Demiroluk/New York University Tandon School of Engineering
Asset Valuation: Application and Analysis for Transportation Infrastructure Assets (20-04126) - A257
Zaid Alyami/Jasara, Susan Tighe/Jasara
Identifying Critical Roadways: Efficiency, Fairness, and Robustness (20-04652) - A258
Taehoon Lim/UT Center for Transportation Research, Zhanmin Zhang/UT Center for Transportation Research

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Network-wide Life-Cycle Cost Analysis That Takes into Account the Effect of Road Roughness on Road Capacity (20-05026) - A259

Onur Kalan/New York University, Kaan Ozbay/New York University, Abdullah Kurkcu/New York University, Jingqin Gao/New York University, Vacha Desai/New York University, Drashti Joshi/New York University

Exploration of Interdependency-Based Cross-Asset Maintenance Programming (20-05413) - B450

Zhaohua Wang/Georgia Institute of Technology (Georgia Tech), Mingshu Li/Georgia Institute of Technology (Georgia Tech), Ryan Salameh/Georgia Institute of Technology (Georgia Tech), Yihua Xu/Georgia Institute of Technology (Georgia Tech)

Artificial Intelligence in Transportation Asset Management: Current Practice, Challenges, and Opportunities (20-05475) - B451

Mohammad Zobair Ibne Bashar/University of Colorado, Boulder, Cristina Torres-Machi/University of Colorado, Boulder

Leveraging Data and Technologies for Better Road Paving Performance Management: A Case Study of PaveDC in Washington, D.C. (20-05627) - B452

Ting Ma/District of Columbia Department of Transportation

Policy Implications of Standalone Timing of Interventions Versus Holistic Timing (20-02745) - B453

Runjia Du/Purdue University, Samuel Labi/Purdue University, Jon Fricker/Purdue University, Yu Qiao/Purdue University

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1551

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

Dwight David Eisenhower Transportation Fellowship Program Poster Session, Part 3 (Part 1, Session 1138; Part 2, Session 1274)

Sponsored By Section - Research and Education

1552

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

Research Exploiting Urban and Regional Transportation Data

Clotilde Minster, The World Bank, presiding

Stacey Bricka, MacroSys Research and Technology, presiding

Sponsored By Standing Committee on Urban Transportation Data and Information Systems

 This poster session includes papers that investigated a wide variety of innovations using urban and regional data . Topics covered include: data from ride hailing systems, examinations of methods to estimate multimodal origin-destination data, applications of probe speed data, methods to process and apply vehicle trajectory data, and examinations of regional travel patterns.

How Built Environment Impacts Online Carhailing Ridership (20-01077) - A120

Hui Bi/Southeast University, Zhirui Ye/Southeast University, Chao Wang/Southeast University, Enhui Chen/Southeast University

An Explanatory Model of Transfer Flow Between Bus and Metro Using Network Properties (20-01606) - A121

Wenjing Wang/Research Institute of Highway, Ministry of Transport, Yihong Wang/Research Institute of Highway, Ministry of Transport, Gonçalo Correia/Research Institute of Highway, Ministry of Transport, Yusen Chen/Research Institute of Highway, Ministry of Transport

Cycle-Based Traffic Volume Estimation Using Sampled Vehicle Trajectory Data: Tucker Decomposition Method (20-01704) - A122

Keshuang Tang/Tongji University, Chaopeng Tan/Tongji University, Yumin Cao/Tongji University, Jiarong Yao/Tongji University, Jian Sun/Tongji University

Feature Selection for Enhancing Purpose Imputation from GPS Data Without GIS Data (20-02203) - A123

Minh Hieu Nguyen/IFSTTAR , Jimmy Armoogum/IFSTTAR

A Framework to Quantify the Differences in Multimodal Travel Demand: A Case Study Using Brisbane Bluetooth and Smartcard Data (20-03007) - A124

Etikaf Hussain/Queensland University of Technology, Krishna Behara/Queensland University of Technology, Ashish Bhaskar/Queensland University of Technology, Edward Chung/Queensland University of Technology

Statistical Evaluation of the Data Requirement for Ramp Metering Performance Assessment: A Case Study of SR-51, Arizona (20-03641) - A125

Xiaobo Ma/University of Arizona, Abolfazl Karimpour/University of Arizona, Yao-Jan Wu/University of Arizona

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Exploring Regional Travel Time Reliability Concepts with a Case Study in Virginia (20-04721) - A126

Chien-Lun Lan/Virginia Transportation Research Council, Mo Zhao/Virginia Transportation Research Council, Ramkumar Venkatanarayana/Virginia Transportation Research Council, Justice Appiah/Virginia Transportation Research Council

Assessing Urban Travel Patterns: An Analysis of Traffic Analysis Zone-Based Mobility Patterns (20-05748) - A127

zheng zhang/Beijing University of Technology, Yanyan Chen/Beijing University of Technology, Tianwen Liang/Beijing University of Technology

An Innovative Non-Parametric Method for Data Outlier Filtering (20-05761) - A128

Zifeng Wu/Kittelson & Associates, Inc. (KAI), Zhouxiang Wu/Kittelson & Associates, Inc. (KAI), Laurence Rilett/Kittelson & Associates, Inc. (KAI)

Estimation of Origin-Destination Matrices with Floating Car Data. Experimental Results, and Practical Considerations (20-05901) - A129

Gregorio Gecchele/SRL Ltd, Massimiliano Gastaldi/SRL Ltd, Riccardo Rossi/SRL Ltd

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1554

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

Advancements in Asphalt Materials and Technologies

Lindsi Hammond, Geotechnical Resources, Inc. (GRI), presiding

Sponsored By Standing Committee on Critical Issues and Emerging Technologies in Asphalt

 This poster session presents the latest in asphalt materials and technology advancements covering a wide range of topics from presenters all over the world.

Quantification of the Effect of Binder Source on the Flexibility of Long-Term Aged Asphalt Concrete (20-00695) - B403

Zehui Zhu/University of Illinois, Urbana Champaign, Punit Singhvi/University of Illinois, Urbana Champaign, Uthman Mohamed-Ali/University of Illinois, Urbana Champaign, Hasan Ozer/University of Illinois, Urbana Champaign, Imad Al-Qadi/University of Illinois, Urbana Champaign

Evaluation of the Minnesota Asphalt Mixtures Based on a Balanced Mix Design Approach (20-00417) - B405

Haydar Al-Khayat/Texas A&M University, David Newcomb/Texas A&M University, Fujie Zhou/Texas A&M University, David Deusen/Texas A&M University

Development of a Long-Term Aging Protocol for Asphalt Mixtures (20-00716) - B398

Shashwath Sreedhar/GeoDesign, Inc., Erdem Coleri/GeoDesign, Inc.

Removal Method Evaluations of Residual Mineral Fillers Based on FTIR (20-01172) - B409

Qian Xiang/Tongji University, Xiangdao Hou/Tongji University, Zifeng Zhao/Tongji University, Tao Wang/Tongji University, Feipeng Xiao/Tongji University

Performance Characterization of Asphalt Binders Modified with Recycled Polyethylene (20-01323) - B408

Fan Yin/National Center for Asphalt Technology (NCAT), Raquel Moraes/National Center for Asphalt Technology (NCAT), Nam Tran/National Center for Asphalt Technology (NCAT), Kim Holmes/National Center for Asphalt Technology (NCAT)

Correlating the Asphalt Binder High-Temperature Properties to HMA Permanent Deformation and Field Rutting: A Laboratory Field Study (20-01526) - B407

Lubinda WALUBITA/Texas A&M Transportation Institute, Enad Mahmoud/Texas A&M Transportation Institute, Luis Fuentes/Texas A&M Transportation Institute, Adrianus Prakoso/Texas A&M Transportation Institute, Mena Souliman/Texas A&M Transportation Institute, Sang-Ick Lee/Texas A&M Transportation Institute

Laboratory Simulation and Performance Assessment of Segregation in Asphalt Mixture (20-02233) - B396

Nishant Bhargava/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, Samsuz Zaman/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, Anjan Siddagangaiah/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

Variability of Reclaimed Asphalt Pavement (RAP) Properties Within a State and Its Effects on RAP Specifications (20-02515) - B402

Alexander Austerman/University of Massachusetts, Dartmouth, Walaa Mogawer/University of Massachusetts, Dartmouth, Kevin Stuart/University of Massachusetts, Dartmouth

A Long-Term Field Study on Low-Temperature Cracking Performance of Asphalt Pavements Using the Bending Beam Rheometer (20-03620) - B397

Abu Sufian Mohammad Asib/University of Utah, Pedro Romero/University of Utah, Faramarz Safazadeh/University of Utah

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Evaluation of the Dongre Workability Test for Characterizing Consistency of RAP Piles (20-04119) - B401

David J. Mensching/Federal Highway Administration (FHWA), Jack Youtcheff/Federal Highway Administration (FHWA), Raj Dongre/Federal Highway Administration (FHWA)

Evaluation of Graphite Nanoplatelets Influence on the Compaction Properties of Asphalt Mixtures (20-04203) - B404

Tianhao Yan/Universita Politecnica delle Marche, Lorenzo Paolo Ingrassia/Universita Politecnica delle Marche, Ravi Kumar/Universita Politecnica delle Marche, Mugurel Turos/Universita Politecnica delle Marche, Francesco Canestrari/Universita Politecnica delle Marche, Xiaohu Lu/Universita Politecnica delle Marche, Mihai Marasteanu/Universita Politecnica delle Marche

Development of a 4.75 mm (No. 4) NMAS Mixture for Implementation in LADOTD Specifications (20-04881) - B399

Saman Salari/Louisiana Department of Transportation and Development, Corey Mayeux/Louisiana Department of Transportation and Development, Samuel Cooper/Louisiana Department of Transportation and Development

A New Mixture Design Approach for Mitigating Cracking Issue of Asphalt Concrete Pavement (20-05290) - B406

Md Mehedi Hasan/University of New Mexico, Rafi Tarefder/University of New Mexico

Comparison of Methods for Accelerated Aging Treatments of Compacted Asphalt Mixtures (20-05082) - B400

Yong Wen/Hong Kong Polytechnic University, Yuhong Wang/Hong Kong Polytechnic University, Ling Chen/Hong Kong Polytechnic University, Fang-Jin Li/Hong Kong Polytechnic University, Kin-Ming Chan/Hong Kong Polytechnic University

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1555

<u>Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A</u>

Asphalt Binders: Modified Binders, Specifications, and Investigations

Moses Akentuna, Louisiana Transportation Research Center (LTRC), presiding
Enad Mahmoud, Texas Department of Transportation, presiding
Sponsored By Standing Committee on Asphalt Binders

This is a poster session on asphalt binders. Topics included are modified binders, specifications, and other investigations.

Investigating the Rheology and Performance-Related Properties of Crumb Rubber Modified Bitumen Using Conventional and New DSR Tests (20-00087) - B377

Mrinali Rochlani/Technische Universität Dresden, Sabine Leischner/Technische Universität Dresden, David Wareham/Technische Universität Dresden, Silvia Caro/Technische Universität Dresden, Gustavo Canon Falla/Technische Universität Dresden, Frohmut Wellner/Technische Universität Dresden

Effect of Epoxy Modification on the Oxidative Aging of Asphalt Mastics (20-00262) - B344

Panos Apostolidis/Delft University of Technology, Xueyan Liu/Delft University of Technology, Paul Marocho/Delft University of Technology, Martin van de Ven/Delft University of Technology, Sandra Erkens/Delft University of Technology, Tom Scarpas/Delft University of Technology

Differential Scanning Calorimetric Studies of Crosslinking Epoxy-Asphalt Binders (20-00272) - B345

Panos Apostolidis/Delft University of Technology, Xueyan Liu/Delft University of Technology, Sandra Erkens/Delft University of Technology, Tom Scarpas/Delft University of Technology

Design of Epoxy-Asphalt Binder as Binary System (20-00273) - B346

Panos Apostolidis/Delft University of Technology, Xueyan Liu/Delft University of Technology, Sandra Erkens/Delft University of Technology, Tom Scarpas/Delft University of Technology

Chemical and Rheological Characterization of Aging Behaviors of Xinjiang Rock Asphalt-Modified Bitumen (20-00359) - B352

Long Cheng/Southeast University, Jiang Yu/Southeast University, Lei Zhang/Southeast University

Optimization Process of Self-Healing Polyurethane Prepolymer Modified Asphalt Binder (20-00397) - B382

Sharareh Shirzad/Louisiana State University, Marwa Hassan/Louisiana State University, Louay Mohammad/Louisiana State University, Sreelatha Balamurugan/Louisiana State University

Rheological and Mechanical Evaluation of Polyurethane Prepolymer Modified Asphalt Mixture with Self-Healing Abilities (20-00473) - B381

Sharareh Shirzad/Louisiana State University, Marwa Hassan/Louisiana State University, Louay Mohammad/Louisiana State University

The Effect of Laboratory Aging on Chemistry and Rheology of Crumb Rubber Modified Bitumen (20-00492) - B353

Haopeng Wang/Delft University of Technology, Xueyan Liu/Delft University of Technology, Panos Apostolidis/Delft University of Technology, Martin van de Ven/Delft University of Technology, Sandra Erkens/Delft University of Technology, Tom Scarpas/Delft University of Technology

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Correlating Bitumen SARA Fractions to Rheological Indicators and Tensile Strength (20-00621) - B347

Nazmus Sakib/University of Illinois at Urbana-Champaign, Ramez Hajj/University of Illinois at Urbana-Champaign, Rachel Hure/University of Illinois at Urbana-Champaign, Ayah Alomari/University of Illinois at Urbana-Champaign, Amit Bhasin/University of Illinois at Urbana-Champaign

Multi-Gene Genetic Programming Models for Asphalt Rubber Binder Viscosity Prediction (20-00700) - B368

Michele Lanotte/Khalifa University of Science and Technology, Sepehr Soleimani/Khalifa University of Science and Technology

Effects of Lignin Modification on Bitumen Rheology (20-00768) - B343

Yi Zhang/Chang'an University, Xueyan Liu/Chang'an University, Panos Apostolidis/Chang'an University, Wolfgang Gard/Chang'an University, Natascha Poeran/Chang'an University, Martin van de Ven/Chang'an University, Sandra Erkens/Chang'an University, Tom Scarpas/Chang'an University

Relating Linear Viscoelastic Rheology to Fatigue and Rutting Characteristics of Crumb Rubber Modified Binders (20-00782) - B365

Anas Jamrah/Marathon Petroleum Company LP, M. Emin Kutay/Marathon Petroleum Company LP

Experimental Investigation of Rubber Swelling in Bitumen (20-00944) - B354

Haopeng Wang/Delft University of Technology, Xueyan Liu/Delft University of Technology, Panos Apostolidis/Delft University of Technology, Sandra Erkens/Delft University of Technology, Tom Scarpas/Delft University of Technology

Complex Shear Modulus Prediction of Crumb Rubber Modified Bitumen Using Micromechanical Models (20-00945) - B355

Haopeng Wang/Delft University of Technology, Xueyan Liu/Delft University of Technology, Hong Zhang/Delft University of Technology, Sandra Erkens/Delft University of Technology, Tom Scarpas/Delft University of Technology

Evaluation of High-Temperature Performance and Modification Mechanism of Different Asphalt Binders Modified with Waste Engine Oil Bottom (20-01164) - B367

Aimin Sha/Chang'an University, WANG TONG/Chang'an University, Wei Jiang/Chang'an University, Baowen Lou/Chang'an University

Characterization of Plasma-Treated Rubberized Asphalt by DSR and GPC (20-01234) - B375

Jin Li/Tongji University, Feipeng Xiao/Tongji University, Serji Amirkhanian/Tongji University

A Micro-Extraction Method for Use with 4 mm Plate Geometry in the Dynamic Shear Rheometer to Evaluate Asphalt Binder Rheology (20-01516) - B348

Angelo Filonzi/University of Texas, Austin, Sang Ki Lee/University of Texas, Austin, Wellington Ferreira/University of Texas, Austin, Ramez Hajj/University of Texas, Austin, Amit Bhasin/University of Texas, Austin

Non-Linear Viscoelastic Response of Crumb Rubber Modified Asphalt Binder Under Large Strains (20-03039) - B340

Saqib Gulzar/North Carolina State University, B. Shane Underwood/North Carolina State University

Adhesion and Healing Properties Investigation of Modified Asphalt Binders (20-03042) - B350

Lu Zhou/Tongji University, Weidong Huang/Tongji University, Chuanqi Yan/Tongji University, Quan Lv/Tongji University

Low Temperature Performance Grade Characterization of Asphalt Binder Using the Dynamic Shear Rheometer (20-03057) - B341

Zhe Zeng/North Carolina State University, B. Shane Underwood/North Carolina State University, Cassie Castorena/North Carolina State University

Effect of Sulfur on Aging Characteristics of Terminal Blend Hybrid Binder (20-03153) - B378

Naipeng Tang/Chongqing University, Ruikun Dong/Chongqing University

Effect of Bio-Oil Composition on Surface Activation of Rubber Particles in Asphalt Binder (20-03206) - B359

Sk Faisal Kabir/Arizona State University, Ellie Fini/Arizona State University

Laboratory Evaluation of the Rotational Viscosity of Reacted and Activated Rubber Modified Binders (20-03286) - B357

Mayzan Isied/University of Texas, Tyler, Mena Souliman/University of Texas, Tyler

Neural Network Modeling for the Rotational Viscosity of Reacted and Activated Rubber Modified Binders (20-03290) - B358

Mayzan Isied/University of Texas, Tyler, Mena Souliman/University of Texas, Tyler

Rheological and Molecular Characterizations of Tire Rubber Modified Asphalt Emulsion (20-03403) - B384

Md Tanvir Sarkar/Louisiana State University, Md Nafiur Rahman/Louisiana State University, Mostafa Elseifi/Louisiana State University, Corey Mayeux/Louisiana State University, Samuel Cooper/Louisiana State University

Effects of Asphalt Binder on the Performance of Gussasphalt Concrete for Steel Deck Bridges (20-03413) - B351

Guilian Zou/South China University of Technology, Xiaoyan Xu/South China University of Technology, Jianxin Li/South China University of Technology, Huayang Yu/South China University of Technology, Changjun Wang/South China University of Technology, Xinhai Liu/South China University of Technology

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Development of Asphalt Performance Grades for Superpave Mix Design in Oman (20-03646) - B363

Mostafa AboHashema/Fayoum University Faculty of Engineering, Ragab Mousa/Fayoum University Faculty of Engineering, Hilal Al Abdel Salam/Fayoum University Faculty of Engineering

Enhanced Storage Stability of Polymer Modified Asphalt Through Nano-Montmorillonite Modification (20-03714) - B369

Zhibin Ren/South China University of Technology, Jiangmiao Yu/South China University of Technology, Zeyu Zhang/South China University of Technology, Feng Guo/South China University of Technology, Huayang Yu/South China University of Technology

Effect of Photocatalysts Modification on Asphalt: Investigations by Laboratory Experiments and Molecular Dynamics Simulation (20-03872) - B349

Xuejuan Cao/Chongqing Jiaotong University School of Civil Engineering, Mei Deng/Chongqing Jiaotong University School of Civil Engineering, Yongjie Ding/Chongqing Jiaotong University School of Civil Engineering, Boming Tang/Chongqing Jiaotong University School of Civil Engineering, Xiaoyu Yang/Chongqing Jiaotong University School of Civil Engineering, Bailin Shan/Chongqing Jiaotong University School of Civil Engineering

Development and Rheological Characterization of STEAM-Modified Asphalt Binder (20-03874) - B366

Rituraj Patel/Indian Institute of Technology, Tirupati, Vinay Nanjegowda/Indian Institute of Technology, Tirupati, Jagadeesh Mahimaluru/Indian Institute of Technology, Tirupati, Krishna Prapoorna Biligiri/Indian Institute of Technology, Tirupati

Effect of Crumb Rubber Modifier Dissolution on Elasticity of Asphalt Binder (20-04292) - B374

Eslam Deef-Allah/Missouri University of Science and Technology, Magdy Abdelrahman/Missouri University of Science and Technology, Yanxiao Li/Missouri University of Science and Technology, Chenglin Wu/Missouri University of Science and Technology

Revised Short-Term Aging Procedures for Asphalt Rubber Binders (20-04423) - B383

David Jones/University of California, Davis, Hashim Rizvi/University of California, Davis, Yanlong Liang/University of California, Davis, Mohamed Alavi/University of California, Davis

Exploration of Alternatives of Elastic Recovery and Conventional Fatigue Analysis Tests of Modified Binders (20-04550) - B380

M Morshed/Arkansas State University, Zahid Hossain/Arkansas State University, Dao-Hao Chen/Arkansas State University, Gaylon Baumgardner/Arkansas State University

Impact of Additives on Cracking Properties of Soft Binders Used in Cold Region (20-04824) - B379

Zhaoxing Xie/Rowan University, Ayman Ali/Rowan University, Yusuf Mehta/Rowan University, Ahmed Saidi/Rowan University, Sai Venkata Gnaneswari Chitikela/Rowan University, Neirouz Bouhrira/Rowan University, Wade Lein/Rowan University, Christopher DeCarlo/Rowan University

Implementation of the AASHTO M 332 Specification: A Case Study (20-04945) - B342

Akshay Gundla/Applied Research Associates, Inc. (ARA), Ramadan Salim/Applied Research Associates, Inc. (ARA), B. Shane Underwood/Applied Research Associates, Inc. (ARA), Kamil Kaloush/Applied Research Associates, Inc. (ARA)

Thermo-Viscoelastic Analyses of Low-Temperature Cracking Performances of SBS Polymer Modified Binders (20-05008) - B364

Md Amanul Hasan/University of New Mexico, Rafi Tarefder/University of New Mexico

Effect of Guayule Resin as a Bio-Based Additive on Storage Stability and Liquid Phase Separation of Asphalt Rubber Binder (20-05186) - B373

Ahmed Hemida/Missouri University of Science and Technology, Magdy Abdelrahman/Missouri University of Science and Technology

Using Conventional Performance Grading Tests to Determine the Poisson's Ratio of Asphalt Binders at Low Temperatures (20-05657) - B376

Pouria Hajikarimi/Purdue University, Mohammad Ali Notani/Purdue University, Reyhaneh Rahbar-Rastegar/Purdue University, John Haddock/Purdue University

An Experimental Study of Mixing Carbon Nanotubes with Asphalt Binder Using Foaming Technology (20-05716) - B356

Mehdi Zadshir/Columbia University, Xiaokong Yu/Columbia University, Irene Nigro/Columbia University, Huiming Yin/Columbia University

Asphalt Binders: Rejuvenation, Non-Specification Testing, and Investigations

Kamal Hossain, Memorial University of Newfoundland, presiding
Zhanping You, Michigan Technological University, presiding
Sponsored By Standing Committee on Asphalt Binders

 This is a poster session on asphalt binders. Topics included are rejuvenation, non-specification testing, and other investigations.

Impact of Reactive Oxygen Species on Asphalt Binder Aging (20-00240) - B335

Johannes Mirwald/Vienna University of Technology, Daniel Maschauer/Vienna University of Technology, Bernhard Hofko/Vienna University of Technology, Hinrich Grothe/Vienna University of Technology

Adsorption-Desorption Reaction Model of Asphalt Binder on a Calcium Functionalized Mineral Surface (20-00263) - B336

Panos Apostolidis/Delft University of Technology, Xueyan Liu/Delft University of Technology, Martin van de Ven/Delft University of Technology, Aikaterini Varveri/Delft University of Technology, Sandra Erkens/Delft University of Technology, Tom Scarpas/Delft University of Technology

Fatigue Resistance of Aged Asphalt Binders: An Investigation of Different Analytical Methods in Linear Amplitude Sweep Test (20-00277) - B316

Hanyu Zhang/Southeast University, Kairen Shen/Southeast University, Gang Xu/Southeast University, Xianhua CHEN/Southeast University

Study of Rejuvenator Effects on Aged Asphalt Using Molecular Dynamics Simulation (20-00580) - B301

Bingyan Cui/Southeast University, Xingyu Gu/Southeast University

Microscopic Observations of Cavitation Instability in Asphalt Binders at Intermediate Temperature (20-00596) - B338

Ramez Hajj/University of Illinois at Urbana-Champaign, Adam Ramm/University of Illinois at Urbana-Champaign, Amit Bhasin/University of Illinois at Urbana-Champaign, Michael Downer/University of Illinois at Urbana-Champaign

Investigation of Viscoelastic Behavior of Asphalt Mastic with Different Filler Contents Using the Multiple Stress Creep Test (20-01127) - B324

Song Li/National University of Singapore, Ghim Ong/National University of Singapore, Fujian Ni/National University of Singapore

Crack Length–Based Healing Characterization of Bitumen at Different Levels of Cracking Damage (20-01213) - B302

Linglin Li/Aston Institute of Materials Research, Yangming Gao/Aston Institute of Materials Research, Yuqing Zhang/Aston Institute of Materials Research

Investigating Degree of Blending Between RAP and Virgin Binder Using Atomic Force Microscopy and Focused Ion Beam (20-01419) - B333

Mansour Solaimanian/No Organization, Xuan Chen/No Organization

Relating Asphalt Binders Response to LAS and LAOS Tests at Intermediate Temperatures (20-01598) - B317

Nikhil Saboo/Indian Institute of Technology, Bhubaneswar, Mayank Sukhija/Indian Institute of Technology, Bhubaneswar, Mohit Chaudhary/Indian Institute of Technology, Bhubaneswar

Modeling Crack Evolution in Bituminous Binders Under a Cyclic Torsional Load Using Pseudo J-Integral Paris' Law (20-02022) - B303

Yangming Gao/Aston University, Linglin Li/Aston University, Yuqing Zhang/Aston University

Aging Characterizations of Modified Asphalt Binders Based on Low Field Nuclear Magnetic Resonance (20-02214) - B304

Jing Li/Suzhou University of Science and Technology, Junan Shen/Suzhou University of Science and Technology, Pengcheng Shi/Suzhou University of Science and Technology

The Effect of Rejuvenators on Performance-Based Properties of Aged Polymer Modified Bitumen (20-02432) - B325

Peng Lin/Tongji University, Xueyan Liu/Tongji University, Panos Apostolidis/Tongji University, Sandra Erkens/Tongji University, Martin van de Ven/Tongji University, Tom Scarpas/Tongji University, Weidong Huang/Tongji University

Statistical Evaluation of Short-Term Aging Using Large Molecular Size of Asphalt in the Mixtures with Anti-Stripping Additives (20-02623) - B314

Sungun Kim/Kangwon National University, Young-jin Jo/Kangwon National University, Yeong-sam Kim/Kangwon National University, Kwang W. Kim/Kangwon National University

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Do "Bee Structures" Hinder Self-Healing Processes in Bitumen? (20-02908) - B320

Ellie Fini/Arizona State University, Albert Hung/Arizona State University, Masoumeh Mousavi/Arizona State University

Optimizing the Rejuvenators Dosage of Aged Polymer Modified Bitumen Through Performance-Based Tests (20-03013) - B326

Peng Lin/Tongji University, Xueyan Liu/Tongji University, Panos Apostolidis/Tongji University, Sandra Erkens/Tongji University, Martin van de Ven/Tongji University, Tom Scarpas/Tongji University, Weidong Huang/Tongji University

Chemical and Rheological Characterization of Biological Oil and Bio Asphalt by Hydrothermal Liquefaction Using Lignocellulose (20-03173) - B339

Yongjie Ding/Chongqing Jiaotong University School of Civil Engineering, Xiaolong Li/Chongqing Jiaotong University School of Civil Engineering, Yugui Liu/Chongqing Jiaotong University School of Civil Engineering, Xuejuan Cao/Chongqing Jiaotong University School of Civil Engineering, Boming Tang/Chongqing Jiaotong University School of Civil Engineering, Mei Deng/Chongqing Jiaotong University School of Civil Engineering

Thermal Characteristics and Non-Isothermal Kinetics Analysis of Asphalt Sara Fractions (20-03268) - B312

wenjing xia/Nanjing Forestry University, Hao Wang/Nanjing Forestry University, Tao Xu/Nanjing Forestry University

Estimating Asphalt Binder Fatigue at Multiple Temperatures Using a Simplified Pseudo-Strain Energy Analysis Approach in the LAS Test (20-03332) - B328

Hui Chen/University of Wisconsin, Madison, Yuan Zhang/University of Wisconsin, Madison, Hussain U. Bahia/University of Wisconsin, Madison

Laboratory Investigation of the Adhesion and Self-Healing Properties of High-Viscosity Modified Asphalt Binders (20-03985) - B300

Mingjun Hu/Tongji University, Daquan Sun/Tongji University, Tong Lu/Tongji University, Jianmin Ma/Tongji University, Fan Yu/Tongji University

Laboratory Evaluation of the Property of Asphalt Binder in Mastic by MSCR Test (20-04306) - B323

Song Li/Southeast University, Fujian Ni/Southeast University, Qiao Dong/Southeast University

Fourier Transformation Infra-Red Spectroscopic Analyses of Modified Asphalt Binders (20-04412) - B337

Mohammad Nazmul Hassan/Arkansas State University, Zahid Hossain/Arkansas State University, Zhanping You/Arkansas State University, Gaylon Baumgardner/Arkansas State University

Effect of Soy-Based Asphalt Rejuvenators on Asphalt Binders of Different Performance Grades (20-04585) - B306

Adalberto Faxina/Universidade de São Paulo, Felipe Santos/Universidade de São Paulo

Evaluation of Cracking Susceptibility of Alaskan Polymer Modified Asphalt Binders Using Chemical and Rheological Indices (20-04587) - B321

Jun Liu/Missouri University of Science and Technology, Jenny Liu/Missouri University of Science and Technology, Steve Saboundjian/Missouri University of Science and Technology

Rheology and Oxidative Aging of Oils Used in Asphalt Recycling (20-04764) - B327

Jing Xu/University of Wisconsin, Madison, Yuan Zhang/University of Wisconsin, Madison, Hussain U. Bahia/University of Wisconsin, Madison

Correlating Laboratory Conditioning with Field Aging for Asphalt Using Rheological Parameters (20-04797) - B313

Runhua Zhang/University of New Hampshire, Jo Sias/University of New Hampshire, Eshan Dave/University of New Hampshire

Behaviors of Asphalt Under Certain Aging Degrees and Effects of Rejuvenation (20-04916) - B308

Tao Zhou/Harbin Institute of Technology, Liping Cao/Harbin Institute of Technology, Ellie Fini/Harbin Institute of Technology, Zejiao Dong/Harbin Institute of Technology, Zhiyang Liu/Harbin Institute of Technology, Xuchang Ying/Harbin Institute of Technology

A New Time-Temperature Superposition Method for Joint Optimization of Complex Shear Modulus and Phase Angle of Asphalt Binder (20-05045) - B310

Kinming Chan/Hong Kong Polytechnic University, Yuhong Wang/Hong Kong Polytechnic University, Fang-Jin Li/Hong Kong Polytechnic University

Changes in the Relaxation Spectra of Asphalt Binders During Aging and Rejuvenation (20-05096) - B311

Fang-Jin Li/Hong Kong Polytechnic University, Yuhong Wang/Hong Kong Polytechnic University, Kin-Ming Chan/Hong Kong Polytechnic University

Influence of Different Rejuvenator Incorporation Methods on the Rheological and Aging Properties of the Recycled Asphalt Binders (20-05111) - B322

Yuetan Ma/University of Tennessee, Knoxville, Wei Hu/University of Tennessee, Knoxville, Pawel Polaczyk/University of Tennessee, Knoxville, Bingye Han/University of Tennessee, Knoxville, Miaomiao Zhang/University of Tennessee, Knoxville, Baoshan Huang/University of Tennessee, Knoxville

Correlating the Binder Fatigue Parameters to Axial Fatigue Test for Asphalt Mixtures (20-05133) - B332

Ramadan Salim/Arizona State University, B. Shane Underwood/Arizona State University, Kamil Kaloush/Arizona State University

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DSR Testing and Mechanistic Analysis to Predict BBR Low Temperature Behavior of Asphalt Binder (20-05171) - B305

Santosh Kommidi/University of Nebraska, Lincoln, Yong-Rak Kim/University of Nebraska, Lincoln

Development of a Computer Program for Calculation of Alpha Parameter in LAS Test and Comparison with Rheological Parameters (20-05551) - B330

Seyed Farhad Abdollahi/Sharif University of Technology, Mehdi Farrokhi/Sharif University of Technology, Nader Tabatabaee/Sharif University of Technology

Role of Aging, Rejuvenation, and SBS Modification on Healing Capacity of Asphalt Binders Using a Simplified Viscoelastic Continuum Damage Model (20-05558) - B331

Babak Asadi/Sharif University of Technology, Nader Tabatabaee/Sharif University of Technology

A Tool Based on the Linear-Elastic Fracture Mechanics to Analyze the Outputs of the Linear Amplitude Sweep Test (20-05581) - B307

Daniela Garcia/Universidade de São Paulo, Adalberto Faxina/Universidade de São Paulo

Evaluation of Laboratory Aging Procedures on Field Cracking Performance of Asphalt Binders (20-05598) - B329

Raquel Moraes/National Center for Asphalt Technology (NCAT), Fan Yin/National Center for Asphalt Technology (NCAT), Chen Chen/National Center for Asphalt Technology (NCAT), Adrian Andriescu/National Center for Asphalt Technology (NCAT), David J. Mensching/National Center for Asphalt Technology (NCAT), Nam Tran/National Center for Asphalt Technology (NCAT)

Rheological Characterization of Rejuvenated Asphalt Binders (20-05620) - B315

Rayhan Bin Ahmed/Memorial University of Newfoundland, Kamal Hossain/Memorial University of Newfoundland, Mike Aurilio/Memorial University of Newfoundland

Field Implementation of Handheld Fourier Transform Infrared Spectrometer for Quantifying SBS Content in Polymer Modified Asphalt Binder (20-05776) - B319

Roksana Hossain/Louisiana Tech University, Lamiya Noor/Louisiana Tech University, Nazimuddin Wasiuddin/Louisiana Tech University, Louay Mohammad/Louisiana Tech University

Implementation of Handheld FT-IR Spectrometer to Determine the RAP Content for Quality Control of Plant Mix (20-05840) - B318

Shams Arafat/Louisiana Tech University, Lamiya Noor/Louisiana Tech University, Nazimuddin Wasiuddin/Louisiana Tech University, Delmar Salomon/Louisiana Tech University

Automated System for Asphalt Performance Testing (20-06000) - B334

Haleh Azari/Pavement Systems, LLC, Alaeddin Mohseni/Pavement Systems, LLC

Optimizing the Efficiency of Bio-Rejuvenators Using a Balanced Feedstock (20-06126) - B309

Alireza Samieadel/Arizona State University, Amirul Islam Rajib/Arizona State University, Kodanda Phani Raj Dandamudi/Arizona State University, Daniel Oldham/Arizona State University, Shuguang Deng/Arizona State University, Ellie Fini/Arizona State University

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

Using Rubber in Asphalt Mixtures
Jennifer Breuer, Superior Bowen, presiding
Sponsored By Standing Committee on Non-Binder Components of Asphalt Mixtures

Fracture and Toughness Behavior of Polymer and Crumb Rubber Modified Asphalt Mastics Composed of Basalt and Hydrated Lime Fillers (20-00141) - B391

Dharamveer Singh/Indian Institute of Technology, Bombay, Aditya Das/Indian Institute of Technology, Bombay, Ayyanna Habal/Indian Institute of Technology, Bombay, Shreyanshu Bhonsle/Indian Institute of Technology, Bombay

Fatigue Performance Assessment of Recycled Tire Rubber Modified Asphalt Mixtures Using Viscoelastic Continuum Damage Analysis and AASHTOWare Pavement ME Design (20-03990) - B392

Salih Kocak/University of West Florida, M. Emin Kutay/University of West Florida

Temperature to Perform Fatigue Tests from Rheological Behavior of Asphalt Rubber Mixtures (20-04137) - B390

Liseane Thives/Universidade Federal de Santa Catarina, Jorge Pais/Universidade Federal de Santa Catarina

Fatigue Fracture Properties of Asphalt Mixes Containing Low Content of Crumb Rubber Modifier (20-04482) - B394

Yanlong Liang/University of California, Davis, John Harvey/University of California, Davis, Rongzong Wu/University of California, Davis, Liya Jiao/University of California, Davis, David Jones/University of California, Davis

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Laboratory Evaluation of Rubberized Binder and Mix Containing a Low Content of Devulcanized Rubber Modifier (20-04642) - B393
Yanlong Liang/University of California, Davis, David Jones/University of California, Davis, John Harvey/University of California, Davis, Jeffery Buscheck/University of California, Davis
Laboratory Investigation of High Rubber Content in Hot Mix Asphalt Mixtures (20-04947) - B395
Siyu Chen/Michigan Technological University, Dongdong Ge/Michigan Technological University, Dongzhao Jin/Michigan Technological University, Xiaodong Zhou/Michigan Technological University, Zhanping You/Michigan Technological University

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Addressing Additives in Asphalt Mixtures and Cold Mix
Fan Yin, National Center for Asphalt Technology (NCAT), presiding
Sponsored By Standing Committee on Non-Binder Components of Asphalt Mixtures

Characterization of the Evolutive Mechanical Properties and Electrical Resistance of Cold Mix Asphalt Prepared with Bitumen Emulsion and Cement During Curing (20-01081) - B387
Rui Li/Hong Kong Polytechnic University, Zhen Leng/Hong Kong Polytechnic University, Yongli Wang/Hong Kong Polytechnic University, Fuliao Zou/Hong Kong Polytechnic University
Effect of Wastewater Treatment Sludge (WTS) on Binder and HMA Performance (20-02936) - B389
Robeam Melaku/University of North Dakota, Jun Liu/University of North Dakota, Daba Gedafa/University of North Dakota
Laboratory Evaluation of Modified Hot Mix Asphalt Using Nanoclay and Nanocellulose (20-03916) - B388
Thomas Johnson/University of Alberta, Leila Hashemian/University of Alberta
Frictional Characterization of Evotehrm Modified Warm Mix Asphalt to Evaluate the Ease of Mixing and Compaction (20-04563) - B386
Biswajit Bairgi/University of New Mexico, Rafi Tarefder/University of New Mexico

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Earthwork Issues in the Transportation Field
Michelle Bernhardt-Barry, University of Arkansas, Fayetteville, presiding
Stacey Kulesza, Kansas State University, presiding
Sponsored By Standing Committee on Transportation Earthworks

New methods to calculate earthwork quantities during construction and slope failure studies are presented.

Research on 3D Earthwork Calculation Algorithm and Development (20-03936) - B419
Nan Li/Southeast University, Mengru Zhang/Southeast University, Li Dong/Southeast University, Jianchuan Cheng/Southeast University, Yunlong Zhang/Southeast University
Failure Analysis of an Instrumented Highway Slope on Yazoo Clay (20-04060) - B429
Mohammad Sadik Khan/Jackson State University, Masoud Nobahar/Jackson State University, Robert Ferguson/Jackson State University, Henry Chia/Jackson State University, John Ivoke/Jackson State University

Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Advances in Numerical Modeling and Soft Computing for Assessing Performance of Geotechnical Assets
Alessandra Bianchini, U.S. Air Force Civil Engineer Center (USAFCEC), presiding
Surya Sarat Chandra Congress, Texas A&M University, presiding
Sponsored By Standing Committee on Geotechnical Instrumentation and Modeling

In this session the latest advances in the numerical modeling of the geostructures are presented. In addition, several uses of soft computing and big data in predicting the performance of geostructures as well as predicting the material properties are discussed.

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MultiSmartTrack: A New Formulation and Program to Analyze Responses of Layered Track Under Train Loading (20-00057) - B420
Zhongyang Wu/No Organization, Zhe Luo/No Organization, Ernian Pan/No Organization

Effect of Moisture Content on Pile Displacement Under Cyclic Dynamic Load in Integral Abutment Bridges (20-00909) - B425
Jafar Razmi/Arizona State University

Prediction of Critical Factor of Safety in Soil Slopes Using Adaptive Network-Based Fuzzy Inference System (20-02315) - B424
Khadijeh Shirzad/North Carolina Agricultural and Technical State University, Babak Vafaei/North Carolina Agricultural and Technical State University, Hyoshin Park/North Carolina Agricultural and Technical State University

Liquefaction Numerical Analysis of a Cantilevered Retaining Wall Using a Simple Finn-Byrne Model (20-02616) - B421
Amin Iraji/Southern Illinois University, Edwardsville, Abdolreza Osouli/Southern Illinois University, Edwardsville

Numerical Analysis on Sinkhole-Induced Ground Deformation (20-03199) - B422
Moataz Soliman/University of Central Florida, Luis Arboleda/University of Central Florida, Boohyun Nam/University of Central Florida

Artificial Neural Network–Based Predictive Soil Temperature Model of High Plastic Yazoo Clay (20-04017) - B428
Mohammad Sadik Khan/Jackson State University, John Ivoke/Jackson State University, Masoud Nobahar/Jackson State University, Stephanie Boggs/Jackson State University, Farshad Amini/Jackson State University

Use of Random Forest Model for Subgrade Resilient Modulus Prediction (20-03353) - B423
Steve Pahno/University of Georgia, Hampton Worthey/University of Georgia, Jidong Yang/University of Georgia, S. Sonny Kim/University of Georgia

Deep Learning Aided Target Recognition for Volume-Change Measurement of Unsaturated Soils (20-05701) - B426
Xiaolong Xia/Missouri University of Science and Technology, Xiong Zhang/Missouri University of Science and Technology, Zhaozheng Yin/Missouri University of Science and Technology, Wei Luo/Missouri University of Science and Technology

Exploring Artificial Neural Network for Evaluating the Undrained Shear Strength of Soil from the CPT Data (20-05615) - B427
Murad Abu-Farsakh/Louisiana Department of Transportation and Development, Md Ariful Hassan Mojumder/Louisiana Department of Transportation and Development

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Durability of Stabilized Geomaterials and Field Test Methods
Gregory Halsted, Portland Cement Association, presiding
Sponsored By Standing Committee on Stabilization of Geomaterials and Recycled Materials

 This session includes presentations on the durability of stabilized quarry by-product, alternate compaction procedures, and the use of the portable falling weight deflectometer.

Using of Portable Falling Weight Deflectometer to Determine Treatment Depth of Subgrades in Highway Reconstruction of Southern China (20-00610) - B418
Le Ding/Changsha University of Science and Technology, Junhui Zhang/Changsha University of Science and Technology

Durability Aspects of Chemically Stabilized Quarry By-Product Applications in Pavement Base and Sub-Base (20-04567) - B416
Issam Qamhia/University of Illinois, Urbana Champaign, Erol Tutumluer/University of Illinois, Urbana Champaign, Hasan Ozer/University of Illinois, Urbana Champaign, Huseyin Boler/University of Illinois, Urbana Champaign, Heather Shoup/University of Illinois, Urbana Champaign, Andrew Stolba/University of Illinois, Urbana Champaign

Performance and Cost Analysis of Integral Shaping Construction Technologies for Cement Treated Macadam Base Layer in Airport Pavement (20-02365) - B417
Ningyi Su/Tongji University, Jie Yuan/Tongji University, Feipeng Xiao/Tongji University

Regional Transportation Systems Management and Operations 2020
Pat Noyes, Pat Noyes and Associates, presiding
Sponsored By Standing Committee on Regional Transportation Systems Management and Operations

Development of a Decision-Support System for Integrated Active Traffic Management Systems Considering Travel Time Reliability (20-03657) - B441
Whoibin Chung/Virginia Department of Transportation, Mohamed Abdel-Aty/Virginia Department of Transportation, Ho-Chul Park/Virginia Department of Transportation, Qing Cai/Virginia Department of Transportation, Mdhasibur Rahman/Virginia Department of Transportation, Yaobang Gong/Virginia Department of Transportation

Visualizing the Impact of Integrated Corridor Management Strategies on Work Zone Closures Using Dynamic Modeling Methods (20-04705) - B443
Jeffrey Shelton/Texas A&M Transportation Institute, Mathew Miller/Texas A&M Transportation Institute, John Nevares/Texas A&M Transportation Institute, Adam Kaliszewski/Texas A&M Transportation Institute

A Mixture of Text Mining and Random Parameter Approach to Understanding Contributing Factors Associated with Incident Responder Safety (20-03567) - B444
Xiaobing Li/University of Alabama, Jun Liu/University of Alabama, Praveena Penmetsa/University of Alabama, Qifan Nie/University of Alabama, Shashi Nambisan/University of Alabama, Alex Hainen/University of Alabama

Developing and Testing of a Dynamic Freeway Sliding Mode Variable Speed Controller (20-01238) - B445
Hossam Abdelghaffar/Virginia Polytechnic Institute and State University, Maha Elouni/Virginia Polytechnic Institute and State University, Youssef Bichiou/Virginia Polytechnic Institute and State University, Hesham Rakha/Virginia Polytechnic Institute and State University

A Roadway Context Classification Approach for Developing Regional Safety Performance Functions for Florida Intersections (20-04475) - B442
Ghalia Gamaleldin/University of Central Florida, Haitham Al-Deek/University of Central Florida, Adrian Sandt/University of Central Florida, Alan El-Urfali/University of Central Florida, Md Imrul Kayes/University of Central Florida, Valentina Gamero/University of Central Florida

Traffic Signal Systems Using Machine Learning
Sponsored By Standing Committee on Traffic Signal Systems

Safety-Oriented Adaptive Traffic Signal Using Multi-Objective Deep Reinforcement Learning (20-01096) - B433
Yaobang Gong/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Jinghui Yuan/University of Central Florida, Qing Cai/University of Central Florida

A Multi-Agent Deep Reinforcement Learning for Network-wide Traffic Signal Control (20-01313) - B434
Zhenning Li/University of Hawai'i at Manoa, Hao Yu/University of Hawai'i at Manoa, Guohui Zhang/University of Hawai'i at Manoa, David Ma/University of Hawai'i at Manoa, Jun Wang/University of Hawai'i at Manoa

Large-Scale Traffic Signal Control Using Machine Learning: Some Traffic Flow Considerations (20-01794) - B435
Jorge Laval/Georgia Institute of Technology (Georgia Tech), Hao Zhou/Georgia Institute of Technology (Georgia Tech)

A Model-Based Deep Q-Learning Algorithm for Traffic Signal Timing Control at Isolated Intersections (20-01867) - B432
Yun Yuan/University of Utah, Xianfeng Yang/University of Utah, Hao Wang/University of Utah, Tian Zhao/University of Utah, Yang Liu/University of Utah

A Reinforcement Learning–Based Traffic Control Strategy in a Macroscopic Fundamental Diagram Region (20-02575) - B437
Lingyu Zheng/Tongji University, Bing Wu/Tongji University

Combining Machine Learning and Fuzzy Rule-Based System in Automating Signal Timing Expert's Decisions During Non-Recurrent Congestion (20-04011) - B440
Mosammat Tahnin Tariq/Florida International University, Aidin Massahi/Florida International University, Rajib Saha/Florida International University, Mohammed Hadi/Florida International University

Multi-Intersection Control with Deep Reinforcement Learning and Ring-and-Barrier Controllers (20-04851) - B438
Matthew Muresan/University of Waterloo, Guangyuan Pan/University of Waterloo, Liping Fu/University of Waterloo

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Learning to Recommend Signal Plans Under Incidents by Hierarchical Models: Traffic Prediction and Congestion Management for Cranberry Township (20-05048) - B439
Weiran Yao/Carnegie Mellon University, Sean Qian/Carnegie Mellon University
Reinforcement Learning–Based Traffic Signal Control Using Trajectory Data from Connected Vehicles (20-05201) - B431
Qiangqiang Guo/University of Washington, Xuegang Ban/University of Washington
A Machine Learning Approach to Real-Time Trajectory Optimization at Connected Signalized Intersections (20-05862) - B436
Danial Esaid/University of California, Riverside, Peng Hao/University of California, Riverside, Guoyuan Wu/University of California, Riverside, Fei Ye/University of California, Riverside, Kanok Boriboonsomsin/University of California, Riverside, Matthew Barth/University of California, Riverside
Multi-Agent Reinforcement Learning Method for Arterial Traffic Signal Control with Delayed Reward (20-06130) - B430
Han Wang/Southeast University, Jian Zhang/Southeast University, Shuyang Dong/Southeast University, Fang Tang/Southeast University

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Advances in Roadside Maintenance Operations
Scott Lucas, Ohio Department of Transportation, presiding
Sponsored By Standing Committee on Roadside Maintenance Operations

This poster session covers recent advances in Roadside Maintenance Operations. Poster will be presented on improvements made in collecting roadside vegetation and maintenance operations data.

Ohio DOT Collects Quantitative and Qualitative Litter Data to Lean Who Litters and Why (P20-21177) - B410
Scott Lucas/Ohio Department of Transportation
Washington State DOT Roadside Asset Management (P20-21178) - B411
Raymond Willard/Washington State Department of Transportation
A Multi-Faceted Approach to Improve Conditions for Pollinators Along Washington State Highways (P20-21179) - B412
Raymond Willard/Washington State Department of Transportation
AHD50 Roadside Maintenance Operations (P20-21180) - B413
Scott Lucas/Ohio Department of Transportation

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Taking a Data Deep Dive: Emerging Techniques and Analysis Using Transit and Mobility Data
Catherine Lawson, University at Albany State University of New York, presiding
Sponsored By Public Transportation Group, Subcommittee on Information on Transformative Trends in Transit Data

New uses and sources of transit and related mobility data provide new insights, analyses, and understandings. This session demonstrates a broad range of data types for transit planning including optimization strategies, models for origins and destinations, prediction of arrival times, passengers' preferences, intermodal transit connections, and so much more!

Understanding the Determinants of Young Commuters' Metro-Bikeshare Usage Frequency Using Big Data (20-01205) - A249
Yang Liu/Southeast University, Yanjie Ji/Southeast University, Tao Feng/Southeast University, Harry Timmermans/Southeast University
Modeling Strategy Heterogeneity and Passengers' Preferences from Smartcard Data in a Large-Scale Public Transport Network (20-02277) - A231
Jacqueline Arriagada Fernandez/Universidad de Chile, Marcela Munizaga/Universidad de Chile, Angelo Guevara/Universidad de Chile, Carlo Prato/Universidad de Chile

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Identification of Metro-Bikeshare Transfer Trip Chains by Matching Bikeshare and Metro Smartcards: A Data Fusion Method (20-02786) - A248

Xinwei Ma/Southeast University, Yanjie Ji/Southeast University, Yufei Yuan/Southeast University, Yuchuan Jin/Southeast University

Adjacency Matrix Modeling for Urban Subway Passenger Travel Information Extraction Based on Cell Phone Data (20-02823) - A232

Fei Yang/Southwest Jiaotong University, Lilei Wang/Southwest Jiaotong University, Fan Zuo/Southwest Jiaotong University, Yudong Guo/Southwest Jiaotong University, Xin Yue/Southwest Jiaotong University

Measuring Local Bus Connections to Rail and Bus Rapid Transit: Improving Direct Ridership Models with a Cumulative Opportunity Approach (20-02913) - A233

Andrew Guthrie/University of Memphis, Yingling Fan/University of Memphis

Path Restoration Method for Sparse GPS Trajectory Based on Bayesian Network (20-03642) - A241

Leyi Lou/Ningbo University, Huang Zhengfeng/Ningbo University, Pengjun Zheng/Ningbo University

Open Source Software in Public Transportation: A Case Study (20-04197) - A240

Sean Barbeau/University of South Florida, Steven Polzin/University of South Florida

A Deep-Learning Model for Predicting Public Transit Arrival Times (20-04440) - A242

Armin Khayyer/Auburn University, Daniel Silva/Auburn University, Alexander Vinel/Auburn University

Analyzing Network-wide Patterns of Rail Transit Delays Using Crowdsourced Data and Bayesian Network Learning (20-04448) - A230

Mehmet Ulak/Stony Brook University, Anil Yazici/Stony Brook University, Yun Zhang/Stony Brook University

Optimization Models for Estimating Transit Network Origin-Destination Flows with AVL/APC Data (20-04596) - A243

Xinyu Liu/University of Florida, Pascal Van Hentenryck/University of Florida, Xilei Zhao/University of Florida

Data-Driven, Real-Time Platform Crowding Prediction Using Automated Fare Collection and Vehicle Location Data in Urban Railway Systems (20-04688) - A234

Home Tuncel/Northeastern University, Haris Koutsopoulos/Northeastern University, Zhenliang Ma/Northeastern University

Public Transit Smartcard Data-Driven Customer Segmentation and Personalized Information Provision: Empirical Demonstration Based on Hong Kong's MTR (20-04876) - A244

Abhishek Basu/Ohio State University, Rabi Mishalani/Ohio State University, Jinhua Zhao/Ohio State University, Haris Koutsopoulos/Ohio State University

Longitudinal Modeling of the Daily Subway Ridership: Combination of Several Passive Data Streams to Investigate the Influence of Alternative Modes of Transport (20-04958) - A245

Elodie Deschaintres/Ecole Polytechnique de Montreal, Catherine Morency/Ecole Polytechnique de Montreal, Martin Trepanier/Ecole Polytechnique de Montreal

Bus Travel Time Prediction Based on AVL Data of Multiple Routes (20-05931) - A246

Pengyao Ye/Southwest Jiaotong University, Mengqiu Du/Southwest Jiaotong University, Wenbo Fan/Southwest Jiaotong University, Hong Yang/Southwest Jiaotong University

Understand the Impact of Transportation Network Companies on Urban Traffic Using Large-Scale Trajectory Data (20-02381) - A247

Xinwu Qian/Purdue University, Tian Lei/Purdue University, Jiawei Xue/Purdue University, Zengxiang Lei/Purdue University, Satish Ukkusuri/Purdue University

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Topics on Transit Capacity and Quality of Service
Ziyuan Pu, University of Washington, presiding
Sponsored By Standing Committee on Transit Capacity and Quality of Service

The Transit Capacity and Quality of Service Manual (TCQSM 3rd edition, TCRP Report 165) provides a quality of service framework from the passenger and transit provider points of view based on aspects of transit availability and transit comfort and convenience. In addition, the TCQSM includes techniques for calculating the capacity and other operational characteristics of transit services. The papers in this poster session examine various aspects of transit capacity and quality of service issues for bus, rail, and ferry modes.

A Model for Real-Time Bus Holding Subject to Vehicle Capacity Limits (20-00102) - A195
Konstantinos Gkiotsalitis/University of Twente, Eric van Berkum/University of Twente

(continued)

Capacity-Constrained Bus Bridging Optimization Framework (20-00677) - A196
Alaa Itani/University of Toronto, Siva Srikukenthiran/University of Toronto, Amer Shalaby/University of Toronto

Relating Transit Capacity Measurement to Users' Experience of Crowding (20-05012) - A172
William Kuttner/Central Transportation Planning Staff (CTPS)

Research on Collaborative Inflow Control for Urban Rail Transit Network Based on Station-to-Line Spatial-Temporal Relation (20-02021) - A177
Ruixia Yang/Beijing Jiaotong University, Weiteng Zhou/Beijing Jiaotong University, Baoming Han/Beijing Jiaotong University, Dewei Li/Beijing Jiaotong University, Bin Zheng/Beijing Jiaotong University

Delays and Queues at Bus Stops (20-00459) - A178
Rodrigo Fernandez/Universidad de Los Andes, Rafael Delpiano/Universidad de Los Andes

Refining Bus Stop Tiers Methodology Toward Sustainability (20-03319) - A179
Gabriella Marquez/Long Beach Transit, Shirley Hsiao/Long Beach Transit, Christopher MacKechnie/Long Beach Transit

Evaluation of Balanced Level Between Demand and Supply of Bus Stops Using a Performance Measure Based on Smartcard Data (20-05884) - A171
Garyoung Lee/Seoul National University, Shin-Hyung Cho/Seoul National University, Eun Lee/Seoul National University, Seung-Young Kho/Seoul National University, Dong-Kyu Kim/Seoul National University

The Influence of Rainy Weather on Bus Lost Time for Regular Bus Stops (20-00130) - A183
Margarita Novales/Universidade da Coruna - Group of Railways and Transportation Engineering, Alfonso Orro/Universidade da Coruna - Group of Railways and Transportation Engineering, José Pérez-López/Universidade da Coruna - Group of Railways and Transportation Engineering, Jorge Feal/Universidade da Coruna - Group of Railways and Transportation Engineering, Miguel Bugarín/Universidade da Coruna - Group of Railways and Transportation Engineering

Estimating the Value of Public Transit Customer Experience Infrastructure: An International Expert Delphi Study (20-01113) - A185
Graham Currie/Monash University, Nicholas Fournier/Monash University, Chris De Gruyter/Monash University

A Quantitative Representation Model of Congestion in Metro Station Based on Passenger Perception (20-02541) - A186
Jing Teng/Kyoto University, Weiwei Pan/Kyoto University, Cen Zhang/Kyoto University

Exploring Special Memorial Sections Determining Passengers' Overall Satisfaction of Public Transportation On-Board Trip (20-04281) - A182
Xiaohong Chen/Tongji University, Jiaqi Cheng/Tongji University, Jianhong Ye/Tongji University

All Aboard: Analyzing Wait Times at Passenger Ferry Landings (20-05622) - A187
Doug Rose/New York City Economic Development Corporation, Joshua Nadel/New York City Economic Development Corporation, Chandler Diffee/New York City Economic Development Corporation, James Wong/New York City Economic Development Corporation

Transit Economic Equity Index: Developing a Comprehensive Measure of Transit Service Equity (20-05752) - A188
Torrey Lyons/University of Utah, Dong-ah Choi/University of Utah

Conceptual and Microsimulation Modeling of Converting a General Traffic Lane to a Dedicated Bus Lane: An Exploratory Analysis of the Modal Shift Effects (20-02034) - A189
Guangchuan Yang/Wuhan University, Daobin Wang/Wuhan University

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Micromobility, Mobility as a Service and Shared Automated Vehicles
Jean Ruestman, Michigan Department of Transportation, presiding
Sponsored By Standing Committee on Emerging and Innovative Public Transport and Technologies

Periodic Stop Skipping: NP-Hardness and Computational Limitations (20-00069) - A204
Konstantinos Gkiotsalitis/University of Twente

Day-to-Day Market Evaluation of Last-Mile Transit Operations Using Modular Autonomous Vehicles with En-Route Transfers (20-00216) - A192
Nicholas Caros/Massachusetts Institute of Technology (MIT), Joseph Chow/Massachusetts Institute of Technology (MIT)

Who Are the Potential Users of Shared E-Scooters?: An Examination of Sociodemographic, Attitudinal, and Environmental Factors (20-00391) - A193
Raktim Mitra/Ryerson University, Paul Hess/Ryerson University

(continued)

Applying the Delphi Method to Determine the Influence of Autonomous Vehicles on Traditional Public Transport (20-00488) - A191

Raphaela Maier/Hasselt University, Muhammad Adnan/Hasselt University, Tom Bellemens/Hasselt University

Spatial Associations in Dockless Shared E-Scooter Usage (20-00622) - A200

Or Caspi/Rutgers, The State University of New Jersey, Michael Smart/Rutgers, The State University of New Jersey, Robert Noland/Rutgers, The State University of New Jersey

On-Demand Flexible Transit in Fast Growing Cities: The Experience of the MVMANT Service in Dubai (20-00683) - A201

Nadia Giuffrida/University of Catania, Michela Le Pira/University of Catania, Inturri Giuseppe/University of Catania, Matteo Ignaccolo/University of Catania, Giovanni Calabrò/University of Catania, Blochin Cuius/University of Catania, Riccardo D'Angelo/University of Catania

Possible Futures for a Mobility-as-a-Service Market (20-00786) - A202

Marcus Enoch/Loughborough University, Stephen Potter/Loughborough University, Paraskevi Michalaki/Loughborough University

Dockless Electric Scooters and Transit Use in an Urban/University Environment (20-01383) - A222

Natalia Zuniga-Garcia/University of Texas, Austin, Randy Machemehl/University of Texas, Austin

A Simulated Annealing Algorithm for Solving the E-Scooter to Chargers Assignment Problem (20-02629) - A210

Saleh Mousa/Booz Allen Hamilton, Inc., Mahmoud Masoud/Booz Allen Hamilton, Inc., Mohammed Elhenawy/Booz Allen Hamilton, Inc., Mohammed Almannaa/Booz Allen Hamilton, Inc., Sebastien Glaser/Booz Allen Hamilton, Inc., Andry Rakotonirainy/Booz Allen Hamilton, Inc.

Toward a Co-Design Framework for Future Mobility Systems (20-02645) - A211

Gioele Zardini/Stanford University, Nicolas Lanzetti/Stanford University, Mauro Salazar/Stanford University, Andrea Censi/Stanford University, Emilio Frazzoli/Stanford University, Marco Pavone/Stanford University

A Heuristic Approach for Improving Utilization in Micromobility Systems with Crowdsourced Resupply (20-02690) - A212

Lacy Greening/Georgia Institute of Technology (Georgia Tech), Alan Erera/Georgia Institute of Technology (Georgia Tech)

A Study on Users' Willingness to Accept Mobility-as-a-Service Based on UTAUT Model (20-03215) - A181

Jiaqi Zheng/Tongji University, Jianhong Ye/Tongji University, Fabin Yi/Tongji University

A Conceptual Framework for Drivers and Barriers of Mobility-as-a-Service (20-03269) - A214

Yashar Araghi/TNO, Nico Larco/TNO, Claus Doll/TNO, Geiske Bouma/TNO, Diana Vonk Noordegraaf/TNO, Konstantin Krauß/TNO

Understanding the Impact of Heterogeneous Rider Preferences on a Shared Autonomous Vehicle System (20-03655) - A203

Mustafa Lokhandwala/Purdue University, Hua Cai/Purdue University

Effect of Incentive Mechanism Toward the Parking Behaviors of Bikesharing Users (20-03931) - A220

Fei Yang/Southwest Jiaotong University, Jianyao Zhou/Southwest Jiaotong University, Di Zhu/Southwest Jiaotong University, Haitao Wu/Southwest Jiaotong University

A Flow-Based Automated Taxi's Route Choice Model Considering Traffic Congestion Delays (20-04258) - A190

Xiao Liang/Delft University of Technology, Gonçalo Correia/Delft University of Technology

The Irruption of the Electric Scooter in Barcelona: A Case Study of Mobility Implications (20-05179) - A221

Francesc Gasparin Casajust/The Center for Innovation in Transport (CENIT), Sergi Saurí/The Center for Innovation in Transport (CENIT), Genis Majoral/The Center for Innovation in Transport (CENIT)

Optimal Relocation Strategy for Public Bike System with Selective Pickup and Delivery (20-05582) - A194

Euntak Lee/Seoul Institute, Bongsoo Son/Seoul Institute, Youngjun Han/Seoul Institute

Large-Scale Simulation of Shared Autonomous Vehicles: Integrating the Supply and Demand Perspectives (20-05837) - A224

Krishna Murthy Gurumurthy/Argonne National Laboratory, Felipe de Souza/Argonne National Laboratory, Annesha Enam/Argonne National Laboratory, Joshua Auld/Argonne National Laboratory

First-Mile Last-Mile Collector–Distributor System Using Shared Autonomous Mobility (20-06044) - A223

Krishna Murthy Gurumurthy/University of Texas, Austin, Kara Kockelman/University of Texas, Austin, Natalia Zuniga-Garcia/University of Texas, Austin

Mode Choice Models of Private Car User and Public Transportation User Toward Mobility-as-a-Service: Integrated Choice and Latent Variable Approach (20-06096) - A180

Youngseo Kim/Seoul National University, Eui-Jin Kim/Seoul National University, Sunghoon Jang/Seoul National University, Dong-Kyu Kim/Seoul National University

Bus Transit Research and Practices, Part 2 (Part 1, Session 1227)
Konstantinos Kepaptsoglou, National Technical University of Athens (NTUA), presiding
Sponsored By Standing Committee on Bus Transit Systems

Passenger-Specific Area on Bus Rapid Transit Station Platforms (20-00310) - A237
Sewmini Panambara Arachchillage/Queensland University of Technology, Jonathan Bunker/Queensland University of Technology, Ashish Bhaskar/Queensland University of Technology, Marc Miska/Queensland University of Technology
Bus Operations Optimization: A Literature Review on Bus Holding, Rescheduling, and Stop Skipping (20-00414) - A205
Konstantinos Gkiotsalitis/University of Twente
Meaningful Modeling of Section Bus Running Times by Time Varying Mixture Distributions of Fixed Components (20-00439) - A238
Beda Büchel/ETH Zurich, Francesco Corman/ETH Zurich
Dual-Objective Transit Signal Priority for Improving Speed and Reliability of High-Frequency Lines: A Deep Reinforcement Learning Approach (20-00470) - A206
Wen Xun Hu/University of Toronto, Amer Shalaby/University of Toronto, Baher Abdulhai/University of Toronto
Joint Optimization of Scheduling and Capacity for Mixed Traffic with Autonomous and Human-Driven Buses (20-00656) - A239
Zhuang Dai/Beihang University, Xiaolei Ma/Beihang University, Xiaoyue Cathy Liu/Beihang University
Guidance for Design and Implementation of Queue Jump Lane with Pre-Signal for a Heterogeneous Traffic Environment (20-00763) - A226
Kinjal Bhattacharyya/Indian Institute of Technology Kharagpur, Bhargab Maitra/Indian Institute of Technology Kharagpur, Manfred Boltze/Indian Institute of Technology Kharagpur
Transit Vehicle Scheduling for Battery-Powered Vehicles (20-00901) - A228
Michael Bundschuh/PTV Group, Klaus Noekel/PTV Group
Timetable Design for Urban Transit Corridors with Time-Varying Vehicle Capacity (20-01139) - A229
Zhiwei Chen/University of South Florida, Xiaopeng (Shaw) Li/University of South Florida
Out of Service: Identifying Route-Level Determinants of Bus Ridership Over Time in Montréal, Québec, Canada (20-01173) - A216
Nick Chaloux/University of Saskatchewan, Ahmed El-Geneidy/University of Saskatchewan, Ehab Diab/University of Saskatchewan
Optimizing Schedule of Flexible Feeder Transit Considering the Time-Dependent Travel Speed (20-01317) - A217
Yuqiong Wang/Beijing Jiaotong University, Shunping Jia/Beijing Jiaotong University, Ruibin Wei/Beijing Jiaotong University
Multiple Feeder Bus Routes Design Model Considering Existing Bus Lines (20-01676) - A218
Runxuan Zhou/Southeast University, Shanshan Liu/Southeast University, Xiucheng Guo/Southeast University
Factors Affecting Bus Bunching at the Stop Level: A Geographically Weighted Regression Approach (20-01939) - A219
Eva Chioni/National Technical University of Athens (NTUA), Christina Iliopoulou/National Technical University of Athens (NTUA), Christina Milioti/National Technical University of Athens (NTUA), Konstantinos Kepaptsoglou/National Technical University of Athens (NTUA)
Modeling Passenger Satisfaction of Exclusive Bus Lanes in Shanghai, China (20-04218) - A207
Linghui He/Tongji University, Dongyuan Yang/Tongji University, Jian Li/Tongji University
Design Method of Feeder Bus Network Based on Belt-Shaped Passenger-Attracting Zone: Case of Harbin, China (20-04428) - A208
Xianghai Meng/Harbin Institute of Technology, Enze Zhang/Harbin Institute of Technology, Xinyu Liang/Harbin Institute of Technology
A Statistical Analysis of Public Opinions from a Low-Speed Automated Shuttle Demonstration (20-04541) - A209
Nikhil Menon/University of South Florida, Pei-Sung Lin/University of South Florida, Rakesh Rangaswamy/University of South Florida, Achilleas Kourtellis/University of South Florida, Cong Chen/University of South Florida, Robert Bertini/University of South Florida

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Optimal Design of Bus Stop Locations Integrating Continuum Approximation and Discrete Models (20-05162) - A236

Xiaoling Luo/Southwest Jiaotong University, Liang Xia/Southwest Jiaotong University, Yangsheng Jiang/Southwest Jiaotong University, Wenbo Fan/Southwest Jiaotong University

Developing an Optimal Algorithm for Demand Responsive Feeder Transit Service Accommodating Temporary Stops (20-05350) - A215

Amirreza Nickkar/Morgan State University, Young-Jae Lee/Morgan State University, Mana Meskar/Morgan State University

Examining the Impact of Overlapping Bus Services on Dwell Times and Bunching (20-05679) - A225

Travis Glick/Portland State University, Miguel Figliozzi/Portland State University, Miles Crumley/Portland State University

Quantifying the Mobility Benefits of Transit Signal Priority (20-05692) - A198

MD Sultan Ali/Florida International University, Priyanka Alluri/Florida International University, Thobias Sando/Florida International University

Discover Potential Zones for Airport Shuttle Bus Services Using Trajectory Data (20-05964) - A199

Yuxiong Ji/Tongji University, Yuhan Ji/Tongji University, Yu Shen/Tongji University, Yuchuan Du/Tongji University

Dynamic Interlining in Bus Operations (20-06038) - A235

Seyedmostafa Zahedi/Northeastern University, Haris Koutsopoulos/Northeastern University, Zhenliang Ma/Northeastern University

Sparse and Dense Hybrid Grid Bus Network Model for Square Cities of Downtown in the Corner (20-00820) - A227

Chen Guo/Chang'an University, Jianjun Wang/Chang'an University, Zhengyu Wang/Chang'an University, Yueying Huo/Chang'an University

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
How to Make a Fast Train Go Faster: Intercity Rail Operations
Joseph Glowitz, PS-E, presiding
Sponsored By Standing Committee on Intercity Passenger Rail

Holistic Approach for Operation, Infrastructure Development, and Regulation Policies in Liberalized Intercity Market (20-06003) - A140

Martin Smoliner/Graz University of Technology

Analysis of Factors Affecting Delay of High-Speed Railway in China Based on Bayesian Network Modeling (20-03880) - A141

Jing WANG/Tongji university, key laboratory of road and traffic engineering, ministry of education, Yichuan Peng/Tongji university, key laboratory of road and traffic engineering, ministry of education, Jian Lu/Tongji university, key laboratory of road and traffic engineering, ministry of education

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A
Advances in Railroad Operating Technologies
Adrian Hellman, OST-R/Volpe Center, presiding
Sponsored By Standing Committee on Railroad Operating Technologies

Gap Detection of Switch Machines in Complex Environment Based on Object Detection and Image Processing (20-00128) - A145

Ting Tao/Tongji University, Decun Dong/Tongji University, Huang Shize/Tongji University, Wei Chen/Tongji University

Reformulating and Solving the Cyclic Train Timetabling Problem Through Extended Time-Space Network Construct and Alternating Direction Method of Multipliers Methods (20-00361) - A148

Yongxiang Zhang/Southwest Jiaotong University, Qiyuan Peng/Southwest Jiaotong University, Yu Yao/Southwest Jiaotong University, Xin Zhang/Southwest Jiaotong University, Qingwei Zhong/Southwest Jiaotong University, Xuesong Zhou/Southwest Jiaotong University

A Dynamic Model for Real-Time Track Assignment at Railway Yards (20-00661) - A144

Konstantinos Gkiotsalitis/University of Twente, Oskar Eikenbroek/University of Twente, Eric van Berkum/University of Twente, Bram Schasfoort/University of Twente

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Solution of Multi-Crew Bases Train Attendants Crew Scheduling Problems: The Chinese High-Speed Railway Case (20-02952) - A143

Chunxiao ZHAO/Beijing Jiaotong University, Xingchen Zhang/Beijing Jiaotong University, Junhua Chen/Beijing Jiaotong University

Visualization and System Design of Railway Delays (20-03630) - A146

Xiong Yang/South Jiaotong University, xu ling/South Jiaotong University, CHAO WEN/South Jiaotong University

Fitting Knock-On Delay Duration Distribution Based on High-Speed Train Operation Records (20-04829) - A147

xu ling/Southwest Jiaotong University, CHAO WEN/Southwest Jiaotong University

Compressing Arrival Headway Between Trains by Speed Control on High-Speed Railway (20-03435) - A149

Chaoyu Wang/Southwest Jiaotong University, Gongyuan Lu/Southwest Jiaotong University, Qiyuan Peng/Southwest Jiaotong University, Bisheng He/Southwest Jiaotong University

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

Advances in Freight Rail Transportation
Pasi Lautala, Michigan Technological University, presiding
Sponsored By Standing Committee on Freight Rail Transportation

Investigating Unmanned Aerial Vehicle Use for Railway Maintenance, Safety, and Security (20-00074) - A130
John Green/California State University, Fresno

How Expensive Is the Transport Cost in China?: Estimating Spatial Decay Parameters of Distance Using the Bilateral Trade Gravity Model (20-00194) - A136
Tan Lin/Tongji University, Xinghua Li/Tongji University, Chao Yang/Tongji University, Wei Wang/Tongji University, Siyu Li/Tongji University

Comprehensive Optimization of Railway Freight Operation Planning and Pricing Based on the Fixed Carbon Emission Reduction Policies (20-00577) - A137
Lin Li/Southwest Jiaotong University, Xiaoqiang Zhang/Southwest Jiaotong University

Access Protocols for Railroads: Reframing the Infrastructure Separation Debate (20-00703) - A131
John Allen/Independent Transportation Consultant, Gregory Newmark/Independent Transportation Consultant

Customer's Preference for Freight Service Attributes of China Railway Express (20-01152) - A135
Qinglin Li/Southwest Jiaotong University, Lóránt Tavasszy/Southwest Jiaotong University, Jafar Rezaei/Southwest Jiaotong University, Bart Wiegmans/Southwest Jiaotong University, Jingwei Guo/Southwest Jiaotong University, Yinying Tang/Southwest Jiaotong University, Qiyuan Peng/Southwest Jiaotong University

Separating Poor Playmates: Untangling Commuter Rail from Freight (20-01469) - A132
John Allen/Independent Transportation Consultant, Gregory Newmark/Independent Transportation Consultant

A Framework for Capturing the Business Benefits of Railway Digitalization (20-04366) - A134
Andrew Nash/crowdsourced-transport.com, Felix Laube/crowdsourced-transport.com

Machine Learning Analysis of Railroad Freight Train Derailment Severity (20-04812) - A133
Brandon Wang/University of Illinois at Urbana-Champaign, Jaemin Kim/University of Illinois at Urbana-Champaign, Christopher Barkan/University of Illinois at Urbana-Champaign

Multi-Objective Trajectory Optimization for Heavy Haul Trains Based on Quadratic Programming (20-05604) - A138
Baoxue Bai/Southwest Jiaotong University, Zhuang Xiao/Southwest Jiaotong University, Qingyuan Wang/Southwest Jiaotong University, Pengfei Sun/Southwest Jiaotong University, Xiaoyun Feng/Southwest Jiaotong University

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Tuesday, 01:30 p.m. - 03:15 p.m., Convention Center, Hall A

Current Research in Hazardous Materials Transportation
Sponsored By Standing Committee on Transportation of Hazardous Materials

Hazmat Transportation Routing Planning: Comparisons of a Multi-Objective Compromise Weight Model and a Multi-Objective Evolutionary Algorithm (20-02196) - A160
Ta-Yin Hu/National Cheng Kung University, Yu-Cheng Hsu/National Cheng Kung University, Tsai-Yun Liao/National Cheng Kung University

Multimodal Transportation of Hazardous Material with the Traffic Restriction Constraint (20-00817) - A161
Liying Song/Beijing Jiaotong University, Lutong Yu/Beijing Jiaotong University

(continued)

Exploration of Hazardous Material Truck Crashes on Wyoming's Interstate Roads Using a Novel Hamiltonian Monte Carlo Markov Chain Bayesian Inference (20-04388) - A150

Irfan Ahmed/Federal Highway Administration (FHWA), Sherif Gaweesh/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA)

Use of Multi-Rotor Unmanned Aerial Vehicles for Hazardous Materials Transport Leakage Monitoring (20-02735) - A162

Bai Li/Shanghai Jiao Tong University, Rong Cao/Shanghai Jiao Tong University, Zhongren Peng/Shanghai Jiao Tong University

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Current Research in Truck Size and Weight (Canceled)
Daniel Haake, HDR, presiding
Sponsored By Standing Committee on Truck Size and Weight

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Advancing Frontiers in Trucking Industry Analysis and Operations
Rodrigo Mesa-Arango, Florida Institute of Technology, presiding
Sponsored By Standing Committee on Trucking Industry Research

Developing a Methodology to Predict the Adoption Rate of Connected Autonomous Trucks in Transportation Organizations Using Peer Effects (20-03148) - A157

Jesse Simpson/University of Memphis, Sabyasachee Mishra/University of Memphis

Performance Analysis of Truck Parking Terminal Using Simulation (20-03288) - A155

Narayana Raju/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Said Easa/Sardar Vallabhbhai National Institute of Technology, Surat, Gaurang Joshi/Sardar Vallabhbhai National Institute of Technology, Surat

Hours-of-Service Flexibility (20-04501) - A156

Jeffrey Short/American Transportation Research Institute (ATRI), Alexandra Shirk/American Transportation Research Institute (ATRI), Sarah Saltzman/American Transportation Research Institute (ATRI)

Review of Potential Impacts, Impediments, and Future Research Needs of Automated Trucks and Truck Platooning Technologies (20-04695) - A158

Dahye Lee/Texas A&M University, Jeffery Warner/Texas A&M University, Curtis Morgan/Texas A&M University

Truck Parking Usage Patterns by Facility Amenity Availability (20-04762) - A154

Sharif Mahmud/University of Arkansas, Fayetteville, Taslima Akter/University of Arkansas, Fayetteville, Sarah Hernandez/University of Arkansas, Fayetteville

A GIS-Based Spatial Modeling Approach to Relate Parking Locations to Truck Safety in the Highway System (20-04941) - A153

Antonio Hurtado-Beltran/University of Nebraska, Lincoln, Laurence Rilett/University of Nebraska, Lincoln, Yunwoo Nam/University of Nebraska, Lincoln

A Study of the Rate of Usage and Incentives to Increase the Use of the Truck Stop Electrification Service at Overnight Truck Parking Stations (20-04999) - A152

Mohsen Shahandashti/University of Texas, Arlington, Bahram Abediniangerabi/University of Texas, Arlington, Binaya Pudasaini/University of Texas, Arlington, Sean McCauley/University of Texas, Arlington

Assessment of Hazardous Pipeline Crossings for Freight Truck Routes in the Los Angeles County (20-06134) - A151

Alejandro Uribe/California State University, Long Beach, Ravi Mazin/California State University, Long Beach, Shailesh Chandra/California State University, Long Beach, Hung Nguyen/California State University, Long Beach

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Mobility as a Service and Mobility on Demand Contributions to Sustainability and Decarbonization
Ronald Boenau, Self-employed, presiding
Susan Shaheen, University of California, Berkeley, presiding
Sponsored By Standing Committee on International Cooperation, Standing Committee on Emerging and Innovative Public Transport and Technologies

This session will bring together distinctive approaches and visions of MaaS and MOD to address the potential of each to help transport decarbonize and increase urban sustainability. Panelists will address the significance of MaaS and MOD toward these questions, how inefficiently we use cars (time in use, occupancy in use, asset spend per minute used) and how we could provide the mobility we currently have with much less impact on the environment and build social capital at the same time.

MaaS Alliance (P20-21724)
Jacob Bangsgaard/ERTICO - ITS Europe
MaaS Evaluation (P20-21725)
Jana Sochor/RISE Viktoria
Other Perspectives (P20-21726)
Philippe Crist/International Transport Forum
MOD Alliance (P20-21885)
Amy Ford/ITS America
MaaS America Alliance (P20-21886)
Timothy McGuckin/Intelligent Transportation Society of America
MOD Evaluation (P20-21887)
Elliot Martin/University of California, Berkeley
SHARE Study Perspective (P20-21888)
Greg Marsden/University of Leeds
UITP Perspective (P20-21889)
Guido Di Pasquale/Union Internationale des Transports Publics (UITP)

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Now Hiring: New Skills Needed to Meet Changing Demands in Transportation
Hyun-A Park, Spy Pond Partners, LLC, presiding
Nikola Ivanov, University of Maryland, College Park, presiding
Sponsored By Young Members Council (YMC), Policy and Organization Group, Planning and Environment Group, Design and Construction Group

Advances in technology, improvements in data collection and analysis, shifts in public expectations, and an increased emphasis on innovation are changing the way transportation agencies do business. In order to meet these changing demands, transportation agencies need to build new skills and capabilities both within the workforce and at the organization level. This session focuses on identifying the new skills needed today and predicting additional skills and capabilities agencies will need in the future. The diverse panel of professionals will present their ideas and dialogue with the audience on the strategies agencies can use to fill the gaps in skills and prepare for the future.

Why We Need Young Workers (P20-21073)
Carlos Braceras/Utah Department of Transportation
New Technologies and the New Workforce (P20-21080)
Randell Iwasaki/Contra Costa Transportation Authority
Transit Agency Needs (P20-21074)
Leslie Richards/Southeastern Pennsylvania Transportation Authority
Recent Graduate Perspective (P20-21075)
Hannah Groshong/Spy Pond Partners, LLC
Small Agency Perspective (P20-21076)
Linsey Willis/Contra Costa Transportation Authority

(continued)

Large Agency Perspective (P20-21077)
Michael Nesbitt/Federal Highway Administration (FHWA)
Transit Agency Perspective (P20-21078)
Kathryn "Jade" Clayton/Maryland Transit Administration

1577

Current Issues in Revenue and Finance: From Taxes to Public–Private Partnerships
Rimon Rafiah, Economikr, presiding
Sponsored By Standing Committee on Revenue and Finance, Subcommittee on Public-Private Partnerships

This session focuses on the wide range of topics, both national and international, as addressed in papers submitted to the Standing Committee on Revenue and Finance, including on Public Private Partnerships (P3). The papers to be presented in this session include public opinion on federal taxation options, government support of shadow toll concessions in Spain, impact of electric and hybrid vehicles on Alabama highway trust fund, and evaluation of the P3 market in the USA with relation to bond market indices.

What Do Americans Think About Federal Tax Options to Support Transportation?: Results from Year 10 of a National Survey (20-01927)
Asha Weinstein Agrawal/San Jose State University, Hilary Nixon/San Jose State University
Ex-Post Evaluation of Government Support to Shadow Toll Highways in Spain (20-01616)
Laura Garrido/TRANSyT-UPM, Jose Manuel Vassallo/TRANSyT-UPM
Impact of Electric and Hybrid Vehicles on Highway Trust Fund: A Case Study in Alabama (20-05085)
Dan Xu/Auburn University, Huaguo Zhou/Auburn University, Chennan Xue/Auburn University, Jeffrey LaMondia/Auburn University
Evaluation of the Transportation Public–Private Partnership Market in the United States: A Bond Index Approach (20-05224)
Yu Wang/University of Maryland, College Park, Kunqi Zhang/University of Maryland, College Park, Qingbin Cui/University of Maryland, College Park, Felix Delgado/University of Maryland, College Park

1578

Congestion Pricing in a New Mobility Landscape
Jonathan Peters, City University of New York (CUNY), presiding
Sponsored By Standing Committee on Congestion Pricing

Congestion pricing is among the most effective mechanisms to manage demand for scarce infrastructure. It has been effective in addressing congestion on roadways in urban cores, providing reliable travel times on freeways, and is frequently used in mass transit systems to manage rider demand. Trends in new mobility, most notably growth in the shared economy and the emergence of Mobility-as-a-Service, could fundamentally change how drivers use and pay for public infrastructure. This session features new research with implications for how congestion pricing is implemented and its effectiveness within a new mobility landscape that is shared, integrated and multi-modal.

Estimating the Earnings from Peer-to-Peer Carsharing for Vehicle Owners on the Turo Platform Using Anonymized Data (20-05593)
Joseph Schwieterman/DePaul University, Christopher Smith/DePaul University
Taxing Ridehailing Services: Revenue Usages, Pricing Schemes, and Media Discussions (20-01422)
Zhirong Zhao/University of Minnesota, Twin Cities, Camila Fonseca/University of Minnesota, Twin Cities, Raihana Zeerak/University of Minnesota, Twin Cities
Toll Avoidance at Highways and Utility of Alternative Routes; Evidence from Highway Drivers in Greece (20-01449)
Ioannis Politis/Aristotle University of Thessaloniki, Michalis Kyriakoglou/Aristotle University of Thessaloniki, Georgios Georgiadis/Aristotle University of Thessaloniki, Panagiotis Papaioannou/Aristotle University of Thessaloniki
Traffic and Welfare Impacts of Credit-Based Congestion Pricing Applications: An Austin Case Study (20-04823)
Weijia Li/University of Texas, Austin, Kara Kockelman/University of Texas, Austin, Yantao Huang/University of Texas, Austin

1579

Public Transit and Paratransit in Developing Countries: Relative Perceptions and Lessons Learned on Integration
Ajay Kumar, The World Bank, presiding
Sponsored By Standing Committee on Transportation in the Developing Countries

Integrating Formal and Informal Transit into One Hybrid Passenger Transport System in Lagos, Nigeria (20-016 61)
Louis Alcorn/University of Texas, Austin, Alex Karner/University of Texas, Austin
Activity Participation and Perceptions on Informal Public Transport and Bus Rapid Transit in Dar es Salaam (20 -03989)
Lucy Joseph/Universiteit Hasselt, An Neven/Universiteit Hasselt, Karel Martens/Universiteit Hasselt, Opportuna Kweka/ Universiteit Hasselt, Geert Wets/Universiteit Hasselt, Davy Janssens/Universiteit Hasselt
A History of Transport Planning in African Cities: Toward the Integration of Paratransit (20-04293)
Virginie Boutueil/No Organization, Gaele Lesteven/No Organization, Luc Nemett/No Organization
The Rise of Paratransit Digital Platforms in Large African Metropolises: Competitive Strategies Between International and Local Platforms (20-04901)
Virginie Boutueil/Ecole des Ponts ParisTech, Thomas Quillerier/Ecole des Ponts ParisTech
Efficiency-Based Evaluation of Public Transport and Paratransit Systems: Lessons Learned Toward a Scenario for Integrated Transportation Perspective (20-05848)
Nandan Dawda/Sardar Vallabhbhai National Institute of Technology, Surat, Hardik Gajera/Sardar Vallabhbhai National Institute of Technology, Surat, Gaurang Joshi/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Sanjay Kumar Dave/Sardar Vallabhbhai National Institute of Technology, Surat

1580

Moving Research into Reality: Pedestrian and Technology Transfer
Cynthia Jones, Ohio Department of Transportation, presiding
Kohinoor Kar, Arizona Department of Transportation, presiding
Sponsored By Standing Committee on Technology Transfer, Standing Committee on Pedestrians

The Technology Transfer Committee (ABG30) and Pedestrian Committee (ANF10) will host a podium session exploring methods of technology transfer to move research into reality. Two Pedestrian research presentations feature findings on counting methodologies and automated ADA self evaluations.Two technology transfer papers will also be presented to share research in that field. Then the focus of the session will be exploration of technology transfer methods for the two pedestrian papers. Audience participation is encouraged.

A Hierarchical Counting Method to Predict Destinations at a Large-Scale Event Using GPS Data (20-06047)
Tim van Oijen/Delft University of Technology, Winnie Daamen/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology
Automated Self-Evaluations of Pedestrian Rights of Way for ADA Compliance (20-03647)
Majid Mastali/Tetra Tech, Inc., Scott Sandstrom/Tetra Tech, Inc., Jun-Seok Oh/Tetra Tech, Inc.
Framework and Processes for Effective Transportation Research Implementation and Benefit Quantification (2 0-00827)
Hafiz Munir/Minnesota Department of Transportation

1581

Not Your Typical Travel Modeling: These Mode Choice Models Go Long
Venu Garikapati, National Renewable Energy Laboratory (NREL), presiding
Sponsored By Standing Committee on National Transportation Data Requirements and Programs, Subcommittee on Long Distance and Intercity Travel

(continued)

A Comprehensive Assessment of Mode-Specific Predictor Variables for Long-Distance Travel Mode Choice Models (20-02307)
Jeffrey LaMondia/Auburn University, Anuar Onayev/Auburn University, Lisa Aultman-Hall/Auburn University
An Exploratory Analysis of Long-Distance Travel in England (20-02883)
Muhammad Adeel/University of Leeds, Zia Wadud/University of Leeds, Jillian Anable/University of Leeds
Testing the Moderating Effect of Customized Travel Mode in the Competition of Long-Distance Mode (20-04460)
Jingjing Hao/Southwest Jiaotong University, Ling Zhang/Southwest Jiaotong University
Predicting Travel Mode Choice Based on 2017 NHTS Trip Data with Multi-Nomial Logit Model and Light Gradient Boosting Machine (20-05987)
Ziyi Dai/Georgia Institute of Technology (Georgia Tech), Haobing Liu/Georgia Institute of Technology (Georgia Tech), Randall Guensler/Georgia Institute of Technology (Georgia Tech)

1582

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 152B
Evaluations and Applications of Emerging Crowdsourced Data Sets
Michael D. Fontaine, VTRC, presiding
Sponsored By Standing Committee on Urban Transportation Data and Information Systems

Crowdsourced data has become broadly used for a wide range of analyses in urban areas. This data must often be validated before it can be used, so evaluations of speed data quality and event data quality are presented. Applications of emerging crowdsourced data to examine ride hailing trends and changes in congestion and reliability are also presented.

An Exploratory Analysis of the Relationship Among Congestion, Travel-Time Reliability, and Freight-Related Performance Management Measures and Their Associativity with the Roadway Attributes (20-01390)
Chowdhury Siddiqui/South Carolina Department of Transportation, Kwanpyo Ko/South Carolina Department of Transportation
Evolution of Ridehailing and Ridesharing in Chicago: 2013–2018 (20-02959)
Sneha Roy/Cambridge Systematics, Inc., Anurag Komanduri/Cambridge Systematics, Inc., Kimon Proussaloglou/Cambridge Systematics, Inc.
Evaluation of Crowdsourced Event Reports for Real Time Implementation: Spatial and Temporal Accuracy Analyses (20-05676)
Yuandong Liu/Oak Ridge National Laboratory, Nima Hoseinzadeh/Oak Ridge National Laboratory, Lee Han/Oak Ridge National Laboratory, Candace E. Brakewood/Oak Ridge National Laboratory
Evaluate Probe Speed Data Quality for Congestion Performance Measures (20-05717)
Fahmida Rahman/Kentucky Transportation Cabinet, Xu Zhang/Kentucky Transportation Cabinet, Mei Chen/Kentucky Transportation Cabinet

1583 CM (1.75)

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 156
Big Tools for Small Areas
Jeff Carroll, High Street Consulting Group, LLC, presiding
Sponsored By Standing Committee on Transportation Planning for Small and Medium-Sized Communities

This lectern session will provide attendees with research and demonstrated practices intended to address the specific and unique transportion needs and challenges of rural, small and medium sized communities.

Renewing Rural Infrastructure: Lessons from the Belvue Bridge Benefit Assessment (20-04211)
Gregory Newmark/Kansas State University
An Active Transportation Access and Connectivity Assessment Tool to Support Planning in Small- and Medium-Sized Communities (20-04506)
Jeffrey LaMondia/Auburn University, Ruth Brock/Auburn University, William Carter/Auburn University, Barb Struempler/Auburn University
Show Me the Highlights: The Planning Research Digest: A New Resource for Planning Practitioners (P20-20773)
Jerry Everett/University of Tennessee

1584

Information and Communications Technologies and the Evolution of Travel Choices
Mahmudur Fatmi, University of British Columbia, Okanagan, presiding
Sponsored By Standing Committee on Effects of Information and Communication Technologies (ICT) on Travel Choices

How Attractive Is It to Use the Internet While Commuting?: A Work Attitude–Based Segmentation of Northern California Commuters (20-00927)
Sungtaek Choi/Georgia Institute of Technology (Georgia Tech), Patricia Mokhtarian/Georgia Institute of Technology (Georgia Tech)
Understanding the Impacts of Pokémon Go on Route and Mode Choice Decisions (20-00422)
Yuntao Guo/University of Hawaii, Srinivas Peeta/University of Hawaii, Shubham Agrawal/University of Hawaii, Irina Benedyk/University of Hawaii
Exploring the Elements and Determinants of the Value of Time for Manually Driving and Automated Driving: A Qualitative Approach (20-05355)
Viktoriya Kolarova/German Aerospace Center (DLR), Institute of Transport Research
A Comparison of Online and In-Person Activity Engagement: The Case of Shopping and Eating Meals (20-02509)
Felipe Dias/University of Texas, Austin, Patrícia Lavieri/University of Texas, Austin, Shivam Sharda/University of Texas, Austin, Sara Khoeini/University of Texas, Austin, Chandra Bhat/University of Texas, Austin, Ram Pendyala/University of Texas, Austin, Abdul Pinjari/University of Texas, Austin, Gitakrishnan Ramadurai/University of Texas, Austin, Karthik Srinivasan/University of Texas, Austin
Propensity Toward Ownership and Use of Automated Vehicles: Who Are the Adopters? Who the Non-Adopters? Who Is Hesitant? (20-03064)
Tho Le/University of California, Giovanni Circella/University of California, Grant Matson/University of California

1585

Integrating National Environmental Policy Act and Section 106 Consultation
Linda Henderson, Texas Department of Transportation, presiding
Sponsored By Standing Committee on Historic and Archeological Preservation in Transportation, Standing Committee on Environmental Analysis in Transportation

Integrating Public Involvement: The Ongoing Saga of the Waterville Interurban Bridge (P20-20500)
Erica Schneider/Ohio Department of Transportation
Integrating NEPA and Section 106: Lessons from FRA (P20-20501)
amanda ciampolillo/Federal Railroad Administration (FRA)
ACHP Perspectives on Integrating Section 106 and NEPA (P20-20503)
Sarah Stokely/Advisory Council on Historic Preservation, Mandy Ranslow/Advisory Council on Historic Preservation

1586

Energy Use and Emissions from Advanced/Automated Medium and Heavy Duty Vehicles
Paul Leiby, Oak Ridge National Laboratory, presiding
Sponsored By Standing Committee on Transportation Energy, Standing Committee on Transportation and Air Quality, Standing Committee on Alternative Transportation Fuels and Technologies

 This session is broad scope to give the audience interested in transportation energy, fuels, and emissions new insights on evolving trends related road shipping. It will cover emerging fuel efficiency, automation and other technologies and practices that will influence future MD/HD trucking/freight fuel efficiency. A separate, parallel session will focus more specifically on truck electrification.

Changing Patterns of Road Freight and Their Implications for Energy (P20-20344)
Alicia Birky/National Renewable Energy Laboratory (NREL)

(continued)

Opportunities and Challenges for Energy and Emission Reduction from Advanced Heavy Duty Vehicles (P20-20 812)
Carl Hergart/Paccar Corporation
How to Slash GHG Emissions in the Freight Sector: Policy Insights from a Technology Adoption Model of Canada (20-00178)
William Hammond/Simon Fraser University, Jonn Axsen/Simon Fraser University, Erik Kjeang/Simon Fraser University

1587

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 140B
Equity and Environmental Justice Issues in Bicycle and Pedestrian Planning
Aaron Golub ADD50, Portland State University, presiding
Sponsored By Standing Committee on Environmental Justice in Transportation, Standing Committee on Social and Economic Factors of Transportation

Do investments in cycling and pedestrian infrastructure improve equity in access? What barriers do different populations face when trying to cycle? This session will feature four papers focused on addressing issues of equity and environmental justice in the planning for and evaluation of cycling and pedestrian transportation systems.

The Impact of Individual's Exposure to Business Establishments on Active Travel Behavior: A Statewide Analysis (20-02044)
Yicong Yang/University of Wisconsin, Madison, Carolyn McAndrews/University of Wisconsin, Madison
Barriers to Cycling, Barriers to Health: An Equity Analysis Using 2017 NHTS Data (20-02278)
Lindsay Braun/University of Illinois at Urbana-Champaign
Can Cycling Contribute to Accessibility Equity?: Evidence from Bogotá, Colombia (20-02309)
Luis Guzman/Universidad de Los Andes, Daniel Rosas-Satizabal/Universidad de Los Andes, Daniel Oviedo/Universidad de Los Andes
Does Accessibility via Green Transportation Modes Matter for Transportation Equity?: An Investigation for Two Medium-Size U.S. Cities (20-01023)
Na Chen/University of Cincinnati, Chih-Hao Wang/University of Cincinnati

1588

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 201
Developments to Improve Unpaved Road Performance
Gordon Keller, Genesee Geotechnical, presiding
Sponsored By Standing Committee on Low-Volume Roads

This session presents research on ways to improve the performance of unpaved roads through mechanical and chemical means, better aggregate selection, and innovative evaluation methods.

Field Performance and Evaluation of Geogrid Reinforcement in Low-Volume Unpaved Roads: Four-Year Field Observation (20-01447)
Chun-Hsing Ho/Northern Arizona University, Jeremy DeGeyter/Northern Arizona University, Cui Ying/Northern Arizona University
Evaluation of Rural Unpaved Roads Using Conventional and Innovative Methods in Illinois (20-04504)
Mohammad Hossain/Bradley University, Erol Tutumluer/Bradley University, Tim Peters/Bradley University
Evaluation of Cost-Effective Aggregate Options for Granular Roadways (20-04811)
Sajjad Satvati/Michigan State University, Bora Cetin/Michigan State University, Jeramy Ashlock/Michigan State University
Laboratory Method to Assess Efficacy of Dust Suppressants for Dirt and Gravel Roads (20-04819)
Audrey Stallworth/Pennsylvania State University University Park : Penn State, Eric Chase/Pennsylvania State University University Park : Penn State, William Burgos/Pennsylvania State University University Park : Penn State, Nathaniel Warner/Pennsylvania State University University Park : Penn State

1589

Current Practices in Highway Stormwater Management
Brian Currier, California State University, Sacramento, presiding
Sponsored By Standing Committee on Stormwater

This session will describe emerging practices and research to assist stormwater managers at DOTs .

Current DOT Stormwater Research Overview (P20-20147)
Becky Humphreys/Ohio Department of Transportation, Brian Currier/California State University, Sacramento
Evaluating Results from PennDOT's Statewide SCM Inspections (P20-20148)
Jeffrey MacKay/NTM Engineering, Inc., Winnie Okello/Pennsylvania Department of Transportation
Hydraulic Performance Evaluation of Wattles Used for Erosion and Sediment Control (20-00097)
J. Whitman/Auburn University, Michael Perez/Auburn University, Jaime Schussler/Auburn University, Lan Liu/Auburn University
Forensic Evaluation of Roadside Ditches in Urban Settings Using Mobile LiDAR (20-00215)
Cheng-Chun Lee/Texas A&M University, College Station, Nasir Gharaibeh/Texas A&M University, College Station

1590

Innovations in Pavement Design and Rehabilitation
James Bryce, Marshall University, presiding
Sponsored By Standing Committee on General and Emerging Pavement Design, Subcommittee on Interlayer Systems to Control Reflective Cracking

A National ASCE Design Standard for Permeable Interlocking Concrete Pavement (20-01605)
David Smith/Interlocking Conc Pavement Institute, Robert Bowers/Interlocking Conc Pavement Institute, David Hein/Interlocking Conc Pavement Institute
Optimal Structure Combination for Inverted Asphalt Pavement Incorporating Cracks in Cement-Treated Sub-Base (20-04816)
Aimin Sha/Chang'an University, Zhenqiang Han/Chang'an University, Liya Jiao/Chang'an University, Liqun Hu/Chang'an University, Hongyin Li/Chang'an University
Analysis of Temperature Variation and Thermal-Induced Reflective Cracking Potential in Composite Pavements (20-05148)
Pengyu Xie/Rutgers, The State University of New Jersey, Hao Wang/Rutgers, The State University of New Jersey
Optimized Thickness of Non-Woven Geofabric Stress Relief Layer for Unbonded Concrete Overlays (20-00452)
Bernard Izevbekhai/Minnesota Department of Transportation

1591

Current Topics in Steel Girder Bridges
Jennifer McConnell, University of Delaware, presiding
Sponsored By Standing Committee on Steel Bridges, Standing Committee on Seismic Design and Performance of Bridges, Standing Committee on Construction of Bridges and Structures, Standing Committee on Fabrication and Inspection of Metal Structures

 This session features four papers addressing topics of current interest in the area of steel girder bridges , including a paper on the seismic performance of simple-span for dead load, continuous for live load bridges, a paper on phased-array ultrasonic testing of welds, a paper on themo-mechanical coupling behavior of early-age concrete in a composite structure, and a paper on the field performance of curved steel girder bridges with integral abutments.

Proposed Changes to AWS D1.5 Annex K PAUT Inspection Procedures Based on NCHRP Report 908 (P20-20203)
Robert Connor/Purdue University, Curtis Schroeder/Wiss, Janney, Elstner Associates, Glenn Washer/University of Missouri, Columbia

(continued)

SDCL in Seismic Areas: A Comparative Study of Cyclic and Shake Table Tests (20-00910)
Amir Sadeghnejad/Florida International University, Sheharyar Rehmat/Florida International University, Islam Mantawy/Florida International University, Atorod Azizinamini/Florida International University
Curved Steel Girder Integral Abutment Bridges in Vermont (20-04103)
Scott Civjan/University of Massachusetts, Amherst, James Lacroix/University of Massachusetts, Amherst, Kristin Higgins/University of Massachusetts, Amherst, Asako Takeuchi/University of Massachusetts, Amherst
Numerical Simulation on the Thermo-Mechanical Coupling Behavior of Early-Age Concrete in Large-Scale Steel-Concrete Combination Segment (20-01460)
Jiang Liu/School of Highway, Chang'an University, Yongjian LIU/School of Highway, Chang'an University

1592

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 204A
Advances in Tunneling and Underground Design and Construction
James Long, Pennsylvania Department of Conservation and Natural Resources, presiding
Sponsored By Standing Committee on Tunnels and Underground Structures

Review and History of the Eisenhower-Johnson Memorial Tunnels Design and Construction (20-02290)
Gauen Alexander/Colorado School of Mines, Marte Gutierrez/Colorado School of Mines, Ashton Krajnovich/Colorado School of Mines, Stephen Harelson/Colorado School of Mines
A Mechanical Model and Numerical Simulation Analysis of Segment Joints of Large Diameter Shield Tunnels Under High Water Pressure: A Case Study of Qiongzhou Strait Shield Tunnel in China (20-04967)
Xi Jiang/Tongji University, Wei Chen/Tongji University, Likuan Dong/Tongji University, Zeying Tan/Tongji University, Xuehui Zhang/Tongji University, Yun Bai/Tongji University
Concrete Lining Damage and Structural Stability Assessment During Tunnel Fires: Case Studies (20-03938)
Nan Hua/University at Buffalo - The State University of New York, Anthony Tessari/University at Buffalo - The State University of New York, Negar Elhami Khorasani/University at Buffalo - The State University of New York
Analysis of the Vibration and Rock Damage Caused by Blasting in the Construction of Mountain Tunnel (20-02198)
Wenfeng Zhou/Tongji University, Shaoming Liao/Tongji University, Qingyang Qin/Tongji University
As-Encountered Prediction of Tunnel Boring Machine Performance Parameters Using Recurrent Neural Networks (20-05928)
Kabir Nagrecha/California State University, Los Angeles, Luis Fisher/California State University, Los Angeles, Michael Mooney/California State University, Los Angeles, Tonatiuh Rodriguez-Nikl/California State University, Los Angeles, Mehran Mazari/California State University, Los Angeles, Mohammad Pourhomayoun/California State University, Los Angeles

1593

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 207A
Fiber Reinforced Polymers Applications in Transportation Infrastructure
Wael Zatar, Marshall University, presiding
William Potter, Florida Department of Transportation, presiding
Sponsored By Standing Committee on Structural Fiber Reinforced Polymers

FRP is an important topic of research worldwide. This session focuses on innovation and future deployment of FRP in all kinds of transportation infrastructure, along with lessons learned and recommendations.

Numerical Modeling of Deteriorated Bridge Bent Caps with Externally Bonded CFRP Retrofit (20-00907)
Yazan Almomani/University of Texas, Arlington, Nur Yazdani/University of Texas, Arlington, Eyosias Beneberu/University of Texas, Arlington
A New Hybrid FRP Reinforcing/Prestressing Cable for Transportation Structures (20-01917)
Jonathon Tanks/National Institute for Materials Science, Kimiyoshi Naito/National Institute for Materials Science, Hiroyuki Oguma/National Institute for Materials Science
Prestressed CFRP Composites for Bridge Rehabilitation: Theory and Case Studies (P20-20641)
Yail Jimmy Kim/University of Colorado Denver - Anschutz Medical Campus
DECID2 Smart Composite Platform: Recent Advances in Sensor Placement and Reinforcement of Assembly Areas (P20-20642)
Monssef Drissi-Habti/IFSTTAR

1594

Surface Resistivity and Other Factors Related to Performance-Engineered Concrete Mixtures
Peter Taylor, National CP Tech Center, ISU, presiding
Sponsored By Standing Committee on Durability of Concrete

This session will look at factors related to Performance Engineered Concrete Mixtures with a focus on surface resisitivity.

Influence of Internal Curing and Coarse Aggregate Type on Concrete's Surface Resistivity (20-04789)
Jose Milla/Louisiana Transportation Research Center (LTRC), William Saunders/Louisiana Transportation Research Center (LTRC), Samuel Cooper/Louisiana Transportation Research Center (LTRC)
Assessment of Concrete Curing Duration Using Bulk Electrical Conductivity and Porosity (20-05197)
Kanchani Basnayake/Western Michigan University, Abul Mazumder/Western Michigan University, Upul Attanayake/Western Michigan University, Neal Berke/Western Michigan University
Effect of Concrete Curing Conditions and Air Content on the Formation Factor and the Transport Properties Classification Based on AASHTO-PP84 (20-04848)
Jussara Tanesi/SES Group & Associates, LLC, Luca Montanari/SES Group & Associates, LLC, Haejin Kim/SES Group & Associates, LLC, Ahmad Ardani/SES Group & Associates, LLC, Colin Lobo/SES Group & Associates, LLC, Rongjin Hong/SES Group & Associates, LLC, Karthik Obla/SES Group & Associates, LLC

1595

Seasonal Climatic Effects on Transportation Infrastructure, Part 2 (Part 1, Session 1452)
David Orr, Cornell Local Roads Program, presiding
Sponsored By Standing Committee on Seasonal Climatic Effects on Transportation Infrastructure

Seasonal Climatic Effects on Transportaton Infrastructure - Part 1 looks at Freeze Thaw behavior on our infrastructure

Potential Use of NASA's SMAP Freeze-Thaw Tool to Assist in Seasonal Load Restriction Timing in the Northern United States (20-00329)
Simon Kraatz/University of Massachusetts, Amherst, Heather Miller/University of Massachusetts, Amherst, Benjamin Poirier/University of Massachusetts, Amherst, Mahsa Moradi/University of Massachusetts, Amherst, Jennifer Jacobs/University of Massachusetts, Amherst
Monitoring Track Surface Deformation During a Freeze-Thaw Cycle: A Case Study (20-00809)
Alireza Roghani/National Research Council Canada, Juan Hiedra Cobo/National Research Council Canada, Jonathan Meehan/National Research Council Canada, Frederic Verluise/National Research Council Canada, Paul Charbachi/National Research Council Canada
Using Ground Penetrating Radar to Evaluate Freeze-Thaw Condition of Railway Substructure (20-00860)
Alireza Roghani/National Research Council Canada, Hamed Kashani/National Research Council Canada, Bruce Wiljanen/National Research Council Canada
Effectiveness of Geosynthetics as Insulation to Freeze-Thaw: Field Instrumentation and Numerical Modeling (20-02774)
Asif Ahmed/SUNY Poly, Md Azizul Islam/SUNY Poly, Tanvir Imtiaz/SUNY Poly

1596

Topics in Transportation Earthworks: Slope Failures, Intelligent Compaction, and Mechanically Stabilized Earth Walls
John Yzenas, J Yzenas Consulting, LLC, presiding
Antonio Marinucci, V2C Strategists, LLC, presiding
Sponsored By Standing Committee on Transportation Earthworks

This session deals with a variety of topics of interest to the Transportation Earthworks Committee . Subjects include rapid repair methods for slope failures, numerical models in intelligent compaction, and MSE wall deflections with footing loads.

Lateral Facing Deflections of Geosynthetic-Reinforced Retaining Walls Under Footing Loading (20-02245)
Mustapha Rahmaninezhad/University of Kansas, Jie Han/University of Kansas
Finite Element Modeling of a Mechanically Stabilized Earth Trial Wall (20-03803)
Andrew Lees/Tensar International, Michael Dobie/Tensar International
Incorporating Calibrated Numerical Models in Estimating Moduli of Compacted Geomaterials from Integrated Intelligent Compaction Measurements and Laboratory Testing (20-04190)
Aria Fathi/University of Texas, El Paso, Cesar Tirado/University of Texas, El Paso, Sergio Rocha/University of Texas, El Paso, Mehran Mazari/University of Texas, El Paso, Soheil Nazarian/University of Texas, El Paso
Rapid Repair Methods for Embankment Slope Failure and Recommended Implementation Procedures to Avoid Recurring Failures: The Case of Texas (20-04906)
Seyed Ehsan Zahed/VRX Inc., Bahram Abediniangerabi/VRX Inc., Sahadat Hossain/VRX Inc., Mohsen Shahandashti/VRX Inc.

1597

Artificial Intelligence and Machine Learning Applications for Geotechnical Design and Analysis: Next Generation of Engineering Practice
Negin Yousefpour, Arup USA, presiding
Xingwei Chen, Louisiana Department of Transportation and Development, presiding
Sponsored By Standing Committee on Geotechnical Instrumentation and Modeling, Standing Committee on Soil and Rock Properties, Standing Committee on Foundations of Bridges and Other Structures

With fast-growing computational power, emerging Artificial Intelligence (AI) and Machine Learning (ML) methods for advanced engineering have attracted extensive interest by researchers and practitioners in various fields of engineering , including geotechnics. There is a great potential to systematically and objectively apply AI /ML for more reliable and cost-effective geotechnical design and analysis. This is a significant topic of research and advancement, considering the inherent uncertainties in soil and rock properties, common usage of locally calibrated and uncertain empirical methods for design, as well as the great amount of data available from field and lab testing.

Evaluating the Ultimate Pile Capacity from CPT Data Using Artificial Neural Network (20-02191)
Md Ariful Hassan Mojumder/Louisiana Department of Transportation and Development, Murad Abu-Farsakh/Louisiana Department of Transportation and Development, Zhongjie Zhang/Louisiana Department of Transportation and Development
Bridge Scour Forecast Using Artificial Intelligence (20-04067)
Negin Yousefpour/Arup USA, Steve Downie/Arup USA, Steve Walker/Arup USA, Nathan Perkins/Arup USA, Hristo Dikanski/Arup USA
Machine Learning Methods to Map Stabilizer Effectiveness Based on Common Soil Properties (20-04158)
Amit Gajurel/Boise State University, Bhaskar Chittoori/Boise State University, Partha Sarathi Mukherjee/Boise State University, Mojtaba Sadegh/Boise State University
Application of Genetic Expression Programming for the Estimation of the Strength Properties of Cement Stabilized Reclaimed Materials (20-00713)
Mohammad Rashidi/University of Texas, El Paso, Reza Ashtiani/University of Texas, El Paso

1598

Advances in Stabilized Soil Testing and Modeling
Reza Ashtiani, University of Texas, El Paso, presiding
Sponsored By Standing Committee on Stabilization of Geomaterials and Recycled Materials

 This session includes a selection of presentations on advances in the laboratory testing and modeling of stabilized soils and full-depth reclamation (FDR) mix design with emphases on cracking, aggregate bases, and patching applications.

Development and Field Calibration of Shrinkage Cracking Model for Cementitiously Stabilized Layers (20-05826)
Jingan Wang/Washington State University, Xiaojun Li/Washington State University, Haifang Wen/Washington State University, Balasingam Muhunthan/Washington State University
Treated Versus Untreated Aggregate Bases for Flexible Pavements: A Nationwide Comparative Study (20-04228)
Hemant GC/University of Texas, Tyler, Mena Souliman/University of Texas, Tyler, Mayzan Isied/University of Texas, Tyler, Lubinda WALUBITA/University of Texas, Tyler
Full-Scale Laboratory Evaluation of the Effectiveness of Subgrade Soil Stabilization Practices for Patching Applications (20-03082)
Ali Behnood/Purdue University, Jan Olek/Purdue University
Full-Depth Reclamation Mix Design: The Effects of Sample Size, Conditioning Procedure, and Testing Temperature (20-00989)
Fawaz Kaseer/University of Florida, Edith Arambula Mercado/University of Florida, Jon Epps/University of Florida, Amy Martin/University of Florida, Renato Ceccovilli/University of Florida

1599

Innovative Uses of Software Platforms to Meet the Needs of the Next Generation of Traffic Management Systems
Jon Obenberger, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Freeway Operations

This session will highlight successful practices and lessons learned from agencies who are using or pursing modular software platforms that leverage commercial off-the-shelf and open source products combined with application program interfaces (APIs) to meet the evolving needs, expectations, and resource constraints facing their agencies as they prepare for, manage, maintain, and operate the next generation of their traffic management systems.

Sunguide's Software Platform: Meeting the Future Needs of the Florida DOT's Next Generation of Traffic Management Systems (P20-21228)
Raj Ponnaluri/Florida Department of Transportation
Creation and Management of Agency-Owned Traffic Management Software (P20-21229)
Steven Dellenback/Southwest Research Institute
Next-Generation Traffic Management Systems in the Indiana DOT (P20-21682)
Edward Cox/Indiana Department of Transportation
Future TMS Expansion and Integration for Optimizing Road Network Operations: A Victorian DoT Perspective (P20-21857)
Matthew Hall/Department of Transport, Victoria

1600

Performance Evaluation of Traffic Signal Systems Using Trajectory Data
Sponsored By Standing Committee on Traffic Signal Systems

(continued)

Multi-Objective Performance Evaluation for Actuated Traffic Signal Systems Using Probe Vehicle Data and High-Resolution Traffic Signal Events Data (20-01456)
Pengfei (Taylor) Li/University of Texas, Arlington, Farzana Chowdhury/University of Texas, Arlington, Peirong (Slade) Wang/University of Texas, Arlington, Sayem Imtiaz/University of Texas, Arlington
Using Connected Vehicle Data to Reassess Dilemma Zone Performance of Heavy Vehicles (20-02403)
Howell Li/Purdue University, Tom Platte/Purdue University, Jijo Mathew/Purdue University, Ben Smith/Purdue University, Enrique Saldivar-Carranza/Purdue University, Darcy Bullock/Purdue University
Quantitative Performance Assessment of Signal Control Effectiveness: Comprehensive Framework Using Vehicle Trajectories (20-05438)
Marija Ostojic/Northwestern University, Archak Mittal/Northwestern University, Hani Mahmassani/Northwestern University
Scalable and Actionable Performance Measures for Traffic Signal Systems Using Probe Vehicle Trajectory Data (20-04464)
Jonathan Waddell/Wayne State University, Stephen Remias/Wayne State University, Jenna Kirsch/Wayne State University, Stanley Young/Wayne State University

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1601

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 101
Driver Behavior in Work Zones
Kristian Pedersen, Danish Road Directorate, presiding
Sponsored By Standing Committee on Work Zone Traffic Control

"Speed Up to Hit the Worker": Impact of Hacked Road Signs on Work Zone Safety (20-02473)
Alireza Ermagun/Mississippi State University, Megan Finney/Mississippi State University, Kaveh Bakhsh Kelarestaghi/Mississippi State University, Kevin Heaslip/Mississippi State University
Truck-Mounted Attenuators and Driver Behavior at Highway Single-Lane Closures: Comparative Effects of Three Traffic Management Layouts (20-01590)
Ross Blackman/Queensland University of Technology, Ashim Debnath/Queensland University of Technology, Matthew Legge/Queensland University of Technology
Risk to Workers or Vehicle Damage: What Makes Drivers Slow Down in Work Zones? (20-02555)
Ashim Debnath/Deakin University, Narelle Haworth/Deakin University, Ross Blackman/Deakin University
Review of Work Zone Queue Management Teams and a Portable Automated Queue Warning System in Virginia (20-01350)
Benjamin Cottrell/Virginia Transportation Research Council, Chien-Lun Lan/Virginia Transportation Research Council

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1602

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 208
New Approaches and Technologies Enhancing Pavement Maintenance
Thomas Kazmierowski, Golder Associates Inc., presiding
Rob Zilay, Dye Management Group, Inc., presiding
Sponsored By Standing Committee on Pavement Maintenance

This session includes papers describing new approaches and technologies for (1) using crack fundamental elements (CFE) and 3D pavement surface data to study real-world crack deterioration behavior and to correlate these new performance indicators with the optimal maintenance and rehabilitation (M&R) methods; (2) developing an enhanced LCCA based methodology which utilizes the 3D slab-based cracking data to select the best strategy for JPCP MR&R by determining the timing and cost for slab replacement and lane reconstruction; (3) creating a porous cold patch asphalt mixture for pothole repair with respect to porous pavement and (4) establishing a pavement performance development model of maintenance treatments to calculate the cost-effectiveness of maintenance treatments considering secondary maintenance costs based.

New Pavement Performance Indicators Using Crack Fundamental Elements and 3D Pavement Surface Data with Multi-Time Stamp Registration for Crack Deterioration Analysis and Optimal Treatment Determination (20-05068)
Yichang(James) Tsai/Georgia Institute of Technology (Georgia Tech), Zhongyu Yang/Georgia Institute of Technology (Georgia Tech)

(continued)

Enhancing JPCP Maintenance, Rehabilitation, and Reconstruction Decision Making Using 3D Slab-Based Cracking Data and LCCA (20-05333)
Ryan Salameh/Georgia Institute of Technology (Georgia Tech), Yichang(James) Tsai/Georgia Institute of Technology (Georgia Tech)

Design and Performance Evaluation of Cold Patch Asphalt Mixtures for Porous Asphalt Pavement (20-01013)
Xiang Wang/Southeast University, Qiao Dong/Southeast University, Jiawei Yuan/Southeast University, Pei Zhang/Southeast University, Tianjie Zhang/Southeast University

Evaluation of Effectiveness of Asphalt Pavement Maintenance Treatments Considering Secondary Maintenance Costs (20-01112)
Fujian Ni/Southeast University, Jialing Jiang/Southeast University, Linyi Yao/Southeast University, Qiao Dong/Southeast University

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1603

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 202B
Bridging Plans and Projects: How Planning and Environmental Linkages Eliminates Duplication in Environmental Reviews
Manisha Patel, WSP, presiding
Sponsored By Standing Committee on Environmental Issues in Transportation Law

Relying on decisions made during the planning stage on subjects such as the purpose and need of a project or project alternatives can save time and costs during the project development stage. The Federal Highway Administration and the Federal Transit Administration have relied on existing authorities, known as Planning and Environmental Linkages (PEL), for this practice since the early 2000s. This panel will explore the various authorities for PEL, how they work, what is the state of practice in this area, and what might be in the future for this concept as the Administration implements its One Federal Decision policy.

Panel Discussion (P20-21345)
Eric Beightel/WSP, David Miller/Nossaman LLP, Carmelo Acevedo/Arizona Department of Transportation

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1604

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 207B
Homeless Encampments in Rights of Way Are Nothing New, Part 2 (Part 1, Session 1538)
Marcelle Jones, Stantec Consulting Service, presiding
Sponsored By Standing Committee on Eminent Domain and Land Use, Standing Committee on Transportation Law

Homeless encampments in rights of way are a growing challenge because of the dangers inherent in unregulated human encroachment near transportation facilities, as well as the illegal activities encampments frequently beget. Environmental concerns involving health, sanitation, and hazardous substances associated with such encampments must also be addressed. Part 2. This presentation will be a round table discussion focusing on best practices for dealing with the issues associated with homeless encampments in the right of way.

Panel Discussion: Roundtable (P20-21750)
Christopher Kramer/Jennings, Strouss & Salmon, Danielle Constant/Jennings, Strouss & Salmon, Samantha Juneau/Minnesota Department of Transportation, William James/Tennessee Attorney General

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1605

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 102B
Roundabout Research in Design and Operations
Eugene Russell, Kansas State University, presiding
Sponsored By Standing Committee on Roundabouts

Roundabout research is prominent across the world. This session will explore research in the areas of roundabout designs, including Turbo roundabouts, and analysis of operations, emissions and sustainability.

Multi-Objective Evaluation Model of Single-Lane Roundabouts: Safety, Mobility, and Sustainability (20-05108)
Hend Ahmed/Ryerson University, Said Easa/Ryerson University

(continued)

The Deviation Angle for One-Lane Roundabouts: A General Mathematical Formulation (20-04168)

Nicola Berloco/Politecnico di Bari, Paolo Intini/Politecnico di Bari, Pasquale Colonna/Politecnico di Bari, Vittorio Ranieri/Politecnico di Bari

Performance Evaluation of Basic Turbo Roundabouts as an Alternative to Conventional Double-Lane Roundabouts (20-05405)

Zuhair Elhassy/University of Central Florida, Hatem Abou-Senna/University of Central Florida, Essam Radwan/University of Central Florida

A Comparative Empirical Assessment of Roundabouts Operations in Rural Areas: Impacts On Congestion-Specific Vehicle Speed Profiles and Pollutant and Noise Emissions (20-02308)

Paulo Fernandes/University of Aveiro, Centre for Mechanical Technology and Automation, Ricardo Tomás/University of Aveiro, Centre for Mechanical Technology and Automation, Francesco Accuto/University of Aveiro, Centre for Mechanical Technology and Automation, Antonio Pascale/University of Aveiro, Centre for Mechanical Technology and Automation, Behnam Bahmankhah/University of Aveiro, Centre for Mechanical Technology and Automation, Claudio Guarnaccia/University of Aveiro, Centre for Mechanical Technology and Automation, Anna Granà/University of Aveiro, Centre for Mechanical Technology and Automation, Margarida Coelho/University of Aveiro, Centre for Mechanical Technology and Automation

1606

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 103B

User Information Needs for Connected and Automated Vehicle Technologies
John Campbell, Exponent, Inc., presiding
Sponsored By Standing Committee on User Information Systems

Categorizing Driving Style Using Connected Vehicle Data: Application of Unsupervised Learning (20-03131)

Amin Mohammadnazar/University of Tennessee, Knoxville, Ramin Arvin/University of Tennessee, Knoxville, Asad Khattak/University of Tennessee, Knoxville

Performance Evaluation of Field-Test Vehicles Platooning: Application of Adaptive Cruise Control and Cooperative Adaptive Cruise Control (20-04896)

Iman Mahdinia/University of Tennessee, Knoxville, Ramin Arvin/University of Tennessee, Knoxville, Asad Khattak/University of Tennessee, Knoxville, Amir Ghiasi/University of Tennessee, Knoxville

Characterization of Drivers' Engagement in Secondary Tasks: Application of Deep Learning for Data-Driven In-Vehicle Systems (20-01512)

Osama Osman/University of Tennessee, Chattanooga, Hesham Rakha/University of Tennessee, Chattanooga

Different Level Automation Technology Acceptance: Older Adult Drivers (20-04178)

Sanaz Motamedi/University of Florida, Alaa Masrahi/University of Florida, Tobias Bopp/University of Florida, Jyh-Hone Wang/University of Florida

Connected Vehicle Real-Time Traveler Information Messages for Freeway Speed Harmonization Under Adverse Weather Condition: Trajectory-Level Analysis Using Driving Simulator (20-04753)

Guangchuan Yang/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA), Sherif Gaweesh/Federal Highway Administration (FHWA), Eric Adomah/Federal Highway Administration (FHWA)

1607

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 103A

Vulnerable Road Users: Simulator and Virtual Reality Analyses
Siby Samuel, University of Waterloo, presiding
Sponsored By Standing Committee on Simulation and Measurement of Vehicle and Operator Performance

Safety Measures for Left Turns at Signalized Intersections: A Review (20-05793)

Sardar Elias/University of Waterloo, Moojan Ghafurian/University of Waterloo, Siby Samuel/University of Waterloo

Simulation-Based Analysis of a Driver–Pedestrian Conflict at an Uncontrolled Location in an Urban Multi-Lane Arterial (20-05760)

Maria Rojas Ibarra/Recinto Universitario de Mayaguez Universidad de Puerto Rico, Alberto Figueroa-Medina/Recinto Universitario de Mayaguez Universidad de Puerto Rico, Didier Valdés/Recinto Universitario de Mayaguez Universidad de Puerto Rico, Benjamin Colucci Rios/Recinto Universitario de Mayaguez Universidad de Puerto Rico, Alcibiades Bustillo Zarate/Recinto Universitario de Mayaguez Universidad de Puerto Rico, Natacha Cardona Rodriguez/Recinto Universitario de Mayaguez Universidad de Puerto Rico

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The Use of Virtual Reality Simulators in Bicycle and Pedestrian Human Subject Testing: A Synthesis (20-04844)
Austin Angulo/University of Virginia, Erin Robartes/University of Virginia, T. Donna Chen/University of Virginia, Matthew Dean/University of Virginia, Emily Chen/University of Virginia, Arsalan Heydarian/University of Virginia, Brian Smith/University of Virginia

Emergency Takeover on a Driving Simulator Highway: Teen Versus Adult Versus Older Drivers (20-04327)
Helen Loeb/Children's Hospital of Philadelphia, Aditya Belwadi/Children's Hospital of Philadelphia, Saniyah Shaikh/Children's Hospital of Philadelphia, Jalaj Maheshwari/Children's Hospital of Philadelphia, Chris Bijumon/Children's Hospital of Philadelphia, Michelle Shen/Children's Hospital of Philadelphia

A Study for Correlation Between Driver Age and Visual Acuities and Safety Driving Based on VR Technologies (20-03160)
Dongmin Lee/University of Seoul, Sooncheon Hwang/University of Seoul, Sunhoon Kim/University of Seoul, Myohee Myeong/University of Seoul

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1608

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 102A
Evaluating and Implementing Advanced Vehicle Headlighting Systems
Daniel Stern, Driving Vision News, presiding
Sponsored By Standing Committee on Visibility

Recent technological evolution in lighting systems, sensors and cameras has made intelligent vehicle headlighting systems feasible. Systems such as adaptive driving beam (ADB) headlights are being used in some parts of the world. Speakers in this session will describe the potential safety benefits of advanced vehicle lighting and how these systems can be evaluated to ensure they realize those benefits for road users.

Headlight Safety Ratings: Challenges and Impacts (P20-21513)
Ian Reagan/Insurance Institute for Highway Safety
Crash Avoidance with Advanced Headlighting Systems: Investigating Field Effectiveness (P20-21514)
Carol Flannagan/University of Michigan, Transportation Research Institute
Converging Technology, Safety Evidence, and Standards for New Headlight Systems (P20-21515)
John Bullough/Rensselaer Polytechnic Institute (RPI)
Vehicle Lighting: Standards for Advanced Functionality (P20-21663)
Michael Larsen/General Motors Company, Joseph Jaklic/OSRAM

1609

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 145B
Cross-Cutting Issues in Shared Mobility
Sarah Kaufman, New York University, presiding
Sponsored By Standing Committee on Emerging and Innovative Public Transport and Technologies

The number and types of transportation modes that are now part of the mobility landscape continues to grow. Each mode and service model offers unique challenges, but many of the lessons learned cut across many modes. Issues such as equity, policy and planning must be addressed regardless of the mode being discussed – and the decisions must take a holistic approach to not only optimizing the mobility network, but also making it accessible to all travelers. This session will present five research papers that address cross-cutting issues in shared mobility.

Spatial Pricing of Ridesourcing Services in a Congested Transportation Network (20-00379)
Zhaomiao Guo/University of Central Florida
Shared Electric Scooters and Transportation Equity: A Cross-City Analysis (20-02957)
Bernard Arnell/Massachusetts Institute of Technology (MIT), Peyman Noursalehi/Massachusetts Institute of Technology (MIT), Eric Huntley/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT)
A Decision Support Tool for Planning Neighborhood-Scale Deployment of Low-Speed Shared Automated Shuttles (20-04150)
Lei Zhu/National Renewable Energy Laboratory (NREL), Jinghui Wang/National Renewable Energy Laboratory (NREL), Venu Garikapati/National Renewable Energy Laboratory (NREL), Stanley Young/National Renewable Energy Laboratory (NREL)

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Cabs to Careers?: Lessons from a Traditional Taxicab Firm's Implementation of a Ride Service for Low-Income Workers (20-05354)

Annette Ruth/University of Wisconsin, Madison, Alexander Allon/University of Wisconsin, Madison, Carolyn McAndrews /University of Wisconsin, Madison

A Review of Current Scooter Share Permits: Commonalities and Best Practices (20-05630)

Patricia Tice/University of Central Florida

1610   CM (1.75)

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 150A

Innovations in Bus Transit Systems Planning, Design, and Operations

Thomas Schwetz, Lane Transit District, presiding

Sponsored By Standing Committee on Bus Transit Systems

Innovation is a key to promote bus transit systems planning, design, and operations. Many transit agencies have adopted innovated technology, operation plans and strategies in order to enhance and/or supplement their transit services to the public. This section discusses the innovations in bus rapid transit systems, tactical transit lanes, electric bus holding, and energy and emission impact of autonomous bus. Audiences who are interested in how innovations enhance bus transit systems are welcome to join this session.

Understanding the Effectiveness of Bus Rapid Transit Systems in Small- and Medium-Sized Cities in North America (20-04950)

Michaela Sidloski/University of Saskatchewan, Ehab Diab/University of Saskatchewan

Tactical Transit Lanes: Recent Trends (20-00628)

John Gahbauer/University of California, Los Angeles, Juan Matute/University of California, Los Angeles

Bus Holding of Electric Vehicles: An Exact Optimization Approach (20-00073)

Konstantinos Gkiotsalitis/University of Twente

Evaluating Energy and Emission Impact of Autonomous Bus on Urban Expressway (20-05052)

Yixin Zhang/Beijing Jiaotong University, Xumei Chen/Beijing Jiaotong University, Lei Yu/Beijing Jiaotong University

1611   CM (1.75)

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 147B

Light Rail and Street Car Planning for Priority Park and Ride and Ridership

Monica Meade, Rummel, Klepper, and Kahl, LLP (RK&K), presiding

Sponsored By Standing Committee on Light Rail Transit, Subcommittee on Streetcars

This session explores light rail and streetcar planning including issues associated with on-road priority, ridership and park and ride policy and design.

Exploring the Relationship Between Light Rail Transit and Bus: Competition Substitution or Congestion Substitution (20-04422)

Yefu Chen/University of Texas, Austin, Junfeng Jiao/University of Texas, Austin

Existing Problems of Transit Signal Priority on Streetcar Routes (20-03653)

Ivan Kwong/University of Toronto Schools - Humbert Location, Mehdi Nourinejad/University of Toronto Schools - Humbert Location, Amer Shalaby/University of Toronto Schools - Humbert Location

Evaluating the Operation Performance of Tram Lanes with Intermittent Priority with Coexistence of Regular and Automated Vehicles (20-03537)

Ran Liu/Tongji University, Dongxiu Ou/Tongji University

Assessment of Park and Ride Acceptability of Users in Developing Countries Using Discrete Choice Experiment (20-03813)

Nadika Jayasooriya/Colombo LRT JV, Loshaka Perera/Colombo LRT JV, Gayani Rajapaksha/Colombo LRT JV

1612

How to Get from Here to There Fast: Intercity Rail Disruptions and Network Modeling
Francis Loetterle, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Intercity Passenger Rail

Robust Capacitated Train Rescheduling with Passenger Reassignment Under Stochastic Disruptions (20-03562)
Xin Hong/Beijing Jiaotong University, Lingyun Meng/Beijing Jiaotong University, Francesco Corman/Beijing Jiaotong University, Andrea D'Ariano/Beijing Jiaotong University, Lucas Veelenturf/Beijing Jiaotong University, Sihui Long/Beijing Jiaotong University
Network Planning for Innovative Track-Based Transportation Technologies: A Minimum Spanning Tree Algorithm to Demonstrate Network Benefits (20-03481)
Dapeng Zhang/Virgin Hyperloop One, Yanning Li/Virgin Hyperloop One
A Sequential Search Journey Planner System for the Indian Rail Network (20-05926)
Sethu Vinayagam Udhayasekar/Indian Institute of Technology, Madras, Priya R/Indian Institute of Technology, Madras, Bhargava Chilukuri/Indian Institute of Technology, Madras
Antithesis of Big Data: In-Depth Analysis of High-Speed Rail Accidents (20-03370)
LIU LV/New Jersey Institute of Technology, Rongfang Liu/New Jersey Institute of Technology

1613

Precision Scheduled Railroading
Kevin Keller, HDR, presiding
Sponsored By Standing Committee on Freight Rail Transportation, Standing Committee on Railroad Operating Technologies, Subcommittee on Rail Capacity

Growing demands for faster and more efficient transportation have led all transportation sectors to look for ways to optimize their operations. Rail transportation is no exception and most Class I freight railroads have been looking for alternative solutions to become more efficient and reliable. The prominent solution has been Precision Scheduled Railroading (PSR) based on five guiding principles — service, cost control, asset utilization, safety and people. Most railroads have adopted PSR or PSR-like principles in their strategy, but its arrival has witnessed mixed reactions. This session brings together academic and industry leaders to discuss PSR opportunities and challenges to various stakeholders.

A Primer to Precision Railroading (20-02260)
Mohd Rapik Saat/Association of American Railroads (AAR)
PSR Challenges and Opportunities from Shippers' Perspective (P20-20816)
Peter Swan/Penn State, Harrisburg
Digital Transformation of Rail Yard Planning and Operations (P20-20821)
Jeremiah Dirnberger/Wabtec Corporation
The Operational Nuts and Bolts of Precision Scheduled Railroading (P20-21835)
Carl Van Dyke/TransNetOpt

1614

Autonomous Track Inspection
Feras Naser, No Organization, presiding
Radim Bruzek, ENSCO, Inc., presiding
Sponsored By Standing Committee on Railway Maintenance

 Railway track inspections involve repeated measurements of track parameters to assess safety and condition of infrastructure. Emerging technology provides the opportunity to make these measurements from an autonomous inspection vehicle. North American efforts will be discussed and the experience with similar technology in the UK will be presented along with discussion of associated measurements in France.

(continued)

FRA Development and Utilization of Autonomous Inspection Technologies (P20-20485)
Cameron Stuart/Federal Railroad Administration (FRA)
Application of Autonomous Inspection Systems at the Metropolitian Atlanta Rapid Transit Authority (P20-20486)
Abhay Joshi/Metropolitan Atlanta Rapid Transit Authority (MARTA), Jennifer Zahacwewski/ENSCO, Inc.
Autonomous Inspection Systems Support Maintenance Planning at NYCT (P20-20487)
Tom Lamb, Valerie Marcolongo/ENCADA, LLC
Dynamics Measurements to Improve Track Quality Monitoring (P20-20608)
Danilo Sorentino/SNCF
Using In-Service Trains to Autonomously Inspect Railway Track Geometry (P20-20488)
Mani Entezami/University of Birmingham

| 1615 | CM (1.75)

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 146B
Getting the Goods in and Out: Evaluating Innovations in Urban Freight
Erica Wygonik, RSG, presiding
Sponsored By Standing Committee on Urban Freight Transportation

Collaborative Parcels Logistics via the Carrier's Carrier Operating Model (20-00826)
Fraser McLeod/University of Southampton, Tom Cherrett/University of Southampton, Oliver Bates/University of Southampton, Tolga Bektaş/University of Southampton, Carlos Lamas-Fernandez/University of Southampton, Julian Allen/University of Southampton, Marzena Piotrowska/University of Southampton, Maja Piecyk/University of Southampton
Electrification of Urban Waste Collection: Introducing a Simulation-Based Methodology for Feasibility, Impact, and Cost Analysis (20-03271)
Ricardo Ewert/Technische Universität Berlin, Alexander Grahle/Technische Universität Berlin, Kai Martins-Turner/Technische Universität Berlin, Anne Syré/Technische Universität Berlin, Kai Nagel/Technische Universität Berlin, Dietmar Göhlich/Technische Universität Berlin
Charge Scheduling of Electric Vehicles for Last-Mile Distribution of an E-grocer (20-04304)
Menno Dalmijn/Delft University of Technology, Bilge Atasoy/Delft University of Technology, Peter Bijl/Delft University of Technology, Rudy Negenborn/Delft University of Technology
An Analysis of Robot-Assisted Last-Mile Delivery Systems (20-01385)
Michele Simoni/Massachusetts Institute of Technology (MIT), Erhan Kutanoglu/Massachusetts Institute of Technology (MIT), Christian Claudel/Massachusetts Institute of Technology (MIT)

| 1616 |

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, 144A
Current Research in Agriculture and Food Transportation
Jolanda Prozzi, Texas A&M University, College Station, presiding
Sponsored By Standing Committee on Agriculture and Food Transportation

U.S. Ethanol: Evolving Supply Chain and Rail-Truck Competition (20-00480)
Elvis Ndembe/Small Urban and Rural Transit Center
An Integrated Solution for Location-Inventory-Routing Problem of Fresh Products with Environmental Consideration (20-00544)
Liying Song/Beijing Jiaotong University, Handong Li/Beijing Jiaotong University
Agricultural Product Harvest Equilibrium Under Bottleneck Capacity and Random Disasters (20-01781)
Jia Yao/Harbin Institute of Technology, Shi An/Harbin Institute of Technology
E-Grocery Home Delivery Impacts on Food Access and Equity: A Portland Case Study (20-05623)
Katherine Keeling/Portland State University, Miguel Figliozzi/Portland State University
Data-Driven Study on the Log Movements for the Upper Midwest: Impact of Rail Car Fleet Size on Freight Storage and Car Idling (20-05922)
Sangpil Ko/Korea Railroad Research Institute, Pasi Lautala/Korea Railroad Research Institute, Kuilin Zhang/Korea Railroad Research Institute

1617

Freight Day, Part 4: Building Resilient Ships and Seaports: Toward Cleaner Maritime Transportation and Infrastructure (Part 1, Session 1401; Part 2, Session 1472; Part 3, Session 1549)
David Willauer, Cambridge Systematics, Inc., presiding
Sponsored By Standing Committee on Transportation of Hazardous Materials, Freight Systems Group, Marine Group, Standing Committee on Ports and Channels

U.S. ports are facing challenges today preparing for disasters and preventing supply chain disruptions that impact day-to-day operations. Additionally, new emissions requirements from the International Maritime Organization (IMO) in 2020 will require ships to reduce fuel sulfur content. In response to these challenges, ports and marine operators are employing supply chain risk management strategies, building resilient transportation infrastructure, working toward solutions to reduce sulfur in fuel and building new ships with alternative fuel capabilities. The session format includes mini presentations followed by questions on key themes. The presentations will be followed by a panel discussion with audience questions and answers.

Supply Chain Business Continuity Considerations and Strategies (P20-20071)
Anne Strauss-Wieder/North Jersey Transportation Planning Authority
Enterprise LNG Infrastructure and Fuel: Port of Jacksonville Case Study (P20-20072)
Matthew Fisher/Eagle LNG Partners
MARAD Waterfront Asset Management Tool (P20-20073)
Travis Black/Maritime Administration (MARAD)
Guide to Surviving and Thriving with IMO (P20-20074)
James Corbett/University of Delaware
Exploiting Digital Twinning Capabilities for Port Resilience Evaluation: A Port of Singapore Application (P20-20075)
Elise Miller-Hooks/George Mason University
Port Enterprise Risk, Security, and Resilience of LNG and Hydrogen Fuels: Port of Virginia Case Study (P20-21061)
James H. Lambert/University of Virginia

1618

Latest in Truck Size and Weight Research
Kakan Dey, West Virginia University, presiding
Daniel Haake, HDR, presiding
Sponsored By Standing Committee on Truck Size and Weight

Researchers continue to explore the potential challenges and opportunities involved in varying oversized and overweight configurations. This session will explore methods to quantify the effect overweight vehicles have on infrastructure and vehicle rollover thresholds. Additionally, the session will discuss how a Gradient Boosting Machine Learning Algorithm characterized and predicted Superload movements in Florida.

Impact of Overweight Trucks on Infrastructure in New Jersey (20-05483)
Hani Nassif/Rutgers, The State University of New Jersey, Peng Lou/Rutgers, The State University of New Jersey, Kaan Ozbay/Rutgers, The State University of New Jersey, Sami Demiroluk/Rutgers, The State University of New Jersey
A Novel Framework for the Quantification of Pavement Damages in the Overload Corridors (20-00502)
Ali Morovatdar/University of Texas, El Paso, Reza Ashtiani/University of Texas, El Paso, Carlos Licon/University of Texas, El Paso, Cesar Tirado/University of Texas, El Paso, Enad Mahmoud/University of Texas, El Paso
Evaluating the Effect of Payload on the Rollover Threshold Speed of Vehicles (20-00428)
Mohammadreza Sabouri/Sharif University of Technology, Arman Hamidi/Sharif University of Technology
Characterization and Prediction of Superload in Florida Using Gradient Boosting Machine Learning Algorithm (20-05155)
Julian Jesso/Embry-Riddle Aeronautical University, Dan Su/Embry-Riddle Aeronautical University, Ye Xia/Embry-Riddle Aeronautical University

1619 CM (1.75)

Current Issues in General Aviation
Zachariah DeVeau, Kimley-Horn and Associates, Inc., presiding
Sponsored By Standing Committee on Aviation System Planning

This session will examine some of the current issues facing General Aviation today. This includes an overview and context on some of the tools that the FAA uses to track and monitor activity at airports including what changes in data reporting we can expect related to ADS-B and how it can be used to inform airport planning and development decisions. It will also highlight best practices and solutions to filling the gaps in data collection efforts for economic impact studies and ways to improve the data collection effort. Finally, with remote air traffic control towers being tested around the country, this session will provide an overview of where the remote ATCT program is and what we can and should expect from them in the future.

ADS-B? TFMSC? Ops Counting? BasedAircraft.com?: GA Issues that Matter to You (P20-20970)
Kent Duffy/Federal Aviation Administration (FAA)
Economic Impact Data Collection at General Aviation Airports: Issues and Solutions (P20-20971)
Steven Landau/EBP
Remote Air Traffic Control Towers: Impacts to the General Aviation Landscape (P20-20972)
Zachariah DeVeau/Kimley-Horn and Associates, Inc.

1620

Safety Aspects of Aircraft Automation and Systems Complexity
Bart Elias, Congressional Research Service (CRS), presiding
Sponsored By Standing Committee on Aviation Security and Emergency Management

In recent years, transport airplane accidents have changed to include many more systems and automation causes. In general, these systems have resulted in overall improved safety. Yet questions about systems and automation remain. Recent transport aircraft accidents indicate that a single failed sensor can lead to a catastrophic outcome. What are the implications for the aviation community in operating these complex aircraft in terms of design, certification, training and operations? This panel will address these challenges by including perspectives from regulators, operators, and safety investigators and consultants.

Policy Interest in Automation Complexity and Aircraft Certification (P20-20507)
Bart Elias/Congressional Research Service (CRS)
NTSB Perspective on Flight Deck Automation Issues (P20-20225)
Dujuan Sevillian/National Transportation Safety Board (NTSB)
Flight Deck Handling Qualities Standards for Transport Aircraft (Part 1: Standards Process) (P20-20226)
Douglas Moss/SAE International
Flight Deck Handling Qualities Standards for Transport Aircraft (Part 2: Automation Philosophy) (P20-21452)
Shem Malmquist/Florida Institute of Technology

1416

Sustainability and Transportation
Timothy Sexton, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Transportation and Sustainability

How Does Public Support for Sustainable Transportation Policies Vary Across Countries? (20-05632) - A130
Xuenan Ni/Massachusetts Institute of Technology (MIT), Joanna Moody/Massachusetts Institute of Technology (MIT), Jinhua Zhao/Massachusetts Institute of Technology (MIT)

(continued)

Assessing the Energy Savings Potential of Employer Provided Mobility: A Case Study Approach (20-05756) - A1 31

Daniel Zimny-Schmitt/National Renewable Energy Laboratory (NREL), Alana Wilson/National Renewable Energy Laboratory (NREL), Joshua Sperling/National Renewable Energy Laboratory (NREL), Andrew Duvall/National Renewable Energy Laboratory (NREL), Stanley Young/National Renewable Energy Laboratory (NREL)

Optimizing the Bikesharing System from a Life-Cycle Perspective (20-02597) - A132

Hao Luo/Purdue University, Fu Zhao/Purdue University, Wei-Qiang Chen/Purdue University, Hua Cai/Purdue University

Everything Is Connected: How Attitudes, Skills, and Access Matter for Shaping Sustainable Travel Behavior (20 -02265) - A133

Chunli Zhao/Lunds Universitet, Zahra Hamidi/Lunds Universitet

A Multiple Attribute Decision-Making Method for Sustainable Transportation Network Design (20-06082) - A134

Yongping Zhang/California State Polytechnic University, Pomona, Hongzhi Lin/California State Polytechnic University, Pomona

Sustainability-Based Appraisal of Transport Infrastructure Projects: A Review of the Asian Development Bank's Framework (20-03433) - A135

Samuel Labi/Purdue University, Asif Faiz/Purdue University, Tariq Saeed/Purdue University

High-Tech Business Location, Transportation Accessibility, and Implications for Sustainability: Differences Between High-Tech Specializations Using in the U.S. Two Booming Regions (20-03489) - A136

Ahoura Zandiatashbar/University of Illinois, Chicago, Shima Hamidi/University of Illinois, Chicago, Nicole Foster/University of Illinois, Chicago

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Highway Capacity Manual Uninterrupted Flow
Alexandra Kondyli, University of Kansas, presiding
Sponsored By Standing Committee on Highway Capacity and Quality of Service

Technical papers related to Uninterrupted Flow Methods in the Highway Capacity Manual

Guidance for Applying Traffic Microsimulation to Studies on User Perception of Level of Service (20-01506) - A 232

Fernando Piva/Universidade de Sao Paulo Escola de Engenharia de Sao Carlos, José Reynaldo Setti/Universidade de Sao Paulo Escola de Engenharia de Sao Carlos, Scott Washburn/Universidade de Sao Paulo Escola de Engenharia de Sao Carlos

A Methodology to Evaluate the Quality of Service of Traffic Flow on Intercity Expressway Sections by Using Follower Percentage (20-01727) - A233

Hiroyuki Konda/Central Nippon Highway Engineering Nagoya Co., Ltd.,, Hideki Nakamura/Central Nippon Highway Engineering Nagoya Co., Ltd.,

Highway Basic Segments Capacity Analysis and Passenger Car Equivalents Estimation for Connected and Automated Vehicles in Mixed Traffic Conditions (20-02495) - A235

Qiheng Lin/Tongji University, Wanjing Ma/Tongji University, Ling Wang/Tongji University, Ziliang He/Tongji University, Jian Gao/Tongji University

Empirical Observation of Maximum Throughput Change in Isolated Merging Bottleneck Depending on On-Ram p Traffic Flow Ratio (20-02949) - A236

Junhyung Lee/Korea Institute of Civil Engineering and Building Technology (KICT), Bongsoo Son/Korea Institute of Civil Engineering and Building Technology (KICT), Taewan Kim/Korea Institute of Civil Engineering and Building Technology (KICT)

Freeway Network Travel-Time Reliability Analysis Methodology and Software Tool Development (20-03812) - A2 37

Wei Sun/University of Washington, Scott Washburn/University of Washington

Reformulation of the HCM Density Equation for Freeway On-Ramp Merges (20-04010) - A238

Jacqueline Jenkins/Cleveland State University

Modeling Framework for Capacity Analysis of Freeway Segments: Application to Ramp Weaves (20-04063) - A2 39

Dezhong Xu/North Carolina State University, Nagui Rouphail/North Carolina State University, Seyedbehzad Aghdashi/North Carolina State University, Ishtiak Ahmed/North Carolina State University, Lily Elefteriadou/North Carolina State University

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Estimation of the Effect of Rain and Incidents on Freeway Capacity and Free-Flow Speed (20-04257) - A240

Abdulmajeed Alsharari/University of Kansas, Mohamadamin Asgharzadeh/University of Kansas, Alexandra Kondyli/University of Kansas

Developing Highway Capacity Manual Capacity Adjustment Factors for Connected and Automated Traffic on Freeway Segments (20-04639) - A243

Adekunle Adebisi/University of Cincinnati, Yan Liu/University of Cincinnati, Bastian Schroeder/University of Cincinnati, Jiaqi Ma/University of Cincinnati, Burak Cesme/University of Cincinnati, Anxi Jia/University of Cincinnati, Abby Morgan/University of Cincinnati

Methodology for Estimating the Capacity and Level of Service for the Mega Roundabout Intersection (20-00433) - A230

Ahmed Mohamed/Harbin Institute of Technology, Yusheng Ci/Harbin Institute of Technology, Yiqiu Tan/Harbin Institute of Technology

Impact of Incidents and Adverse Weather Conditions on Freeway Segment Capacity (20-04432) - A241

Wei Sun/University of Washington, Scott Washburn/University of Washington

Predicting Lane-by-Lane Flows and Speeds for Freeway Segments (20-04607) - A242

Fabio Sasahara/University of Florida, Luan Guilherme Staichak Carvalho/University of Florida, Tanay Datta Chowdhury/University of Florida, Zachary Jerome/University of Florida, Lily Elefteriadou/University of Florida, Alexander Skabardonis/University of Florida

Evaluating the Impact of Incidents on Freeway Facilities: Updating the Capacity Adjustments (20-04803) - A244

Jeremy Addison/Institute for Transportation Research and Education (ITRE), Seyedbehzad Aghdashi/Institute for Transportation Research and Education (ITRE), Nagui Rouphail/Institute for Transportation Research and Education (ITRE)

Modeling Perceived Level of Service of Intercity Expressway (20-04908) - A245

Sachin Shah/Sardar Vallabhbhai National Institute of Technology, Surat, Chintan Advani/Sardar Vallabhbhai National Institute of Technology, Surat, Ajinkya Mane/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Gaurang Joshi/Sardar Vallabhbhai National Institute of Technology, Surat

Freeway's Traffic Flow State Identification with Consideration of Disturbances by Individual's Vehicle: A Hybrid Scheme of Gaussian Mixture Model and K-Means Clustering (20-05123) - A246

Leila Azizi/Florida International University, Mohammed Hadi/Florida International University

Macroscopic Modeling of Louisiana Freeways Using Highway Capacity Freeway Facilities Method (20-05178) - A247

Soheil Sajjadi/Arcadis U.S., Luis Alvergue/Arcadis U.S., Thomas Montz/Arcadis U.S., Siavash Shojaat/Arcadis U.S.

Congestion Index: A New Performance Measure to Characterize Congestion and Level-of-Service on Freeways (20-05233) - A248

Ninad Gore/University of North Carolina, Charlotte, Srinivas Pulugurtha/University of North Carolina, Charlotte, Shriniwas Arkatkar/University of North Carolina, Charlotte, Gaurang Joshi/University of North Carolina, Charlotte

Modeling and Validating Traffic Responsive Ramp Metering in the HCM Context: The MaxView Algorithm (20-05345) - A249

Seyedbehzad Aghdashi/Institute for Transportation Research and Education (ITRE), Joy Davis/Institute for Transportation Research and Education (ITRE), Thomas Chase/Institute for Transportation Research and Education (ITRE), Christopher Cunningham/Institute for Transportation Research and Education (ITRE)

Optimum Volume of Freeway Corridors (20-05423) - A250

Siavash Shojaat/Arcadis-US, Inc., Justin Geistefeldt/Arcadis-US, Inc., Brian Wolshon/Arcadis-US, Inc.

Development of Breakdown Probability Models for Rural Freeway Work Zones Using Field Data and Simulation (20-05493) - A251

Nicholas Jehn/Kimley-Horn and Associates, Inc., Rod Turochy/Kimley-Horn and Associates, Inc.

A Data-Driven Methodology for Estimating Per-Lane, Free-Flow Speed for Freeways (20-05541) - A252

Yinhai Wang/University of Washington, John Ash/University of Washington, Cole Kopca/University of Washington, Salvatore Antonio Biancardo/University of Washington

Assessing Automated and Connected Automated Vehicle Capacities on a Highway (20-06042) - A253

Bumsik Kim/Virginia Polytechnic Institute and State University, Kevin Heaslip/Virginia Polytechnic Institute and State University, Mirla Abi Aad/Virginia Polytechnic Institute and State University, Antonio Fuentes/Virginia Polytechnic Institute and State University, Noah Goodall/Virginia Polytechnic Institute and State University

Statewide Hourly Traffic Volume Estimation via XGBoost: A Scalable Tree Boosting System (20-01994) - A234

Zhiyan Yi/University of Utah, Xiaoyue Cathy Liu/University of Utah, Nikola Markovic/University of Utah, Jeff Phillips/University of Utah

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Innovation in Transportation Equity for the Development of More Robust Performance Metrics and Standards

Margaret-Avis Akofio-Sowah, WSP, presiding

Andrea d'Amato, Massachusetts Department of Transportation, presiding

Sponsored By Standing Committee on Strategic Management, Standing Committee on Social and Economic Factors of Transportation, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Environmental Justice in Transportation, Joint Subcommittee on Transportation Equity of ADD50, ADD20, ADD40, ABC10, ABE30, ABE60, ADA60, and AP025

Does Public Transport Serve Those Who Need It Most? (20-01020) - A120

John P. Pritchard/Technion - Israel Institute of Technology, Anna Zanchetta/Technion - Israel Institute of Technology, Karel Martens/Technion - Israel Institute of Technology

Measuring Access to Public Transit for People with Disabilities Using Detailed Sidewalk Data (20-01800) - A111

Kaylyn Levine/University of Texas, Austin, Alex Karner/University of Texas, Austin

Assessing the Equity Implications of Localized Congestion and Emissions Impacts of Four Traffic Assignment Scenarios in the Los Angeles Basin (20-02927) - A121

Jessica Lazarus/University of California, Berkeley, Ahmad Bin Thaneya/University of California, Berkeley, Ioanna Kavvada/University of California, Berkeley, Jane Macfarlane/University of California, Berkeley, Bin Wang/University of California, Berkeley

Connecting People with Jobs: Light Rail's Impact on Commuting Patterns (20-04056) - A122

Maryam Khabazi/University of North Carolina, Chapel Hill, Isabelle Nilsson/University of North Carolina, Chapel Hill

Innovation on Job Accessibility and Transit Scenario Planning with General Transit Feed Specification Data (20-04505) - A123

Madison Swayne/University of Southern California, Marlon Boarnet/University of Southern California, Gary Painter/University of Southern California

Whose Buses Run on Time?: The Social Equity of Bus On-Time Performance in Canada's Largest City (20-04604) - A124

Matthew Palm/University of Toronto, Amer Shalaby/University of Toronto, Steven Farber/University of Toronto

Measuring Accessibility and the Sustainable Development Goal Transport Target: A Case Study of Nairobi's Matatus (20-04685) - A125

Travis Fried/Word Resources Institute, Thet Hein Tun/Word Resources Institute, Jacqueline Klopp/Word Resources Institute, Benjamin Welle/Word Resources Institute

Transit Deserts: A Spatial-Temporal Analysis of Equity and Accessibility (20-05019) - A126

Javad Jomehpour Chahar Aman/Southern Methodist University, Janille Smith-Colin/Southern Methodist University

Public Policy Enabled by Mobility-as-a-Service (20-04244) - A127

Christina Ditmore/University of Alaska, Anchorage

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

7th Annual Fresh Ideas for Statewide Planning: Demographic Shifts

Elise Barrella, Wake Forest University, presiding

John Kaliski, Cambridge Systematics, Inc., presiding

Sponsored By Standing Committee on Statewide Multimodal Transportation Planning

The 2010s have been a decade of rapid change and shifting demographics of transportation users (i.e., age, household type, race and ethnicity, income, identity, etc.). Looking beyond 2020, what will the transportation system need to be like in 5, 10, 20, or more years in order to meet the needs of diverse users? How are transportation agencies and service providers anticipating and responding to demographic trends locally, regionally, and nationally? Fresh Ideas are new/emerging approaches or local best practices that have not been widely shared with others. Presenters share tools, methods, or approaches that can scale to statewide and regional planning while recognizing significant differences between or within local population needs.

Meaningful Public Outreach to LEP Populations: Applying Granularity to Safe Harbor Thresholds (P20-20405) - A137

Yahaira Graxirena/Central Massachusetts Regional Planning Commission, Sujatha Krishnan/CMRPC

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Standardizing Microsimulations for Local Conditions (P20-20406) - A138
John Thomson/Kentucky Transportation Cabinet, Robert Frazier/HDR, Adam Hedges/HDR
Who Wants a Crystal Ball When You Have a Flashlight? (P20-20407) - A139
Martin Milkovits/Cambridge Systematics, Inc., Alex Bettinardi/Oregon Department of Transportation, Jeffrey Newman/C
ambridge Systematics, Inc., Rachel Copperman/Cambridge Systematics, Inc., Sarah Sun/Federal Highway
Administration (FHWA)
**Using the 2017 National Household Travel Survey Data to Explore the Elderly's Travel Patterns (P20-20408) - A1
40**
Aly Tawfik/California State University, Fresno, Dr. Eazaz Sadeghvaziri/California State University, Fresno
**TransFuture: A Probabilistic Scenario Planning Tool for Considering Emerging Technologies and Societal
Trends (P20-20409) - A141**
Santanu Roy/HDR, Makarand Gawade/HDR, Alexander Trauger/MetroPlan Orlando
Accessibility: Distribution Across Diverse Populations (P20-20410) - A142
Kristin Carlson/Center for Transportation Studies, Andrew Owen/Accessibility Observatory, Center for Transportation
Studies, University of Minnesota
Crowdsourcing Fresh Questions About Demographic Shifts and Planning (P20-20411) - A143
John Kaliski/Cambridge Systematics, Inc., Elise Barrella/Wake Forest University, Bryan Pounds/Massachusetts
Department of Transportation, Eduardo Maeyama/Kimley-Horn and Associates, Inc., Marsha Fiol/Virginia Department
of Transportation, Alexander Trauger/MetroPlan Orlando, Jessie Jones/Arkansas Department of Transportation

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Progress in Statewide and Long-Range Multimodal Planning
Janille Smith-Colin, Southern Methodist University, presiding
Sponsored By Standing Committee on Statewide Multimodal Transportation Planning

Presenters share innovative approaches for enhancing statewide multimodal transportation planning and analysis.

Graphic Guidance for Long-Range Transportation Plans (20-00107) - A144
Rachel Foss/Kansas State University, Gregory Newmark/Kansas State University
Military Transportation in State Freight and Defense Community Plans (20-00479) - A145
Chad Miller/University of Southern Mississippi
Income and Vehicle-Ownership Effects on Household Mobility: A Cross-State Comparison (20-03270) - A146
Yi-Shih Chung/National Chiao Tung University, Chi-Hung Wu/National Chiao Tung University
**Investigating Tools for Evaluating Service and Improvement Opportunities on Bicycle Routes in Ohio (20-03605
) - A147**
Gulsah Akar/University of California, Davis, Kevin Lee/University of California, Davis, Meredyth Sanders/University of
California, Davis, Kailai Wang/University of California, Davis
**Development of Industry Sector-wise Freight Generation Models at the Regional Level in India (20-04091) - A14
8**
Sowjanya Dhulipala/Indian Institute of Technology, Bombay, Gopal Patil/Indian Institute of Technology, Bombay
**Opportunities for Incorporating Long-Distance Travel Behavior into Future Statewide Forecasting Models:
Learnings from a Current State-of-the-Practice Survey (20-05160) - A149**
Jeffrey LaMondia/Auburn University, Fernando Cordero/Auburn University

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Emerging Techniques and Practices for Integrated Multimodal Transportation and Land Use Planning
Hannah Twaddell, ICF, presiding
Sponsored By Standing Committee on Metropolitan Policy, Planning, and Processes

**Accounting for the Temporal Resolution of Integrated Land Use and Travel Demand Modeling: An Analytical
Approach for Evaluating Road Capacity Projects (20-02538) - A150**
Elmira Kalhor/University of Vermont, Gregory Rowangould/University of Vermont
**Influence of Rail Transit on Development Patterns in the Mountain Megaregion with Implications for Transit
and Land Use Planning (20-04667) - A151**
Arthur Nelson/University of Arizona, Robert Hibberd/University of Arizona

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Definitions, Types, and Criteria of Centers in Planning Practice: A Review of 126 Regional Transportation Plans in the United States (20-05538) - A152
Sadegh Sabouri/University of Utah, Dong-ah Choi/University of Utah, Keunhyun Park/University of Utah, S. Hassan Ameli/University of Utah
Toward a Quantitative Methodology for Evaluating the Distribution of Space in Complete Streets (20-04964) - A 153
Ben Azoulay/Concordia University, Barrett Hedges/Concordia University, Zachary Patterson/Concordia University

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Public Lands Transportation Fellows: Solving Transportation Challenges at U.S. National Wildlife Refuges
Jaime Sullivan, Western Transportation Institute (WTI), presiding
Sponsored By Standing Committee on Transportation Needs of National Parks and Public Lands

This session presents an overview of the Public Lands Transportation Fellows (PLTF) program and presents the work of the recent-graduates that were selected and are currently stationed in national wildlife refuges in the US. The Western Transportation Institute (WTI) has partnered with the US Fish and Wildlife Service to administer this program, and WTI has worked with other federal land management agencies (FLMAs) in the past for placement of fellows. The fellows are provided with a unique opportunity for professional experience and public service while working directly with field staff to solve transportation challenges. Several past graduates of the PLTF program are currently employed professionally by FLMAs or within FHWA.

Public Lands Transportation Fellows: A Unique and Mutually Beneficial Partnership (P20-20456) - A154
Jaime Sullivan/Western Transportation Institute (WTI), Natalie Villwock-Witte/Western Transportation Institute (WTI), Phillip Shapiro/Shapiro Transportation Consulting, LLC
Community-Based Planning: Providing Access to Public Transportation at Valle de Oro Urban Wildlife Refuge (P20-20457) - A155
Nathan Begay/Western Transportation Institute (WTI)
3 Refuges Become 1: Connectivity and Accessibility at the Potomac River National Wildlife Refuge Complex (P 20-20458) - A156
Naomi Fireman/Western Transportation Institute (WTI)
Public–Private–Nonprofit Partnership: The Road to Successful Development, Implementation, and Long-Lastin g Sustainability to Recreational Transportation Projects (P20-20459) - A157
Vincent Ziols/Western Transportation Institute (WTI)

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Current Research in Public Involvement
Jamille Robbins, North Carolina Department of Transportation, presiding
Sponsored By Standing Committee on Public Involvement in Transportation

The Public Involvement Poster Session will highlight best practices, new technologies and lessons learned, build awareness and skills, and advance the state of the art in public involvement for transportation.

I-485 Express Lanes (Charlotte, North Carolina) (P20-20508) - A160
Hillary DeLong/HNTB Corporation
Fostering Influence on Social Media (P20-20509) - A161
Gabriella Kolodzy/Texas A&M Transportation Institute
2045 Long-Range Transportation Plan (Hillsborough County, Florida) (P20-20511) - A167
Jennifer Musselman/Kittelson & Associates, Inc. (KAI)
Connect the Crescent (New Orleans) (P20-20512) - A179
Tara Tolford/University of New Orleans
NC Moves 2050 Plan (P20-20513) - A178
Nastasha Earle-Young/North Carolina Department of Transportation
183 South Project (Austin,Texas) (P20-20515) - A177
Hillary Ross/Atkins

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Route 1 Over I-95 Bridge Replacement (Stamford, Connecticut) (P20-20516) - A170
Jill Barrett/Fitzgerald & Halliday, Inc.
The Kyle Field Transportation Plan: Football Thursday Edition, Year 2 (College Station,Texas) (P20-20517) - A171
Madison Metsker-Galarza/Texas A&M Transportation Institute
You Asked for Buses That Come on Time and More Often (Massachusetts) (P20-20521) - A172
Heather Hume/Massachusetts Bay Transportation Authority

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Communicating with John and Jane Q. Public About Transportation Funding
Pamela Lebeaux, WSP, presiding
Terri Parker, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Public Involvement in Transportation

This session includes posters from the winner and three runners-up from the annual Communicating with John & Jane Q. Public Competition sponsored by the TRB Committee on Public Involvement. The 2020 theme of the competition was Communicating about Transportation Funding.

Back to Basics: How a Love for Oregon Roads Leads to the Understanding of Transportation Funding (P20-20564) - A158
Michelle Godfrey
Equitable Public Engagement: Participatory Budgeting for Transporation Funds (P20-20574) - A159
Jennifer Godzeno/Participatory Budgeting Project
Preparing to Launch Utah's Road Usage Charge Program (P20-20575) - A168
Eileen Barron/Utah Department of Transportation
Multi-Funding Sources and Building Support (P20-20576) - A169
Jennifer Schultz/HNTB Corporation

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Transportation Equity: Cross-Cutting Poster Session
Gloria Jeff, Minnesota Department of Transportation, presiding
Andrea d'Amato, Massachusetts Department of Transportation, presiding
Steven Farber, University of Toronto, presiding
Sponsored By Standing Committee on Social and Economic Factors of Transportation, Joint Subcommittee on Transportation Equity of ADD50, ADD20, ADD40, ABC10, ABE30, ABE60, ADA60, and AP025, Standing Committee on Environmental Justice in Transportation, Standing Committee on Transportation and Sustainability, Standing Committee on Strategic Management, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Accessible Transportation and Mobility, Standing Committee on Public Involvement in Transportation, Standing Committee on Public Transportation Planning and Development

So Many Different Things Open Up to a Person Who Is Mobile: Subsidizing Car Ownership for Low-Income Individuals and Households (20-00066) - A107
Nicholas Klein/Cornell University
Examining the Feasibility of Shared Mobility Programs for Reducing Transportation Inequities: Perspectives from the Frontline (20-05163) - A106
Sarah Robinson/University of Texas, Arlington, Courtney Cronley/University of Texas, Arlington, Kyung Hyun/University of Texas, Arlington, Farah Naz/University of Texas, Arlington
How (Should) We Evaluate Demand Responsive Transit's Impact on Transport Equity?: A Systematic Review. (20-01466) - A108
Benjamin Kaufman/Griffith University, Matthew Burke/Griffith University, Abraham Leung/Griffith University
Autonomous Vehicles and Social Exclusion: Analyzing Residents' Potential In-Vehicle Activities Through the Lens of Equity (20-03065) - A112
Haotian Zhong/Texas A&M University, College Station, Wei Li/Texas A&M University, College Station, Mark Burris/Texas A&M University, College Station, Alireza Talebpour/Texas A&M University, College Station, Kumares Sinha/Texas A&M University, College Station

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Pitfalls in the Measurement of Transport Inequalities and Transport Poverty (20-02987) - A110

Alex Karner/University of Texas, Austin, Rafael Pereira/University of Texas, Austin

Nationwide Examination of the Spatial Mismatch Conditions Across the 100 Largest Metropolitan Areas in the United States (20-02561) - A113

Yunlei Qi/University of Minnesota, Twin Cities

Social Perception and Holistic Assessment of Bus Rapid Transit in Soweto (20-04283) - A114

Maria Vanderschuren/University of Cape Town, Lerato Molefe/University of Cape Town, Alison Gwynne-Evans/University of Cape Town

Political, Social, and Spatial Borders to Formalization: A Case Study of East Jerusalem (20-01945) - A115

Tamara Kerzhner/University of California, Berkeley

Vision Zero Hashtags in Social Media: Understanding End-User Needs from Natural Language Processing (20-05521) - A109

Subasish Das/Texas A&M Transportation Institute, Kartikeya Jha/Texas A&M Transportation Institute, Anandi Dutta/Texas A&M Transportation Institute

Developing a Census Block Level Accessibility Measure for St. Louis Metropolitan Area (20-04249) - A116

Amir Poorfakhraei/East West Gateway Council of Governments, Brenden Giblin/East West Gateway Council of Governments, Ajdin Hamzagic/East West Gateway Council of Governments, Simon Court/East West Gateway Council of Governments, Lubna Shoaib/East West Gateway Council of Governments

Who Benefits from Autonomous Vehicles (AVs)?: Equity Aspects of AV Policies in a Full-Scale Prototype Cities (20-03223) - A117

BAT HEN NAHMIAS BIRAN/Ariel University, Jimi Oke/Ariel University, Nishant Kumar/Ariel University, Arun Akkinepally/Ariel University, Carlos Lima Azevedo/Ariel University, Joseph Ferreira/Ariel University, P. Christopher Zegras/Ariel University, Moshe Ben-Akiva/Ariel University

Adoption and Use of One-Way Carsharing in Oakland, California: A Spatial, Demographic, and Equity Analysis (20-03151) - A118

Alexandra Pan/University of California, Berkeley, Elliot Martin/University of California, Berkeley, Susan Shaheen/University of California, Berkeley

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Environmental Justice in Transportation Equity

Aaron Golub ADD50, Portland State University, presiding

Gloria Jeff, Minnesota Department of Transportation, presiding

Sponsored By Standing Committee on Environmental Justice in Transportation, Standing Committee on Transportation and Sustainability, Standing Committee on Social and Economic Factors of Transportation, Standing Committee on Strategic Management, Standing Committee on Transportation Issues in Major Cities

Accessibility to Health Care Within the Context of the Behavioral Model for Vulnerable Populations (20-05033) - A105

Erin Murphy/University of Texas, Arlington, Courtney Cronley/University of Texas, Arlington, Noelle Fields/University of Texas, Arlington, Vivian Miller/University of Texas, Arlington, Stephen Mattingly/University of Texas, Arlington, Dana Hill/University of Texas, Arlington

Housing, Mobility, and Well-Being Among the Older Population in the United States: A Literature Review (20-00678) - A104

Shengxiao Li/University of Pennsylvania

Is Spatial Mismatch Really Spatial, and Really a Mismatch?: Recent Evidence on Employment Among Minorities in U.S. Cities and Suburbs (20-00742) - A102

Julene Paul/University of California, Los Angeles, Eric Morris/University of California, Los Angeles

Spatial Access by Public Transport and Likelihood of Health Care Consultations at Hospitals (20-02057) - A103

Boer Cui/McGill University, Geneviève Boisjoly/McGill University, Rania Wasfi/McGill University, Heather Orpana/McGill University, Kevin Manaugh ANF10/McGill University, Ron Buliung/McGill University, Yan Kestens/McGill University, Ahmed El-Geneidy/McGill University

Utilizing Geographic Information Systems to Map Food Availability (20-01532) - A101

Tysean Wooten/North Carolina Central University, Timothy Mulrooney/North Carolina Central University

Beyond Quantitative Analysis: Examining Equity Practices at U.S. Public Transit Agencies (20-05166) - A100

Alex Karner/University of Texas, Austin, Kaylyn Levine/University of Texas, Austin

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Quality Assurance Management
Ervin Dukatz, Mathy Construction Company, presiding
Sponsored By Standing Committee on Quality Assurance Management

Improving Inspection for Construction Quality Assurance (20-04974) - B313
Gregory Doyle/Federal Highway Administration (FHWA), Robert Christman/Federal Highway Administration (FHWA), Jeff Lewis/Federal Highway Administration (FHWA)
Implementation Process for Performance-Related Specifications Shadow Projects: The Example of MaineDOT (20-05059) - B311
Jaehoon Jeong/North Carolina State University, Yizhuang Wang/North Carolina State University, Amir Ghanbari/North Carolina State University, Casey Nash/North Carolina State University, Derek Nener-Plante/North Carolina State University, B. Shane Underwood/North Carolina State University, Youngsoo Kim/North Carolina State University
Asphalt Mixture Quality Acceptance Using the Hamburg Wheel-Tracking Test (20-05136) - B310
Jusang Lee/Indiana Department of Transportation, Dario Batioja-Alvarez/Indiana Department of Transportation, Reyhaneh Rahbar-Rastegar/Indiana Department of Transportation, John Haddock/Indiana Department of Transportation
Non-Destructive Testing Methods in Quality Assurance and Quality Control of Concrete for Monitoring Strength Gain During Production (20-03334) - B312
Setare Ghahri Saremi/University of Maryland, Dimitrios Goulias/University of Maryland, Anjuman Ara Akhter/University of Maryland

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Frontiers in Concrete Pavement Construction
Sabrina Garber, The Transtec Group, Inc., presiding
Sponsored By Standing Committee on Concrete Pavement Construction and Rehabilitation

Synthesis of Precast Concrete Pavement Specifications and Proposed Approval Process (20-05267) - B304
Dan Offenbacker/Rowan University, Douglas Cleary/Rowan University, Ayman Ali/Rowan University, Yusuf Mehta/Rowan University
Evaluation of Shrinkage Reducing Admixture Used as a Curing Spray on Concrete Pavements (20-04669) - B308
Julio Paniagua/University of California, Davis, Fabian Paniagua/University of California, Davis, Angel Mateos/University of California, Davis, John Harvey/University of California, Davis, Rongzong Wu/University of California, Davis
Temperature Gradient and Thermal Stresses in Pavement Quality Concrete Containing Reclaimed Asphalt Pavement Aggregates (20-00851) - B306
Sarah Abraham/Indian Institute of Technology, Roorkee, G.D. R.N./Indian Institute of Technology, Roorkee
Development of a Full-Scale Implementation of a New Methodology for Full-Depth Repair Using Ultra-High Performance Fiber-Reinforced Concrete Precast Panels for Airfield Rigid Pavement (20-05659) - B307
Jean Gamarra/Federal Aviation Administration (FAA)
Design and Full-Scale Implementation of the Largest Operational Electrically Conductive Concrete Heated Pavement System (20-05660) - B305
Amir Malakooti/Iowa State University, Wei Theh/Iowa State University, Sajed Sadati/Iowa State University, Halil Ceylan/Iowa State University, Sunghwan Kim/Iowa State University, Mani Mina/Iowa State University, Kristen Cetin/Iowa State University, Peter Taylor/Iowa State University

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Using Rejuvenators and Recycled/Reclaimed Materials in Asphalt Mixtures
Sadie Casillas, University of Arkansas, Fayetteville, presiding
Sponsored By Standing Committee on Non-Binder Components of Asphalt Mixtures

(continued)

Effects of Reclaimed Asphalt Pavement Content and Fractionation Process on Binder Properties, Mix Design, and Cracking Resistance (20-00675) - B314

Xingyu Gu/Southeast University, Zhou Zhou/Southeast University, Yanxu Jiang/Southeast University, Fujian Ni/Southeast University

Laboratory Performance Comparison of Different Content RAP Mixtures with Different Wax Warm Mixing Agents (20-01222) - B319

ze wang/Tongji University, Fen Ye/Tongji University

Determine the Degree of Blending Between RAP and Virgin Binder Using the Superpave Volumetric Mixture Design (20-01496) - B324

Mansour Solaimanian/No Organization, Xuan Chen/No Organization

Recycled Strain Relief Asphalt Mixtures: Binders Evaluation (20-02366) - B316

Caio Raul/University of São Paulo, Kamilla Vasconcelos/University of São Paulo, Liedi Bernucci/University of São Paulo

Effect of Blending Effectiveness and Rejuvenator on Higher RAP Content Mixture Design (20-02491) - B329

Shuai Yu/Pennsylvania State University University Park : Penn State, Shihui Shen/Pennsylvania State University University Park : Penn State, Zhidong Zhang/Pennsylvania State University University Park : Penn State, Honglei Wang/Pennsylvania State University University Park : Penn State

Characteristics of Effective Asphalt Mix Rejuvenation (20-03780) - B326

Hesham Ali/Louisiana State University, Louay Mohammad/Louisiana State University, Mojtaba Mohammadafzali/Louisiana State University, Farshad Haddadi/Louisiana State University, Moses Akentuna/Louisiana State University, Greg Sholar/Louisiana State University, Howard Moseley/Louisiana State University, Wayne Rilko/Louisiana State University, Cassady Allen/Louisiana State University

Experimental Investigation to Examine the Effects of Type, Dosage, and Treating Methods of Rejuvenators in Aged Bituminous Materials: Mechanical-Chemical Characteristics (20-04027) - B317

Gabriel Nsengiyumva/University of Nebraska, Lincoln, Hamzeh Haghshenas/University of Nebraska, Lincoln, Yong-Rak Kim/University of Nebraska, Lincoln, Santosh Kommidi/University of Nebraska, Lincoln

Bio-Rejuvenators: Field Performance and a Preliminary Performance Indicator (20-04149) - B328

Fujie Zhou/Texas A&M Transportation Institute, Soohyok Im/Texas A&M Transportation Institute, Joshua Yuan/Texas A&M Transportation Institute, Pravat Karki/Texas A&M Transportation Institute, Sheng Hu/Texas A&M Transportation Institute, Ryan Barborak/Texas A&M Transportation Institute

Relationships Among Chemistry, Rheology, and Fracture/Fatigue Performance of Recovered Asphalt Binders and Asphalt Mixtures Containing RAP (20-04470) - B327

Peyman Barghabany/Louisiana State University, Wei Cao/Louisiana State University, Louay Mohammad/Louisiana State University, Samuel Cooper/Louisiana State University, Samuel Cooper, Jr./Louisiana State University

Approach for Determination of Maximum Reclaimed Asphalt Pavement Content in Polymer-Modified Asphalt Mixture (20-04486) - B323

Bongsuk Park/University of Florida, Jian Zou/University of Florida, Reynaldo Roque/University of Florida, George Lopp/University of Florida, Zhengyu Wu/University of Florida

Effect of Bio-Oils and Wastewater Sludge on the Performance of Binders and HMA with High RAP Content (20-04666) - B315

Robeam Melaku/University of North Dakota, Jun Liu/University of North Dakota, Daba Gedafa/University of North Dakota

Microsurfacing Mixtures with Reclaimed Asphalt Pavement: Blending Efficiency and Effective Styrene Butadiene Rubber Concentration (20-04904) - B318

Anping Wang/Tongji University, Shihui Shen/Tongji University

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Aggregates and Fillers in Asphalt Mixtures
Hong Park, Tennessee Department of Transportation, presiding
Sponsored By Standing Committee on Non-Binder Components of Asphalt Mixtures

Relative Effect of Aggregate Shape Properties and Asphalt Binder Properties on Results of Compression and Tension/Compression Tests on HMA (20-00383) - B331

Jorge Luiz Lucas Júnior/Federal University of Ceara, Lucas Babadopulos/Federal University of Ceara, Jorge Soares/Federal University of Ceara

(continued)

Effect of Compaction Energy and Aggregate Selection on the Performance of DVR and SBS Modified Mixtures (20-00526) - B333

Aksel Seitllari/Michigan State University, Michele Lanotte/Michigan State University, M. Emin Kutay/Michigan State University

Utilization of Red Mud as an Alternative Mineral Filler in Asphalt Mastics to Replace Natural Limestone Powder (20-00902) - B334

Jizhe Zhang/Shandong University, Peizhao Li/Shandong University, Changjun Sun/Shandong University, Ming Liang/Shandong University, Zhanyong Yao/Shandong University, Hongguang Jiang/Shandong University, Xiaomeng Zhang/Shandong University, Gordon Airey/Shandong University

Influence of Fillers on Mechanical Properties of Porous Asphalt Mixture Using Microstructural Finite Element Analysis (20-01079) - B337

Pengfei Liu/Rheinisch-Westfalische Technische Hochschule Aachen, Guoyang Lu/Rheinisch-Westfalische Technische Hochschule Aachen, Xu Yang/Rheinisch-Westfalische Technische Hochschule Aachen, Dawei Wang/Rheinisch-Westfalische Technische Hochschule Aachen, Sabine Leischner/Rheinisch-Westfalische Technische Hochschule Aachen, Markus Oeser/Rheinisch-Westfalische Technische Hochschule Aachen

Role of Aggregate Gradation in Balancing Performance of Asphalt Concrete Mixtures (20-01386) - B330

Denis Iran Vieira Souza/University of Texas, El Paso, Victor Garcia/University of Texas, El Paso, Imad Abdallah/University of Texas, El Paso, Soheil Nazarian/University of Texas, El Paso

A New Progressed Mastic Aging Method and Effect of Fillers on SBS Modified Bitumen Aging (20-01725) - B320

Chengwei Xing/Tongji University, Liping Liu/Tongji University, Jianwei Sheng/Tongji University

Understanding Asphalt Mixture Compaction Mechanism from the Perspective of Coarse Aggregate Movement (20-02000) - B332

Xue Wang/Tongji University, Shihui Shen/Tongji University, Hai Huang/Tongji University, Matthew Hartenstein/Tongji University

Effect of Fly Ash on Asphalt Binder Performance and Aging Rate (20-04319) - B335

Ahmed Abdalla/Temple University, Mohammed Alsalihi/Temple University, Ahmed Faheem/Temple University

Effectiveness of Glass Powder and Glass-Hydrated Lime Composites as Alternative Fillers in Asphalt Mixes (20-04408) - B321

Jayvant Choudhary/Indian Institute of Technology (BHU) Varanasi, Brind Kumar/Indian Institute of Technology (BHU) Varanasi, Ankit Gupta/Indian Institute of Technology (BHU) Varanasi

Determination of Volumetric Characteristics of FAM Mixtures Using X-Ray Micro-Computed Tomography and Their Effects on the Rheological Behavior of the Material (20-05056) - B336

Patrícia Osmari/Federal University of Rio de Janeiro, Rogério Costa/Federal University of Rio de Janeiro, Francisco Aragao/Federal University of Rio de Janeiro, Delson Braz/Federal University of Rio de Janeiro, Regina Barroso/Federal University of Rio de Janeiro, Liebert Nogueira/Federal University of Rio de Janeiro, Andressa Ng/Federal University of Rio de Janeiro

Using Imaging Techniques to Analyze the Microstructure of Asphalt Concrete Mixtures: A Literature Review (20-05065) - B322

Mai Alawneh/University of Saskatchewan, Haithem Soliman/University of Saskatchewan

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Surface Requirements of Asphalt Mixtures
Kiran Mohanraj, The Transtec Group, Inc., presiding
Mena Souliman, University of Texas, Tyler, presiding
Sponsored By Standing Committee on Surface Requirements of Asphalt Mixtures

Characterization of RAP Added SMA Mixtures (20-00458) - B347

Sai Kubair/BITS Pilani, Waim Ravindra/BITS Pilani, Bhanuprasad Katla/BITS Pilani, Sridhar Raju/BITS Pilani, Subhash TK/BITS Pilani

The Effects of Cohesive and Adhesive Parameters on the Moisture Resistance of Thin Friction Course with Varying Mix Design Parameters (20-00726) - B358

Yajin Han/Southeast University, Jiwang Jiang/Southeast University, Fujian Ni/Southeast University, Qiao Dong/Southeast University, Xiaopeng Li/Southeast University

Development of an Integrated Aging-Moisture Predictive Model for Asphalt Concrete (20-01071) - B354

Mona Nobakht/Fugro, Maryam Sakhaeifar/Fugro, Robert Lytton/Fugro

(continued)

Multi-Scale Damage Characterization of Asphalt Mixture Subject to Freeze-Thaw Cycles (20-01218) - B341

Yunhong YU/Southeast University, Gang Xu/Southeast University, Degou CAI/Southeast University, Liangwei LOU/Southeast University, Yuefeng Shi/Southeast University, Jun Yang/Southeast University

A Comparative Study on the Early Stage of Skid Resistance Development Between Polyurethane-Bound Porous Mixture and Asphalt Mixture (20-01260) - B348

Jiachen Shi/Tongji University, Lin Cong/Tongji University, Fan Yang/Tongji University, Tongjing Wang/Tongji University, Guihong Guo/Tongji University

Exploring the Impact of Water Phase on Freeze-Thaw Damage of Asphalt Mixtures Using Information Entropy (20-01671) - B343

Hengzhen Li/Harbin Institute of Technology, Huining Xu/Harbin Institute of Technology, Yiqiu Tan/Harbin Institute of Technology

Quantifying In Situ Tack Coat Performance Using the OreTackBond for Quality Control (20-01795) - B346

Blaine Wruck/Oregon State University, Erdem Coleri/Oregon State University, Richard Villarreal/Oregon State University, James Batti/Oregon State University

Developing Technologies and Procedures to Reduce Tracking and Achieve Uniform and Accurate Tack Coat Application (20-02182) - B345

Erdem Coleri/Oregon State University, Richard Villarreal/Oregon State University, Blaine Wruck/Oregon State University

Determining the Relationship Among Hamburg Wheel-Tracking Test Parameters and Correlation to Field Performance of Asphalt Pavements (20-02268) - B350

Fan Yin/National Center for Asphalt Technology (NCAT), Chen Chen/National Center for Asphalt Technology (NCAT), Randy West/National Center for Asphalt Technology (NCAT), Amy Martin/National Center for Asphalt Technology (NCAT), Edith Arambula Mercado/National Center for Asphalt Technology (NCAT)

Measurement and Modeling of Skid Resistance of Asphalt Pavement: A Review (20-02353) - B352

Miao Yu/Chongqing Jiaotong University, Zhanping You/Chongqing Jiaotong University, Guoxiong Wu/Chongqing Jiaotong University, Lingyun Kong/Chongqing Jiaotong University, Chaochao Liu/Chongqing Jiaotong University, Junfeng Gao/Chongqing Jiaotong University

Development of a Tire-Pavement Dynamic Friction Analyzer for Investigation of the Dynamic Friction Coefficient Between Tire and Pavement (20-02848) - B353

Miao Yu/Chongqing Jiaotong University, Tong Shiyao/Chongqing Jiaotong University, Zhanping You/Chongqing Jiaotong University, Guoxiong Wu/Chongqing Jiaotong University, Xiaoyan Li/Chongqing Jiaotong University, Yongjie Ding/Chongqing Jiaotong University

Effect of the Gradation on Total Voids, Interconnected Voids, and Permeability of Porous Asphalt Concrete (20-03501) - B344

Qidi Zong/Tongji University, Jingang Wang/Tongji University, Feipeng Xiao/Tongji University, Jun Chen/Tongji University, Ji Liu/Tongji University

Effect of Aging and Minerals on the Moisture Sensitivity of Asphalt Mixtures Based on Molecular Dynamics Simulation (20-03504) - B340

Bingyan Cui/Southeast University, Xingyu Gu/Southeast University, Dongliang Hu/Southeast University

Investigating the Skeleton Strength of Open-Graded Friction Course Using Discrete Element Method (20-03754) - B359

Hao Wu/Central South University, Jia Yu/Central South University, Weimin Song/Central South University, Zihao Xu/Central South University, Fei Xu/Central South University

An Alternative Permeability Indicator to Determine Optimal Maintenance Timing for Open-Graded Friction Course (20-03845) - B342

Shenghua Wu/University of South Alabama, Li Liu/University of South Alabama, Gang Yao/University of South Alabama, Juan Zhang/University of South Alabama, Omar Tahri/University of South Alabama

Utilizing Photo Detection Technique to Assess the Impact of Anti-Stripping Additive on Stripping Potential of Asphalt Mixtures (20-04239) - B349

Nishant Bhargava/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, Nagarjuna Undela/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, Anjan Siddagangaiah/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

Laboratory Characterization of Rutting and Moisture-Induced Damage Potential of Foamed Warm Mix Asphalt Containing RAP (20-04377) - B368

Mohammad Rahman/University of California, Davis, Rouzbeh Ghabchi/University of California, Davis, Musharraf Zaman/University of California, Davis, Syed Ashik Ali/University of California, Davis, Amir Arshadi/University of California, Davis

Evaluating Moisture Damage Using Impact Resonance Test (20-04445) - B356

Shivpal Yadav/North Carolina State University, Abhilash Kusam/North Carolina State University, khtarhusein Tayebali/North Carolina State University

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Factors Affecting the Interlayer Shear Strength of Lab and Field Samples (20-04463) - B355
Abu Sufian/University of Wisconsin, Madison, Dan Swiertz/University of Wisconsin, Madison, Hussain U. Bahia/University of Wisconsin, Madison, Louay Mohammad/University of Wisconsin, Madison, Moses Akentuna/University of Wisconsin, Madison

A Simple Homogenization-Based Approach to Predict Raveling in Porous Asphalt (20-05083) - B357
Hong Zhang/Delft University of Technology, Kumar Anupam/Delft University of Technology, Tom Scarpas/Delft University of Technology, Cor Kasbergen/Delft University of Technology, Sandra Erkens/Delft University of Technology

Feasibility of 9.5-mm Stone Matrix Asphalt for Thin Lift Overlay in Washington State (20-05144) - B351
Justin Lim/Washington State University, Amir Bahadori/Washington State University, Haifang Wen/Washington State University, Kevin Littleton/Washington State University, Pete Corley/Washington State University, Balasingam Muhunthan/Washington State University

Design and Performance of High-Toughness Ultra-Thin Friction Course in South China (20-05227) - B338
Fuda Chen/South China University of Technology, Jiangmiao Yu/South China University of Technology, Huayang Yu/South China University of Technology, Nikun Yang/South China University of Technology

Effect of Additives and Aging on Moisture-Induced Damage Potential of Asphalt Mixes Using Surface Free Energy and Laboratory-Based Performance Tests (20-05741) - B369
Syed Ashik Ali/University of Oklahoma, Musharraf Zaman/University of Oklahoma, Rouzbeh Ghabchi/University of Oklahoma, Mohammad Rahman/University of Oklahoma, Sagar Ghos/University of Oklahoma, Shivani Rani/University of Oklahoma

Multi-Scale Evaluation of Moisture Damage in Asphalt Mixtures (20-06124) - B339
Munir Nazzal/University of Cincinnati

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Modeling of Asphalt Mixtures Behavior and Performance
Hussein Kassem, Beirut Arab University, presiding
Krishna Prapoorna Biligiri, Indian Institute of Technology, Tirupati, presiding
Sponsored By Standing Committee on Structural Requirements of Asphalt Mixtures, Subcommittee on Advanced Models to Understand Behavior and Performance of Asphalt Mixtures

Identification of Microstructural Characteristics in Semi-Flexible Pavement Material Using Micromechanics and Nano-Techniques (20-00375) - B363
Xing Cai/North Carolina State University, Hong Zhang/North Carolina State University, Jiayun Zhang/North Carolina State University, Zeheng Yao/North Carolina State University, Xianhua CHEN/North Carolina State University, Jun Yang/North Carolina State University

Damage Analysis of Semi-Flexible Pavement Material Under the Axial Compression Test Based on Acoustic Emission Technique (20-00451) - B364
Xing Cai/North Carolina State University, Liuxu Fu/North Carolina State University, Jiayun Zhang/North Carolina State University, Xianhua CHEN/North Carolina State University, Jun Yang/North Carolina State University

Establishment of Index for Fracture Resistance of Asphalt Mixtures Using an Improved Method Based on Modified Paris' Law (20-00679) - B375
Hui Chen/University of Wisconsin, Madison, Rong LUO/University of Wisconsin, Madison

Numerical Analysis of Ultrasonic Propagation Characteristics in Asphalt Concrete Using COMSOL (20-00750) - B378
Shuwei Li/Southeast University, Xingyu Gu/Southeast University, Qiao Dong/Southeast University, Tianjie Zhang/Southeast University, Zhen Liu/Southeast University

Long-Term Anti-Cracking Performance of Asphalt Mixtures of In Situ Semirigid Base Asphalt Pavements (20-01069) - B377
Fujian Ni/Southeast University, Hui Du/Southeast University, Song Li/Southeast University, Qiao Dong/Southeast University

Analytical Solution and Application of a Simple Shear Rutting Test (20-01503) - B379
Xi Luo/Texas A&M Transportation Institute, Sheng Hu/Texas A&M Transportation Institute, Fujie Zhou/Texas A&M Transportation Institute, Bill Crockford/Texas A&M Transportation Institute

Micromechanical Modeling of Asphalt Mixture Compaction Using Discrete Element Method (20-03645) - B367
Loay Al Khateeb/Norges teknisk-naturvitenskapelige universitet

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Interconversion of Asphalt Concrete Material Functions with Laboratory and Finite Element Validations (20-04274) - B373

A S M Rahman/Texas A&M University Transportation Institute, Mesbah Ahmed/Texas A&M University Transportation Institute, Rafi Tarefder/Texas A&M University Transportation Institute

An Efficient and Robust Method for Predicting Asphalt Concrete Dynamic Modulus (20-04358) - B387

Hongren Gong/University of Tennessee, Knoxville, Yuanshuai Dong/University of Tennessee, Knoxville, Yiren Sun/University of Tennessee, Knoxville, Pawel Polaczyk/University of Tennessee, Knoxville, Wei Hu/University of Tennessee, Knoxville, Baoshan Huang/University of Tennessee, Knoxville

A New Approach for Predicting Complex Modulus and Phase Angle of Asphalt Concrete from Binder Rheology (20-04483) - B374

A S M Rahman/Texas A&M University Transportation Institute, Rafi Tarefder/Texas A&M University Transportation Institute

Probabilistic Modeling for Uncertainty of Rutting Resistance of Asphalt Mixtures Using Flow Number Test (20-04634) - B365

Hussein Kassem/Beirut Arab University, Husam Sadek/Beirut Arab University, Mohammed Sadeq/Beirut Arab University

Sensitivity Analysis on Semi-Circular Bending Test Using the Plackett-Burman Matrix (20-05015) - B389

Shadi Saadeh/California State University, Long Beach, Yazan Al-Zubi/California State University, Long Beach, Enad Mahmoud/California State University, Long Beach, David Renteria/California State University, Long Beach, Louay Mohammad/California State University, Long Beach

Comparing the I-FIT Flexibility Index to FlexPAVE Fatigue Performance Predictions Using Field-Compacted Mixtures (20-05439) - B388

Jusang Lee/Indiana Department of Transportation, Dario Batioja-Alvarez/Indiana Department of Transportation, Reyhaneh Rahbar-Rastegar/Indiana Department of Transportation, John Haddock/Indiana Department of Transportation

An Innovative Adaptive Neuro Fuzzy Inference System Approach to Predict the Dynamic Modulus of Hot Mix Asphalt (20-05516) - B376

Ali Heidaripanah/Design of Superior Pavements, Pishro Pars Rah Company, Mehdi Hashemi Jokar/Design of Superior Pavements, Pishro Pars Rah Company, Maziar Moaveni/Design of Superior Pavements, Pishro Pars Rah Company, Abolfazl Hassani/Design of Superior Pavements, Pishro Pars Rah Company, Amir Kavussi/Design of Superior Pavements, Pishro Pars Rah Company

Refinement of Climate-, Depth-, and Time-Based Laboratory Aging Procedure for Asphalt Mixtures (20-05589) - B384

Elizabeth Braswell/North Carolina State University, Nooralhuda Saleh/North Carolina State University, Michael Elwardany/North Carolina State University, Farhad Yousefi Rad/North Carolina State University, Cassie Castorena/North Carolina State University, B. Shane Underwood/North Carolina State University, Youngsoo Kim/North Carolina State University

A Predictive Framework for Modeling Changes in Asphalt Mixture Moduli with Oxidative Aging (20-05685) - B385

Nooralhuda Saleh/North Carolina State University, Douglas Mocelin/North Carolina State University, Farhad Yousefi Rad/North Carolina State University, Cassie Castorena/North Carolina State University, B. Shane Underwood/North Carolina State University, Youngsoo Kim/North Carolina State University

Prediction of Fracture Life of Warm Asphalt Mixes Using Symbolic Regression Approach (20-05861) - B366

Ashok Julaganti/Indian Institute of Technology, Guwahati, Rajan Choudhary/Indian Institute of Technology, Guwahati, Abhinay Kumar/Indian Institute of Technology, Guwahati, Bimlesh Kumar/Indian Institute of Technology, Guwahati

Uncertainty Quantification of Simplified Viscoelastic Continuum Damage Fatigue Model Using the Bayesian Inference–Based Markov Chain Monte Carlo Method (20-05940) - B386

Jing Ding/North Carolina State University, Yizhuang Wang/North Carolina State University, Saqib Gulzar/North Carolina State University, Youngsoo Kim/North Carolina State University, B. Shane Underwood/North Carolina State University

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Design, Characterization, and Evaluation of Asphalt Mixtures
Mohamed Alavi, University of Tehran, presiding
Victor Garcia, The University of Texas at El Paso, presiding
Sponsored By Standing Committee on Structural Requirements of Asphalt Mixtures

(continued)

Permeability and Mechanical Property Measurements of Reinforced Asphalt Overlay with Paving Fabrics Using Novel Approaches (20-00101) - B380

Ehsan Solatiyan/Ecole de technologie superieure, Nicolas Bueche/Ecole de technologie superieure, Michel Vaillancourt/ Ecole de technologie superieure, Alan Carter/Ecole de technologie superieure

Evaluation of Complex Poisson's Ratio of Field Asphalt Mixtures Using Direct Tension Test (20-01789) - B405

Meng Ling/Texas A&M University, College Station, Yong Deng/Texas A&M University, College Station, Yao Zhang/Texas A&M University, College Station, Xue Luo/Texas A&M University, College Station, Robert Lytton/Texas A&M University, College Station

Conceptualization of Three-Stage Fatigue Failure in Asphalt Rubber Gap-Graded Mixtures Using Dynamic Semi -Circular Bending Test (20-02014) - B397

Veena Venudharan/Indian Institute of Technology, Palakkad, Krishna Prapoorna Biligiri/Indian Institute of Technology, Palakkad

Factors Effecting the Rutting Resistance of Asphalt Pavement Based on the Field Cores Using Multi-Sequence d Repeated Loading Test (20-02049) - B404

Zili Zhao/Southeast University, Jiwang Jiang/Southeast University, Fujian Ni/Southeast University, Qiao Dong/Southeast University, Jitong Ding/Southeast University

Use of the Hamburg Wheel-Tracking Device in Characterizing Fatigue Behavior of Asphalt Mixtures (20-03197) - B395

Zhidong Zhang/Tongji University, Shihui Shen/Tongji University, Bin Shi/Tongji University, Honglei Wang/Tongji University

Predicting Dynamic Modulus and Rutting Performance of Asphalt Mixture from Binder Properties and Mixture Design Variables (20-03313) - B390

Chuanqi Yan/University of Wisconsin, Madison, Yuan Zhang/University of Wisconsin, Madison, Hussain U. Bahia/University of Wisconsin, Madison

Correlating the Asphalt Binder Low Temperature to HMA Fracture Properties and Field Cracking Performance: A Texas Case Study (20-03793) - B399

Lubinda WALUBITA/Fundacion Universidad del Norte, Enad Mahmoud/Fundacion Universidad del Norte, Luis Fuentes/ Fundacion Universidad del Norte, Sang LEE/Fundacion Universidad del Norte

Comparison Between SCB-IFIT, Un-notched SCB-IFIT, and IDEAL-CT for Measuring Cracking Resistance of Asphalt Mixtures (20-03805) - B391

Chuanqi Yan/University of Wisconsin, Madison, Yuan Zhang/University of Wisconsin, Madison, Hussain U. Bahia/University of Wisconsin, Madison

An Investigation of the Permanent Deformation Behavior of Hot Mix Asphalt Utilizing Dynamic Creep Test and Modified Wheel Tracker (20-04008) - B394

Abhirup Roy-Chowdhury/University of Canterbury, Mofreh Saleh/University of Canterbury, Miguel Moyers-Gonzalez/University of Canterbury

Effect of Asphalt Mixture Components on the Uncertainty in Dynamic Modulus Mastercurves (20-04221) - B402

Hussein Kassem/Beirut Arab University, Ghassan Chehab/Beirut Arab University, Shadi Najjar/Beirut Arab University

Evaluating Fatigue Performance of Fine Aggregate Matrix Mixes Using Linear Amplitude Sweep and Time Sweep Testing (20-04271) - B398

Liya Jiao/University of California, Davis, Mohamed Elkashef/University of California, Davis, David Jones/University of California, Davis, John Harvey/University of California, Davis

Permanent Deformation Resistance of Long-Term Field Aged Asphalt Pavements (20-04332) - B393

Shenghua Wu/University of South Alabama, Weiguang Zhang/University of South Alabama, Shihui Shen/University of South Alabama, Balasingam Muhunthan/University of South Alabama

Comprehensive Evaluation of Rutting of Warm Mix Asphalt Utilizing Long-Term Pavement Performance Specific Pavement Studies (20-04946) - B383

Biswajit Bairgi/University of New Mexico, Rafi Tarefder/University of New Mexico, A S M Rahman/University of New Mexico, Matias M. Mendez Larrain/University of New Mexico

Glass Transition Temperature of Asphalt Materials Based on Dynamic Mechanical Analysis (20-05210) - B381

Guang Yang/Harbin Institute of Technology, Xudong Wang/Harbin Institute of Technology, Yanzhu Wang/Harbin Institute of Technology, Xingye Zhou/Harbin Institute of Technology, Lei Zhang/Harbin Institute of Technology

Characterization of Long-Term Field Rutting Performance of Asphalt Pavements Based on Hamburg Wheel-Tra cking Test Results (20-05822) - B392

Weiguang Zhang/Southeast University, Xiao Chen/Southeast University, Shihui Shen/Southeast University, Louay Mohammad/Southeast University, Bingyan Cui/Southeast University, Shenghua Wu/Southeast University, Tao Ma/Southeast University

Proposed Revisions to AASHTO TP 116 (20-05828) - B400

Haleh Azari/Pavement Systems, LLC, Alaeddin Mohseni/Pavement Systems, LLC

(continued)

Feasibility of Using Mastic for Performance Grading in Place of Extraction Using SPS10 Mixtures (20-05891) - B 401

Haleh Azari/Pavement Systems, LLC, Alaeddin Mohseni/Pavement Systems, LLC, Richard Steger/Pavement Systems, LLC, Dennis Muncy/Pavement Systems, LLC

Phase Transition Characteristics of Asphalt Mixtures for Stress Absorbing Membrane Interlayer (20-05912) - B3 82

Guang Yang/Harbin Institute of Technology, Xudong Wang/Harbin Institute of Technology, Yanzhu Wang/Harbin Institute of Technology

Proposed Reduction in Testing Time of Dynamic Modulus for Performance-Based Quality Assurance of Asphalt Paving (20-05958) - B403

Hussein Kassem/Beirut Arab University, Yara Hamdar/Beirut Arab University, Ghassan Chehab/Beirut Arab University

Investigation of the Variability of Asphalt Dynamic Modulus in South Carolina and Its Influence in the MEPDG (20-06098) - B396

Srinivasan Nagarajan/Clemson University, Bradley Putman/Clemson University, Jared Hanna/Clemson University

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Emerging Legal Issues

Sponsored By Standing Committee on Emerging Technology Law, Standing Committee on Tort Liability and Risk Management

Liability Design for Autonomous Vehicles and Human-Driven Vehicles: A Hierarchical Game-Theoretic Approach (20-02088) - B406

Xuan Di/Columbia University, Xu Chen/Columbia University

Privacy and Trust in Public Internet of Things Deployments: A Transportation Perspective (20-00297) - B407

Caitlin Cottrill/University of Aberdeen, Naomi Jacobs/University of Aberdeen, Milan Markovic/University of Aberdeen, Pete Edwards/University of Aberdeen

Evaluating the Effectiveness of Distracted Driving-Related Legislation (20-05677) - B408

Seunghoon Kim/Ohio State University, youngbin Lym/Ohio State University, Zhenhua Chen/Ohio State University

Innovation in a Legal Vacuum: The Uncertain Legal Landscape for Shared Micromobility (20-04183) - B409

David Pimentel/University of Idaho, Michael Lowry/University of Idaho, Timothy Koglin/University of Idaho, Ronald Pimentel/University of Idaho

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1639

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Improving Safety Through Traffic Enforcement Design and Implementation

Eric Fitzsimmons, Kansas State University, presiding
Michael Brown, Alexandria Police Department, presiding
Sponsored By Standing Committee on Traffic Law Enforcement

Effects of Evasive Behavior on the Location of Enforcement Equipment in Highway Systems (20-00079) - A203

Lucas Franceschi/Universidade Federal de Santa Catarina, Gustavo Otto/Universidade Federal de Santa Catarina, Luciano Kaesemodel/Universidade Federal de Santa Catarina, Valter Tani/Universidade Federal de Santa Catarina, Amir Valente/Universidade Federal de Santa Catarina

Economic Analysis of Highway Patrol Enforcement Versus Investments Using a Quantifiable Modeling Approach (20-00875) - A204

Osama Abaza/University of Alaska, Anchorage, Muhammad Saif Uddin/University of Alaska, Anchorage

Relationships Among Traffic Enforcement, Driver Behavior, and Safety: An Empirical Analysis Based on Multi-V ariate Time-Series Techniques (20-02779) - A205

Mingjie Feng/Tongji University, Xuesong Wang/Tongji University, Lulu Zhou/Tongji University

Evaluation of Penalty and Enforcement Strategies to Combat Speeding Offenses Among Professional Drivers: A Hong Kong Stated Preference Experiment (20-02887) - A206

Tiantian Chen/The Hong Kong Polytechnic Universtiy, N.N. Sze/The Hong Kong Polytechnic Universtiy, Shobhit Saxena /The Hong Kong Polytechnic Universtiy, Abdul Pinjari/The Hong Kong Polytechnic Universtiy, Chandra Bhat/The Hong Kong Polytechnic Universtiy, Lu Bai/The Hong Kong Polytechnic Universtiy

Using Bayesian Tobit Models to Analyze Collision Rates and Automated Enforcement (20-03703) - A207

Shewkar Ibrahim/City of Edmonton, Tarek Sayed/City of Edmonton, Yanyong Guo/City of Edmonton

(continued)

Evaluation and Analysis of Automated Enforcement Systems for Traffic Violation at Urban Intersections (20-038 96) - A208

Yunxuan Li/Southeast University, Jinghui Yuan/Southeast University, Jian Lu/Southeast University, Zeyang Cheng/Sout heast University

Evaluating the Impact of Traffic Violations on Crash Injury Severity on Wyoming Interstates: An Investigation with a Random Parameters Model with Heterogeneity in Means Approach (20-04097) - A209

anas alrejjal/University of Wyoming, milhan moomen/University of Wyoming, Khaled Ksaibati/University of Wyoming

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1640

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Occupant Protection Posters
Stephen Arhin, Howard University, presiding
Sponsored By Standing Committee on Occupant Protection

This event includes MV occupant protection posters covering a range of behavioral, engineering, and mathematical modeling issues with application to seatbelt non-use hot zones, seating position, injury severity levels, crash energy dissipation, youth occupant restraint, crash ratings and injury and restraint regulations/laws.

Bivariate Ordered Modeling of the Injury Severity Levels of Drivers and School-Age Child Passengers in Traffic Crashes (20-03523) - A210

Jaeyoung Lee/Central South University, Mohamed Abdel-Aty/Central South University, Suyi Mao/Central South University

Promoting Youth Occupant Restraint Based on Need (20-02135) - A200

Kimberly Vachal/North Dakota State University

Numerical Investigation of New Non-Conventional Energy Dissipating Systems and Their Applications (20-0131 8) - A201

HAILELELOUL SAHLE HABTE/Laboratoire Quartz, Supmeca, Akrum Abdul–Latif/Laboratoire Quartz, Supmeca

Evaluating the Effects of Vehicle Safety Ratings on Side Impact Crash Outcomes (20-00205) - A211

Abhay Lidbe/University of Alabama, Praveena Penmetsa/University of Alabama, Teng Wang/University of Alabama, Emmanuel Kofi Adanu/University of Alabama, Shashi Nambisan/University of Alabama

Potential Benefits of Animal AEB Systems Based on U.S. Crash Data (20-04760) - A202

Jeremy Decker/Virginia Polytechnic Institute and State University, Samantha Haus/Virginia Polytechnic Institute and State University, Hampton Gabler/Virginia Polytechnic Institute and State University

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1641

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A
Current Research on Alcohol, Other Drugs, and Transportation
Ryan Smith, National Transportation Safety Board (NTSB), presiding
Sponsored By Standing Committee on Alcohol, Other Drugs, and Transportation

Severity Analysis of Passenger-Carrying, Single-Vehicle Crashes Involving Drunk Driving (20-01036) - A212

Abhay Lidbe/University of Alabama, Emmanuel Kofi Adanu/University of Alabama, Elsa Tedla/University of Alabama, Steven Jones/University of Alabama

Modeling the Effects of Different Blood Alcohol Concentrations on Lateral Driving Performance: Influences of Age and Gender (20-00942) - A213

Ankit Kumar Yadav/Indian Institute of Technology, Bombay, Nagendra Velaga/Indian Institute of Technology, Bombay

Pedestrians Under Influence: Findings from Correspondence Regression Analysis (20-05381) - A214

Subasish Das/Texas A&M Transportation Institute, Sruthi Ashraf/Texas A&M Transportation Institute, Anandi Dutta/Texa s A&M Transportation Institute, Ly-Na Tran/Texas A&M Transportation Institute

Assessing Administrative Record Systems for Use in Impaired Driving Prevention Programs (20-00056) - A215

Kimberly Vachal/North Dakota State University, Andrew Kubas/North Dakota State University

DUI-Child Endangerment Laws: How Are They Used in Courts? (20-00765) - A216

Eduardo Romano/Pacific Institute for Research and Evaluation, Tara Kelley-Baker/Pacific Institute for Research and Evaluation, Eileen Taylor/Pacific Institute for Research and Evaluation

(continued)

Survival Analysis of the North Dakota 24/7 Sobriety Program to Predict Recidivism (20-02549) - A217

Shantanu Awasthi/North Dakota State University, Ihsan Khan/North Dakota State University, Yun Zhou/North Dakota State University, Seguy Tchakounte-Wakem/North Dakota State University, Kimberly Vachal/North Dakota State University, Bong-Jin Choi/North Dakota State University

Understanding Patterns in Marijuana Impaired Traffic Crashes: A Case Study on Louisiana (20-05309) - A218

Subasish Das/Texas A&M Transportation Institute, Ly-Na Tran/Texas A&M Transportation Institute, Bita Maraghehpour/Texas A&M Transportation Institute

Macroscopic Analysis of Violations and Crashes Involving Driving Under the Influence of Alcohol or Drugs (20-02737) - A219

Jaeyoung Lee/Central South University, Xiaoqi Zhai/Central South University, Mohamed Abdel-Aty/Central South University, Huang Helai/Central South University

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Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Research on Safety Mobility of Older Persons
Nina Silverstein, University of Massachusetts, Boston, presiding
Sponsored By Standing Committee on Safe Mobility of Older Persons

At the Intersection of Aging, Cognition, and Roadway Design (20-00478) - A222

Tia Mastromatto/TransAnalytics, LLC, Sophia Vardaki/TransAnalytics, LLC, Loren Staplin/TransAnalytics, LLC

The Effect of Older Adults' Recreational Walking on Quality of Life and Life Satisfaction (20-00878) - A223

Devajyoti Deka/Alan M. Voorhees Transportation Center, Charles Brown/Alan M. Voorhees Transportation Center, James Sinclair/Alan M. Voorhees Transportation Center, Andrea Lubin/Alan M. Voorhees Transportation Center, Lisa Cintron/Alan M. Voorhees Transportation Center

Older Driver Crash Fatalities by Age and Sex, 2000–2017 (20-01262) - A224

Kendra Ratnapradipa/University of Nebraska, Medical Center, Caitlin Pope/University of Nebraska, Medical Center, Ann Nwosu/University of Nebraska, Medical Center, Motao Zhu/University of Nebraska, Medical Center

The Effects of the Transportation Environment on the Voluntary Surrender of Driver's Licenses of Seniors (20-02352) - A225

Naoya Aonuma/Waseda University, Kuniaki Sasaki/Waseda University

Aging Drivers' Interaction States as Surrogate Safety Measures in Evaluating Cooperative Merging Assistance System (20-05838) - A226

Flavius Matata/University of North Florida, Festo Mjogolo/University of North Florida, Lina Lwambagaza/University of North Florida, Thobias Sando/University of North Florida, Doreen Kobelo/University of North Florida, Maxim Dulebenets/University of North Florida

Using SHRP2 Data to Examine Safety Concerns for Older Drivers Turning Left at Signalized Intersections (20-06059) - A227

Tracy Zafian/University of Massachusetts, Amherst, Michael Knodler/University of Massachusetts, Amherst, Siby Samuel/University of Massachusetts, Amherst, Ravi Agrawal/University of Massachusetts, Amherst

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1643

Tuesday, 03:45 p.m. - 05:30 p.m., Convention Center, Hall A

Analyzing and Planning the Pedestrian Environment
Laura Sandt, UNC Highway Safety Research Center, presiding
Sponsored By Standing Committee on Pedestrians

Walk Access to Neighborhood Parks: Evaluating Sidewalk Quality and Street Connectivity (20-00064) - A180

Mintesnot Woldeamanuel/California State University, Northbridge

Pedestrian Path Generation Considering Latent Arrival Time Constraints (20-00204) - A181

Ken Hidaka/Toyota Central R&D Labs., Inc., Keiichiro Hayakawa/Toyota Central R&D Labs., Inc., Tomoki Nishi/Toyota Central R&D Labs., Inc., Tomotaka Usui/Toyota Central R&D Labs., Inc., Toshiyuki Yamamoto/Toyota Central R&D Labs., Inc.

Vehicle and Pedestrian Level of Service in Street Designs with Elements of Shared Space (20-00652) - A182

Ioannis Kaparias/University of Southampton, Rui Wang/University of Southampton

(continued)

Pedestrian Crossing Warrants for Urban Midblock Sections Under Mixed Traffic Conditions (20-00738) - A183

Hareshkumar Golakiya/Sardar Vallabhbhai National Institute of Technology, Surat, Ashish Dhamaniya/Sardar Vallabhbhai National Institute of Technology, Surat, Satish Chandra/Sardar Vallabhbhai National Institute of Technology, Surat, Omkrishan Sharma/Sardar Vallabhbhai National Institute of Technology, Surat

Pedestrian Volume Modeling and Risk Mapping in Philadelphia (20-00908) - A184

Tyler Tran/University City District, Seth Budick/University City District

Measuring Perceptions of Social Environments for Walking: A Systematic Review of Walkability Surveys (20-01012) - A185

Nicole Iroz-Elardo/University of Arizona, Arlie Adkins/University of Arizona, Maia Ingram/University of Arizona

The Role of the Natural and Built Environment in Different Types of Walking Duration in the Netherlands (20-01524) - A186

Jie Gao/Universiteit Utrecht Faculteit Geowetenschappen, Carlijn Kamphuis/Universiteit Utrecht Faculteit Geowetenschappen, Marco Helbich/Universiteit Utrecht Faculteit Geowetenschappen, Dick Ettema/Universiteit Utrecht Faculteit Geowetenschappen

Pedestrian Network Design Model with Application (20-02162) - A187

Christina Iliopoulou/National Technical University of Athens (NTUA), Maria Tseliou/National Technical University of Athens (NTUA), Konstantinos Kepaptsoglou/National Technical University of Athens (NTUA), Stratos Papadimitriou/National Technical University of Athens (NTUA)

A Pedestrian Satisfaction–Based Methodology for Prioritization of Critical Sidewalk and Crosswalk Elements Influencing Safety and Walkability (20-02187) - A188

Bandhan Majumdar/Birla Institute of Technology & Science, Pilani - Hyderabad Campus, Nikitha Vendotti/Birla Institute of Technology & Science, Pilani - Hyderabad Campus, Mallikarjun Patil/Birla Institute of Technology & Science, Pilani - Hyderabad Campus, Prasanta Sahu/Birla Institute of Technology & Science, Pilani - Hyderabad Campus

Evaluating Walkable Streets with a 3D Stated Preference Survey (20-02452) - A189

Dena Kasraian/Eindhoven University of Technology, Sneha Adhikari/Eindhoven University of Technology, David Kossowsky/Eindhoven University of Technology, Michael Luubert/Eindhoven University of Technology, Brent Hall/Eindhoven University of Technology, Jason Hawkins/Eindhoven University of Technology, Khandker Nurul Habib/Eindhoven University of Technology, Jeremy Bowes/Eindhoven University of Technology, Sara Diamond/Eindhoven University of Technology, Paul Hess/Eindhoven University of Technology, Michael Wolfe/Eindhoven University of Technology, Judy Farvolden/Eindhoven University of Technology, Matthew Roorda/Eindhoven University of Technology

A Deep Neural Network Approach for Pedestrian Trajectory Prediction Considering Heterogeneity (20-02643) - A190

Hossein Esfahani/Utah State University, Ziqi Song/Utah State University

A Natural Experiment to Assess the Impacts of Street-Level Urban Design Interventions on Walkability and Business Activity (20-03393) - A191

Maher Said/American University of Beirut, Georges Geha/American University of Beirut, Maya Abou-Zeid/American University of Beirut

Equity in Pedestrian Plans (20-04039) - A192

Amber Berg/Kansas State University, Gregory Newmark/Kansas State University

Planning Suburban Sidewalks: A Study of Mode Mismatch, Property Values, and Accessibility (20-04380) - A193

Leoma Van Dort/University of Minnesota, Twin Cities, Austin Hauf/University of Minnesota, Twin Cities, Haley Sevening/University of Minnesota, Twin Cities, Erin Daly/University of Minnesota, Twin Cities, Alena DeGrado/University of Minnesota, Twin Cities, Greg Lindsey/University of Minnesota, Twin Cities

Application and Effect Research of Virtual Reality in Evaluation of Walking Experience of Branch Roads (20-04602) - A194

Ying Hui/Tongji University, Yujiao Wang/Tongji University

A Behavioral Based Pedestrian Modeling Approach: Formulation, Sensitivity Analysis, and Calibration (20-05446) - A195

Samer Hamdar/George Washington University, Alireza Talebpour/George Washington University, Kyla D'Sa/George Washington University, Victor Knoop/George Washington University, Winnie Daamen/George Washington University, Martin Treiber/George Washington University

Exploring the Trend of Walkability Measures by Applying Hierarchical Clustering Technique (20-05463) - A196

MD Mehedi Hasan/Western Michigan University, Jun-Seok Oh/Western Michigan University

Practical Evaluation Method for Policies to Improve Walkability in Central Urban Area Using Pedestrian Behavior Modeling (20-05897) - A197

Ryoji Ishii/The Institute of Behavioral Sciences, Masahiko Kikuchi/The Institute of Behavioral Sciences, Keita Iwadate/The Institute of Behavioral Sciences, Eiji Hato/The Institute of Behavioral Sciences, Takahiro Ishigami/The Institute of Behavioral Sciences, Wataru Mogi/The Institute of Behavioral Sciences

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What Street Improvements Better Promote Active Travel?: A Case Study of the Seattle Neighborhood Greenway (20-05919) - A198

Jiarui Tao/University of California, Irvine

Transit Caucus

Brendon Hemily, Hemily and Associates, presiding
Sponsored By Public Transportation Group

Freight and Marine Caucus

Jim Kruse, Texas A&M Transportation Institute, presiding
Richard Bornhorst, FACTOR, Inc., presiding
Sponsored By Freight Systems Group, Marine Group, Standing Committee on Marine Safety and Human Factors, Standing Committee on Ports and Channels, Standing Committee on Inland Water Transportation, Standing Committee on Marine Environment, Standing Committee on Freight Transportation Economics and Regulation, Standing Committee on Freight Transportation Planning and Logistics, Standing Committee on International Trade and Transportation, Standing Committee on Urban Freight Transportation, Standing Committee on Agriculture and Food Transportation, Standing Committee on Military Transportation, Standing Committee on Transportation of Hazardous Materials, Standing Committee on Intermodal Freight Transport, Standing Committee on Intermodal Freight Terminal Design and Operations, Standing Committee on Truck Size and Weight, Standing Committee on Trucking Industry Research, Rail Group

1644

Traffic Equilibrium and Dynamics

Ali Zockaie, Michigan State University, presiding
Sponsored By Standing Committee on Transportation Network Modeling

Accelerating Traffic Assignment with Customizable Contraction Hierarchies (20-00313)
Arne Schneck/PTV Group, Klaus Noekel/PTV Group
Market Equilibrium and Pricing of E-Hail Services with Pooling (20-00385)
Kenan Zhang/Northwestern University, Marco Nie/Northwestern University
A Mixed Behavior Equilibrium Model with Mode Choice and Its Application to the Endogenous Ratio of Automated Vehicles (20-00576)
Guangchao Wang/Hubei University of Economics, Hang Qi/Hubei University of Economics, Ning Jia/Hubei University of Economics, Zhengbing He/Hubei University of Economics
Day-to-Day Dynamic Traffic Assignment with Imperfect Information and Information-Sharing Behavior (20-01750)
Yang Yu/Imperial College London, Ke Han/Imperial College London
Multi-Class Traffic Assignment Model for Mixed Traffic Flow of Human-Driven Vehicles and Connected and Autonomous Vehicles (20-01791)
Jian Wang/Ningbo University, Srinivas Peeta/Ningbo University, Xiaozheng He/Ningbo University
Multi-Class Information Flow Propagation Control Under Vehicle-to-Vehicle Communication Environments (20-01839)
Jian Wang/Ningbo University, Srinivas Peeta/Ningbo University, Lili Lu/Ningbo University, Tao Li/Ningbo University
Hyperpath-Based Algorithms for the Transit Equilibrium Assignment Problem (20-03106)
Zhandong Xu/Southwest Jiaotong University, Jun Xie/Southwest Jiaotong University, Marco Nie/Southwest Jiaotong University, Xiaobo Liu/Southwest Jiaotong University
Using DTA Models to Evaluate User Delay Costs Due to Incidents: A Case Study in Austin, Texas (20-04618)
Tianxin Li/University of Texas, Natalia Ruiz-Juri/University of Texas, Heidi W. Ross/University of Texas, Randy Machemehl/University of Texas, John Nevares/University of Texas, Adam Kaliszewski/University of Texas

(continued)

An Analytical and Agent-Based Model to Evaluate Ridepooling Impact Factors (20-05327)
Aledia Bilali/Bundeswehr University, Munich, Roman Engelhardt/Bundeswehr University, Munich, Florian Dandl/Bundeswehr University, Munich, Ulrich Fastenrath/Bundeswehr University, Munich, Klaus Bogenberger/Bundeswehr University, Munich

1645

Tuesday, 06:00 p.m. - 07:30 p.m., Convention Center, 204A
Advancements in Mapping and 3D Technologies Using LiDAR and Photogrammetry
Stephen Bespalko, Exemplar Technology, LLC, presiding
Sponsored By Standing Committee on Geospatial Data Acquisition Technologies

Pothole Mapping and Patching Quantity Estimates Using LiDAR-Based Mobile Mapping Systems (20-02255)
Radhika Ravi/Purdue University, Ayman Habib/Purdue University, Darcy Bullock/Purdue University
Applicability of Photogrammetry for Inspection and Monitoring of Dry-Stone Masonry Retaining Walls (20-04998)
Alexandra Hain/University of Connecticut, Arash Zaghi/University of Connecticut
A Voxel-Based Methodology for Automated 3D Sight Distance Assessment on Highways Using Mobile LiDAR Data (20-04131)
Amr Shalkamy/University of Alberta, Karim El-Basyouny/University of Alberta, Hai Yang Xu/University of Alberta

1646

Tuesday, 06:00 p.m. - 07:30 p.m., Convention Center, 209A
Pavement and Water
Xiaochao Tang, Widener University, presiding
Sponsored By Standing Committee on Subsurface Drainage

The session provides the various aspects of water in the pavement system covering modeling, characterization and mitigation. The session focuses on proposed methods to drain water effectively through porous asphalt or stormwater infiltration bed. The session also covers assessing the hydroplaning risk from flooding and excessive rainfall.

Methodology to Evaluate Hydroplaning Risk Under Flooded-Drain and Unsteady Rainfall Conditions (20-03503)
Menna Yassin/Federal Highway Administration (FHWA), Manjriker Gunaratne/Federal Highway Administration (FHWA)
Modeling Underground Aggregate Stormwater Infiltration Beds (20-03520)
Liv Haselbach/Lamar University, Nara Almeida/Lamar University, Thinesh Selvaratnam/Lamar University, Dongseong Han/Lamar University
Investigation of CFD Applicability for Predicting Hydraulic Conductivity of Porous Asphalts (20-06037)
Veronica Fedele/Politecnico di Bari, Nicola Berloco/Politecnico di Bari, Pasquale Colonna/Politecnico di Bari, Ashton Hertrich/Politecnico di Bari, Paolo Intini/Politecnico di Bari, Vittorio Ranieri/Politecnico di Bari, John Sansalone/Politecnico di Bari

1647

Tuesday, 06:00 p.m. - 07:30 p.m., Convention Center, Salon A
State of the Art Review of Cooperative Automated Transportation Systems
Tracy Larkin Thomason, Nevada Department of Transportation, presiding
Sponsored By Standing Committee on Vehicle-Highway Automation

Through NCHRP 20-24(128), multiple state/agency leaders are touring domestic and international CAT system deployments to document how public agencies can ensure mutually beneficial outcomes, particularly safety, while advancing future CAT deployments. Key topics being explored include policies, legislation, regulations; planning scenarios; technical considerations (e.g., infrastructure needs, data management, procurement, security); funding mechanisms; and partnerships with the private sector.

Panel Discussion (P20-20204)

Panelist 1 (P20-21284)
Carlos Braceras/Utah Department of Transportation

(continued)

Panelist 2 (P20-21285)
Julie Lorenz/Kansas Department of Transportation
Panelist 3 (P20-21286)
Shante Hastings/Delaware Department of Transportation

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Tuesday, 06:00 p.m. - 07:30 p.m., Convention Center, 208
Pavement Maintenance: Surface Treatments and Patching Materials
David Peshkin, Applied Pavement Technology, Inc., presiding
Eshan Dave, University of New Hampshire, presiding
Sponsored By Standing Committee on Pavement Maintenance

The first half of this session explores papers that study the impact of studded tire use on pavement structures and evaluate wear resistance of experimental surface treatments. The second half of the session includes papers describing experimental investigations of pothole patching materials

Impact of Studded Tire Use on Pavement Structures in Cold Climates (20-00256)
Osama Abaza/University of Alaska, Anchorage, Mahmoud Arafat/University of Alaska, Anchorage, Muhammad Saif Uddin/University of Alaska, Anchorage
Field Evaluation of Experimental Concrete Surface Wear Mitigation Treatments on I-80 in California (20-02398)
Jeff Stempihar/NCE, Jose Medina/NCE, Thomas Van Dam/NCE, Pete Schmalzer/NCE
Experimental Investigation of Pothole Patching Materials (20-03598)
Debaroti Ghosh/Nichols Consulting Engineers, Mugurel Turos/Nichols Consulting Engineers, Mihai Marasteanu/Nichols Consulting Engineers
Patching Potholes Using a Half-Warm Mix Asphalt Produced by 100% RAP and Waste Cooking Oil–Based Biobinder (20-01233)
Taekil Oh/California State University, Chico, Kun Zhang/California State University, Chico, Balasingam Muhunthan/California State University, Chico, Ran Li/California State University, Chico

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Tuesday, 06:00 p.m. - 07:30 p.m., Convention Center, 203
Structures Maintenance
Michael Brown, WSP, presiding
Sponsored By Standing Committee on Structures Maintenance

Strengthen Hollow Core Concrete Bridges with Deficient Transverse Hinge Joints with a Steel and Concrete Composite Anchorage System (20-03323)
Hui Jin/University of Wisconsin, Platteville, Hanwan Jiang/University of Wisconsin, Platteville, Ruinian Jiang/University of Wisconsin, Platteville, Hanyu Zhan/University of Wisconsin, Platteville, Yue Xu/University of Wisconsin, Platteville
Repair of Severely Damaged RC Beams with High Strength Cementitious Grout (20-05975)
Antoine Gergess/University of Balamand, MAHFOUD SHEIKHSHABAB/University of Balamand, Razane Massouh/University of Balamand
Performance Evaluation of Bridge Approaches: Assessing and Preventing Void Formation (20-05788)
Mohamed ElBatanouny/Wiss, Janney, Elstner Associates, Inc., Kathleen Hawkins/Wiss, Janney, Elstner Associates, Inc., Nathaniel Rende/Wiss, Janney, Elstner Associates, Inc., Paul Krauss/Wiss, Janney, Elstner Associates, Inc.
Repair of Corroded Steel Bridge Columns Using Ultra-High Performance Concrete: An Experimental Study (20-05867)
BINOD SHRESTHA/Missouri University of Science and Technology, AHMED GHENI/Missouri University of Science and Technology, Mohanad Abdulazeez/Missouri University of Science and Technology, Mohamed ElGawady/Missouri University of Science and Technology

1650

Polymers and Adhesion
Michael Stenko, Transpo Industries, Inc., presiding
Sponsored By Standing Committee on Polymer Concretes, Adhesives, and Sealers

The session includes presentations on polymer concrete and binders, bond strength and adhesion.

The Effect of Hard Segment Content of Polyurethane on the Property of Polyurethane Porous Mixture (20-00632)
Guihong Guo/Tongji University, Lin Cong/Tongji University, Fan Yang/Tongji University, Minda Ren/Tongji University
Experimental Study on Mechanical Behaviors of Asphalt-Aggregate Interface Under Direct Shear Loading (20-04317)
Chao Zhang/Harbin Institute of Technology, Yiqiu Tan/Harbin Institute of Technology, Huijie Lv/Harbin Institute of Technology, Shenqing Xiao/Harbin Institute of Technology
Bond Behavior of Steel Bridge H-Pile Columns Encased In Polymer Concrete Jackets (20-05855)
Mohanad Abdulazeez/Missouri University of Science and Technology, Kyle Brown/Missouri University of Science and Technology, Mohamed ElGawady/Missouri University of Science and Technology

1651

Transportation and Economic Development
Sharada Vadali, Economic Insights and Research, presiding
Konstantina (Nadia) Gkritza, Purdue University, presiding
Sponsored By Standing Committee on Transportation and Economic Development

Impact of High-Speed Rail on the Evolution of Urban Spatial Structure in China (20-01158) - A101
Qipeng Sun/Chang'an University, Sijie Wang/Chang'an University, Fei Ma/Chang'an University
The Impacts of Industrialization on Freight Movement in China (20-01941) - A102
dongmei chen/King Abdullah Petroleum Studies and Research Center, Yagyavalk Bhatt/King Abdullah Petroleum Studies and Research Center
Expressway, Spatial Agglomeration, and Technology Spillover: A Case Study of Chinese Cities (20-00192) - A103
Tan Lin/Tongji University, Xinghua Li/Tongji University, Chao Yang/Tongji University, Wei Wang/Tongji University, Siyu Li/Tongji University
Heterogeneous Impacts of Transportation: New Evidence from Instrumental Variable Quantile Regressions (20-01180) - A104
Jianling Li/University of Texas, Mahmut Yasar/University of Texas
Analysis for the Straw Effects of New High-Speed Rail Construction on Inter-Regional Dependency (20-02835) - A105
MEINA ZHENG/Southeast University, Xiucheng Guo/Southeast University, Feng Liu/Southeast University
Transit Access and the Post-Entry Performance of New Establishments (20-00969) - A100
Xueying Chen/Rutgers, The State University of New Jersey, Robert Noland/Rutgers, The State University of New Jersey
Changes in Import Volumes for Small Ports in the United States After the Panama Canal Expansion (20-04879) - A106
Jorge Medina/New Jersey City University, Jong-Ho Kim/New Jersey City University, EunSu Lee/New Jersey City University
Assessing the Effect of Sustainable Streets Projects in Local Business Areas in New York City (20-04606) - A107
Josef Szende/New York City Department of Transportation, Charles Ukegbu/New York City Department of Transportation, Mark Seaman/New York City Department of Transportation
Medical Device Industry Linkages and Transportation Implications for Minnesota (20-04698) - A108
Yoon Joo Cho/University of Minnesota Hubert H Humphrey School of Public Affairs, Lee Munnich/University of Minnesota Hubert H Humphrey School of Public Affairs, Thomas Horan/University of Minnesota Hubert H Humphrey School of Public Affairs

Emerging Research in Social and Economic Factors of Transportation
Steven Farber, University of Toronto, presiding
Michael Smart, Rutgers, The State University of New Jersey, presiding
Nicholas Klein, Cornell University, presiding
Sponsored By Standing Committee on Social and Economic Factors of Transportation

Are Immigrants Migrating Away from Transit?: Immigrant Transit Use Trends in California (20-02325) - A138
Evelyn Blumenberg/University of California, Los Angeles, Andrew Schouten/University of California, Los Angeles, Madeline Ruvolo/University of California, Los Angeles, Brian Taylor/University of California, Los Angeles
Do Immigrants in the United States Continue to Rely More on Alternative Modes of Transportation Than U.S.-Born Residents? (20-01178) - A139
Sang Wan Lee/Portland State University, Michael Smart/Portland State University
A Tale of Two Limited English Proficiency Communities: Connecting Mobility Marginalized Communities via Technology (20-03368) - A140
Rongfang Liu/New Jersey Institute of Technology, LIU LV/New Jersey Institute of Technology, Hindy Schachter/New Jersey Institute of Technology, Cristian Borcea/New Jersey Institute of Technology
Residential and Daily Travel Preferences of South Asian International Students in Australia (20-00717) - A141
Rahman Shafi/Monash University, Alexa Delbosc/Monash University, Geoff Rose/Monash University
The Role of Transportation, Urban Amenities, and Life Cycle on the Residential Location Choice of Young Adults (20-01701) - A137
Jaeyong Shin/University of Illinois, Chicago, Nebiyou Tilahun/University of Illinois, Chicago
The Role of Public Transit in School Choice and After-School Activity Participation: A Study of Toronto Area High School Students (20-01241) - A142
Matthew Palm/University of Toronto, Steven Farber/University of Toronto
Thoughts for Food in Older Age: A Qualitative Study on Factors Influencing Online Grocery Shopping and Mode Choice for In-Person Grocery Shopping (20-04082) - A143
Ana Bezirgani/University of Quebec, Ugo Lachapelle/University of Quebec
Factors Affecting Parental Safety Perception, Satisfaction with School Travel and Mood in Primary School Children in the Netherlands (20-00290) - A144
Pauline van den Berg/Technische Universiteit Eindhoven, E. Owen Waygood/Technische Universiteit Eindhoven, Iris van de Craats/Technische Universiteit Eindhoven, Astrid Kemperman/Technische Universiteit Eindhoven
Factors Associated with Travel Behavior of Millennials and Older Adults: A Scoping Review (20-02396) - A145
Shaila Jamal/McMaster University, K. Bruce Newbold/McMaster University
What Factors Contribute to Higher Travel Happiness?: Evidence from Beijing, China (20-04141) - A146
Aihua Fan/Beijing Jiaotong University, Xumei Chen/Beijing Jiaotong University, Xiaomei Zhang/Beijing Jiaotong University
Views from the Other Side of the Road: Exploring Public Attitudes Toward Autonomous Vehicles (20-06140) - A147
Thomas Norton/ARUP, Melissa Ruhl ABE30/ARUP, Tim Armitage/ARUP, Brian Matthews/ARUP, John Miles/ARUP
Exploring the Causes of Mobility-Related Social Exclusion for Non-Motorized Households (20-03384) - A148
Dominic Villeneuve/Technical University of Munich, Vincent Kaufmann/Technical University of Munich
Do I Need to Bring a Car?: An Exploratory Qualitative Analysis of Online Transportation Discussions (20-02212) - A149
Evan Iacobucci/Rutgers, The State University of New Jersey, New Brunswick
Assessing Impacts of Urban New Park Development on Traffic and Environment of Surrounding Community (P20-21495) - A152
Fengxiang Qiao/Texas Southern University, Hanzhen Wang/Texas Southern University
Bridging the Transportation Divide (P20-21496) - A153
Jacqueline Kuzio/Texas A&M Transportation Institute
Incorporating State-of-the-Practice Economic Valuation into the CIA Process (P20-21490) - A154
Steven Bert/Institute for Transportation Research and Education
Market Acceptance of Autonomous Vehicles in Transportation Disadvantaged Areas: Implications for Policy and Planning (P20-21491) - A155
Konstantina (Nadia) Gkritza/Purdue University, Christos Gkartzonikas/Purdue University, Lisa Lorena Losada Rojas/Purdue University

(continued)

Geographical Information Systems-Based Evacuation Analysis of Vulnerable Communities in the Florida Panhandle: A Case Study of Hurricane Michael (P20-21492) - A156

Mahyar Ghorbanzadeh/Florida State University, Eren Ozguven/FAMU-FSU College of Engineering, Simone Burns/FAMU-FSU College of Engineering

Assessing Community Impacts of Infill Development in Urban Dense Residential Areas (P20-21493) - A151

Fengxiang Qiao/Texas Southern University, Lijie Zhou/Texas Southern University

Impact Assessment of Traffic Noise on Community Environment Under Various Acoustic Barriers During Urban Infill Development Process (P20-21494) - A150

Boya You/Texas Southern University, Fengxiang Qiao/Texas Southern University, Qing Li/Texas Department of Transportation, Lei Yu/Texas Southern University, Wu Ying/Texas Southern University

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1653

Tuesday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A

Poster Session on Transportation and Land Development

John Renne, Florida Atlantic University, presiding

Sponsored By Standing Committee on Transportation and Land Development

Modeling Demand for Ridesourcing Services in the City of Chicago: A Direct Demand Machine Learning Approach (20-04692) - A116

Xilei Zhao/University of Florida, Xinyu Liu/University of Florida, Xiang Yan/University of Florida

Assessing the Global Efficiency of Household Residential Location Choices (20-02252) - A117

Catherine Morency/Ecole Polytechnique de Montreal, Hubert Verreault/Ecole Polytechnique de Montreal

How Transit Shapes Cities: Evidence for Scaling (20-00137) - A111

Hao Wu/University of Sydney Sydney, David Levinson/University of Sydney Sydney, Somwrita Sarkar/University of Sydney Sydney

Measuring Full Cost Accessibility by Auto (20-00207) - A112

Mengying Cui/The University of Sydney, David Levinson/The University of Sydney

Relationships Among Land Use, Transit, and Household Expenditures in Small Urban Areas (20-00237) - A118

Jeremy Mattson/North Dakota State University

24-Hour Safety Threats in My Community?: An Examination of Environmental Inequity in Freight Related Road Safety (20-00304) - A119

Quan Yuan/University of Southern California, Jueyu Wang/University of Southern California

Accessibility of Hospitals: An Application of the Concept of Substitutability (20-00514) - A120

Charlotte Giesbers/Delft University of Technology, Kees Maat/Delft University of Technology, Sander Van Cranenburgh/Delft University of Technology, Bert van Wee/Delft University of Technology

The (Overlooked) Link Between Express Bus Stations and Commercial Rents with Implications for Transit and Land Use Planning (20-00736) - A114

Arthur Nelson/University of Arizona, Robert Hibberd/University of Arizona

Traffic Generated by Mixed-Use Developments: A Follow-Up 31-Region Study Using Consistent Built Environment Measures (20-01240) - A121

Guang Tian/University of New Orleans, Keunhyun Park/University of New Orleans, Reid Ewing/University of New Orleans, Mackenzie Watten/University of New Orleans, Jerry Walters/University of New Orleans

Do People Willing to Pay More to Live in a Walkable Environment Is Context-Dependent?: A Comparative Hedonic Model Approach (20-01694) - A122

Shanna Trichês Lucchesi/Universidade Federal do Rio Grande do Sul, Ana Larranaga/Universidade Federal do Rio Grande do Sul, Helena Cybis/Universidade Federal do Rio Grande do Sul, João de Abreu e Silva/Universidade Federal do Rio Grande do Sul, Julian Ochoa/Universidade Federal do Rio Grande do Sul

Effects of the Built Environment on Attitudes and Preferences Toward Autonomous Vehicles (20-02058) - A110

Zhiqiu Jiang/University of Virginia, Sicheng Wang/University of Virginia, Andrew Mondschein/University of Virginia, Robert Noland/University of Virginia

Net Migration and Cities: The Role of Transportation and Urban Characteristics in Affecting Population Shifts (20-02291) - A136

Jaeyong Shin/University of Illinois, Chicago

Investigating the Spatial and Temporal Distributions of Major Beltway Project Impacts on Residential Property Prices in North Carolina (20-02348) - A123

John Murray/Texas A&M Transportation Institute, Eleni Bardaka/Texas A&M Transportation Institute

What's Access Worth?: A Hedonic Pricing Approach to Valuing Cities (20-02585) - A113

Hema Rayaprolu/The University of Sydney, David Levinson/The University of Sydney

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Residential Self-Selection and Transit Usage Around New Transit Stations (20-02722) - A124

Matthew Conway/Arizona State University

The Path Between Place of Living and Mental Health: Transportation and Land Use Systems Impacts on Postpartum Depression Incidence (20-02898) - A125

Mohammad Tayarani/Cornell University, Shuojia Wang/Cornell University, Razieh Nadafian/Cornell University, Yiye Zhang/Cornell University, H. Oliver Gao/Cornell University

Analysis of Recreational and Last-Mile E-Scooter Utilization in Different Land Use Regions (20-03020) - A126

Mingmin Liu/Purdue University, Jijo Mathew/Purdue University, Deborah Horton/Purdue University, Darcy Bullock/Purdue University

The Link Between Transit Station Proximity and Mode Choice to Work, Working at Home, Vehicle Ownership, and Transportation Costs with Implications for Transit and Land Use Planning (20-04331) - A115

Arthur Nelson/University of Arizona, Robert Hibberd/University of Arizona

Non-Linearities in the Relationship Between the Built Environment and Metropolitan Structure with Driving and Walking Modal Share (20-04511) - A127

Jaime Orrego-Oñate/Portland State University, Kelly Clifton/Portland State University

Modeling the Influential Factors to Promote Active Transportation on College Campus (20-04626) - A128

Taslima Akter/University of Arkansas, Fayetteville, Bhuiyan Alam/University of Arkansas, Fayetteville

Land Use Inference from Mobility Mobile Phone Data and Household Travel Surveys (20-04885) - A129

Francisco Benitez/University of Sevilla, Noelia Caceres/University of Sevilla, Luis Romero/University of Sevilla

Street-Level Urban Design Features, Walkability, and Property Values: A Multi-Level Analysis in New York City (20-05017) - A130

Shima Hamidi/University of Texas, Arlington, Muhammad Qaisrani/University of Texas, Arlington, Reid Ewing/University of Texas, Arlington

Transportation Accessibility Assessment of Critical Facilities: A GIS-Based Case Study in Northwest Florida Focusing on Libraries and Hospitals (20-05335) - A131

Mahyar Ghorbanzadeh/Florida State University, Eren Ozguven/Florida State University, Curtis Tenney/Florida State University, Zoe Leonarczyk/Florida State University, Faye Jones/Florida State University, Marcia Mardis/Florida State University

Estimating Urban Population and Employment Distribution Based on Land Use, Built Spatial Form, and Accessibility (20-05513) - A132

Zhi Ren/Wuhan University of Technology, Ming Zhong/Wuhan University of Technology, Dashun Li/Wuhan University of Technology, Shaobo Liu/Wuhan University of Technology, Xiaofeng Ma/Wuhan University of Technology

Multi-Criteria Approach for Analysis of the Appreciation Potential of Urban Areas: A Case Study in Brazil (20-05563) - A133

Josiane Lima/Federal University of Itajuba, Ana Clara Barbieri-Bortot/Federal University of Itajuba

The Importance of Stochasticity on Microsimulation Model Output (20-05777) - A134

Antonio Hurtado-Beltran/University of Nebraska, Lincoln, Laurence Rilett/University of Nebraska, Lincoln

Developing Multimodal Trip Generation Model: Improving ITE's Method (20-06067) - A135

Muntahith Orvin/The University of British Columbia, Sheikh Daryus Ahmed/The University of British Columbia, Mahmudur Fatmi/The University of British Columbia, Gordon Lovegrove/The University of British Columbia

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1654

Tuesday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A

Traffic Flow Theory and Characteristics, Part 1 (Part 2, Session 1655; Part 3, Session 1656; Part 4, Session 1760 ; Part 5, Session 1761)

Xiaopeng Liang, University of Texas, Austin, presiding

Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

A Novel Car-Following Model Based on Safety Potential Field Theory Under Connected and Automated Vehicles Environment (20-01005) - B300

linheng Li/Southeast University, Jing Gan/Southeast University, Xinkai Ji/Southeast University, Xu Qu/Southeast University, Bin Ran/Southeast University

Development of a Conflict-Solving Model for Simulating Behavior of Motorcycles Under Mixed Traffic Condition (20-03680) - B302

Linh Trinh/Nagaoka University of Technology, Kazushi Sano/Nagaoka University of Technology, Kiichiro Hatoyama/Nagaoka University of Technology

(continued)

Modeling the Effects of Autonomous Vehicles on Network Performance: A Microscopic Motorway Simulation (20-04252) - B303

Georgios Mesionis/Aimsun, Inc., Mark Brackstone/Aimsun, Inc., Natalie Gravett/Aimsun, Inc.

Inter-Vehicular Gap-Based Algorithm for Automated Vehicles in Heterogeneous Traffic (20-04773) - B304

Anuj Budhkar/Indian Institute of Technology Bombay, Akhilesh Maurya/Indian Institute of Technology Bombay

Car-Following Characteristics of Adaptive Cruise Control from Empirical Data (20-05590) - B305

Noah Goodall/Virginia Department of Transportation, Chien-Lun Lan/Virginia Department of Transportation

A Model-Free Approach for Connected and Autonomous Vehicles Trajectory Scheduling: Monte Carlo Tree Search-Based Mixed Traffic Flow Control Algorithm (20-06053) - B306

Yanqiu Cheng/Missouri University of Science and Technology, Xianbiao Hu/Missouri University of Science and Technology, Qing Tang/Missouri University of Science and Technology, Hongsheng Qi/Missouri University of Science and Technology

A Game-Theoretic Framework for Autonomous Vehicles Velocity Control: Bridging Microscopic Differential Games and Macroscopic Mean Field Games (20-01762) - B307

Kuang Huang/Columbia University, Xuan Di/Columbia University, Qiang Du/Columbia University, Xi Chen/Columbia University

Freeway Traffic State Estimation with Mixed Connected Automated Vehicles and Human-Driven Vehicles (20-01806) - B308

Xianfeng Yang/University of Utah, Zhehao Zhang/University of Utah, Yun Yuan/University of Utah, Xin Li/University of Utah

Optimal Distributed Control of Connected Automated Vehicles at Autonomous Intersections (20-01961) - B309

Shi'an Wang/University of Minnesota, Twin Cities, Rongsheng Chen/University of Minnesota, Twin Cities, Michael Levin/University of Minnesota, Twin Cities

High-Resolution Ubiquitous Traffic Sensing with Autonomous Vehicles (20-01971) - B310

Wei Ma/Carnegie Mellon University, Koutian Huang/Carnegie Mellon University, Sean Qian/Carnegie Mellon University

Estimating Adaptive Cruise Control Model Parameters from On-Board Radar Units (20-02336) - B311

George Gunter/Vanderbilt University, Daniel Work/Vanderbilt University, Yanbing Wang/Vanderbilt University

Optimal Traffic Flow Control via Time-Gap Regulation (20-02759) - B312

Claudio Roncoli/Aalto University

Predictive Speed Harmonization in Traffic Flow with Connected and Automated Vehicles: Machine Learning Application (20-00823) - B317

Amr Elfar/Northwestern University, Alireza Talebpour/Northwestern University, Hani Mahmassani/Northwestern University

Pedestrian Trajectory Prediction Model for Autonomous Vehicles Using Sequence Learning with Auxiliary Information (20-03486) - B316

Arash Kalatian/Ryerson University, Bilal Farooq/Ryerson University

Joint Queue Estimation and Max Pressure Control for Signalized Urban Networks with Connected Vehicles (20-05904) - B318

Siyu Zhang/Zhejiang University, Manolis Diamantis/Zhejiang University, Yibing Wang/Zhejiang University, Jingnan Cao/Zhejiang University, Yonghui Hu/Zhejiang University, Jingqiu Guo/Zhejiang University, Ioannis Papamichail/Zhejiang University, Markos Papageorgiou/Zhejiang University, Lihui Zhang/Zhejiang University, Simon Hu/Zhejiang University

Headway-Based Probabilistic Risk Analysis of Crashes and Conflicts in the Freeway Merge Segments with the Presence of Autonomous Vehicles (20-00824) - B301

Jie Zhu/No Organization, Ivana Tasic/No Organization

The Cooperative Sorting Strategy for Connected and Automated Vehicle Platoons (20-01737) - B313

Jiaming Wu/University of Wisconsin, Madison, Soyoung Ahn/University of Wisconsin, Madison, Yang Zhou/University of Wisconsin, Madison, Pan Liu/University of Wisconsin, Madison

Real-Time Monitoring of AV's Time Gap Variations Based on Bayesian Updating and Control Charts (20-02536) - B314

Wissam Kontar/University of Wisconsin, Madison, Soyoung Ahn/University of Wisconsin, Madison

Heterogeneous Connected and Autonomous Vehicles: Analysis and Control Using Spring-Mass-Damper System (20-04968) - B315

Soohyuk Bang/Connetics Transportation Group, Soyoung Ahn/Connetics Transportation Group

Traffic Flow Theory and Characteristics, Part 2 (Part 1, Session 1654; Part 3, Session 1656; Part 4, Session 1760 ; Part 5, Session 1761)

Jack Haddad, Technion Israel Institute of Technology, presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

Investigating the Relationship Between Controller Locations and Dynamic Traffic Control in Generic Transportation Networks (20-00733) - B320

Marco Rinaldi/University of Luxembourg, Francesco Viti/University of Luxembourg

Estimation of Macroscopic Fundamental Diagrams Based on Information Retrieved from Online Traffic Maps: Calibration, Empirical Data, and Validation (20-05536) - B321

Vana Gkania/University of Cyprus, Loukas Dimitriou/University of Cyprus

A Generalized Day-to-Day Bayesian Learning Traffic Model (20-01080) - B322

Zheng Zhu/Hong Kong University of Science and Technology, Shanjiang Zhu/Hong Kong University of Science and Technology, Zhengfei Zheng/Hong Kong University of Science and Technology, Hai Yang/Hong Kong University of Science and Technology

The Collapse of Urban Traffic Networks (20-01220) - B323

Lukas Ambuhl/ETH Zurich, Luis Olmos/ETH Zurich, Monica Menendez/ETH Zurich, Marta Gonzalez/ETH Zurich

Matching the Macroscopic Fundamental Diagram with Demand Profiles: From a Perspective of Departure Time Choice Behavior (20-01401) - B324

Kai Yuan/Delft University of Technology, Victor Knoop/Delft University of Technology, Hans Van Lint/Delft University of Technology

A Decentralized Network Control Approach Based on Continuum Traffic Flow Modeling (20-01726) - B325

Li Li/New York University, Saif Jabari/New York University

Optimum Route Guidance in Multi-Region Networks: A Linear Approach (20-02563) - B326

Alexander Genser/Eidgenossische Technische Hochschule Zurich, Anastasios Kouvelas/Eidgenossische Technische Hochschule Zurich

Macroscopic Traffic Dynamics in Urban Networks During Incidents (20-02862) - B327

Sasan Amini/Technische Universitat Munchen, Gabriel Tilg/Technische Universitat Munchen, Busch Fritz/Technische Universitat Munchen

Estimating Large-Scale Vehicular Emission Incorporating Network-wide Fundamental Diagram for Heterogeneous Vehicles: Comparison of Supervised Learning and Non-Linear Regression Models (20-04032) - B328

Ramin Saedi/Michigan State University, Rajat Verma/Michigan State University, Ali Zockaie/Michigan State University, Mehrnaz Ghamami/Michigan State University, Timothy Gates/Michigan State University

Prediction Error–Based Parameter Estimation for Multi-Region MFD Networks (20-01142) - B329

Isik Ilber Sirmatel/Ecole Polytechnique Federale de Lausanne (EPFL), Nikolas Geroliminis/Ecole Polytechnique Federale de Lausanne (EPFL)

Directivity and Percolation Analysis of Urban Travel Patterns: Exploratory Case Study Using Taxi Trip Data (20-03341) - B330

Mohaiminul Haque/George Washington University, Seungmo Kang/George Washington University, Samer Hamdar/George Washington University

Travel Time Variability and Congestion Assessment Through the Experience of Mobility Companies: Network Relations and Origin-Destination Clusters (20-04568) - B331

Haleh Ale Ahmad/Northwestern University, Ying Chen/Northwestern University, Hani Mahmassani/Northwestern University

Collecting Large-Scale Traffic Data with a Swarm of Drones (20-00222) - B332

Emmanouil Barmpounakis/Ecole Polytechnique Federale de Lausanne, Nikolas Geroliminis/Ecole Polytechnique Federale de Lausanne

Can Dynamic Priority Be Pareto Improving? (20-00546) - B333

Raphael Lamotte/Ecole Polytechnique Federale de Lausanne (EPFL), André de Palma/Ecole Polytechnique Federale de Lausanne (EPFL), Nikolas Geroliminis/Ecole Polytechnique Federale de Lausanne (EPFL)

Regional Dynamic Traffic Assignment Framework with Time-Dependent Trip Lengths (20-00615) - B334

Sergio Batista/New York University - Abu Dhabi Campus, Ludovic Leclercq/New York University - Abu Dhabi Campus, Monica Menendez/New York University - Abu Dhabi Campus

Calibrating MFD Models from Mobile Phone Data (20-01229) - B335

Mahendra Paipuri/IFSTTAR , Yanyan Xu/IFSTTAR , Marta Gonzalez/IFSTTAR , Ludovic Leclercq/IFSTTAR

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Multi-Region Network Perimeter Control via Model Free Adaptive Iterative Learning Control (20-01253) - B336

Ye Ren/Ecole Polytechnique Federale de Lausanne (EPFL), Zhongsheng Hou/Ecole Polytechnique Federale de Lausanne (EPFL), Isik Ilber Sirmatel/Ecole Polytechnique Federale de Lausanne (EPFL), Nikolas Geroliminis/Ecole Polytechnique Federale de Lausanne (EPFL)

A Measure of Dynamical Efficiency for Multimodal Interconnected Urban Systems (20-01658) - B337

Leonardo Bellocchi/Ecole Polytechnique Federale de Lausanne (EPFL), Mohamed Bellagha/Ecole Polytechnique Federale de Lausanne (EPFL), Vito Latora/Ecole Polytechnique Federale de Lausanne (EPFL), Nikolas Geroliminis/Ecole Polytechnique Federale de Lausanne (EPFL)

Dynamic Estimation of Urban Zonal Speed from Mobile Sensing Data and Macroscopic Paths (20-02833) - B338

Manon Seppecher/IFSTTAR , Ludovic Leclercq/IFSTTAR , Angelo Furno/IFSTTAR , Delphine Lejri/IFSTTAR , Amélie-May Lupinski/IFSTTAR

Analytical Approximations for Macroscopic Fundamental Diagrams with Turning Traffic (20-00088) - B339

Guanhao Xu/Pennsylvania State University, Zhengyao Yu/Pennsylvania State University, Vikash Gayah/Pennsylvania State University

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Tuesday, 06:00 p.m. - 07:30 p.m., Convention Center, Hall A

Traffic Flow Theory and Characteristics, Part 3 (Part 1, Session 1654; Part 2, Session 1655; Part 4, Session 1760 ; Part 5, Session 1761)
Vikash Gayah, Pennsylvania State University, presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

Estimation of the Potential Demand of Shared Mobility Services Through the Clustering of Similar Individual Trips (20-00168) - B340

Cyril Veve/Universite de Lyon, Nicolas Chiabaut/Universite de Lyon

Modeling and Optimizing Bus Transit Priority Along an Arterial: A Moving Bottleneck Approach (20-00326) - B341

Kan Wu/Pennsylvania State University, S. Ilgin Guler/Pennsylvania State University

Estimation of Intersection Turning Movement Flows with NETFLOCON: Upper and Lower Bound Constraint Calibration (20-00345) - B342

Jelena Karapetrovic/New Mexico State University, Peter Martin/New Mexico State University

Examining Human Perception Heterogeneity in Perceiving the Level of Traffic States (20-00412) - B343

Chunyang Han/Central South University, Huang Helai/Central South University, Chao Liu/Central South University, Amjad Pervez/Central South University, Wenjing Zhao/Central South University, Xiaoqi Zhai/Central South University

A Review of Game Theory Models of Lane Changing (20-00450) - B344

Ang Ji/The University of Sydney, David Levinson/The University of Sydney

The Impact of Stochasticity on Traffic Flow Dynamics in Macroscopic Continuum Models (20-00535) - B345

Shi-Teng Zheng/Beijing Jiaotong University, Rui Jiang/Beijing Jiaotong University, Bin Jia/Beijing Jiaotong University, Junfang Tian/Beijing Jiaotong University, Ziyou Gao/Beijing Jiaotong University

Calibration and Impact of Control Strategies for Splitting Truck Platoons at On-Ramps: A Simulation Study on Fuel Consumption (20-01351) - B346

Andres Ladino/IFSTTAR , Aurélien Duret/IFSTTAR , Nour-Eddin El Faouzi/IFSTTAR

GE-GAN: A Deep-Learning Framework for Virtual Road Traffic State Detector Design (20-01528) - B347

Dongwei Xu/Zhejiang University of Technology, Chen Wei/Zhejiang University of Technology, Peng Peng/Zhejiang University of Technology, Qi Xuan/Zhejiang University of Technology, Hai Guo/Zhejiang University of Technology, Shan Yu/Zhejiang University of Technology

A Semi-Markov Approach for Modeling Pedestrian Delay at Unsignalized Crosswalks (20-01707) - B348

Yunchang Zhang/Purdue University

A Methodology to Estimate the Macroscopic Fundamental Diagram Using the Critical Links in an Urban Network (20-01740) - B349

Elham Saffari/University of Queensland, Mehmet Yildirimoglu/University of Queensland, Mark Hickman/University of Queensland

Driver Behavior Models with Perception Errors: A Choice Modeling Framework with Stochastic Variables (20-01745) - B350

Sangram Nirmale/Indian Institute of Science, Abdul Pinjari/Indian Institute of Science

Modeling Multimodal Region-Level Traffic Flow Dynamics and Dispatching Schemes in a Ridesharing Environment (20-01784) - B351

Yutong Shen/Beihang University, Nan Zheng/Beihang University, Jingyang Liao/Beihang University

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Lane-Based Queue Length Estimation at Signalized Intersections Using Single-Section License Plate Recognition Data (20-01895) - B352

Keshuang Tang/Tongji University, Hao Wu/Tongji University, Jiarong Yao/Tongji University, Chaopeng Tan/Tongji University, Yangbeibei Ji/Tongji University

Microscopic Traffic Simulation with Collision Formation (20-02416) - B353

Claire Silverstein/George Washington University, Samer Hamdar/George Washington University, Alireza Talebpour/George Washington University

Probabilistic Stationary Queuing Model at Signalized Intersections Experiencing Potential Downstream Queue Spillover (20-02475) - B354

Xianfeng Yang/Changsha University of Science and Technology, Wei Hao/Changsha University of Science and Technology, Xiaoyue Cathy Liu/Changsha University of Science and Technology

Spatio-Temporal Trajectory Characteristic Analysis for Traffic State Transition Prediction Near Expressway Merge Bottleneck (20-02751) - B355

Qian Wan/Guilin University of Electronic Technology, Guoqing Peng/Guilin University of Electronic Technology, Zhibin Li/Guilin University of Electronic Technology, Qiyu Liang/Guilin University of Electronic Technology, Mingzhe Liu/Guilin University of Electronic Technology

Using Asymmetric Theory to Identify Heterogeneous Drivers' Behavior Characteristics Through Traffic Oscillation (20-03444) - B356

Qian Wan/Guilin University of Electronic Technology, Guoqing Peng/Guilin University of Electronic Technology, Zhibin Li/Guilin University of Electronic Technology, Zhenyou Xie/Guilin University of Electronic Technology, Xiaojin Zhao/Guilin University of Electronic Technology, Yuhang Gu/Guilin University of Electronic Technology

Tuesday, 07:30 p.m. - 09:00 p.m., Convention Center, West Overlook

Risk and Resilience Caucus

John Contestabile, Skyline Network Engineering, presiding

William Anderson, Transportation Research Board, presiding

Jeffrey Western, Western Management and Consulting, LLC, presiding

Sponsored By Section - Transportation Systems Resilience, Standing Committee on Critical Transportation Infrastructure Protection, Standing Committee on the Logistics of Disaster Response and Business Continuity, Standing Committee on Emergency Evacuations, Standing Committee on Transportation and Sustainability, Standing Committee on Transportation Asset Management, Special Task Force on Climate Change and Energy, Risk Management Subcommittee, Standing Committee on Transportation Asset Management

Wednesday, January 15 (Sessions 1483, 1657 - 1766)

1657

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 154
Transportation Resilience 2019: Key Takeaways and Lessons Learned
Mark Abkowitz, Vanderbilt University, presiding
Sponsored By Special Task Force on Climate Change and Energy

Transportation Resilience 2019 provided information on emerging best practices and research results on how to adapt surface transportation networks to the potential impacts of natural disasters and extreme weather events. The conference examined efforts to integrate resilience in the transportation sector , including planning and programming, capital improvements, operations and maintenance. Session tracks focused on proactive adaptation, resilience recovery, and strategic retreat, respectively, structured to promote proactive resilience research and implement the results. This session will review the key takeaways and lessons learned from the conference.

FHWA Perspective of Transportation Resilience to Natural Hazards and Extreme Weather Events (P20-20205)
Heather Holsinger/Federal Highway Administration (FHWA), Michael Culp/Federal Highway Administration (FHWA)
TRB Conference Perspective and Strategic Retreat (P20-20208)
Mark Abkowitz/Vanderbilt University
Conference Rapportuer: Highlights and Critical Issues (P20-21917)
Aimee Flannery/Applied Engineering Management Corporation

1658

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 151B
Transportation Asset Management in Action: Using Asset Management Data and Tools
Matthew Haubrich, Iowa Department of Transportation, presiding
Sponsored By Standing Committee on Transportation Asset Management

This informative session will feature how transportation agencies in Iowa, Maryland, and North Carolina make cross-asset and multi-modal asset management decisions by employing the best data and tools available. Key philosophies integrated into an optimized asset management program include: data-driven decision making, integrated information systems for data management, and project prioritization to drive performance.

Conceptual Transportation Cross Asset Resource Allocation Framework (20-02518)
Yazan Abukhalil/Iowa State University, Omar Smadi/Iowa State University, Ahmad Alhasan/Iowa State University
Building a Successful Data-Driven Project Selection Process from the Ground Up: The NCDOT Experience (P20-20586)
David Wasserman/North Carolina Department of Transportation
Automated Real-Time Roadway Asset Inventory: Integrating Artificial Intelligence Research into Practice-Ready Solutions (20-05118)
Nima Kargah-Ostadi/iEngineering Corporation, Ammar Waqar/iEngineering Corporation, Adil Hanif/iEngineering Corporation

1659

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 152A
From Motherhood to Sexual Harassment: Exploring Gender Factors That Impact Mobility
Dawn Hood, University of Minnesota, Twin Cities, presiding
Sponsored By Standing Committee on Women's Issues in Transportation

This session explores a variety of gender factors that impact mobility.

Giving Up Job Search Because I Don't Have a Car: Labor Market Participation and Employment Status Among Single Mothers with and Without Cars (20-05702)
Miwa Matsuo/Kobe University, Hiroyuki Iseki/Kobe University

(continued)

Exploring the Factors Affecting Women's Choice to Drive in Saudi Arabia (20-02274)
Najah Al-Garawi/University College London, Maria Kamargianni/University College London, Weibo Li/University College London
Sexual Harassment in Public Transport in Bogotá (20-01325)
Lina Marcela Quiñones/No Organization
Gender Differences in the Perception of Safety in Public Transport (20-00709)
Laila AIT BIHI OUALI/Imperial College London, Daniel Graham/Imperial College London, Mark TROMPET/Imperial College London, Alexander BARRON/Imperial College London
Gender Differences in Drivers' Reported Behaviors. International Comparison Based on ESRA2 Data on 32 Countries (20-00188)
Marie-Axelle Granié/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Myriam Evennou/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Craig Lyon/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Uta Meesmann/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Noureddine Oulid-Azouz/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Robyn Robertson/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Katrien Torfs/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Wouter Van den Berghe/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Ward Vanlaar/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux

1660

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 102B
Missing and Murdered Indigenous Women: Implications for Transportation
Margo Hill, Eastern Washington University, presiding
Ronald Hall, Bubar & Hall Consulting, LLC, presiding
Sponsored By Standing Committee on Native American Transportation Issues

There are thousands of deaths and disappearances of Native women and girls in the U.S and Canada. These native women and girls vanish from tribal lands, rural communities and cities with no official accounting. Transportation and transit intersect with human trafficking and jurisdictional problems tribal people encounter. Native Americans have unique mobility patterns as they travel from rural tribal territories to urban centers. This session will discuss issues of risk factors, human trafficking and the complicated jurisdictional scheme of Indian Country makes it difficult to protect native women.

Human Trafficking Awareness Intersecting with Tribal People and Transit in Indian Country (P20-21864)
Kristen Joyner/Southwest Transit Association (SWTA)
Recent State Laws Addressing Human Trafficking (P20-21865)
Ruth Buffalo/North Dakota State University
Tribal Law and Planning for Safe Mobility and Stopping Human Trafficking (P20-21866)
Margo Hill/Eastern Washington University

1661

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 150B
The Future of Workforce Development Through Practice Ready Examples
Victoria Beale, Ohio Department of Transportation, presiding
Diana Long, Appalachian Transportation Institute, presiding
Sponsored By Standing Committee on Transportation Education and Training, Task Force on Knowledge Management, Standing Committee on Management and Productivity, Standing Committee on Technology Transfer

Come to this session prepared to learn. Whether it is transit, roadway engineering or another discipline within transportation, the presenters provide good in-sight into workforce development and education with clear, implementable takeaways.

A Blended Classroom in a Learning Studio: Redesigning the Introductory Course to Transportation Engineering (20-04835)
Jalil Kianfar/Saint Louis University

(continued)

Reimaging a Sustainable, Resilient Workforce for Curbside Management in Washington, D.C. (20-05167)
Benito Perez/District Department of Transportation, Maxwell Whetstone/District Department of Transportation
Preparing the Future Professional in Accessible Transport for Seniors and Persons with Disabilities (20-01341)
Mahtot Gebresselassie/Virginia Polytechnic Institute and State University
Responding to Disciplinary Challenges Facing the Transportation Workforce: A Guide to Developing Targeted Career Pathway Solutions (20-04993)
Scott Jakovich/California State University, Long Beach

1662

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 152B
Travel Purpose and Mode Imputation from GPS Data
Stacey Bricka, MacroSys Research and Technology, presiding
Sponsored By Standing Committee on Travel Survey Methods

 Research into the imputation of travel purpose and mode from a traveler's GPS points has been a focus of travel survey methods for almost twenty years. This session highlights the current research into this area.

A Data-Driven Analytical Framework of Estimating Multimodal Travel Demand Patterns Using Mobile Device Location Data (20-00743)
Chenfeng Xiong/University of Maryland, College Park, Sepehr Ghader/University of Maryland, College Park, Aref Darzi/University of Maryland, College Park, Yixuan Pan/University of Maryland, College Park, Lei Zhang/University of Maryland, College Park
Association Rules and Prediction of Travel Choices: A Case Study of Transportation Mode Choice (20-00915)
Jiajia Zhang/Technische Universiteit Eindhoven, Tao Feng/Technische Universiteit Eindhoven, Harry Timmermans/Technische Universiteit Eindhoven, Zhengkui Lin/Technische Universiteit Eindhoven
Smartphone GPS Data in Mode Transfer Behavior Identification by a Two-Step Mechanism (20-00923)
Zhenxing Yao/Chang'an University, Jianghui Wen/Chang'an University, Fan Yang/Chang'an University, Haihang Jiang/Chang'an University, Xinyue Xu/Chang'an University
A Procedure Optimization Method Based on Support Vector Machine for Identifying Transportation Mode Under Different Traffic Conditions Using GPS Trajectory Data (20-02223)
Fei Yang/Southwest Jiaotong University, Haihang Jiang/Southwest Jiaotong University, Zhenxing Yao/Southwest Jiaotong University, Jianyao Zhou/Southwest Jiaotong University, Peng Cao/Southwest Jiaotong University
Identification of Non-Routine Tours in Everyday Travel Behavior (20-03129)
Miriam Magdolen/Karlsruhe Institute of Technology, Lisa Ecke/Karlsruhe Institute of Technology, Tim Hilgert/Karlsruhe Institute of Technology, Bastian Chlond/Karlsruhe Institute of Technology, Peter Vortisch/Karlsruhe Institute of Technology

1663

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 151A
Mainstreaming Resiliency: Physical Security Faces New Challenges
Rae Zimmerman, New York University, presiding
Joshua DeFlorio, The Port Authority of New York and New Jersey, presiding
Sponsored By Standing Committee on Critical Transportation Infrastructure Protection, Standing Committee on Tunnels and Underground Structures, Standing Committee on Surface Transportation Weather, Standing Committee on Regional Transportation Systems Management and Operations, Standing Committee on Maintenance and Operations Personnel

 Transportation systems are targets of multiple hazards from unintentional and intentional attacks. Physical security applies to immediate protection and long-term resilience. Key questions are whether physical security measures can be applied simultaneously across multiple hazards, be designed for resiliency, meet short-term and long-term emergencies, connect physical security and infrastructure, and support socio-economic goals. Physical security synergies among multiple hazards can reduce costs, support consistency and social and economic sensitivity among security measures. This panel brings together representatives from multiple sectors to address these perspectives for a comprehensive approach to resilient physical security systems.

The Challenge of Physical Security Adaptation to Multi-Hazards for Resilient Transportation (P20-20144)
Rae Zimmerman/New York University

(continued)

Infrastructure-Related Resiliency Design Guidelines for Weather- and Climate-Related Threats (P20-20145)
Susanne DesRoches/City of New York
Incident Management in Complex Spaces: Challenges to Situation Awareness for Transportation Security (P20-20246)
Charles Jennings/City University of New York (CUNY)
Resilience Strategies to Extreme Weather by Operations, Maintenance, and Emergency Managers (P20-20247)
Paul Pisano/Paul Pisano LLC
Roadway Maintenance Workforce: The Front Line of Transportation Infrastructure Resilience (P20-20248)
David Bergner/Monte Vista Associates, LLC
Interactive Discussion with Panelists (P20-20289)
Joshua DeFlorio/The Port Authority of New York and New Jersey

1664   CM (1.75)

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 146B
Transportation Innovations in Parks and Public Lands
Rachel Collins, U.S. National Park Service, presiding
Sponsored By Standing Committee on Transportation Needs of National Parks and Public Lands

Public lands transportation planning examples often come from popular recreation destinations, where difficult policy, partnership and technical issues are at stake. New tools and planning processes allow units to explore innovative approaches to emerging transportation challenges and visitor use management issues. This session will provide examples of innovations in both process and practice.

White River National Forest Hanging Lake Recreation Site (P20-20852)
Benjamin Rasmussen/OST-R/Volpe Center
Challenges and Opportunities at Acadia National Park (P20-20867)
John Kelly/U.S. National Park Service
Using Emerging Technologies at the Bureau of Land Management (P20-20868)
David Jeppesen/U.S. Department of the Interior (DOI)

1665   CM (1.75)

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 146A
Fifty Years of the National Environmental Policy Act: Is the Clock Ticking?
Martin Palmer, Washington State Department of Transportation, presiding
Sponsored By Standing Committee on Environmental Analysis in Transportation, Section - Environment and Energy, Standing Committee on Ecology and Transportation

The National Environmental Policy Act was the world's first comprehensive national policy on the environment . Now fifty years old, the act's guiding principles are still as hated and feared as they are revered . This session will provide a brief retrospective of the sweeping changes that occurred over the last half century and what the next half century may have in store for transportation as the intersection of protection for the natural environment and parochial human interests grows. Discussions will look at the potential future direction in disciplines such as historic properties, archaeological sites and endangered species, and ultimately public decision- making process as delineated by the Act.

The Brief History and Politics of the National Environmental Policy Act (P20-20648)
Buddy Desai/Jacobs
The Endangered Species Act and NEPA (P20-20613)
Daniel Buford/Federal Highway Administration (FHWA)
Where We Started, Where We've Been, and Where We're Heading: 50 Years Considering Historic Properties in NEPA (P20-20645)
Owen Lindauer/Federal Highway Administration (FHWA)
Evolution of Hazardous Waste Assessment During the NEPA Process on Transit Projects (P20-20858)
Steven Eget/Dewberry
Current Initiatives (P20-20646)
Diane Nulton/HDR

1666

Vehicle Miles Traveled Reduction as Climate Action
Eric Sundquist, State Smart Transportation Initiative, presiding
Sponsored By Standing Committee on Transportation and Sustainability

The session will explore impacts of urban vehicle-miles-traveled on auto mode share, air pollution, and ways that states are working to reduce VMT and carbon pollution.

Emissions from the Taxi and For-Hire Vehicle Transportation Sector in New York City (20-04136)
Jennifer Roberton/City of New York Mayor's Office of Sustainability, Stephan Schmidt/City of New York Mayor's Office of Sustainability, Rodney Stiles/City of New York Mayor's Office of Sustainability
Office Commuting Patterns in the Greater Toronto Area: The Importance of Automobile Mode Share in Understanding the Full Impact of Urban Form on Vehicle Kilometers Traveled (20-00914)
Yang Xi/University of Toronto, Jeff Allen/University of Toronto, Steven Farber/University of Toronto, Eric Miller/University of Toronto, Robert Keel/University of Toronto
California's Move to Rein in Vehicle Miles Traveled: Policy Reform and Implementation (P20-21817)
Christopher Ganson/California Governor's Office

1667

Pavement Surface Properties and Vehicle Interaction
Andy Mergenmeier, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Pavement Surface Properties and Vehicle Interaction

Mathematical Insights into the Relationship Between Pavement Roughness and Vehicle Vibration (20-05057)
Chenglong Liu/Tongji University, Difei Wu/Tongji University, Yishun Li/Tongji University, Shengchuan Jiang/Tongji University, Yuchuan Du/Tongji University
Overcoming the Limitations of the Sand Patch Test Using the 3D Laser (20-00913)
Jorge Prozzi/University of Texas, Austin, yorguo El Hachem/University of Texas, Austin
Monitoring of Macrotexture Deterioration for Micro-Milled Tunnel Cement Concrete Pavement Using 3D Line Laser Data (20-01097)
Haimei Liang/Chang'an University, Xiaofang Liu/Chang'an University, Guoqing Zhao/Chang'an University, Shuqi Li/Chang'an University, Bing Hui/Chang'an University
Evaluation of Surface Characteristics on Sidewalk Pavements for Ride Quality of an Electric Mobility Scooter (20-03566)
Kazuya Tomiyama/Kitami Institute of Technology, Kazushi Moriishi/Kitami Institute of Technology

1668

Seismic Bridge Engineering Research, Analysis, and Design
Elmer Marx, Alaska Department of Transportation and Public Facilities, presiding
Sponsored By Standing Committee on Seismic Design and Performance of Bridges

Three presentations on earthquake engineering topics related to the design and performance of bridges will delivered. Topics address fragility curve generation of bridge columns, seismic retrofit using isolation bearings and the cyclic performance of shear connectors.

Seismic Isolation Retrofitting of Typical Multispan Steel Girder Bridges in New York State (20-00754)
DONGMING FENG/Thornton Tomasetti, Fangyin Zhang/Thornton Tomasetti
Experimental Investigation on the Cyclic Performances of Perfobond Rib Shear Connectors (20-01998)
Zhixiang Li/Washington State University, Canhui Zao/Washington State University, Kailai Deng/Washington State University, Xianming Shi/Washington State University

(continued)

Development of Seismic Fragility Curves for Bridges Based on Historical Data (20-04659)
Eduardo Allen Binet/Research Center for Integrated Disaster Risk Management (CIGIDEN), Felipe Baratta/Research Center for Integrated Disaster Risk Management (CIGIDEN), Alondra Chamorro/Research Center for Integrated Disaster Risk Management (CIGIDEN), Hernán de Solminihac/Research Center for Integrated Disaster Risk Management (CIGIDEN), Tomás Echaveguren/Research Center for Integrated Disaster Risk Management (CIGIDEN)

1669

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 207B
Culvert Inspection and Disaster Recovery
Alena Mikhaylova, Rinker Materials, presiding
Sponsored By Standing Committee on Culverts, Buried Bridges, and Hydraulic Structures, Standing Committee on Subsurface Soil-Structure Interaction

This session provides describes a new culvert inspection vehicle, a machine learning based method for optimal pipeline inspection, a numerical study on excavations of lifeline systems, and best practices for post-disaster reconstruction safety.

An Improved, Low-Cost Culvert and Hydraulic-Infrastructure Inspection Vehicle: CHIVE (20-00334)
Timothy Wood/The Citadel, Craig Niswender/The Citadel
Machine Learning–Based Optimal Inspection Plan of Underground Pipeline (20-03158)
Xudong Fan/Case Western Reserve University, Xiong Yu/Case Western Reserve University
Numerical Study on Impact of Excavations on Lifeline Facilities (20-04768)
Seddigheh Hasanpour Estahbanati/Amirkabir University of Technology, Reza Boushehri/Amirkabir University of Technology, Abbas Soroush/Amirkabir University of Technology, Omid Ghasemi-Fare/Amirkabir University of Technology

1670

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 201
Intermediate Cracking Performance Indices for Asphalt Mixtures
Phillip Blankenship, Blankenship Asphalt Tech and Training, presiding
Erdem Coleri, Oregon State University, presiding
Sponsored By Standing Committee on Structural Requirements of Asphalt Mixtures

Methods to Evaluate Intermediate Temperature Properties of Asphalt Mixtures by the Semi-Circular Bending Test (20-00404)
Faramarz Safazadeh/University of Utah, Pedro Romero/University of Utah, Abu Sufian Asib/University of Utah, Kevin VanFrank/University of Utah
Flexibility Index Threshold Optimization for Various Asphalt Mixes and Climatic Conditions (20-01417)
Uthman Mohamed-Ali/University of Illinois, Urbana Champaign, Imad Al-Qadi/University of Illinois, Urbana Champaign, Hasan Ozer/University of Illinois, Urbana Champaign
Comprehensive Evaluation of Various Performance Indicators Used for Cracking Performance Assessment of Asphalt Mixtures (20-02644)
Hamza Alkuime/University of Idaho, Fahmid Tousif/University of Idaho, Emad Kassem/University of Idaho, Fouad Bayomy/University of Idaho
Assessment of Cracking Performance Indices of Asphalt Mixtures at Intermediate Temperatures (20-04942)
Aksel Seitllari/Michigan State University, ilker Boz/Michigan State University, Jhony Habbouche/Michigan State University, Stacey Diefenderfer/Michigan State University
"Simplified" Cracking Tests: Evaluation of the Ideal-CT Performed Using a Marshall Testing Platform (20-03902)
Elvis Castillo-Camarena/University of Arkansas, Fayetteville, Kevin Hall/University of Arkansas, Fayetteville

1671

Basic Research and Emerging Technologies Related to Concrete
John Kevern, University of Missouri, Kansas City, presiding
Sponsored By Standing Committee on Basic Research and Emerging Technologies Related to Concrete

This session contains the best papers submitted to AFN10 Basic Research and Emerging Technologies Related to Concrete.

Evaluating the Self-Healing Efficiency of Hydrogel-Encapsulated Bacteria in Concrete (20-00693)
Ahsennur Soysal/Louisiana State University, Jose Milla/Louisiana State University, Gary King/Louisiana State University, Marwa Hassan/Louisiana State University, Tyson Rupnow/Louisiana State University
Concrete Surface Treatment Using Strontium Nitrate (20-02133)
Byounghooi Cho/University of Central Florida, Boohyun Nam/University of Central Florida, Swadeshmukul Santra/University of Central Florida, Mike Barry/University of Central Florida, Steve Novak/University of Central Florida
Graphene Oxide Modified Cementitious Paste with Principally Alkali-Activated Fly Ash (20-02650)
Zhipeng Li/Washington State University, Xianming Shi/Washington State University
Effect of Fatigue Load Temperature Condition on Chloride Impermeability and Degradation Mechanism of Pavement Concrete (20-00125)
Zhenghua Lyu/Chang'an University, Aiqin Shen/Chang'an University, Yinchuan Guo/Chang'an University, Hua Wu/Chang'an University

1672

Driving and the Technology of Weather
Mohamed Ahmed, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Surface Transportation Weather

Use of Space-Time Semivarogram Models Toward Developing Guilelines for a Region-wide RWIS Network Implementation (20-05444)
Simita Biswas/University of Alberta, Tae J. Kwon/University of Alberta
Correlation Between Visibility and Traffic Safety Visual Distance in Daytime Foggy Area (20-02570)
Shuya Sun/Beijing University of Technology, Jiangbi Hu/Beijing University of Technology, Ronghua Wang/Beijing University of Technology, Xiaojuan Gao/Beijing University of Technology
Single and Multiple Vehicle Crashes Due to Hydroplaning: A Case Study of Interpretable Machine Learning (20-04749)
Subasish Das/Texas A&M Transportation Institute, Anandi Dutta/Texas A&M Transportation Institute, Kakan Dey/Texas A&M Transportation Institute, Mohammad Jalayer/Texas A&M Transportation Institute, Abhisek Mudgal/Texas A&M Transportation Institute
Exploring Weather-Related Connected Vehicle Application for Improving Winter Travel (20-00730)
Yaqin He/Washington State University, Michelle Akin/Washington State University, Xianming Shi/Washington State University

1673

Advances in Connected and Automated Vehicles Applications
Matthew Barth, University of California, Riverside, presiding
Sponsored By Standing Committee on Intelligent Transportation Systems

Integrated Intersection Control for Connected, Automated Vehicles, and Pedestrians: A Simulation-Based Evaluation (20-05248)
Tanja Niels/Bundeswehr University, Munich, Nikola Mitrovic/Bundeswehr University, Munich, Nemanja Dobrota/Bundeswehr University, Munich, Klaus Bogenberger/Bundeswehr University, Munich, Aleksandar Stevanovic/Bundeswehr University, Munich, Robert Bertini/Bundeswehr University, Munich

(continued)

Development and Performance Evaluation of a Connected Vehicle Application Development Platform (20-05605)

Mhafuzul Islam/Clemson University, Mizanur Rahman/Clemson University, Sakib Khan/Clemson University, Mashrur Chowdhury/Clemson University, Lipika Deka/Clemson University

Utilizing Analytical Hierarchy Process with Stochastic Return-on-Investment to Justify Connected Vehicle-Base d Deployment Decisions (20-02194)

Mahmoud Arafat/Florida International University, Shahadat Iqbal/Florida International University, Mohammed Hadi/Flori da International University

Development and Evaluation of Cooperative Intersection Management Algorithm Under Connected and Automated Vehicles Environment (20-03586)

Slobodan Gutesa/New Jersey Institute of Technology, Joyoung Lee/New Jersey Institute of Technology, Dejan Besenski /New Jersey Institute of Technology

1674

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Salon A
TRB Forum on Preparing for Automated Vehicles and Shared Mobility
Catherine McGhee, Virginia Transportation Research Council, presiding
Sponsored By Standing Committee on Vehicle-Highway Automation, TRB Forum on Preparing for Automated Vehicles and Shared Mobility

This session will discuss longer-term issues around automation and shared mobility addressed by the TRB Forum on Preparing for Automated Vehicles and Shared Mobility during 2019. These include preparing for shared automation, the role of connectivity, economic implications, and the future roles of the public and private sector.

The Transition to a Shared Autonomous Future (P20-21606)
Timothy Papandreou/Emerging Transport Advisors
The Importance of Connectivity (P20-21607)
Jeffrey Lindley/Institute of Transportation Engineers (ITE)
Research Keeping Up with Change (P20-21608)
Abbas Mohaddes/Econolite
Economic Impacts of a Shared Autonomous Future (P20-21609)
King Gee/American Association of State Highway and Transportation Officials
Changing Roles of the Public and Private Sector (P20-21610)
Ginna Reeder/I-95 Corridor Coalition

1675

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Salon B
Driver Behavior in Car Following and Lane Changing
Ludovic Leclercq, IFSTTAR , presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

Investigating the Impact of the Connected Environment on Driver Response Time in Car-Following Scenarios (20-00508)
Anshuman Sharma/University of Queensland, Zuduo Zheng/University of Queensland, Jiwon Kim/University of Queensland, Ashish Bhaskar/University of Queensland, Md. Mazharul Haque/University of Queensland
String Stability in Heterogeneous Traffic: An Uncertainty Analysis Approach (20-03130)
Julien Monteil/IBM Research, Marcello Montanino/IBM Research, Vincenzo Punzo/IBM Research
Vehicle Trajectory Data Collection Using Aerial Videography (20-03146)
Mohammadreza Khajeh Hosseini/University of Illinois, Urbana Champaign, Saipraneeth Devunuri/University of Illinois, Urbana Champaign, Alireza Talebpour/University of Illinois, Urbana Champaign, Samer Hamdar/University of Illinois, Urbana Champaign
Categorizing Merging and Diverging Strategies of Truck Drivers at Motorway Ramps and Weaving Sections Using Trajectory Data Set (20-03535)
Salil Sharma/Delft University of Technology, Maaike Snelder/Delft University of Technology, Lóránt Tavasszy/Delft University of Technology, Hans Van Lint/Delft University of Technology
Driver Reactions to Uphill Grades: Inference from a Stochastic Car-Following Model (20-05305)
Tu Xu/Georgia Institute of Technology (Georgia Tech), Jorge Laval/Georgia Institute of Technology (Georgia Tech)

1676

Training, Education, and Career Development for the 21st-Century Roadway Maintenance Workforce
Nancy Laffey, Applied Pavement Technology, Inc., presiding
Sponsored By Standing Committee on Maintenance and Operations Personnel, Standing Committee on Transportation Education and Training, Standing Committee on Maintenance and Operations Management

State and local transportation agencies are challenged with recruiting and retaining qualified road maintenance technicans. Older employees are retiring while others leave for the private sector and younger workers are less interested in roadway maintenance jobs. Meanwhile, new technologies, systems, methods, equipment and expanded duties demand higher skills and knowledge, especially with the advent of connected and autonomous vehicles. It is essential that training programs are developed that improve proficiency of current employees, provide for career advancement, attract new employees and create a "pipeline" of future workers beginning at early high-school level. This session will explore initiatives for this evolving workforce.

How to Build a Training Curriculum That Aligns with Performance Expectations and Workforce Development Goals (P20-21038)
Nancy Laffey/Applied Pavement Technology, Inc.
Making Your Training Valuable: Aligning Training to Business Needs (P20-21039)
Thomas Elliott/Federal Highway Administration (FHWA)
Front Range Community College's A.A.S. in Highway Maintenance Degree (P20-21040)
Susan Baillargeon/Front Range Community College
Tennessee DOT's Reconnect Continuing Education Initiative (P20-21041)
Clay Culwell/Tennessee Department of Transportation

1677   **CM** (1.75)

Role of Governance in Transit Performance
Nat Bottigheimer, Regional Plan Association, Inc., presiding
Sponsored By Standing Committee on Transit Management and Performance

The organization of transportation institutions and funding mechanisms significantly influence the quality of transit service and their integration across jurisdictional boundaries. This session begins with a comparative analysis of the benefits and drawbacks to different multi-jurisdictional governance strategies in four regions. A regional transit provider will describe how they are using data arguments to forge partnerships with local jurisdictions. The TransitCenter will discuss their work across the United States to strengthen institutional relationships to better serve transit riders. The session will conclude with a panel discussion including perspectives from a regional transit executive and a local elected official.

Organizing Transit Institutions to Facilitate Cross-Jurisdictional Service Integration: A Multi-Region Comparative Case Study (20-00607)
David Weinreich/University of Texas, Arlington
Using Data Arguments to Effectively Forge Pro-Transit Municipal Partnerships (P20-20803)
Adam Burger/Santa Clara Valley Transportation Authority
TransitCenter Efforts to Reduce Institutional Barriers to Transit Effectiveness (P20-20903)
David Bragdon/TransitCenter, Inc.
Des Moines Regional Transit Executive Perspective (P20-20856)
Elizabeth Presutti/Des Moines Area Regional Transit Authority (DART)
Elected Official's Perspective (P20-20869)
Lisa Bender/City of Minneapolis

1678

Bus System Operations, Technology, and Applications, Part 2 (Part 1, Session 1129)
Thomas Schwetz, Lane Transit District, presiding
Sponsored By Standing Committee on Bus Transit Systems

Hear about a BRT-hybred paratranit system in South America, use of machine learning to estimate mode shift, and planning a high-frequency transfer-based bus network.

Examining Barranquilla's BRT-Paratransit Hybrid System: A Case Study (20-04188)
Manuel Santana Palacios/University of California, Berkeley
Planning a High-Frequency, Transfer-Based Bus Network: How Do We Get There? (20-00926)
Emily Grise/University of Alberta, Anson Stewart/University of Alberta, Ahmed El-Geneidy/University of Alberta
Cluster-Based Methodology for Scheduling a University Shuttle System (20-05308)
Ahmadreza Mahmoudzadeh/Texas A&M University, Xiubin Wang/Texas A&M University
Using Machine Learning Classifier to Estimate Mode Shift Attributed to Bus Local Network Expansion and Bus Rapid Transit (20-02912)
Qing Li/Texas Department of Transportation, Ana Ramirez Huerta/Texas Department of Transportation, Andrew Mao/Texas Department of Transportation, Fengxiang Qiao/Texas Department of Transportation

1679   CM (1.75)

Transformative Developments in Commuter Rail Planning
Thomas Hickey, Jacobs, presiding
Sponsored By Standing Committee on Commuter Rail Transportation

Commuter rail is a dynamic form of regional rail transit that often shares tracks with Amtrak and freight railroad operations. As such it faces a myriad of special challenges that are neither absolutely rail transit or railroad in character. This session presents lessons learned from recent attempts to start new commuter rail systems or convert traditional commuter rail systems into modernized regional rail.

From Commuter to Regional Rail: The Philadelphia Story (P20-20838)
Victoria Harris/Southeastern Pennsylvania Transportation Authority, Thomas Hickey/Jacobs
North Meets South: Spanning the D.C. Region with Commuter Rail (P20-20839)
Sonali Soneji/Virginia Railway Express, Kyle Nembhard/Maryland Transit Administration
The MBTA Rail Vision and the North-South Rail Link: Tension Between Bottom-Up Planning and Legacy Megaprojects (P20-20841)
Scott Hamwey/Massachusetts Department of Transportation
Commuter Rail in Alaska: Why Highways Always Seem to Win (P20-20846)
Cynthia Wentworth/Passenger Rail lfor Commuters Anchorage-MatSu
The Smart Growth Mobility Project: A Model for Regional Rail (P20-20871)
Anthony Donovan/Maine Rail Transit Coalition

1680

Supply Chain Visibility and Improved Management of Capacity Constraints
Sponsored By Standing Committee on Freight Transportation Economics and Regulation

National Freight Research, Methods, and Tools to Understand Freight Transportation, Part 1 (Part 2, Session 1725)
Birat Pandey, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Freight Transportation Planning and Logistics, Standing Committee on Intermodal Freight Transport, Standing Committee on Truck Size and Weight, Standing Committee on Trucking Industry Research, Standing Committee on Urban Freight Transportation

The purpose of this session is to help advance the state of freight transportation practice by disseminating and receiving user's feedback on latest available national resources on freight research, datasets, tools and plans. The session will focus on learning from FAST Act compliant state freight plans, latest freight research, data, available tools that FHWA has been developing for the past couple of years. These tools addresses the current and upcoming needs of freight transportation programs around the country.

Opening Remarks (P20-21588)
Birat Pandey/Federal Highway Administration (FHWA)
Leadership Welcome (P20-21589)
Caitlin Hughes/U.S. Department of Transportation
Review and Analysis of State Freight Plans (P20-21590)
Tiffany Julien/Federal Highway Administration (FHWA)
Freight Transportation Performance Management (P20-21591)
Jeffrey Purdy/Federal Highway Administration (FHWA)
Quick Response Freight Methods Update (P20-21611)
Birat Pandey/Federal Highway Administration (FHWA)
National Highway Freight Network StoryMap Tool (P20-21612)
Chandra Bondzie/Federal Highway Administration (FHWA)
The FHWA Freight Fluidity Supply Chain Monitoiring Program (P20-21614)
Chandra Bondzie/Federal Highway Administration (FHWA)
Facilitated Discussion (P20-21615)
Alisa Fine/OST-R/Volpe Center, Laura Black/OST-R/Volpe Center
Updated Visualization Tool: Freight Analysis Framework (P20-21565)
Chester Ford/OST-R/Bureau of Transportation Statistics

Current Research in International Trade and Transportation
Isabel Victoria-Jaramillo, Cambridge Systematics, Inc., presiding
Sponsored By Standing Committee on International Trade and Transportation

A New Optimization Model for Advanced Vessel Schedule Recovery in Liner Shipping (20-00642)
Olumide Abioye/Florida A&M University-Florida State University College of Engineering, Maxim Dulebenets/Florida A&M University-Florida State University College of Engineering, Masoud Kavoosi/Florida A&M University-Florida State University College of Engineering, Junayed Pasha/Florida A&M University-Florida State University College of Engineering, Oluwatosin Theophilus/Florida A&M University-Florida State University College of Engineering
Tactical-Level Decisions in Liner Shipping: An Integrated Optimization Approach (20-00722)
Junayed Pasha/Florida A&M University-Florida State University College of Engineering, Maxim Dulebenets/Florida A&M University-Florida State University College of Engineering, Masoud Kavoosi/Florida A&M University-Florida State University College of Engineering, Oluwatosin Theophilus/Florida A&M University-Florida State University College of Engineering, Olumide Abioye/Florida A&M University-Florida State University College of Engineering
Advanced Methods for Commercial Vehicle Wait Time Prediction at a Border Crossing (20-03515)
Sushant Sharma/Texas A&M Transportation Institute, Dong Hun Kang/Texas A&M Transportation Institute, Jose Rivera Montes de Oca/Texas A&M Transportation Institute, Abhisek Mudgal/Texas A&M Transportation Institute

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Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 143A
Impact of Large Policy Changes on the Aviation Industry
Jagoda Egeland, International Transport Forum, presiding
Sponsored By Standing Committee on Aviation Economics and Forecasting, International Members Council-Aviation, Standing Committee on Intergovernmental Relations in Aviation, Standing Committee on Environmental Impacts of Aviation

Brexit and Aviation: A European Union Perspective (P20-20243)
Maximilian Bauernfeind/Austrian Ministry for Transport, Innovation and Technology
Airline Privatization in Africa (P20-20244)
Megersa Abate/The World Bank
Government Policy and Air Connectivity: An Airline Perspective (P20-20563)
David Lee/Airlines for America
ICAO's 40th Assembly: What's Ahead? (P20-20602)
Ananthanarayan Sainarayan/ICAO

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Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 143B
Counter-Unmanned Aircraft Systems Operations: Complexity and Necessity
Bart Elias, Congressional Research Service (CRS), presiding
Sponsored By Standing Committee on Airfield and Airspace Capacity and Delay, Aviation Group, Subcommittee on Unmanned Aircraft Systems (UAS), Standing Committee on Aviation Security and Emergency Management

Unmanned Aircraft System Detection and Mitigation: A Maelstrom of Regulation to Promote Safety and Security (P20-20270)
Ryan Wallace/Embry Riddle Aeronautical University
State DOT Perspective (P20-20271)
Darshan Divakaran/North Carolina Department of Transportation
Airport Perspective (P20-20273)
Chad Makovsky/DFW International Airport Board
DHS Perspective (P20-21756)
Carissa Vandermey/U.S. Department of Homeland Security
DOJ Perspective (P20-21767)
Julie Dickerson/U.S. Department of Justice

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Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, 145A
Leveraging Data Analysis to Improve Maritime Vessel Safety
Liam LaRue, National Transportation Safety Board (NTSB), presiding
Sponsored By Standing Committee on Marine Safety and Human Factors

Lifeboat Drills Safety Analysis/Assessment (P20-20276)
Brian Craig/Lamar University
Survival Craft Safety (P20-20277)
Brian Salerno/Cruise Lines International Association
Tug and Barge Industry Man-Over-Board Issues (P20-20280)
Daniel Harlow/Shell
Opportunities for Utilizing Safety Reporting Data and Analysis for Improved Safety (P20-20975)
Baxter Smoak/U.S. Coast Guard (USCG)

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Parking Space: Recent Research in Parking Topics
Rachel Weinberger, Weinberger & Associates, presiding
Sponsored By Standing Committee on Transportation Demand Management, Subcommittee on Parking Management

This session includes a variety of recent research in parking management policy.

Automated Vehicles and Central Business District Parking: The Effects of Drop-Off Travel on Traffic Flow and Vehicle Emissions (20-00426) - B430
Huajun Chai/University of California, Davis, Caroline Rodier/University of California, Davis, H. Michael Zhang/University of California, Davis, Miguel Jaller/University of California, Davis, Jeffery Song/University of California, Davis, Gursewak Singh/University of California, Davis

Who Says There's No Place to Park?: Evaluating Parking Sentiment Through Online Reviews (20-02508) - B431
Andrew Mondschein/University of Virginia, David King/University of Virginia, Christopher Hoehne/University of Virginia, Zhiqiu Jiang/University of Virginia, Mikhail Chester/University of Virginia

Spatiotemporal Classifier: A Novel Model of Citywide Parking Guidance Based on Crowdsourced Parking Events (20-00895) - B432
Yan Nie/Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Qinghao Lu/Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Haoyan Chen/Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Lei Peng/Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences

How Are Uber and Lyft Shaping Municipal On-Street Parking Revenue? (20-00654) - B433
Benjamin Clark/Univeristy of Oregon, Anne Brown/Univeristy of Oregon

Parking Occupancy and Shared Parking: Comparative Case Studies of Parking Reduction at Transit-Oriented Developments in the United States (20-00694) - B434
Reid Ewing/University of California, Los Angeles, Keuntae Kim/University of California, Los Angeles, Sadegh Sabouri/University of California, Los Angeles, Fariba Siddiq/University of California, Los Angeles

Macroscopic Modeling and Dynamic Control of Parking Dispatching in an Era of Autonomous Vehicles (20-02267) - B435
Cong Zhao/Tongji University, Feixiong Liao/Tongji University, Xinghua Li/Tongji University, Yuchuan Du/Tongji University

----Assessing Minimum Parking Requirements and Parking Capacities of Residential Development in the Bangkok Metropolitan Region (20-02354) - B436
Chakaphan Chullabodhi/Chulalongkorn University, Saksith Chalermpong/Chulalongkorn University, Apiwat Ratanawaraha/Chulalongkorn University, Hironori Kato/Chulalongkorn University

Parking and Economic Productivity: Would Silicon Valley Be Richer with Lower Parking Requirements? (20-02960) - B437
Michael Manville/University of California, Los Angeles, C.J. Gabbe/University of California, Los Angeles, Taner Osman/University of California, Los Angeles

Development of Joint SP-Off-RP Model for Shanghai Commute Mode Choices in Response to Parking Fee Management (20-03761) - B438
Ping Zhang/Tongji University, Xin Ye/Tongji University, Ke Wang/Tongji University

ITE Guideline Versus Actual Trip and Parking Generation: Evidence from a Transit-Oriented Development in an Auto-Oriented Region (20-05306) - B439
Shima Hamidi/University of Texas, Arlington, Roya Etminani/University of Texas, Arlington, Sanggyun Kang/University of Texas, Arlington, Reid Ewing/University of Texas, Arlington

Can High-Quality Public Transport Support Reduced Car Parking Requirements for New Residential Apartments? (20-00681) - B440
Chris De Gruyter/RMIT University, Long Truong/RMIT University, Elizabeth Taylor/RMIT University

Study on Short-Term Accurate Prediction of Parking Demand (20-01862) - B441
Linbo Li/Tongji University, Yang Li/Tongji University, Yahua Zhang/Tongji University

Analyzing Drivers' Intention to Accept Parking App by Structural Equation Model (20-00937) - B442
Chang Yang/Ningbo University, Xiaofei Ye/Ningbo University, Jin Xie/Ningbo University, Xingchen Yan/Ningbo University, Lili Lu/Ningbo University

Urban Traffic Parking System Dynamics Model with Macroscopic Properties: A Comparative Study Between Shanghai and Zurich (20-05858) - B443
Biruk Gebremedhin Mesfin/Shanghai Jiao Tong University, Jian Sun/Shanghai Jiao Tong University

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Parking Forcast of Railway Station Garages Based on Passenger Behavior Analysis Using LSTM Network (20-05375) - B444

Songxue Gai/Tongji University, Xiaoqing Zeng/Tongji University

Parking Detection Method Using Quadtree Decomposition Analysis (20-03540) - B445

Khaled Shaaban/Qatar University, Houweida Tounsi/Qatar University

Time Window–Based Dual Bin Packing Approach for Improved Sharing of Parking Resources (20-03415) - B446

Pengfei Zhao/Beijing University of Technology, Hongzhi Guan/Beijing University of Technology, Heng Wei/Beijing University of Technology, Shixu Liu/Beijing University of Technology

Applying SimPark for Parking Policy Analysis in Amsterdam (20-01487) - B447

Jan Vuurstaek/Universiteit Hasselt, Milou Bisseling/Universiteit Hasselt, Luk Knapen/Universiteit Hasselt, Elenna Dugundji/Universiteit Hasselt, Jeroen Schmidt/Universiteit Hasselt, Jullian van Kampen/Universiteit Hasselt, Bas Schotten/Universiteit Hasselt, Tom Bellemens/Universiteit Hasselt

Development of Multi-Nomial Logit Model for Shanghai Auto Drivers' Non-Work Mode Choices in Response to Parking Fee Management (20-05534) - B448

Ping Zhang/Tongji University, Xin Ye/Tongji University, Ke Wang/Tongji University

Assessment of Students' Campus Parking in Rural Areas (20-06081) - B449

Jaser Mahasneh/Jordan University of Science and Technology, Doaa Al-Alawneh/Jordan University of Science and Technology, Anne Gharaibeh/Jordan University of Science and Technology

An Agent-Based Simulation Model for Evaluation of Parking Policies in the Era of Autonomous Vehicles (20-00198) - B450

Sina Bahrami/University of Toronto, Matthew Roorda/University of Toronto

Optimal Dedicated Locations for Curbside Pickup and Drop-Off Ridesourcing and Ridesharing Autonomous Vehicles (20-01773) - B451

Xidong Pi/Carnegie Mellon University, Susu Xu/Carnegie Mellon University, Sean Qian/Carnegie Mellon University

Curb Management in Business Districts: Current Trends and Future Options (20-05476) - B452

Juan Matute/University of California, Los Angeles, Yu Hong Hwang/University of California, Los Angeles

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<u>Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A</u>
Advances in Monitoring Walking and Bicycling Activity
Frank Proulx, Toole Design, presiding
Sponsored By Standing Committee on Highway Traffic Monitoring, Subcommittee on Bicycle and Pedestrian Data

 This poster session contains papers that describe advances and innovative practices in monitoring walking and bicycling activity.

Simulating and Evaluating Rebalancing Strategies for Dockless Bikesharing Systems (20-00477) - A240

Joseph Pierre/Massachusetts Institute of Technology (MIT), Samantha D'Alonzo/Massachusetts Institute of Technology (MIT), Damian Barabonkov/Massachusetts Institute of Technology (MIT), Daniel Kondor/Massachusetts Institute of Technology (MIT), Mai Anh Tien/Massachusetts Institute of Technology (MIT), Xiaohu Zhang/Massachusetts Institute of Technology (MIT)

Toward Stratified Random Sampling: Design and Implementation of a Count Program to Monitor On-Street Pedestrian Activity (20-00792) - A241

Addison Larson/Delaware Valley Regional Planning Commission, Cassidy Boulan/Delaware Valley Regional Planning Commission

An Improved Method of Non-Motorized Traffic Tracking and Classification to Accurately Acquire Traffic Characteristics at Intersections (20-01482) - A242

Xiaohan Liu/Southeast University, Hao Wang/Southeast University

Inferring Bicycle Facility Type from GPS Trajectories: An Approach Based on Long Short-Term Memory Recurrent Neural Networks (20-02008) - A243

Jiazu Zhou/Nanyang Technological University, Qianqian Du/Nanyang Technological University, Feng Zhu/Nanyang Technological University

Measuring Instantaneous Cyclist Speed Using 1D LiDAR (20-02486) - A244

Ehsan Nateghinia/McGill University, David Beitel/McGill University, Asad Lesani/McGill University, Luis Miranda-Moreno/McGill University

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Efficiency Evaluation of Shared Bicycle Stations in Urban Cities: A Two-Stage Double Bootstrap Data Envelopment Analysis (20-02557) - A245
Jungyeol Hong/University of Seoul, Reuben Tamakloe/University of Seoul, Jihoon Tak/University of Seoul, Dongjoo Park/University of Seoul

Generating High-Resolution Pedestrian Trajectories Based on Wi-Fi and Bluetooth Tracking in Urban Outdoor Space: A Preliminary Study (20-02886) - A246
Juhyeon Park/Ulsan National Institute of Science and Technology (UNIST), Jeongseob Kim/Ulsan National Institute of Science and Technology (UNIST)

Exposure, Crash Risk, and Equity: Models of Pedestrian and Bicycle Crashes in Minneapolis (20-03629) - A247
Greg Lindsey/University of Minnesota, Tao Tao/University of Minnesota, Jueyu Wang/University of Minnesota, Xinyu Cao/University of Minnesota

Estimating Pedestrian Volumes for Signalized and Stop-Controlled Intersections (20-04187) - A248
Minh Le/Texas A&M Transportation Institute, Srinivas Geedipally/Texas A&M Transportation Institute, Kay Fitzpatrick/Texas A&M Transportation Institute, Raul Avelar/Texas A&M Transportation Institute

Leveraging Crowdsourced Data to Improve Estimation of Bicycle Counts (20-04367) - A249
Keneth Kwayu/Western Michigan University, Valerian Kwigizile/Western Michigan University, Jun-Seok Oh/Western Michigan University

FHWA Developing National Bicycle Facility Inventory Data Project (20-04985) - A250
Nathan Hicks/CDM Smith, Martin Guttenplan/CDM Smith, Michael Rutkowski/CDM Smith

Mapping Bicycling Exposure and Safety Risk Using Strava Metro (20-05018) - A251
Colin Ferster/University of Victoria, Trisalyn Nelson/University of Victoria, Karen Laberee/University of Victoria, Meghan Winters/University of Victoria

Quality Assurance and Quality Control Processes for Large-Scale and Regional Bicycle and Pedestrian Volume Data Programs: A 2019 Update (20-05277) - A252
Blythe Carter Geiger/Institute for Transportation Research and Education (ITRE), Sarah Searcy/Institute for Transportation Research and Education (ITRE), Craig Baird/Institute for Transportation Research and Education (ITRE)

A Machine Learning–Based Study on Pedestrian-Type Classification in a Heterogeneous Flow Involving Individuals with Disabilities (20-05468) - A253
Hossein Esfahani/Utah State University, Ziqi Song/Utah State University

Wipedestrian: Low-Cost, WiFi-Based Traffic Monitoring System for Tracking and Classification of Non-Motorized Traffic (20-05887) - A254
Zilin Huang/South China University of Technology, Yongjie Lin/South China University of Technology, Qiguang Chen/South China University of Technology

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Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Travel Behavior Mega Poster Session
Mahdieh Allahviranloo, City College of New York, presiding
Sponsored By Standing Committee on Traveler Behavior and Values

Consumer Response to Transformative Innovations in Transportation: Advancing the Reflexive Participant Approach to Survey Research (20-00155) - A172
Jonn Axsen/Simon Fraser University, Kenneth Kurani/Simon Fraser University, Benjamin Sovacool/Simon Fraser University

Modeling Social Distance and Activity-Travel Decision Similarity to Identify Influential Agents in Social Networks and Geographic Space: Application to Travel Mode Choice Analysis (20-00282) - A178
Jinhee Kim/Yonsei University, Yun Bae/Yonsei University, Jin-Hyuk Chung/Yonsei University

The Job-Housing Relationship and Excess Commuting of China's Megacities: An Intergenerational Perspective (20-00298) - A179
Wei Zhu/Tongji University

Moral Utility in Daily Time Allocation to Activities and Travel (20-00309) - A125
Konstadinos Goulias/University of California, Santa Barbara, Elizabeth McBride/University of California, Santa Barbara, Adam Davis/University of California, Santa Barbara

Would You Rather Teleport or Spend Some Time Commuting?: Investigating Individuals' Teleportation Preferences (20-00349) - A180
Prasanna Humagain/Utah State University, Patrick Singleton/Utah State University

(continued)

Understanding the Impacts of Congestion Pricing and Reward Policies on Millennial Car Travelers in China (20-00367) - A181

Yuntao Guo/University of Hawaii, Yaping Li/University of Hawaii, Srinivas Peeta/University of Hawaii, Jian Lu/University of Hawaii

Activity Sequence Generation Using Universal Mobility Patterns (20-00465) - A182

Wim Ectors/Hasselt University, Bruno Kochan/Hasselt University, Davy Janssens/Hasselt University, Tom Bellemens/Hasselt University, Geert Wets/Hasselt University

Investigating Heterogeneity in Preferences for Mobility-as-a-Service Plans Through a Latent Class Choice Model (20-00515) - A183

Melinda Matyas/University College London, Maria Kamargianni/University College London

A Review of Big Data Sources for Trip-Generation Modeling (20-00564) - A184

Natalia Sobrino/Universidad Politecnica de Madrid, Juan Gomez/Universidad Politecnica de Madrid, Jose Manuel Vassallo/Universidad Politecnica de Madrid

A Comparative Study of Contact Frequencies Among Social Network Members in Five Countries (20-00676) - A185

Giancarlos Troncoso Parady/University of Tokyo, Andreas Frei/University of Tokyo, Matthias Kowald/University of Tokyo, Sergio Guidon/University of Tokyo, Michael Wicki/University of Tokyo, Pauline van den Berg/University of Tokyo, Juan Carrasco/University of Tokyo, Theo Arentze/University of Tokyo, Harry Timmermans/University of Tokyo, Barry Wellman/University of Tokyo, Kiyoshi Takami/University of Tokyo, Noboru Harata/University of Tokyo, Kay Axhausen/University of Tokyo

Lifestyles and Modal Choices: A Value-Based Approach (20-00755) - A186

Veronique Van Acker/University of Liège, Sazkia Sandoval/University of Liège, Mario Cools/University of Liège

Latent Vehicle Type Propensity Segments: Considering the Influence of Household Vehicle Fleet Structure (20-00866) - A187

Xinyi Wang/Georgia Institute of Technology (Georgia Tech), Faaiqa Shaw/Georgia Institute of Technology (Georgia Tech), Patricia Mokhtarian/Georgia Institute of Technology (Georgia Tech)

Travel Behavior Adaptation of Transnational Short-Term Residents (20-00896) - A188

Mayara Moraes Monteiro/MIT Portugal - University of Porto, João de Abreu e Silva/MIT Portugal - University of Porto, Jesper Ingvardson/MIT Portugal - University of Porto, Jorge Pinho de Sousa/MIT Portugal - University of Porto

Children, Income, and the Impact of Home Delivery on Household Shopping Trips (20-00994) - A189

C. Anna Spurlock/Lawrence Berkeley National Laboratory, Annika Todd/Lawrence Berkeley National Laboratory, Gabrielle Wong-Parodi/Lawrence Berkeley National Laboratory, Victor Walker/Lawrence Berkeley National Laboratory

Generating Service Boundaries for Endovascular Clot Retrieval Hospitals Using Multi-Agent Transport Simulation Model (20-01082) - A190

Atousa Tajaddini/Monash University School of Engineering, Tri Nguyen/Monash University School of Engineering, Thanh Phan/Monash University School of Engineering, Richard Beare/Monash University School of Engineering, Hai Vu/Monash University School of Engineering

Immobility and Activity Levels: A Comparison of the United States and France (20-01159) - A191

Cédric Garcia/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Jimmy Armoogum/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux, Irfan Batur/Institut Francais des Sciences et Technologies des Transports de l'Amenagement et des Reseaux

Vehicle Choice and CO2 Emissions Information: Framing Effects and Individual Climate Change Stage of Change (20-01270) - A134

E. Owen Waygood/Ecole Polytechnique de Montreal, Bobin Wang/Ecole Polytechnique de Montreal, Ricardo Daziano/Ecole Polytechnique de Montreal, Zachary Patterson/Ecole Polytechnique de Montreal, Markéta Braun Kohlova/Ecole Polytechnique de Montreal

Bicycle and Car Trip Chaining Behavior: Which Traveler Extends Commute Tour Distances by How Much to Incorporate Which Secondary Activity? (20-01303) - A135

Florian Schneider/Delft University of Technology, Winnie Daamen/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

A Utility-Based Choice Model for Seemingly Suboptimal Behavior (20-01371) - A128

Rajesh Paleti/Pennsylvania State University University Park : Penn State

Multinomial Probit Model with Multivariate Truncated Normal Kernel Errors: Analysis of Airline Itinerary Choices (20-01376) - A129

Rajesh Paleti/Pennsylvania State University University Park : Penn State

An Exploration of Statewide Fragmentation of Activity and Travel and a Taxonomy of Daily Time Use Patterns Using Sequence Analysis in California (20-01463) - A126

Konstadinos Goulias/University of California, Santa Barbara, Elizabeth McBride/University of California, Santa Barbara, Adam Davis/University of California, Santa Barbara

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Impact of Incorporating Users' Choice-Making Under Uncertainty on Carsharing Usage and Operator Revenue (20-01662) - A136

Chenyang Wu/Imperial College London, Scott Le Vine/Imperial College London, Aruna Sivakumar/Imperial College London, John Polak/Imperial College London

Exploring the Role of Attitude in the Acceptance of Self-Driving Shuttles (20-01693) - A137

Yan Xing/University of California, Davis, Susan Handy/University of California, Davis, Giovanni Circella/University of California, Davis, Yunshi Wang/University of California, Davis, Farzad Alemi/University of California, Davis

Shortest Paths, Travel Costs, and Traffic (20-01702) - A138

Mengying Cui/The University of Sydney, David Levinson/The University of Sydney

Activity Time-Use Patterns and Experienced Satisfaction: Travel Behavioral Dynamics from the 2010–2013 American Time-Use Survey Data (20-01706) - A127

Srinath Ravulaparthy/Oak Ridge National Laboratory, Konstadinos Goulias/Oak Ridge National Laboratory

The Role of Self-Selection in Household Vehicle Type Choice: Empirical Evidence from a Developing Country (20-01974) - A139

Ali Mohammadi/University of Illinois, Chicago, Mohammad Kermanshah/University of Illinois, Chicago, Pooria Choobchian/University of Illinois, Chicago, Ramin Shabanpour/University of Illinois, Chicago

On the Impact of Income, Age, and Travel Distance on the Value of Time (20-02064) - A140

Nicholas Fournier/Monash University, Eleni Christofa/Monash University

Understanding Habit of Travel by Personal Modes in Context of Transit Usage (20-02146) - A141

N. Vasudevan/Sardar Vallabhbhai National Institute of Technology, Surat, Ninad Gore/Sardar Vallabhbhai National Institute of Technology, Surat, Rupali Zope/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Gaurang Joshi/Sardar Vallabhbhai National Institute of Technology, Surat

Mining Commuting Behavior Using Association Rules from AFC Smartcard Data in Urban Rail Transit Networks (20-02193) - A142

Xin Guo/Nanyang Technological University, David Wang/Nanyang Technological University, Jianjun Wu/Nanyang Technological University, Huijun Sun/Nanyang Technological University, Li Zhou/Nanyang Technological University

A Personalized Choice Model for Managed Lane Travel Behavior (20-02235) - A143

Yifei Xie/Massachusetts Institute of Technology (MIT), Yundi Zhang/Massachusetts Institute of Technology (MIT), Arun Akkinepally/Massachusetts Institute of Technology (MIT), Moshe Ben-Akiva/Massachusetts Institute of Technology (MIT)

The Influence of Latent Lifestyle on Acceptance of Mobility-as-a-Service (20-02393) - A144

Seheon Kim/Eindhoven University of Technology, Soora Rasouli/Eindhoven University of Technology

Activity Behavior of Residents of Paraisópolis Slum: Analysis of Multi-Day Activity Patterns Using Data Collected with Smartphones (20-02445) - A145

Bruna Pizzol/University of São Paulo, Orlando Strambi/University of São Paulo, Mariana Giannotti/University of São Paulo, Bianca Alves/University of São Paulo

Travel Mode Attitudes and Their Influence on the Use of On-Demand Mobility for Commuting: A Case Study in Eight Chinese Cities (20-02625) - A146

Sascha von Behren/Karlsruhe Institute of Technology, Jorma Wolfram/Karlsruhe Institute of Technology, Peter Vortisch/Karlsruhe Institute of Technology

Short-Term Forecast for Transfer Passenger Flow in Urban Rail Transit: A Deep-Learning Approach Combined Spatio-Temporal Characteristics (20-02636) - A147

Yiyang Peng/Southwest Jiaotong University, Xiaobo Liu/Southwest Jiaotong University, Hezhou Qu/Southwest Jiaotong University

Measuring Consumers' Willingness to Pay Toward Adoption of Connected and Autonomous Vehicles Based on Their Social Network (20-02648) - A148

Ishant Sharma/University of Memphis, Sabyasachee Mishra/University of Memphis

On the Variability of Ideal Travel Time: Revisiting the Positive Utility of Travel (20-02659) - A149

Huyen Le/Ohio State University, Ralph Buehler/Ohio State University, Yingling Fan/Ohio State University, Steve Hankey/Ohio State University

Development of Alternative Stochastic Frontier Models for Estimating Time-Space Prism Vertices (20-02684) - A150

Ke Wang/Tongji University, Xin Ye/Tongji University

Tourist Trip Design Problem Considering Fatigue (20-02721) - A151

Ali Qureshi/Kyoto University, Taewhan Ko/Kyoto University, Jan-Dirk Schmoecker/Kyoto University, Satoshi Fujii/Kyoto University

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A Model for the Willingness to Swap of Queueing Up Transit Passengers Under Bus Bunching (20-02748) - A152

Jiangyan Huang/Southeast University, Di Huang/Southeast University, Zhiyuan Liu/Southeast University

How Do People Use Ridehailing?: An Exploratory Analysis of Associated Travel Behavior (20-02752) - A153

Rezwana Rafiq/University of California, Irvine, Michael McNally/University of California, Irvine

The Impact of Autonomous Vehicles and Multi-Tasking on Value of Travel Time (20-02753) - A154

Ali Ardeshiri/University of New South Wales, Taha Rashidi/University of New South Wales, Joshua Auld/University of New South Wales

Eliciting Consumers' Preference Toward Electric Vehicles: Application of an ICLV on Stated Preference Data (20-02904) - A155

Milad Ghasri/University of New South Wales, Ali Ardeshiri/University of New South Wales, Taha Rashidi/University of New South Wales

How Do People Feel While Walking?: A Multi-Variate Analysis of Emotional Well-Being for Utilitarian and Recreational Walking Episodes (20-03120) - A130

Aupal Mondal/University of Texas, Austin, Chandra Bhat/University of Texas, Austin, Meagan Costey/University of Texas, Austin, Aarti Bhat/University of Texas, Austin, Teagan Webb/University of Texas, Austin, Tassio Magassy/University of Texas, Austin, Ram Pendyala/University of Texas, Austin, William Lam/University of Texas, Austin

Modeling the Rounding of Departure Times in Travel Surveys: Comparing the Effect of Trip Purposes and Travel Modes (20-03324) - A156

Yoshihiro Sato/Kumamoto University, Takuya Maruyama/Kumamoto University

Valuation of Metro Crowding Considering Heterogeneity of Route Choice Behaviors (20-03730) - A157

Hosuk Shin/Seoul National University College of Engineering, Dong-Kyu Kim/Seoul National University College of Engineering, Seung-Young Kho/Seoul National University College of Engineering, Shin-Hyung Cho/Seoul National University College of Engineering

Exploring the Role of Ridehailing in Trip Chains (20-03731) - A158

Tanjeeb Ahmed/University of California, Irvine, Michael Hyland/University of California, Irvine

Analyzing Travel Behavior Responses Under Personalized Incentives with Interpretable Machine Learning Methods (20-04435) - A159

Jun Zhao/University of Maryland, College Park, Chenfeng Xiong/University of Maryland, College Park, Ya Ji/University of Maryland, College Park, Lei Zhang/University of Maryland, College Park

Transit and Non-Transit Users' Mode Choice of Ridesourcing: The Role of Attitudes (20-05278) - A160

Ghazaleh Azimi/Florida International University, Alireza Rahimi/Florida International University, Hamidreza Asgari/Florida International University, Xia Jin/Florida International University

Taxihailing Choice and Emission Reduction Analysis Based on Floating Car Data: A Case Study of Shanghai (20-05508) - A161

Zhiwei Yin/Shanghai Jiao Tong University, Jian Sun/Shanghai Jiao Tong University, Yingwei Ye/Shanghai Jiao Tong University, Ying Zhang/Shanghai Jiao Tong University

Driving Fido: Travel Demand and Emissions from Dog Park Trips in Seattle (20-05537) - A162

Don MacKenzie/University of Washington, Hyun Cho/University of Washington

Modeling the Reasons for Choosing Dockless Bikesharing Services?: Assessing the Effects of Transportation Infrastructure, Land Use, and Neighborhood Attributes (20-05684) - A167

Muntahith Orvin/The University of British Columbia, Mahmudur Fatmi/The University of British Columbia

Estimating Joint Activity/Travel Benefit Based on Travel Characteristics Survey Data (20-05817) - A168

Yang Chen/Southeast University, Xiao Fu/Southeast University, Zhiyuan Liu/Southeast University

A Charging Location Choice Model for Plug-in Hybrid Electric Vehicle Users (20-05899) - A169

Bolong Yun/Shanghai Jiao Tong University, Jian Sun/Shanghai Jiao Tong University, Yingjie Zhang/Shanghai Jiao Tong University

Mobility, Time Poverty, and Well-Being: How Are They Connected and How Much Does Mobility Matter? (20-05942) - A131

Irfan Batur/Arizona State University, Shivam Sharda/Arizona State University, Taehooie Kim/Arizona State University, Sara Khoeini/Arizona State University, Ram Pendyala/Arizona State University, Chandra Bhat/Arizona State University

To Commute by Private Car or Public Transportation?: Understanding Young Commuters' Mode Choices from an Extended Theory of Planned Behavior (20-05972) - A170

Farhana Ahmed/Australian Road Research Board, John Catchpole/Australian Road Research Board, Thiruni Edirisinghe/Australian Road Research Board

Influences of Norm and Excitement on Bike Use Behavior of High-Income People in China (20-06104) - A171

Miriam Magdolen/Karlsruhe Institute of Technology, Tim Wörle/Karlsruhe Institute of Technology, Tim Hilgert/Karlsruhe Institute of Technology, Sascha von Behren/Karlsruhe Institute of Technology

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A Joint Model of Place of Residence and Place of Work: Making Use of Gibbs Sampling to Overcome Data Limitations (20-00218) - A132

Jason Hawkins/University of Toronto, Hengyang Zhang/University of Toronto, Khandker Nurul Habib/University of Toronto

Heterogeneity in Marginal Cost of Urban Mobility: Evidence from a Large-Scale Household Travel Survey in the Greater Toronto and Hamilton Area (20-00220) - A133

Jason Hawkins/University of Toronto, Khandker Nurul Habib/University of Toronto

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Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Best of the Transportation Planning Applications Conference and More!

Jill Hough, CHS Consulting Group, presiding

Sponsored By Standing Committee on Transportation Planning Applications

This session showcases the best recent innovations making their way into the practice of transportation planning, modeling and analysis.

Cycling Network Model for London (Cynemon) (20-00643) - A100

Charles Richardson/Citilabs, Inc., Vipul Modi/Citilabs, Inc., Robin Forrest/Citilabs, Inc.

Promoting Considerate Parking Behavior in Dockless Bike Sharing: An Experimental Study (20-02915) - A101

Duan Su/Beijing Jiaotong University, Yacan Wang/Beijing Jiaotong University, Nan Yang/Beijing Jiaotong University

Relating Transit Capacity Measurements to Users' Experience of Crowding (P20-20304) - A102

William Kuttner/Central Transportation Planning Staff (CTPS), Bruce Kaplan/Central Transportation Planning Staff (CTPS)

24-Hour Transit Assignments: Process and Application to Equity Analysis (P20-20313) - A103

Thaya Patton/Oregon Metro

Measuring Weekend Congestion: A Florida Case Study (20-01098) - A104

Rafael Almario/Cambridge Systematics, Inc., Jessica VanDenBogaert/Cambridge Systematics, Inc., Richard Ge/Cambridge Systematics, Inc., Praveen Pasumarthy/Cambridge Systematics, Inc., Richard Margiotta/Cambridge Systematics, Inc.

I-375 Improvement Project: The Conversion of a Freeway to a Surface Street Using a Mesoscopic DTA model (20-03611) - A105

Sarah Binkowski/HNTB Corporation, Danielle Booms/HNTB Corporation

Toll Optimization Algorithm for Evaluating Road Pricing Scenarios: Application to SacSim (P20-20309) - A106

Albab Noor/RSG, Kyle Shipley/Sacramento Area Council of Governments

Using Multiple Years of Truck GPS Data for Freight Model Development and Validation (P20-20310) - A107

Colin Smith/RSG

Identifying Truck Bias in LBS Data (P20-20317) - A108

Byron Chigoy/Texas A&M University Transportation Institute

Potential Applications of Google-Based, Travel-Time Data in Transportation Planning Analyses (20-04365) - A109

Feng Xie/Metropolitan Washington Council of Governments, Dusan Vuksan/Metropolitan Washington Council of Governments

Multiple Uses of Big Data for Model Validation and Beyond (P20-20305) - A110

Venkat Sarvepalli/AECOM

Activating Big Data for Active Transportation with a Statewide Data Platform (P20-20306) - A111

Laura Schewel/StreetLight Data

Analytical Benefits of a Smartphone-Based Survey from a Smaller Region (P20-20308) - A112

Christopher Coy/RSG Inc, Lethal Coe/Whatcom Council of Governments

Developing a Park Activity Location Choice Model from Passive Origin-Destination Data Tables (20-04720) - A113

Gregory Macfarlane/Brigham Young University, Teresa Tapia/Brigham Young University

Poking at the Future of Autonomous Vehicle Effects Like a Lab Rat (P20-20303) - A114

Ronald Milam/Fehr & Peers

An Agent-Based Simulation Model for the Performance Assessment of Autonomous Mobility on-Demand Systems with Multiple Fleet Operators (20-04184) - A115

Senlei Wang/Delft University of Technology, Gonçalo Correia/Delft University of Technology, Hai Lin/Delft University of Technology

(continued)

The Effect of Non-Infrastructural-Based Travel Plans: Results from a Randomized Controlled Trial in Singapore (20-01593) - A116

Tiffany Foo/Land Transport Authority, Waiyan Leong/Land Transport Authority

Impacts of Teleworking and Coworking on Travel: A Case Study from Southern California (20-04629) - A117

Michelle Bina/Cambridge Systematics, Inc., JingJing Zang/Cambridge Systematics, Inc., Kevin Kane/Cambridge Systematics, Inc., Sneha Roy/Cambridge Systematics, Inc., Anurag Komanduri/Cambridge Systematics, Inc., Mark McCourt/Cambridge Systematics, Inc.

A Neighborhood-Based Analysis of Grocery Shopping in New York City (20-06132) - A118

fior perez/City College of New York

Motive Matters: How Travel Purpose Interacts with Predictors of Individual Driving Behavior in Greater Montreal (20-01418) - A119

James DeWeese/McGill University, Ahmed El-Geneidy/McGill University

An Enhanced and Efficient Population Synthesis Approach to Support Advanced Travel Demand Models (20-04457) - A120

Ramachandran Balakrishna/Caliper Corporation, Srinivasan Sundaram/Caliper Corporation, Jim Lam/Caliper Corporation

Toward Human-Scale Transport Metrics (P20-20314) - A121

Suzanne Childress/Puget Sound Regional Council (PSRC), Brian Lee/Puget Sound Regional Council, Brice Nichols/Puget Sound Regional Council (PSRC)

San Francisco's Web-Based Travel Demand Calculation and Visualization Tool (P20-20307) - A122

Daniel Wu/San Francisco Planning Department, Sherie George/San Francisco Planning Department

Use of a Response Surface Model to Quantify Forecasting Error Intervals for Disparate Impacts Analysis (P20-20311) - A123

John Gliebe/Cambridge Systematics, Inc.

Parallelization of the ActivitySim Activity-Based Travel Modeling Framework (P20-20312) - A124

Ben Stabler/RSG

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Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A

Health, Transportation, and Emerging Research

Ipek Sener, Texas A&M Transportation Institute, presiding

Sponsored By Standing Committee on Environmental Justice in Transportation, Standing Committee on Traveler Behavior and Values, Standing Committee on Transportation and Sustainability, Joint Subcommittee on Health and Transportation of ADD50 and ABJ30

Integrated Impact Assessment of Active Travel: Expanding the Scope of the Health Economic Assessment Tool for Walking and Cycling (20-00303) - A203

Thomas Götschi/University of Zurich/University of Oregon, Sonja Kahlmeier/University of Zurich/University of Oregon, Alberto Castro Fernandez/University of Zurich/University of Oregon, Christian Brand/University of Zurich/University of Oregon, Paul Kelly/University of Zurich/University of Oregon, Christoph Lieb/University of Zurich/University of Oregon, David Rojas Rueda/University of Zurich/University of Oregon, James Woodcock/University of Zurich/University of Oregon, Francesca Racioppi/University of Zurich/University of Oregon

Compact Development and BMI: Environmental Determinism or Self-Selection? (20-01047) - A204

Shima Hamidi/University of Texas, Arlington, Reid Ewing/University of Texas, Arlington

The Geographic Disparities in Transportation-Related Physical Activity in the United States: An Analysis of 2017 NHTS Data (20-01840) - A201

Hongwei Dong/California State University, Fresno

Estimation of PM Inhalation for Cyclists and Pedestrians in Short Urban Trips: A Comparison Based on a Lisbon Case Study (20-02178) - A205

Anabela Ribeiro/Universidade de Coimbra, Marta Faria/Universidade de Coimbra, Diego Gimenez-Gaydou/Universidade de Coimbra, Ana Vasconcelos/Universidade de Coimbra, Tiago Farias/Universidade de Coimbra

Transportation Barriers to Health Care in the United States (20-02641) - A206

Mary Wolfe/University of North Carolina, Chapel Hill, Noreen McDonald/University of North Carolina, Chapel Hill, G. Holmes/University of North Carolina, Chapel Hill

Transportation Health Economic Return on Investment. A New Health Metrics to Compare Projects and Practical Application on Road Maintenance Policies (20-03078) - A207

Anne de Bortoli/Eurovia

(continued)

New Evidence on the Role of Transportation and Land Use Systems on Public Health: Mortality in Heart Failure Patients (20-03457) - A208

Mohammad Tayarani/Cornell University, Subhi Al'Aref/Cornell University, James Min/Cornell University, Yiye Zhang/Cornell University, H. Oliver Gao/Cornell University

Plan for Healthy Neighborhoods to Improve Mental Well-Being: A Pilot Study in Fresno, California (20-04357) - A202

Hongwei Dong/California State University, Fresno, Ming Li/California State University, Fresno, Miguel Perez/California State University, Fresno, Chih-Hao Wang/California State University, Fresno

Overweight/Obesity Relationship with Travel Patterns, Socioeconomic Characteristics, and Built Environment Around an Individual (20-05069) - A209

Gopal Patil/Indian Institute of Technology, Bombay, Gajanand Sharma/Indian Institute of Technology, Bombay

Role of Transportation and Urban Design to the Health Impacts: A Case Study of Dallas-Fort Worth, Texas (20-05351) - A219

Shirin Rad/University of Texas, Arlington, MEHRDAD ARABI/University of Texas, Arlington, Kyung Hyun/University of Texas, Arlington, Stephen Mattingly/University of Texas, Arlington

Quantifying the Health Impacts of Transportation Investments to Support Routine Transportation Decision Making: A Case Study in Raleigh, North Carolina (20-05592) - A218

Theodore Mansfield/RSG Inc, Vincent Bernardin/RSG Inc, Mushtaqur Rahman/RSG Inc

What Affects Motocyclists' Attitudes Toward Air Pollution in a Polluted City?: A Case Study in Tehran (20-06076) - A217

Arsham Bakhtiari/No Organization, Meeghat Habibian/No Organization

Assessing the Impact of Transportation on Health: A Review of Performance Measures (20-06123) - A216

Aikaterini Deliali/University of Massachusetts, Amherst, Sarah Esenther/University of Massachusetts, Amherst, Christine Frisard/University of Massachusetts, Amherst, Karin Goins/University of Massachusetts, Amherst, Stephenie Lemon/University of Massachusetts, Amherst, Krystal Pollitt/University of Massachusetts, Amherst, Eleni Christofa/University of Massachusetts, Amherst

E-Bikes and Physical Activity: A Systematic Review (20-01488) - A215

Marx Paris/McGill University, Kevin Manaugh ANF10/McGill University

Autonomous Vehicles and Public Health: A Conceptual Model and Policy Recommendation (20-01576) - A214

Soheil Sohrabi/Texas A&M University, College Station, Haneen Khreis/Texas A&M University, College Station, Dominique Lord/Texas A&M University, College Station

Opportunities for Incorporating Health Considerations in Transportation Decision Making (20-04719) - A213

Laura Sandt/University of North Carolina, Chapel Hill, Meg Bryson/University of North Carolina, Chapel Hill, Lauren Blackburn/University of North Carolina, Chapel Hill, Alyson West/University of North Carolina, Chapel Hill, Daniel Rodriguez/University of North Carolina, Chapel Hill, Sagar Shah/University of North Carolina, Chapel Hill

Health Impact Assessment of Automated Vehicles in San Francisco Bay Area Using the Integrated Transport and Health Impacts Model (20-06016) - A212

Elham Pourrahmani/University of California, Davis, Miguel Jaller/University of California, Davis, Neil Maizlish/University of California, Davis, Caroline Rodier/University of California, Davis

Understanding Potential Exposure of Bicyclists on Roadways to Traffic-Related Air Pollution: Findings from El Paso, Texas, Using Strava Metro Data (20-01017) - A200

Kyuhyun Lee/Texas A&M Transportation Institute, Ipek Sener/Texas A&M Transportation Institute

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Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Highway Safety Performance Research
John Nitzel, Jacobs, presiding
Sponsored By Standing Committee on Highway Safety Performance

Estimating Safety Performance Functions for Two-Lane Rural Roads Using an Alternative Functional Form for Traffic Volume (20-00041) - B323

Vikash Gayah/Pennsylvania State University, Eric Donnell/Pennsylvania State University

Safety Evaluation of Directional Interchange with Semi-Direct Ramp Connections and Loops (20-00496) - B300

Khaled Hamad/University of Sharjah, Abdulkarim Ismail/University of Sharjah

Investigation of Associations Between Multiple Freeway Roadway Characteristics and Freight Safety Performance (20-00618) - B301

Juneyoung Park/Hanyang University, Mohamed Abdel-Aty/Hanyang University, Ling Wang/Hanyang University, Gunwoo Lee/Hanyang University, Jungyeol Hong/Hanyang University

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Time-Varying Analysis of Traffic Conflicts in Upstream Toll Plaza Diverging Area (20-00648) - B302

Lu Xing/Southeast University, Jie He/Southeast University, Qing Cai/Southeast University, Jinghui Yuan/Southeast University

Revisiting Expressway Single-Tunnel Crash Characteristics Analysis: A Six-Zone Analytic Approach (20-00660) - B303

Amjad Pervez/Central South University, Ye Li/Central South University, Huang Helai/Central South University, Chunyang Han/Central South University, Wang Jie/Central South University

Variation in Crash Modification Factors Due to Specification and Measurement Error (20-00864) - B304

Yemi Adediji/Rutgers, The State University of New Jersey, Robert Noland/Rutgers, The State University of New Jersey

Accuracy Assessment of Using Application Programming Interface in the Development of Safety Performance Function on Indian Expressway (20-01281) - B305

Leeza Malik/Indian Institute of Technology, Delhi, Amber Gupta/Indian Institute of Technology, Delhi, Geetam Tiwari/Indian Institute of Technology, Delhi

Traffic Conflict Prediction Model in Interchange Diverging Area Based on Gap Acceptance Theory (20-01536) - B306

Zhanji Zheng/Southeast University, Yongfeng Ma/Southeast University, Qiaojun Xiang/Southeast University, Han Li/Southeast University, Yangyang Zhao/Southeast University

Economic Assessment of Road Infrastructure Safety Schemes in Greece Using Crash Prediction Methodology (20-01634) - B307

George Yannis/National Technical University of Athens (NTUA), Anastasios Dragomanovits/National Technical University of Athens (NTUA), Julia Roussou/National Technical University of Athens (NTUA), Dimitrios Nikolaou/National Technical University of Athens (NTUA)

Application of Geographically and Temporally Weighted Regression Models for Estimating Safety Performance Functions of Multi-Lane Rural Highways in Tennessee (20-02544) - B326

Amin Mohammadnazar/University of Tennessee, Knoxville, Numan Ahmad/University of Tennessee, Knoxville, Iman Mahdinia/University of Tennessee, Knoxville, Asad Khattak/University of Tennessee, Knoxville

Safety Performance Functions for Rural, Two-Way, Stop-Controlled Intersections (20-02595) - B328

Ming Sun/University of Louisiana, Lafayette, Xiaoduan Sun/University of Louisiana, Lafayette, M. Ashifur Rahman/University of Louisiana, Lafayette, Mousumy Akter/University of Louisiana, Lafayette, Subasish Das/University of Louisiana, Lafayette

Improving the Transferability of the Crash Prediction Model Using the TrAdaBoost.R2 Algorithm (20-02676) - B308

Dongjie Tang/Tongji University, Xuesong Wang/Tongji University, Xiaohan Yang/Tongji University

Examining the Standard Errors of Crash Modification Factors Developed with Empirical Bayes Before-After Studies (20-03041) - B309

Lingtao Wu/Texas A&M Transportation Institute, Ying Chen/Texas A&M Transportation Institute, Zhongxiang Huang/Texas A&M Transportation Institute

Safety Evaluation of Mandatory Lane-Change Behaviors in Lane-Unbalanced Merging Area Using Vehicle Trajectory Data (20-03150) - B320

Ye Chen/Southeast University, Meng Li/Southeast University, Zhibin Li/Southeast University, Yutin Luo/Southeast University

Developing Safety Performance Functions for Rural Multi-Lane Highways in Tennessee: Accounting for Unobserved Heterogeneity (20-03205) - B327

Behram Wali/Massachusetts Institute of Technology (MIT), Numan Ahmad/Massachusetts Institute of Technology (MIT), Asad Khattak/Massachusetts Institute of Technology (MIT), Amin Mohammadnazar/Massachusetts Institute of Technology (MIT)

Development of Network Screening Safety Performance Functions for Roadway Departure Safety in Virginia (20-03261) - B310

Young-Jun Kweon/National Highway Traffic Safety Administration (NHTSA), In-Kyu Lim/National Highway Traffic Safety Administration (NHTSA)

Research on Characteristics and Prediction Methods of Expressway Accidents (20-03262) - B311

Jiyuan Tan/North China University of Technology, Qianqian Qiu/North China University of Technology, Shuofeng Wang/North China University of Technology, Na Xie/North China University of Technology, Yuelong Su/North China University of Technology, Yujing Wang/North China University of Technology, Weiwei Guo/North China University of Technology, Ke Zhang/North China University of Technology

Two-Way, Stop-Controlled Intersection Analysis with Zero-Inflated Models (20-03303) - B329

Ming Sun/University of Louisiana, Lafayette, Xiaoduan Sun/University of Louisiana, Lafayette, M. Ashifur Rahman/University of Louisiana, Lafayette, Mousumy Akter/University of Louisiana, Lafayette, Subasish Das/University of Louisiana, Lafayette

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Safety Analysis of Displaced Left Turn Intersections (20-03379) - B312

Ahmed Abdelrahman/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Jaeyoung Lee/University of Central Florida, Lishengsa Yue/University of Central Florida, Ma'en Al-Omari/University of Central Florida

Safety Evaluation of High-Friction Surface Treatments (20-04012) - B313

Craig Lyon/Ryerson University, Bhagwant Persaud/Ryerson University, David Merritt/Ryerson University, Joseph Cheung/Ryerson University

Calibration of Wyoming-Specific Safety Performance Functions for Urban and Suburban Five-Lane Arterial Roadway Corridors (20-04083) - B331

Mohamed Ahmed/Federal Highway Administration (FHWA), Ahmad Elterkawi/Federal Highway Administration (FHWA), Irfan Ahmed/Federal Highway Administration (FHWA)

Safety Effectiveness of All-Electronic Toll Collection System (20-04159) - B314

Meghna Chakraborty/Michigan State University, Steven Stapleton/Michigan State University, Mehrnaz Ghamami/Michigan State University, Timothy Gates/Michigan State University

Safety Performance of Autonomous Vehicles on an Urban Arterial in Proximity of a Driveway (20-04169) - B315

Seyedeh Maryam Mousavi/Texas A&M University, College Station, Dominique Lord/Texas A&M University, College Station, Seyed Reza Mousavi/Texas A&M University, College Station, Maryam Shirinzad/Texas A&M University, College Station, Maryam Shirinzad/Texas A&M University, College Station

Field Implementation of Directional Rumble Strips to Deter Wrong-Way Driving on Freeways (20-04521) - B316

Chennan Xue/Auburn University, Huaguo Zhou/Auburn University, Dan Xu/Auburn University

SPF Real-Time Data Versus AADT (20-04840) - B317

MAURICIO BURGOS/Florida International University, Cecilia Kadeha/Florida International University, Priyanka Alluri/Florida International University, Albert Gan/Florida International University

Safety Performance Functions for Fatal Crashes on National Highways Under Heterogeneous Traffic Flow (20-04893) - B318

Hasan Naqvi/National Highways Authority of India, Geetam Tiwari/National Highways Authority of India

Factors Influencing the Likelihood of Occurrence of a Wrong-Way Driving Crash and Injury Severity (20-04902) - B319

Sarvani Duvvuri/University of North Carolina, Charlotte, Srinivas Pulugurtha/University of North Carolina, Charlotte

The Variability of Urban Safety Performance Functions for Different Road Elements: An Italian Case Study (20-04921) - B333

Paolo Intini/Politecnico di Bari, Nicola Berloco/Politecnico di Bari, Gabriele Cavalluzzi/Politecnico di Bari, Pasquale Colonna/Politecnico di Bari, Dominique Lord/Politecnico di Bari, Vittorio Ranieri/Politecnico di Bari

Using No-U-Turn Hamiltonian Monte Carlo Bayesian Method to Investigate the Contributing Factors of Crash Injury Severity in Very Low-Volume Rural Roads of Wyoming (20-05079) - B332

Irfan Ahmed/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA), haun Wulff/Federal Highway Administration (FHWA)

Development of Conflict Severity Index for Safety Evaluation of Right Turn Related Crashes at Unsignalized Intersections on Intercity Highways (20-05211) - B321

Madhumita Paul/Indian Institute of Technology, Roorkee, Soumyodeep Chatterjee/Indian Institute of Technology, Roorkee, Indrajit Ghosh/Indian Institute of Technology, Roorkee

Effects of Traffic Signal Control Parameters on Vehicular Crash Frequency at Four-Leg Signalized Intersection Approaches (20-05464) - B322

Dusan Jolovic/Garver LLC, Milos Pljakic/Garver LLC

Effect of Intermittent Shoulder Rumble Strips Application Strategy on the Development of Crash Modification Factors (20-05578) - B337

Md Julfiker Hossain/University of Connecticut, Mohamed Ahmed/University of Connecticut

Estimating Baseline Numbers for Safety Measure Target Setting in Virginia (20-01426) - B324

Scott Himes/VHB, Vikash Gayah/VHB, Jeffrey Gooch/VHB, Stephen Read/VHB

Safety Performance Functions for Rural Arterial Roads in Egypt (20-01448) - B325

Sania Elagamy/Mansoura University Faculty of Engineering, Usama Shahdah/Mansoura University Faculty of Engineering, Sherif El-Badawy/Mansoura University Faculty of Engineering, Sayed Shwaly/Mansoura University Faculty of Engineering, Zaki Zidan/Mansoura University Faculty of Engineering

Highway Safety Manual Calibration: Variance of the Calibration Factor and the Sample Size (20-01993) - B330

Mahdi Rajabi/Jacobs, Patrick Gerard/Jacobs, Jennifer Ogle/Jacobs

Before-and-After Empirical Bayes Evaluation of Citywide Installation of Driver Feedback Signs (20-03212) - B334

Mingjian Wu/University of Alberta, Karim El-Basyouny/University of Alberta, Tae J. Kwon/University of Alberta

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Probe-Speed Based Safety Performance Metrics in Georgia: A Case Study (20-04778) - B335

David Ederer/Georgia Institute of Technology (Georgia Tech), Michael Rodgers/Georgia Institute of Technology (Georgia Tech), Michael Hunter/Georgia Institute of Technology (Georgia Tech), Kari Watkins/Georgia Institute of Technology (Georgia Tech)

Analysis, Modeling, and Simulation Framework for Safety Performance Assessment of the Wyoming Connected Vehicle Pilot Deployment Program (20-05214) - B336

Guangchuan Yang/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA), Eric Adomah/Federal Highway Administration (FHWA)

Single-Vehicle Roadway Departure Crashes on Rural Curved Segments: Analysis of Injury Severity Using Random Parameters with Heterogeneity in Means and Variances (20-05256) - B338

Mouyid Islam/California Polytechnic State University, San Luis Obispo, Anurag Pande/California Polytechnic State University, San Luis Obispo

Movement-Based Safety Performance Functions for Signalized Intersections (20-05366) - B339

Taehun Lee/North Carolina State University, Thomas Chase/North Carolina State University, Christopher Cunningham/North Carolina State University, Shannon Warchol/North Carolina State University

Comparison of Crash Modification Factors for Engineering Treatments Estimated by Before-After Empirical Bayes and Propensity Score Matching Methods (20-05570) - B340

Bo Lan/UNC Highway Safety Research Center

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Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Pedestrian Design and Behavior
Michael Cynecki, Lee Engineering, LLC, presiding
Sponsored By Standing Committee on Pedestrians

Pedestrian Walking Speeds at Signalized Intersections in Utah (20-00025) - B341

Jordi Berrett/Brigham Young University, Grant Schultz/Brigham Young University, Dennis Eggett/Brigham Young University

To Jaywalk or Not to Jaywalk: Pedestrians' Decision to Cross at Midblock Sections of Urban Roads (20-00129) - B342

Ajjima Soathong/University of Auckland, Subeh Chowdhury/University of Auckland, Dr Doug Wilson/University of Auckland, Dr Prakash Ranjitkar/University of Auckland

Disaggregated and Aggregated Levels Factors Affecting the Red Light Running Behavior of Pedestrian (20-00302) - B343

Dianchen Zhu/Hong Kong Polytechnic University, N.N. Sze/Hong Kong Polytechnic University, Lu Bai/Hong Kong Polytechnic University

An Augmentation Function for Active Pedestrian Safety System Based on Crash Risk Evaluation (20-01021) - B344

Lishengsa Yue/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Yina Wu/University of Central Florida, Jinghui Yuan/University of Central Florida

Multi-State Semi-Markov Modeling of Recurrent Events: Estimating Driver Waiting Time at Semi-Controlled Crosswalks (20-01032) - B345

Yunchang Zhang/Purdue University, Jon D. Fricker/Purdue University

Examining the Umbrella Effects on Pedestrian Walking Speeds at the Building Entrance During Rainy Days (20-01749) - B346

Xiaomeng Shi/Southeast University, Shuqi Xue/Southeast University, Heng Chang/Southeast University, Nirajan Shiwakoti/Southeast University, Zhirui Ye/Southeast University

An Extended Lattice Gas Model for the Crowd in a Corridor Using the Statistical Characteristics of Pedestrian Movements (20-01834) - B347

Tan Chen/Shool of Transportation, Southeast University, Yu Tu/Shool of Transportation, Southeast University, Xuedong Hua/Shool of Transportation, Southeast University, Weicen Ling/Shool of Transportation, Southeast University, Wei Wang/Shool of Transportation, Southeast University

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Impacts of Mobile Screens on Pedestrian Visual Performance at Night: Pilot Study Results (20-02569) - B348

John Bullough/Rensselaer Polytechnic Institute (RPI), Emily Alligretti/Rensselaer Polytechnic Institute (RPI), Aaron Alsdorf/Rensselaer Polytechnic Institute (RPI), Camden Burns/Rensselaer Polytechnic Institute (RPI), Adam Champagne/Rensselaer Polytechnic Institute (RPI), Bryce Crawford/Rensselaer Polytechnic Institute (RPI), Andravas Patabendi De Vas Gunawardena/Rensselaer Polytechnic Institute (RPI), Yu Du/Rensselaer Polytechnic Institute (RPI), Emily Freeman/Rensselaer Polytechnic Institute (RPI), Yining Lai/Rensselaer Polytechnic Institute (RPI), Kelsey Mitchell /Rensselaer Polytechnic Institute (RPI), Katherine Snively/Rensselaer Polytechnic Institute (RPI), Sofia Sosa-Yanez/Rensselaer Polytechnic Institute (RPI), Jinhao Su/Rensselaer Polytechnic Institute (RPI), Jerry Tung/Rensselaer Polytechnic Institute (RPI), Akila Udage/Rensselaer Polytechnic Institute (RPI), Gejin Zhu/Rensselaer Polytechnic Institute (RPI)

Deep Survival Model for Pedestrian Crossing Behavior in Mixed Traffic Conditions (20-03102) - B349

Arash Kalatian/Ryerson University, Bilal Farooq/Ryerson University

Pedestrians' Crossing Patterns Design for Symmetric Intersections (20-03281) - B350

Yugang Liu/Southwest Jiaotong University, Liying Tang/Southwest Jiaotong University, Bin Chen/Southwest Jiaotong University, Hongtai Yang/Southwest Jiaotong University

Effect of Tactile Walking Surface Indicators on Travelers with Mobility Disabilities (20-03347) - B351

Billie Bentzen/Elon University, Alan Scott/Elon University, Robert Wall-Emerson/Elon University, Janet Barlow/Elon University

Experimental Characterization of Pedestrian Lateral Oscillation Dynamics on Stairs (20-03348) - B352

Jianyu Wang/Southwest Jiaotong University, Jian Ma/Southwest Jiaotong University, Peng Lin/Southwest Jiaotong University, Majid Sarvi/Southwest Jiaotong University

A Study of Pedestrian Crossing Speeds at Midblock Crossing Using LiDAR (20-03376) - B353

Akhil Tiwari/University of Alaska, Anchorage, Vinod Vasudevan/University of Alaska, Anchorage, Partha Chakroborty/University of Alaska, Anchorage

Effect of Sidewalk Vendors on Pedestrian Movement Characteristics: A Microscopic Simulation Study of Addis Ababa, Ethiopia (20-03506) - B355

Kibret Hagos/Hasselt University, Muhammad Adnan/Hasselt University, Ansar-ul-Haque Yasar/Hasselt University

Performance Evaluation of an Alternative Crossing Design for Critical Intersections (20-03547) - B356

Muhammad Abdullah/University of Management and Technology, Takashi Oguchi/University of Management and Technology

Deviation of Pedestrian Path Due to Presence of Building Entrance (20-03594) - B357

Shi Sun/Harbin Institute of Technology, Cheng Sun/Harbin Institute of Technology, Dorine Duives/Harbin Institute of Technology, Serge Hoogendoorn/Harbin Institute of Technology

Evaluating the Effectiveness of the Street Smart New Jersey Campaign Behavioral Pedestrian Safety Analysis (20-03624) - B358

Mohammad Jalayer/Rowan University, Deep Patel/Rowan University, Patrick Szary/Rowan University, Keith Hamas/Rowan University

Distracted Behavior of Pedestrian While Crossing Streets: A Case Study in China (20-03651) - B359

Mingyu Hou/Southeast University, Jianchuan Cheng/Southeast University, Yunlong Zhang/Southeast University

Pedestrian Crossing Behavior Based on Spatial Evolutionary Game Theory (20-03807) - B373

Shi Qiu/Beijing University of Technology, Shuihai Dou/Beijing University of Technology, Heng Gu/Beijing University of Technology, Zhonghua Wei/Beijing University of Technology, Qixuan Zhao/Beijing University of Technology

Evaluating the Effectiveness of New Designed Crosswalk Markings at Intersections in China Considering Vehicle–Pedestrian Interaction (20-03945) - B374

Yang Bian/Beijing University of Technology, Kun Liang/Beijing University of Technology, Xiaohua Zhao/Beijing University of Technology, Haijian Li/Beijing University of Technology, Liping Yang/Beijing University of Technology

Analysis of Pedestrian Temporal Gap Acceptance Behavior at Unsignalized Intersections (20-04259) - B354

Vinod Vasudevan/University of Alaska, Anchorage, Mayur Mehta/University of Alaska, Anchorage, Bhupali Dutta/University of Alaska, Anchorage

Behavioral Profiling of Cycling and Walking in Nine European Cities (20-04386) - B375

Tim De Ceunynck/Vias institute, Gert Jan Wijlhuizen/Vias institute, Aslak Fyhri/Vias institute, Regine Gerike/Vias institute, Dagmar Köhler/Vias institute, Alice Ciccone/Vias institute, Atze Dijkstra/Vias institute, Jacques Commandeur/Vias institute, Emmanuelle Dupont/Vias institute, Mario Cools/Vias institute

Utilization Analysis of Mumbai Skywalks and Establishing Factors Influencing Its Use (20-04454) - B363

Samarth Bhatia/Indian Institute of Technology, Bombay, Gopal Patil/Indian Institute of Technology, Bombay, Aniruddha Chopadekar/Indian Institute of Technology, Bombay, Sunil Sharma/Indian Institute of Technology, Bombay

Contrasting Perspectives on the Comfort and Safety of Pedestrians Interacting with Other Road Users (20-04566) - B364

Alexander Bigazzi/University of British Columbia, Gurdiljot Gill/University of British Columbia, Meghan Winters/University of British Columbia

(continued)

Perceived Safety and Experienced Incidents Between Pedestrians and Cyclists in a High-Volume, Non-Motorized Shared Space (20-04574) - B365

Filippos Gkekas/University of British Columbia, Alexander Bigazzi/University of British Columbia, Gurdiljot Gill/University of British Columbia

Driving Today: Safer for People in Cars, More Dangerous for People on Foot? (20-04591) - B366

Norman Garrick/University of Connecticut, Anne Quevreaux/University of Connecticut, Carol Atkinson-Palombo/University of Connecticut

Capturing Pedestrians' Walking Behavior Based on Information Retrieved by Eye-Tracking Devices (20-04681) - B367

Andreas Gregoriades/University of Cyprus, Neophytos Zavrides/University of Cyprus, Loukas Dimitriou/University of Cyprus

Variations in Utilitarian and Recreational Walking Behavior Across Canada (20-04924) - B368

Christina Borowiec/McMaster University, Darren Scott/McMaster University

Signalized Mid-Block Crosswalks Experience in Dar Es Salaam, Tanzania: An Evaluation of Awareness and Utilization (20-05984) - B369

Boniphace Kutela/Texas A&M Transportation Institute, Sia Mwende/Texas A&M Transportation Institute, Frank Mushi/Texas A&M Transportation Institute, Victor Malima/Texas A&M Transportation Institute

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1693

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Transit Network Modeling
Patrick Coleman, AECOM, presiding
Sponsored By Standing Committee on Public Transportation Planning and Development

This session offers posters for a selection of papers involving network modeling and public transit topics .

Refined Choice Set Generation and the Investigation of Multi-Criterion Transit Route Choice Behavior (20-01439) - B401

Benjamin Tomhave/University of Minnesota, Twin Cities, Alireza Khani/University of Minnesota, Twin Cities

Urban Transit Network Design with Distinct Passenger Groups: Model and Application (20-01632) - B412

Dimitrios Nioras/National Technical University of Athens (NTUA), Christina Iliopoulou/National Technical University of Athens (NTUA), Konstantinos Kepaptsoglou/National Technical University of Athens (NTUA), Zongzhi Li/National Technical University of Athens (NTUA)

Park-and-Ride Choice Behavior in a Multimodal Network with Overlapping Routes (20-02574) - B400

Alexander Webb/University of Minnesota, Twin Cities, Alireza Khani/University of Minnesota, Twin Cities

A Deep Neural Network for Public Transport Origin Destination Prediction (20-03081) - B410

Hoang Nguyen/Commonwealth Scientific and Industrial Research Organisation, Le Minh Kieu/Commonwealth Scientific and Industrial Research Organisation, Chen Cai/Commonwealth Scientific and Industrial Research Organisation

Learning and Adaptation in Dynamic Transit Assignment Models for Congested Networks (20-03602) - B411

Oded Cats/Delft University of Technology, Jens West/Delft University of Technology

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1694

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Public Transportation Demand: Explorations of Traveler Response and Traveler Characteristics
John Evans, Resource Systems Group, Inc., presiding
Sponsored By Standing Committee on Public Transportation Planning and Development

 This session offers a selection of posters based on papers covering a variety of traveler response and traveler characteristics topics surrounding public transportation demand.

A Survey to Explore Behavior, Intelligent Transportation Systems Needs and Level of Service Expectations for Student Parking at a University Campus (20-00133) - B394

Ruey Cheu/The University of Texas at El Paso, Okan Gurbuz/The University of Texas at El Paso

Tensions and Complementarities Between Mass Transit and Ridehailing Through a Survey-Based Randomization (20-00483) - B402

Annika Todd/Lawrence Berkeley National Laboratory, C. Anna Spurlock/Lawrence Berkeley National Laboratory, Saika Belal/Lawrence Berkeley National Laboratory

(continued)

Temporal Variations in Daily Activity Networks Using Smartcard Data (20-01216) - B390

Xia Zhao/Beijing University of Technology, Mengying Cui/Beijing University of Technology, David Levinson/Beijing University of Technology

The Rise and Fall of Transit Ridership Across Canada: Understanding the Determinants (20-01364) - B392

Ehab Diab/University of Saskatchewan, Dena Kasraian/University of Saskatchewan, Eric Miller/University of Saskatchewan, Amer Shalaby/University of Saskatchewan

Who's Ditching the Bus (20-02273) - B403

Simon Berrebi/Georgia Institute of Technology (Georgia Tech), Kari Watkins/Georgia Institute of Technology (Georgia Tech)

Transit Demand Determinants: An Empirical Analysis of Long-Run Elasticities and Asymmetric Effects (20-02942) - B393

Lisa Li/University of Toronto, Dena Kasraian/University of Toronto, Amer Shalaby/University of Toronto

Rating the Composition: Deconstructing the Demand-Side Effects on Transit Use Changes in California (20-02964) - B406

Andrew Schouten/University of California, Los Angeles, Evelyn Blumenberg/University of California, Los Angeles, Brian Taylor/University of California, Los Angeles

How Do Trip Purposes Affect the Determinants of Rider Satisfaction?: A Study Using the Impact-Asymmetry Analysis (20-03484) - B404

Xinyi Wu/University of Minnesota, Twin Cities

Mind for Mass Transit: Commuters' Assessment of Public Transport as a "Reasonable" Option (20-04538) - B391

James DeWeese/McGill University, Ahmed El-Geneidy/McGill University

Spatial and Temporal Differences in Weekday Travel Durations Between Private-for-Hire Transportation Services and Transit in the City Center (20-06019) - B405

Kelly Clifton/Portland State University, Baxter Shandobil/Portland State University, Ty Lazarchik/Portland State University

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1695

<u>Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A</u>
Current Topics in Public Transportation
Natalie Stiffler, Via Mobility Services, presiding
Sponsored By Standing Committee on Public Transportation Planning and Development

This session includes posters covering a variety of current topics in public transportation planning and policy.

Funding Regional Rail in China's Pearl River Delta: From Metro to High-Speed Rail (20-00289) - B408
Jiawen Yang/Peking University, Xiongbin Lin/Peking University

After the Referendum: Fixing Traffic in Nashville, Tennessee (20-01347) - B416
Jacob Thompson/Tennessee State University, Kimberly Triplett/Tennessee State University

Planning of Bikeshare System in a Multimodal Transportation Network (20-02030) - B409
Yi He/Utah State University, Zhaocai Liu/Utah State University, Ziqi Song/Utah State University

Are Transportation Network Companies a Substitute for Buses?: A Case Study in Pittsburgh (20-02099) - B417
Rick Grahn/Carnegie Mellon University, Sean Qian/Carnegie Mellon University, Chris Hendrickson/Carnegie Mellon University, Scott Matthews/Carnegie Mellon University

State of the BART: Analyzing the Factors Influencing Bay Area Rapid Transit Ridership Peaking and Their Change Over Time (20-02472) - B407
Jacob Wasserman/UCLA Institute of Transportation Studies, Brian Taylor/UCLA Institute of Transportation Studies

Bicycling Connectivity for First- and Last-Mile Solution to Expanding Transit Service Coverage and Impacts: A Case Study of Hamilton County, Ohio (20-04050) - B418
Ting Zuo/University of Cincinnati, Heng Wei/University of Cincinnati, Na Chen/University of Cincinnati

Quantification of Rail Transit's Comparative Advantages in Travel Cost and Time Over Taxi: An Empirical Study in Washington, D.C., and Chicago, Illinois (20-04117) - B415
Sajeeb Kumar Kirtonia/Florida State University, Yanshuo Sun/Florida State University

Modeling the Impact of Bus Operations on Urban Transport Systems Using an Activity-Based Microsimulation Platform: A Case Study of Singapore (20-01650) - B397
Duy Nguyen-Phuoc/Danang University of Science and Technology, Diem-Trinh Le/Danang University of Science and Technology, Zhou Meng/Danang University of Science and Technology, Simon Oh/Danang University of Science and Technology

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The Role of Cycling Toward Urban Transit Stations: Simultaneously Modeling the Access Mode and Station Choice (20-03401) - B398

Danique Ton/Delft University of Technology, Sanmay Shelat/Delft University of Technology, Sandra Nijenstein/Delft University of Technology, Lotte Rijsman/Delft University of Technology, Niels van Oort/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

Effect of the Built Environment on Bike on Bus Demand: A Case Study in the A-Line Twin Cities (20-02479) - B419

Jueyu Wang/University of Minnesota, Eric Lind/University of Minnesota, Anna Flintoft/University of Minnesota, Greg Lindsey/University of Minnesota

Exploring Variation in Built Environment Predictors of Ridership by Transit Mode (20-01322) - B399

Laura Aston/Monash University, Graham Currie/Monash University, Md Kamruzzaman/Monash University, Alexa Delbosc/Monash University, Nicholas Fournier/Monash University, David Teller/Monash University

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1696

Wednesday, 08:00 a.m. - 09:45 a.m., Convention Center, Hall A
Public Transportation Fare Policy, Fare Evasion, and Fare Integration
Steve Dickey, Salem Area Mass Transit District, presiding
Sponsored By Standing Committee on Public Transportation Marketing and Fare Policy

 This session will cover many important topics pertaining to public transportation fare policy , including the design of zone-based fare systems and time-dependent transit pricing. Additional fare-related topics that will be discussed include fare evasion and multi-region fare integration systems.

Design of Zone Fare System in a Rail Transit Line (20-05318) - B421

Yi Yang/Southwest Jiaotong University, Lianbo Deng/Southwest Jiaotong University, Qing Wang/Southwest Jiaotong University, Wenliang Zhou/Southwest Jiaotong University

Non-Additive Fares Within Congested Frequency-Based Transit Assignment (20-05250) - B420

Saeed Maadi/Kyoto University, Jan-Dirk Schmoecker/Kyoto University, Jinhyun Hong/Kyoto University

How the Metro Fare Preferential Policy Influence on Passengers' Departure Time: A Case Study of Beijing, China (20-05765) - B422

Jiancheng Weng/Beijing University of Technology, Siyong Ma/Beijing University of Technology, Ning Kong/Beijing University of Technology, Zhe Liu/Beijing University of Technology, Yuxing Sun/Beijing University of Technology

Time-Dependent Public Transit Pricing with Consideration of Elastic and Spatially Distributed Demand (20-03964) - B414

Yuqiang Ning/Florida State University, Yanshuo Sun/Florida State University

Key Drivers of Fare Evasion in Metro Systems: Evidence from Athens, Greece (20-00340) - B413

Christina Milioti/National Technical University of Athens (NTUA), Aggelos Panoutsopoulos/National Technical University of Athens (NTUA), Konstantinos Kepaptsoglou/National Technical University of Athens (NTUA), Yannis Tyrinopoulos/National Technical University of Athens (NTUA)

Public Transport Users' Valuation and Willingness-to-Pay for a Multi-Regional and Multi-Operator Integrated Ticketing System (20-02766) - B423

Ilyas Alhassan/University of Leeds Institute for Transport Studies, Bryan Matthews/University of Leeds Institute for Transport Studies, Jeremy Toner/University of Leeds Institute for Transport Studies, Yusak Susilo/University of Leeds Institute for Transport Studies

Operational Design for a Real-Time Flexible Transit System Under Passengers' Demands and Willingness to Pay (20-01833) - B424

Mingyang Pei/South China University of Technology, Peiqun Lin/South China University of Technology, Jun Du/South China University of Technology

Advancing Public Transit Perspectives: Attitudes, Information, and Interventions
Dea van Lierop, Universiteit Utrecht, presiding
Sponsored By Standing Committee on Public Transportation Marketing and Fare Policy

Passengers provide an important perspective on public transit services. This session will consider a variety of passenger-related topics pertaining to quality of service, customer satisfaction, and the desire to use public transit. Additionally, information provision and interventions to encourage transit use will be discussed.

Modeling the Desire for Using Public Transport (20-00705) - B429
E. Owen Waygood/Ecole Polytechnique de Montreal, Jonas De Vos/Ecole Polytechnique de Montreal, Laurence Letarte/Ecole Polytechnique de Montreal
Frequent Transit Riders, Mode Choice, and Values: How Can We Design and Evaluate Interventions to Encourage More Consistent Transit Use Among Existing Riders? (20-05063) - B427
Monisha Reginald/Massachusetts Department of Transportation , Alissa Zimmer/Massachusetts Department of Transportation, Anna Gartsman/Massachusetts Department of Transportation
The Role of Timetable, Rolling Stock Rescheduling and Information Strategies to Passengers in Public Transport Disruptions (20-00574) - B428
Nuannuan Leng/ETH Zurich, Zhengwen Liao/ETH Zurich, Francesco Corman/ETH Zurich

Recent Research in Intermodal Freight Transport
Jolene Hayes, Fehr & Peers, presiding
Sponsored By Standing Committee on Intermodal Freight Transport

Reefers on Rails: Investigating User Perceptions and Technological Prospects (20-00518) - B380
Bob Castelein/Erasmus University Rotterdam, Harry Geerlings/Erasmus University Rotterdam, Ron van Duin/Erasmus University Rotterdam
Model for Collaboration Among Carriers in Domestic Intermodal Freight Transport (20-02790) - B381
Majbah Uddin/Oak Ridge National Laboratory, Nathan Huynh/Oak Ridge National Laboratory
A European Multimodal Freight Model Accounting for Under-Performing Countries (20-03595) - B382
Paraskevas Nikolaou/University of Cyprus, Loukas Dimitriou/University of Cyprus
Intermodal Freight Network Design Model Considering Emission Levels and Time Constraints (20-05199) - B38 3
Panagiota Goulianou/Florida Atlantic University, Anastasios Charisis/Florida Atlantic University, Dan Liu/Florida Atlantic University, Evangelos Kaisar/Florida Atlantic University, Mihalis Golias/Florida Atlantic University

Contemporary Issues in Intermodal Freight Terminal Design and Operations
Nathan Huynh, University of South Carolina, presiding
Sponsored By Standing Committee on Intermodal Freight Terminal Design and Operations

Countermeasures for Reducing Truck Congestion at Marine Terminals (20-00804) - B384
Yi Qi/Texas Southern University, Hasin Jinna/Texas Southern University, Qun Zhao/Texas Southern University, Mehdi Azimi/Texas Southern University, Tao Tao/Texas Southern University
A Practical Model for Inbound Container Distribution Organization in Rail-Water Transhipping Terminal (20-017 80) - B385
JIAHAO ZHAO/Beijing Jiaotong University, Xiaoning Zhu/Beijing Jiaotong University, Li Wang/Beijing Jiaotong University, Bin Ran/Beijing Jiaotong University

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 152A
Transportation Combatting Human Trafficking
Maha Alkhateeb, Office of the Secretary of Transportation (OST), presiding
Julie Abraham, Office of the Secretary of Transportation (OST), presiding
Sponsored By Standing Committee on Women's Issues in Transportation, Task Force on Transit Safety and Security

The Transportation Combating Human Trafficking lectern session sponsored by the TRB's Standing Committee on Women's Issues in Transportation (ABE70) will be comprised of panelists representing DOT, research, hotlines, states, and multimodal organizations. Panelists will underscore the important role of transportation stakeholders in combating human trafficking, highlighting immediate, actionable steps all stakeholders can take to help combat this crime. DOT will underscore actions the Department is taking on the issue of human trafficking, including implementation of recommendations made by the Department's Advisory Committee on Human Trafficking (ACHT). The question and answer session will emphasize gaps and opportunities in counter-trafficking research within the transportation sector, and invite audience input. The panel is particularly timely as January is National Human Trafficking Prevention and Awareness month, and 2020 is the 20th anniversary of the passage of Trafficking Victims Protection Act, the landmark legislation on human trafficking.

State DOT Contributions to the Study, Investigation, and Interdiction of Human Trafficking (P20-21837)
Chris Baglin/No Organization
Human Trafficking Discussion Panelists (P20-21838)
Shannon Eggleston/American Association of State Highway and Transportation Officials, Hillary Konczal/Metra, Chad Aldridge/Port of Seattle, Caroline Diemar/Polaris

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 154
Vehicle Adoption in Developing Countries: Electrification and 2- to 4-Wheelers
V. Setty Pendakur, Pacific Policy and Planning Associates, presiding
Sponsored By Standing Committee on Transportation in the Developing Countries

Understanding Motorcycle Full Ban Policy's Personal and Societal Impacts in China (20-00364)
Yuntao Guo/University of Hawaii, Jian Wang/University of Hawaii, Srinivas Peeta/University of Hawaii, Panagiotis Anastasopoulos/University of Hawaii
The Evolutionary Path of Automobility in BRICS Countries (20-00929)
Stefan Seum/German Aerospace Center, Angelika Schulz/German Aerospace Center, Tobias Kuhnimhof/German Aerospace Center
To E-Bike or Not to E-Bike?: Application of a Small-Size Chinese City (20-01128)
Yang Hu/Utrecht University, Anae Sobhani/Utrecht University, Dick Ettema/Utrecht University
India's Approach to Electric Mobility (20-03871)
Om Agarwal/World Resources Institute - India, Neha Yadav/World Resources Institute - India

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 150B
Moving Transportation Safety Research into Practice
Susan Herbel, SBH Consult, presiding
Stacy Williams, University of Arkansas, Fayetteville, presiding
Sponsored By Standing Committee on Technology Transfer, Standing Committee on Transportation Safety Management Systems

A primary goal for completed transportation research is to have the knowledge gained implemented to successfully address real-world transportation challenges. The Technology Transfer Committee (ABG30) will collaborate with the Transportation Safety Management Committee (ANB10) on a session that will focus on strategies to implement current research. The session will feature three presentations, followed by a panel discussion. Panel members will offer suggestions for next steps toward effective implementation within the context of each topic. Audience participation is encouraged.

(continued)

Does News Coverage of Traffic Crashes Affect Perceived Blame and Preferred Solutions?: Evidence from an Experiment (20-03189)
Tara Goddard/Texas A&M University, Kelcie Ralph/Texas A&M University, Calvin Thigpen/Texas A&M University, Evan Iacobucci/Texas A&M University
Roadway Safety Management in Small Municipalities (20-04134)
Boris Claros/University of Wisconsin, Madison, Madhav Chitturi/University of Wisconsin, Madison, Andrea Bill/University of Wisconsin, Madison, David Noyce/University of Wisconsin, Madison
Incorporating Vulnerable Road User Safety into the Transportation Asset Management Decision-Making Process to Mitigate Pedestrian Fatalities (20-03668)
Carlos Chang Albitres/University of Texas, El Paso, Marketa Vavrova/University of Texas, El Paso, Edgar Rodriguez/University of Texas, El Paso

1703

Travel Data Users' Forum: Mobility Data Specification: A Collaborative Solution to Sharing Private Mobility Data
Jim Hubbell, StreetLight Data, presiding
Sponsored By Standing Committee on Urban Transportation Data and Information Systems

 Private mobility providers have always played an important role in the overall transportation system. In the past few years, an explosion of new mobility modes and concepts have radically altered the urban transportation landscape. Amidst all this rapid change, a beacon of hope and stability has emerged: the Mobility Data Specification (MDS). Similar to a common language, the MDS gives cities a tool to actively manage private mobility providers and the public right-of-way. MDS allows cities to collect valuable insights through a shared data vocabulary and to communicate directly with product companies in real time using code. Come ready to ask questions and share your own stories!

Keynote (P20-20631)
Jamie Parks/San Francisco Municipal Transportation Agency
Viewpoint 1 (P20-20635)
Beaudry Kock/Spin
Viewpoint 2 (P20-20636)
Annie Chang/SAE International
Viewpoint 3 (P20-20638)
Rolf Schmitt/OST-R/Bureau of Transportation Statistics

1704

Best of Papers Submitted to Committees on Geographic Information Science and Applications (ABJ60) and Statewide Transportation Data and Information Systems (ABJ20)
Pedro Camargo, AequilibraE, presiding
Sponsored By Standing Committee on Geographic Information Science and Applications, Standing Committee on Statewide Transportation Data and Information Systems

 This hybrid session highlights the best papers presented to the Committees on Geographic Information Science and Applications (ABJ60) and Statewide Transportation Data and Information Systems (ABJ20) for review. The format combines lightning talk presentations coupled with a follow-up poster session with the individual speakers within the same room for more in-depth discussions.

Private Car Versus Public Transit: Spatiotemporal Variations of Travel Time in Cities Using Emerging Data Sources (20-00639)
Yuan Liao/Chalmers tekniska högskola, Jorge Gil/Chalmers tekniska högskola, Rafael Pereira/Chalmers tekniska högskola, Sonia Yeh/Chalmers tekniska högskola, Vilhelm Verendel/Chalmers tekniska högskola
Detecting Travel Mode from GPS Data with a Bottom-Up Method (20-01700)
Yang Zhou/Tongji University, Chao Yang/Tongji University, Xiangdong Xu/Tongji University, Satish Ukkusuri/Tongji University

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Online Map Matching Based on Higher-Order Hidden Markov Model (20-01847)
Xiao Fu/Southeast University, Jiaxu Zhang/Southeast University, Yue Zhang/Southeast University, Biyu Chen/Southeast University, Zhiyuan Liu/Southeast University

User Activity and Trip Recognition Using Spatial Positioning System Data by Integrating the Geohash and GIS Approaches (20-03983)
Hafez Irshaid/General Motors Company, MD Mehedi Hasan/General Motors Company, Raed Hasan/General Motors Company, Jun-Seok Oh/General Motors Company

Planimetric Spatial Data and the Provision of Sidewalk Infrastructure in Cities (20-04278)
Nicholas Coppola/University of Colorado Denver - Anschutz Medical Campus, Wesley Marshall/University of Colorado Denver - Anschutz Medical Campus

Development of a Large-Scale Horizontal Curve Inventory for Safety Analysis Using Open GIS Data (20-06080)
Yuhao Wang/University of Massachusetts, Amherst, Chengbo Ai/University of Massachusetts, Amherst, Shi Qiu/University of Massachusetts, Amherst

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1706

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 102B
Innovations in Data Visualization
Charles Lattimer, Atkins, presiding
Sponsored By Standing Committee on Visualization in Transportation

A Web-Based Data Visualization Platform for MATSim (20-01500)
William Charlton/Technische Universitat Berlin, Janek Laudan/Technische Universitat Berlin

Mining and Visualizing Traffic Sensor Data: A Joint Analysis of Clustering and Transitions Probabilities (20-01670)
Alexander Paz/Queensland University of Technology, Carlos Gaviria/Queensland University of Technology, Cristian Arteaga/Queensland University of Technology, Smit Thakkar/Queensland University of Technology, Douglas Baker/Queensland University of Technology

Traffic Management System Data Visualization for Behavioral Understanding of Signal Operations Under Emergency Vehicle Preemption (20-01903)
Chaitrali Shirke/Queensland University of Technology, Nidhi Rajput/Queensland University of Technology, Ashish Bhaskar/Queensland University of Technology, Manu Hingorani/Queensland University of Technology

Cycling Behavior in Virtual Reality: A Comparison Between Keyboard Controlled and Instrumented Bicycle Experiments (20-05968)
Martyna Bogacz/University of Leeds Institute for Transport Studies, Chiara Calastri/University of Leeds Institute for Transport Studies, Charisma Choudhury/University of Leeds Institute for Transport Studies, Stephane Hess/University of Leeds Institute for Transport Studies, Alex Erath/University of Leeds Institute for Transport Studies, Michael van Eggermond/University of Leeds Institute for Transport Studies, Faisal Mushtaq/University of Leeds Institute for Transport Studies, Muhammad Awais/University of Leeds Institute for Transport Studies

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1707

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 151A
Keeping Our Nation's Transportation Assets Secure from Cyber Attacks
C Douglass Couto, Independent Consultant, presiding
Sponsored By Standing Committee on Critical Transportation Infrastructure Protection, Standing Committee on Information Systems and Technology, Standing Committee on Intelligent Transportation Systems

This session will examine what tools are available to assist transportation leaders in assessing, identifying and mitigating cybersecurity threats and attacks against critical transportation assets and systems. As we automate and adopt to a world of sensors, big data, improved connectivity, digital cities, connected vehicles, and grater mobility there is an increasing risk from those who wish to play havoc with or totally disrupt our transportation systems. The good news is there are more tools and best practices being created to combat this growing threat. This session will discuss these tools, policies, and where to go for assistance before, during or after an attack.

Cybersecurity as Part of Our Planning Processes and Operations (P20-20928)
Brian Kelley/Ohio Turnpike and Infrastructure Commission
There's Safety in the Clouds (P20-20929)
Marty Provost/Info Tech, Inc.

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Mitigating the Cybersecurity Risks Associated with Deploying Connected Vehicles (P20-21449)
Steve Sill/Federal Highway Administration (FHWA)
Keeping Our Company and Our Customers Secure (P20-21900)
Stephen Haag/HNTB Corporation

1708   CM (1.75)

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 145A
Travel Modeling Techniques
Rachel Copperman, Cambridge Systematics, Inc., presiding
Sponsored By Standing Committee on Transportation Demand Forecasting

Addressing Endogeneity in Strategic Mode Choice Models (20-01631)
Thomas Guerrero-Barbosa/Universidad Francisco de Paula Santander Ocaña, Angelo Guevara/Universidad Francisco de Paula Santander Ocaña, Juan Ortúzar/Universidad Francisco de Paula Santander Ocaña, Elisabetta Cherchi/Universidad Francisco de Paula Santander Ocaña
A Machine Learning Approach to Censored Bikesharing Demand Modeling (20-00718)
Daniele Gammelli/Danmarks Tekniske Universitet, Filipe Rodrigues/Danmarks Tekniske Universitet, Dario Pacino/Danmarks Tekniske Universitet, Haci Kurtaran/Danmarks Tekniske Universitet, Francisco Pereira/Danmarks Tekniske Universitet
Choice Models with Stochastic Variables and Random Coefficients: Application to Disentangle Variability in Network Travel Times from Travelers' Taste Heterogeneity (20-02789)
Abdul Pinjari/Indian Institute of Science, Mehek Biswas/Indian Institute of Science, Sulagna Ghosh/Indian Institute of Science
Discussants (P20-20895)
Michael Maness/University of South Florida, Josephine Kressner/Transport Foundry, John Gliebe/Cambridge Systematics, Inc.

1709

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 146A
What's Hot with State DOTs
Melissa Savage, American Association of State Highway and Transportation Officials, presiding
Sponsored By Standing Committee on Environmental Analysis in Transportation

This session will provide an opportunity for attendees to hear the latest from state DOT practitioners about some of the innovative solutions they employ in the environmental process.

Hot Issues in Washington State (P20-20665)
Karin Landsberg/Washington State Department of Transportation
Recreation Area Issues (P20-20666)
Carissa Watanabe/Utah Department of Transportation
Innovative Solutions: What's Hot in State DOT Environmental Programs (P20-20667)
Carlos Swonke/Texas Department of Transportation
NEPA Assignment (P20-20669)
Kris Gade/Arizona Department of Transportation
Maryland DOT Perspective (P20-21697)
Colleen Turner/Maryland Department of Transportation

1710

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 140A
Advances in Emissions and Air Quality Analysis
Gregory Rowangould, University of Vermont, presiding
Sponsored By Standing Committee on Transportation and Air Quality

Innovations in modeling and measuring motor vehicle emissions and traffic-related air pollution, including the use of machine learning techniques and drones

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A Machine Learning Approach for Predicting Near-Road Ultrafine Particle Concentrations Using Local Traffic Characteristics (20-01031)
Junshi Xu/University of Toronto, An Wang/University of Toronto, Nicole Schmidt/University of Toronto, Matthew Adams/University of Toronto, Marianne Hatzopoulou/University of Toronto
Development of Roadway Link Screening Model for Regional-Level, Near-Road Air Quality Analysis: A Case Study for Particulate Matter (20-03022)
Daejin Kim/Georgia Institute of Technology (Georgia Tech), Haobing Liu/Georgia Institute of Technology (Georgia Tech), Michael Rodgers/Georgia Institute of Technology (Georgia Tech), Randall Guensler/Georgia Institute of Technology (Georgia Tech)
Estimating Light-Duty Vehicle Emission Factors Using Random Forest Regression Model with Pavement Roughness (20-06058)
Fengxiang Qiao/Texas Southern University, Mahreen Nabi/Texas Southern University, Lei Yu/Texas Southern University
Evaluation of the Precision and Accuracy of Cycle Average Light Duty Gasoline Vehicles Tailpipe Emission Rates Predicted by Modal Models (20-04673)
Tongchuan Wei/North Carolina State University, H. Christopher Frey/North Carolina State University
Investigating Spatio-Temporal Variations of Pollutants (PM, CO, VOC) at the Urban Roadside of Shanghai Using an Unmanned Aerial Vehicle Platform (20-02783)
Tie Zheng/Shanghai Jiao Tong University, Si-Yu Li/Shanghai Jiao Tong University
Vertical and Horizontal Profiles of Particulate Matter and BC Near Elevated Highway Based on Unmanned Aerial Vehicle Monitoring (20-02747)
Rong Cao/Shanghai Jiao Tong University, Bai Li/Shanghai Jiao Tong University, Zhongren Peng/Shanghai Jiao Tong University, Hong-Di He/Shanghai Jiao Tong University

1711

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 140B
Transportation Equity Analysis
Steven Farber, University of Toronto, presiding
Michael Smart, Rutgers, The State University of New Jersey, presiding
Sponsored By Standing Committee on Social and Economic Factors of Transportation

Transportation Equity, Education Equity, and School Choice: Making the Connections (20-01570)
Ariel Bierbaum/University of Texas, Austin, Alex Karner/University of Texas, Austin, Jesus Barajas/University of Texas, Austin
Suburbanization of Poverty and Changes in Transit Accessibility Over Time (20-01966)
Chang Liu/North Carolina State University, Eleni Bardaka/North Carolina State University
Exploring the Accessibility Gap: Quantifying Transport Disadvantage in the City of Toronto (20-03919)
Janelle Lee/University of Waterloo, Jeffrey Casello/University of Waterloo, Jennifer Dean/University of Waterloo
Planning Transport for Social Inclusion: An Accessibility-Activity Participation Approach (20-00619)
Jeff Allen/University of Toronto, Steven Farber/University of Toronto

1712

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 202B
Seismic Bridge Engineer: Historic Perspective
Elmer Marx, Alaska Department of Transportation and Public Facilities, presiding
Sponsored By Standing Committee on Seismic Design and Performance of Bridges

In commemoration of TRB's first century, this session will focus on the history and development of modern seismic analysis and design practice.

Lessons Learned from Historic Seismic Events (P20-20399)
Ian Buckle/University of Nevada, Reno
Historic Development of Seismic Hazards (P20-20400)
Nicolas Luco/U.S. Geological Survey
Historic Development of Seismic Code Provisions (P20-20401)
Roy Imbsen/Imbsen Consulting

1713

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 207B
Buried Pipes: High-Density Polyethylene Pipe, Gasket Deterioration, and Concrete Box Structures
Jesse Beaver, Simpson Gumpertz & Heger, Inc., presiding
Sponsored By Standing Committee on Culverts, Buried Bridges, and Hydraulic Structures, Standing Committee on Resource Conservation and Recovery, Standing Committee on Subsurface Soil-Structure Interaction

This session provides state of practice research related to axial pullout force on plastic pipes due to ground movement, a degradation model for the tensile strength of PVC and ribber gaskets, installation of a double box bridge, and investigation of the dynamic amplification factor for concrete box culverts.

Installing Double Box Bridge Under CN Railroad with Limited Timeframe: A Case Study (20-02933)
Imad Aleithawe/Waggoner Eng
A Degradation Model for the Tensile Strength of PVC and Rubber Gasket Materials Exposed to Benzene and PCE Saturated Aqueous Solutions (20-03237)
Payam Hosseini/North Carolina State University, Sultan Alhomair/North Carolina State University, Zahra Faeli/North Carolina State University, Mohammad Pour-Ghaz/North Carolina State University, Mohammed Gabr/North Carolina State University, Detlef Knappe/North Carolina State University, Cyrus Parker/North Carolina State University
Investigation of Dynamic Amplification Factor for Concrete Box Culverts Through Finite Element Modeling (20-04049)
Andrew Wells/University of Delaware, Kalehiwot Manahiloh/University of Delaware, Harry Shenton III/University of Delaware
Axial Pullout Force on Buried Medium Density Polyethylene Pipelines Subjected to Relative Ground Movement (20-04021)
Abu Muntakim/Memorial University of New Foundland, Ashutosh Dhar/Memorial University of New Foundland

1714

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 201
Performance-Engineered Asphalt Mixture Designs
Thomas Bennert, Rutgers, The State University of New Jersey, presiding
Nathan Morian, Nevada Department of Transportation, presiding
Sponsored By Standing Committee on Structural Requirements of Asphalt Mixtures

Evaluation of Scb/I-Fit Testing for Implementation into Performance Engineered Asphalt Mixture Design in Arkansas (20-04675)
Kevin Hall/University of Arkansas, Fayetteville, Nathan Parnell/University of Arkansas, Fayetteville, Elvis Castillo-Camarena/University of Arkansas, Fayetteville
Validation of Hamburg Performance Testing Correlated to Field Performance Rutting Data and Development of a Data-Driven Case for Balanced Mix Design (20-04229)
Ashley Buss/Iowa State University, Kai Xin/Iowa State University, Scott Schram/Iowa State University
Development of Rutting Index Parameter Based on Stress Sweep Rutting Test and Permanent Deformation Shift Model (20-01362)
Amir Ghanbari/North Carolina State University, B. Shane Underwood/North Carolina State University, Youngsoo Kim/North Carolina State University
Developing Performance-Based Specifications for Asphalt Mixture Design in Oregon (20-00231)
Shashwath Sreedhar/GeoDesign, Inc., Erdem Coleri/GeoDesign, Inc., Ihsan Obaid/GeoDesign, Inc.

1715

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 202A
Concretes with Fly Ash and Rubber
Darin Hodges, South Dakota Department of Transportation, presiding
Sponsored By Standing Committee on Properties of Concrete

(continued)

Mechanical Properties of High Early Strength Class C Fly Ash-Based Alkali Activated Concrete (20-05426)

Eslam Gomaa/Missouri University of Science and Technology, Simon Sargon/Missouri University of Science and Technology, Cedric Kashosi/Missouri University of Science and Technology, Ahmed Gheni/Missouri University of Science and Technology, Mohamed ElGawady/Missouri University of Science and Technology

Fracture Properties and Restrained Shrinkage Cracking Resistance of Cement Mortar Reinforced by Recycled Steel Fiber from Scrap Tires (20-05357)

Xijun Shi/Texas A&M University, Leonardo Brescia-Norambuena/Texas A&M University, Zachary Grasley/Texas A&M University, Joshua Hogancamp/Texas A&M University

Preparation and Properties of Engineered Cementitious Composites Incorporating a High Volume of Fly Ash (20-03765)

Shuyin Wu/Southeast University, Jun Yang/Southeast University, Ruochong Yang/Southeast University, Jipeng Zhu/Southeast University

Beneficial Use of Recovered Fiber Rubber from Waste Tires in Concrete: Mechanical Characterizations (20-01324)

Jianying Hu/Southeast University, Jielun Gu/Southeast University, Igor Rodrigues de Lima/Southeast University, Rodrigo Schossler/Southeast University, Xiong Yu/Southeast University, Tao Ma/Southeast University

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1716

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 101
Advances in Automation, Real-Time Prediction, and Vehicle to Infrastructure (V2I) Applications
Renee Ray, Conduent, presiding
Sponsored By Standing Committee on Intelligent Transportation Systems

Automatic Detection and Reporting of Congestion and Interference in the 5.9 GHz DSRC Band (20-06083)

Hamed Noori/University of British Columbia, Amith Khandakar/University of British Columbia, Ruizhan Shen/University of British Columbia, Lorena de Geuser/University of British Columbia, David Michelson/University of British Columbia

Real-Time Predictive Control Strategy Optimization (20-02153)

Samarth Gupta/Singapore-MIT Alliance, Ravi Seshadri/Singapore-MIT Alliance, Bilge Atasoy/Singapore-MIT Alliance, Arun Akkinepally/Singapore-MIT Alliance, Francisco Pereira/Singapore-MIT Alliance, Gary Tan/Singapore-MIT Alliance, Moshe Ben-Akiva/Singapore-MIT Alliance

Receding Horizon Platoon Trajectory Planning of Cooperative Vehicles on Corridor (20-02884)

Meiqi Liu/Delft University of Technology, Meng Wang/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

A Vendor-Independent Reliability Testing Model for Vehicle-to-Infrastructure Communications (20-04003)

Fatma Elzahraa Madkour/University of Idaho, Umair Mohammad/University of Idaho, Sameh Sorour/University of Idaho, Mohamed Hefeida/University of Idaho, Ahmed Abdel-Rahim/University of Idaho

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1717

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Salon B
Novel Methods in Simulation
Robert Bertini, USF Center for Urban Transportation Research, presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

Calibration of Microsimulation Model for Heterogeneous Traffic Using Mode-Specific Performance Measures (20-00162)

Kinjal Bhattacharyya/Indian Institute of Technology Kharagpur, Bhargab Maitra/Indian Institute of Technology Kharagpur, Manfred Boltze/Indian Institute of Technology Kharagpur

Enhanced MFC: Introducing Dynamics of Electrified Vehicles for Free Flow Microsimulation Modeling (20-02155)

Yinglong He/European Commission, Michail Makridis/European Commission, Konstantinos Mattas/European Commission, Georgios Fontaras/European Commission, Biagio Ciuffo/European Commission, Hongming Xu/European Commission

Continuous First Order Signalized Node Models in Dynamic Macroscopic Simulation of Traffic Flows (20-02420)

Raheleh Yahyamozdarani/Katholieke Universiteit Leuven, Willem Himpe/Katholieke Universiteit Leuven, Chris Tampere/Katholieke Universiteit Leuven

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A Calibration Framework for Simulation Tools to Manage Uncertain Future Conditions (20-02471)
Moein Hosseini/Northwestern University, Hani Mahmassani/Northwestern University, David Hale/Northwestern University
Applying Bayesian Optimization for Calibration of Transportation Simulation Models (20-04245)
Di Sha/New York University Tandon School of Engineering, Kaan Ozbay/New York University Tandon School of Engineering, Yue Ding/New York University Tandon School of Engineering

1718

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 207A
Panel Discussion on Collecting and Managing Vegetation Assets on the Roadway
Scott Lucas, Ohio Department of Transportation, presiding
Raymond Willard, Washington State Department of Transportation, presiding
John LeFante, DBI Services, Inc., presiding
Sponsored By Standing Committee on Roadside Maintenance Operations

Asset management is an expanding field. By gathering information on desirable vegetation on the right-of-way, you can assign it a value and determine a maintenance schedule. Assets can also be protected and be considered when planning new construction projects. The panel will discuss different ways they use asset management in their operation.

Panel Discussion on Collecting and Managing Vegetation Assets on the Roadway (P20-20936)
John LeFante/DBI Services, Inc., Raymond Willard/Washington State Department of Transportation, Scott Lucas/Ohio Department of Transportation

1719

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 206
Hyperloop: Commuter Dream or Regulatory Nightmare?
Ian Williams, University of Michigan, Ann Arbor, presiding
Sponsored By Standing Committee on Emerging Technology Law

While still in the early stages of development, Hyperloop, a proposed high-speed transit system, could significantly alter how people move between cities. Its potential has captured imaginations with enticing promises of turning day-long drives into breezy 30 minute commutes. But how far away is that potential future, and what legal and regulatory challenges does it face? Panelists will discuss both the potential of this emerging technology, the barriers to its deployment, and the legal and regulatory issues it could create.

Panel Discussion (P20-21195)
Mary Herman/Hyperloop One, Andrew Smith/First Rule, Thea Walsh/Mid-Ohio Regional Planning Commission, Michael Morris/North Central Texas Council of Governments, Bryant Walker Smith/University of South Carolina

1720

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Salon A
Intersections Among Safety, Speed, Design, and Decarbonization
John Milton, Washington State Department of Transportation, presiding
Sponsored By Section - Safety

Toward More Comprehensive Evaluation of Traffic Risks and Safety Strategies (P20-21325)
Todd Litman/Victoria Transport Policy Institute
Speed Reduction, CO2 Emissions, and Latest Crash and Safety Research (P20-21326)
Stephen Perkins/International Transport Forum
Intersection Design for Walking Safety and Vision Zero (P20-21327)
Seleta Reynolds/City of Los Angeles Department of Transportation
Impacts of the Reduction of Speed Limits on Speed Practiced, Accidents Rates, Variations in Travel Time, and Effects on the Environment (P20-21329)
Marine Millot/Cerema
The New PIARC Safety Manual (P20-21330)
John Milton/Washington State Department of Transportation

1721

Highway Safety Performance Research
Karen Dixon, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Highway Safety Performance

Explaining Crash Modification Factors: A Case Study (20-00625)
Gary Davis/University of Minnesota, Twin Cities
Diagnostics Revisited (20-00351)
Jake Kononov/DiExSys, LLC, James Williams/DiExSys, LLC, Catherine Durso/DiExSys, LLC
Safety Evaluation of Median U-Turn Crossover-Based Intersections (20-01603)
Ma'en Al-Omari/University of Central Florida, Mohamed Abdel-Aty/University of Central Florida, Jaeyoung Lee/University of Central Florida, Lishengsa Yue/University of Central Florida, Ahmed Abdelrahman/University of Central Florida
Safety Performance of One-Way Arterials (20-04363)
Srinivas Geedipally/Texas A&M Transportation Institute, Dominique Lord/Texas A&M Transportation Institute, Michael Pratt/Texas A&M Transportation Institute, Kay Fitzpatrick/Texas A&M Transportation Institute, Eun Sug Park/Texas A&M Transportation Institute

1722

Transit Quality of Service: Perspectives on Crowding, Frequency, and Passenger Perceptions
P.S. Sriraj, University of Illinois, Chicago, presiding
Sponsored By Standing Committee on Transit Capacity and Quality of Service

The Transit Capacity and Quality of Service Manual (3rd edition, TCRP Report 165) provides a quality of service framework based on aspects of transit availability (frequency, service span, and access) and transit comfort and convenience (passenger loads, reliability, and travel time). The papers in this session deal with various quality of service issues. One of the four papers in this session focuses on access to rail transit in crowded conditions, an additional two papers address the frequency of bus service, and a fourth paper examines passengers' perceived quality of bus service.

Evaluating the Dynamic Accessibility of Metro Systems Under Oversaturated Conditions (20-04608)
Wei Li/Shenzhen Technology University, Qin Luo/Shenzhen Technology University
On Ridership and Frequency (20-00461)
Simon Berrebi/Georgia Institute of Technology (Georgia Tech), Taylor Gibbs/Georgia Institute of Technology (Georgia Tech), Sanskruti Joshi/Georgia Institute of Technology (Georgia Tech), Kari Watkins/Georgia Institute of Technology (Georgia Tech)
Frequency Optimization Models for Reducing Overcrowding Discomfort (20-00953)
Kinshuk Agrawal/Indian Institute of Technology, Delhi, Hemant Suman/Indian Institute of Technology, Delhi, Nomesh Bolia/Indian Institute of Technology, Delhi
The Perceived Quality from Bus Transit Service: A Route-Level Analysis (20-00772)
Connor Nikel/McMaster University, Gamal Eldeeb/McMaster University, Moataz Mohamed/McMaster University

1723

Examination of Transit Bus Crash Contributors and Relational Aspects of Transit Operations
Lisa Staes, USF Center for Urban Transportation Research, presiding
Sponsored By Task Force on Transit Safety and Security

The Influence of Lane Width on Bus Crashes (20-00715)
Boya Dai/Texas A&M Transportation Institute, Joan Hudson/Texas A&M Transportation Institute, Ben Ettelman/Texas A&M Transportation Institute, Eun Sug Park/Texas A&M Transportation Institute
Impact of Bus Routes on Crash Frequency in Metropolitan Areas (20-02262)
Renato Guadamuz/Pennsylvania State University, Vikash Gayah/Pennsylvania State University, Rajesh Paleti/Pennsylvania State University

(continued)

Operational Characteristics of a Bus Service and Their Modification Due to a Safety-Driven Acceleration Limit (20-01738)

Konstantinos Gkiotsalitis/University of Twente, Xenia Karekla/University of Twente

Exploring the Relationship Between Operational Characteristics and the Safety Performance: An Application of Hurdle Model with Random Effects (20-03721)

Jianrong Qiu/Monash University, David Logan/Monash University, Jennifer Oxley/Monash University, Christopher Lowe/Monash University

1724 CM (1.75)

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 146B
Design Impacts on the Human Experience in Transportation Environments
Charles Rivasplata, San Jose State University, presiding
Sponsored By Standing Committee on Passenger Intermodal Facilities, Art and Design Excellence in Transportation Subcommittee, AP045(1), Standing Committee on Landscape and Environmental Design

Come explore the diverse aspects of place-making for stations- sound-scapes, park and rides, and challenges in adapting for demand- thought-provoking, enlightening, with time for questions and answers.

Sound Design in Transportation Environments (P20-20826)
Elizabeth Valmont/Arup USA
Marginal Impacts of Park-and-Ride Facilities in the Twin Cities (20-00850)
Michael Duncan/Florida State University
Demand-Adaptive Transit Design for Urban Transportation Hubs (20-01285)
Xinwu Qian/Purdue University, Jiawei Xue/Purdue University, Zengxiang Lei/Purdue University, Juan Suarez/Purdue University, Satish Ukkusuri/Purdue University

1725 CM (1.75)

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 150A
National Freight Research, Methods, and Tools to Understand Freight Transportation, Part 2 (Part 1, Session 1681)
Birat Pandey, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Intermodal Freight Transport, Standing Committee on Freight Transportation Planning and Logistics, Standing Committee on Truck Size and Weight, Standing Committee on Trucking Industry Research, Standing Committee on Urban Freight Transportation

The purpose of this session is to help advance state of freight transportation practice by disseminating and receiving user's feedback on latest available national resources on freight research , data sets, tools and plans. The session will focus on learning from FAST act compliant state freight plans , latest freight research, data, available tools that FHWA has been developing for the past couple of years. These tools addresses the current and upcoming needs of freight transportation programs around the country.

Opening and Presenter Introduction (P20-21561)
Birat Pandey/Federal Highway Administration (FHWA)
Truck Parking Data and Planning (P20-21562)
Jeffrey Purdy/Federal Highway Administration (FHWA)
Freight Truck Estimates from FAF Assignment (P20-21563)
Birat Pandey/Federal Highway Administration (FHWA), Howard Slavin/Caliper Corporation
Converting FAF Commodity Tonnage into Truck (P20-21564)
Birat Pandey/Federal Highway Administration (FHWA), Krishnan Viswanathan/Cambridge Systematics, Inc.
Special Small Area Tabulation (P20-21566)
Chester Ford/OST-R/Bureau of Transportation Statistics
National Freight Model (P20-21567)
Vidya Mysore/Federal Highway Administration (FHWA), Maren Outwater/RSG
Future Freight and Logistics Survey (P20-21568)
Birat Pandey/Federal Highway Administration (FHWA), Peiyu Jing/Massachusetts Institute of Technology (MIT)
Facilitated Discussion (P20-21569)
Alisa Fine/OST-R/Volpe Center, Laura Black/OST-R/Volpe Center

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Closing and Next Steps (P20-21571)
Vidya Mysore/Federal Highway Administration (FHWA)

1726   CM (1.75)

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 143B
A Look Back on a Century of Aviation System Planning: Accomplishments, Lessons, and Its Meaning for the Future
Chris Groh, Kutchins & Groh, LLC, presiding
Sponsored By Standing Committee on Aviation System Planning, Aviation Group, Standing Committee on Intergovernmental Relations in Aviation, Standing Committee on Environmental Impacts of Aviation

An assessment of the past is typically the first phase of any planning exercise. While the aviation industry struggles and debates on how to plan for the next century, this panel will first answer the question "how did we get here?" by looking back on the previous century. Topics include the history of airport planning, the evolving role of general aviation operations and airports, and how the passenger experience was crafted during the "golden age of travel." Trends from yesteryear will be compared with tomorrow's promise of the future to reveal how these new innovative ideas are being recycled and what can learn from our past. As Maya Angelou is credited saying: "You can't really know where you are going until you know where you have been."

From Grass Pastures to Galactic Spaceports: The Evolution of Airport Planning (P20-20285)
David Byers/Quadrex Aviation LLC
The Postwar Vision of an Airpark in Every Community (P20-20286)
Theresa Kraus/Federal Aviation Administration (FAA)
Airports, Airlines, and the Passenger Experience (P20-20287)
Daniel Rust/University of Wisconsin, Superior
The Future of Airport Planning: What's Old Is New Again (P20-20320)
Chris Groh/Kutchins & Groh, LLC

1727

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, 143A
The Far Future: Forecasting, Disruptive Technology, and Infrastructure Needs
Roger Schaufele, Federal Aviation Administration (FAA), presiding
Sponsored By Standing Committee on Aviation Economics and Forecasting, Standing Committee on Airfield and Airspace Capacity and Delay

Forecasting Transportation Energy Demand (P20-20239)
Robert Spicer/BP PLC
Industry Perspective (P20-20240)
Danielle Rinsler/Uber Technologies Inc.
Using Socioeconomic Data in Air Passenger Demand Forecasting (P20-20241)
Geoffrey Gosling/Aviation System Consulting, LLC
Future of ATC (P20-20242)
Dennis Sawyer/MITRE Corporation

1737

TRB: Our History and Our Future
Katie Turnbull, Texas A&M Transportation Institute, presiding
Sponsored By Executive Committee

Panelists in this session will discuss The Transportation Research Board , 1920-2020: Everyone Interested is Invited , which chronicles the events that shaped TRB as well as the people that purposely designed , carefully constructed, and devotedly maintained the entity that is now TRB. Panelists will respond to questions, providing their perspectives of the key events and activities in TRB's history that makes TRB what it is today and why TRB is so important to the constituency that they represent. Sarah Jo Peterson, the book's author, will also join the panelists for open questions from the audience.

TRB Past and Future: Panel Discussion (P20-21351)
Susan Hanson/Clark University, Hari Kalla/Federal Highway Administration (FHWA), Carlos Braceras/Utah Department of Transportation, Alison Conway/City College of New York, Carol Lewis/Texas Southern University, Sarah Jo Peterson/ 23 Urban Strategies, LLC

1728

Transportation Modeling Network Mega and Joint Poster Session with Traveler Behavior and Values
Yanfeng Ouyang, University of Illinois, Urbana Champaign, presiding
Sponsored By Standing Committee on Transportation Network Modeling , Standing Committee on Traveler Behavior and Values

An Integer Programming Formulation for Vehicle Routing Problem with Pickup Time Windows in Capacitated Space-Time Networks and Scalable Solutions (20-01091) - A109
Peirong (Slade) Wang/University of Texas, Arlington, Pengfei (Taylor) Li/University of Texas, Arlington
Tolerance-Based Column Generation Algorithm to the Bounded Rational Dynamic Activity-Travel Assignment P roblem (20-01881) - A110
Dong Wang/Beijing Jiaotong University, Feixiong Liao/Beijing Jiaotong University, Ziyou Gao/Beijing Jiaotong University , Hai-Jun Huang/Beijing Jiaotong University, Soora Rasouli/Beijing Jiaotong University
Sensitivity-Analysis Method for q-Generalized Logit Traffic Assignment (20-02003) - A111
Tien Thiem Bui/Kanazawa University, Japan, Shoichiro Nakayama/Kanazawa University, Japan, Hiromichi Yamaguchi/ Kanazawa University, Japan
A Distributed Gradient-Based Approach for Cell Transmission Model-Based System Optimal Dynamic Traffic Assignment (20-02548) - A112
Ali Hajbabaie/North Carolina State University, Mehrzad Mehrabipour/North Carolina State University
Traffic Assignment Analysis of Traffic Networks with Max-Pressure Control (20-02726) - A113
Rongsheng Chen/University of Minnesota, Michael Levin/University of Minnesota
Solving Stochastic Traffic Equilibrium Problems with Barzailai-Borwein Stepsize (20-02809) - A114
Muqing Du/Hohai University, Heqing Tan/Hohai University, Anthony Chen/Hohai University
Convergence Behavior for Traffic Assignment Characterization Metrics (20-03396) - A115
Priyadarshan Patil/University of Texas, Austin, Katherine Ross/University of Texas, Austin, Stephen Boyles/University of Texas, Austin
A New Network Equilibrium Flow Model: Formation and Algorithm of Quantity Regulation User Equilibrium (20-04145) - A116
Ruqing Huang/Georgia Institute of Technology (Georgia Tech), Zhongxiang Huang/Georgia Institute of Technology (Geo rgia Tech), Lee Han/Georgia Institute of Technology (Georgia Tech)
An Efficient Algorithm for the Traffic Assignment Problem with Side Constraints (20-04455) - A117
Liyang Feng/Southwest Jiaotong University, Jun Xie/Southwest Jiaotong University, Marco Nie/Southwest Jiaotong University, Xiaobo Liu/Southwest Jiaotong University
A Parallel Computing Approach to Solve Traffic Assignment Using Path-Based Gradient Projection Algorithm (2 0-05457) - A118
Xinyuan Chen/Southeast University, Zhiyuan Liu/Southeast University, Anish Khadka/Southeast University, Kai Zhang/S outheast University

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Robust Optimal Deployment of Roadside Units in Transportation Networks with Mixed Traffic (20-01403) - A122

Ye Li/New York University Shanghai, Zhibin Chen/New York University Shanghai, Yafeng Yin/New York University Shanghai

Stochastic Transit OD Demand Estimation Using Multi-Day APC Observations (20-01519) - A131

Ran Sun/University of California, Davis, Yueyue Fan/University of California, Davis, Yudi Yang/University of California, Davis

A Proper Formulation for Integrating Demand and Supply of Transport into a Supernetwork (20-01539) - A120

Ali Najmi/University of New South Wales, Taha Rashidi/University of New South Wales, David Rey/University of New South Wales, S. Travis Waller/University of New South Wales

Online Route Choice Modeling for Mobility-as-a-Service Networks with Non-Separable, Congestible Link Capacity Effects (20-01963) - A101

Jia Xu/New York University, Joseph Chow/New York University, Song Gao/New York University

A Path-Based Many-to-Many Assignment Game to Model Mobility-as-a-Service Networks (20-02048) - A102

Theodoros Pantelidis/New York University Tandon School of Engineering, Saeid Rasulkhani/New York University Tandon School of Engineering, Joseph Chow/New York University Tandon School of Engineering

Max-Pressure Intersection Control Based on Travel-Time Data (20-02075) - A129

Rongsheng Chen/University of Minnesota, Michael Levin/University of Minnesota, David Rey/University of Minnesota, Vinayak Dixit/University of Minnesota

Optimal Traffic Metering Locations and Levels in Urban Transportation Networks (20-02344) - A132

Rasool Mohebifard/North Carolina State University, Ali Hajbabaie/North Carolina State University

An Integer Programming Model for Dynamic Taxi Sharing Considering Provider Profit (20-02525) - A127

Yeming Hao/University of Maryland, College Park, Ali Haghani/University of Maryland, College Park

Multi-Objective Electric Vehicle Facility Management: Exact Method for Network Design and Dynamic Pricing Scheme with User Decisions (20-03045) - A123

Amir Mirheli/North Carolina State University, Leila Hajibabai/North Carolina State University

A Queueing-Theoretic Performance Model for Oversaturated Traffic Systems (20-03048) - A130

Qixiu Cheng/Southeast University, Zhiyuan Liu/Southeast University, Jifu Guo/Southeast University, Xin Wu/Southeast University, Xuesong Zhou/Southeast University

Optimal Vehicle Relocation and Operator Assignment for One-Way Carsharing Systems: Model, Algorithm, and Numerical and Computational Evaluations (20-03182) - A124

Hanjun Fu/Tongji University, Chi Xie/Tongji University

A Many-to-Many Assignment Game Method to Evaluate Cost Allocations of Link Operators in a Mobility-as-a-Service Market Without Route Enumeration (20-03500) - A100

Saeid Rasulkhani/New York University Tandon School of Engineering, Theodoros Pantelidis/New York University Tandon School of Engineering, Joseph Chow/New York University Tandon School of Engineering

Estimating the Probabilistic Dynamic Origin-Destination Demand Through Computational Graphs (20-04351) - A125

Wei Ma/Carnegie Mellon University, Sean Qian/Carnegie Mellon University

Optimization of Multi-Type Sensor Locations for Simultaneous Estimation of Link Travel Time and Origin-Destination Demand (20-04493) - A133

Hao Fu/Hong Kong Polytechnic University, William Lam/Hong Kong Polytechnic University, Hu Shao/Hong Kong Polytechnic University, Agachai Sumalee/Hong Kong Polytechnic University

On the Design of Tradable Credit Scheme to Manage Vehicluar Emissions Under Traveler Heterogeneity in Future Credit Price Perception (20-04775) - A126

Mohammad Miralinaghi/Purdue University, Srinivas Peeta/Purdue University

Identifying Critical Links in Transportation Network Design Problems for Maximizing Network Accessibility (20-04955) - A128

Yufeng Zhang/University of Minnesota, Twin Cities, Alireza Khani/University of Minnesota, Twin Cities

Advanced Data Analytics and Mesoscopic Dynamic Traffic Assignment Simulation for Traffic Impact Analysis of Maryland Casinos (20-05367) - A121

David Donaldson/University of Maryland, Laura Garrido/University of Maryland, Zheng Zhu/University of Maryland, Lei Zhang/University of Maryland

An Integer Programming Formulation for Heterogeneous Traffic Dynamics and Assignment: A Multi-Commodity Network Flow Model in Space-Time Networks (20-01074) - A119

Peirong (Slade) Wang/University of Texas, Arlington, Pengfei (Taylor) Li/University of Texas, Arlington

Average Distance to Visit a Subset of Random Points via Consecutive Nearest Neighbor Search (20-02437) - A106

Chao Lei/University of Illinois, Urbana Champaign, Yanfeng Ouyang/University of Illinois, Urbana Champaign

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Resource Planning Under Reliable Hypercube Queuing Equilibrium with Server Cooperation (20-02718) - A103

Han Liu/University of Illinois, Urbana Champaign, Jian Wang/University of Illinois, Urbana Champaign, Yanfeng Ouyang /University of Illinois, Urbana Champaign

Optimal Investment and Management of Shared Bikes in a Competitive Market (20-02723) - A104

Zhoutong Jiang/University of Illinois, Urbana Champaign, Chao Lei/University of Illinois, Urbana Champaign, Yanfeng Ouyang/University of Illinois, Urbana Champaign

Zone-to-Zone Demand Responsive Transportation Systems: Design and Implementation (20-05668) - A105

Shiyu Shen/University of Illinois, Urbana Champaign, Yanfeng Ouyang/University of Illinois, Urbana Champaign, Shuai Ren/University of Illinois, Urbana Champaign, Mengke Chen/University of Illinois, Urbana Champaign, Luyun Zhao/University of Illinois, Urbana Champaign

Incorporating Safety Reliability into Route Choice Model: Heterogeneous Crash Risk Aversions (20-01856) - A134

Chunyang Han/Central South University, Huang Helai/Central South University, Guangming Xu/Central South University, Amjad Pervez/Central South University, Wenjing Zhao/Central South University, Xiaoqi Zhai/Central South University

Multiclass Traffic Evolution Model for Electric and Gasoline Vehicles with Bi-Objective Path Choice Behavior (20-02032) - A137

Xiaoyu Ma/Rensselaer Polytechnic Institute (RPI), Xiaozheng He/Rensselaer Polytechnic Institute (RPI)

A Coordinated Routing Mechanism for Connected Vehicles with Information Perturbation Under Mixed-Strategy Congestion Game (20-02073) - A107

Stephen Spana/University of Florida, Lili Du/University of Florida, Yafeng Yin/University of Florida

Data-Driven Re-Optimization for Taxi Routing Under Small Data (20-02760) - A108

Hongcheng Liu/University of Florida, Lili Du/University of Florida, Yongpei Guan/University of Florida

Evaluation of Local Congestion Management Using Generalized Recursive Logit Model in Time-Space Network (20-02858) - A135

Miho Yonezawa/The University of Tokyo, Daiki Shimizu/The University of Tokyo, Eiji Hato/The University of Tokyo

Mode Choices and Optimal Car Ownership of Stochastic User Equilibrium with Ridesharing (20-03235) - A136

Tongfei Li/National University of Singapore, Yang Liu/National University of Singapore

Reliable Least-Time Path Estimation and Computation in Stochastic Time-Varying Networks with Spatio-Temporal Dependencies (20-04763) - A138

Monika Filipovska/Northwestern University, Hani Mahmassani/Northwestern University

Calibrating Route Choice for Urban Rail System: A Comparative Analysis Using Simulation-Based Optimization Methods (20-05092) - A139

Baichuan Mo/Monash University, Zhenliang Ma/Monash University, Haris Koutsopoulos/Monash University, Jinhua Zhao/Monash University

Learning Optimal Traffic Routing Behaviors Using Markovian Framework in Microscopic Simulation (20-05569) - A148

Theophile Cabannes/University of California, Berkeley, Jiayi Li/University of California, Berkeley, Fangyu Wu/University of California, Berkeley, Harry Dong/University of California, Berkeley, Alexandre Bayen/University of California, Berkeley

Dynamic Signal Control and Route Choice Equilibrium on Mixed Networks: A Modified Stackelberg Games Approach (20-05740) - A149

Hang Yang/Tongji University, Zhongyu Wang/Tongji University, Yajie Zou/Tongji University, Bing Wu/Tongji University, Yinhai Wang/Tongji University

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1729

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Pavement Management Performance and Performance Modeling
Syed Haider, Michigan State University, presiding
Sponsored By Standing Committee on Pavement Management Systems

Investigation of Relationship Between Pavement Condition Index and International Roughness Index of Asphalt Roads Based on the Long-Term Pavement Performance Data (20-00338) - B350

S. Madeh Piryonesi/University of Toronto, Tamer El-Diraby/University of Toronto

3D Visualization of Airport Pavements Quality Based on BIM and WebGL Integration (20-00647) - B342

Zhen Liu/Southeast University, Xingyu Gu/Southeast University, Qiao Dong/Southeast University, Shanshan Tu/Southeast University, Shuwei Li/Southeast University

Impact of New-Generation, Wide-Base Tires on Fuel Consumption and Roughness (20-02948) - B351

Izak Said/University of Illinois, Urbana Champaign, Egemen Okte/University of Illinois, Urbana Champaign, Jaime Hernandez/University of Illinois, Urbana Champaign, Imad Al-Qadi/University of Illinois, Urbana Champaign

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Assessment of Pavement Condition on the Interstate Highway System (20-03408) - B352

Amy Simpson/Wood Technical Consulting Solutions, Sareh Kouchaki/Wood Technical Consulting Solutions, Pedro Serigos/Wood Technical Consulting Solutions, Gonzalo Rada/Wood Technical Consulting Solutions, Jonathan Groeger/Wood Technical Consulting Solutions

Incorporating Pavement Smoothness Benefits to Enhance the Iowa Department of Transportation's Pavement Type Determination Process (20-03760) - B353

MAX GROGG/Applied Pavement Technology, Inc., Kelly Smith/Applied Pavement Technology, Inc., Christopher Williges/Applied Pavement Technology, Inc., Scott Schram/Applied Pavement Technology, Inc.

A Bayesian Approach to Enhance Accuracy of Time-Series Analyses and Prediction of Pavement Condition Data (20-00963) - B354

Tim Blumenfeld/Technische Universitaet Darmstadt

Non-Parametric Deterioration Curves Using Difference Data on Condition Measurements: Methodology and Initial Empirical Evidence (20-01763) - B355

Craig Richmond/University of Pittsburgh, Tariq Saeed/University of Pittsburgh

Prediction of Pavement Performance Using Non-Homogeneous Markov Models: Incorporating the Impact of Preventive Maintenance (20-01965) - B356

Mohamed S. Yamany/Purdue University, Dulcy M. Abraham/Purdue University

Road Load–Based Model for Vehicle Repair and Maintenance Cost Estimation (20-03557) - B357

Muluneh Sime/Nevada Automotive Test Center, Gary Bailey/Nevada Automotive Test Center, Elie Hajj/Nevada Automotive Test Center, Rami Chkaiban/Nevada Automotive Test Center, Reid Pulley/Nevada Automotive Test Center

Development of Machine Learning Models for Predicting Rutting Classification in Asphalt Pavement Using Network-level Data (20-03995) - B358

Seyedamin Banihashemrad/Texas A&M University, College Station, Charles Gurganus/Texas A&M University, College Station, Maryam Sakhaeifar/Texas A&M University, College Station

Large-Scale Evaluation of Pavement Performance Models Utilizing Automated Pavement Condition Survey Data (20-04444) - B359

Xiang Shu/California Department of Transportation (CALTRANS), Zhongren Wang/California Department of Transportation (CALTRANS), Imad Basheer/California Department of Transportation (CALTRANS)

Deterioration Modeling of Flexible Pavements Based on As-Produced and As-Constructed Properties (20-04484) - B340

Arash Mohammad Hosseini/Temple University, Ahmed Faheem/Temple University, Hani Titi/Temple University

Statistics and Artificial Intelligence–Based Pavement Performance and Remaining Service Life-Prediction Models for Iowa Flexible and Composite Pavement Systems (20-05040) - B341

Orhan Kaya/Iowa State University, Halil Ceylan/Iowa State University, Sunghwan Kim/Iowa State University, Danny Waid/Iowa State University, Brian Moore/Iowa State University

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1730

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Jointed Plain Concrete, Continuously Reinforced Concrete, Airfield, and Novel Pavement Design and Modeling

Wouter Brink, Applied Research Associates, Inc. (ARA), presiding

Sponsored By Standing Committee on Design and Rehabilitation of Concrete Pavements

Development of a Load-Related Faulting Prediction Model in Jointed Concrete Pavement Using LTPP Data (20-00657) - B320

Yu Chen/Texas A&M University, Sajib Sahan/Texas A&M University, Robert Lytton/Texas A&M University

Influence of Pavement ME Input Level on Performance Prediction of Jointed Plain Concrete Pavement (20-01491) - B321

Davis Wing/University of Georgia, Stephan Durham/University of Georgia, S. Sonny Kim/University of Georgia, Mi Chorzepa/University of Georgia

Model for Airfield Pavement Resiliency Against Extreme Dynamic Events Analysis (20-04586) - B322

Alessandra Bianchini/U.S. Air Force Civil Engineer Center (USAFCEC), David Whitmore/U.S. Air Force Civil Engineer Center (USAFCEC), Victor Aguilar-Vidal/U.S. Air Force Civil Engineer Center (USAFCEC), Marta Miletic/U.S. Air Force Civil Engineer Center (USAFCEC), James Davidson/U.S. Air Force Civil Engineer Center (USAFCEC)

Monitoring the Prestress Force in Cross-Tensioned Concrete Pavement by Using Vibration Analysis (20-05151) - B323

Hui Chen/Tongji University, Jianming Ling/Tongji University, Difei Wu/Tongji University, Mengyuan Zeng/Tongji University, Hongduo Zhao/Tongji University

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Assessment of California's Continuously Reinforced Concrete Pavement Practice and Performance (20-05312) - B324

Jeff Stempihar/NCE, Nick Weitzel/NCE, Thomas Van Dam/NCE, Pete Schmalzer/NCE, Linda Pierce/NCE

Comparison of Critical Stress Responses in Single and Multiple Slabs for Airfield Rigid Pavement Design (20-05555) - B325

Apidej Sakulneya/Rutgers, The State University of New Jersey, Hao Wang/Rutgers, The State University of New Jersey

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Convention Center, Hall A

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Pavement Structural Testing, Evaluation, and Modeling

Nadarajah Sivaneswaran, Federal Highway Administration (FHWA), presiding

Clark Morrison, North Carolina Department of Transportation, presiding

Brian Diefenderfer, Virginia Transportation Research Council, presiding

Sponsored By Standing Committee on Pavement Structural Modeling and Evaluation

Developing a Semi-Analytical Finite Element Program for Dynamic Response Analysis of Field Asphalt Pavement (20-00278) - B330

Kairen Shen/Southeast University, Hanyu Zhang/Southeast University, Jusheng Tong/Southeast University, Xianhua CHEN/Southeast University

Comparison of RAPTOR Measurements with Falling Weight Deflectometer Deflections Using Backcalculation (20-00319) - B331

Stine Madsen/Technical University of Denmark, Niels Pedersen/Technical University of Denmark

A Methodology for Determination of the Structural Layer Coefficient of Unbound Base Materials in Florida (20-00447) - B332

Dennis Hiltunen/University of Florida, Hyunchul Hwang/University of Florida

Simulation Verification and Analysis on Dynamic Response of Semi-Rigid Base Asphalt Pavement Based on Field Measurement (20-00635) - B343

shiqin xing/Southeast University, Xingyu Gu/Southeast University, Bingfeng Zheng/Southeast University, Bingyan Cui/Southeast University

Structural Characterization of Thick Lift Asphalt and Semi-Flexible Pavements (20-00752) - B333

Mostafa Nakhaei/Auburn University, Caroline McCarty/Auburn University, David Timm/Auburn University

Incorporating Traffic Speed Deflectometer Data into Pavement Management System for Network-Level Performance Monitoring (20-01445) - B334

Sittampalam Manoharan/Griffith University - Gold Coast Campus, Gary Chai/Griffith University - Gold Coast Campus, Sanaul Chowdhury/Griffith University - Gold Coast Campus

In Situ Temperature Sensitivity of Foamed Asphalt Stabilized Base Material (20-02397) - B348

Frederico Vasconcellos Guatimosim/University of São Paulo, Kamilla Vasconcelos/University of São Paulo, Luis Miguel Gutierrez/University of São Paulo, Liedi Bernucci/University of São Paulo, Kim Jenkins/University of São Paulo, Alan Carter/University of São Paulo

Dynamic Backcalculation Approach of Deflections Obtained from the Rolling Dynamic Deflectometer (20-03110) - B344

Julius Marvin Flores/Sejong University, Hyun Jong Lee/Sejong University, Carlo Elipse/Sejong University, Wangsoo Lee/Sejong University, Kideok Kim/Sejong University

Assessment of a Low-Volume Flexible Pavement Through Dynamic Backcalculation (20-03423) - B346

Gabriel Bazi/Lebanese American University, Steve Saboundjian/Lebanese American University, Tatiana Bou Assi/Lebanese American University, Mary Diab/Lebanese American University

Dynamic Behavior of Asphalt Pavements Under the Rolling Dynamic Deflectometer Loading (20-03517) - B345

Julius Marvin Flores/Sejong University, Hyun Jong Lee/Sejong University, Carlo Elipse/Sejong University, Wangsoo Lee/Sejong University, Kideok Kim/Sejong University, Jongeun Baek/Sejong University

Predicting Asphalt Concrete Master Curve Using Dynamic Backcalculation (20-03897) - B347

Gabriel Bazi/Lebanese American University, Tatiana Bou Assi/Lebanese American University

Decision-Support Criteria for Flood Inundated Roadways: A Case Study (20-03948) - B335

Akshay Gundla/Florida Department of Transportation, Edward Offei/Florida Department of Transportation, Guangming Wang/Florida Department of Transportation, Charles Holzschuher/Florida Department of Transportation, Bouzid Choubane/Florida Department of Transportation

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A Methodology for Backcalculating the Thermal Properties and Design of Thermally Insulated Flexible Pavement Structures (20-04078) - B336

Zhuang Zhuo/Rowan University, Ayman Ali/Rowan University, Zhaoxing Xie/Rowan University, Yusuf Mehta/Rowan University, Cheng Zhu/Rowan University, Wade Lein/Rowan University, Christopher DeCarlo/Rowan University

Structural Performance of Asphalt Pavements with Unbound Granular, Cement-Treated, and Recycled Asphalt Bases Under Heavy Traffic (20-04777) - B349

Lucas Andrade/Universidade de São Paulo, Iuri Bessa/Universidade de São Paulo, kamilla Vasconcelos/Universidade de São Paulo, Liedi Bernucci/Universidade de São Paulo, Carlos Suzuki/Universidade de São Paulo

1732

<u>Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A</u>
Chip Seals, Crack Seals, and Performance of Pavement Preservation
Amy Simpson, Wood Technical Consulting Solutions, presiding
Sponsored By Standing Committee on Pavement Preservation, Standing Committee on Pavement Maintenance

Life-Extending Benefit of Crack Sealing for Pavement Preservation (20-00966) - B312
Adriana Vargas-Nordcbeck/National Center for Asphalt Technology (NCAT), Farhang Jalali/National Center for Asphalt Technology (NCAT)

Friction and Texture Performance of Chip Seals for Low- and High-Volume Traffic Roadways (20-01398) - B313
Danny Martinez-Rodriguez/Auburn University, Adriana Vargas-Nordcbeck/Auburn University

Short- and Long-Term Field Performances and Optimal Timing of Chip Seal in Hot and Humid Climates (20-02796) - B300
Momen Mousa/Louisiana State University, Mostafa Elseifi/Louisiana State University, Mohammad Zobair Ibne Bashar/Louisiana State University, Zhongjie Zhang/Louisiana State University, Kevin Gaspard/Louisiana State University

Development of a Decision-Making Tool to Select Optimum Preventive Maintenance Treatments in Hot and Humid Climate (20-03190) - B301
Momen Mousa/Louisiana State University, Mostafa Elseifi/Louisiana State University, Zhongjie Zhang/Louisiana State University, Kevin Gaspard/Louisiana State University

Effect of Composition of Water on Accelerating Moisture Damage in Pavement (20-06022) - B302
Carlos Obando/Arizona State University, Daniel Oldham/Arizona State University, Kamil Kaloush/Arizona State University, Ellie Fini/Arizona State University

1733

<u>Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A</u>
Asphalt and Concrete Pavement Maintenance and Repair
DingXin Cheng, California State University, Chico, presiding
Mary Rawls, S&ME, Inc., presiding
Sponsored By Standing Committee on Pavement Maintenance

This session includes papers studying concrete and asphalt pavement maintenance and repair (techniques and materials) performance based on laboratory and analytical studies along with observing field performance.

Sustainable Anti-Icing Asphalt Pavement Incorporating CaCl2-Zeolite Coated with Microporous Epoxy (20-02704) - B314
Yan Zhang/Washington State University, Sen Du/Washington State University, Xianming Shi/Washington State University

Reliability Analysis of Minnesota's Unbonded Concrete Overlay Performance (20-04531) - B315
Bernard Izevbekhai/Minnesota Department of Transportation, Norma Farah/Minnesota Department of Transportation, Glenn Engstrom/Minnesota Department of Transportation

Analysis of Critical Factors to Asphalt Overlay Performance Using Gradient Boosted Models (20-05260) - B316
Miaomiao Zhang/University of Tennessee, Knoxville, Xiaoyang Jia/University of Tennessee, Knoxville, Hongren Gong/University of Tennessee, Knoxville, Rui Xiao/University of Tennessee, Knoxville, Xi Jiang/University of Tennessee, Knoxville, Yuetan Ma/University of Tennessee, Knoxville, Baoshan Huang/University of Tennessee, Knoxville

Properties of Magnesium Phosphate Cement Mortar Used for Cement Concrete Pavement Rapid Repairing (20-03552) - B317
Zhou Changjun/Dalian University of Technology, Liu Fei/Dalian University of Technology, Pan Baofeng/Dalian University of Technology, Yan Shiao/Dalian University of Technology, Zhang Jian/Dalian University of Technology

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JPCP Slab-Level Condition Forecasting for Slab Replacement Planning Using Multi-Stage Markov Chain and Six-Year 3D Pavement Surface Data (20-05437) - B318

Yiching Wu/Georgia Institute of Technology (Georgia Tech), Georgene Geary/Georgia Institute of Technology (Georgia Tech), Ernay Robinson-Perry/Georgia Institute of Technology (Georgia Tech), Yichang Tsai/Georgia Institute of Technology (Georgia Tech)

1734

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Recent Developments in Pavement Surface Treatments
Amy Burlarley-Hyland, City of Waco, presiding
Kamal Hossain, Memorial University of Newfoundland, presiding
Sponsored By Standing Committee on Pavement Maintenance, Standing Committee on Pavement Preservation

This session includes papers describing new approaches to chip seals and includes papers studying skid resistance improvements made with surface treatments.

Laboratory Performance of Tire Rubber Modified Asphalt Emulsion in Chip Seal Applications (20-03758) - B319
Md Nafiur Rahman/Louisiana State University, Md Tanvir Sarkar/Louisiana State University, Mostafa Elseifi/Louisiana State University, Corey Mayeux/Louisiana State University, Samuel Cooper/Louisiana State University
Incorporating Laser Technlogy for Automatically Adjusting Binder Application Rates for Seal Coat Design and Construction (20-00410) - B326
Jorge Prozzi/University of Texas, Austin
A Long-Term Performance Monitoring and Analysis Program for Georgia's High-Friction Surface Treatment (20 -03905) - B327
Cibi Pranav/Georgia Institute of Technology (Georgia Tech), Zhaohua Wang/Georgia Institute of Technology (Georgia Tech), Yichang(James) Tsai/Georgia Institute of Technology (Georgia Tech)
Comparative Investigation of Hot-Applied and Emulsion-Based Chip Seal Treatments Using Image Processing Techniques and Performance Tests (20-04042) - B328
Yogesh Kumbargeri/SME, ilker Boz/SME, M. Emin Kutay/SME
Aggregate Characteristics-Based Preventive Maintenance Treatments for Optimized Skid Resistance of Pavements (20-04932) - B329
Joshua Li/Oklahoma State University, Dominique Pittenger/Oklahoma State University, Kelvin Wang/Oklahoma State University, Guangwei Yang/Oklahoma State University, Musharraf Zaman/Oklahoma State University, You Jason ZHAN/Oklahoma State University

1735

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A
Joint and Crack Sealants Characterization and Modeling for Performance
Katie Chou, T. Y. Lin International, presiding
Sponsored By Standing Committee on Sealants and Fillers for Joints and Cracks

Evaluation of Self-Healing Characteristic of Asphalt Materials by Intermittent Loading Test (20-00339) - B303
Chenguang SHI/Southeast University, Rong LUO/Southeast University, Hanqi LIU/Southeast University, Jun Yang/Southeast University
Adhesive Properties of Hot-Applied Crack Sealants and Asphalt Mixtures Based on Surface Free Energy Measurements (20-02020) - B304
Shuyin Wu/Southeast University, Jun Yang/Southeast University, Ruochong Yang/Southeast University, Jipeng Zhu/Southeast University
Effects of Shape and Bond Strength on Adhesive Failure of Joint Sealants (20-02992) - B305
Jinho Kim/Texas A&M University, College Station, Dan Zollinger/Texas A&M University, College Station
PTZ Camera-Based Image Processing Pipeline for Automatic Size Estimation of Cracks in Expressways (20-033 63) - B306
Chunyan Shao/Tongji University, Yuchuan Du/Tongji University, Qunle Du/Tongji University, Ning Pan/Tongji University
Mechanical Response Analysis of Transverse Crack Treatment of Asphalt Pavement Based on Discrete Element Method (20-04362) - B307
Sainan Xie/Harbin Institute of Technology, Junyan Yi/Harbin Institute of Technology, Hengting Wang/Harbin Institute of Technology, Shih-Hsien Yang/Harbin Institute of Technology, Decheng Feng/Harbin Institute of Technology

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Decision Trees for Selecting Asphalt Pavement Crack Sealing Method (20-06143) - B308

Jared Munch/No Organization, Uma Arepalli/No Organization, Manik Barman/No Organization

Natural Aging Characteristics of Hot-Poured Sealants (20-01675) - B309

Liping Cao/Harbin Institute of Technology, Chen Yang/Harbin Institute of Technology, Weijun Wang/Harbin Institute of Technology, Zejiao Dong/Harbin Institute of Technology, Huiming Yin/Harbin Institute of Technology

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1736

Wednesday, 10:15 a.m. - 12:00 p.m., Convention Center, Hall A

Micromobility Poster Session: Planning, Policy, and User Behavior for Shared Bikes and Scooters
Matthew Ridgway, Fehr & Peers, presiding
Sponsored By Standing Committee on Bicycle Transportation

Exploring Dockless Bikeshare Usage: A Case Study of Beijing, China (20-00301) - A150

Zheyan Chen/Universiteit Utrecht, Dea van Lierop/Universiteit Utrecht, Dick Ettema/Universiteit Utrecht

Rain or Shine: Impact of Weather on E-Scooter Sharing and Pedal Bikesharing (20-01111) - A155

Annie Chang/McGill University, Mojdeh Sharafi/McGill University, Luis Miranda-Moreno/McGill University, Lijun Sun/McGill University

How Can Disaggregate Data Facilitate Transportation Equity Analysis?: A Case of the Coast Bikeshare System in Southern Tampa (20-01135) - A151

Zhiwei Chen/University of South Florida, Yujie Guo/University of South Florida, Amy Stuart/University of South Florida, Yu Zhang/University of South Florida, Xiaopeng (Shaw) Li/University of South Florida

If You Provide, Will They Ride?: Motivators and Deterrents to Bikeshare (20-01297) - A152

Ronald Pimentel/Washington State University - Vancouver, Michael Lowry/Washington State University - Vancouver, David Pimentel/Washington State University - Vancouver, Timothy Koglin/Washington State University - Vancouver, Amanda Glazer/Washington State University - Vancouver, Grace Moe/Washington State University - Vancouver, Marianna Knysh/Washington State University - Vancouver

Usage Frequency of Metro-Bikeshare Integration: Evidence from Nanjing, China (20-01298) - A153

Zhuangbin Shi/Southeast University, Yang Liu/Southeast University, Qiyang Liu/Southeast University

Expanding a (Electric) Bicycle-Sharing System to a New City: Prediction of Demand with Spatial Regression and Random Forests (20-01336) - A154

Sergio Guidon/Eidgenossische Technische Hochschule Zurich, Daniel Reck/Eidgenossische Technische Hochschule Zurich, Kay Axhausen/Eidgenossische Technische Hochschule Zurich

How Does Dockless Bikesharing System Behave by Incentivizing Users to Participate in Rebalancing? (20-01561) - A170

Xue Jin/Southeast University, Xinwei Ma/Southeast University, Yanjie Ji/Southeast University

E-Scooters in Rosslyn Virginia: Demographics of Riders and User and Non-User Perspectives (20-01808) - A157

Owain James/Virginia Polytechnic Institute and State University, John Hicks/Virginia Polytechnic Institute and State University, J Swiderski/Virginia Polytechnic Institute and State University, Ralph Buehler/Virginia Polytechnic Institute and State University

Comparing the Temporal Determinants of Dockless Scooter-Share and Station-Based Bikeshare in Washington, D.C. (20-01822) - A158

Hannah Younes/University of Maryland, College Park, Zhenpeng Zou/University of Maryland, College Park, Jiahui Wu/University of Maryland, College Park, Giovanni Baiocchi/University of Maryland, College Park

Bikeshare and Safety: Risk Assessment and Management (20-01982) - A159

Karl Kim/University of Hawaii, Jiwnath Ghimire/University of Hawaii, Pradip Pant/University of Hawaii, Eric Yamashita/University of Hawaii

Understanding the Difference in Regularity of Bikesharing Usage Between Docked and Dockless Bikesharing Systems (20-02369) - A171

Mingjia He/Southeast University, Xinwei Ma/Southeast University, Yanjie Ji/Southeast University, Yuchuan Jin/Southeast University, Jianbiao Wang/Southeast University

Using GPS Big Data to Define a Bikeshare User Typology and Model On-/Off-Road Bicycle Facility Preferences (20-02441) - A160

Benjamin Burmester/Auburn University, Jeffrey LaMondia/Auburn University

Modal Shift from Car to Dockless Bikesharing: A Psychological Perspective (20-02506) - A172

Jianbiao Wang/Southeast University, Xinwei Ma/Southeast University, Yanjie Ji/Southeast University, Liangpeng Gao/Southeast University, Mingjia He/Southeast University

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Research on the Influencing Factors of Brand Choice of Free-Floating Shared Bike from the Perspectives of Users and Bike Attributes (20-02878) - A161

Xinyu Wang/University of Shanghai for Science and Technology, Hong-cheng Gan/University of Shanghai for Science and Technology

Does Bikeshare Change Travel for Users as Well as Non-Users?: Evidence from the Sacramento Region (20-03 035) - A162

Dillon Fitch/University of California, Davis, Hossain Mohiuddin/University of California, Davis, Susan Handy/University of California, Davis

Identifying the Usage Pattern Change in Station-Based Bikesharing System Under the Influence of Free-Floatin g Bikesharing System: A Data-Driven Approach (20-03164) - A167

Junyi Ji/Southeast University, Jiyang Zhang/Southeast University, Chengcheng Xu/Southeast University, Min Yang/Sout heast University

Forecasting Passenger Demand and Bike Distribution of Dockless Bikesharing Using Journey Data (20-03502) - A168

Mingzhuang Hua/Southeast University, Jingxu Chen/Southeast University, Xuewu Chen/Southeast University, Zuoxian Gan/Southeast University, Pengfei Wang/Southeast University

Inferring the Optimal Number of Dockless, Shared Bikes in a New Area by Applying the Gradient Boosting Decision Tree Model (20-03821) - A169

Dong Xiao/Monash University, Tianqi Gu/Monash University, Inhi Kim/Monash University, Yuanqiu Bao/Monash University

A Low-Dimensional Model for Bikesharing Demand Forecasting That Explicitly Accounts for Weather Data (20-03842) - A177

Guido Cantelmo/Technical University of Munich, Constantinos Antoniou/Technical University of Munich, Rafał Kucharski/Technical University of Munich

Investigating Impact of Bikesharing Systems on Modal Shift: A Case Study in Delft, the Netherlands (20-04424) - A182

Xinwei Ma/Delft University of Technology, Yufei Yuan/Delft University of Technology, Niels van Oort/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

Scoot Over: Determinants of Shared Electric Scooter Use in Washington, D.C. (20-04631) - A156

Leila Hawa/McGill University, Boer Cui/McGill University, Lijun Sun/McGill University, Ahmed El-Geneidy/McGill University

Analyzing the Difference Between Bikeshare Trips Made on Regular and Electric Bicycles (20-04817) - A178

Adam Borsch/Georgia Institute of Technology (Georgia Tech), Catherine Ross/Georgia Institute of Technology (Georgia Tech), Kari Watkins/Georgia Institute of Technology (Georgia Tech)

Bikeshare System Reliability: The Distribution of Delay Caused by Bike Unavailability (20-05298) - A179

Valentin Beauvoir/University of Sydney, Emily Moylan/University of Sydney

Analysis of the Effects of Urban Form on Dockless Bikeshare and Scootershare Systems Usage: The Case of Washington, D.C. (20-05474) - A180

Kiana Roshan Zamir/University of Maryland, College Park, Arefeh Nasri/University of Maryland, College Park, Stefanie Brodie/University of Maryland, College Park

To Scoot or Not to Scoot: Findings from a Recent Survey About the Benefits and Barriers of Using E-Scooters for Riders and Non-Riders (20-05729) - A181

Rebecca Sanders/Arizona State University, Michael Branion-Calles/Arizona State University, Trisalyn Nelson/Arizona State University

Chair's Luncheon
Sponsored By Executive Committee

The Chair's Luncheon is the premier event of the Annual Meeting, drawing an audience of 800 leaders in transportation from the public and private sectors throughout the United States and abroad. The program for the Chair's Luncheon, hosted by 2019 Executive Committee Chair Vicki Arroyo, includes the introduction of new Executive Committee members and officers; recognition of special guests; the Luncheon's keynote address; the presentation of TRB's most prestigious awards; and the Centennial Celebration addresses. U.S. Department of Transportation Secretary Chao, the Luncheon's Keynote speaker, will address the priorities of the U.S. Department of Transportation. The Centennial Celebration speaker, Sarah Jo Peterson, the author of The Transportation Research Board, 1920-2020: Everyone Interested is Invited, will address the importance of sponsors in building and maintaining TRB. A separate fee and ticket is required for the lunch. Gallery seating is available at no charge, beginning at 12:45 p.m.

1738

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, 146A
Multilevel Approaches of Innovation in Cities, Part 1 (Part 2, Session 1763)
Claude Marin-Lamellet, Université Gustave Eiffel, presiding
Corinne Blanquart, IFSTTAR , presiding
Nour-Eddin El Faouzi, Université Gustave Eiffel, presiding
Sponsored By Standing Committee on International Cooperation, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Urban Transportation Data and Information Systems, Standing Committee on Intelligent Transportation Systems, Standing Committee on User Information Systems, Standing Committee on Pedestrians, Standing Committee on Emerging and Innovative Public Transport and Technologies, Standing Committee on Automated Transit Systems, Standing Committee on Urban Freight Transportation

Innovation policy explicitly promotes technical innovations to enable the transition of the current transportation system into a sustainable transportation system. In this workshop, we emphasize that policy should also consider non-technolo gical innovation covering at least three dimensions: innovation supply, process innovation and business model innovation. Some of the key components are: Frugal mobility for sustainable future, organizationnal innovation, New services and business models.

The Role of Public–Private–Academic Collaboration on Urban Freight Innovation (P20-21804)
Jose Holguin-Veras/Rensselaer Polytechnic Institute (RPI)
Assessing the Role of New Business Models for Mobility-as-a-Service in the Context of Innovation Paths (P20-21805)
Henk Meurs/Radboud University, Nijmegen
Toward Climate Neutral and Smart Cities: The Mission Approach Under Horizon Europe (P20-21806)
Laura Hetel/European Commission

1739 CM (1.50)

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, 152A
Digital Asset or Digital Liability
Clinton Bench, University of California, Los Angeles, presiding
Tamara Haas, New Mexico Department of Transportation, presiding
Sponsored By Standing Committee on Strategic Management

What organizational changes, stakeholder engagement, and analytical processes are necessary for agencies of all sizes to fully utilize "smart assets to guide investment decisions and the allocation of operational, maintenance resources? This would allow a move away from age-based asset management decision-making and toward condition-based decision-making, and would promote better integration into asset management of policies related to safety, security, resiliency, and emission reductions. What are best practices in interagency collaboration to ensure that real-time data on the status and health of facilities and rolling assets to improve efficiency at all levels and provide actionable real-time information to customers?

Managing Data as an Asset (P20-20054)
Rachel Bain/Massachusetts Department of Transportation
Are You Listening to Your Assets? (P20-20065)
Yousef Kimiagar/Hatch
Leveraging Data to Achieve Asset Management Outcomes in Seattle (P20-20302)
Benjamin de la Pena/Seattle Department of Transportation
Update on NCHRP 08-113: Integrating Performance, Risk, and Asset Management Practices (P20-20885)
Mara Campbell/Jacobs
Digital Practices in the Highway Asset Information Management: A National and International View (P20-20899)
Jagannath Mallela/WSP
Mobility on Demand Alliance (P20-21643)
Amy Ford/ITS America
Technology Performance (P20-21644)
Mara Campbell/Jacobs

1740

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, 150B
Research in Urban Transportation History: From Sydney Trams to Los Angeles Ballot Box Planning to Canadian Street Cars
Daniel Rust, University of Wisconsin, Superior, presiding
Sponsored By Standing Committee on Transportation History

This session presents three innovative research projects exploring urban transportation history from the mid-nineteenth century to the present. By using compiled financial and statistical data, as well as archival research, Barrieau revisits the history of the Canadian streetcar industry. King and Wachs explore the history of how ballot box measures have guided transportation infrastructure planning in Los Angeles, California, for over 100 years. Finally, Lahoorpoor studies the relationship of modal choice (tram vs. trains) and how these modes influenced urban form and density over a period of 70 years in Sydney, Australia.

Trains, Trams, and Terraces: Population Growth and Network Expansion in Sydney: 1861–1931 (20-01807)
Bahman Lahoorpoor/The University of Sydney, David Levinson/The University of Sydney
A Canadian Electric Streetcar Industry History (1861–2019) (20-02096)
Pierre Barrieau ABG50/Université de Montréal
Centuries of Ballot Box Transportation Planning in Los Angeles (20-00686)
Hannah King/University of California, Los Angeles, Martin Wachs/University of California, Los Angeles

1741

Data Governance Is a Journey, Not a Destination
Anita Vandervalk-Ostrander, ITERIS, Inc., presiding
Sponsored By Standing Committee on Statewide Transportation Data and Information Systems, Standing Committee on Information Systems and Technology, Standing Committee on Geographic Information Science and Applications

Although most Departments of Transportation (DOTs) have embraced data governance, implementation continues to be a challenge. The presence of legacy data systems, understaffed agencies, and difficulty to obtain support across an agency are all deterrents to implementing a data governance system. Despite these hurdles and many more, agencies are making strides toward implementation of data governance to manage data and information. This session brings together data and information managers to share their successes and challenges along the journey as they look to the future of data governance.

Overview of Implementation Challenges and Opportunities: Summary of 15-State Peer Exchange (P20-20296)
Anita Vandervalk-Ostrander/ITERIS, Inc.
The FHWA Perspective (P20-20297)
Brian Brotsos/Federal Highway Administration (FHWA)
Data Governance: The Caltrans Perspective (P20-20298)
Chad Baker/California Department of Transportation (CALTRANS)
Embracing the Data Silos (P20-20299)
James Meyer/Arizona Department of Transportation, Bo Guo/Gistic Research Inc.
Commonwealth of Virginia Data Governance Framework (P20-20300)
Carlos Rivero/Commonwealth of Virginia

1742

Improving Traffic State Analysis and Prediction with Machine Learning
Mohamed Zaki, University of Central Florida, presiding
Sponsored By Standing Committee on Artificial Intelligence and Advanced Computing Applications

Machine learning tools have demonstrated great success in improving traffic operation. This session presents innovative deep learning methods to address challenging problems associated with the development of incident detection, traffic estimation and prediction models.

Short-Term Travel Speed Prediction for Urban Expressways: Graph Attention Network Model (20-02137)
Keshuang Tang/Tongji University School of Transportation Engineering, Xiaosong Li/Tongji University School of Transportation Engineering, Siqu Chen/Tongji University School of Transportation Engineering, Di Zang/Tongji University School of Transportation Engineering, Jian Sun/Tongji University School of Transportation Engineering
Short-Term Traffic Prediction and Incident Detection with Single Traffic Detector Using Recurrent Neural Network (20-02505)
Dong Pan/George Washington University, Wei Zhang/George Washington University, Samer Hamdar/George Washington University, Seungmo Kang/George Washington University
A Deep-Learning Approach for Predictive Analytics to Support Diversion During Freeway Incidents (20-02598)
Rajib Saha/Florida International University, Mosammat Tahnin Tariq/Florida International University, Mohammed Hadi/Florida International University
Situation-Aware Multi-Step Traffic Speed Prediction: No-Regret Learning Approach (20-04202)
Eunhye Kim/Northwestern University, Hani Mahmassani/Northwestern University
Graph-Partitioning-Based Diffusion Convolution Recurrent Neural Network for Large-Scale Traffic Forecasting (20-05450)
Tanwi Mallick/Argonne National Laboratory, Prasanna Balaprakash/Argonne National Laboratory, Eric Rask/Argonne National Laboratory, Jane Macfarlane/Argonne National Laboratory

1743

Lessons from the Field and Research Needs on Disaster Response Operations and Logistics
Felipe Aros-Vera, Ohio University, presiding
Johanna Amaya - Leal, Iowa State University, presiding
Sponsored By Standing Committee on the Logistics of Disaster Response and Business Continuity, Subcommittee on Humanitarian Relief

Views from the Federal Level (P20-20034)
Michael Callahan/USDOT Office of Intelligence, Security and Emergency Response
Urban Search and Rescue Branch (P20-21649)
Dean Scott/Federal Emergency Management Agency
Regional Emergency Transportation (P20-21648)
David Lutes/Federal Aviation Administration (FAA)
Transportation Recovery (P20-21647)
Carlos Figueroa/Federal Highway Administration (FHWA)

1744

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, 140A
Improving Mobility Energy Productivity Through Shared, Automated, and Electrified Transport
Paul Leiby, Oak Ridge National Laboratory, presiding
Sponsored By Standing Committee on Transportation Energy, Section - Environment and Energy, Standing Committee on Alternative Transportation Fuels and Technologies

 Recently, extensive research efforts have sought to refine our understanding of how new mobility technologies , through combinations of electrification, automation, and shared transport options, can help limit emissions, promote efficient energy use, and improve mobility. This session will focus on the results of some recent large integrated modeling and analysis efforts.

Measuring Mobility Potential: A Novel Metric to Quantify Mobility Energy Productivity of Transportation Systems (P20-20904)
Venu Garikapati/National Renewable Energy Laboratory (NREL)
Energy and Mobility Impacts of Behavioral Scenarios of Connected, Automated, and Shared Vehicles in POLARIS (P20-20792)
Joshua Auld/Argonne National Laboratory
Integrated Mesoscale Urban Systems Modeling with Behavior, Energy, Autonomy, and Mobility (P20-20793)
Colin Sheppard/Lawrence Berkeley National Laboratory

1745

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, 140B
The Transportation–Land Use Connection in the Global South
John Renne, Florida Atlantic University, presiding
Sponsored By Standing Committee on Transportation and Land Development

This podium session explores a number of mobility and multimodal topics from cities in South America and Asia .

Characterization of Bicycle-Bus Integration in Developing Countries: A Case Study of Fortaleza, Brazil (20-0474 3)
Matheus Siqueira/Universidade Federal do Ceara, Taís Costa/Universidade Federal do Ceara, Carlos Felipe Loureiro/Universidade Federal do Ceara
Before and After BRT: Using Remote Sensing to Measure Impacts on Urban Growth Patterns in Quito (Ecuador) and Cali (Colombia) (20-05185)
Luis Tafur Herrera/University of North Carolina, Chapel Hill

(continued)

Mobility-Based Employment Choice: A Perspective from Informal Settlements of Delhi (20-05203)
S.L.N. Sarma Sadhu/United Nations Development Programme (UNDP), Amit Sharma/United Nations Development Programme (UNDP), Astrid Bratli/United Nations Development Programme (UNDP), Geetam Tiwari/United Nations Development Programme (UNDP)

Trip Generation Rates of Land Uses in a Developing Country City (20-05852)
Tanjeeb Ahmed/University of California, Irvine, Suman Mitra/University of California, Irvine, Rezwana Rafiq/University of California, Irvine, Sanjana Islam/University of California, Irvine

Does Built Environment Matter in Mode Choice?: The Case of Major Destinations in Dhaka (20-05948)
Paromita Nakshi/Bangladesh University of Engineering and Technology, Anindya Debnath/Bangladesh University of Engineering and Technology

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1746

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, 201
Influence of Humans and Vehicles on Geometric Design
Nick Stamatiadis, Kentucky Transportation Center, presiding
Sponsored By Standing Committee on Geometric Design

Evaluating Relationships Between Perception-Reaction Times, Emergency Deceleration Rates, and Crash Outcomes Using Naturalistic Driving Data (20-04883)
Jonathan Wood/Wayne State University, Shaohu Zhang/Wayne State University

Calibrating Design Guidelines Using Mental Workload and Reliability Analysis (20-04534)
Karim Habib/University of Alberta, Maged Gouda/University of Alberta, Karim El-Basyouny/University of Alberta

NCHRP Task 20-07: MASH Test Vehicle Recommendations (20-05970)
Kellon Ronspies/University of Nebraska, Lincoln, Cody Stolle/University of Nebraska, Lincoln, Ronald Faller/University of Nebraska, Lincoln, Bob Bielenberg/University of Nebraska, Lincoln

The Influence of Lane Width on Semi-Autonomous Vehicle Performance (20-03822)
Alfredo Garcia/Universitat Politècnica de València, Francisco Javier Camacho-Torregrosa/Universitat Politècnica de València

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1747

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, 202A
Design and Analysis of Roadside Barrier Systems
Joseph Jones, Leidos, Inc., presiding
Sponsored By Standing Committee on Roadside Safety Design

Development of the NCHRP 17-43 Roadway Departure Database (20-03903)
Luke Riexinger/Virginia Polytechnic Institute and State University, Hampton Gabler/Virginia Polytechnic Institute and State University

In-Service Performance Evaluation of Median Cable Barriers and Strong-Post W-Beam Guardrails on I-85 in Alabama (20-04174)
Lisa Lugo Kuzy/Western Kentucky University, Niloufar Shirani-bidabadi/Western Kentucky University, Kirolos Haleem/ Western Kentucky University, Michael Anderson/Western Kentucky University

Crash Testing and Evaluation of Culvert-Mounted Midwest Guardrail System (20-04189)
Mojdeh Asadollahi Pajouh/University of Nevada, Las Vegas, Bob Bielenberg/University of Nevada, Las Vegas, Jennifer Rasmussen/University of Nevada, Las Vegas, Ronald Faller/University of Nevada, Las Vegas

Evaluation of W-Beam Guardrail and Terminal Posts Installed in Metal Sleeves (20-06051)
Nauman Sheikh/Texas A&M Transportation Institute, Roger Bligh/Texas A&M Transportation Institute

1748

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, CANCELLED
CANCELLED - Transforming Roadside Management and Technology Practices for the Benefit of Safety, Ecology, and Economy
Beverly Storey, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Roadside Maintenance Operations

 Beverly Storey will discuss the findings on her paper on reviewing the advantages of mowing reductions.

1749

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, Salon B
What's New at the National Highway Traffic Safety Administration, Part 1 (Part 2, Session 1765)
Jon Krohmer, National Highway Traffic Safety Administration (NHTSA), presiding
Sponsored By Section - Safety

What's New at NHTSA (P20-21500)
James Owens/National Highway Traffic Safety Administration (NHTSA)
Drug-Impaired Driving Research (P20-21501)
DeReece Smither/National Highway Traffic Safety Administration (NHTSA)
National Emergency Medical Services Information System (P20-21504)
Eric Chaney/National Highway Traffic Safety Administration (NHTSA)
Driver Alcohol Detection System for Safety (P20-21510)
Bud (Abdullatif) Zaouk/KEA Technologies Inc
Improving Safety for Vulnerable Road Users (P20-21511)
Kristie Johnson/National Highway Traffic Safety Administration (NHTSA)

1750

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, 102B
Driver Distraction and Fatigue
Swaroop Dinakar, Crash Safety Research Center, LLC, presiding
Sponsored By Standing Committee on Vehicle User Characteristics

Investigating Trends in Handheld Driver Cell Phone Use by Type in Consideration of Driver, Vehicle, and Site-Specific Factors (20-03978)
Fatemeh Fakhrmoosavi/Michigan State University, Mohammadreza Kavianipour/Michigan State University, Peter Savolainen/Michigan State University
The Role of Habits in Cell Phone–Related Driver Distractions (20-05451)
Braden Hansma/University of Toronto, Susana Marulanda/University of Toronto, Huei-Yen "Winnie" Chen/University of Toronto, Birsen Donmez/University of Toronto
Effects of Partial Sleep Deprivation on Braking Response of Drivers in Hazard Scenarios (20-01272)
Kirti Mahajan/Indian Institute of Technology, Bombay, Nagendra Velaga/Indian Institute of Technology, Bombay
Detecting Driver Distractions Using a Deep-Learning Approach and Multi-Source Naturalistic Driving Data (20-01635)
Yihao Zhang/Tongji University, Jian Sun/Tongji University, Junhua Wang/Tongji University, Zuduo Zheng/Tongji University, Yixin Li/Tongji University, Mingtao Wu/Tongji University
Validation Study on Blood Pulse Waveform Measurements Based Driver Fatigue Detecting (20-03843)
Xin Li/Wuhan University, Chaozhong Wu/Wuhan University, Hui Zhang/Wuhan University, Qi Zhang/Wuhan University, Yifan Sun/Wuhan University

1751

Pedestrian Safety Data and Tools
Robert Schneider, University of Wisconsin, Milwaukee, presiding
Sponsored By Standing Committee on Pedestrians

Safety in Numbers: A Methodological Perspective on the Literature (20-00690)
Nicholas Kehoe/Toxcel, LLC, Steve Jackson/Toxcel, LLC, Sheryl Miller/Toxcel, LLC, Elissa Goughnour/Toxcel, LLC, Kristie Johnson/Toxcel, LLC
Pedestrian Injuries in North Carolina, 2007–2012: A Comparative Analysis Using Police, Emergency Department , and Death Certificate Data Sources (20-00796)
Laura Sandt/UNC Highway Safety Research Center, Scott Proescholdbell/UNC Highway Safety Research Center, Kelly Evenson/UNC Highway Safety Research Center, Susan Ennett/UNC Highway Safety Research Center, Whitney Robinson/UNC Highway Safety Research Center, Daniel Rodriguez/UNC Highway Safety Research Center, Katherine Harmon/UNC Highway Safety Research Center, Stephen Marshall/UNC Highway Safety Research Center
Investigation of Traffic and Safety Behavior of Pedestrians Texting or Web Surfing (20-03448)
Marilia Ropaka/National Technical University of Athens (NTUA), Dimitrios Nikolaou/National Technical University of Athens (NTUA), George Yannis/National Technical University of Athens (NTUA)
Do Not Pass Go: Effective Interventions to Reduce Multiple Threat Conflicts and Improve Pedestrian Safety (20 -05291)
Nichole Morris/University of Minnesota, Twin Cities, Curtis Craig/University of Minnesota, Twin Cities, Ron Van Houten/ University of Minnesota, Twin Cities

1752   **CM** (1.50)

Lessons from Around the World: Rural Rider Preferences, Mobility as a Service Feasibility, and Intermodal Services
Jonathan Brooks, LINK Houston, presiding
Sponsored By Standing Committee on Rural Public and Intercity Bus Transportation

What do residents of rural areas want in bus service? How are rural regions making intermodal connections into urban areas? Can Mobility as a Service improve access to opportunity in small cities and rural areas? Join this session to learn about these and related issues. The session will combine lectern presentations with ample time for interactive Q& A discussion about how rural and intercity transportation is changing around the world .

Preferences Toward Bus Alternatives in Rural Areas of the Netherlands: A Stated Choice Experiment (20-03818)
Kristel Bronsvoort/Delft University of Technology, María J. Alonso-González/Delft University of Technology, Niels van Oort/Delft University of Technology, Eric Molin/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology
The Intermodal Connection of High-Speed Rail with an Inter-Regional Bus Service: A Case Study in Japan (20-0 0406)
Ryosuke Yashiro/The University of Tokyo, Hironori Kato/The University of Tokyo
Exploring the Feasibility of Mobility-as-a-Service in Small Urban and Rural Communities: Lessons from a Case Study (20-02763)
Xinyu Liu/University of Wisconsin, Milwaukee, Jie Yu/University of Wisconsin, Milwaukee, Shamsi Trisha/University of Wisconsin, Milwaukee, Edward Beimborn/University of Wisconsin, Milwaukee

1753

Behavior and Policies for Taxis and Demand Responsive Transit
Lindsey Morse, Imperial College London, presiding
Sponsored By Standing Committee on Paratransit

Three presentations explore the behaviors of users and drivers in demand responsive systems. One presentation investigates the benefits and challenges of incorporating e-hailing services in a paratransit program. Another presentation analyzes the behaviors of taxi drivers using a mobile application. A third presentation assess the value that customers place on the convenience of taxi service compared to fixed-route transit.

Benefits and Challenges of On-Demand E-Hailing Paratransit Programs: A Case Study of Pilot Programs in New York City and Boston (20-03017)
Madeleine Parker/University of California, Berkeley
An Analysis of User Behavior Change Resulting from Transportation Mobile Applications: A Case Study of Taxi Drivers in Seoul (20-02687)
Daisik Nam/University of California, Irvine, Bumsik Kim/University of California, Irvine, Kijung Ahn/University of California, Irvine
Assessment of the Value Associated with Convenience and Time for Taxi Trips in New York City (20-04018)
Mehmet Ulak/Stony Brook University, Anil Yazici/Stony Brook University, Mohammad Aljarrah/Stony Brook University

1754   CM (1.50)

Engagement and Management of Stakeholder Groups During the Airport Planning Process
Steve Denes, Greater Toronto Airports Authority, presiding
Sponsored By Aviation Group, International Members Council-Aviation

This session explores the relationship between airports and their stakeholders – a lack of understanding can lead to lack of ability to work together or come to appropriate agreements on final plans for airport development. Best practices for stakeholder engagement from around the world will be discussed, along with how text mining and sentiment analysis is used to help airport owners understand their stakeholders. The amount and depth of stakeholder involvement necessary in conducting airport master plans depends on the airport leadership's goals and the expertise of staff and consultants.How communities react to stakeholder engagement efforts will be discussed, as well as how can airport owners obtain better representation from their surrounding communities when it comes to airport development and its environmental and community consequences.

Introduction (P20-20760)
Kum (Dan) Wong/Prince Sultan University
A Case Study in International Stakeholder Engagement: New Mexico City International Airport (P20-20754)
Elizabeth McQueen/Kimley-Horn and Associates, Inc.
The Dos and Don'ts of Master Plan Stakeholder Management: A Career Planner's Retrospective (P20-20755)
Wayne Schuster/Retired Airport Executive
Understanding Community Opinions: An Overview of Sentiment Analysis (P20-20756)
Tony Diana/Federal Aviation Administration (FAA)
Feedback on Community Engagement Workshops and Efforts for the FAA (P20-20757)
Beth White/Federal Aviation Administration (FAA)
Toronto Regarding Management of Community Interests for the Noise Exposure Forecast (P20-20759)
Robyn Connelly/Greater Toronto Airports Authority

1755

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, 143B

Measuring Performance Across Transportation Modes: Similarities, Differences, and Synergies

Sam Granato, Ohio Department of Transportation, presiding

Sponsored By Aviation Group, Task Force on Data for Decisions and Performance Measures, Policy and Organization Group, Standing Committee on Performance Management, Rail Group, Standing Committee on Freight Rail Transportation, Standing Committee on Airfield and Airspace Capacity and Delay, Standing Committee on Ports and Channels

This cross-cutting session brings together speakers from several modes of transport. These speakers will present and discuss the state of the practice for integrating performance data into performance management - including performance measures, data sources, and analysis techniques. Capturing and processing system performance data is integral to delivering modal and intermodal performance information that can enhance decision-making. The session provides an opportunity to compare the approaches to performance measurement used in different modes , comparisons that may lead to both innovation and collaborations across modes.

Stretching Performance Measures Beyond Big Data: Lessons from the Special Task Force on Data for Decisions and Performance Measures (P20-20122)
Joseph Schofer/Northwestern University
Performance Measurement and Metrics: Maritime Ports (P20-20124)
Daniel Smith/The Tioga Group, Inc.
Performance Measurement and Metrics: Freight and Passenger Rail (P20-20126)
Elizabeth (Libby) Ogard/Prime Focus, LLC
Performance Measurement and Metrics: Commercial Aviation (P20-20128)
Lance Sherry/George Mason University
Maximizing Performance Management to Support Decision Making (P20-20127)
Mara Campbell/Jacobs

1483

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, Hall A

Novel Use of Economic Analysis in Decision Making
Sabyasachee Mishra, University of Memphis, presiding
Sponsored By Standing Committee on Transportation Economics

Impact of Transit on Multifamily Property Values: A Meta-Analysis (20-00626) - A160
Fariba Siddiq/University of California, Los Angeles, Amanda Dillon/University of California, Los Angeles, Reid Ewing/University of California, Los Angeles
How to Align Transportation Policy with Residential Location Preference Among Trade-Offs: Choosing Public Transit, Housing Density, or Fuel Tax Revenue (20-01024) - A161
Christian Sprague/Cornell University, H. Oliver Gao/Cornell University
Impact of Heavy-Rail-Based Rapid Transit on House Prices: Evidence from the Fremont, California, Warm Springs BART Extension Project (20-01033) - A162
Shishir Mathur/San Jose State University
Latent Attitudes of Existing Travel Modes on Autonomous Vehicle Adoption (20-01060) - A167
Baichuan Mo/Tongji University, Qing Yi Wang/Tongji University, Yu Shen/Tongji University, Jinhua Zhao/Tongji University
Stated Preference for Autonomous Driving and Its variation with Travel Distance (20-01255) - A168
Jaehyung Lee/Yonsei University, Euntak Lee/Yonsei University, Jaewoong Yun/Yonsei University, Jin-Hyuk Chung/Yonsei University, Jinhee Kim/Yonsei University
Impact of Transportation Network Companies on the Labor Supply of the Taxi Industry (20-01330) - A169
Lu Ling/Purdue University, Xinwu Qian/Purdue University, Satish Ukkusuri/Purdue University
Evaluating Benefit-Cost Analysis of I-80 Truck Climbing Lanes in Wyoming: An Operational and Safety Analysis Approach (20-01435) - A170
Muhammad Tahmidul Haq/University of Wyoming, Milan Zlatkovic/University of Wyoming, Khaled Ksaibati/University of Wyoming

(continued)

Impact of Transit-Oriented Development on Residential Property Value Around Urban Rail Stations: Evidence from Shanghai, China (20-01591) - A171

Yang Jiang/China Sustainable Transportation Center, Peiqin Gu/China Sustainable Transportation Center, Jie Qi/China Sustainable Transportation Center, Zhejing Cao/China Sustainable Transportation Center, Yulin Chen/China Sustainable Transportation Center

Can Urban Rail Transit Land Value Be Captured?: In Athens Probably Not (20-01996) - A172

Athena Roumboutsos/University of the Aegean, Danai Bolorizou/University of the Aegean

A Study on the Value and Market Potential of Blockchain-Based Solutions Supporting Asset Sharing Between Car Rental Operators (20-04459) - A177

Dimitrios Kourtesis/European Commission, Michail Makridis/European Commission, Stefanos Tsiakmakis/European Commission, Nikolaos Tsoniotis/European Commission, Georgios Fontaras/European Commission

Method to Determine the Personal Budget Spent in Urban Transport (20-04866) - A178

Fabiene Cristina de Carvalho da Costa/Federal University of Rio de Janeiro, Carlos Nassi/Federal University of Rio de Janeiro

Asymmetric Logistic Model for Estimation of Mileage-Related Vehicle Depreciation Function of Roadway Characteristics (20-04956) - A179

Rami Chkaiban/University of Nevada, Reno, Elie Hajj/University of Nevada, Reno, Muluneh Sime/University of Nevada, Reno, Gary Bailey/University of Nevada, Reno, Peter E. Sebaaly/University of Nevada, Reno

Alternatives in Economic Analysis and Prioritization of Highway Safety Improvement Projects in Texas (20-05101) - A180

Ioannis Tsapakis/Texas A&M Transportation Institute, Sushant Sharma/Texas A&M Transportation Institute, William Holik/Texas A&M Transportation Institute

Exploring the Economic Impact of Traffic Crashes at the Zonal Level (20-05263) - A181

Amin Mohamadi Hezaveh/North Carolina Department of Transportation, Christopher Cherry/North Carolina Department of Transportation

The Feasibility of Introducing Urban Rail Transit Lines Linking the New Towns for the Megacity: From the Aspect of Land Value Uplift Based on Difference in Difference Model (20-05524) - A182

Junfang Li/Shanghai University of Engineering and Science, Jie Yu/Shanghai University of Engineering and Science, Hua Hu/Shanghai University of Engineering and Science, Zhigang Liu/Shanghai University of Engineering and Science

Impact of Transportation Network Companies on Select Metropolitan Area Vehicle Miles of Travel (20-05961) - A183

Richard Driscoll/Cambridge Systematics, Inc., Kurt Lehmann/Cambridge Systematics, Inc.

Highway Improvement Project Selection: An Analytical Framework for Economic Evaluation of Project Alternatives (P20-21386) - A184

Edem Dzakwasi/Economic Decisions Group, Inc

Planning to Programming Expansion Project Ranking Evaluation Criteria (P20-21387) - A185

Baloka Belezamo/Arizona Department of Transportation

Economic Benefits of New York City Cordon Pricing (P20-21388) - A186

Amirhossein Baghestani/City College of New York, Mahdieh Allahviranloo/City College of New York, Carla Tejada/City College of New York

Prioritization of Autonomous Public Transit Buses on Urban Roads (P20-21389) - A187

Ishant Sharma/University of Memphis, Sabyasachee Mishra/University of Memphis, Mihalis Golias/University of Memphis

Systemic Project Selection Framework for Local Roads in Florida (P20-21390) - A188

Roozbeh Rahmani/University of Florida

Economic Analysis of Freight Corridors and Projects in Texas (P20-21391) - A189

Rydell Walthall/University of Texas, Austin

Road Project Selection: Considerations of Project Scheduling, Relationship Between Road Capacity and Project Duration, and Road User Behavior (P20-21392) - A190

Sania E. Seilabi/Purdue University

Project Performance Assessment in Plan Bay Area 2050 (P20-21393) - A191

Anup Tapase/Metropolitan Transportation Commission (MTC)

Funding and Financing Surface Transportation: What Will the Future Bring?

Rimon Rafiah, Economikr, presiding

Sponsored By Standing Committee on Revenue and Finance, Subcommittee on Public-Private Partnerships

Many experts expect significant evolution and changes in surface transportation funding and financing in the coming decades. Studies and demonstrations related to challenges and anticipated evolution and changes are critical to shaping the future of surface transportation systems. This poster session highlights analysis and summaries of timely and creative topics, including cost allocation and equity, urban vs. rural, regional managed lane networks, P3 and alternate contracting efficiencies, road user charges, value capture, bikeshare systems, ballot initiatives and public perceptions of transportation fees and taxes.

Mileage-Based Road User Charge System: A Literature Review (20-00808) - A150

Olga Bredikhina/Alabama Transportation Institute, Justin Fisher/Alabama Transportation Institute, Bouran Mozayen/Alabama Transportation Institute, Melissa Wheeler/Alabama Transportation Institute

No Free Rides: Winners and Losers of the TTC U-Pass (20-01084) - A151

Alex Butler/Dillon Consulting

Fair and Efficient Usage of Transportation Supply with Envy Minimization and Allocated System Efficiency (20-03058) - A152

Daisik Nam/University of California, Irvine, R. Jayakrishnan/University of California, Irvine

Increasing Bikeshare Revenue Through Value-Based Pricing: Lessons from Behavioral Economics (20-03183) - A153

Mohan Venigalla/George Mason University, Thomas Brennan/George Mason University, Siddartha Rayaprolu/George Mason University, Shruthi Kaviti/George Mason University

High-Speed Railway and Airline Cooperative Game Model and Analysis Under Revenue-Sharing Contract (20-03338) - A154

Liang Wei/Beijing Jiaotong University, Xiushan Jiang/Beijing Jiaotong University, Tao Zhu/Beijing Jiaotong University

Capital Versus Operation and Maintenance: The Rise and Fall of Dockless Bikeshare in China (20-03367) - A155

Rongfang Liu/New Jersey Institute of Technology, Yikai Hu/New Jersey Institute of Technology

Updating Truck Permit Fee Schedule Based on Pavement Damage Analysis of Shale Gas Overweight Trucks in Louisiana (20-03483) - A156

Yilong Liu/Louisiana Transportation Research Center (LTRC), Zhong Wu/Louisiana Transportation Research Center (LTRC), Tyson Rupnow/Louisiana Transportation Research Center (LTRC)

Growing Transit to Support Priced Transportation Systems (20-03683) - A157

Patrick DeCorla-Souza/Federal Highway Administration (FHWA), William Ankner/Federal Highway Administration (FHWA), Gabriel Roth/Federal Highway Administration (FHWA)

Simplified Comparison of Oversize and Overweight Vehicles Permit Fee Structure in the U.S. Western States (20-05129) - A158

Ehsan Dehghan-Niri/New Mexico State University, Douglas Cortes/New Mexico State University, Sina Zamen/New Mexico State University, Fernando Alvidrez/New Mexico State University, David Jauregui/New Mexico State University

Transportation Ballot Initiatives and Equity: Passage and Funding Mechanisms at the Local, County, and State Levels (20-05990) - A159

Elyse Lewis/University of Washington, Alice Grossman/University of Washington

Saving Refinancing Cost Under Cash Flow Shortage: The Option Value of Contingent Finance Support in Transportation Public–Private Partnership Projects (20-04477) - A149

Yunping Liang/Georgia Institute of Technology (Georgia Tech), Baabak Ashuri/Georgia Institute of Technology (Georgia Tech)

The Impact of Incorporating Non-User Revenue Sources in Highway Cost Allocation Equity Analysis (P20-20345) - A148

Bismark Agbelie/Catholic University of America (CUA)

Policy and Legal Frameworks for Equitable Revenue Sharing Programs for Priced Managed Lanes: Case Studies (P20-20357) - A147

Gabor Debreczeni/WSP

Achieving Equity in Highway Funding: Charging All Classes of Highway Users Based on the Cost Imposed on the System Combined with Efficient Market Pricing (P20-20349) - A146

Michael Lawrence/Jack Faucett Associates, Inc.

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Alternative Contracting Methods Evaluation Toolset (P20-20351) - A140
Michael Garvin/Virginia Polytechnic Institute and State University, Daniel D'Angelo/Applied Research Associates, Inc. (ARA)
Implementing Airport Public–Private Partnerships: Guidance for Decision Makers (P20-20352) - A142
Caitlin Ghoshal/WSP
Capitalizing on the Value Created by Transportation: Implementation Manual (P20-20353) - A141
Sasha Page/IMG Rebel, Daniel D'Angelo/Applied Research Associates, Inc. (ARA)
Income and Geographic Equity Effects of Current Gas Taxes and Potential RUCs for 10 States (P20-20354) - A1 43
Jenna Goldberg/EBP, Kyle Schroeckenthaler/EBP, Stephen Fitzroy/EBP
Public Perception of Transportation Fees and Taxes in North Carolina (P20-20355) - A144
Nicolas Norboge/NCSU-ITRE, Weston Head/Institute for Transportation Research and Education (ITRE)
Information Source for Major Transportation Projects: Development Process and Lessons Learned (P20-20356) - A145
Qingbin Cui/University of Maryland, College Park

1757

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, Hall A
Emerging Issues in Urban Big Data
Patrick Coleman, AECOM, presiding
Stacey Bricka, MacroSys Research and Technology, presiding
Sponsored By Standing Committee on Urban Transportation Data and Information Systems, Subcommittee on Urban Big Data

This session includes posters covering a wide range of applications that involve the application of big data to urban transportation issues. Topics covered in this session include using mobile phone data to examine urban mobility patterns, examinations of data from ridehailing applications, and other emerging uses of big data in metropolitan areas.

A Prototype Model of Ridehailing Service Provision (20-00112) - A100
Francisco Calderón/University of Toronto, Eric Miller/University of Toronto
Activity Estimation from Mobile Phone Data (20-00846) - A101
Michael Cik/Graz University of Technology, Alexandra Lechner/Graz University of Technology, Cornelia Hebenstreit/Graz University of Technology, Martin Fellendorf/Graz University of Technology
Examining Regional Mobility Patterns of Public Transit and Automobile Users Based on Smartcard and Mobile Internet Data (20-00996) - A102
Xi Chen/Beihang University, Yinhai Wang/Beihang University, Jinjun Tang/Beihang University, Zhuang Dai/Beihang University, Xiaolei Ma/Beihang University
Investigation of Travel-Time Budget Based on Big Data from Mobile Phone Signaling in South Korea (20-01185) - A103
Younshik Chung/Yeungnam University, Sangki Nam/Yeungnam University, Woo-Young Ahn/Yeungnam University
Targeted Marketing Data as a Transportation Data Source: Applications, Integration, and Validation (20-01237) - A104
Faaiqa Shaw/Georgia Institute of Technology (Georgia Tech), Xinyi Wang/Georgia Institute of Technology (Georgia Tech), Patricia Mokhtarian/Georgia Institute of Technology (Georgia Tech), Kari Watkins/Georgia Institute of Technology (Georgia Tech)
Revealing Mobility Patterns and Urban Spatial Structures by Fusing Multi-Source Data (20-01695) - A105
Shuo Ding/Tongji University, Yingying Xing/Tongji University, Jian Lu/Tongji University
Characterization of Individual Mobility, for Non-Routine Mobility Patterns: A Case Study (20-02296) - A106
Inês Cunha/Universidade de Coimbra, Anabela Ribeiro/Universidade de Coimbra, Rui Gomes/Universidade de Coimbra
Capturing Multi-Stop, Trip-Chaining Patterns from Mobile Phone Data: A Case Study of China (20-02327) - A107
Jin Zhang/Southwest Jiaotong University, Yiheng Chen/Southwest Jiaotong University, Pengpeng Xu/Southwest Jiaotong University, Xiaohu Tang/Southwest Jiaotong University, Ni Dong/Southwest Jiaotong University
Estimating the Effect of Uber and Lyft on Parking Violations in New York City (20-02770) - A108
Zhan Guo/New York University, Junjie Cai/New York University, Junru Lu/New York University, Pranay Anchan/New York University, shijia Gu/New York University, Yuxuan Wang/New York University

(continued)

Empirical Validation of Network Learning with Taxi GPS Data from Wuhan, China (20-04005) - A109

Jia Xu/New York University, Qian Xie/New York University, Joseph Chow/New York University, Xintao Liu/New York University

Route Choice Behavior Analysis Considering Heterogenous Travel Distances Using Occupied Taxi Trajectory Data (20-04148) - A110

Yajuan Deng/Missouri University of Science and Technology, Meiye Li/Missouri University of Science and Technology, Xianbiao Hu/Missouri University of Science and Technology

The Role of Urban Big Data in Travel Behavior Research: A Review and Synthesis (20-05283) - A111

chihuangji wang/University at Buffalo - The State University of New York, Daniel Hess/University at Buffalo - The State University of New York

Retrieving Activity Locations from Mobile Device Location Data Based on a Hierarchical Density-Based Clustering Method (20-05286) - A112

Yixuan Pan/University of Maryland, College Park, Lei Zhang/University of Maryland, College Park

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1758

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, Hall A
Road Scholars: New Research in Travel Time, Speed, and Reliability Data
Ramkumar Venkatanarayana, Virginia Transportation Research Council, presiding
Jiaqi Ma, University of Cincinnati, presiding
Mei Chen, Kentucky Transportation Center, presiding
Sponsored By Standing Committee on Urban Transportation Data and Information Systems, Subcommittee on Travel Time Speed and Reliability, Standing Committee on Highway Traffic Monitoring

This session covers the use, analysis, and estimation of travel time, speed, and reliability. Topics covered include methods to analyze, process, and validate data; performance measures and determination of appropriate metrics; comparison of various sources of travel time data; modeling of travel time; queue length estimation; handling missing data, comparisons across sources of data; full travel path as well as road segment travel times; and inclusion of other data such as weather into travel time estimates.

Exploration on the Effects of Rainfall on Origin-Destination-Based, Travel-Time Reliability Using the Gaussian Mixture Model (20-00408) - A113

Qi Zhang/Chang'an University, Hong Chen/Chang'an University, Yibin Zhang/Chang'an University, Min Zhang/Chang'an University

The Transit Travel Time Machine: Comparing Three Different Tools for Travel-Time Estimation (20-00566) - A114

Bahman Lahoorpoor/The University of Sydney, David Levinson/The University of Sydney

Decentralized Optimization of Vehicle Route Planning: A Cross-City Comparative Study (20-00924) - A115

Brionna Davis/University of Minnesota, Grace Jennings/University of Minnesota, Taylor Pothast/University of Minnesota, Ilias Gerostathopoulos/University of Minnesota, Evangelos Pournaras/University of Minnesota, Raphael Stern/University of Minnesota

Developing Planning-Level Prediction Models for the Travel-Time Reliability of the National Highway System: A Study of 13 States (20-01481) - A116

Chowdhury Siddiqui/South Carolina Department of Transportation

Travel-Time Estimation of Diverging Traffic Stream in Highways Based on Timestamp Data (20-01687) - A117

Sunghoon Kim/Korea Advanced Institute of Science and Technology (KAIST), Hwapyeong Yu/Korea Advanced Institute of Science and Technology (KAIST), Hwasoo Yeo/Korea Advanced Institute of Science and Technology (KAIST)

Using License Plate Recognition Data to Gain Insight into Urban Travel-Time Distributions (20-01733) - A118

Xiaoqin Luo/Zhejiang University, Xuegang Ban/Zhejiang University, Dianhai Wang/Zhejiang University

Maximum Likelihood Estimation of Probe Vehicle Penetration Rates and Queue Length Distributions from Probe Vehicle Data (20-01782) - A119

Yan Zhao/University of Michigan, Ann Arbor, Henry Liu/University of Michigan, Ann Arbor

A Framework to Benchmark Travel-Time Prediction Models (20-01885) - A120

Sara Respati/Queensland University of Technology, Ashish Bhaskar/Queensland University of Technology, Edward Chung/Queensland University of Technology, Zuduo Zheng/Queensland University of Technology

A Hidden Markov Model for the Estimation of Dependent Queues Using Probe Vehicle Data (20-01901) - A121

Yan Zhao/University of Michigan, Ann Arbor, Henry Liu/University of Michigan, Ann Arbor, Shengyin Shen/University of Michigan, Ann Arbor

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Short-Term Travel Speed Prediction for Urban Expressways: Hybrid Convolutional Neural Network Models (20-01968) - A122

Keshuang Tang/Tongji University School of Transportation Engineering, Siqu Chen/Tongji University School of Transportation Engineering, Yumin Cao/Tongji University School of Transportation Engineering, Xiaosong Li/Tongji University School of Transportation Engineering, Di Zang/Tongji University School of Transportation Engineering, Jian Sun/Tongji University School of Transportation Engineering

Real-Time Prediction of Vehicle Accumulation and Travel Times Over Extended Freeway Segments Using a Reproducible Elliptical Bivariate Relationship (20-02391) - A123

Dongju Ka/Korea University, Chungwon Lee/Korea University, Koohong Chung/Korea University

Verification of Crowdsourced Speed Data in Surface Streets: A Case Study of Waze and Bluetooth Speed Data in Sevierville, Tennessee (20-02620) - A124

Nima Hoseinzadeh/University of Tennessee, Knoxville, Yuandong Liu/University of Tennessee, Knoxville, Lee Han/University of Tennessee, Knoxville, Candace E. Brakewood/University of Tennessee, Knoxville, Amin Mohammadnazar/University of Tennessee, Knoxville

Identification of OD Trips from GPS Data Streams to Measure Travel Time Reliability of Dedicated Trucks (20-03889) - A125

Li Zhao/University of Nebraska, Lincoln, Ying LI/University of Nebraska, Lincoln, Laurence Rilett/University of Nebraska, Lincoln

Examining Short-Term Freeway Travel-Time Prediction Models with Different Periodic Functions (20-04095) - A126

Xu Miao/The key laboratory of Road and Traffic Engineering,Ministry of Education, Tongji University, Bing Wu/The key laboratory of Road and Traffic Engineering,Ministry of Education, Tongji University, Yajie Zou/The key laboratory of Road and Traffic Engineering,Ministry of Education, Tongji University, Lingtao Wu/The key laboratory of Road and Traffic Engineering,Ministry of Education, Tongji University

The Role of "Gossip" in Instantaneous Driving Decisions: Evidence of Behavior Propagation Using Instrumented Vehicle Data (20-04401) - A127

Meng Zhang/WSP USA Corp, Asad Khattak/WSP USA Corp, Huiyuan Liu/WSP USA Corp, Brian Reed/WSP USA Corp

Quantifying Probe Vendors' Ability to Capture Congestion Events: Steps Toward Automating the Slowdown Validation Process (20-04678) - A128

Sanaz Aliari/University of Maryland, College Park, Zachary Vander Laan/University of Maryland, College Park, Sepideh Eshragh/University of Maryland, College Park, Elham Sharifi/University of Maryland, College Park

Validating Travel-Time Reliability as a Function of Congestion Using Wi-Fi Sensor-Derived Travel-Time Data (20-05128) - A129

Vikram Singh/Sardar Vallabhbhai National Institute of Technology, Surat, Ninad Gore/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Gaurang Joshi/Sardar Vallabhbhai National Institute of Technology, Surat, Ashish Bhaskar/Sardar Vallabhbhai National Institute of Technology, Surat

Travel Time and Reliability Thresholds for Freeway Links from Planning Perspective (20-05249) - A130

Srinivas Pulugurtha/University of North Carolina, Charlotte, Swapneel Kodupuganti/University of North Carolina, Charlotte

Probe Vehicle Performance Measures for Assessing Travel-Time Reliability (20-05982) - A131

Shoaib Mahmud/Iowa State University, Md Toushik Ahmed Niloy/Iowa State University, Kyle Thompson/Iowa State University, Christopher Day/Iowa State University

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1759

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, Hall A

Road (Data) Warriors: Student Data Challenge on Urban Travel Time, Speed, and Reliability

Stephen Remias, Wayne State University, presiding
Masoud Hamedi, ITERIS, Inc., presiding
Sponsored By Standing Committee on Urban Transportation Data and Information Systems, Subcommittee on Travel Time Speed and Reliability, Standing Committee on Highway Traffic Monitoring

This session will include poster presentations from the top submissions to the Travel Time, Speed, and Reliability (ABJ30(3)) subcommittee's Student Data Challenge.

Viginia Crash Data Analysis (P20-21190) - A132

Binya Zhang/University of Maryland, College Park, Qinglian He/Center for Advanced Transportation Technology, Sanaz Aliari/University of Maryland, College Park

(continued)

A Multi-Level Extreme Gradient Boosting Model for Vehicle Crash Type Prediction in Virginia (P20-21191) - A133

Xiyue Li/University of Illinois, Urbana Champaign, Mohammad Amin Nabian/University of Illinois, Urbana Champaign, Hadi Meidani/University of Illinois, Urbana Champaign

1760

Traffic Flow Theory and Characteristics, Part 4 (Part 1, Session 1654; Part 2, Session 1655; Part 3, Session 1656 ; Part 5, Session 1761)

Ali Zockaie, Michigan State University, presiding

Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

Practical Approach for the Estimation of Conflicting Traffic Volume at Mid-Block Median Openings (20-02487) - B300

Tathagatha khan/Indian School of Mines, Dhanbad, Smruti Mohapatra/Indian School of Mines, Dhanbad

Studying Car-Following Dynamics on the Basis of the HighD Data Set (20-02558) - B301

Valentina Kurtc/SIMETRA Group (A+S Transproekt LLC)

Developing Extended Trajectory Database for Heterogeneous Traffic Like NGSIM Database (20-02626) - B302

Narayana Raju/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Said Easa/Sardar Vallabhbhai National Institute of Technology, Surat, Gaurang Joshi/Sardar Vallabhbhai National Institute of Technology, Surat

Impact of Advisory Speed Limit on the Overall Performance of Signalized Networks: A Network Fundamental Diagram Approach (20-02733) - B303

Ximeng Fan/University of California, Irvine, Pengyuan Sun/University of California, Irvine, Wenlong Jin/University of California, Irvine

Differences in Freeway Car Following: Empirical Findings from Naturalistic Driving Studies in Shanghai and Ann Arbor (20-02811) - B305

Meixin Zhu/Tongji University, Yinhai Wang/Tongji University, Xuesong Wang/Tongji University

Method for Verifying the Identification Accuracy of Critical Segments Considering Highly Correlated Characteristics of Traffic Flow (20-02857) - B306

Zundong (Jay) Zhang/North China University of Technology, Menyao Zhu/North China University of Technology, Xuegang Ban/North China University of Technology, Yifan Zhang/North China University of Technology

A Non-Linear Model Predictive Control Approach for Coordinated Control of Highways (20-03159) - B307

Kimia Chavoshi/Eidgenossische Technische Hochschule Zurich, Anastasios Kouvelas/Eidgenossische Technische Hochschule Zurich

Experiments on the Influence of Wall-Shaped Obstacle on Pedestrian Egress Efficiency (20-03273) - B308

Xiaolu Jia/University of Tokyo, Daichi Yanagisawa/University of Tokyo, Claudio Feliciani/University of Tokyo, Katsuhiro Nishinari/University of Tokyo

Mixed Traffic Flow on a Multi-Lane Road: Equilibrium Properties and Implications for Lane Control (20-03336) - B309

Jia Li/Texas Tech University

Modeling Lane-Changing Behaviors in Merging Area of Urban Expressway: A Case Study from Nanjing, China (20-03402) - B310

Quan Chen/Southeast University, Hao Wang/Southeast University, Changyin Dong/Southeast University

A Formulation of the Relaxation Phenomenon for Lane-Changing Dynamics in an Arbitrary Car-Following Model (20-03440) - B311

Ronan Keane/Cornell University, H. Oliver Gao/Cornell University

A Semi-Lagrangian Dynamic System Optimum Traffic Assignment Model in Continuum Space (20-03446) - B313

Rafegh Aghamohammadi/Georgia Institute of Technology (Georgia Tech), Ludovic Leclercq/Georgia Institute of Technology (Georgia Tech), Jorge Laval/Georgia Institute of Technology (Georgia Tech)

Hybrid Modeling of Mandatory Lane Changes Near Freeway Diverges (20-03468) - B314

Hao Zhou/Georgia Institute of Technology (Georgia Tech), Randall Guensler/Georgia Institute of Technology (Georgia Tech), Jorge Laval/Georgia Institute of Technology (Georgia Tech)

Experiments on Exit Choice Behavior in Walking and Running Scenarios in Straight and L-Shaped Corridors (2 0-03915) - B315

Daichi Yanagisawa/The University of Tokyo, Milad Haghani/The University of Tokyo, Majid Sarvi/The University of Tokyo

Calibrating Microscopic Models for Commercially Available Autonomous Driving Systems: A Multi-Objective Approach (20-00689) - B316

Felipe de Souza/University of Minnesota, Raphael Stern/University of Minnesota

(continued)

Modeling System Dynamics for Mixed Traffic with Partially Connected and Automated Vehicles (20-01778) - B317

Lianhua An/Tongji University, Jia Hu/Tongji University, Xianfeng Yang/Tongji University

1761

Wednesday, 02:30 p.m. - 04:00 p.m., Convention Center, Hall A

Traffic Flow Theory and Characteristics, Part 5 (Part 1, Session 1654; Part 2, Session 1655; Part 3, Session 1656; Part 4, Session 1760)

Hwasoo Yeo, Korea Advanced Institute of Science and Technology (KAIST), presiding
Sponsored By Standing Committee on Traffic Flow Theory and Characteristics

What If Many Smart Cars Conduct Ego-Efficient Lane Changes in Traffic Flow: An Answer Provided by Reinforcement Learning (20-04313) - B330

Yibing Wang/Tongji University, Jingqiu Guo/Tongji University, Mingming Zhao/Tongji University, Yonghui Hu/Tongji University, Ioannis Papamichail/Tongji University, Markos Papageorgiou/Tongji University, Robert Bertini/Tongji University

Calibration of VISSIM Desired Acceleration Functions: Implications for Microsimulation (20-04411) - B331

David Florence/Texas A&M University Transportation Institute, Xiaoyu Guo/Texas A&M University Transportation Institute, Kevin Balke/Texas A&M University Transportation Institute

Capacity Gains of Splitting Cross Traffic into Multiple Sub-Streams (20-04529) - B332

Victor Knoop/Delft University of Technology, Maria Wierbos/Delft University of Technology, Otto Van Boggelen/Delft University of Technology

Action Points in Human Driving (20-04663) - B333

Peter Wagner/DLR - German Aerospace Center

How Many People Can Simultaneously Move Through Space?: A Study of the Impact of Complex Flow Situations on the Shape of the Fundamental Diagram (20-04758) - B334

Dorine Duives/Delft University of Technology, Martijn Sparnaaij/Delft University of Technology, Winnie Daamen/Delft University of Technology, Serge Hoogendoorn/Delft University of Technology

Optimizing Dedicated Lane Allocation for Fastag Tollway Operations Using Microsimulation: A Case Study of Toll Plaza, Rajasthan, India (20-04805) - B335

Manraj Bains/Sardar Vallabhbhai National Institute of Technology, Surat, Ramya Shesha Sanagapalli/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat, Anbumani K S/Sardar Vallabhbhai National Institute of Technology, Surat, Rajdeep Jadeja/Sardar Vallabhbhai National Institute of Technology, Surat

Car Following and Microscopic Traffic Simulation Under Distracted Driving (20-04903) - B336

sunbola zatmeh-kanj/Technion Israel Institute of Technology, Tomer Toledo/Technion Israel Institute of Technology

Modeling Longitudinal Driving Behavior by Incorporating Uncertainty by Driver Perception (20-05081) - B337

Bing Wu/Tongji University, Yanting Liu/Tongji University, Daiheng Ni/Tongji University, Xuesong Wang/Tongji University, Linbo Li/Tongji University

Vehicular Trajectory–Based Investigation of Driving Behavior at Signalized Intersection Operating with Weak Lane Discipline (20-05131) - B338

Ritvik Chauhan/Sardar Vallabhbhai National Institute of Technology, Surat, Narayana Raju/Sardar Vallabhbhai National Institute of Technology, Surat, Ashish Dhamaniya/Sardar Vallabhbhai National Institute of Technology, Surat, Shriniwas Arkatkar/Sardar Vallabhbhai National Institute of Technology, Surat

Evaluating the Impact of Rain on Lane-Changing Behavior Using Naturalistic Driving Data: Cluster Analysis and Multi-Level Modeling Approach (20-05517) - B339

Anik Das/Federal Highway Administration (FHWA), Md Nasim Khan/Federal Highway Administration (FHWA), Mohamed Ahmed/Federal Highway Administration (FHWA), haun Wulff/Federal Highway Administration (FHWA)

Analysis of Vehicle Following Behavior Using Vehicle Trajectory Data Under Mixed Traffic Conditions (20-05529) - B340

Madhuri Kashyap N R/INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI, Bhargava Chilukuri/INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI, Karthik Srinivasan/INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI, Gowri Asaithambi/INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI

Evaluating Lateral Interactions of Motorized Two-Wheelers Using Multi-Gene Symbolic Genetic Programming (20-05629) - B341

Sanhita Das/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, Narayana Raju/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, Akhilesh Maurya/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, Shriniwas Arkatkar/INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

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A Novel Approach for Calibrating Freeway Highway Multi-Regimes Fundamental Diagram (20-05709) - B342

Emmanuel Kidando/Mercer University, Alican Karaer/Mercer University, Boniphace Kutela/Mercer University, Angela Kitali/Mercer University, Ren Moses/Mercer University, Eren Ozguven/Mercer University, Thobias Sando/Mercer University

Analysis of Platooning Through Microscopic Traffic Flow Simulation (20-05944) - B343

Marilo Martin-Gasulla/University of Florida, Peter Sukennik/University of Florida, Jared Best/University of Florida, Jochen Lohmiller/University of Florida

Learning Passing Decision Making in Mixed Traffic (20-06031) - B344

Anuj Budhkar/Indian Institute of Technology Bombay, Durba Kundu/Indian Institute of Technology Bombay, Akhilesh Maurya/Indian Institute of Technology Bombay

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1762

Wednesday, 02:30 p.m. - 06:00 p.m., Convention Center, Salon C
Intelligent Transportation Systems Project Updates
Brian Cronin, Federal Highway Administration (FHWA), presiding
Sponsored By Standing Committee on Intelligent Transportation Systems

Welcome (P20-21547)
Brian Cronin/Federal Highway Administration (FHWA), Gregory Krueger/HNTB Corporation
Domestic Update (P20-21548)

USDOT Artificial Intelligence Research (P20-21549)
Jonathan Walker/U.S. Department of Transportation
The Use of AI in Transportation Management Centers (P20-21550)
Gene Donaldson/Delaware Department of Transportation
The FHWA Connected Vehicle Early Deployer Technical Assistance Program (P20-21551)
Aaron Greenwood/Leidos, Inc.
IOT for Transportation and Automation (P20-21552)
Katy Salamati/SAS Institute, Inc.
Lessons Learned from Comprehensive SPAT Deployment and Future Plans (P20-21553)
Alan Davis/Georgia Department of Transportation
Exploring the Use of CARMA in the State of Florida (P20-21554)
Raj Ponnaluri/Florida Department of Transportation
International Update (P20-21556)

Korea ITS Update (P20-21557)
Young Jun Moon/The Korea Transport Institute (KOTI)
ITS World Congress: Los Angeles Update (P20-21558)
Laura Chace/ITS America
Lincoln Tunnel Exclusive Bus Lane Automation Project (P20-21720)
Mark Muriello/The Port Authority of New York and New Jersey
Automated Bus Consortium: Project Update (P20-21721)
Jason Mumford/AECOM, Jean Ruestman/Michigan Department of Transportation

1763

Multilevel Approaches of Innovation in Cities, Part 2 (Part 1, Session 1738)
Claude Marin-Lamellet, Université Gustave Eiffel, presiding
Corinne Blanquart, IFSTTAR , presiding
Nour-Eddin El Faouzi, Université Gustave Eiffel, presiding
Sponsored By Standing Committee on International Cooperation, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Urban Transportation Data and Information Systems, Standing Committee on Intelligent Transportation Systems, Standing Committee on User Information Systems, Standing Committee on Pedestrians, Standing Committee on Emerging and Innovative Public Transport and Technologies, Standing Committee on Automated Transit Systems, Standing Committee on Urban Freight Transportation

Innovation policy explicitly promotes technical innovations to enable the transition of the current transportation system into a sustainable transportation system. In this workshop, we emphasize that policy should also consider non-technolo gical innovation covering at least three dimensions: innovation supply, process innovation and business model innovation. Some of the key components are: Frugal mobility for sustainable future, organizationnal innovation, New services and business models (PART II)

A Comprehensive Workflow to Model Mobility and Energy Impacts of New Technologies at the Regional Level (P20-21807)
Aymeric Rousseau/Argonne National Laboratory
A Framework for an Integrated Management Support System with the Consideration of a Multi-Level, Decision-Making Process (P20-21808)
Mohammed Hadi/Florida International University
Creating Digital Twins of Cities: From Data Acquisition to 3D Modeling (P20-21809)
Bruno Vallet/Université Gustave Eiffel

1764   CM (1.50)

Reducing Greenhouse Gas Emissions in Transportation: State Best Practices and Experience
Jonathan Rubin, University of Maine, presiding
Sponsored By Section - Environment and Energy, Standing Committee on Transportation and Air Quality, Standing Committee on Transportation Energy, Standing Committee on Alternative Transportation Fuels and Technologies

Transportation is essential for modern life, but contributes substantially to the greenhouse gas emissions (GHGs). Despite the availability of methods to reduce GHGs, state DOTs face challenges to integrate emission reductions into their planning and programming processes, including limited funding, incomplete data, and lack of staff capacity. This session will discuss methods for State DOTs to reduce GHGs by identifying and describe tools, methods, and data sources that State DOTs can use to assess GHG emissions and evaluate GHG reduction opportunities through planning and programming, design, environmental review, construction, maintenance, and operations. Selected state DOTs will discuss their successes and challenges.

Methods for State DOTs to Reduce Greenhouse Gas Emissions from the Transportation Sector (P20-20149)
Christopher Porter/Cambridge Systematics, Inc.
Minnesota Successes and Challenges (P20-20194)
Timothy Sexton/Minnesota Department of Transportation
Washington State Successes and Challenges (P20-20245)
Karin Landsberg/Washington State Department of Transportation
GHG Emissions Reductions: Texas DOT Perspective (P20-21384)
Jackie Ploch/Texas Department of Transportation

1765

Wednesday, 04:30 p.m. - 06:00 p.m., Convention Center, Salon B
What's New at the National Highway Traffic Safety Administration, Part 2 (Part 1, Session 1749)
Chou-Lin Chen, National Highway Traffic Safety Administration (NHTSA), presiding
Sponsored By Section - Safety

Current NCSA Data Releases (P20-21505)
Rajesh (Raj) Subramanian/National Highway Traffic Safety Administration (NHTSA)
National Driver Register and Problem Driver Pointer System (P20-21506)
Khoa Nguyen/National Highway Traffic Safety Administration (NHTSA)
Data Products and Tools (P20-21507)
Umesh Shankar/National Highway Traffic Safety Administration (NHTSA)
Model Minimum Uniform Crash Criteria (P20-21508)
Sarah Weissman Pascual/National Highway Traffic Safety Administration (NHTSA)
NHTSA/FHWA Cooperation on Roadside Object Contact Data Collection (P20-21509)
Mark Mynatt/National Highway Traffic Safety Administration (NHTSA)

1766   CM (1.50)

Wednesday, 04:30 p.m. - 06:00 p.m., Convention Center, 143A
International Approaches to Aviation Environmental Regulation
Hazel Peace, Jacobs, presiding
Sponsored By Aviation Group, International Members Council-Aviation, Standing Committee on Intergovernmental Relations in Aviation, Standing Committee on Environmental Impacts of Aviation

This sessions explores international approaches to environmental regulation. Different metrics and methodologies are used around the world to assess what is acceptable and unacceptable for environmental impacts. For example noise metrics and how noise complaints are dealt with can be very different from one country to the next . For air quality emission and air quality concentration standards vary around the world, as does the acceptance of what is appropriate to include in and environmental assessment. What about bird hazards, how is this dealt with around the world? There will also be an update and overview of recent developments via CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) and how aviation fuels can contribute to this.

International Approaches to Air Quality (P20-20596)
Hazel Peace/Jacobs
International Approaches to Noise (P20-20597)
Mary Ellen Eagan/HMMH
CORSIA and Sustainable Aviation Fuels (P20-20598)
Nathan Brown/Federal Aviation Administration (FAA)
Wildlife Hazards at Airports in the United States and Abroad (P20-20600)
Mike Begier/U.S. Department of Agriculture (USDA)

1705

Wednesday, 06:15 p.m. - 07:15 p.m., Convention Center, 140B
Freight Data Users Forum: Good Practices, Innovations, and Next Steps in Freight Performance Measurement
Alison Conway, City College of New York, presiding
Sponsored By Standing Committee on Freight Transportation Data

The Freight Data Users Forum is an annual event that brings together the expert community of freight data users to share experience, learn about recent advances, and provide input on next generation needs related to a critical and timely freight data product or process. This year's freight data forum will discuss Freight Performance Measures required by MAP-21 and the FAST Act. Individuals from FHWA and several state DOTs will discuss their recent work investigating factors that influence freight network performance and linking travel time data with broader freight system policy objectives. States, MPOs, and other stakeholders interested in freight performance measurement are encouraged to attend - this event is open to all TRB attendees.

(continued)

Overview of National Freight Performance Measure Efforts (P20-20527)
Jeffrey Purdy/Federal Highway Administration (FHWA)
Modeling Interstate Truck Reliability of Several Southeastern States of the United States (20-01501)
Chowdhury Siddiqui/South Carolina Department of Transportation
Linking Land Use and Freight Performance Measurement: Lessons from New York State (P20-20528)
Catherine Lawson/University at Albany State University of New York

Thursday, January 16 (Sessions 1767)

1767

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, 101
Making Targets Matter: Responding with Performance-Driven Decisions
Michael Grant, ICF, presiding
Patricia Hendren, I-95 Corridor Coalition, presiding
Matthew Hardy, American Association of State Highway and Transportation Officials, presiding
Sponsored By Standing Committee on Performance Management, Task Force on Data for Decisions and Performance Measures, Standing Committee on Strategic Management, Standing Committee on Management and Productivity, Standing Committee on Transportation Asset Management

Transportation agencies are adopting Transportation Performance Management (TPM) principles to align investment and operations decisions with desired outcomes. But what actions and decisions are practitioners undertaking after targets are set to meet those targets? How are agencies making targets matter by monitoring performance, conducting analysis, and then adjusting decisions in response? Participants in this interactive workshop will explore how practitioners can successfully use performance targets and monitored data to support decision making related to programs, investments, operations, and other strategies.

Update on NCHRP Project 02-27: Making Targets Matter (P20-20706)
Anna Batista/High Street Consulting Group, LLC, Joe Crossett/High Street Consulting Group, LLC, Beth Zgoda/ICF
Maryland DOT's Excellerator (P20-20707)
Corey Stottlemyer/Maryland Department of Transportation
Washington Metropolitan Area Transit Authority Performance Accountability (P20-20708)
Anthony Harris/Washington Metropolitan Area Transit Authority
Georgia State Road and Tollway Authority's Performance Management Program (P20-20709)
Jamie Fischer/State Road and Tollway Authority (SRTA) (Georgia)
Virginia DOT's Use of Performance Data to Support Safety Strategies (P20-20710)
Margie Ray/Virginia Department of Transportation
Arizona DOT's Priorities-Based Project Selection Process (P20-20711)
Bret Anderson/Arizona Department of Transportation, Eric Weiner/Decision Lens
Chicago Transit Authority Performance Management (P20-20927)
Zipporah Goldenfeld/Chicago Transit Authority

1768

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, 140A
Journey through Asset Management: Introduction and Interactive Quests through the Updated AASHTO TAM Guide
Hyun-A Park, Spy Pond Partners, LLC, presiding
Kathryn Zimmerman, Applied Pavement Technology, Inc., presiding
Sponsored By Standing Committee on Transportation Asset Management

As the importance of transportation asset management grows, and agencies consider expanding their programs to include additional assets and travel modes, there is an increasing need for assistance with capacity building activities that enhance skills and advance the state of the practice. A key contributor to these activities is the release of the updated Transportation Asset Management Guide through AASHTO. This workshop features a demonstration of the Guide's new digital platform and facilitated discussion on how it can support workforce development activities.

1769 CM (4.00)

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, 206
Nudging the Commute: Behavioral Science and Mode Choice
Caleb Winter, Oregon Metro, presiding
Sponsored By Standing Committee on Transportation Demand Management, Standing Committee on Transportation Issues in Major Cities, Standing Committee on Urban Transportation Data and Information Systems, Standing Committee on Emerging and Innovative Public Transport and Technologies, Standing Committee on Public Transportation Marketing and Fare Policy

New methods to better understand consumer travel behavior, particularly around mode choice and mode shift, can benefit transportation efforts in many fields. Behavioral economics offers insights into how travelers make decisions about transportation: how they select a given mode or what might lead them to make a different choice. This workshop will highlight the importance of applying behavioral economics in transportation by learning from early-adopter transportation agencies and discussing how behavioral economics can be integrated into TRB's research and practitioner community.

Presentation (P20-21259)
Ashley Whillans/Harvard Business School
Presentation (P20-21261)
Joseph Sherlock/Duke University
Presentation (P20-21262)
Douglas Palmer/ideas42
Presentation (P20-21263)
Michael Kaemingk/The Behavioural Insights Team

1770

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, 103B
Research Data Management for State DOTs
Kendra Levine, University of California, Berkeley, presiding
Sponsored By Standing Committee on Conduct of Research, Standing Committee on Library and Information Science for Transportation

Data management is an important step in the research process by which researchers document how data are collected, processed, handled, and stored. Building on previous workshops that have focused on writing data management plans (DMPs) in response to the U.S. DOT Public Access Plan mandate, this workshop will explore how DOTs create DMPs, as well as issues including compliance and data archiving, to increase the value of data collection and curation activities and increase the adoption of innovation.

Why Should State DOTs Consider Research Data Management Practices? (P20-20672)
Kendra Levine/University of California, Berkeley
Current Practices and Examples of Data Reuse and Data-Sharing Frameworks Across Organizations (P20-20675)
David Kuehn/Federal Highway Administration (FHWA)
State DOT Perspectives on Research Data Management (P20-20681)
Joan Hua/University of Washington, Kathy Szolomayer/Washington State Department of Transportation
Guidance and Resources for Research Data Management Developed Through the Course of NCHRP 20-110 (P20-20685)
Leighton Christiansen/OST-R/Bureau of Transportation Statistics, Jacob Carlson/University of Michigan, Ann Arbor

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, 150A
The Evolution of Transportation Innovation and Technology Transfer Processes Across the 20th and 21st Centuries: A Transportation History Perspective
Matthew Miller, Texas A&M Transportation Institute, presiding
Sponsored By Standing Committee on Transportation History, Standing Committee on Technology Transfer

An interactive presentation and response workshop, this session offers an education on the lasting effects of technology transfer and the spread of innovation, whether formal or informal, across the 1900s and early 2000s. Several podium presenters will detail examples of these innovations and their adoption—or failure to spread—and the factors that led to these circumstances. Roundtables will include posters listing innovations and notes from attendees. '

Where Research Goes to Die: Creative Destruction and the Reuse of Failed Research (P20-20712)
Pierre Barrieau ABG50/Université de Montréal
The NASA Aeronautics Research Mission Directorate and the Transfer of Research and Innovation to Commercial Aviation and the National Airspace System (P20-20714)
David Ballard/GRA, Incorporated
Extension at Universities Helps the Low-Volume Road Community (P20-20717)
David Orr/Cornell Local Roads Program
Tracing Technology Transfer Innovations Across Two Strategic Highways Research Programs (P20-20713)
Stephen Andrle/Transportation Research Board
P4 Model as a Tool for Tech Transfer (P20-20716)
Allie Kelly/The Ray

CM (4.00)

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, 204B
Near-Road Air Quality: Current Conditions and Analysis Insights
Karin Landsberg, Washington State Department of Transportation, presiding
Sponsored By Standing Committee on Transportation and Air Quality, Subcommittee on Transportation Air Quality Research Needs

With the advent of EPA-mandated near-road monitoring in 2014, the US developed a continuous record of air pollution levels near major roads across numerous metropolitan areas. Simultaneously, work has been ongoing to model near-road air quality in compliance with US requirements to assess carbon monoxide (CO) and particulate matter (PM) hot-spots. In addition, state actions place greater emphasis on community-based air quality, especially for disadvantaged communities near major roads. This workshop brings researchers and practitioners together to assess the state of knowledge on the near-road environment, to share lessons learned about analysis methods, and to identify important research needs and planning implications.

Near-Road Air Quality: Introduction (P20-20175)
Douglas Eisinger/Sonoma Technology, Inc.
Near-Road Air Quality: Pooled Fund Air Quality Measurements (P20-20176)
Steven Brown/Sonoma Technology, Inc.
Near-Road Air Quality: Pooled Fund Measurements Compared to Modeled Concentrations (P20-20179)
Kenneth Craig/Sonoma Technology, Inc.
Near-Road Air Quality: Texas Case Study and Recent Analysis Lessons (P20-20180)
Reza Farzaneh/Texas A&M Transportation Institute, Jackie Ploch/Texas Department of Transportation, Suriya Vallamsundar/Texas A&M Transportation Institute
Near-Road Air Quality: FHWA Research (P20-20181)
Cecilia Ho/Federal Highway Administration (FHWA)
Near-Road Air Quality: EPA Research (P20-20182)
Richard Baldauf/U.S. Environmental Protection Agency (EPA)
Near-Road Air Quality: Mitigation Opportunities and the Benefits of Near-Road Barriers (P20-20183)
John Gallagher/Trinity College, Dublin
Near-Road Air Quality: Transportation Conformity and the Future of U.S. Hot Spot Analysis (P20-20178)
Meg Patulski/U.S. Environmental Protection Agency (EPA), Laura Berry/U.S. Environmental Protection Agency (EPA)

(continued)

Near-Road Air Quality: Lessons from Outside the United States (P20-20177)
Marianne Hatzopoulou/University of Toronto

1773

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, 204C
Toward Sustainable Management of Retired Electric Vehicle Batteries
Hanjiro Ambrose, University of California, Davis, presiding
Sponsored By Standing Committee on Alternative Transportation Fuels and Technologies, Standing Committee on Transportation Energy, Standing Committee on Transportation and Sustainability, Standing Committee on Environmental Justice in Transportation

As electric vehicle sales accelerate, responsible disposal of batteries is rapidly becoming a key topic for policymakers. This workshop will deepen the level of understanding of the viable solutions and promising policy options for battery recycling and reuse. The workshop will bring together key stakeholders to discuss the state of practice, help identify research needs, provide updates to on-going research efforts, and discuss potential policy development.

Panel 1: U.S. Department of Energy Perspective on Battery Management (P20-20552)
Rachael Nealer/U.S. Department of Energy (DOE)
Panel 1: Electric Vehicle Battery Recycling Strategies (P20-20554)
Linda Gaines/Argonne National Laboratory
Panel 1: Electric Vehicle Battery Health Assessment and Management Strategies (P20-20558)
Ahmad Pesaran/National Renewable Energy Laboratory (NREL)
Panel 2: Industry Perspective on Battery Management and Recycling Strategies (P20-20559)
Todd Coy/Kinsburky Brothers
Panel 2: Electric Vehicle Manufacturer Perspective on Battery Management and Recycling (P20-20561)
Jon Weisman/Tesla Motors
Panel 1: Academic Perspective (P20-21727)
Gabrielle Gaustad/Alfred University
Panel 2: Industry Perspective (P20-21728)
Michael Slater/Farasis Energy

1774   **CM** (4.00)

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, Salon B
Sustainability Reflections
Timothy Sexton, Minnesota Department of Transportation, presiding
Sponsored By Standing Committee on Transportation and Sustainability, Standing Committee on Transportation and Economic Development, Standing Committee on Social and Economic Factors of Transportation, Standing Committee on Transportation and Land Development, Special Task Force on Climate Change and Energy, Section - Transportation Systems Resilience

' Sustainability includes diverse topics and it is impossible to attend all the sessions related to sustainability at the TRB Annual Meeting. This workshop begins with a series of brief presentations from experts in a range of fields—equity, environment, and economics—about what they learned at the 2020 Annual Meeting. Presentations will be followed by facilitated small-group discussions that will be used to help advance sustainability initiatives within TRB and generate strategic approaches for participants to advance sustainable practices within their own work programs.'

1775

Equity: Diagnosis and Restoration
Gloria Jeff, Minnesota Department of Transportation, presiding
Andrea d'Amato, Massachusetts Department of Transportation, presiding
Sponsored By Standing Committee on Environmental Justice in Transportation , Standing Committee on Strategic Management, Standing Committee on Transportation and Sustainability , Standing Committee on Transportation Issues in Major Cities

' This workshop will offer an opportunity to synthesize the recommendations of the 2020 TRB Annual Meeting's curated track on equity and will include a meeting of the Joint Subcommittee on Transportation Equity .'

1776

Modeling and Simulation for the Design and Evaluation of Roadside Safety Hardware
Chuck Plaxico, Roadsafe LLC, presiding
Sponsored By Standing Committee on Roadside Safety Design, Subcommittee on Roadside Safety Design Computational Mechanics

' This workshop has the objective of facilitating an exchange of knowledge of finite element (FE) modeling and simulation among analysts and researchers working in the field of roadside safety hardware design. It is comprised of various presentations, covering a wide variety of topics related to FE modeling of roadside safety problems. These include verification and validation procedures, techniques and best practices for modeling various components (such as fasteners, welds, joints, accelerometers, etc.), and material modeling for various materials (such as high-strength steel, aluminum, concrete, soil , wood, etc.). The topics also include updates on latest vehicle models, and user improvements to existing models. The participants are highly encouraged to share techniques, methods, or processes that result in the improvement of finite element modeling and simulation . Participants of this workshop are just as excited to share and learn from each other's failures as they are to share and learn from their successes .'

Numerical FE Crash Simulations of Concrete MASH TL-5 Barriers to Verify Impact Forces (P20-21592)
Ran Cao/City College of New York
Suggested RSVVP Metrics for Short-Duration Crashes (P20-21593)
Fadi Tahan/George Mason University
Assessment of Material Properties Used for Modeling Roadside Hardware Versus Mill Reports from Tested Hardware (P20-21594)
Chuck Plaxico/Roadsafe LLC
European Rules for the Use of Virtual Testing and Examples (P20-21595)
Marco Anghileri/Politecnico di Milano
Simulation of Anthropometric Crash Test Dummys in Roadside Hardware Impacts (P20-21596)
Bob Bielenberg/University of Nebraska, Lincoln
Simulation Experiences with the New RAM 1500 Pickup Truck Model (P20-21597)
Bob Bielenberg/University of Nebraska, Lincoln
Experience with the New Dodge RAM Pickup Versus the Chevy Silverado Model (P20-21598)
Nathan Schulz/Texas A&M Transportation Institute
Update on Recent Simulation Efforts at the Center for Collision Safety and Analysis (P20-21599)
Fadi Tahan/George Mason University
Update on the Development of the Single-Unit Truck Model (P20-21600)
Akram Abu-Odeh/Texas A&M Transportation Institute

Pavement Performance Analysis Workshop (PAWS)
Jonathan Groeger, Wood Environment & Infrastructure Solutions, Inc., presiding
Sponsored By Standing Committee on Pavement Condition Evaluation, Standing Committee on Pavement Management Systems, Subcommittee on Pavement Management Systems in Local Governments, Standing Committee on General and Emerging Pavement Design, Standing Committee on Full-Scale Accelerated Pavement Testing, Standing Committee on Design and Rehabilitation of Concrete Pavements, Standing Committee on Design and Rehabilitation of Asphalt Pavements, Standing Committee on Pavement Structural Modeling and Evaluation, Standing Committee on Pavement Surface Properties and Vehicle Interaction

'The purpose of this workshop is for the discussion of methods of analysis of pavement performance data. Presentations at this workshop address the technical interests of professionals engaged in highway research and engineering design, maintenance, and rehabilitation who are engaged in collecting, processing, and analyzing such data and developing insights into the behavior of pavements. Presentations offered by workshop attendees (by prior arrangement) focus on work-in-progress concerning the development of techniques for extracting and analyzing data, and early results of recent applications of these techniques. Topics such as model building, sensitivity analysis, and development of transfer functions linking structural response to distress are especially popular and welcome. This workshop has a minimum of formality to encourage open discussion among attendees and minimize the time between the presenters' preparation and disseminiation of analytical results. The agenda is prepared in advance, based on responses to a call for abstracts. Abstracts are reviewed solely for conformity with the guidelines, and as many as time permits are placed on the agenda. Presentations are not subjected to prior technical review. Comments by workshop attendees are not recorded. '

A Novel Evaluation Method for Pavement Distress Based on the Impact of Ride Comfort (P20-21741)
Yishun Li/Tongji University
Non-Destructive Test Data on Flexible Pavements Acquired at the National Airport Pavement Test Facility for Construction Cycle 9 (P20-21742)
Matthew Brynick/Federal Aviation Administration (FAA)
Data-Driven Modeling of Pavement In-Service Performance Using Life-Cycle Information (P20-21747)
Arash Mohammad Hosseini/Temple University
Development of Preliminary Transfer Functions for Performance Predictions in FlexPAVE (P20-21748)
Yizhuang Wang/North Carolina State University
Evaluation of Emerging Pavement Performance Prediction Models in the FlexPAVE Software (P20-21749)
Amir Golalipour/Engineering and Software Consultants, Inc.
Introducing the FHWA InfoMaterials Portal (P20-21751)
Yan "Jane" Jiang/Federal Highway Administration (FHWA)
Developing New Approach to CRC Pavement Punchout Model Calibration (P20-21769)
Issa Issa/Texas A&M University
Automated Pothole Detection and Quantification: Integrating Artificial Intelligence Research into Practice-Ready Solutions (P20-21770)
Nima Kargah-Ostadi/iEngineering Corporation
On the Prediction of Pavement Treatment Effectiveness Using a Data-Driven Model (P20-21771)
Fengdi Guo/Massachusetts Institute of Technology (MIT)
Toward Continuous Distress Severities and Repeatable Condition Data (P20-21773)
Michael Nieminen/International Cybernetics Company, LP

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, 103A
Extraction and Characterization of Reclaimed Asphalt Binders Containing Polymers and Additives
Hassan Tabatabaee, Cargill, Inc., presiding
Raquel Moraes, National Center for Asphalt Technology (NCAT), presiding
Sponsored By Standing Committee on Asphalt Binders

Characterizing binders reclaimed from recycled asphalt materials (RAM) is complex because of the unknown composition of the original asphalt, since modifiers (for example, polymers, acids, rubber, or recycling agents) may be present. It is essential to understand the impact of the extraction and recovery process on the resulting physical properties of the reclaimed binder. Variables such as procedure, solvent, time, and temperature can alter modifier integrity. Chemical and physical interactions in RAM may influence the reclaimed binder properties. Thus, binder tests may not represent field performance. The workshop reviews current and in-progress research to help practitioners test and interpret reclaimed asphalt binder properties.

Introduction and Motivation for This Workshop: Survey of U.S. State and Canadian Provincial Highway Agencies: Extraction and Recovery Process Variables (P20-21371)
Hassan Tabatabaee/Cargill, Inc., Raquel Moraes/National Center for Asphalt Technology (NCAT)
Effect of Solvents Used in Binder Extraction on Modified Asphalts' Properties (P20-21372)
Hussain U. Bahia/University of Wisconsin, Madison
The Effect of Solvent Extraction Recovery on the Physical Properties of Asphalt Binders (P20-21373)
R. Michael Anderson/Asphalt Institute
Comparison of Recovered Binder Results from Traditional Extraction Method Versus Automated One (P20-21374)
Amir Golalipour/Engineering and Software Consultants, Inc.
ASTM Standardization Process for Auto-Extraction of Neat and Modified Bitumen (P20-21376)
Ann Baranov/Infratest USA, Inc
Extraction and Characterization of Reclaimed Modified Asphalt Binders: Challenges and Opportunities (P20-21701)
Jean-Pascal Planche/Western Research Institute, Michael Elwardany/Western Research Institute, Ryan Boysen/Western Research Institute

Thursday, 08:00 a.m. - 12:00 p.m., Convention Center, Salon C
Workshop on Challenges and Opportunities of Road Vehicle Automation
Jane Lappin, Toyota Research Institute, Inc., presiding
Valerie Shuman, Shuman Consulting Group, LLC, presiding
Sponsored By Standing Committee on Vehicle-Highway Automation

'This workshop kicks off the technical program development for the 2020 Automated Vehicle Symposium, which will be held in San Diego, California, in late July 2020.'

Recap of AVS2019 in Orlando, Florida (P20-21447)

A Look Ahead to AVS2020 in San Diego, California (P20-21448)

The United Kingdom's Future of Mobility Landscape (P20-21834)
Juhi Verma/Department for Transport, United Kingdom
Japan's SIP-Adus Program (P20-21858)
Ryota Shirato/Nissan Motor Co., Ltd.
European Commission Program (P20-21859)
Tom Alkim/European Commission
Who is in Control? Road Safety and Automation in Road Traffic (P20-21860)
Serge Dam/Rijkswaterstaat

1780

Resilience, Safety, and Security of Bridges and Tunnels: U.S. and International Topics
Harry Capers, Arora and Associates, P.C., presiding
Jeffrey Western, Western Management and Consulting, LLC, presiding
Sponsored By Standing Committee on Bridge Management, Standing Committee on General Structures, Section - Structures, Standing Committee on Tunnels and Underground Structures, Section - Transportation Systems Resilience, Standing Committee on Critical Transportation Infrastructure Protection

' The robustness, resilience, safety, and security concerns of national and international bridges and tunnels include past bridge collapses, bridge and tunnel fires, and other extreme events, revealing the vulnerabilities of transportation infrastructure. This workshop provides an update on national and international bridge and tunnel activities to prevent or lessen the impact of natural and man-made events in the future and offers a forum for discussion of challenges facing owners.'

1781

Pedestrian Safety, Accessibility, and Harassment: Experiences Across Age, Race, Class, Ability, and Gender
Kevin Manaugh ANF10, McGill University, presiding
Charles Brown, Alan M. Voorhees Transportation Center, presiding
Sponsored By Standing Committee on Pedestrians, Standing Committee on Social and Economic Factors of Transportation

' A person's race, gender, abilities, age, and even choice of clothing can have dramatic impacts on their experience of walking. Harassment (unwanted attention or police intervention) unequally targets women and people of color. This workshop invites dialogue between practitioners, academics, policy makers, and activists about how to improve the experiences of these groups of pedestrians. It will suggest further research on identity-based safety and security for pedestrians. '

Mobility Violations: How Walking and Walkability Affects Disparities in Policing (P20-20783)
Jesus Barajas/University of Illinois at Urbana-Champaign
Policing and Pedestrians: On-Street Conversations About a Complicated Relationship (P20-20784)
Arlie Adkins/University of Arizona
Whose Voice Is Heard When Planning and Designing for Pedestrians? (P20-20785)
Tabitha Combs/University of North Carolina
Gender and Pedestrian Space, Behavior, and Experience (P20-20786)
Tara Goddard/Texas A&M University

1782

Making Sense of Emerging Data Sources for Nonmotorized Transportation: Tools, Tips, and Knowledge Gaps for Effective Analysis

Bahar Dadashova, Texas A&M Transportation Institute, presiding

Sponsored By Standing Committee on Bicycle Transportation, Standing Committee on Urban Transportation Data and Information Systems, Subcommittee on Bicycle and Pedestrian Data, Standing Committee on Transportation Demand Forecasting, Joint Subcommittee on Health and Transportation of ADD50 and ABJ30, Standing Committee on Pedestrians

Emerging data sources (e.g., data from smartphone apps) can supplement traditional counts for non-motorized planning applications. This workshop will provide insights into tools for the effective use of non-motorized data from emerging sources, with a focus on how to address challenges faced by professionals (for example, travel demand, route choice, and exposure). The session will facilitate discussion between data providers and users, with three separate panel discussions on uses of emerging datasets for planning and policy-making, data gaps and analysis methods, and data privacy issues. Workshop results will be used to identify knowledge gaps and challenges for future research.

Panel 1: Use of Emerging Data in Practice and Policy Making (P20-20719)
Rachel Zack/Remix, Frank Proulx/Toole Design, Alexander Kado/City of Minneapolis
Panel 2: Use of Emerging Data in Transportation Analysis: Data Needs and Analysis Methods (P20-20721)
Rebecca Sanders/Arizona State University, Shawn Turner/Texas A&M University Transportation Institute, Sean Co/StreetLight Data, Frank Kopas/Moovit
Panel 3: Data Privacy and Data Sharing: Lessons Learned (P20-20723)
Calvin Thigpen/Lime, Michael Schwartz/Ride Report, Gretchen Stoeltje/Texas A&M Transportation Institute, Rodrigo Davies/Strava

1783

Rural Transportation for Everyone: Policy and Practice in 2020

Jaime Sullivan, Western Transportation Institute (WTI), presiding
John Shaw, Iowa State University, presiding

Sponsored By Standing Committee on Rural Public and Intercity Bus Transportation, Standing Committee on Native American Transportation Issues, Standing Committee on Statewide Multimodal Transportation Planning, Standing Committee on Transportation Planning for Small and Medium-Sized Communities, Standing Committee on Transportation Needs of National Parks and Public Lands, Standing Committee on Low-Volume Roads, Standing Committee on Transportation Safety Management Systems, Subcommittee on Rural Road Safety Policy, Programming, and Implementation, Standing Committee on Pedestrians

Everybody, including physically, economically and socially disadvantaged people, needs accessible, affordable, and safe transportation to ensure access to economic and social opportunities. Providing this mobility and accessibility is particularly challenging in rural communities where activities are dispersed, and public resources limited. As a result, many rural communities face severe mobility disparities which are inequitable and reduce local economic development. This multi-modal, multi-disciplinary workshop will begin with a panel presentation and finish with interactive round table discussions on the challenges that rural communities face in providing equitable access to disadvantaged groups, and creative solutions to these problems.

Planning with, not Planning for: Considering Rural Equity in Transportation (P20-20340)
Carrie Kissel/National Association of Development Organization (NADO)
Evaluating and Improving Rural Transportation Equity (P20-20341)
Todd Litman/Victoria Transport Policy Institute
Mobility Services and Needs of North Dakota's Transit System to Provide for North Dakota Residents (P20-20737)
Jill Hough/North Dakota State University
Transportation Equity in Greater Minnesota (P20-20358)
Jake Granholm/Minnesota Management and Budget, Hally Turner/Minnesota Department of Transportation

(continued)

Discussion of Potential Rural Transportation Joint Subcommittee (P20-20762)

Jaime Sullivan/Western Transportation Institute (WTI), John Shaw/Iowa State University

Breakout Group Facilitators (P20-20768)

Jill Hough/North Dakota State University, Wesley Kumfer/University of North Carolina, Joseph Marek/Clackamas County, John Kaliski/Cambridge Systematics, Inc., Ronald Hall/Bubar & Hall Consulting, LLC, Roxanne Bash/Federal Highway Administration (FHWA), Laura Fay/Western Transportation Institute

Summary, Closing, and Action Items (P20-20763)

Jaime Sullivan/Western Transportation Institute (WTI), John Shaw/Iowa State University