Welcome to AHB45 Committee on Traffic Flow Theory and Characteristics

January 13, 2020

Self-Introductions Members/Friends

Please don’t forget to sign in!

Agenda

Welcome and Call to Order	**S. Ahn**
Introductions – Members & Friends	**All Attendees**
Review and Approval of Minutes	**S. Ahn**
Chair Report	**S. Ahn**
TRB Report	**R. Cunard/R. Bertini**
FHWA Programs & Activities	**J. Sturrock/R. James**
TFTC Subcommittee Reports	
International Liaison	International members and attendees
Trajectory Data Collection	X. Li
Traffic Monitoring with a Swarm of Drones	N. Geroliminis
Liaison with other Committees	All Attendees
Task Force on System Simulations (AHB80T)	R. Bertini
Announcements and Future Meetings	All Attendees
New Business	All Attendees
Adjourn	All Attendees

Review and Approve Minutes

- January 14, 2019
- July 23, 2019
- Thanks to Vikash Gayah and Ruiwei Chen for preparing the minutes!
- Thanks to Ali, Rob, and Rafegh for making them available on our committee website!

Chair Report

Subcommittee Meetings

Day and Time	Location	Event
Monday 6:00 PM 7:30 PM	Marriott Marquis, Marquis Salon 6 (M2)	Crowd Flow Dynamics, Modeling, and Management Subcommittee, AHB45(2) Serge Hoogendoorn, Delft University of Technology, presiding Shae Zanto, JUB Engineers, Inc., presiding
Monday 6:00 PM 7:30 PM	Marriott Marquis, Marquis Salon 8 (M2)	Traffic Flow Modeling for Connected and Automated Vehicles Subcommittee, AHB45(3) Samer Hamdar, George Washington University, presiding
Monday 7:30 PM 9:30 PM	Marriott Marquis, Marquis Salon 6 (M2)	Traffic Simulation Models, AHB45(1) Mohammed Hadi, Florida International University, presiding

Chair Report

Sunday Workshops

Day and Time	Location	Event
Sunday 9:00 AM 12:00 PM	Convention Center, 103B	Workshop 1032 The Advancement of Modeling Connected and Automated Vehicles: Past and Future Samer Hamdar, George Washington University, presiding
Sunday 1:30 PM 4:30 PM	Convention Center, 103B	Workshop 1072 Traffic Flow Simulation: Persistent Challenges Peter Vortisch, Karlsruhe Institute of Technology, presiding

Chair Report

Special Lectern Session

Day and Time	Location	Event
Tuesday 8:00 AM 9:45 AM	Convention Center, Salon C	Event 1386 (Co-sponsored with AHB30 and A0010) Preparing for Connected and Automated Vehicles: Results from EU-U.S. Research Collaboration Rachel James, Federal Highway Administration (FHWA), presiding Wolfgang Backhaus, Rupprecht Consult, presiding

Chair Report

Lectern Sessions

Day and Time	Location	Event
Monday 8:00 AM 9:45 AM	Convention Center, 101	Event 1120 Traffic Flow Modeling for Connected Automated Vehicles Danjue Chen, University of Massachusetts, Lowell, presiding
Monday 10:15 AM 12:00 PM	Convention Center, 101	Event 1183 Recent Developments in Network-Level Modeling and Control Hani Mahmassani, Northwestern University, presiding
Tuesday 10:15 AM 12:00 PM	Convention Center, 102A	Event 1458 Macroscopic Traffic Flow Modeling and Control S. Ilgin Guler, Pennsylvania State University, presiding
Wednesday 8:00 AM 9:45 AM	Convention Center, Salon B	Event 1675 Driver Behavior in Car Following and Lane Changing Ludovic Leclercq, IFSTTAR , presiding
Wednesday 10:15 AM 12:00 PM	Convention Center, Salon B	Event 1717 Novel Methods in Simulation Robert Bertini, USF Center for Urban Transportation Research, presiding

Chair Report

Poster Sessions

Day and Time	Location	Event
Tuesday 6:00 PM 7:30 PM	Convention Center, Hall A	Event 1654 Traffic Flow Theory and Characteristics, Part 1 Xiaopeng Li, University of South Florida, presiding
Tuesday 6:00 PM 7:30 PM	Convention Center, Hall A	Event 1655 Traffic Flow Theory and Characteristics, Part 2 Jack Haddad, Technion Israel Institute of Technology, presiding
Tuesday 6:00 PM 7:30 PM	Convention Center, Hall A	Event 1656 Traffic Flow Theory and Characteristics, Part 3 Vikash Gayah, Pennsylvania State University, presiding
Wednesday 2:30 PM 4:00 PM	Convention Center, Hall A	Event 1760 Traffic Flow Theory and Characteristics, Part 4 Ali Zockaie, Michigan State University, presiding
Wednesday 2:30 PM 4:00 PM	Convention Center, Hall A	Event 1761 Traffic Flow Theory and Characteristics, Part 5 Hwasoo Yeo, Korea Advanced Institute of Science and Technology (KAIST), presiding

TRB Standing Committees Centennial Papers

- TRB will celebrate its 100th anniversary in 2020.
- TRB Centennial website: http://www.trb.org/Centennial/Celebration.aspx
- Centennial Papers are featured on the Centennial website.
  - https://trbcentennial.nationalacademies.org/centennial-papers/operations-and-preservation

TRB Standing Committees Centennial Papers

- Contributing Authors
  - SOYOUNG AHN, University of Wisconsin-Madison
  - BENJAMIN COIFMAN, The Ohio State University
  - VIKASH GAYAH, Pennsylvania State University
  - MOHAMMED HADI, Florida International University
  - SAMER HAMDAR, George Washington University
  - LUDOVIC LECLERCQ, University of Lyon - IFSTTAR
  - HANI MAHMASSANI, Northwestern University
  - MONICA MENENDEZ, New York University Abu Dhabi
  - ALEX SKABARDONIS, University of California, Berkeley
  - HANS VAN LINT, Delft University of Technology

TRB Standing Committees Centennial Papers

- Oversight by Rich Cunard

- Other Volunteers
  - Jorge Laval, Georgia Institute of Technology
  - Claire Edwina Silverstein, George Washington University
  - Victor Knoop, Delft University of Technology

Thank You!

TRB Centennial Celebration in 2021

- Special Session for TRB Centennial in 2021 (100th Annual Meeting)
  - Volunteers: Christine Buisson, Hani Mahmassani, Ludovic Leclercq
  - Timeline
    - Inform TRB now
    - Draft plan to TRB by June
    - Final plan to TRB by October
  - Please send ideas to Sue

TRB Report

- Robert Bertini
- Rich Cunard

- TRB restructuring
  - Merging with Safety section
  - AHB45 → ACP50

U.S. DOT/FHWA Report

- Jim Sturrock
- Rachel James

Liaison with Other Committees

- Highway Capacity Quality of Service Committee (AHB40)
  J. Sturrock/Others?

- Task Force on Transportation System Simulations
  R. Bertini

- Young Members Council
  E. Gonzales

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- Chair Report — S. Ahn
- TRB Report — R. Cunard/R. Bertini
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Subcommittees

1.	**Joint Subcommittee on Traffic Simulation Models**	**Hadi**
2.	Crowd Flow Dynamics, Modeling and Management	Daamen
3.	Connected Automated Vehicles	Hamdar
4.	Research Problem Statements	Gayah
5.	Paper Review	Ahn
6.	Awards	Leclercq
7.	Mid-Year Meetings	Ahn/Daamen
8.	Outreach and Diversity	
	▪ Committee Communications	Talebpour
	▪ Committee Website	Bertini/Zockaie/Aghamohammadi

Joint Traffic Simulation (SimSub) Subcommittee Report

Presented by

Mohammed Hadi, Ph.D., PE
Florida International University

Transportation System Simulation Manual Workshop
99th Transportation Research Board Annual Meeting

January 2020

Sunday Workshop

- Workshop Title: Traffic Flow Simulation: Persistent Challenges

Peter Vortisch, presiding

- Bring together researchers, vendors, and users of traffic flow simulation to identify persistent challenges and to discuss approaches to solutions.
- Examples include tactical driving, micro–meso integration, vehicle–pedestrian interaction, non-lane-based traffic, microscopic dynamic traffic assignment, and real-time applications.

TRB TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES

TRANSPORTATION RESEARCH BOARD JOINT TRAFFIC SIMULATION SUBCOMMITTEE AHB45 (1) SimSub

1:30		Welcome and Introduction
1:35	John Halkias FHWA	"Traffic analysis challenges and the role of the FHWA"
1:55	Michael Mahut INRO	"Large Scale Traffic Simulation and Assignment"
2:15	Ramachandran Balakrishna, Caliper	"Practical Deployment Considerations for Successful High-Fidelity Microscopic DTA".
2:35	Jordi Casas Aimsun	"Real-time simulation for traffic management: challenges and solutions"
2:55	Martin Fellendorf TU Graz, Austria	"From lane-based to spatial based traffic flow simulation"
3:15	Tobias Kretz PTV Group	„One, a multitude or the crowd – who determines how we move?"
3:35	Hans van Lint TU Delft, The Netherlands	"Simulation for traffic safety research"
3:55	Peter Vortisch, KIT, Germany	"Traffic simulation between traffic engineering and automotive"
4:15		Interactive voting session on simulation challenges

SimSub Activities and Discussions (1)

- Best paper award: Kaan Ozbay, Jorge Laval, Mehdi Ekbatani
  - Application: Applying Bayesian Optimization for Calibration of Transportation Simulation Models
  - Development: Enhanced MFC: Introducing Dynamics of Electrified Vehicles for Free Flow Microsimulation Modeling
  - Life-time award: Ken Courage
- Calibration, Verification and Validation - Ray Benekohal
- Joint SimSub and SimCap Sanhita Lahiri, David Petrucci, and Soheil Sajjadi

November Traffic Simulation Workshop

- Workshop on Traffic Simulation and CAV Modeling
  - Beckman Center of the National Academies of Sciences and Engineering, Irvine, CA
  - November 16-18, 2020
- 2 to 2.5 days.
  - Panel session
  - Breakout sessions
  - Two podium sessions - two parallel tracks, one focus on research and development and one focus on applications and lessons learned
  - Posters
  - Vendor presentations/demonstrations
  - SimSub/SimCap meeting

Workshop Call for Papers

- An extended abstract of no more than 1000 words submitted by March 30th 2020. Notification by June 15.
- Example topics
  - Methodological advancements in traffic simulation modeling
  - Simulation model applications and lessons learned
  - Multi-resolution modeling
  - Multi-agent simulation
  - CAV and shared mobility simulation
  - Real-time simulation application including Decision Support Systems
  - Estimation of reliability, safety, and environmental impacts using simulation.
  - Hardware in the loop simulation
- Working on the possibility of publishing a subset of the presented papers for further review for potential publication in a special issue of a journal.

Additional Discussions (2)

- Transportation System Simulation Manual Development effort update– TSSM support team
- FHWA Effort on A Methodology for Trajectory-Based Calibration of Microsimulation Models." David Hale
- FHWA effort on "Multi-Resolution Modeling for Traffic Analysis."
- Software vendor reports

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▪	Committee Website	Bertini/Zockaie/Aghamohammadi

TFT Crowd subcommittee

- Empirical analyses, modeling, simulation, and management of crowds
- PED2020: Pedestrian and Evacuation Dynamics Conference
  - 28–30 September 2020
  - Melbourne, Australia
  - 10 March 2020 deadline for submission of abstracts
- Book on the basics for pedestrian flows and crowds
  - Basic structure finalised
  - First version of some chapters
- This year no call for papers, intended to have one for next TRB

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Annual Report

AHB45(3) Subcommittee: Traffic Flow Modeling for Connected and Automated Vehicles

AHB45 Meeting

Washington, DC

January, 2020

Traffic Flow Modeling for Connected and Automated Vehicles – AHB45 (3)

2020 Transportation Research Board Annual Meeting Events (12-16 January 2020):

a. **<u>Call for Papers:</u>** 35 Pagers Submitted ~ 3/4 papers →
   - 5 presentations (1 Lectern): Session 1120: Traffic Flow Modeling for Connected and Automated Vehicles; Convention Center 101; Monday 8:00 AM – 9:45 AM
   - 12 Posters: Session 1761: Traffic Flow Theory and Characteristics, Part 1; Convention Center Hall A; Tuesday 6:00 PM – 7:30 PM

b. **Workshop** (Sunday January 13, 2019):
   - 8 Presentations: Session 1032; The Advancement of Modeling Connected and Automated Vehicles: Past and Future; Convention Center 103B; Sunday 9:00 AM – 12:00 PM

Traffic Flow Modeling for Connected and Automated Vehicles – AHB45 (3)

- Possible change in subcommittee name: CATSub
- Possible AVS 2020:
  - Plan A: AI in Connected and Automated Vehicles Modeling, Calibration and Validation
- Possible Call for Papers (to be reviewed by AHB45(3) future Webex Meetings): AAP; IEEE Transactions on ITS; Transportation Research Part C
- Website and Outreach Platform to Industry:
  - Platform part of AHB45(3) website (https://tftCAV.seas.gwu.edu) – contact Samer H. Hamdar – hamdar@gwu.edu)

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   - Committee Communications — Talebpour
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Goals as CRC

- 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!!!
  - Email Vikash if interested in helping

Research Needs Statements

- Submitted one RNS this year
  - Title: Development of models of mixed connected and autonomous vehicle traffic for transportation planning purposes
  - Written by: Xiaopeng Li and Vikash Gayah
  - Supported by: FDOT
    - Champion: Christopher Simpron

NCHRP Synthesis topics

- Documents current practice for specific highway topic
- If selected:
  - Results in funded project of $45K to to review of specific area
  - Can lead to future NCHRP project
- Due February 17, 2020
- Can be written and submitted by anyone
- Would love to have help from volunteers to develop these!!!
  - Email Vikash if interested in helping

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Paper Review & Sessions

Many thanks to subcommittee members, authors and reviewers!

Special Calls for Papers

- Calibration and Validation of Connected and Automated Vehicles' Models: Methods and Data Sources
  - Organizers: Lead by AHB 45(3), Samer Hamdar et al.
  - ~35 papers received
  - 1 podium session

- Improved Flow Modeling and Advanced Control Strategies for Large-Scale Urban Traffic Networks
  - Organizers: Jack Haddad et al.
  - ~ 35 papers received
  - 1 podium session

Paper Review Statistics

Annual Meeting	2020	2019	2018	2017	2016	2015	2014	2013
Papers Received	**194**	196	194	207	173	201	195	172
Percent increase	-1%	1%	-6%	20%	-14%	4%	13%	-3%
Presentation only	93	80	64	67	54	48	32	27
Publication only	0	0	4	1	2	4	3	5
Present and publish	101	116	126	139	117	149	160	140
Submitted Presentation	**194**	196	190	206	171	197	192	167
Lectern Sessions	5	5	5	6	6	6	5	6
Lectern Papers	25	25	25	30	31	27	23	30
Poster Sessions	5	5	4	4	3	2	2	3 (+1)
Poster Papers	86	84	84	84	71	80	84	69 (+6)
Subtotal	111	109	109	114	102	107	107	99
Percent Accepted	57%	56%	57%	55%	60%	54%	56%	59%
Rejected	83	87	81	92	70	90	85	68

Paper Review Statistics

Annual Meeting	**2020**	2019	2018	2017	2016	2015	2014	2013
Submitted Publication	**101**	116	129	140	119	152	163	145
Editorial Review	32							
Accepted (1st & 2nd round)		4	0	0	0	0	1	0
Revise and Re-review		19	34	35	29	42	44	53
To Be Determined		0	0	0	7	5	4	3
Subtotal		23	34	35	36	47	49	56
Publication Slots		23	25	28	~24	~30	35	33
Accepted (Final)		23	25	23	24			
Target Acceptance Rate		20%	20%	20%	20%	20%	22%	23%
Actual Acceptance Rate		20%	20%	16%	20%			
Rejected		93	95	105	81	105	95	89

Review Timeline

Dates	Process	Review Outcome
Aug 1	Papers due	
Oct 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)
- No firm deadline

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6.	**Awards**	**Leclercq**
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	▪ Committee Communications	Talebpour
	▪ Committee Website	Bertini/Zockaie/Aghamohammadi

Award Categories

- TRB
  - D. Grant Mickle Award
  - Fred Burggraf Award

- Operation Section
  - Best 1st Young Author Paper Award (Cunard Award)

- AHB45 TFTC
  - Greenshields Prize
  - Best Paper on Traffic Flow Theory
  - Best Reviewer Award (Nominated and Selected by the Review Coordinators)

Some insights

We are currently working on the 2020 award season!

- 5 awards are discussed within the committee
- The paper must be submitted (and accepted) for publication to qualify for any award
- Please mention your status (Msc., PhD student,…) on the front page! Also mention if the paper is eligible for the Burggraf award!
- Many of the papers submitted for publication in TRR have a young author as the first author (they in theory qualify for the Cunard award)
- Award subcommittee: Rob Bertini, Jiwon Kim, Ludovic Leclercq, Monica Menendez

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

- Although we nominated a paper this year, we didn't get the award.

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

- The paper nominated this year won the Fred Burggraf Award!

19-05932 - Influence of autonomous vehicles on car-following behavior of human drivers

by *Yalda Rahmati, Mohammadreza Khajeh Hosseini, Alireza Talebpour, Benjamin Swain, and Christopher Nelson*

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)

- The paper nominated this year won the Cunard Award!

19-01197: Estimating and comparing response times in traditional and connected environments

by *Anshuman Sharma, Zuduo Zheng, Jiwon Kim, Ashish Bhaskar and Mazharul Haque*

Greenshields Prize

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

No recommendation in 2019.

Best Paper on Traffic Flow Theory

- Recognizes theoretical papers with significant methodological contributions
- Award is given within the Traffic Flow Theory committee

19-05914: Analysis of a two-regime Stochastic Car-Following Model: for explaining capacity drop and oscillation instabilities
by *Tu Xu and Jorge Laval*

Best Reviewer Award

- 2020 Best Reviewer Award

Hwasoo Yeo, KAIST, Korea

Congratulations!!!

CUTC Award

- 2020 Cambridge Systematics New Faculty Award by The Council of University Transportation Centers (CUTC)
- The award is presented annually to a tenure-track faculty member in transportation education and recognizes outstanding teaching and research contributions to the transportation field.

Ilgin Guler, Penn State

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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
- 2021 ISTTT Beijing, China

Mid-Year Meetings

- Midyear meeting 2020
  - Amsterdam, The Netherlands
  - August 17-19, 2020
- Midyear meeting 2021
  - ISTTT 24, Beijing, China
  - July 24-26, 2021
- Midyear meeting 2022?
  - Should vote during the annual meeting in 2021
  - Please send me your ideas/proposals

AMSTERDAM INSTITUTE FOR ADVANCED METROPOLITAN SOLUTIONS

TU Delft

Traffic Flow Theory and The City

TFT midyear meeting 2020

Serge Hoogendoorn (chair), Winnie Daamen (co-chair)
Meng Wang (TU Delft), Hans van Lint (TU Delft),
Panchamy Krishnakumari (TU Delft), and Tom Kuipers (AMS)

Selection of topics…

- Active mode traffic operations
- Advancing the NFD
- Big urban traffic data and their opportunities
- Connected & automated vehicles in the city, including interactions with other modes
- Flow operations and management during events
- Traffic flow operations in and around multi-modal transfer hubs
- Traffic flow theory and AI

Submission

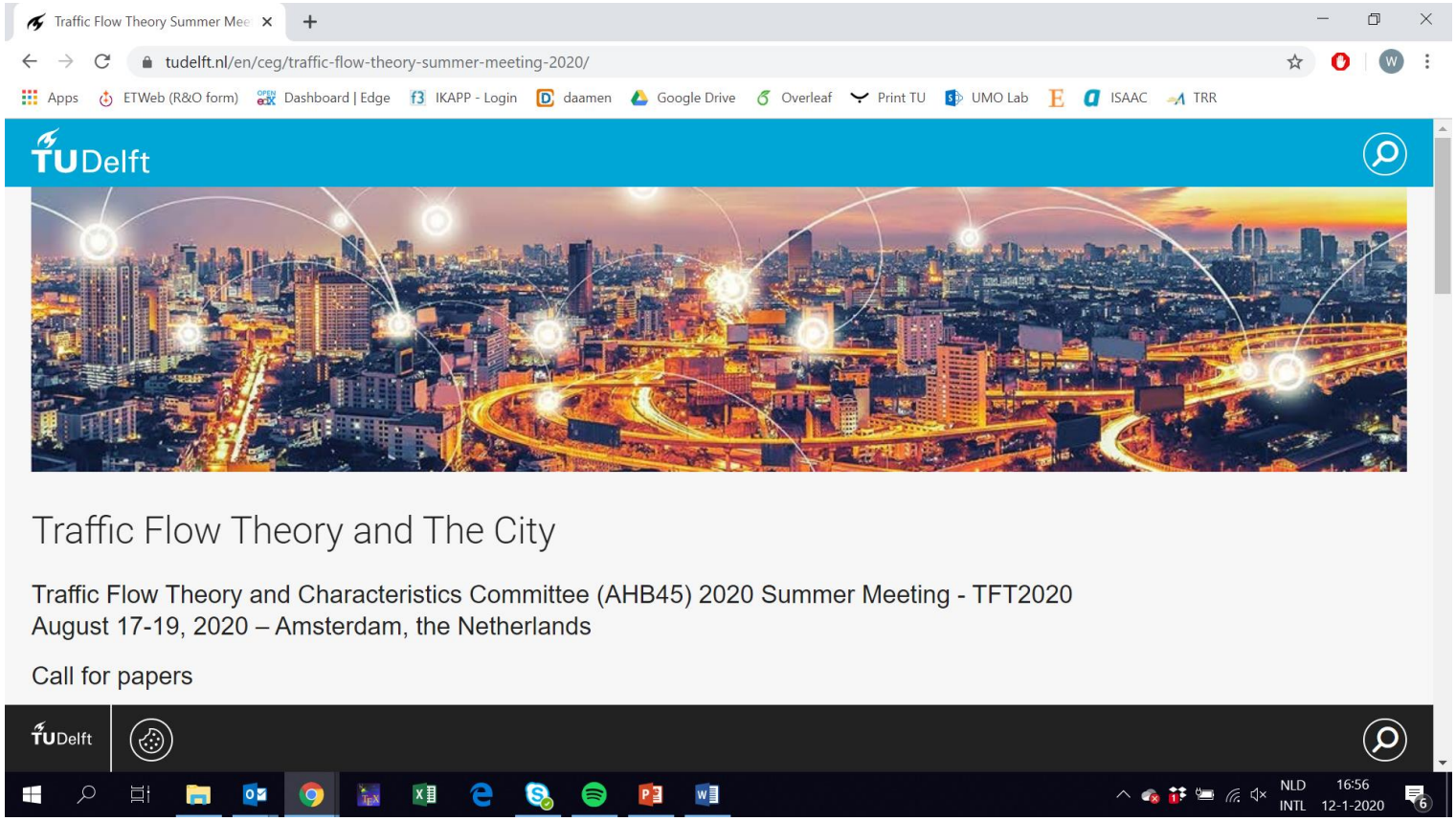
- Extended abstracts (5 pages)
- Deadline submission 1st of March 2020
- Through EasyChair (TFT2020)
- Acceptance notification 1st of May 2020
- Camera ready abstracts 15 June 2020

Meeting information

- Conference date August 17-19, 2020
- Selection of papers to be published in special issues
  - TR-C
  - Collective Dynamics
- Deadline special issues November 1, 2020

AMSTERDAM INSTITUTE FOR ADVANCED METROPOLITAN SOLUTIONS

www.tudelft.nl/TFT2020



TUDelft

TUDelft

A unique moment to visit Amsterdam...

SAIL 2020 – Tallship festival

August 12-16, Amsterdam

www.sail.nl

Venue and hotels

- Meeting held at new AMS location (https://www.ams-institute.org)
- Abundant accommodation available, e.g.:
  - Lloyd Hotel (https://www.lloyd.nl)
  - Volkshotel (https://www.volkshotel.nl)
  - The Student Hotel (https://www.thestudenthotel.com)
- And many others, something for everyone!

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Reports

Outreach and Diversity Subcommittee

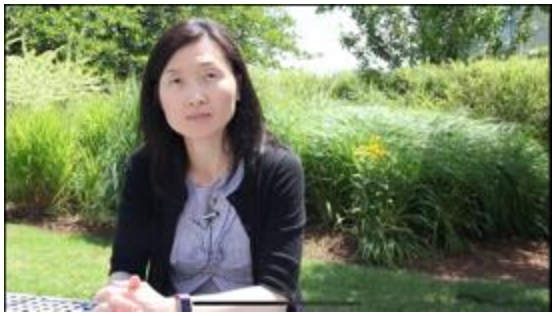
AHB45 Meeting

Washington DC, USA

January, 2020

Outreach and Diversity Subcommittee

- Continuation of Activities Through a Transition Period:
  - Newsletter (http://tftcnews.blogspot.com/)
  - YouTube Channel (https://www.youtube.com/user/AHB45/feed)



  - First journal club will be held on Feb 3, 2020 (first and third Mondays of the month afterwards).

Outreach and Diversity Subcommittee

- Special Thanks to:
  - Alireza Talebpour
  - Justin Schorr
  - Xiaopeng Li
  - Sue Ahn
  - Jorge Laval

  (All TFT website / newsletter contributors and readers)

Transportation Research Board

Traffic Flow Theory and Characteristics Committee—AHB 45

Newsletter

Volume 7, Issue 8-9-10
August, September, October 2019

EVENTS/ANNOUNCEMENTS

TRB 2020 AHB45 Workshop

The Traffic Flow Theory and Characteristics Committee (AHB45) is sponsoring a workshop titled: "The Advancement of Modelling Connected and Automated Vehicles: Past and Future". The workshop is organized by the AHB45 Subcommittee on Traffic Flow Modeling for Connected and Automated Vehicles (AHB45-3) and is part of the 2020 Transportation Research Board Annual Meeting (TRB 2020).

The workshop will take place on Sunday January the 12th, 2020, at the Walter E. Washington Convention Center, Washington, DC, USA. Featuring 8 speakers, your attendance and your active participation in the discussion will help shaping the future research on modeling connected and automated vehicles.

More Details

Newsletter Spotlight

AHB45 TRB 2020 Workshop

Faculty Positions at Purdue University and at the École Polytechnique Fédérale de Lausanne

McTrans Director Position—University of Florida

Traffic in the Media:
"A U.K. Company Is Building a Hub for Flying Taxis in Singapore"

Congratulations to Prof. Markos Markos Papageorgiou on his second ERC Grant: TrafficFluid

Website Update

- Regular updates including meeting announcements, minutes, and presentations
- Last year published papers in ISTTT and TRR will be updated next
- Do we want to list the name and affiliation of meeting attendees on our website?
- An Education page will be also added
- Any other suggestions?

Website Update (Education Page)

- Education Page content:
  - Books and key references
  - Topic-based educational videos
  - Videos of applied examples
  - Data sets for projects

Agenda

Welcome and Call to Order	S. Ahn
Introductions – Members & Friends	All Attendees
Review and Approval of Minutes	S. Ahn
Chair Report	S. Ahn
TRB Report	R. Cunard/R. Bertini
FHWA Programs & Activities	J. Sturrock/R. James
TFTC Subcommittee Reports	
International Liaison	**International members and attendees**
Trajectory Data Collection	**X. Li**
Traffic Monitoring with a Swarm of Drones	**N. Geroliminis**
Liaison with other Committees	All Attendees
Announcements and Future Meetings	All Attendees
New Business	All Attendees
Adjourn	All Attendees

High Resolution Data Trajectory Data Collection from Aerial Videos

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U.S. Department of Transportation
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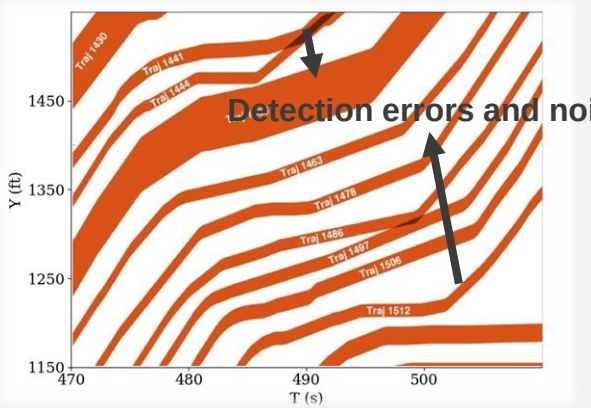
SAXTON LABORATORY

UNIVERSITY OF SOUTH FLORIDA

Existing Vehicle Trajectory Data

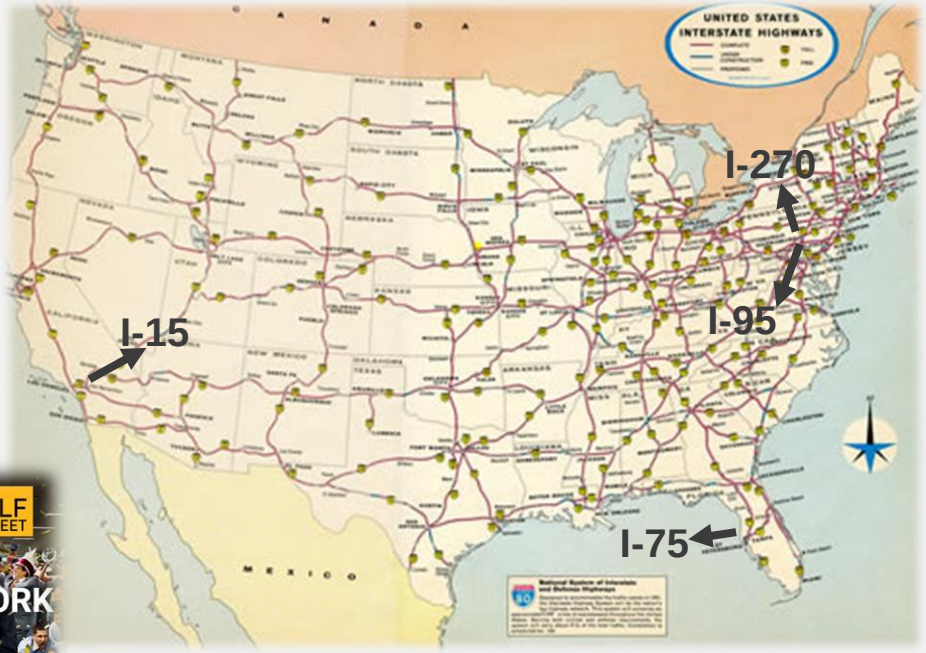
- Microscopic traffic flow studies
  - Car-following, lane-changing behavior
  - Traffic safety
  - Energy consumptions and emissions
- Available datasets
  - NGSIM data (2000 ft coverage for 45 mins)
  - HighD data (hundreds of feet coverage for < 20 mins)



Vehicle Trajectories in NGSIM Data
(Kovvali, Alexiadis et al. 2007)

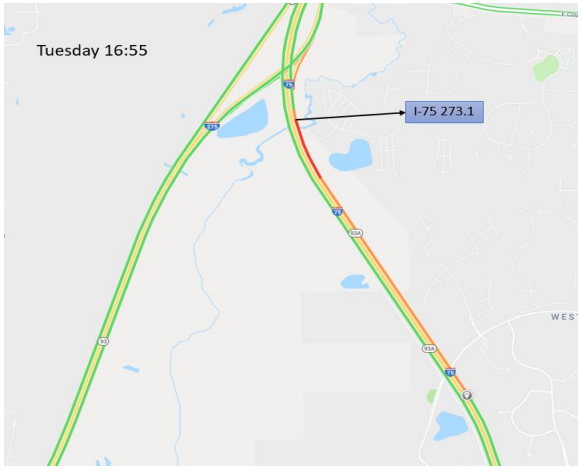
New Trajectory Data Collection Effort

- Sites
  - I-95
  - I-15
  - I-270
  - I75
- Drones and helicopters

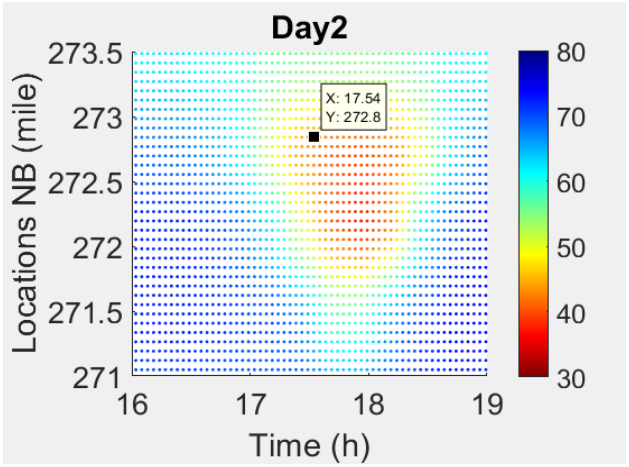


Site Selection

- Google Map
  - Record the bottleneck start time, end time, longest length time and the bottleneck location

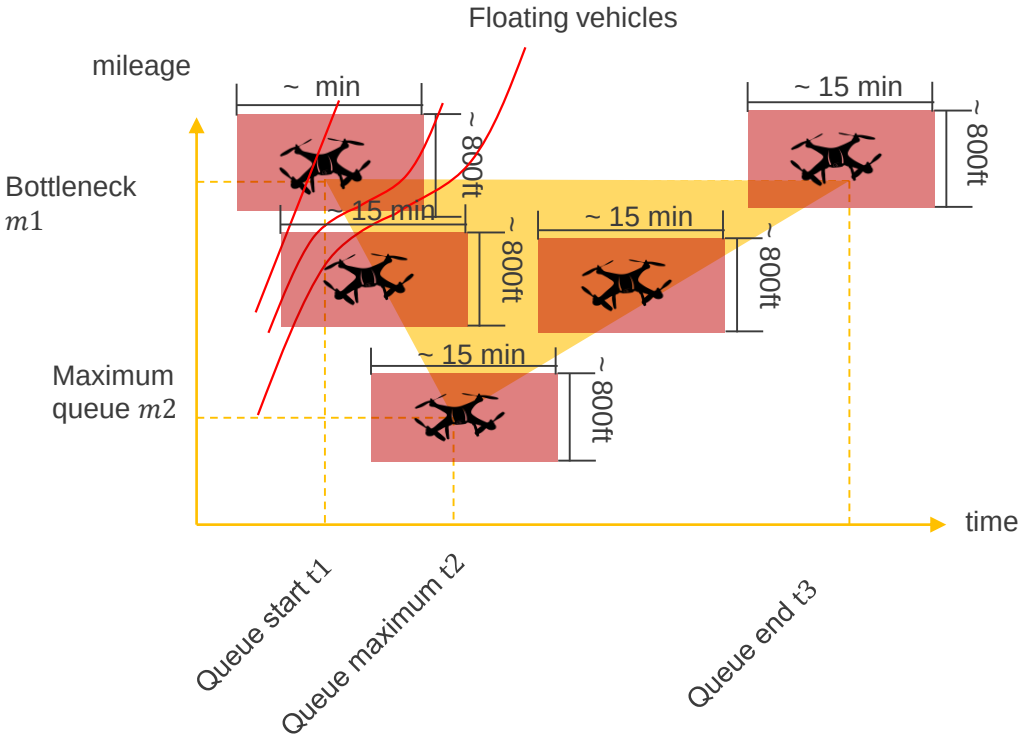


- Microwave Detection Systems in Tampa
- Plot the speed map to identify congestion area



Drone Deployment

- Congestion map
- Drone deployment
- Probe vehicle deployment



I-75 Site Images

- Three overlapping camera frames
- Over 1.2 mile coverage for 2 hrs, containing the life cycle of a bottleneck

A frame from the left camera

A frame from the middle camera

A frame from the right camera

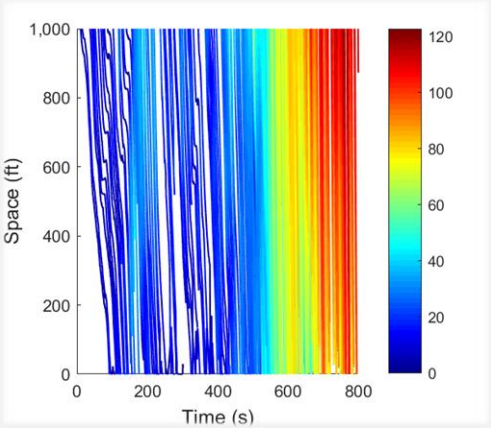
VIRTUAL Trajectory Data - Methods

- VIRTUAL
  - Video-based Intelligent Road Traffic Universal Analysis Tool (VIRTUAL)
  - Reliably, automatically and efficiently extract trajectories from videos taken above traffic.
- Main steps

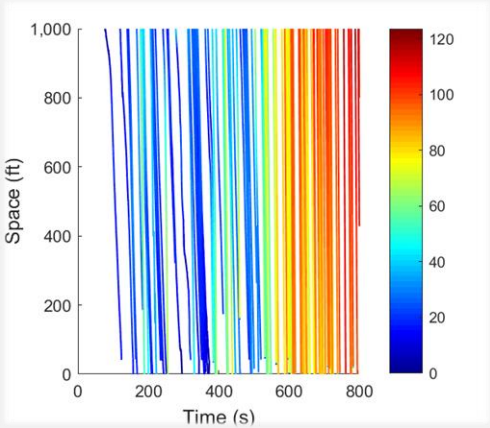
VIRTUAL Trajectory Data - Example

VIRTUAL Trajectory Data - Example

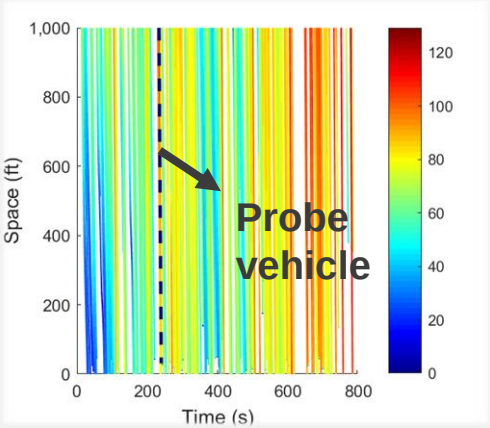
- Sampled Trajectories



Lane 1



Lane 2



Lane 3

Description of the VIRTUAL Trajectory Data

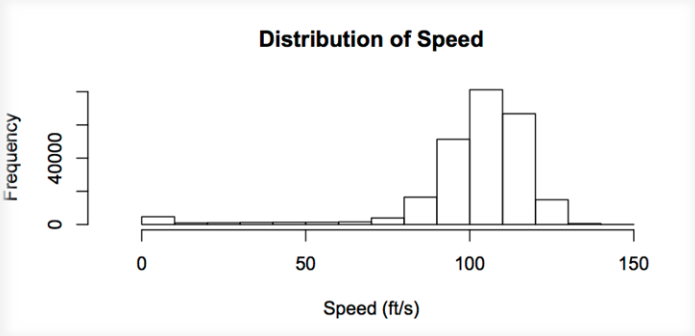
- Extracted raw trajectory data: 47 files (3.67 gigabytes), including:

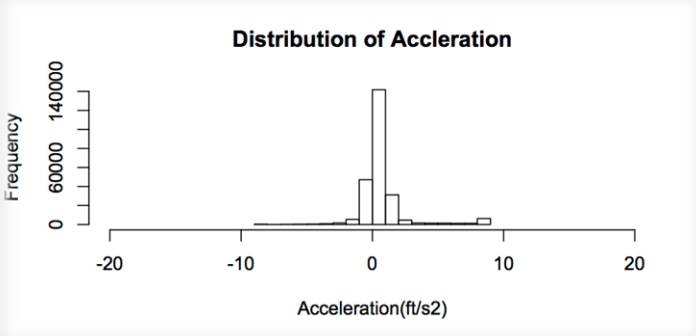
- Vehicle ID: ID number for each vehicle
- Global Time: Time in seconds, where 00:00:00 is 0
- Global X (Longitude): Vehicle's GPS longitude location
- Global Y (Latitude): Vehicle's GPS latitude location
- Length (ft): Vehicle length
- Width (ft): Vehicle width
- Class: Vehicle class (1 motorcycle; 2 auto; 3 truck)
- Lane Num: Lane number
- Location (ft): First vehicle starts at location 0
- Speed (ft/s): Vehicle speed
- Acceleration (ft/s2): Vehicle acceleration
- Headway (ft): Vehicle headway

VIRTUAL Trajectory Data Quality

- Comparison with NGSIM datasets

Dataset	Missed Vehicles	Acceleration	
	Percentage	Range (ft/s2)	Unreasonable Data (abs(acc) > 10ft/s2)
NGSIM	11%	up to 2000	~10%
New Data	<5% for most drone data	up to 20	~0%





Source: FHWA

Improvements

- Address video vibration issues with feature matching
- Merge overlapping video frames with feature matching
- Improve vehicle identification rates in bad conditions

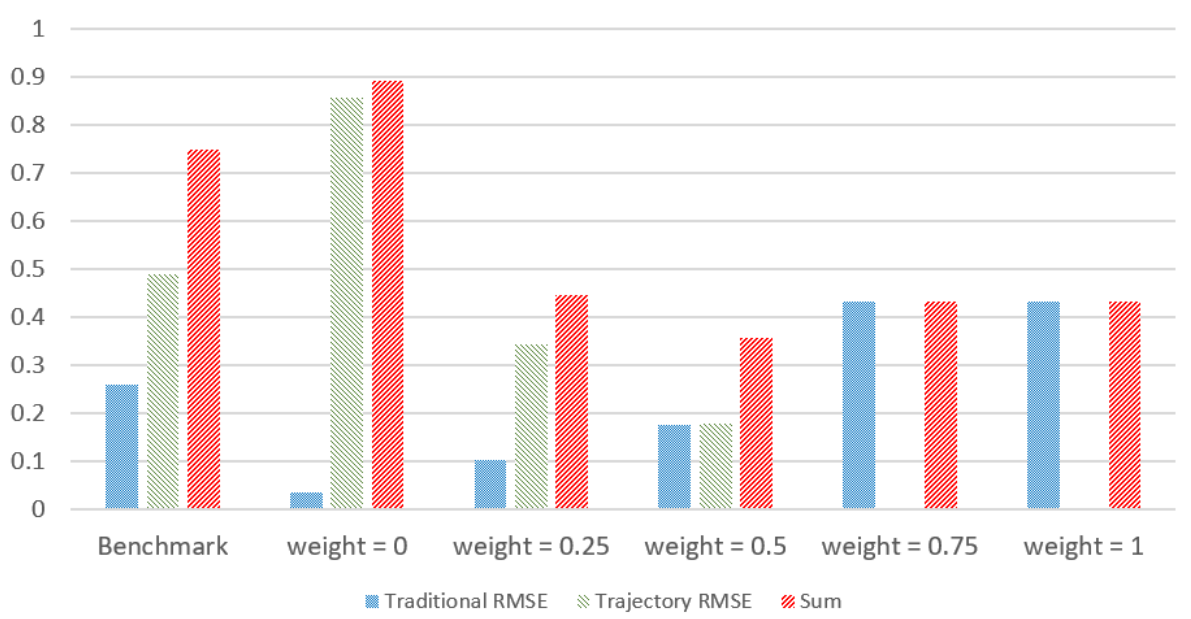
Source: FHWA

(Calibration Experiments) Update

- Obtained initial results for I–95 VA.
  - Five car-following and lane changing model parameters.
  - Explicit enumeration (162 combinations of values).
  - Computed root mean square errors (RMSEs) for:
    - Trajectories (headways, lane numbers).
    - Traditional outputs (segment speeds, lane-specific throughputs).

Comparison of Weighted Results

- Trajectories become much less realistic after purely traditional calibration.
- Only medium weights improve both trajectories AND traditional measures.



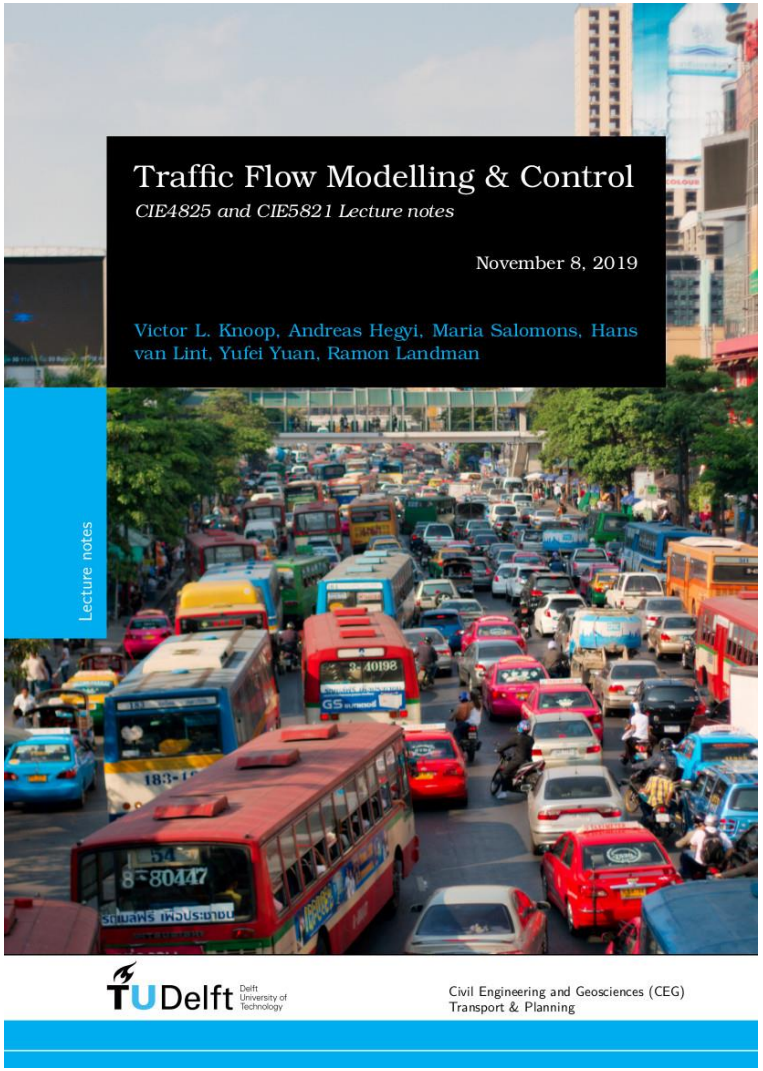
Source: FHWA

VIRTUAL Trajectory Data Access

- VIRTUAL trajectory data shared link:
  - [To be update]
- Contact information:
  - xiaopengli@usf.edu

Source: FHWA

International Liaison



TRB Report

- Robert Bertini
- Rich Cunard

- TRB restructuring
  - Merging with Safety section
  - AHB45 → ACP50

Liaison with Other Committees

- Highway Capacity Quality of Service Committee (AHB40)
  J. Sturrock/Others?

- Task Force on Transportation System Simulations
  R. Bertini

- Young Members Council
  E. Gonzales

Announcements and Future Meetings

- Management of Future Motorway and Urban Traffic Systems (MFTS) Symposium, July 6-8, 2020, Luxembourg
- Automated Vehicles Symposium, July 27-30, 2020, San Diego, CA
- TFTC Midyear Meeting, August 12-16, 2020, Amsterdam, the Netherlands
- ISTTT24, July 24-26, 2021, Beijing, China

New Business

- 2020 Annual Meeting Call for Papers (Due in May)
- 2020 Workshop Proposals (Due in June)
- Special Session for TRB Centennial?
  - Inform TRB now
  - Draft plan to TRB by June
  - Final plan to TRB by October

Adjourn

Please don’t forget to sign in!