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# **Welcome to ACP50 Committee on Traffic Flow Theory and Characteristics**

January 9th, 2023 – 1:30pm / 5 pm (max!)

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# Housekeeping

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- Please sign on paper (in-person attendees) or through the google sheet (online attendees)!
  - For online attendees, please mute yourself. Only questions in the chat will be considered.
  - Will skip self-introduction; Please introduce yourself when you speak.
  - An electronic vote was organized among the committee in December to approve the minutes of 2022 annual and summer meetings. The final versions are available on the website.
  - **Please keep you MyTRB account up to date with your latest info**
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# Agenda



- Welcome and Call to Order L. Leclercq
- TRB Report R. Cunard/R. Bertini
- Chair Report L. Leclercq
- FHWA Programs & Activities J. Sturrock/R. James
- TFTC Subcommittee Reports
  - Connected Automated Vehicles (ACP50(3)) S. Hamdar
  - Research Problem Statements V. Gayah
  - Paper Review L. Leclercq
  - Awards. M. Menendez / J. Kim
  - Mid-Year Meetings L. Leclercq
  - Outreach and Diversity. S. Hamdar/A. Talebpour
  - Subcommittee reshuffling L. Leclercq
- Liaison with other Committees All Attendees
- International Liaison International members and attendees
- Announcements and Future Meetings All Attendees



# TRB Report

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- Rich Cunard
  - Robert Bertini
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# Chair report - Membership

- Welcome to all our new members (2022 rotation)!!!!
- New international members:
  - Francesco Viti (Univ Luxembourg) - Luxembourg
  - Lina Kattan (Univ Calgary) – Canada
  - Marco Rinaldi (AMS) – Netherlands
- New members:
  - Maria Laura Delle Monache (Berkeley)
  - Ramachandran Balakrishna (Caliper)
  - Biagio Ciuffo (JRC)
  - Tamara Djukic (ERTICO)
  - Silvia Varotto (EPFL)



# Chair report - Membership

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- New young members
    - Panchamy Krishnakumari (TU Delft)
    - Irene Martinez (TU Delft)
    - Kenan Zhang (ETHZ / EPFL)
    - Rafegh Aghmohammadi (Michigan)
  
  - V. Gayah remains our Committee Research Coordinator (CRC) and S. Hamdar has been appointed Secretary
  - We are still looking for one State DOT Member (suggestions are welcomed)
  - Gender ratio is now 31%
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# Chair Report – TRB activities

## Subcommittee Meetings

Monday, January 09 1:30 PM- 3:15 PM ET	<b>Traffic Flow Theory and Characteristics Committee</b> Ludovic Leclercq, Universite Gustave Eiffel, presiding Operations and Traffic Management <a href="#">More Details</a>	<b>ACP50</b>
Monday, January 09 6:00 PM- 7:30 PM ET	<b>Traffic Flow Modeling for Connected and Automated Vehicles Subcommittee, ACP50(3)</b> Samer Hamdar, George Washington University, presiding Operations and Traffic Management	<b>ACP50 ACP50(3)</b>
Monday, January 09 7:30 PM- 10:00 PM ET	<b>Simulation Subcommittee (SimSub), ACP80(1), Joint Subcommittee of ACP80, ACP20, ACP25, ACP35, ACP40, ACP50, ACP55, AEP40, AMS10</b> Christopher Melson, Oregon Department of Transportation, presiding John Shaw, Iowa State University, presiding Operations and Traffic Management, Planning and Forecasting, Environment	<b>ACP80 ACP20 ACP25 ACP35            ACP40 ACP50 ACP55            ACP80(1) AEP40 AMS10</b>

## Workshop

Sunday, January 08 1:30 PM- 4:30 PM ET	<b>Workshop 1041</b> <b>Connected and Automated Vehicles in Freight, Ridesharing, and (Para)Transit</b> Samer Hamdar, George Washington University, presiding <i>Workshop   Spotlight Theme   PDH</i> Operations and Traffic Management, Rail, Public Transportation, Spotlight Theme: Rejuvenation Out of Disruption: Envisioning a Transportation System for a Dynamic Future	<b>ACP50 ACH30 AED50 AP080            AR080</b>
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# Chair Report – lecterns

Monday, January 09 8:00 AM- 9:45 AM ET	<b>Lectern Session 2005</b> <b>Recent Advances in Traffic Flow Theory and Characteristics</b> Marco Rinaldi, AMS Institute, presiding <i>Lectern   PDH</i> Operations and Traffic Management	ACP50
Tuesday, January 10 8:00 AM- 9:45 AM ET	<b>Lectern Session 3004</b> <b>Urban Network Modeling and Control</b> Lina Kattan, University of Calgary, Schulich, presiding <i>Lectern   PDH</i> Operations and Traffic Management <a href="#">More Details</a>	ACP50
Tuesday, January 10 10:15 AM- 12:00 PM ET	<b>Lectern Session 3059</b> <b>Traffic Flow with Connected and Autonomous Vehicles: Behavioral Insights</b> Rachel James, Federal Highway Administration (FHWA), presiding <i>Lectern   PDH</i> Operations and Traffic Management, Safety and Human Factors	ACP50
Wednesday, January 11 8:00 AM- 9:45 AM ET	<b>Lectern Session 4002</b> <b>Reproducible Research in Traffic Flow Theory</b> Christine Buisson, Université Gustave Eiffel, presiding <i>Lectern   PDH</i> Operations and Traffic Management	ACP50
Wednesday, January 11 10:15 AM- 12:00 PM ET	<b>Lectern Session 4041</b> <b>Multimodal Traffic Flow Models</b> Tamara Djukic, Aimsun, presiding <i>Lectern   PDH</i> Operations and Traffic Management	ACP50



# Chair Report - Posters

Monday, January 09 10:15 AM- 12:00 PM ET	<b>Poster Session 2096</b> <b>Traffic Flow Theory, Part 1: Network Modeling and On-Demand Mobility (Part 2, Session 3212; Part 3, Session 3213; Part 4, Session 4027)</b> Kenan Zhang, EPFL - École Polytechnique Fédérale de Lausanne, presiding <i>Poster</i> Operations and Traffic Management	<b>ACP50</b>
Tuesday, January 10 6:00 PM- 7:30 PM ET	<b>Poster Session 3212</b> <b>Traffic Flow Theory, Part 2: Connected and Autonomous Vehicles (Part 1, Session 2096; Part 3, Session 3213; Part 4, Session 4027)</b> Danjue Chen, University of Massachusetts, Lowell, presiding <i>Poster</i> Operations and Traffic Management <a href="#">More Details</a>	<b>ACP50</b>
Tuesday, January 10 6:00 PM- 7:30 PM ET	<b>Poster Session 3213</b> <b>Traffic Flow Theory, Part 3: Microscopic Traffic Models and Trajectory Analysis (Part 1, Session 2096; Part 2, Session 3212; Part 4, Session 4027)</b> Biagio Ciuffo, JRC: European Commission Joint Research Centre, presiding <i>Poster</i> Operations and Traffic Management	<b>ACP50</b>
Wednesday, January 11 8:00 AM- 9:45 AM ET	<b>Poster Session 4027</b> <b>Traffic Flow Theory, Part 4: Traffic Modeling, Monitoring, and Control (Part 1, Session 2096; Part 2, Session 3212; Part 3, Session 3213)</b> Maria Laura Delle Monache, University of California, Berkeley, presiding <i>Poster</i> Operations and Traffic Management	<b>ACP50</b>



# Chair Report – Posters (2)

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## Poster Session 2095

### Doctoral Student Research in Transportation Operations and Traffic Control

Monday, January 09  
10:15 AM-  
12:00 PM ET

Huaguo Zhou, Auburn University, presiding  
Michael Knodler, University of Massachusetts, Amherst, presiding  
*Poster*  
Operations and Traffic Management, Pedestrians and Bicyclists

[ACP00](#) [AC000\(1\)](#) [ACP20](#)  
[ACP25](#) [ACP50](#) [ACP55](#)

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## Some insights from the TRB meetings

- Please keep you MyTRB account up to date with your latest info
- MyTRB now includes a mailing system. We are considering transitioning from the Google group to MyTRB system, but we need to be sure that all friends are correctly registered
- Subcommittees should be revisited. They should have a clear purpose, critical tasks and a time horizon (before an evaluation). A key feature of subcommittees is the opportunity to meet during TRB
- Task groups can be created with no time limits but will not have meeting spots during TRB
- Operation and Safety sections have been merged into a single group.
  - Next group chair: Robert Bertini
  - Next section chair: Soyoung Ahn
- Triennial Strategic Plan should be elaborated for all committees. The idea is to identify the critical challenges for the next 3-5 years and the list of priority actions for the committee. TSPs will help sections/groups to foster collaborations between committees.



# U.S. DOT/FHWA Report

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- Jim Sturrock
  - Rachel James
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U.S. Department of Transportation  
Federal Highway Administration

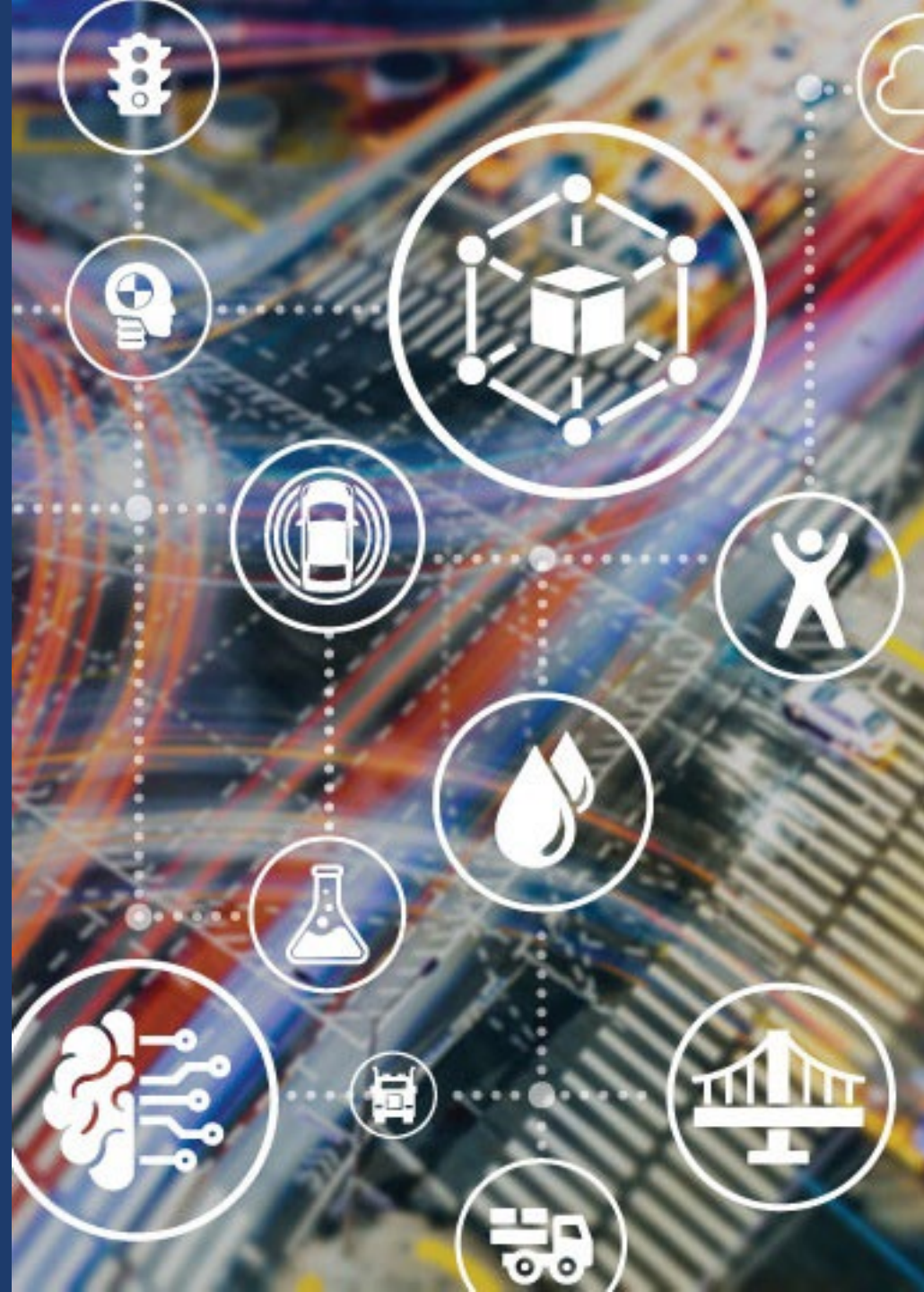
Turner-Fairbank  
Highway Research Center

# Federal Highway Administration (FHWA) Analysis, Modeling, and Simulation (AMS) Research Updates

Rachel James, Ph.D.  
FHWA Office of Safety and Operations  
Research and Development

January 2023

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# Agenda

- ▶ Connected and Automated Vehicle (CAV) AMS Research Program.
- ▶ Ongoing project updates:
  - ▷ Advanced driver assistance system (ADAS) data collection projects.
  - ▷ ADAS and automated driving system (ADS) modeling gap report.\*
- ▶ Published reports:
  - ▷ CAV AMS cornerstone framework.<sup>2</sup>
  - ▷ CAV model improvement.<sup>3,4,5</sup>
  - ▷ CAV case studies.<sup>6,7,8</sup>
  - ▷ Multiresolution modeling for traffic analysis.<sup>9,10,11</sup>

\*FHWA. *Advanced Driver Assistance System and Automated Driving System Modeling Gap Report*. Forthcoming. Washington, DC: FHWA.







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# CAV AMS Research Program



U.S. Department of Transportation  
Federal Highway Administration

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# CAV AMS Program Vision and Goals

- ▶ Vision: Help State and local agencies understand the most likely impacts of CAVs on their roadways according to key performance metrics to support improved operational and investment decisionmaking.
- ▶ Goals: Coordinate CAV AMS efforts across FHWA disciplines:
  - ▷ Accelerate development of AMS tools and models, including improved functionality and validation.
  - ▷ Advance understanding of CAV impacts on roadways according to key performance metrics (e.g., safety, mobility, equity, sustainability).



# Summary of Activities by Stakeholders

## Develop Guidance

modeling, cost/benefit, scenario planning, calibration, measures of effectiveness, assumptions

## Conduct Behavioral Research

human drivers, automated vehicles, work zone safety, fleet penetration

## Establish and Update Standards

shared data format, CAV definitions, cybersecurity

## Collect and Disseminate Data

trajectory, storage, standardization, lane change, car following

## Characterize System Impacts

penetration, mixed, capacity, demand, extreme conditions, infrastructure

## Map Research Needs To Potential Tools and Workflows

open behavior model, tool library

## Engage Stakeholders

industry, academia, State/local, education, collaboration, expert panel, facilitation

## Research and Develop Use Cases and Pilot Projects

emerging technologies, vulnerable road users, impacts

## Research Human Factors

adoption rates, decisionmaking



# CAV AMS Program Plan Desired Outcomes

ID	Title	Description
1	Active CAV AMS community	Establish a dynamic and engaged CAV AMS community that connects key CAV stakeholders, AMS stakeholders, and FHWA personnel to identify essential issues, focus resources and attention, and foster participation in CAV AMS program activity.
2	Track CAV technology capabilities and distribution	Track the functions and capabilities of CAV vehicle and infrastructure technology, including the distribution (both fleet and infrastructure penetration) of these technologies across the nation's surface transportation system.
3	Observe human behavioral responses to various types of CAV technology	Conduct and synthesize research on the behavior of human travelers and drivers, as observed and reported by individuals interacting with different types of CAV technologies in different environments.
4	Collect and share validated system data for CAV AMS	Share validated system data for CAV modeling in a standard format to support CAV AMS tool development efforts.
5	Regularly update available CAV AMS tools and resources	CAV AMS tools and resources provide possible future mixed fleet and technology scenarios but come with a range of uncertainties. It is essential to determine how CAVs and other emerging technology can be incorporated into existing AMS tools to analyze their potential benefits and impacts.







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# Ongoing Projects



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# CARMA<sup>SM</sup> Data Collection

## Research team:

- ▶ Collected data in Northern Virginia, including in an active work zone.
- ▶ Collected data using both a readily identifiable, ADAS-equipped SAE International (SAE) Level 2 vehicle and an inconspicuous, manually driven Level 1 vehicle (MDV).<sup>1</sup>
- ▶ Collected 61 runs, or about 30 terabytes, of raw vehicle sensor data.



Source: FHWA.



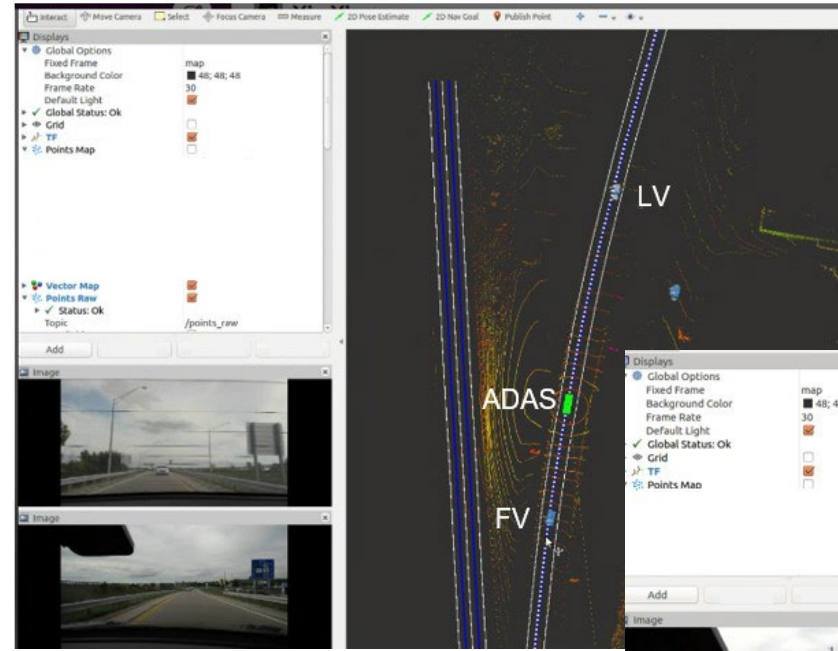
Source: FHWA.



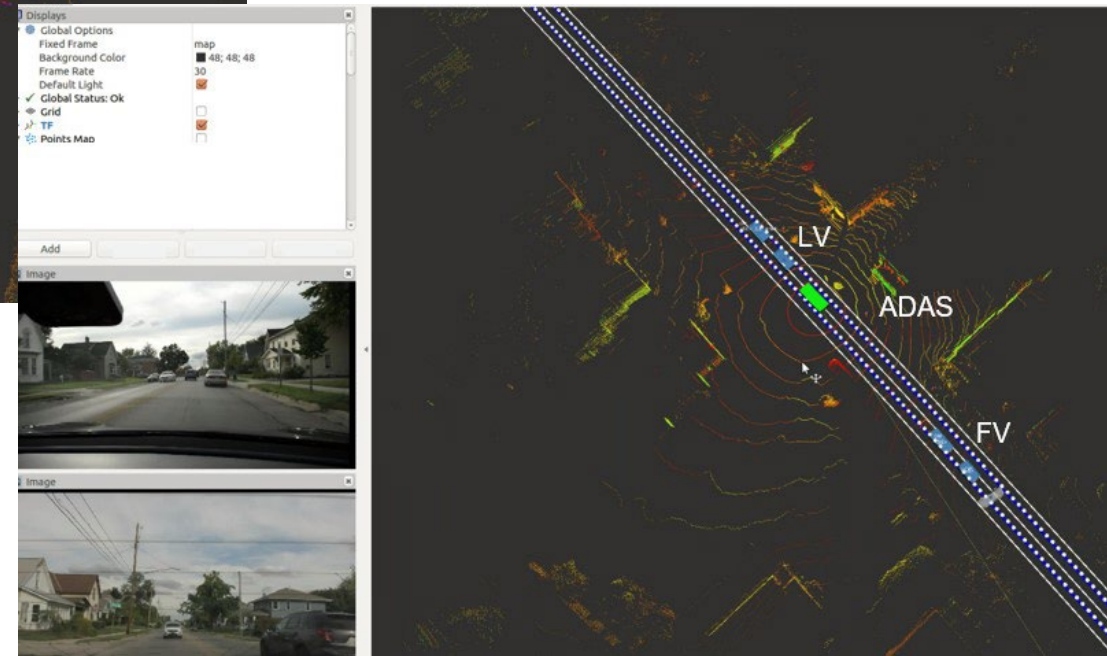
# Acquiring CAV Performance Datasets

## Research team:

- ▶ Collected data in central Ohio to leverage many of the active CAV deployments in the region.
- ▶ Collected data using both readily identifiable and discreet ADAS-equipped Level 2 vehicles.
- ▶ Collected 120 h of driving data.



FV = following vehicle; LV = leading vehicle.



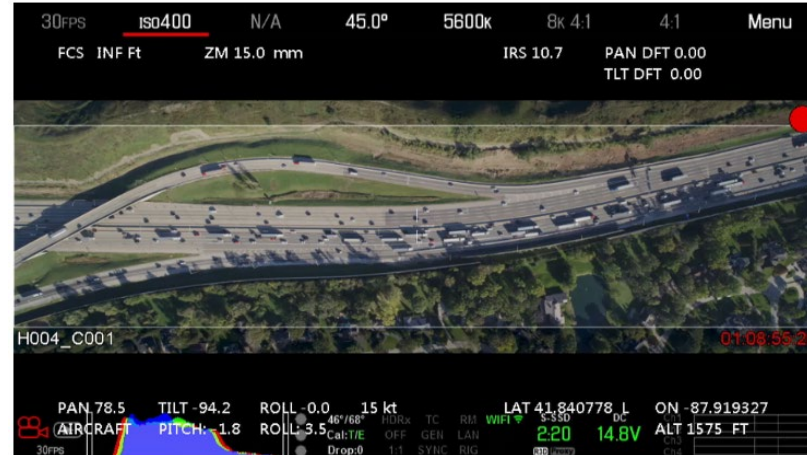
All photos source: FHWA.



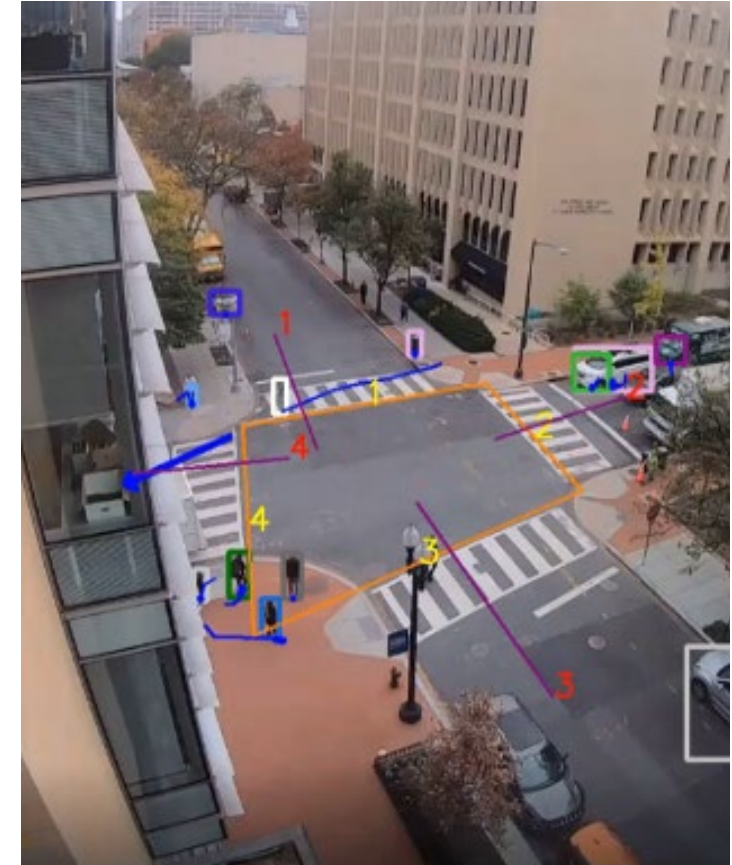
# Third-Generation Simulation

## Research team:

- ▶ Collected data during rush hour in multiple locations in Chicago, IL and Washington, DC.
- ▶ Collected ADAS-equipped vehicle data (Level 1 and Level 2 functionality).
- ▶ Collected accompanying aerial data by using both moving and stationary helicopters and high-altitude fixed cameras.



All photos source: FHWA.



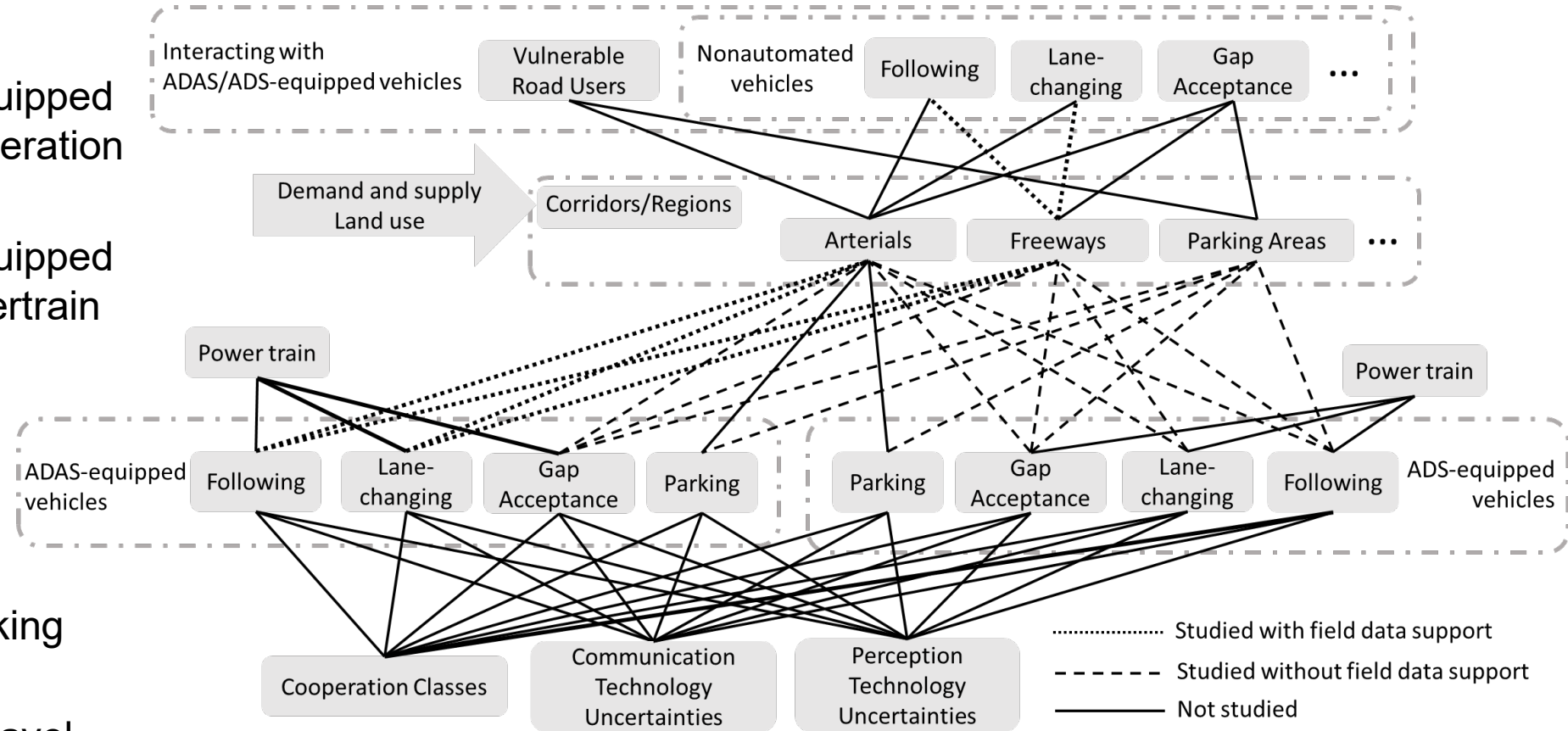
Source: FHWA.



# ADAS and ADS Modeling Gap Report\*

## Methodological Gaps:

1. Impacts of technology.
2. Behavior of ADAS/ADS-equipped vehicles with different cooperation classes.
3. Behavior of ADAS/ADS-equipped vehicles with different powertrain systems.
4. Interactions between ADAS/ADS-equipped vehicles, infrastructure, and other road users.
5. Behavior of vehicles in parking areas.
6. Investigations of regional travel behavior.



Source: FHWA.





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# CAV AMS Research Products

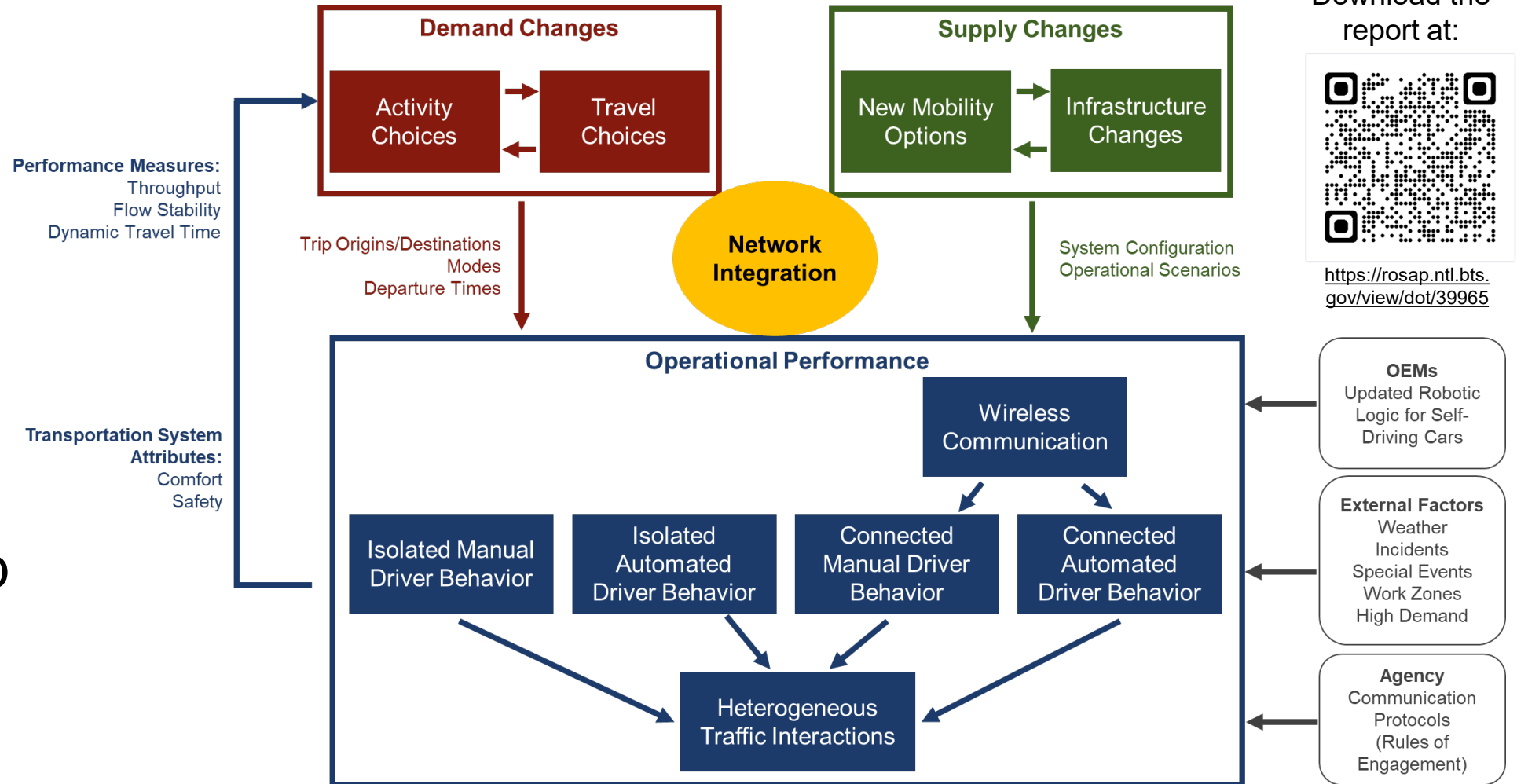


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# CAV AMS Cornerstone Framework Report

- ▶ Provides an architecture for CAV AMS framework.
- ▶ Discusses results of a modeling gap analysis.



OEMs = original equipment manufacturers.

© 2018 Mahmassani, Elfar, Shladover, and Huang.<sup>2</sup> Modified by FHWA.

# CAV Model Improvement: Tool Development

The report documents new open-source tools that capture CAV driving behavior in microsimulation models:

- ▶ Automated vehicle lane-changing algorithm.
- ▶ Cooperative adaptive cruise control and connected vehicle algorithms.
- ▶ Speed harmonization algorithm.
- ▶ Cooperative merge algorithm.



Source: FHWA.<sup>3</sup>

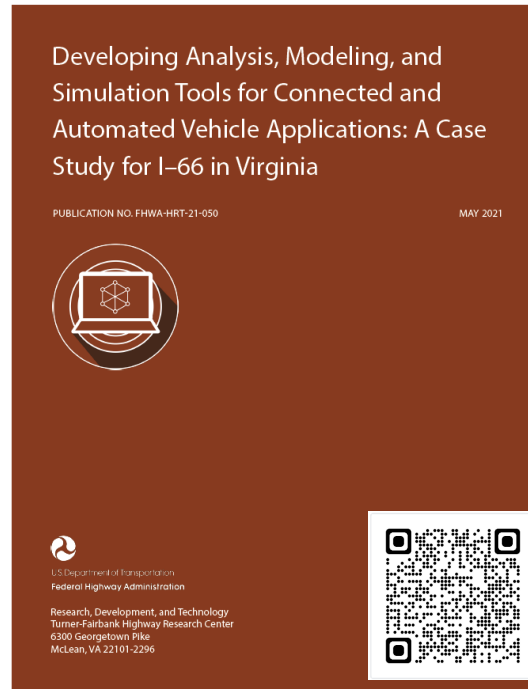
<https://www.fhwa.dot.gov/publications/research/operations/21077/21077.pdf>



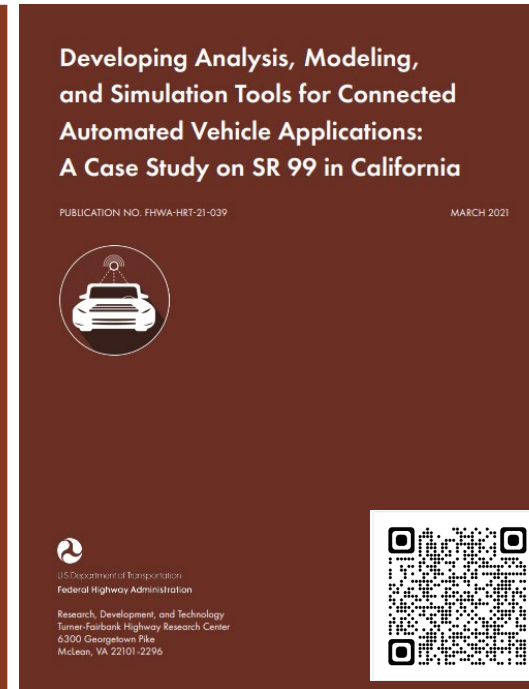
Open-Source Code:  
[its.dot.gov/code/](https://its.dot.gov/code/)  
or  
[github.com/STOL-AMS/4,5](https://github.com/STOL-AMS/4,5)

# CAV Impact Assessment: Case Studies

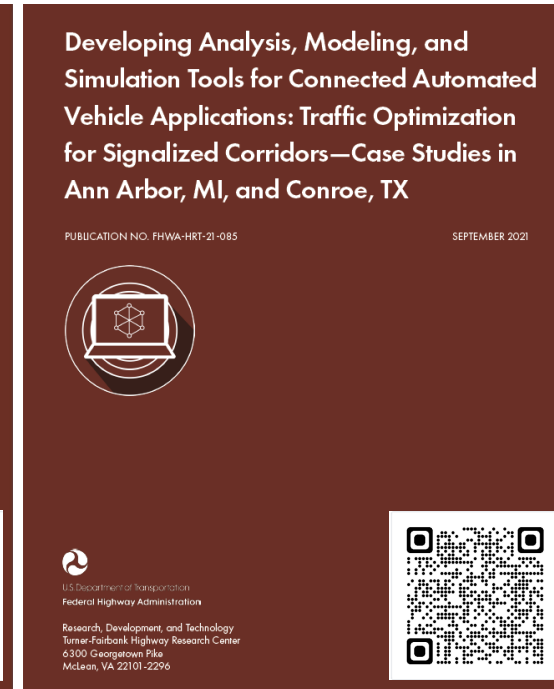
- ▶ Discuss developing realistic simulations by involving local agencies while defining assumptions.
- ▶ Identify likely impacts of CAVs on freeways and arterials through case studies conducted using existing tools and capabilities.



Source: FHWA.<sup>6</sup> <https://www.fhwa.dot.gov/publications/research/operations/21050/21050.pdf>



Source: FHWA.<sup>7</sup> <https://www.fhwa.dot.gov/publications/research/operations/21039/21039.pdf>



Source: FHWA.<sup>8</sup> <https://www.fhwa.dot.gov/publications/research/operations/21085/21085.pdf>



# Multiresolution Modeling (MRM) for Traffic Analysis: State-of-Practice and Gap Analysis Report

- ▶ Documents consistent definitions for MRM concepts.
- ▶ Discusses a unified modeling framework to help transportation professionals better understand the opportunities and challenges associated with MRM.



Source: FHWA.<sup>9</sup>

<https://www.fhwa.dot.gov/publications/research/operations/21082/index.cfm>



# MRM for Traffic Analysis: Case Studies Report

- ▶ Provides a blueprint of the successful pilot studies conducted for the MRM project.
- ▶ Presents lessons learned to agencies to facilitate successful MRM adoption.

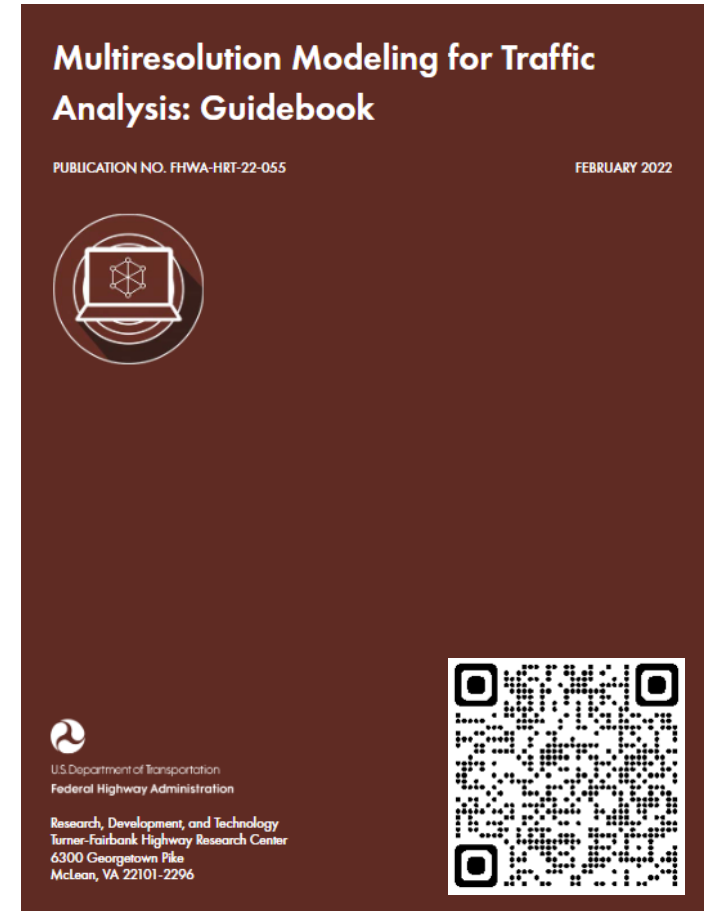


Source: FHWA.<sup>10</sup>

<https://www.fhwa.dot.gov/publications/research/operations/22054/index.cfm>

# MRM for Traffic Analysis: Guidebook

- ▶ Supports transportation professionals in assessing the level of effort needed for MRM.
- ▶ Assists agencies in understanding the benefits of developing multiresolution models for their analyses.
- ▶ Provides guidance for developing multiresolution models.



Source: FHWA.<sup>11</sup>

<https://www.fhwa.dot.gov/publications/research/operations/22055/index.cfm>

# Questions?

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# References

1. SAE International. 2021. *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles*. SAE J 3016. [https://doi.org/10.4271/J3016\\_202104](https://doi.org/10.4271/J3016_202104), last accessed April 12, 2022.
2. Mahmassani, H. S., A. Elfar, S. Shladover, and Z. Huang. 2018. *Development of an Analysis/Modeling/Simulation (AMS) Framework for V2I and Connected/Automated Vehicle Environment*. Report No. FHWA-JPO-18-725. Washington, DC: FHWA.
3. Lu, X., H. Liu, H., X. Li, Q. Li. H. Mahmassani, A. Talebpour, M. Hosseini, Z. Huang, D.K. Hale, and S. E. Shladover. 2021. *Developing Analysis, Modeling, and Simulation Tools for Connected and Automated Vehicle Applications*. Report No. FHWA-HRT-21-077. Washington, DC: FHWA. <https://www.fhwa.dot.gov/publications/research/operations/21077/index.cfm>, last accessed October 26, 2021.
4. U.S. Department of Transportation. n.d. “ITS CodeHub” (web page). <https://its.dot.gov/code/>, last accessed November 3, 2021.
5. GitHub, Inc. 2021. “STOL-AMS” (web page). <https://github.com/STOL-AMS/>, last accessed November 3, 2021.
6. Ma, J., Y. Guo, and Z. Huang. 2021. *Developing Analysis, Modeling, and Simulation (AMS) Tools for Connected and Automated Vehicle Applications: A Case Study for I-66 in Virginia*. Report No. FHWA-HRT-21-050. Washington, DC: FHWA. <https://www.fhwa.dot.gov/publications/research/operations/21050/index.cfm>, last accessed October 26, 2021.
7. Liu, H., X. Lu, S. E. Shladover, and Z. Huang. 2021. *Developing Analysis, Modeling, and Simulation Tools for Connected Automated Vehicle Applications: A Case Study on SR 99 in California*. Report No. FHWA-HRT-21-039. Washington DC: FHWA. <https://www.fhwa.dot.gov/publications/research/operations/21039/index.cfm>, last accessed October 26, 2021.



# References (continued)

8. Huang, Z., J. Ma, Y. Guo, N. Matout, Y. Feng, D. Florence, and K. Balke, et al. 2021. *Developing Analysis, Modeling, and Simulation Tools for Connected Automated Vehicle Applications: Traffic Optimization for Signalized Corridors—Case Studies in Ann Arbor, MI, and Conroe, TX*. Report No. FHWA-HRT-21-085. Washington, DC: FHWA.  
<https://www.fhwa.dot.gov/publications/research/operations/21085/21085.pdf>, last accessed October 26, 2021.
9. Zhao, X., M. Hadi, and D. Hale. 2021. *Multiresolution Modeling for Traffic Analysis: State-of-Practice and Gap Analysis Report*. Report No. FHWA-HRT-21-082. Washington, DC: FHWA.  
<https://www.fhwa.dot.gov/publications/research/operations/21082/index.cfm>, last accessed March 24, 2022.
10. Hadi, M., X. Zhao, and D. Hale. 2021. *Multiresolution Modeling for Traffic Analysis: Case Studies Report*. Report No. FHWA-HRT-22-054. Washington, DC: FHWA.  
<https://www.fhwa.dot.gov/publications/research/operations/22054/index.cfm>, last accessed March 24, 2022.
11. Hadi, M. X. Zhao, and D. Hale. 2021. *Multiresolution Modeling for Traffic Analysis: Guidebook*. Report No. FHWA-HRT-22-055. Washington, DC: FHWA.  
<https://www.fhwa.dot.gov/publications/research/operations/22055/index.cfm>, last accessed March 24, 2022.



# Contacts

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(202) 493-3205

<https://highways.dot.gov/research/operations/analysis-modeling-simulation/analysis-modeling-simulation-overview>



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# Agenda



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  - Mid-Year Meetings L. Leclercq
  - Outreach and Diversity. S. Hamdar/A. Talebpour
  - Subcommittee reshuffling L. Leclercq
- Liaison with other Committees All Attendees
- International Liaison International members and attendees
- Announcements and Future Meetings All Attendees





# Subcommittees

- 
- |  |                          |
|--|--------------------------|
| 1. Connected Automated Vehicles (ACP50(3)) | S. Hamdar                |
| 2. Research Problem Statements             | V. Gayah                 |
| 3. Paper Review                            | L. Leclercq              |
| 4. Awards.                                 | M. Menendez / J. Kim     |
| 5. Mid-Year Meetings                       | L. Leclercq              |
| 6. Outreach and Diversity.                 | S. Hamdar / A. Talebpour |
| ▪ Committee Communications                 | S. Hamdar                |
| ▪ TFTC Webinar                             | J. Laval                 |
| ▪ TFTC Journal Club                        | A. Talebpour             |
| ▪ Committee Website                        | R. Bertini & A. Zockaie  |
| 7. Subcommittee reshuffling                | L. Leclercq              |
-



# Meeting



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## ACP50(3) Subcommittee: Connected and Automated Traffic Flow (CAT-Flow) Subcommittee

ACP50(3) Report

Transportation Research Board Annual Meeting

January the 9<sup>th</sup>, 2023

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# Connected and Automated Traffic Flow (CAT-Flow) Subcommittee – ACP50 (3)



TRB January 2023 (acceptable number of CAV related papers):

**18 handled by ACP50-3 directly; 13 submitted to new Special Call for Papers :**

Behavioral Studies in the Presence of Autonomous Vehicles: From Human Factor Research to Modeling and Simulation

CFP's organizers:

- Danjue Chen ([danjue\\_chen@uml.edu](mailto:danjue_chen@uml.edu))
- Samer Hamdar ([hamdar@gwu.edu](mailto:hamdar@gwu.edu))
- Lina Kattan ([lkattan@ucalgay.ca](mailto:lkattan@ucalgay.ca))
- Ludovic Leclercq ([ludovic.leclercq@univ-eiffel.fr](mailto:ludovic.leclercq@univ-eiffel.fr))
- Michail Makridis ([mmakridis@ethz.ch](mailto:mmakridis@ethz.ch))
- Anshuman Sharma ([anshuman.sharma@uq.net.au](mailto:anshuman.sharma@uq.net.au))
- Meng Wang ([meng.v.wang@gmail.com](mailto:meng.v.wang@gmail.com))
- Zuduo Zheng ([zuduo.zheng@uq.edu.au](mailto:zuduo.zheng@uq.edu.au))

1 Lectern Session (Dr. Rachel James) and 1 Poster Session (Dr. Danjue Chen)

Thank you for CAT-Flow members and friends for your reviews and contributions – please continue engaging us and supporting us with your time and responsiveness





# Connected and Automated Traffic Flow (CAT-Flow) Subcommittee – ACP50 (3)



TRB January 2023 - Workshop (held on Sunday – 1:30 pm – 4:30 pm)

***Title:*** *Connected and Automated Vehicles' (CAVs') Adoption in Freight, Ride-Share, Transit and Paratransit Services: From Behavioral Modeling to Fleet Deployment Studies.*

## Co-Sponsoring Committees/Leads:

- ACH30 – Committee on Human Factors of Vehicles (Dr. Jing Feng - [jfeng2@ncsu.edu](mailto:jfeng2@ncsu.edu))
- AED50 – Committee on Artificial Intelligence and Advanced Computing Applications (Dr. Mecit Cetin - [MCetin@odu.edu](mailto:MCetin@odu.edu))
- AP080 – Committee on Transit Safety and Security (Dr. Lisa Staes - [staes@usf.edu](mailto:staes@usf.edu))

5 Speakers: Industry (1), National Centers (2) , Academicians/Professors (2)

113 registered attendees with contact information





# Connected and Automated Traffic Flow (CAT-Flow) Subcommittee – ACP50 (3)



**Research CAV Survey Document (based on TRB 2020/2021 Workshops) – To Be Updated After TRB2023 Workshop (join us at ACP50-3 Meeting .....**

*Research Needs and Progress:*

**1- Starting with ACC ..... ACC initiative/Webinar Series**

**--> 2-day online workshop (AI in CAV Traffic Flow) – Yang Zhou and Danjue Chen**

**2- Lane Changing/Platooning - 2023**

**3- CAV at junctions ....etc**

**4- Network Fleet - Management and Deployment:**

**Transit/Paratransit/Rideshare/Freight → Expansion to ARTS  
2023 Proposal**





# Connected and Automated Traffic Flow (CAT-Flow) Subcommittee – ACP50 (3)



## Reminder:

- Website Updated:

<https://tftcav.seas.gwu.edu>

- Expanded List of Members and Friends: 50+
- Possible additional collaboration / joint sponsorships: ACP80, ACP40 discussed

A screenshot of the website for the Subcommittee on Connected and Automated Traffic Flow (CAT-Flow). The page has a blue header with the title 'Subcommittee on Connected and Automated Traffic Flow (CAT-Flow)'. Below the header is a navigation menu with links for 'HOME', 'MEMBERS', 'ACTIVITIES', 'EXCHANGE PORTAL', and 'CONTACT'. The main content area is divided into two sections: 'Home' on the left and 'CALENDAR' on the right. The 'Home' section features a blue icon of a car with wireless signals emanating from it. The 'CALENDAR' section shows a calendar for June 2021 with a grid of dates from 1 to 27.

June 2021						
M	T	W	T	F	S	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27





# Connected and Automated Traffic Flow (CAT-Flow) Subcommittee – ACP50 (3)



- Subcommittee Expanded – Please join us:
  - Upcoming Meeting: 6:00 pm until 7:30 pm EST. The meeting will be held at the Marriott Marquis, Salon 9 (M2).

Name	Affiliation
Danjue Chen	University of Wisconsin, Madison
Ali Zochai	Michigan State University
Alireza Talebpour	UIUC
Amir Ghiasi	Leidos
Anshuman Sharma	Postdoctoral fellow, IISc, India
Bingqi Fan	Northwestern University
Chenfeng Xiong	University of Maryland
Claire Silverstein	Noblis-GWU
Dan Work	University of Vanderbilt
Danjue Chen	University of Massachusetts, Lowell
Dazhou Li	Shenyang University of Chemical Technology
Gabor Orosz	University of Michigan, Ann Arbor
Haizhong Wang	Oregon State University
Hao Zhou	Georgia tech
Jian Wang	School of Transportation, Southeast University
Jian Zhang	Beijing Key Laboratory of Traffic Engineering, Beijing University of Technology
Jiang Rui (梁锐)	Beijing Jiaotong University
Jiaqi Ma	UCLA
Jing Dong	Iowa State University
Jinhua TAN	Zhongnan University of Economics and Law
Kitae Jang	KAIST
Kuilin Zhang	Michigan Tech University
Li Song	University of north carolina at charlotte
Lina Kattan	University of Calgary
Mark Brackstone	AIMSUM
Meixin Zhu	University of Washington
Meng Wang	TU Delft, Netherlands
Michael Levin	University of Minnesota
Michael Makridis	ETH Zurich
Mohaiminul Haque	George Washington University

Monica Menendez	NYU - Abu Dhabi
Omer Verbas	Argonne National Laboratory
PENGFEI ZHAO	Beijing University of Civil Engineering and Architecture
Qian Chen	Southeast University, school of automation
Rachel James	USDOT - FHWA
Rafegh Aghamohammadi	Georgia Tech
Rami Ammourah	UIUC
Reza Khajeh-Hossein	UIUC
Samer Hamdar	George Washington University
Seungmo Kang	Korea University
Shun SU	BOKU Universität Wien
Simeon Calvert	TU Delft
Siyuan Gong	Department of Computer Science, College of Information Engineering, Chang'an University, China
Stephen Mattingly	University of Texas at Arlington
Tian junfang (田物方)	Tianjin University
Tu Xu	Zhejiang Lab, Hangzhou, China
Wei Ma	The Hong Kong Polytechnic University
Xiaopeng (Shaw) Li	University of South Florida
Xuesong (Simon) Zhou	Arizona State University
Yang Zhou	University of Wisconsin Madison
Yangjiao Chen	Georgia Institute of Technology
Yasir Ali	Queensland University of Technology
Yuan Zheng	Hong Kong polytechnic university
Zhengtian Xu	George Washington University
Zuduo Zheng	University of Queensland

- Special thanks to all ACP50 committee members/leadership for your support.





# Subcommittees

- 
- |  |                          |
|--|--------------------------|
| 1. Connected Automated Vehicles (ACP50(3)) | S. Hamdar                |
| 2. Research Problem Statements             | V. Gayah                 |
| 3. Paper Review                            | L. Leclercq              |
| 4. Awards.                                 | M. Menendez / J. Kim     |
| 5. Mid-Year Meetings                       | L. Leclercq              |
| 6. Outreach and Diversity.                 | S. Hamdar / A. Talebpour |
| ▪ Committee Communications                 | S. Hamdar                |
| ▪ TFTC Webinar                             | J. Laval                 |
| ▪ TFTC Journal Club                        | A. Talebpour             |
| ▪ Committee Website                        | R. Bertini & A. Zockaie  |
| 7. Subcommittee reshuffling                | L. Leclercq              |
-





# Goals as Committee Research Coordinator

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- Identify research needs
  - Develop research needs statements
  - Seek funding sources
  - Submit RNSs to funding programs
  - Share information about research needs and research in progress
  - Develop/maintain research portfolios
-



# Research Needs Statements

---

- Identify and explain research need that can eventually be turned into a project (e.g., NCHRP)
  - Due Nov 1 annually
  - Can be written by anyone
  - Must be submitted and supported by:
    - State highway safety office
    - Governors highway safety association executive board member
    - NHSTA
    - The more, the better
  - Reviewed for AASHTO committee on Research and Innovation
  - If selected, results in NCHRP project!
  - **Would love to have help from volunteers to develop these!**
    - **Great opportunity for senior PhD students or early career individuals to get engaged!**
    - **Email Vikash if interested in helping**
-



# Research Needs Statements

---

- Submitted one recently last year jointly with SimSub
    - Title: Simulating Mixed Heterogeneous Traffic Flows for Better Assessment of Heavy Vehicles
    - TFTC contributing members: **Mohammed Hadi, Samer Hamdar, Danjue Chen, Vikash Gayah**
    - Supported by: Virginia and Wisconsin DOTs, supported by North Carolina, California, Florida DOTs
-



# Research Needs Statements

---

- Potential collaborative avenues discussed during TRB AM:
    - SimSub
    - Safety committees
    - Highway Capacity committee
    - Network modeling committee
    - Freeway operations committee
  - Volunteers available that work with these committees and can engage in these efforts???
-



# NCHRP Synthesis topics

---

- Documents current practice for specific highway topic
  - If selected:
    - Results in funded project of \$55K to review of specific area
    - Can lead to future NCHRP project
  - Due February 17, 2023
  - Can be written and submitted by anyone
  - Would love to have help from volunteers to develop these!!!
    - Great opportunity for senior PhD students or early career individuals to get engaged!
    - Email Vikash if interested in helping
-



# Potential Synthesis topic

---

- Use of ITS for congestion management
- Planning for CAV impacts
- Impacts of urban freight on traffic in city centers



# Subcommittees

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  7. Subcommittee reshuffling L. Leclercq
-



# Paper Review & Sessions

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Many thanks to subcommittee members, authors and reviewers!







# Review Timeline

Dates	Process	Review Outcome
Aug 1	Papers due	
Aug 18	Review Assignment	<b>Please 'accept/decline' review invitations!</b>
Sept 15	Reviews due	
Oct 1-15	1st round decision	Presentation: Accept, Reject Publication: Reject or Moved to Editorial Review

## Review process after moved to editorial review

- Assigned to an Associate Editor and then a Handling Editor
- A handling editor may invite additional reviewers or make a decision (accept, revise, reject)



# Paper Review Statistics

Annual Meeting	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
<b>Papers Received</b>	<b>174</b>	<b>140</b>	<b>109</b>	<b>194</b>	196	194	207	173	201	195
Percent increase	24%	28%	-44%	-1%	1%	-6%	20%	-14%	4%	13%
Presentation only	113	94	61	93	80	64	67	54	48	32
Publication only	x	x	0	0	0	4	1	2	4	3
Present and publish	59	48	48	101	116	126	139	117	149	160
<b>Submitted Presentation</b>	<b>174</b>	<b>140</b>	<b>109</b>	<b>194</b>	196	190	206	171	197	192
Lectern Sessions	5	1	1	5	5	5	6	6	6	5
Lectern Papers	25	6	4	25	25	25	30	31	27	23
Poster Sessions	4	4	4	5	5	4	4	3	2	2
Poster Papers	83	75	61	86	84	84	84	71	80	84
Subtotal	108	81	65	111	109	109	114	102	107	107
Percent Accepted	62%	58%	60%	57%	56%	57%	55%	60%	54%	56%
Rejected	66	59	44	83	87	81	92	70	90	85



# Paper Review Statistics



Annual Meeting	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Submitted Publication	59	46	48	101	116	129	140	119	152	163
Editorial Review	23	14	15	32						



# Best Reviewer award

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Congratulation to

Saif Eddin Jabari

New-York University Abu Dhabi

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**TRB** TRANSPORTATION RESEARCH BOARD

# CERTIFICATE OF APPRECIATION

## BEST PAPER REVIEWER AWARD

PRESENTED TO

*S. Jabari*

*In recognition to your commitment to the  
Committee on Traffic Flow Theory and Characteristics  
TRB 102<sup>nd</sup> Annual Meeting ~ January 8-12, 2023 ~ Washington, DC*

*Ludovic Leclercq*

LUDOVIC LECLERCQ, CHAIR COMMITTEE  
ON TRAFFIC FLOW THEORY AND  
CHARACTERISTICS

*Richard A. Cunard*

RICHARD A. CUNARD  
TRB STAFF REPRESENTATIVE

**JANUARY 2023**

*The National Academies of*  
SCIENCES • ENGINEERING • MEDICINE





# Subcommittees



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  - Committee Website R. Bertini & A. Zockaie
7. Subcommittee reshuffling L. Leclercq



# Some insights

- 5 awards are discussed within the committee (2 are specific to the TFTC committee, 3 are from TRB)
- Previously, papers had to be submitted (and accepted) for publication to qualify for any award. This year, as part of a trial, we also accepted papers submitted only for presentation, as long as they are later published in TRR.
- Typically, awards are given one year after the paper is presented at TRB. This year, as part of a trial, we made decisions on the Greenshield and Gartner awards on the same year.
- Award subcommittee: Rob Bertini, Jiwon Kim, Sue Ahn, Monica Menendez. The subcommittee chair, Monica Menendez is stepping down this year, and Jiwon Kim will be the next chair.



# Nathan Gartner Award

- Recognizes theoretical papers with significant methodological contributions
- Award is given within the Traffic Flow Theory committee
  
- 2022
  - **22-04077: A Real-Time Distributed Cooperative Adaptive Cruise Control Model Considering Time Delays and Actuator Lag** (by Yingtong Tan and Kuilin Zhang).
  
- 2023
  - **23-04279: Traffic Flow as A Simple Fluid: Towards A Scaling Theory of Urban Congestion** (by Jorge Laval).



**TRB** TRANSPORTATION RESEARCH BOARD



# 2022 Nathan Gartner Award

Presented to

*Yingtong Tan*

*Michigan Technological University*

For the Paper

*A Real-Time Distributed Cooperative Adaptive Cruise Control  
Model Considering Time Delays and Actuator Lag*

*Ludovic Leclercq*

LUDOVIC LECLERCQ, CHAIR COMMITTEE  
ON TRAFFIC FLOW THEORY AND  
CHARACTERISTICS

*Richard A. Cunard*

RICHARD A. CUNARD  
TRB STAFF REPRESENTATIVE

Awarded January 2023

The National Academies of  
SCIENCES • ENGINEERING • MEDICINE



**TRB** TRANSPORTATION RESEARCH BOARD



# 2022 Nathan Gartner Award

Presented to

*Kuilin Zhang*

*Michigan Technological University*

For the Paper

*A Real-Time Distributed Cooperative Adaptive Cruise Control  
Model Considering Time Delays and Actuator Lag*

*Ludovic Leclercq*

LUDOVIC LECLERCQ, CHAIR COMMITTEE  
ON TRAFFIC FLOW THEORY AND  
CHARACTERISTICS

*Richard A. Cunard*

RICHARD A. CUNARD  
TRB STAFF REPRESENTATIVE

Awarded January 2023

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**TRB** TRANSPORTATION RESEARCH BOARD



# 2023 Nathan Gartner Award

Presented to

*Forge A. Laval*

*Georgia Institute of Technology*

For the Paper

*Traffic Flow as A Simple Fluid: Towards A Scaling  
Theory of Urban Congestion*

*Ludovic Leclercq*

LUDOVIC LECLERCQ, CHAIR COMMITTEE  
ON TRAFFIC FLOW THEORY AND  
CHARACTERISTICS

*Richard A. Cunard*

RICHARD A. CUNARD  
TRB STAFF REPRESENTATIVE

**Awarded January 2023**

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# Greenshields Prize

- Recognizes the use of empirical data for understanding traffic phenomena
- Award is given within the Traffic Flow Theory committee

- 2022

- There was no award.

- 2023

- **23-02314: How Will Waymo Self-driving Cars Impact Traffic Flow? - Evidence from Empirical Data** (by Danjue Chen, Tienan Li, Jorge Laval, Soyoung Ahn and Zuduo Zheng).

Paper will be published in TRR under the name “How Will Level 4 Self-driving Cars Impact Traffic Flow? - Evidence from Empirical Data” (by Danjue Chen, Tienan Li, Jorge Laval, Soyoung Ahn and Zuduo Zheng).



**TRB** TRANSPORTATION RESEARCH BOARD



# 2023 Greenshields Award

Presented to

*Danjue Chen*

*University of Massachusetts, Lowell*

For the Paper

*How Will Waymo Self-driving Cars Impact Traffic Flow?  
Evidence from Empirical Data*

*Ludovic Leclercq*

LUDOVIC LECLERCQ, CHAIR COMMITTEE  
ON TRAFFIC FLOW THEORY AND  
CHARACTERISTICS

*Richard A. Cunard*

RICHARD A. CUNARD  
TRB STAFF REPRESENTATIVE

Awarded January 2023

The National Academies of  
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# 2023 Greenshields Award

Presented to

*Tienan Li*

*University of Massachusetts, Lowell*

For the Paper

*How Will Waymo Self-driving Cars Impact Traffic Flow?  
Evidence from Empirical Data*

*Ludovic Leclercq*

LUDOVIC LECLERCQ, CHAIR COMMITTEE  
ON TRAFFIC FLOW THEORY AND  
CHARACTERISTICS

*Richard A. Cunard*

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**TRB** TRANSPORTATION RESEARCH BOARD



# 2023 Greenshields Award

Presented to

*Forge A. Laval*  
*Georgia Institute of Technology*

For the Paper

*How Will Waymo Self-driving Cars Impact Traffic Flow?  
Evidence from Empirical Data*

*Ludovic Leclercq*

LUDOVIC LECLERCQ, CHAIR COMMITTEE  
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*Richard A. Cunard*

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Awarded January 2023

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**TRB** TRANSPORTATION RESEARCH BOARD



# 2023 Greenshields Award

Presented to

*Soyoung Ahn*

*University of Wisconsin, Madison*

For the Paper

*How Will Waymo Self-driving Cars Impact Traffic Flow?  
Evidence from Empirical Data*

*Ludovic Leclercq*

LUDOVIC LECLERCQ, CHAIR COMMITTEE  
ON TRAFFIC FLOW THEORY AND  
CHARACTERISTICS

*Richard A. Cunard*

RICHARD A. CUNARD  
TRB STAFF REPRESENTATIVE

Awarded January 2023

The National Academies of  
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# Cunard Award

- Stimulate and encourage young researchers
- Best 1st Young Author Paper in the area of Operations (first author 35 years of age or younger)
  
- 2022
  - There was no nomination.
  
- 2023
  - There is one paper nominated.





# Fred Burggraf Award



- Established 1966
- Stimulate and encourage young researchers
- Recognition of excellence in transportation research by researchers 35 years of age or younger whose papers have been published under the sponsorship of any Division A Standing Group
- Accompanied by a cash prize
- Honors TRB director from 1951-1964
  
- 2022
  - There was no nomination.
  
- 2023
  - There was no nomination.



# D. Grant Mickle Award

---

- Established 1976
  - Outstanding paper published in the field of operation, safety, and maintenance of transportation facilities.
  - Honors fifth executive director, later 33rd Executive Committee Chair
  
  - 2022
    - There was no nomination.
  
  - 2023
    - There is one paper nominated.
-



# Subcommittees

- 
- |  |                          |
|--|--------------------------|
| 1. Connected Automated Vehicles (ACP50(3)) | S. Hamdar                |
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| 3. Paper Review                            | L. Leclercq              |
| 4. Awards                                  | M. Menendez / J. Kim     |
| 5. Mid-Year Meetings                       | L. Leclercq              |
| 6. Outreach and Diversity.                 | S. Hamdar / A. Talebpour |
| ▪ Committee Communications                 | S. Hamdar                |
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| 7. Subcommittee reshuffling                | L. Leclercq              |
-



# Mid-Year Meetings



- 2007 ISTTT London, UK (in pub)
- 2008 Greenshields Symposium, Woods Hole, Massachusetts
- 2009 ISTTT Hong Kong, China (lunch table)
- 2010 Does Traffic Data Support Traffic Models? Annecy, France
- 2011 ISTTT Berkeley (one hour w/SimSub)
- 2012 Joint Summer Meeting with HCQS Committee, Fort Lauderdale, Florida
- 2013 ISTTT, Noordwijk, the Netherlands
- 2014 Portland, Oregon, USA, Symposium Celebrating 50 Years of Traffic Flow Theory
- 2015 ISTTT Kobe, Japan
- 2016 Sydney, Australia
- 2017 ISTTT Chicago
- 2018 Woods Hole, Massachusetts
- 2019 ISTTT Lausanne, Switzerland
- 2020 Amsterdam, the Netherlands (postponed) – Zoom meeting
- 2021 ISTTT Beijing, China (postponed) – Zoom meeting
- 2022 Zoom meeting
- 2023 Amsterdam, the Netherlands
- 2024 ISTTT Michigan
- 2025 Start making plan!



# TFTC summermeeting Amsterdam

Irene Martinez, Marco Rinaldi (chairs)  
Panchamy Krishnakumari, Hans van Lint, and Serge Hoogendoorn (co-chairs),  
Winnie Daamen, Victor Knoop, and Simeon Calvert (proceedings)

1/9/23

Announcement TRM  
2023, TFTC

74





# Dates & deadlines

---

- Summer meeting: July 26-28, 2023
  - Deadline for abstracts: March 15, 2023
  - Review results: April 15, 2023
  - Camera ready abstract submission: May 30, 2023
-



# Venue location



- Amsterdam Institute of Advanced Metropolitan Solutions (AMS)
- Many hotels in the direct neighbourhood, e.g.:
  - Volkshotel ([www.volkshotel.nl](http://www.volkshotel.nl))
  - Lloyd hotel Amsterdam
  - Student Hotel (not only for students!)
  - Hotel Okura Amsterdam (high end!)
  - Sir Albert hotel (Albert Kuyp)





# Focal topics



Themes considered during the meeting are:

- Urban traffic flow operations theory and models
- Traffic flow theory and AI
- Active mode flow operations
- Traffic flow and automation
- Multi-modal traffic flows in climate resilient cities

*Abstracts on other relevant themes are also welcomed!*

Announcement TRM  
2023, TFTC



# Keynote addresses

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Dan Work (Vanderbilt  
Univeristy) “AI and Traffic  
Flows”



Hani Mahmassani (Northwestern University)  
“Multi-modal traffic flows in resilient cities”





# And there is more!



- TRAIL Summercourse “AI and Traffic Flow Theory” by Panchamy Krishnakumari, Hans van Lint and Serge Hoogendoorn (24 – 26 July, 2023)
- Course is aimed at PhDs with basic background in traffic flow theory and will involve tutorials, coding practicals, hackatons, and lots of fun!

M	T	W	T	F	S	S
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

24-26th TRAIL  
Summercourse

26-28th TFTC Summer  
meeting



# Subcommittees



- 
- |  |                          |
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-





# Annual Report

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## ACP50 Outreach and Diversity Subcommittee

Transportation Research Board 2023 Annual Meeting

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# Annual Report

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## ACP50 Outreach and Diversity Subcommittee

Annual Meeting of the Transportation Research Board  
January 2023

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# Outreach and Diversity Subcommittee

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- Newsletter (<http://tftcnews.blogspot.com/>) is celebrating its 10 year anniversary.
    - 12 issues with each issue corresponding to one months (student volunteer: Mohaiminul Haque)
  - ACP50 Journal Club – Started in December 2021 and has had 5 presentations in 2022 with a very small group.
    - The rules of discussion have been refined - will be open to TFTC members and friends starting February 2023.
    - Target Group: All are welcome, especially graduate students and young professionals
    - Please consider encouraging your students to participate
  - Webinar series
-



# Outreach and Diversity Subcommittee

- Special Thanks to:
  - Samer Hamdar
  - Jorge Laval
  - Danjue Chen
  - Mohaiminul Haque
  - Hao Zhou
  - Alireza Talebpour
  - (All TFTC contributors and readers)

**Transportation Research Board**  
Traffic Flow Theory and Characteristics  
Committee—ACP 50

**Newsletter**



**Volume 9, Issue 10**  
December 2021

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EVENTS/ANNOUNCEMENTS

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**Covid-19 Pandemic Resources**

The entire world is now focusing on Covid-19 Pandemic. We are living in a very difficult time. The virus has surprised almost all sectors of our societies. Our thoughts are for those who are affected by the virus. We are grateful to the public health professionals and other professionals who are helping us to fight against this invisible enemy. To learn about the symptoms of the virus and play your part in this fight, please visit [CDC Covid-19 Webpage](https://www.cdc.gov/covid-19/webpage).

---

**Letter from the Chair of the ACP50 Committee**

Dr. Ludovic Leclercq, the Chair of the ACP50 Committee has sent a open letter to the ACP50 Family and friends. He wishes everyone a happy new year and shares important information regarding the TRB Annual Meeting 2022. Please [visit this link](#) to access the full letter.

---

**Traffic Flow Theory and Characteristics Committee's (ACP50) Events Schedule at TRB 101th Annual Meeting**

Event Name	Date, Time and Location
Poster Session 1093: Traffic Flow Theory, Part 1: Network Modeling and Control	Monday, January 10 10:30 AM-12:00 PM ET Convention Center, Hall A
Poster Session 1178: Traffic Flow Theory, Part 2: Connected and Autonomous Vehicles	Monday, January 10 4:00 PM-5:30 PM ET Convention Center,

**Newsletter Spotlight**

Covid-19 Pandemic Recourses.

Letter from the Chair of the ACP50 Committee

Traffic Flow Theory and Characteristics Committee's (ACP50) Events Schedule at TRB 101th Annual Meeting

Positions:

Department Head Position Open at NC State University.

Faculty Position open at University of Connecticut

Faculty Positions Open at Laboratoire Ingénierie Circulation Transport (LICIT)

Faculty Position open at TUM

Traffic in the Media:

Argo AI Focuses On Cyclist Identification For Automated Vehicles.



# Subcommittees

- 
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| 7. Subcommittee reshuffling                | L. Leclercq              |
-



# Revisiting Subcommittees

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- Joint Subcommittee on Traffic Simulation Models (ACP50(1) SimSub)  
*Christopher Melson / J. Shaw*

This subcommittee is now declared as ACP80(1) with ACP50 as a supporting committee. I propose to remove the mention within ACP50.

- Crowd Flow Dynamics, Modeling and Management (ACP50(2))  
*S. Hoogendoorn / S. Talley*

This committee has been less active for the last three years. The idea would be to revitalize it and make it broader (active modes) and better connected with the pedestrian committee (ACH10). We need volunteers!

- Connected Automated Vehicles (ACP50(3))  
*S. Hamdar*

This committee is very active, nothing to say.

---





# Revisiting subcommittees (2)

---

- Last year we discussed the opportunity to create three new subcommittees:
  - *Network modelling and management*
  - *Mobility services, modelling and design*

Shall we proceed? Who volunteers to lead?

- We also plan to create a task force for the *Triennial strategic plan (Lead by S. Ahn) – please volunteer*
-



# Agenda



- Welcome and Call to Order L. Leclercq
- TRB Report R. Cunard/R. Bertini
- Chair Report L. Leclercq
- FHWA Programs & Activities J. Sturrock/R. James
- TFTC Subcommittee Reports
  - Connected Automated Vehicles (ACP50(3)) S. Hamdar
  - Research Problem Statements V. Gayah
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- [Liaison with other Committees](#) [All Attendees](#)
- International Liaison International members and attendees
- Announcements and Future Meetings All Attendees



# Liaison with Other Committees

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- Joint Subcommittee on Traffic Simulations ACP80(1) Melson / Shaw / Kaan Ozbay
  - Traffic Simulations Committee (ACP80)  
Kaan Ozbay
  - Highway Capacity Quality of Service Committee (ACP40)  
J. Sturrock/Others?
  - Young Members Council  
E. Gonzales
-



# Agenda



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## The Munich Test Bed for Connected and Automated Mobility

### Elements:

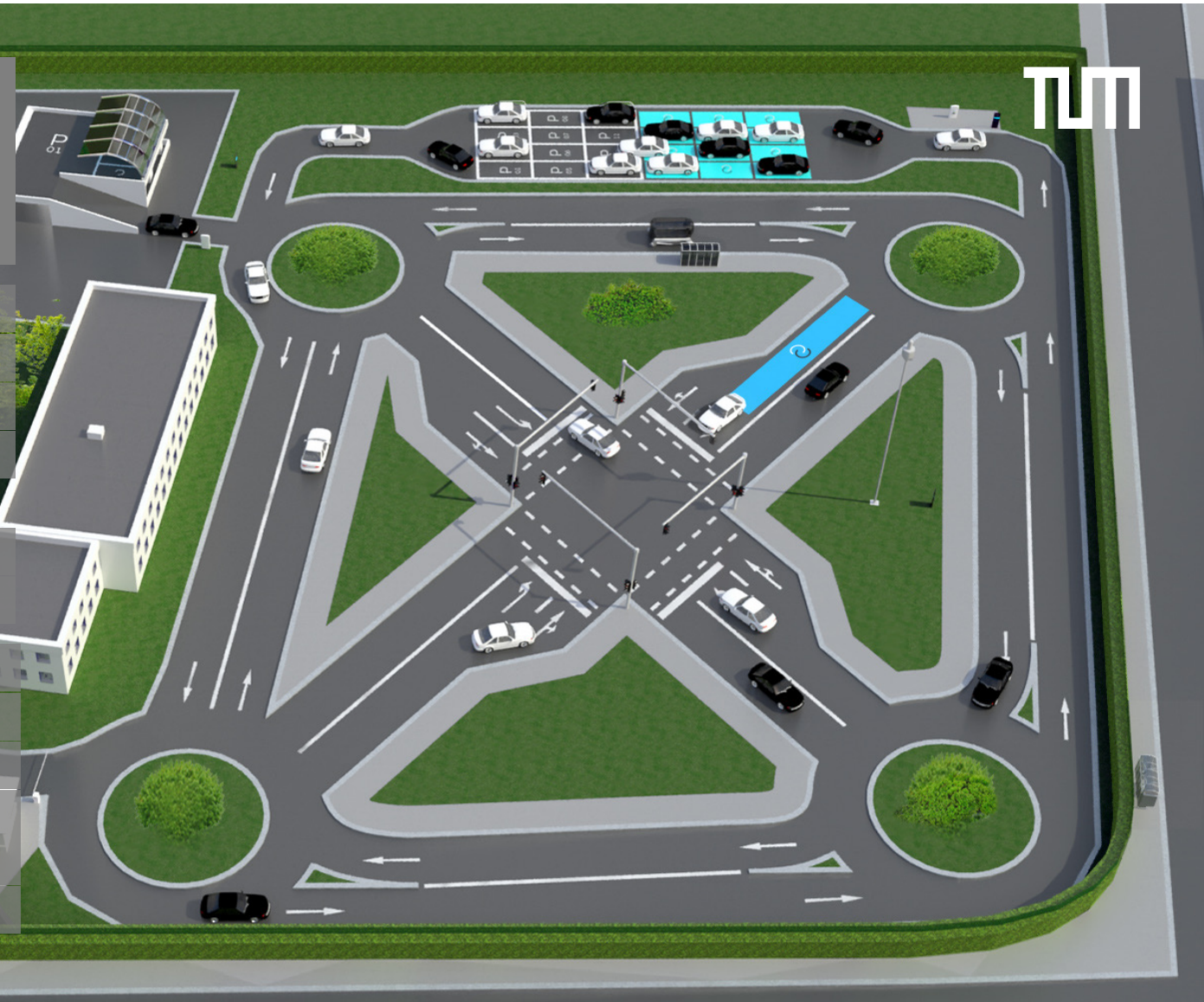
- Intersection area
- Park & Charge Lane
- Drive & Charge Lane

- 5G Connectivity
- Simulation Center

### Highlights:

- Highly dynamic and flexible test bed
- Interaction of CAV with VRU
- Certification of automated driving functions
- X2X-Communication
- Augmented Reality testing in real vehicles

2023 | TUM | Martin Margreiter



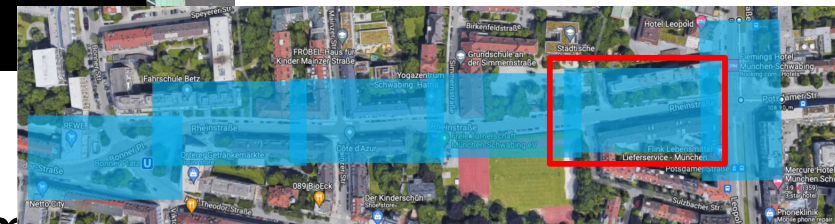
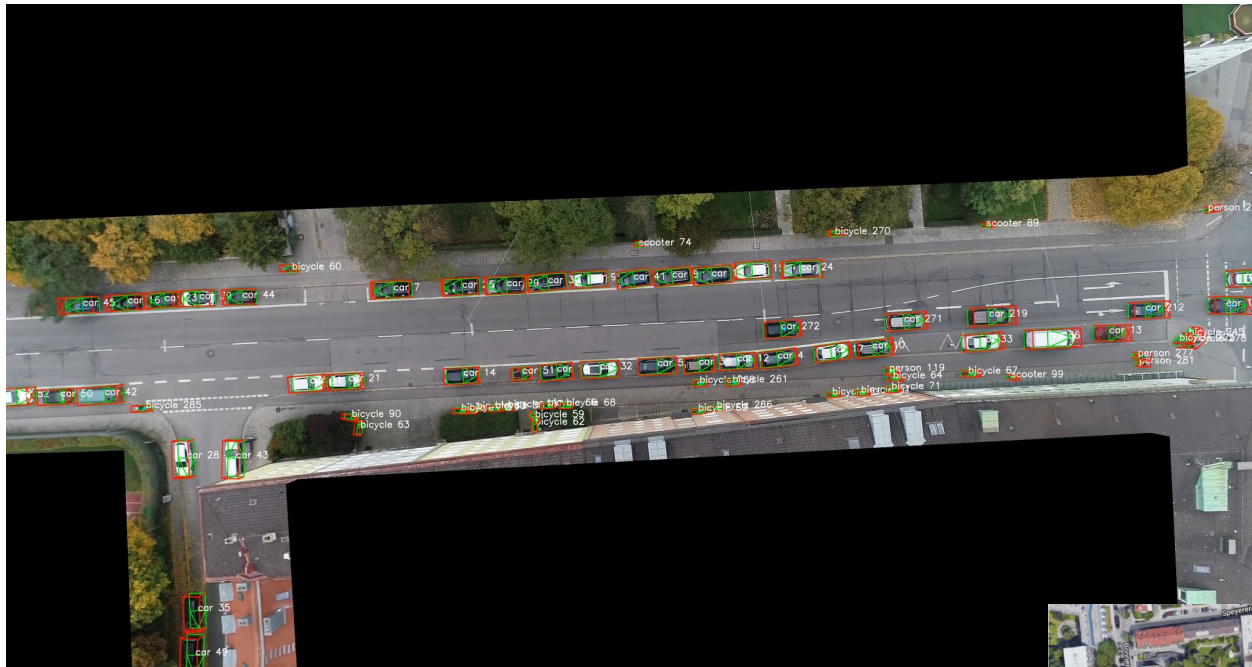




# Munich – Schwabing – Traffic Data Collection using Drones

## Experiment setup:

- Munich, central area
- 2 days (Oct. 6<sup>th</sup> and 12<sup>th</sup>) with ~ 3 continuous hours per day
- 6 locations, filmed by 2 drones per location
- ~700 m in length
- Including:
  - 2 signalized and
  - 3 non-signalized intersections
  - Signalized pedestrian crossing
  - Tram stop



Klaus Bogenberger | ACP 50 Committee Meeting | 2023-01-09



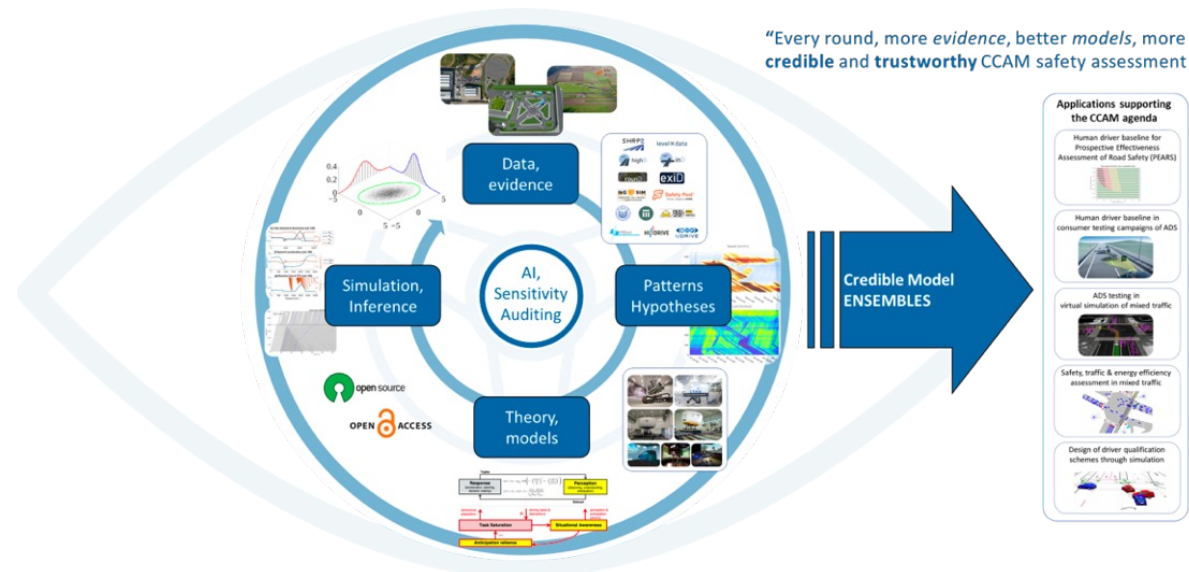


# i4Driving

integrated 4D driver modelling under uncertainty

<https://i4driving.eu>

Vincenzo Punzo, *University of Naples FEDERICO II*, Hans van lint, *Delft University of Technology*





# i4Driving ambition

So, models used  
as (attentive well-  
behaved)  
**BENCHMARK** for  
AV's ...

... AND to  
**simulate messy  
and flawed  
humans** with  
whom AV's interact

- Overarching objective of i4Driving is to deliver **a new (open-source) library of credible (simulation) models** of heterogeneous human driver behaviours ...
- ... which helps set a **safety baseline in virtual assessment of CCAM (connected, cooperative automated mobility)**, i.e., AV's should at least be as safe as our benchmark human model (interacting with potentially not so great drivers)
- The i4Driving library **is central component for a new standard methodology for CCAM assessment** that includes simulation, VR, field lab, sensitivity auditing, ...
- This all entails **much more than just the TFT we all know and love:**
  - Ensemble modelling, **uncertainty quantification**
  - Transferable libraries of 2/3D models & scenario's & **reproducible** experiments
  - Communication/visualisation ideas which are **transparent, rigorous, trustworthy**





**integrated 4D  
driver modelling  
under uncertainty**



**Tonight (9/1) 18:00 Hall A  
poster session**

# TRBAM-23-03557 – VISION FOR A NEW INDUSTRY- STANDARD METHODOLOGY FOR VIRTUAL ASSESSMENT OF AUTOMATED DRIVING SYSTEMS

Hans van Lint, TU Delft  
[j.w.c.vanlint@tudelft.nl](mailto:j.w.c.vanlint@tudelft.nl)



Vincenzo Punzo & Marcello  
Montanino, UNINA

Maria Rodriguez, Panteia

**How can we benchmark the adequacy of automated driving systems (ADS) in real traffic, interacting with real (human) drivers? When is safe safe enough? With how much certainty can we predict this in the first place? Interactions between multiple vehicles are inherently uncertain due to driver and technology heterogeneity and the huge space of possible circumstances. Trustworthy answers require accepting this uncertainty.**



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# Journal of Big Data Analytics in Transportation



Will change the name in 2023

Change in the editorial board:

L. Leclercq has joined S. Ukkusuri as EIC

Welcome all papers related to data & transportation science (not restricted to big data)

#### EDITOR-IN-CHIEF

**Satish V. Ukkusuri**, Purdue University, West Lafayette, IN, USA

#### Distinguished Advisory Editors

**Fred Mannering**, University of South Florida, USA

**Hani Mahmassani**, Northwestern University, USA

**Kay Axhausen**, ETH, Switzerland

**Junyi Zhang**, Hiroshima University, Japan

#### Associate Editors

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**Eleni Vlahogianni**, National Technical University of Athens, Greece

**Francesco Viti**, University of Luxembourg, Luxembourg

**Gitakrishnan Ramadurai**, IIT Madras, India

**Lavanya Marla**, University of Illinois at Urbana Champaign, USA

**Mecit Cetin**, Old Dominion University, Norfolk, VA, USA

**Meead Saberi**, UNSW, Australia

**Ruimin Li**, Tsinghua University, China

**Samiul Hasan**, University of Central Florida, USA

**Zhiyuan Liu**, Southeast University, China



# Upcoming conferences



**26<sup>th</sup> IEEE International Conference on Intelligent Transportation Systems**

September 24<sup>th</sup> - 28<sup>th</sup>, 2023

Palacio Euskalduna, Bilbao, Bizkaia, Spain

[2023.ieee-itsc.org](https://2023.ieee-itsc.org)

**IEEE  
ITSC 2023**



*Towards a New Era of Human-aware, Human-interactive, and Human-friendly ITS*





# INTERNATIONAL SYMPOSIUM ON TRANSPORTATION DATA AND MODELLING

19-22 June 2023 | Ispra, Italy



*Submission of  
contributions is open*

Deadline for abstract  
submission 12  
February 2023



# Parting Thoughts...

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# Adjourn

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Please don't forget to sign in!

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