The Regional Integrated Transportation Information System

- Real-time, multi-agency situational awareness
- Collaborative decision making
- Interactive visualizations for TSMO applications
- Safety and congestion performance measures and AARs

The Work Zone Performance Monitoring Application

- Conduct work zone audits
- Evaluate lane closure permits
- Automated email and txt alerts on safety and congestion issue
- Complies with the Final Rule on Work Zone Safety & Mobility

Probe Data Analytics Suite (includes NPMRDS Analytics)

- System performance measures with 3rd party speed data
- Interactive and visual bottleneck ranking, problem identification, project development, before & after studies, system performance, funding justification, after action reviews, and more
- Compute, visualize, & download MAP-21 PM3 metrics for target-setting, strategy evaluation & reporting

Trajectory/O-D Analytics

- Analyze people and freight movement data
- Dynamic and filterable O-D matrix analysis / roadway segment route analysis
- Validates Travel Demand Models, supplements major corridor planning studies, determine benefits (or consequences) of major improvement projects

Arterial Signal System Performance Measures

- Developed in conjunction with Purdue University
- Rank and compare the change in performance of corridors between two time periods
- Provides before-and-after comparison for corridor performance improvement projects & providing detailed analysis of both congestion and reliability
WELCOME LETTER

Welcome to the 9th International Visualization in Transportation Symposium! Visualization spans many specialized disciplines—even within the transportation industry.

The concept of visualization can be pretty ambiguous. To some it is an end-product like a static graph, a video, or some other image used to communicate. To others it’s a verb—a means to interact with information, to discover, collaborate, explore, or design and build something.

This year’s theme is “A Better View.” We will explore how visualization can dramatically change the way we view the world around us, influence our ability to solve problems, communicate more effectively, discover new insights into the world around us, and more effectively inform our decisions. Explore our demonstration area. Try on a VR/AR headset. Engage with the interactive poster sessions and play around with the latest visual analytics tools and technologies. Learn from the expert on how to apply color theory to digital media during our day 2 workshop. I encourage you to explore the extremely diverse program that we have this year, and seek out sessions and topics that might challenge and expand your personal notion of what visualization is and how it can improve our industry.

Michael L. Pack
Director, Center for Advanced Transportation Technology Laboratory (CATT Lab)
2019 PLANNING COMMITTEE

Michael Pack, University of Maryland, CATT Laboratory
Frank Broen, Teach America Corporation
Kevin Gilson, WSP
Pat Hu, Bureau of Transportation Statistics, OST-R
Charles Lattimer, Atkins, a member of the SNC-Lavalin Group
Jason Williams, Tru Simulation

TRB Staff
Scott Babcock, Senior Program Officer
Kate Debelack, Meetings Assistant
Keyara Dorn, Associate Program Officer
Rhonda A. Levinowsky, Associate Program Officer
Patti Lockhart, Managing Editor

The Transportation Research Board is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. The mission of the Transportation Research Board is to provide leadership in transportation improvements and innovation through trusted, timely, impartial, and evidence-based information exchange, research, and advice regarding all modes of transportation. The Board’s varied activities annually engage about 8,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

www.TRB.org
Enjoy free access to the TRR for 30 days: sagepub.com/freetrial
### SCHEDULE AT A GLANCE

<table>
<thead>
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<th>Time</th>
<th>TUESDAY, NOVEMBER 5</th>
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#### TUESDAY, NOVEMBER 5

- **OPENING SESSION**
  - Kavli Auditorium

- **LUNCH, Great Hall**

- **BREAK, Great Hall**

- **Registration**
  - Great Hall

- **CONTINENTAL BREAKFAST, Great Hall**

- **9:00 AM**
  - Immersive VR/AR Tools for Infrastructure Management, Kavli Auditorium
  - Visualization and Climate Change—Session 1 of 2, NAS 120
  - Systems Performance Measure & Analytics, NAS 125
  - U.S. Department of Transportation’s Solving for Safety Visualization Challenge, Lecture Room

- **10:30 AM**
  - Visualization of Transportation Operations and Performance
    - Kavli Auditorium
  - Using Visualization to Improve Transportation Safety
    - NAS 120
  - Immersive VR/AR Tools for Infrastructure Visualization—Session 1 of 2, Lecture Room

- **2:30 PM**
  - Visualization Techniques for Providing System Performance Measures, NAS 120
  - Visualization and Unmanned Aerial Systems, NAS 120
  - Immersive Interactive 3D Tools for Infrastructure, Lecture Room

#### WEDNESDAY, NOVEMBER 6

- **BREAK, Great Hall**

- **Registration**
  - Great Hall

- **CONTINENTAL BREAKFAST, Great Hall**

- **10:30 AM**
  - Using Visualization to Improve Society and Inform Decisions, Kavli Auditorium
  - Transit Performance Dashboards and Visual Potpourri, Board Room
  - Color Fundamentals for Visualization Creation and Exploration, NAS 280
  - Interactive Poster Session (BIM), NAS West Court

- **12:30 PM**
  - Signals & Arterial Performance Measures, Kavli Auditorium
  - Visualizing Freight Flows and Safety, Lecture Room
  - Visualization and Climate Change, Session 2 of 2
    - Board Room
  - Implementation of BIM for Infrastructure Processes, NAS 250

- **2:30 PM**
  - Where Are You Going and How Did you Get There? People Movement Visualizations, Kavli Auditorium
  - Visualization Tools for Infrastructure Project Management, Lecture Room
SCHEDULE AT A GLANCE, continued

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<th>TUESDAY, NOVEMBER 5</th>
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<td>Visualizing Transit Schedules and Performance: Industry Examples, NAS 120</td>
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<td>5:30 PM</td>
<td>Reception, Technology Demonstrations, and Interactive Poster Session, West Court</td>
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“Logic will get you from A to B. Imagination will get you everywhere.” —Albert Einstein

We couldn’t agree more.

Using smart cities technologies that interact with the community but also collect data will help cities and transit agencies shape the future of urban mobility.

By placing users at the heart of our intelligent mobility approach, we help move what matters.

ATKINS
Member of the SNC-Lavalin Group

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CONFERENCE PROGRAM

TUESDAY, NOVEMBER 5, 2019

7:30 a.m.–5:30 p.m., Great Hall
Registration Open

7:30 a.m.–8:30 a.m., Great Hall
Continental Breakfast

8:30 a.m.–10:00 a.m., Kavli Auditorium
OPENING SESSION
This session will set the stage for the conference with welcoming remarks from the planning committee chair and two keynote addresses.
Moderator: Michael Pack, CATT Laboratory

Welcome
Michael Pack, Director, CATT Laboratory, University of Maryland, and Visualization Conference Planning Committee Chair

Public Sector Keynote Address
20/20 Vision: Uses of Visual Analysis in the Office of Research and Technology
Diana Furchtgott-Roth, Deputy Assistant Secretary for Research and Technology, U.S. Department of Transportation

Private Sector Keynote Address
The Mouse and the Think Tank
Eddie Moreno, Senior Civil Designer, Walt Disney Imagineering, Design and Planning Studio

10:00 a.m.–10:30 a.m., Great Hall
Break

10:30 a.m.–12:00 p.m., Kavli Auditorium
Immersive VR/AR Tools for Infrastructure Management
Visualization tools such as VR and AR have traditionally been leveraged for stakeholder communication and design support. These sessions will cover examples of how innovative VR/AR visualization tools support other project management objectives as well, including asset management, inspection and training, customer way-finding, and design decision support.
Moderator: Kevin Gilson, WSP

PRESENTATIONS:
Augmented Reality for Asset Visualization and Content Management
Felipe Jung, Atkins, a member of the SNC-Lavalin Group
Immersive Work Zone Inspection Training using Virtual Reality
Praveen Edara, University of Missouri-Columbia
Using Virtual Reality for Enhanced Decision Support: A Case Study on the North Tarrant Express Project in Texas
Cameron Schmeits, Center for Transportation Research, UT Austin
StationView: Metro’s New Interactive Toolset with Google Street View Virtual Tour inside Metro Stations
Minhua Wang, Washington Metropolitan Area Transit Authority

10:30 a.m.–12:00 p.m., NAS 120
Visual and Climate Change: Session 1 of 2
How can visualization help us better understand the challenges we face as our climate changes? This session will explore how Power BI has impacted air quality visualization, a new paradigm for evaluating mobility options within an urban area and if visualization helps real people understand sea level rise.
Moderator: Frank Broen, Teach America

PRESENTATIONS:
Visualizing Sea Level Rise Impacts in Transportation Planning
Serena Hoermann, Florida Atlantic University
Identifying and Mapping Flood-Prone Roadways in Philadelphia, PA
Seri Park, Villanova University
Interactive Data Visualization in Air Quality Research
Reza Farzaneh, Texas A&M Transportation Institute
Visualizing the Quality of Mobility in your City using the Mobility Energy Productivity Metric
Stanley Young, National Renewable Energy Laboratory

10:30 a.m.–12:00 p.m., NAS 125
Systems Performance Measure & Analytics
Visualization techniques can be incredibly powerful when used for performance measures and analytics applications. A skillful data visualization can highlight patterns and trends in complex data sets. When combined with performance targets, visualization can identify which operational programs are meeting performance expectations. Visualization can also serve as decision-support tools when improvement is necessary. This session will provide examples of how visualization is used in the context of MAP-21 PM3 performance measures, travel time reliability, and informed decision guidance.
Moderator: Barbara Ostrom, Wood Environment & Infrastructure Solutions, Inc.

PRESENTATIONS:
Reliability Performance Measure
Katie McCann, Virginia DOT
Transportation Systems Analysis and Visualization: A Multiscale and Multivariate Approach to Shopping Districts
Anne Berres, Oak Ridge National Laboratory
Bottleneck Ranking Metrics for Informed Decision Guidance
Mark Franz, UMD CATT Laboratory
MAP-21 PM3 Deep-Dive Visual Analytics
Greg Jordan, UMD CATT Laboratory
U.S. Department of Transportation’s Solving for Safety Visualization Challenge

The U.S. Department of Transportation’s Solving for Safety Visualization Challenge (the Challenge) seeks to develop innovative analytical visualization tools to gain insights and inform decisions to help reduce serious crashes on the U.S. road and rail system. Three of the semi-finalists will present their tools.

Moderator: Patricia Hu, Bureau of Transportation Statistics

PRESENTATIONS:
Overview of the Challenge
Jordan Riddle, Fellow, Bureau of Transportation Statistics, U.S. DOT

Mohamed Abdel-Aty, University of Central Florida

RoadCode
Bo Wang, Ford Motor Company
Callahan Coplai, AICP. Partnerships Manager. Ford Motor Company

My Street
Kim Eccles, VHB

Lunch, sponsored by CATT Laboratory and Atkins, a member of the SNC-Lavalin Group

Visualization of Transportation Operations and Performance
This session will examine the role visualization can play in effectively communicating transportation operations and performance. Presenters will example system performance from both operational and planning perspectives, showing how visualization tools can generate new insights.

Moderator: Charles Lattimer, Atkins, a member of the SNC-Lavalin Group

PRESENTATIONS:
Visualizing Real-Time Traffic Operations in MD, DC, and VA—a Regional Perspective
Taran Hutchinson, University of Maryland

Visually Communicating Holiday Travel Forecasts
Matthew Glasser, Georgia DOT

Visualizing Operations Performance Measures and Public Response to Public Information
Subrat Mahapatra, Maryland State Highway Administration

Measuring and Presenting Ohio DOT Response and Ability to Clear Incidents
Stephanie Marik, Ohio DOT

A Unique Perspective on TMC Operations Video Walls—They Aren’t for CCTV!
Daniel Smith, Florida DOT
Using Visualization to Improve Transportation Safety

Visual analytics tools have the potential to transform our understanding of safety-related issues on our roads. This session explores pedestrian fatality data visualization, crash-risk visualizations, how GIS tools can enhance safety analytics, and naturalistic driver behavior visualizations.

Moderator: Patricia Hu, Bureau of Transportation Statistics

PRESENTATIONS:
- Explore Driver Behavior at Rural High-Speed All-Way Stop Control Intersections by Visualizing Naturalistic Driving Data
  Chenhui Liu, National Research Council
- Interactive Pedestrian Fatality Web Application
  Kyle Titlow, Bureau of Transportation Statistics
- Predicting Crashes by Applying Machine Learning on New Sources of Driver Behavior Data
  Gareth Robins, EROAD
- Utilizing GIS for Traffic Safety
  Sean Lynn, Washington College GIS Program

Immersive VR/AR Tools for Infrastructure Visualization—Session 1 of 2

Gaming techniques, real-time applications, immersive rendering tools, and innovative new display technologies have made virtual and augmented reality tools (VR/AR) more accessible and much more cost effective for transportation projects. These tools provide immersive, participatory experiences and allow users to better assess their surroundings and make informed decisions about the simulated environment. Sessions 1 and 2 will cover several approaches to representing projects with immersive virtual and augmented reality tools.

Moderator: Kevin Gilson, WSP

PRESENTATIONS:
- 360-degree Images for Public Communication on the North Tarrant Express 35W Project
  Cameron Schmeits, Center for Transportation Research, UT Austin
- Improving Quality Management of Pavement Condition Data
  Bahareh Bazargani, Iowa State University
- The Future of 3D Visualization—Interactivity, Smart Traffic, and More
  Sam Lytle, Civil FX

Break
Analyzing Both People and Freight Movements with Waypoint and Trip Data

Trip data is no longer collected by surveys alone. Massive amounts of real-time people and freight movement data is being collected by the private sector via smart phones, connected vehicles, telematics, and other in-vehicle tracking devices. This session covers several of the unique visualization tools and technologies that are being developed to sit on top of these massive data sets, along with the many insights that can be gleaned from these data and tools.

Moderator: Patricia Hu, Bureau of Transportation Statistics

PRESENTATIONS:

Visualizing Spatio-Temporal Activity-Travel Patterns
Avital Vainberg, Massachusetts Institute of Technology

Visualization of Origin-Destination Traffic Flows Using Vehicle Trajectory Data
Simona Babiceanu, University of Virginia

Vehicle Trajectories for Improved Planning and Operations
Michael Schade, UMD CATT Laboratory

Web Based Visualization and Analysis Tools to Support Transportation Planning
Jon Walker, ICF

Visualizing Transit Schedules and Performance: Industry Examples

Operators of transit systems face unique challenges with understanding the performance of their systems and how they interact with systems owned and operated by others. This session covers some of the business intelligence tools and dashboards being implemented by transportation agencies around the country—including how they address some of the demands of transit operators.

Moderator: Matt Haubrich, Iowa DOT

PRESENTATIONS:

Introducing Business Intelligence Monitoring Principles to Commuter Rail Operations
Daniel Mihalov, Metra Commuter Rail

LA Metro Transit Market Share Dashboard
Anurag Komanduri, Cambridge Systematics

Visualizing Scheduled Transit Frequency with TransitFlow
Willliam Geary, CitySwifter

Visualizing Transit Network Performance by Leveraging Big Data
Nikhil Menon, Center for Urban Transportation Research
3:00 p.m.–4:00 p.m., Lecture Room

**Immersive Interactive 3D Tools for Infrastructure**

Technologies, tasks, and tools are rapidly changing the way transportation projects are planned, designed, constructed, maintained, operated and managed. This session focuses on recent trends and emerging tools, including uses of UAVs, LiDAR, augmented reality, and interactive visualization.

**Moderator:** Kerry Himes, Atkins, a member of the SNC-Lavalin Group

**PRESENTATIONS:**

- **Big Data LiDAR Collection and Visualization**  
  Mark Day, Greenman-Pedersen, Inc. (GPI)

- **Using 3D Visualization in Court**  
  Steven Rhyne, Kittelson & Associates, Inc.

- **Practical Uses of Augmented Reality for Transportation**  
  Chris Leone, WSP

4:00 p.m.–5:30 p.m., Kavli Auditorium

**Immersive VR/AR Tools for Infrastructure Visualization—Session 2 of 2**

Gaming techniques, real-time applications, immersive rendering tools and innovative new display technologies have made virtual and augmented reality tools (VR/AR) more accessible and much more cost effective for transportation projects. These tools provide immersive, participatory experiences and allow users to better assess their surroundings and make informed decisions about the simulated environment. Sessions 1 and 2 will cover several approaches to representing projects with immersive virtual and augmented reality tools.

**Moderator:** Kevin Gilson, WSP

**PRESENTATIONS:**

- **Virtual Testing of In-Vehicle Data-Visualization for a CAV**  
  Isaac Gordillo, PTV Group

- **Using 3D Complete Streets Rule-Based Modeling in a Geospatial Framework to Interactively Evaluate Street Design Scenarios**  
  Ilir Bejleri, University of Florida

- **Leveraging Augmented Reality for Highway Construction**  
  Hoda Azari, FHWA

- **Effectively Communicating the Value of Geotechnical Site Characterization for Transportation Projects Through Augmented Reality Visualization**  
  Derrick Dasenbrock, Minnesota DOT
Visualization Techniques for Providing System Performance Measures

Visualization techniques can be incredibly powerful when used in performance measures and analytics applications. A skillful data visualization can highlight patterns and trends in complex data sets. They can also be useful for data exploration and guiding thoughtful discussion of potential causes and effects. This session will provide some examples of how visualization can be used in an exploratory sense to identify trends and understand the causes of congestion.

Moderator: Justin Clarke, FHWA

PRESENTATIONS:
Virginia DOT’s New Dashboard
Jay Styles, Virginia DOT
Florida DOT Multimodal Mobility Measures and Trends
Jessica VanDenBogaert, Florida DOT
High Dimensional Visualizations of Transportation Demand and Supply Conditions
Michalis Xyntarakis, Cambridge Systematics
Understanding Causes of Congestion
Katie McCann, Virginia DOT

Visualization and Unmanned Aerial Systems

Often referred to as drones or UAVs, Unmanned Aerial systems are being adopted by transportation agencies for real-time incident management, situational awareness, surveillance, accident reconstruction, bridge inspection, and other data collection activities. In this session, we will learn how these systems, and the data collected by them, are being used to collect new data, how this data can be leveraged by different transportation disciplines, and the challenges associated with working with unmanned systems and their data.

Moderator: Michael Pack, CATT Laboratory

PRESENTATIONS:
Using Drones for Various Types of Traffic and Driver Behavior Studies
Wei Zhang, FHWA
Damage Assessment of Transportation Infrastructure Post Disaster via Drone-Enabled Field Data Collection and Visualization
Janak Kalaria, ICF
UAVs for Real Time Traffic Visualization using Cameras and V2X Communication
Garrett Dowd, The Ohio State University
Using Drone Imagery in Project Planning
Mark Day, Greenman-Pedersen, Inc. (GPI)
Collection, Analysis, and Interpretation of Data Obtained from Unmanned Aerial Systems (UAS) for Bridges
Hoda Azari, FHWA
5:30 p.m.–7:00 p.m., NAS West Court
Reception, Technology Demonstrations, and Interactive Poster Session, sponsored by CATT Laboratory
The presenters below will have their interactive research on display with their laptops, tablets, and large-screen monitors. Attendees are encouraged to interact with the presenters, explore their research, software, and systems, and engage in discussions with other symposium attendees.

PRESENTATIONS:
MITRE Map: A Flexible Tool for Interactive Display of Spatiotemporal and Attribute Data
Brenda Hogan, The MITRE Corporation
Visualizing Safety Data in Iowa
Skylar Knickerbocker, Iowa State University—InTrans
Using 3D Complete Streets Rule-Based Modeling in a Geospatial Framework to Interactively Evaluate Street Design Scenarios
Ilir Bejleri, University of Florida
TrajAnalytics: A Web-Based Visual Analytics Software of Urban Trajectory Data
Ye Zhao, Kent State University
Visualization in Decision Support: Bringing Design Options to Life
Ryan Noyes, VHB
Transportation Visualization at a National Scale: Developing “Transportation Geography of the United States: 2019/2020”
Kelsey Taylor, Fellow, Bureau of Transportation Statistics

WEDNESDAY NOVEMBER 6, 2019
7:30 a.m.–2:30 p.m., Great Hall
Registration
7:30 a.m.–8:30 a.m., Great Hall
Continental Breakfast
8:30 a.m.–10:00 a.m., Kavli Auditorium
Using Visualization to Improve Society and Inform Decisions
Visualization is more than just a tool and an output. The way in which we approach the concept of visualization can change the way we perform our jobs, make or influence decisions, conduct research, communicate with the public, and understand our impacts on society. This session will explore several philosophical aspects of visualization, discuss approaches to solving problems with visualization, and explore how the process of visualization can help improve transportation operations and safety.
Moderator: Michael Pack, CATT Laboratory

PRESENTATIONS:
Visualizing Inequality in Mobility Using National Household Travel Survey Data in New York State
Chieh (Ross) Wang, Oak Ridge National Laboratory
How Visualization Improves Decision Making
Frank Broen, Teach America

Visual After Action Review of the Woodrow Wilson Bridge Snooper Truck Incident
Taran Hutchinson, University of Maryland

8:30 a.m.–10:00 a.m., Board Room

Transit Performance Dashboards and Visual Potpourri

Transit data—including information on vehicle locations, maintenance issues, ridership, fare collection, and more—are beginning to become more readily available to both transit operators and the public. This session explores various transit analytics dashboards and visualization procedures that are leveraging these data to improve bus and rail performance.
Moderator: Michael Schade, CATT Laboratory

PRESENTATIONS:

Transportation Visualization at a National Scale: Developing “Transportation Geography of the United States: 2019/2020”
Kelsey Taylor, Fellow, Bureau of Transportation Statistics

Comparing Route Alternatives by Travel Mode with Wayfinder3D
William Geary, CitySwifter

Visualization Dashboard for Bus Network Sketch Planning: Examining Route Performance through Origin, Destination, and Interchange Inference Based Metrics
Rucha (Ru) Mehendale, Massachusetts Institute of Technology

Estimating Traffic Volumes for Signalized Intersections Using Connected Vehicle Data
Kaviin Sethu, University College

8:30 a.m.–10:00 a.m., NAS 280

Color Fundamentals for Visualization Creation and Exploration

This workshop provides an overview of the fundamentals of color theory and approaches to color selection for visualization and exploration. Our tutorial is intended for a broad audience of individuals interested in understanding the mysteries of color as applied to visualization. Our journey includes the introduction to the concepts of color models and harmony, a review of color vision principles, the defining of color gamut, spaces and systems, and demonstrating online and mobile apps for performing color analyses of digital media. Freely available commercial and research tools for your continued use in color selection and color deficiency assessments are highlighted. The tutorial includes concepts from art and design such as extending the fundamentals of the Bauhaus into digital media as well as overviews of color perception and appearance principals from vision and visualization researchers and practitioners. Newly emerging trends in automated color selection and deep learning colorization are also highlighted.

PRESENTATIONS:
Theresa-Marie Rhyne, Visualization Consultant
**Interactive Poster Session (BIM)**

The presenters below will have their interactive research on display with their laptops, tablets, and large-screen monitors. Attendees are encouraged to interact with the presenters, explore their research, software, and systems, and engage in discussions with other symposium attendees.

**PRESENTATIONS:**

- **Interactive Data Visualization in Air Quality**
  Reza Farzaneh, Texas A&M Transportation Institute

- **Interactive Pedestrian Fatality Web Application**
  Kyle Titlow, Bureau of Transportation Statistics

- **Visualizing Sea Level Rise Impacts in Transportation Planning**
  Serena Hoermann, Florida Atlantic University

- **Damage Assessment of Transportation Infrastructure Post Disaster via Drone Enabled Field Data Collection and Visualization**
  Janak Kalaria, ICF

- **LA Metro Transit Market Share Dashboard**
  Anurag Komanduri, Cambridge Systematics

- **Introducing Business Intelligence Monitoring Principles to Commuter Rail Operations**
  Daniel Mihalov, Metra Commuter Rail

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**WEDNESDAY NOVEMBER 6, 2019**

**8:30 a.m.–10:00 a.m., NAS West Court**

**Interactive Poster Session (BIM)**

The presenters below will have their interactive research on display with their laptops, tablets, and large-screen monitors. Attendees are encouraged to interact with the presenters, explore their research, software, and systems, and engage in discussions with other symposium attendees.

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  Janak Kalaria, ICF

- **LA Metro Transit Market Share Dashboard**
  Anurag Komanduri, Cambridge Systematics

- **Introducing Business Intelligence Monitoring Principles to Commuter Rail Operations**
  Daniel Mihalov, Metra Commuter Rail

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**10:00 a.m.–10:30 a.m., Great Hall**

**Break**

**10:30 a.m.–12:00 p.m., Kavli Auditorium**

**Signals & Arterial Performance Measures**

The performance of signalized arterials has traditionally been more challenging to analyze than that of freeways. Interruptions in flow caused by traffic signals, along with the porosity of traffic from side streets and midblock destinations, increases the complexity of traffic analysis. With the introduction of higher density data sets like trajectory data and high-resolution traffic controller data, transportation engineers are able to visualize arterial operations with greater clarity and insight. This session will feature presentations on how automated traffic signal performance measures, trajectory analysis, probe data, and connected vehicle data are transforming the way we view arterial performance measures.

**Moderator:** Skylar Knickerbocker, Institute for Transportation, Iowa State University

**PRESENTATIONS:**

- **Intersection Data Visualization Tool for V2X Application Development**
  Sukru Yaren Gelbal, The Ohio State University

- **Using Automated Traffic Signal Performance Measures Visualizations to Improve Traffic Signal Operations**
  Charles Lattimer, Atkins, a member of the SNC-Lavalin Group
Probe Vehicle Data for Arterial Performance Monitoring
Michael Pack, UMD CATT Laboratory

Mid-Block Travel Time and Turning Movement Analysis with Trajectory Data
Greg Jordan, UMD CATT Laboratory

10:30 a.m.–12:00 p.m., Lecture Room
Visualizing Freight Flows and Safety
Reducing crashes, injuries, and fatalities involving commercial trucks and buses is a key component of the safety mission of USDOT. This session looks at how freight-related data—including hours of service, crash reports, and freight flow data, is being leveraged to make better informed decisions at the federal, state, and local levels
Moderator: Ed Strocko, Bureau of Transportation Statistics

PRESENTATIONS:
Visualizing and Predicting Hours of Service Violations
Stephen Eick, VisTracks, Inc.

Visualizing Urban Freight Movement by Leveraging Mobility Data Portals
Eren Yuksel, University of South Florida / Center for Urban Transportation Research

Visualizing Safety Data in Iowa
Skylar Knickerbocker, Iowa State University—InTrans

Using Tableau to Visualize Disaggregated Freight Flow Data in North Carolina
Scott Boone, Cambridge Systematics

10:30 a.m.–12:00 p.m., Board Room
Visualization and Climate Change: Session 2 of 2
How can visualization help us better understand the challenges we face as our climate changes? Can a heat map help us change from gas to electric vehicles? How does travel related energy flow across a city. And how is Honda beginning to consider Mobility As a Service (MaaS)? In addition, can a weighted Voronoi diagram help us to estimate petroleum consumption?
Moderator: Frank Broen, Teach America

PRESENTATIONS:
Estimating Petroleum Product Consumption at Terminals using Satellite Images and Weighted Voronoi Diagram
Hyeonsup Lim, Oak Ridge National Laboratory

Visualizing a Shared, Autonomous, & Electric Vehicle Fleet
Matthew Moniot, National Renewable Energy Laboratory

Application of a Web-based Planning Tool for LA Metro for Siting EV Charging Infrastructure: Heatmaps showing EV Siting Scores
Jon Walker, ICF

Visualization of Traffic Energy Flow Geographic Information Systems
Jeff Cappellucci, National Renewable Energy Laboratory
Implementation of BIM for Infrastructure Processes

BIM for Infrastructure, or 3D-Engineered Model processes (also referred to as Civil Integrated Management or CIM), are being adopted and implemented by DOTs and the FHWA at a rapid pace. The FHWA is promoting CIM and 3D Engineered Models through the Every Day Counts (EDC) initiatives and workshops. These tools and processes include challenges and opportunities from both a technological and a cultural/process perspective. Presenters in these sessions will cover some of these challenges and opportunities from the perspective of state and federal agencies.

Moderator: Chuck Hixon, Edge Technologies

PRESENTATIONS:
A Roadmap for Deploying a Roadway and Bridge BIM/Visualization Program
Jamison Wahl, Stanley Consultants

BIM in Practice: The Challenges & Benefits of 3D Technology
David Loughery, Allplan, Inc.

BIM vs. the Digital Twin
Jennifer Steen, WSP

Measuring the Effects and Performance of BIM in Transportation
Phil Bell, ARA

12:00 p.m.–1:00 p.m., Great Hall
Lunch, sponsored by CATT Laboratory and WSP

1:00 PM - 2:30 PM, Kavli Auditorium
Where Are You Going and How Did you Get There? People Movement Visualizations
This session covers several new visual analytics tools and methodologies for analyzing trajectory and paths data obtained from connected vehicles and devices as they move throughout a transportation network.

Moderator: Michael Schade, CATT Laboratory

PRESENTATIONS:
Computer-Vision Based Visualization of Pedestrian and Vehicle Paths on a Map View using Sparse Camera Networks
Ilan Goodman, Numina

Developing a Chart Selection Matrix for Visualizing National Household Travel Survey Data
Chieh (Ross) Wang, Oak Ridge National Laboratory

MITRE Map: A Flexible Tool for Interactive Display of Spatiotemporal and Attribute Data
Brendan Hogan, The MITRE Corporation

TrajAnalytics: A Web-Based Visual Analytics Software of Urban Trajectory Data
Ye Zhao, Kent State University
Visualization Tools for Infrastructure Project Management

Innovations in tools are changing the way transportation projects are designed, constructed, maintained, and managed. This session focuses on recent trends and emerging tools, including uses of UAVs, LiDAR, augmented reality, and interactive visualization.

Moderator: Chuck Hixon, Edge Technologies

Presentations:

Visualization in Decision Support: Bringing Design Options to Life
Ryan Noyes, VHB

Identifying Physical and Mobile DMV Site Locations in North Carolina
Majed Al-Ghandour, North Carolina DOT

NDE Data Fusion, Analysis, and Visualization for a Quantitative Asset Management
Hoda Azari, FHWA
PUBLIC SECTOR KEYNOTE SPEAKER
DIANA FURCHTGOTT-ROTH is the Deputy Assistant Secretary for Research and Technology (OST-R). She seeks to ensure that research, development and technology activities and budgets across the Department are fully aligned with the Department’s strategic goals and key areas of interest, and that Departmental statistics are reliable and of the highest quality. Ms. Furchtgott-Roth focuses on the deployment of innovation in America’s transportation system, with the goal of lowering barriers in the development of new technology.

Prior to joining DOT, she was Acting Assistant Secretary for Economic Policy at the U.S. Department of Treasury. She has been a senior fellow and director of Economics21 at the Manhattan Institute for Policy Research and an adjunct professor of economics at The George Washington University. She previously served as Chief Economist of the U.S. Department of Labor; Chief of Staff of the President’s Council of Economic Advisers; Deputy Executive Director of the Domestic Policy Council; and Junior Staff Economist at the Council of Economic Advisers. Ms. Furchtgott-Roth is the author of five books and was a columnist for MarketWatch.com and Tax Notes. She received her BA in economics from Swarthmore College and her M.Phil. in economics from Oxford University.

PRIVATE SECTOR KEYNOTE SPEAKER
EDDIE MORENO is a Senior Civil Designer at Walt Disney Imagineering. He has led diverse projects combining value engineering, intelligent parametric models, and the latest in visual design collaboration. His experience spans residential, commercial, and now, as a Walt Disney Imagineer, theme park and resort design. He’s been a speaker at Autodesk University and has held lectures on BIM management, the future of robotic construction, and the unique aspects of engineering and how it applies to theme park design.
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The 13th National Conference on Transportation Asset Management (TAM) provides an opportunity for all practitioners involved in their agency’s asset management initiative to build core competencies and generate new ideas.

- Looking for both practical and innovative presentations.
- Selected abstracts will be featured in either poster or technical podium sessions.
- Presenters will be required to register and attend the conference to be included in the final program.

**Presentation tracks and crosscutting issues:**

- Track 1: Implementation
- Track 2: Data Governance/Tools
- Track 3: Managing Risk
- Track 4: Partners and Peers
- Track 5: Sustaining Asset Management in your Organization
- Crosscutting Issue 1: Transit
- Crosscutting Issue 2: Resilience
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