TRB FINAL PROGRAM

# Innovations in Freight Data Workshop

## April 9-10, 2019

**Arnold and Mabel Beckman Conference Center**
**Irvine, CA**

*Organized by*
**Transportation Research Board**

*www.trb.org/conferences/Freight2019.aspx*

*The National Academies of*
SCIENCES · ENGINEERING · MEDICINE
TRB
TRANSPORTATION RESEARCH BOARD

# WELCOME

Building on the success of its predecessor 2017 workshop, the 2019 Innovations in Freight Data Workshop aims to bring together the community of freight data users to share, discuss, and learn about:

- *The latest applications of emerging data sources and data fusion methods;*
- *Freight data tools that are adaptable, flexible, user-friendly, and preserve proprietary data, or that are developed with open source technology; and*
- *Transferable methods of data collection, analysis, and visualization to meet local, federal, or international freight planning and performance measurement requirements.*

Presenters and attendees are invited to share experience and best practices for addressing persistent gaps in freight data collection and evaluation, and for responding to the new challenges associated with the use of recent and emerging data sources.

**—Alison Conway, City College of New York**
*Innovations in Freight Workshop Planning Team Chair*

## Planning Committee

Alison Conway, City College of New York, *Chair* Avital Barnea, AASHTO
Chandra Bondzie, FHWA
Chester Ford, Bureau of Transportation Statistics Sam Hiscocks, Iowa Department of Transportation Sherif Ishak, Old Dominion University
Nikola Ivanov, University of Maryland CATT Laboratory
Yatman Kwan, California Department of Transportation
Catherine Lawson, University at Albany, SUNY
Donald Ludlow, CPCS
Casey Wells, Texas Department of Transportation
Joel Worrell, Florida Department of Transportation

## Staff

Tom Palmerlee, TRB
Scott Brotemarkle, TRB
Mai Quynh Le, TRB

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 increase the benefits that transportation contributes to society by providing leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied committees, task forces, and panels annually engage about 7,000 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**

# SCHEDULE AT A GLANCE

| Date | Time | Rooms Assigned to Meetings or Sessions | | | | | |
|---|---|---|---|---|---|---|---|
| | | Auditorium | Huntington Room | Atrium | Balboa Room | Board Room | Crystal Cove Room |
| Monday April 8, 2019 | 8:00 a.m.- 10:00 a.m. | | | | Freight Transportation Planning and Logistics (AT015) Committee Meeting | | Agriculture and Food Transportation (AT030) Committee Meeting |
| | 10:30 a.m.- 12:30 p.m. | | | | Urban Freight Transportation (AT025) Committee Meeting | AASHTO COP Freight Planning Task Force | Intermodal Freight Terminal Design and Operations (AT050) Committee Meeting |
| | 1:30 p.m.- 3:15 p.m. | | AASHTO Special Committee on Freight Meeting Part 1 (Public) | | | | |
| | 3:30 p.m.- 5:30 p.m. | | AASHTO Special Committee on Freight Meeting Part 2 (Members Only) | | Intermodal Freight Transport (AT045) Committee Meeting | Freight Transportation Data (ABJ90) Committee Meeting | |
| | 5:30 p.m.- 6:30 p.m. | | | | | Innovations in Freight Data Workshop Planning Meeting (Members Only) | |
| Tuesday April 9, 2019 | 8:30 a.m.- 10:00 a.m. | Opening Session | | | | | |
| | 10:30 a.m.- Noon | Novel Methods of Data Collection (I) | | | | | |
| | 1:00 p.m.-2:30 p.m. | Developing Freight Data into Decision-Making Information | | | | | |
| | 3:00 p.m.- 4:30 p.m. | Developing Data Systems to Manage Commercial Vehicle | | | | | |
| | 4:30 p.m.- 6:00 p.m. | | | Interactive Posters and Reception | | | |
| Wednesday April 10, 2019 | 8:30 a.m.- 10:00 a.m. | Emerging Data Streams and Future Freight Application | | | | | |
| | 10:00 a.m.- 11:15 a.m. | | | Poster Session | | | |
| | 1:00 p.m.-2:30 p.m. | Machine Learning and Computer Vision to Collect and Improve Freight Data | | | | | |
| | 3:00 p.m.- 4:00 p.m. | Closing Session | | | | | |
| | 4:00 p.m.- 5:00 p.m. | | Innovations in Freight Data Workshop Planning Debrief (Members Only) | | | | |

# TRB COMMITTEE MEETINGS

## Monday, April 8, 2019

***All Committee Meetings and the AASHTO Freight Meeting Part 1 Open to the Public***

7:00 a.m.– 8:00 a.m., *Dining Room*
**Breakfast**

8:00 a.m.– 10:00 a.m.
**Freight Transportation Planning and Logistics (AT015) Committee,** ***Balboa Room***
Matthew Roorda, University of Toronto, *presiding*

**Agriculture and Food Transportation (AT030) Committee,** ***Crystal Cove Room***
Mark Berndt, Quetica, *presiding*

10:00 a.m.– 10:30 a.m., *Atrium*
**Break**

10:30 a.m.– 12:30 p.m.
**Urban Freight Transportation (AT025) Committee,** ***Balboa Room***
Bill Eisele, Texas A&M Transportation Institute, *presiding*

**Intermodal Freight Terminal Design and Operations (AT050) Committee,** ***Crystal Cove Room***
Nathan Hutson, University of Southern California, *presiding*

**AASHTO COP Freight Planning Task Force,** ***Board Room***
Tom McQueen, Georgia DOT, *presiding*

12:30 p.m.– 1:30 p.m., *Dining Room*
**Lunch**

1:30 p.m.– 3:30 p.m.
**AASHTO Special Committee on Freight Part 1,** ***Huntington Room***
Roger Millar, Washington State Department of Transportation, *presiding*

3:30 p.m.– 3:45 p.m., *Atrium*
**Break**

3:45 p.m.– 5:30 p.m.
**AASHTO Special Committee on Freight Part 2** ***(Members Only),*** ***Huntington Room***
Roger Millar, Washington State Department of Transportation, *presiding*

**Freight Transportation Data (ABJ90) Committee,** ***Board Room***
Alison Conway, City College of New York, Chair, *presiding*

**Intermodal Freight Transport (AT045) Committee,** ***Balboa Room***
Jolene Hayes, Fehr and Peers, *presiding*

5:30 p.m.– 6:30 p.m.
**Innovations in Freight Data Workshop Planning** ***(Members Only),*** ***Board Room***
Alison Conway, City College of New York, Chair, *presiding*

# WORKSHOP SESSIONS

## Tuesday, April 9, 2019

7:30 a.m.– 4:30 p.m., *Great Hall*
**Registration**

7:30 a.m.– 8:30 a.m., *Dining Room*
**Breakfast**

**8:30 a.m.– 10:00 a.m.**, ***Auditorium***

### Opening Session

Alison Conway, City College of New York, Chair, *presiding*
Catherine Lawson, University at Albany, SUNY, *recording*

**Welcome and Charge to Participants**
Roger Millar, Washington State Department of Transportation
Chris Schmidt, CalTrans

10:00 a.m.– 10:30 a.m., *Atrium*
**Break**

10:30 a.m.– Noon, ***Auditorium***

### Novel Methods of Data Collection (I)

Nikola Ivanov, University of Maryland CATT Laboratory, presiding
Sarah Hernandez, University of Arkansas, recording

Innovative data collection methods are being developed to address persistent freight data challenges, including invisibility of local movements and data time lags. This panel will discuss innovative applications to collect location-specific freight parking, routing, and behavior data.

**A Self-Sustaining, Self-Perpetuating Web-Scraping Application for Crude Oil Railroad Route Information**
Chieh (Ross) Wang, Shih-Miao Chin, Ho-Ling Hwang, Hyeonsup Lim, Oak Ridge National Laboratory

**Next-Generation Smartphone or Tablet-Based Commercial Vehicle Survey**
Lynette Cheah, Singapore University of Technology and Design; Kyungsoo Jeong, Massachusetts Institute of Technology

**Leveraging the Crowd: The Application of Crowdsourced Data to Generate Truck Parking Insights**
Alex Marach, CPCS

Noon– 1:00 p.m., *Dining Room*
**Lunch**

1:00 p.m.– 2:30 p.m., ***Auditorium***

### Developing Freight Data into Decision-Making Information

Holly Cohen, Florida Department of Transportation, *presiding*
Julius Codjoe, Louisiana Department of Transportation, *recording*

State and local agencies are now using common data sources such as vehicle probes, traffic sensors, and weigh-in-motion systems in innovative ways for freight planning and performance measurement. This panel will discuss new freight planning and performance measurement applications for public agencies.

**Truck Empty Backhaul - A Florida Freight Story**
Joel Worrell, Florida Department of Transportation

**Using Freight Data to Inform the 2018 Texas 100 Most Congested Road Sections**
David Schrank, Bill Eisele, Texas A&M Transportation Institute

**Trucks and the Port of Virginia: Understanding Freight Patterns with Big Data**
Robert Case, Hampton Roads Transportation Planning Organization; Catherine Manzo, StreetLight Data

2:30 p.m.– 3:00 p.m., *Atrium*
**Break**

3:00 p.m.– 4:30 p.m., ***Auditorium***
## Developing Data Systems to Manage Commercial Vehicle Behaviors
Donald Ludlow, CPCS Transcom Inc., *presiding*
Paul Bingham, EDR Group, *recording*

Understanding truck activity patterns and supply chain behaviors is critical for planning for and managing goods movements and prioritizing infrastructure investments. This panel will discuss new methods for identifying, measuring, and visualizing freight activities.

**Implementation of a National Freight Fluidity Monitoring Program**
Marygrace Parker, I-95 Corridor Coalition; Joseph Bryan, WSP USA, Inc.

**Truck Activity Pattern Classification Using Anonymous Mobile Sensor Data**
Taslima Akter, Sarah Hernandez, University of Arkansas

**Advanced Uses Of Truck GPS Data: Truck Tour Typologies, Connecting Long-Haul And Short-Haul Trucks, and Longitudinal Analysis to Understand Change in Business Practices Over Time**
Colin Smith, Vincent Bernardin, RSG

4:30 p.m.– 6:00 p.m., ***Atrium***
## Interactive Posters and Reception
Casey Wells, Texas DOT; Sam Hiscocks, Iowa DOT, presiding

Presenters will utilize large flat-screens to interactively demonstrate innovative freight data applications, many of which combine multiple data sources / technologies (e.g. GPS, Bluetooth) to improve data collection, analysis, and decision making.

**An Evolution in Open Source Interactive Freight Data Visualization**
Ben Stabler, Colin Smith, RSG

**Accounting For Uncertainty in Future Goods Movement: Processes for Generating More Granular, Higher Volume Data To Support Planning**
Derek Cutler, EDR Group

**Design and Pilot of a Shipment Tracking Method to Supplement a Commodity Flow Survey**
Peiyu Jing, Massachusetts Institute of Technology; Lynette Cheah, Singapore University of Technology and Design

**Enhancing Truck Activity Monitoring System by Using Advanced Traffic Sensors**
Yiqiao Li, Andre Tok,Institute of Transportation Studies, University of California, Irvine

**Firms in the Future: Applying Today's Data to Forecast the Evolution of Firms for Freight Modeling**
Brent Selby, Krishnan Viswanathan, Cambridge Systematics, Inc.

**Implementing Freight Fluidity in Texas**
Bill Eisele, Nicole Katsikides, Texas A&M University Transportation Institute

**International Truck Travel in the SoCal Region: Understanding Freight Patterns with Big Data**
Keri Robinson, SANDAG; Jess Stetson, StreetLight Data

**NCFRP 49 - Web Guide for Understanding and Using New Data Sources to Address Urban and Metropolitan Freight Challenges**
Vivek Sakhrani, Donald Ludlow (CPCS Transcom)

**Spatiotemporal Analysis of the Freight Analysis Framework Data**
Monique Stinson, Argonne National Laboratory; Birat Pandey, Federal Highway Administration

**The Future of Urban Goods Movement: An Evaluation and Implementation of Data Driven Methods**
Ethan Yue Sun, Fatemeh Ranaiefar, Fehr & Peers

## Wednesday, April 10, 2019

7:30 a.m.– 1:30 p.m., *Great Hall*
**Registration**

7:30 a.m.– 8:30 a.m., *Dining Room*
**Breakfast**

8:30 a.m.– 10:00 a.m., ***Auditorium***
### Emerging Data Streams and Future Freight Application
Patricia Hu, Bureau of Transportation Statistics, *presiding*
Alan Hooper, ATRI, *recording*

Transformational technology advances, such as artifical intelligence and the internet of things, and increasingly vast datasets, such as transaction records are expected to enable new advances for freight data collection, behavior analysis, and decision-making. This future-looking panel will discuss the new opportunities that these innovations may offer for freight planning and management.

**Emerging Datasets and Their Impact on Transportation**
Zach Strickland, Freight Waves

**Trucking Industry Perspective: Electronic Logging Devices - Potential Ways to Leverage the Data for Operations Efficiency**
Greg Dubuque, Liberty Linehaul West

**The Electronic Logging Device (ELD) Mandate and Trucking: How We Got Here and Opportunities for Freight Data, Planning and Management**
Jeffrey Short, American Transportation Research Institute (ATRI)

10:00 a.m.– 10:30 a.m., *Atrium*
**Break**

10:30 a.m.– Noon, ***Atrium***
### Poster Session
Yatman Kwan, California DOT; Chester Ford, Bureau of Transportation Statistics, *presiding*

Using traditional posters, presenters will discuss a variety of unique approaches for freight data collection, performance measurement, planning, and visualization.

**A Freight Forecasting Tool for Northern New Jersey**
Daniel Beagan, Christopher Lamm, Cambridge Systematics, Inc.

**Statewide Freight Activity**
Joel Worrell, Florida Department of Transportation

**California Vehicle Inventory and Use Survey - Large-scale Data Collection and Fusion with Trucking Databases**
Anurag Komanduri, Mobashwir Khan, Cambridge Systematics

**Characterization and Estimation of Traffic Volume: A Truck and Passenger Cordon Study of the Seattle's Urban Core**
Gabriela del Carmen Giron Valderrama, Anne Goodchild, University of Washington

**Conceptual Routing for Potential Hyperloop Freight Network Using the Freight Analysis Framework Database**
Chieh (Ross) Wang, Shih-Miao Chin, Ho-Ling Hwang, Hyeonsup Lim, Oak Ridge National Laboratory

**Data Assesment Methods for Truck-Sea Vessel Flow Analysis**
Mario M Monsreal Monsreal, Don Kang, Texas A&M Transportation Institute

**Emerging Datasets Used in Advanced Freight Models**
Kaveh Shabani, Maren Outwater, RSG

**Mind the Curb: Findings from Commercial Vehicle Curb Usage in California**
Mohammadreza Kamali, Anurag Komanduri, Cambridge Systematics

**Practices for the Geographic Disaggregation on CFS Data in Southern California (Canceled)**
Stephen Yoon, SCAG

**Spatial Disaggregation of Waterborne Commodity Flow by Fusing Truck GPS and Lock Performance Data**
Magdalena Asborno, Sarah Hernandez, University of Arkansas

**The Questions Big Data Can Answer: Commercial Travel Analysis**
Joan Lim, StreetLight Data; Stasa Zivojnovic, Fatemeh Ranaiefar, Fehr and Peers

Noon– 1:00 p.m., *Dining Room*
**Lunch**

1:00 p.m.– 2:30 p.m., ***Auditorium***
## Machine Learning and Computer Vision to Collect and Improve Freight Data
Sherif Ishak, Old Dominion University, *presiding*
Chieh (Ross) Wang, Oak Ridge National Laboratory, *recording*

Computer vision and machine learning offer new opportunities for improving the quality of freight data and for addressing persistent freight data gaps. This panel will discuss recent applications of these approaches.

**Machine Learning Applications to Improve the Commodity Flow Survey**
Christian Moscardi, Census Bureau

**Truck Taxonomy–Classi ication and Commodity via Machine Learning**
Ed Hutchinson, Makarand Gawade, Florida Department of Transportation

**Tracking the Maritime Transportation System with the Automated Identification System (AIS)**
Patricia DiJoseph, USACE

2:30 p.m.– 3:00 p.m., *Atrium*
**Break**

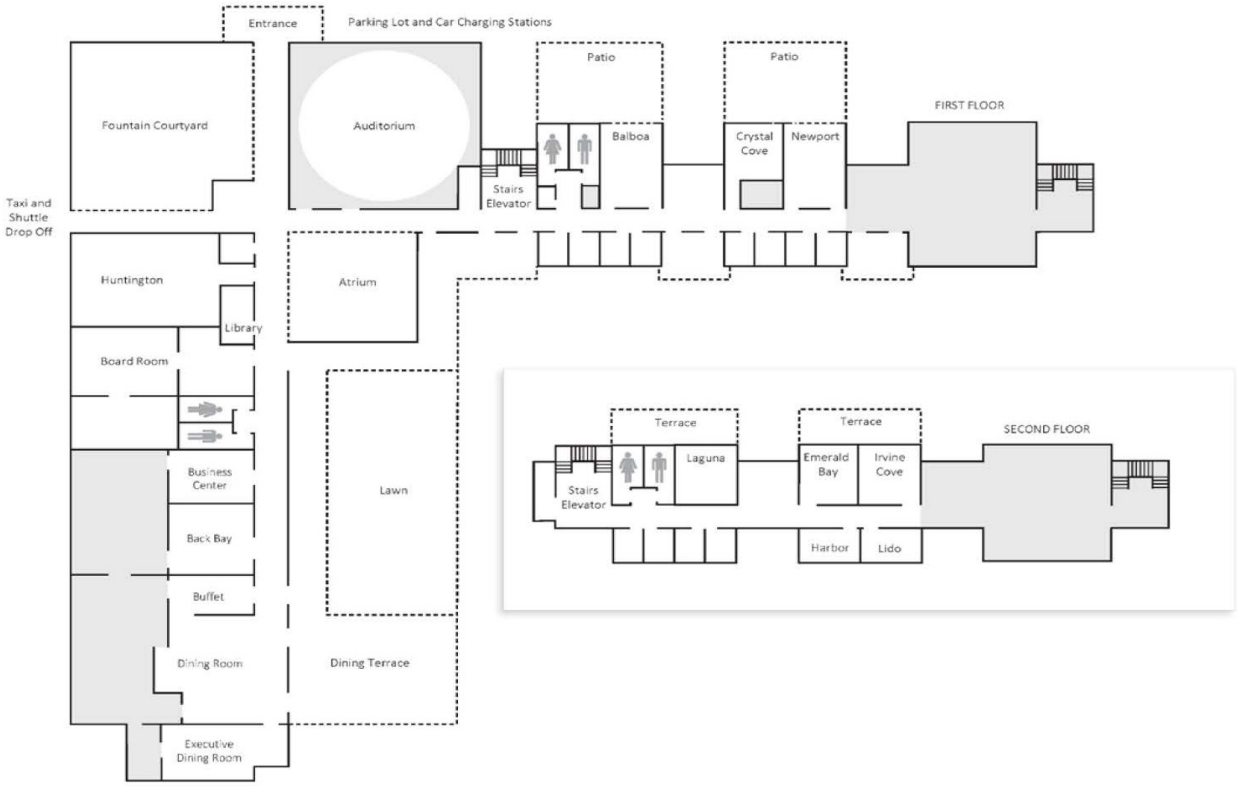
3:00 p.m.– 4:00 p.m., ***Auditorium***
## Closing Session
Alison Conway, City College of New York, Chair, *presiding*

During the closing session, workshop organizers and panel moderators will summarize workshop findings and engage attendees to identify key takeaways from the workshop, including:

- promising new data sources and processing, analysis, or visualization methods;
- transferable advances in practice for freight planning and performance measurement; and
- immediate and long-term research needs to further advance the capabilities of freight data users and to address persistent freight data gaps and challenges.

4:00 p.m.– 5:00 p.m., ***Huntington Room***
## Innovations in Freight Data Workshop Planning Debrief *(Members Only)*
Alison Conway, City College of New York, Chair, *presiding*

# FLOOR PLAN



https://ncfrp48.icfwebservices.com/ncfrp48/reports/

## Hotel Information

Hotel Irvine Jamboree
17900 Jamboree Road
Newport Beach, California 92814

## Contacts

Thomas M. Palmerlee, ***TPalmerlee@nas.edu***
Mai Quynh Le, ***MQLe@nas.edu***

*The National Academies of*
SCIENCES • ENGINEERING • MEDICINE

The nation turns to the National Academies of Sciences, Engineering, and Medicine for independent, objective advice on issues that affect people's lives worldwide.
**www.national-academies.org**

500 Fifth Street, NW
Washington, DC 20001
**www.TRB.org**