

**isttt**  
international  
symposium  
transportation  
& traffic theory

**ISTTT23**  
60th ANNIVERSARY  
The 23rd International Symposium on Transportation and Traffic Theory



**Co-chairs**

**Nikolas Geroliminis**  
(EPFL, Switzerland)

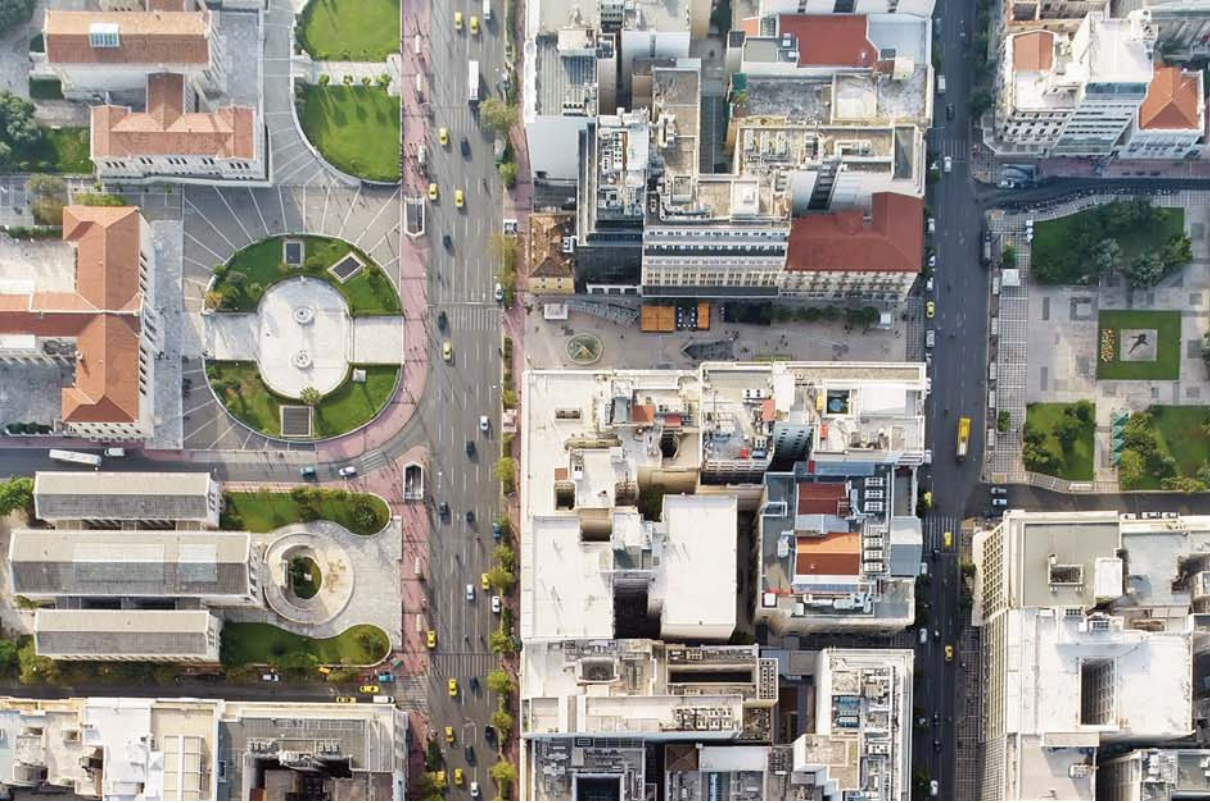
**Ludovic Leclercq**  
(Univ. Lyon - IFSTAR, France)

**JULY 23 - 26, 2019**

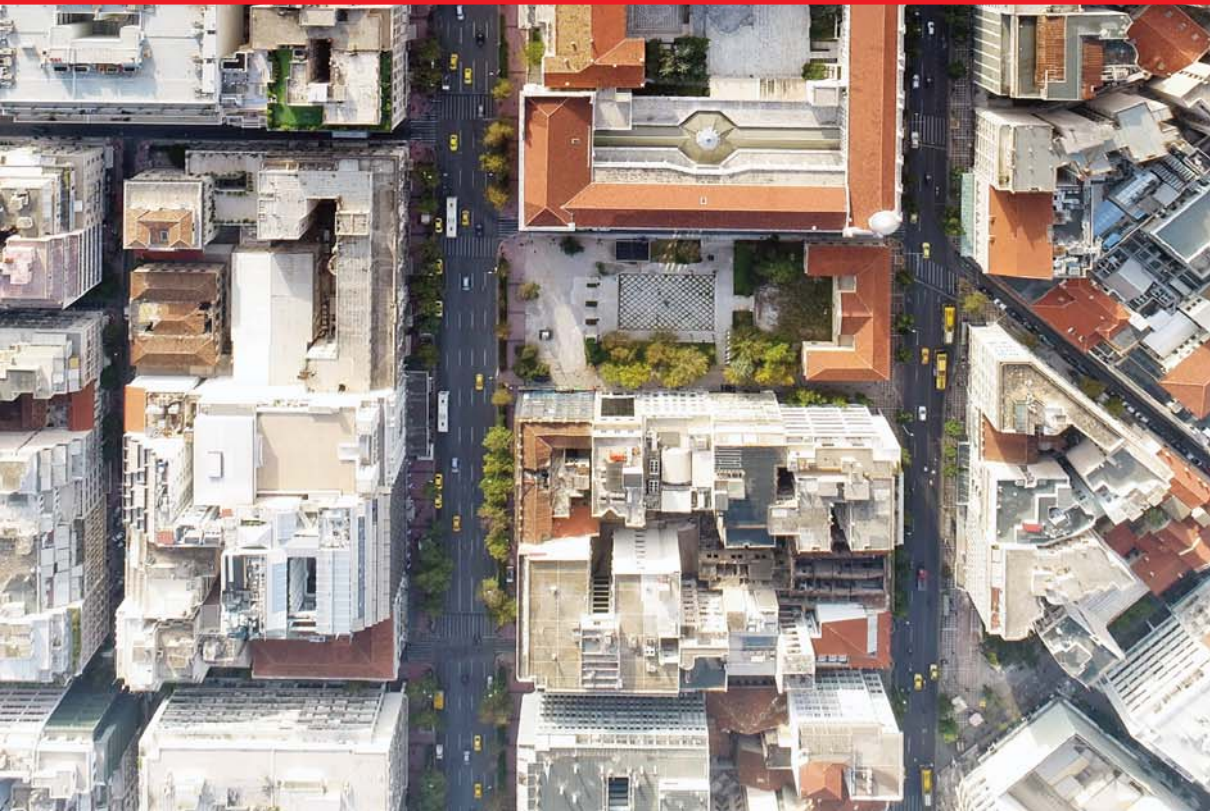
**SYMPOSIUM PROGRAM**

**EPFL CAMPUS LAUSANNE, SWITZERLAND**





WELCOME to ISTTT23





# WELCOME



JULY 2019

Welcome to the 23rd International Symposium on Transportation and Traffic Theory (ISTTT23), and a big welcome to Lausanne. This event is jointly organized by EPFL and IFSTTAR. We are delighted to celebrate the 60th anniversary of ISTTT Series.

Since its launch in 1959, the ISTTT series has remained the primary venue for discussing advances in the theoretical and methodological aspects of the interdisciplinary field of transportation and traffic systems science. The Symposium covers all scientific, fundamental and methodological aspects of transportation systems spanning all modes of transport, while topics related to logistics, optimization, networks and new technologies are also welcome. Like its predecessors, ISTTT23 keeps an open mind about the scope of the conference and what constitutes transportation and traffic theory. Its ambition is to reflect the best work underway anywhere in the world on the science of traffic and transportation.

While transportation research is a growing field in terms of integrated multidisciplinary methodologies, emerging technologies and new shared services, the physics of the phenomena are inspired by many fundamental principles developed over ISTTT Series. New challenges related to large-scale networks modeling and control and the need for real-time decisions under fast-evolving dynamics of systems and travelers advance the field in new directions of research. The ISTTT series reflects some of the highest quality essential work taking place in the world's leading institutes on the science of traffic and transportation and presents a view of the rich influences in the field.

33 papers have been selected for lectern presentation and 15 for poster presentation following a rigorous multi-stage refereeing process. In the first stage, 250 extended abstracts were reviewed by up to members of the international advisory and local organizing committees, resulting in 110 invitations to submit full papers. The second stage entailed the review of the submitted full papers by at least three internationally recognized scholars. Based on that process, 58 papers were retained for revision and submitted directly at Transportation Research part B and part C with additional rounds of full-paper refereeing. All lectern papers have been accepted for publication and appear online before the conference in two special issues in the aforementioned journals. At the same time, earlier versions of these papers have been included in *Procedia* and in the traditional *Book Proceedings*.

We wish you a joyful experience and a pleasant stay in Lausanne. We hope that you enjoy many scientific and networking opportunities and you develop new ideas for research and collaborations.

# IAC & ISTTT

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# ISTTT23

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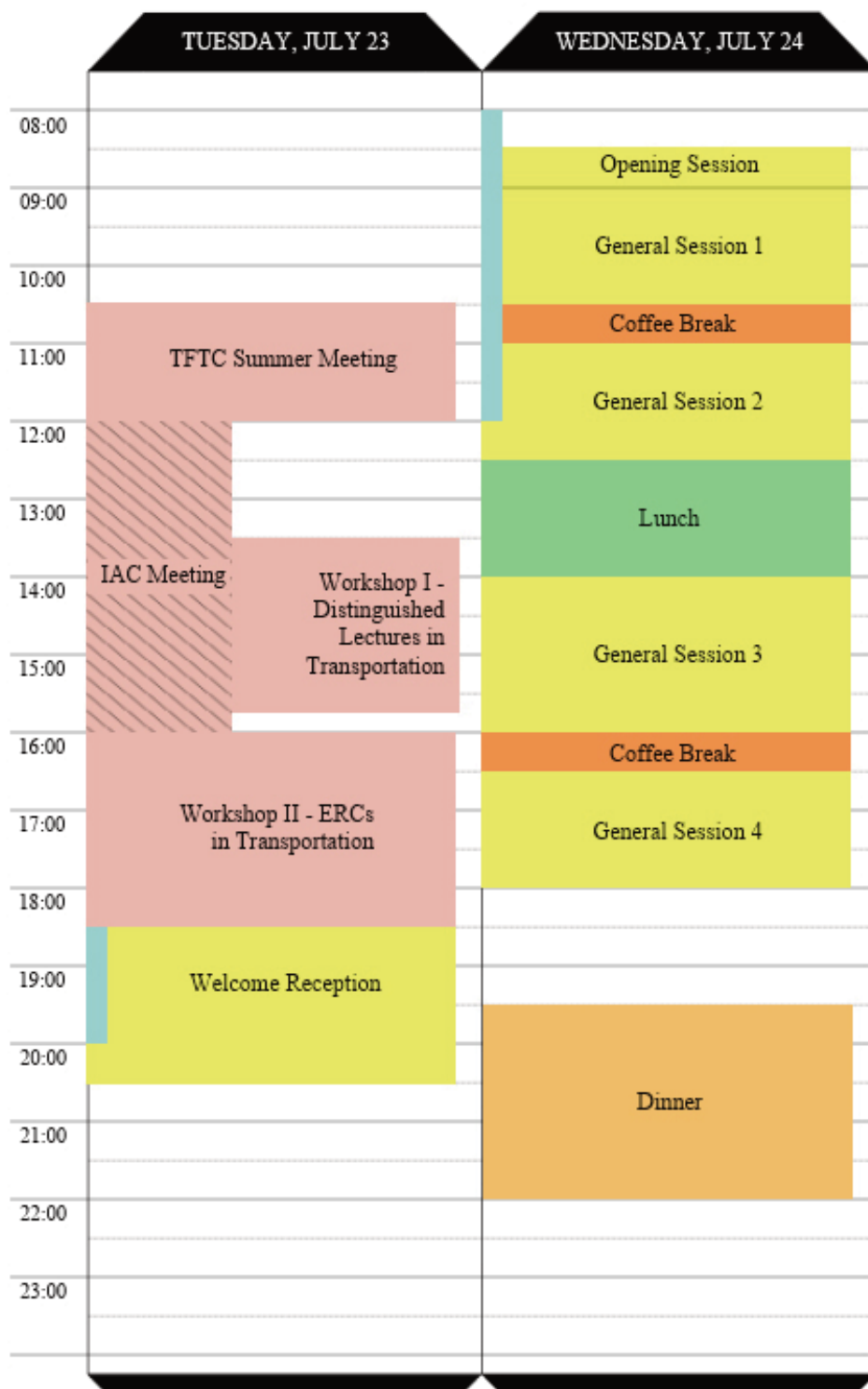
# SCHEDULE & LOCATION



# EPFL CAMPUS MAP



	To	From	Distance (m)
●●●●●	Starling Hotel	STCC	750
●●●●●	Starling Hotel	SV	600
●●●●●	STCC	L'Epicure Restaurant	600
●●●●●	STCC	SV	400
●●●●●	 EPFL Metro Station	Starling Hotel	700



SwissTech Convention Center (STCC)

School of Life Sciences (SV)

L'Epicure Restaurant

SPECIAL EVENT (Offcampus)



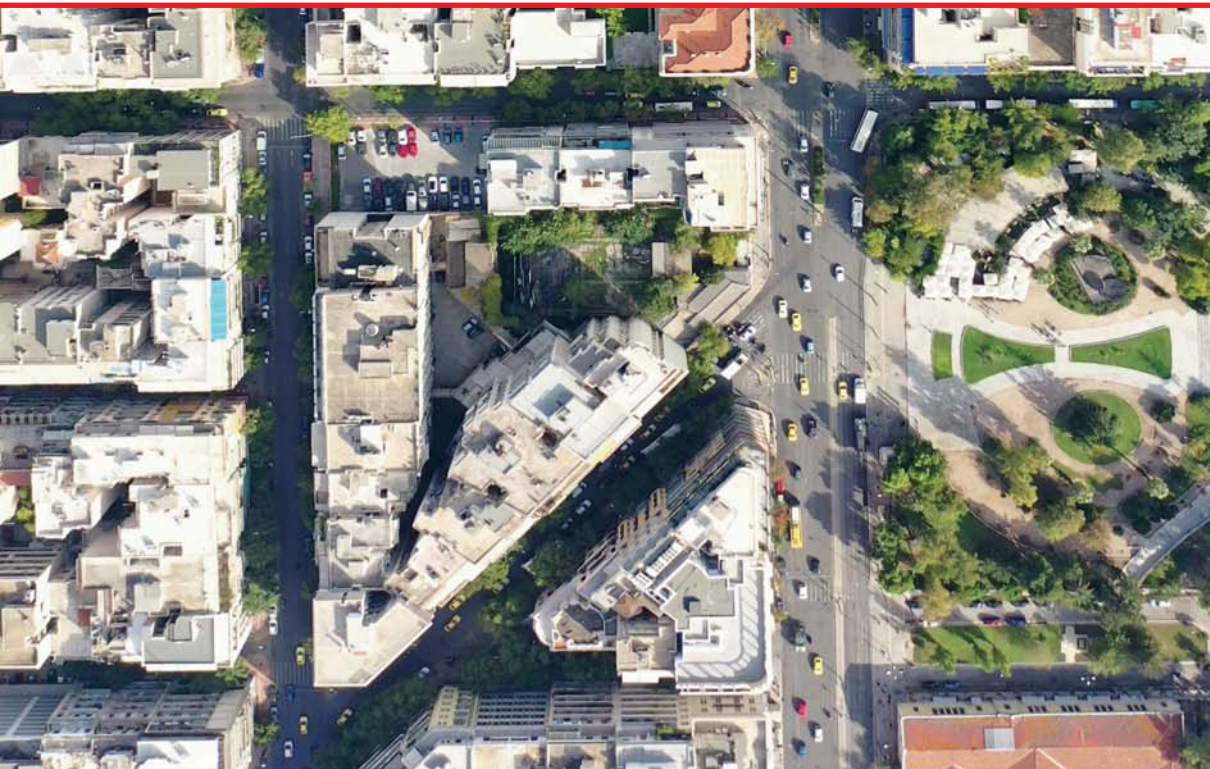


■ SwissTech Convention Center (STCC) - Main Court

■ Registration



TUESDAY  
July 23<sup>rd</sup>, 2019



JULY 23, 2019  
**TUESDAY**  
PRE- CONFERENCE

**11:00 – 12:30** TRB-TFTC Summer Meeting

**13:00 – 17:00** IAC Meeting

**13:30 – 15:45** PRE-CONFERENCE WORKSHOP – PART I  
**Distinguished lectures in Transportation**  
Session Chair: Jack Haddad

***Hedging against Uncertainty in Transportation***

– Elise Miller-Hooks, George Mason University

***Pedestrian Traffic Flow: From Data to Behavioral Insights***

– Winnie Daamen, TU Delft

***AI for Transportation: Trends and Challenges***

– Alexandre Alahi, EPFL

**16:00 – 18:15** PRE-CONFERENCE WORKSHOP – PART II  
**The Future of Mobility. Some breakthroughs from ERC projects in Transportation**  
Session Chairs: Ludovic Leclercq & Nikolas Geroliminis

**Prof. Jean-Pierre Bourguignon**

– President of the European Research Council (ERC)

**Prof. Markos Papageorgiou, TUC, Greece, ERC advanced**

– TRAMAN21: Traffic Management for the 21st Century

– TrafficFluid: Lane-free Artificial-Fluid Environment for Vehicular Traffic

**Prof. Serge Hoogendoorn, TU Delft, The Netherlands, ERC advanced**

– Allegro: Unravelling slow mode traveling and traffic: with innovative data to a new transportation and traffic theory for pedestrians and bicycles

**Prof. Ludovic Leclercq, IFSTTAR, France, ERC consolidator**

– MAGnUM: Multiscale and Multimodal Traffic Modelling Approach for Sustainable Management of Urban Mobility

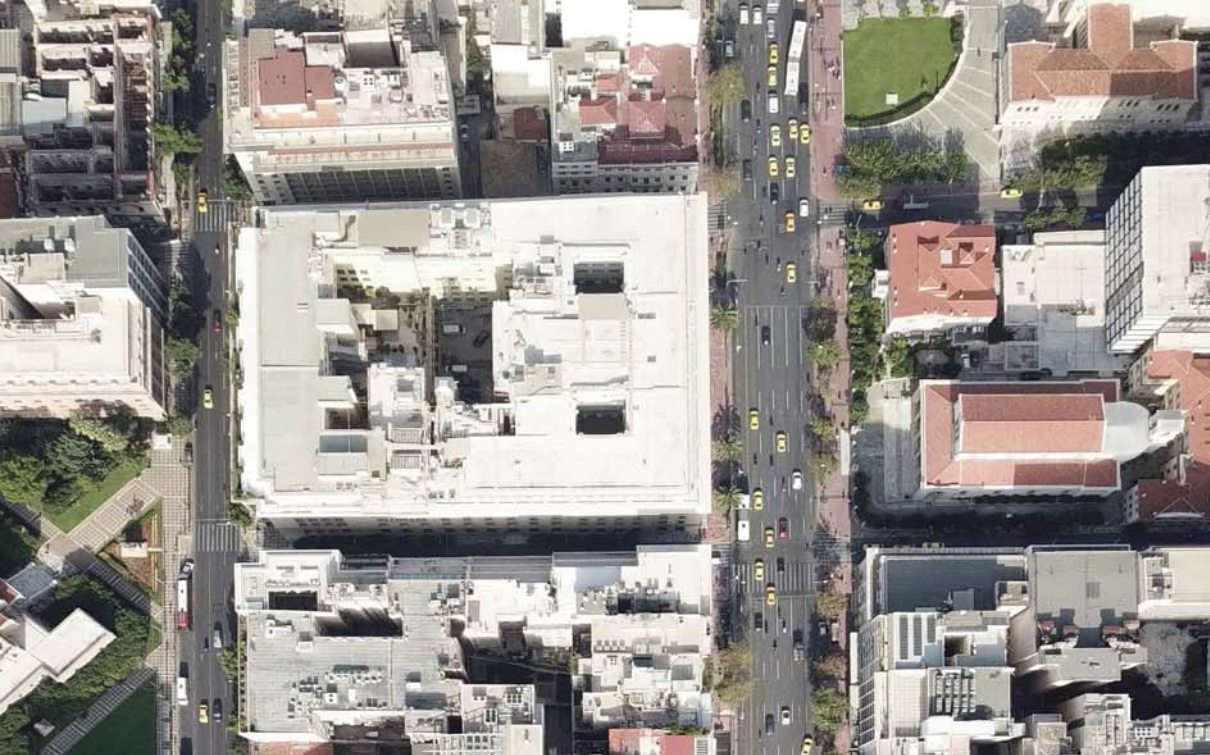
**Prof. Nikolas Geroliminis, EPFL, Switzerland, ERC Starting**

– METAFERW: Modeling and controlling traffic congestion and propagation in large-scale urban multimodal networks

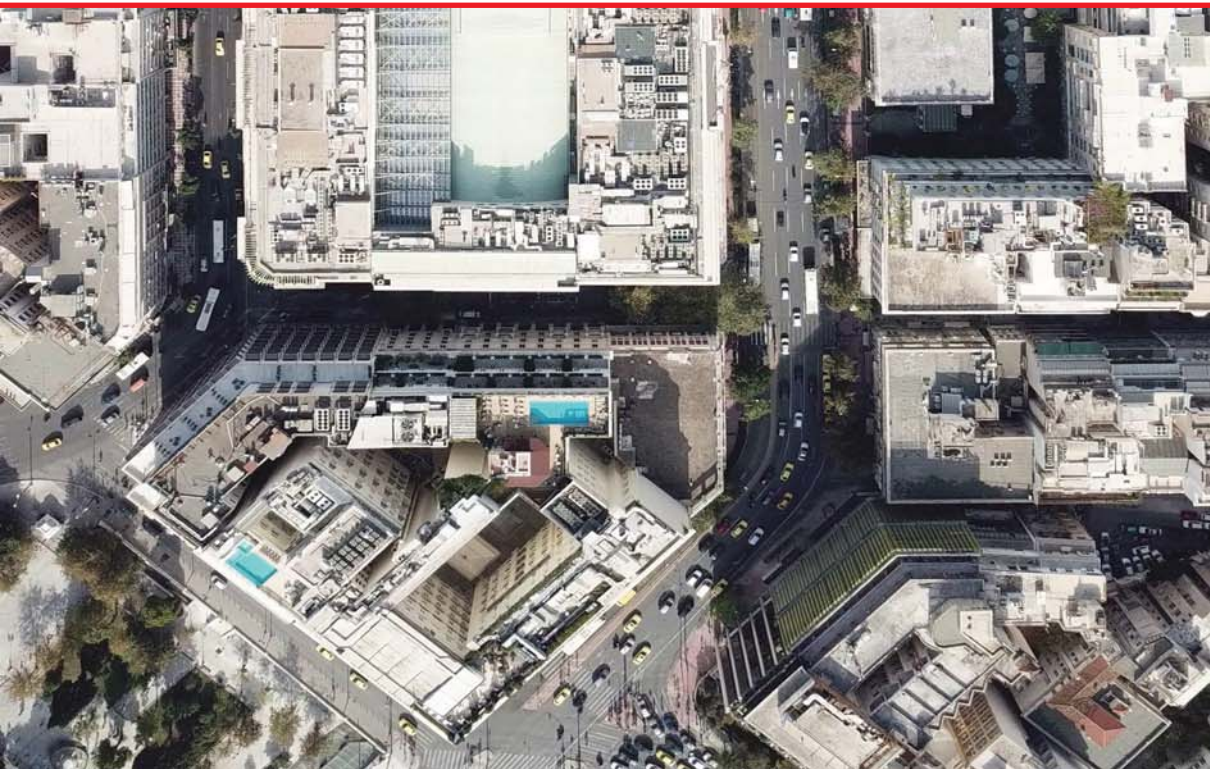
**18:30 – 20:00** ISTTT23 Registration Open

**19:00 – 20:30** Welcome Reception





WEDNESDAY  
July 24<sup>th</sup>, 2019



JULY 24, 2019  
**WEDNESDAY**  
MORNING

**08:00 – 12:00** ISTTT23 Registration Open

**08:30 – 09:00** Opening Remarks

**09:00 – 10:30** **SESSION 1: Shared Mobility Operations**  
Session Chair: Prof. Elise Miller

***Joint Design of Multimodal Transit Networks and Shared Autonomous Mobility Fleets***

– H. Pinto, M. Hyland, H. Mahmassani, I. Verbas

***Path-based Dynamic Pricing for Vehicle Allocation in Ridesharing Systems with Fully Compliant Drivers***

– C. Lei, Z. Jiang, Y. Ouyang

***On the supply curve of ride-hailing systems***

– Z. Xu, Y. Yin, J. Ye

**10:30 – 11:00** Coffee Break

**11:00 – 12:30** **SESSION 2: Macroscopic Flow Models**  
Session Chair: Prof. Serge Hoogendoorn

***Static traffic assignment with residual queues and spillback***

– M. Bliemer, M. Raadsen

***Traffic State Estimation on a Two-Dimensional Network by a State-Space Model***

– Y. Kawasaki, Y. Hara, M. Kuwahara

***Stochastic stability of dynamic user equilibrium in unidirectional networks: Weakly acyclic game approach***

– K. Satsukawa, K. Wada, T. Iryo

**12:30 – 14:00** Lunch

JULY 24, 2019  
**WEDNESDAY**  
AFTERNOON

**14:00 – 16:00** **SESSION 3: Dynamic Network Models**  
Session Chair: Prof. S.C. Wong

*Dynamic Trucking Equilibrium through a Freight Exchange*  
– J. Miller, Y. Nie

*A Continuum Model for Cities Based on the Macroscopic Fundamental Diagram: A Semi-Lagrangian Solution Method*  
– R. Aghamohammadi, J. Laval

*Stabilization strategy for unstable transport systems under general evolutionary dynamics*  
– T. Iryo, M. Smith, D. Watling

*Route choice, travel time variability, and rational inattention*  
– G. Jiang, M. Fosgerau, H. Lo

**16:00 – 16:30** **Coffee Break**

**16:30 – 18:00** **SESSION 4: Travel Demand and Activity Models**  
Session Chair: Prof. Kay Axhausen

*A data driven method for OD matrix estimation*  
– P. Krishnakumari, H. van Lint, T. Djukic, O. Cats

*Incorporating Trip Chaining within Online Demand Estimation*  
– G. Cantelmo, M. Qurashi, A. Prakash, C. Antoniou, F. Viti

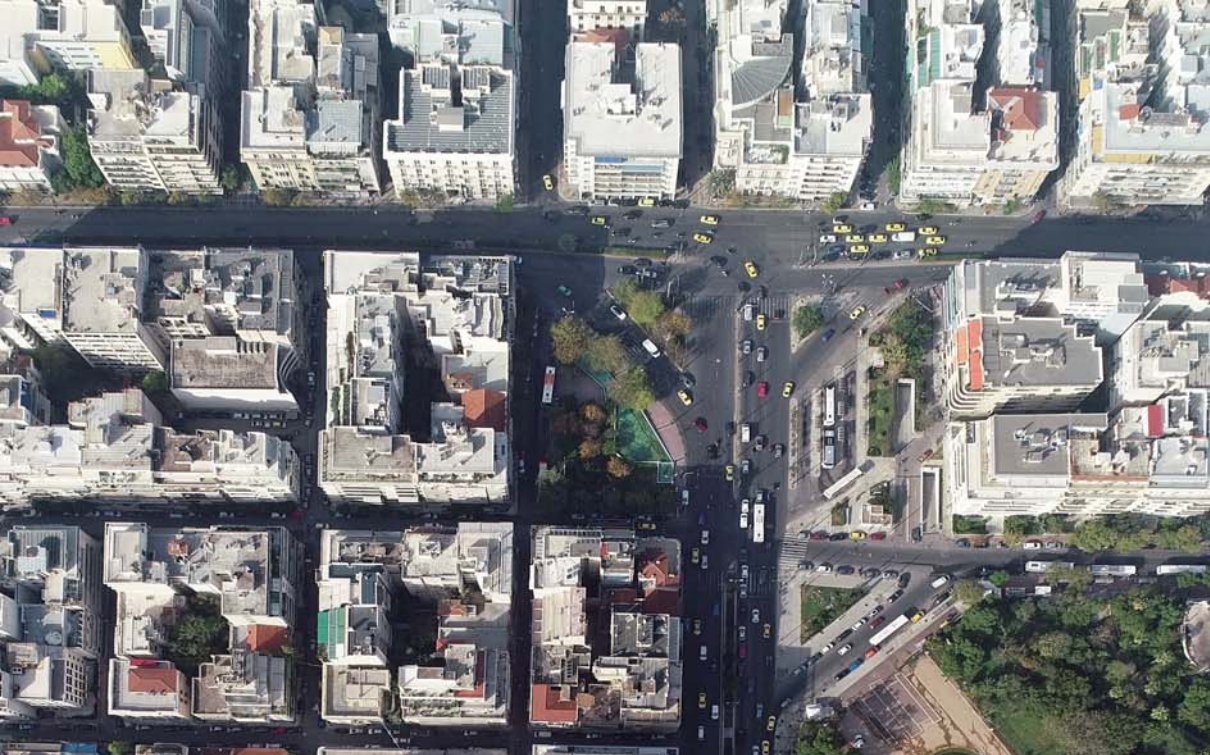
*Day-to-Day Needs-based Activity-Travel Dynamics and Equilibria in Multi-State Supernetworks*  
– P. Liu, F. Liao, Q. Tian, H.J. Huang, H. Timmermans

**19:30 – 22:00** **Conference Dinner**

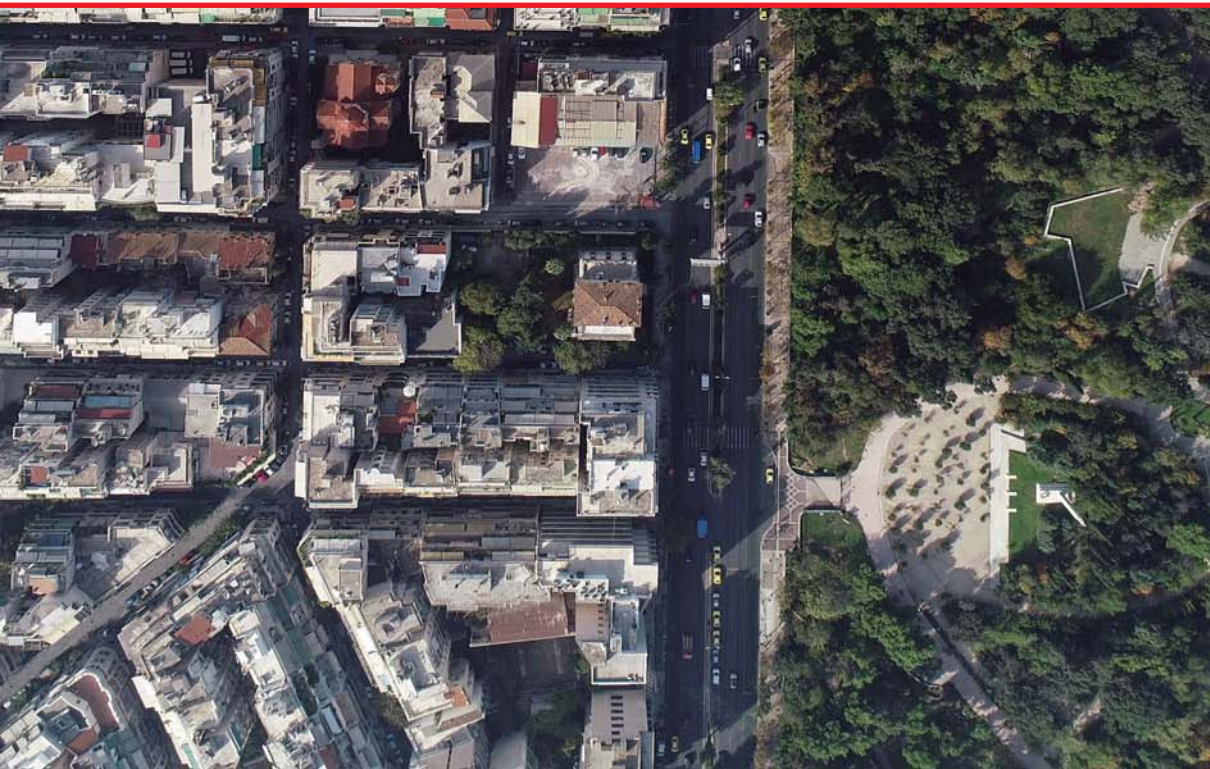








THURSDAY  
July 25<sup>th</sup>, 2019



JULY 25, 2019  
**THURSDAY**  
MORNING

**08:00 – 12:00** ISTTT23 Registration Open

**08:00 – 10:00** **SESSION 5: Transit Planning and Operations**  
Session Chair: Prof. Jean-Patrick Lebacque

*Effect of Transit Signal Priority on Bus Service Reliability*  
– P. Anderson, C. Daganzo

*The danger zone of express services: when increasing frequencies can deteriorate the level of service*  
– H. Larrain, J.C. Muñoz

*Modeling and managing congested transit service with heterogeneous users under monopoly*  
– J. Zhang, H. Yang, R. Lindsey, X. Li

*Operational design for shuttle systems with modular vehicles under oversaturated traffic: Continuous modeling method*  
– Z. Chen, X. (Shaw) Li, X. Zhou

**10:00 – 10:30** Coffee Break

**10:30 – 12:30** **SESSION 6: Network Macroscopic Fundamental Diagram Models and Control**  
Session Chair: Prof. Hani Mahmassani

*Resilient Perimeter Control of Macroscopic Fundamental Diagram Networks under Cyberattacks*  
– J. Haddad, B. Mirkin

*City-wide traffic control: modeling impacts of cordon queues*  
– W. Ni, M. Cassidy

*Demand management with limited cooperation among travelers: A doubly dynamic approach*  
– M. Yildirimoglu, M. Ramezani

*On the modeling of passenger mobility for stochastic bi-modal urban corridors*  
– I. Dakic, L. Ambühl, O. Schümperlin, M. Menendez

**12:30 – 14:00** Lunch



JULY 25, 2019  
**THURSDAY**  
AFTERNOON

**14:00 – 15:30** POSTER SESSION – **SwissTech Convention Center (STCC), Main Court**  
Session Chair: Prof. Monica Menendez

***Continuum car-following model of capacity drop at sag and tunnel bottlenecks***

– K. Wada, I. Martinez, W-L. Jin

***A stochastic model for bus injection in a public transport service***

**D. Morales, J.C. Muñoz, P. Gazmuri**

– *Traffic dynamics under speed disturbance in mixed traffic with automated and non-automated vehicles*

– D. Chen, A. Srivastava, S. Ahn, T. Li

***Personalized Control for Promoting Sustainable Travel Behaviors***

– X. Zhu, F. Wang, C. Chen, D. D. Reed

***Modeling Urban Taxi Services with E-Hailings: A Queuing Network Approach***

– W. Zhang, H. Honnappa, S. V. Ukkusuri

***Reservoir-based surrogate modeling of dynamic user equilibrium***

– Q. Gie, D. Fukuda, K. Han, W. Song

***Optimal privacy control for transport network data sharing***

– B. Y. He, J. Chow

***Paired-line hybrid transit design considering spatial heterogeneity***

– S. Luo, Y. Nie

***Ride-Sourcing Modeling and Pricing in Non-Equilibrium Two-Sided Markets***

– M. Nourinejad, M. Ramezani

***Customer behavioural modelling of order cancellation in coupled ride-sourcing and taxi markets***

– X. Wang, W. Liu, H. Yang, D. Wang, J. Ye

***Self-Adaptive Online Trajectory Sampling (SAOTS) Using Spectral Domain Properties***

– C. Siddique, J. Ban

***Same-Day Delivery with Crowdshipping and Store Fulfillment in Daily operations***

– M. Ni, Q. He, X. Liu, A. Hampapur

***A general formulation for multi-modal dynamic traffic assignment considering multi-class vehicles, public transit and parking***

– X. Pi, W. Ma, Z. Qian

***Personalized public transport mobility service: A journey ranking approach for route guidance***

– A. Ceder, Y. Jiang

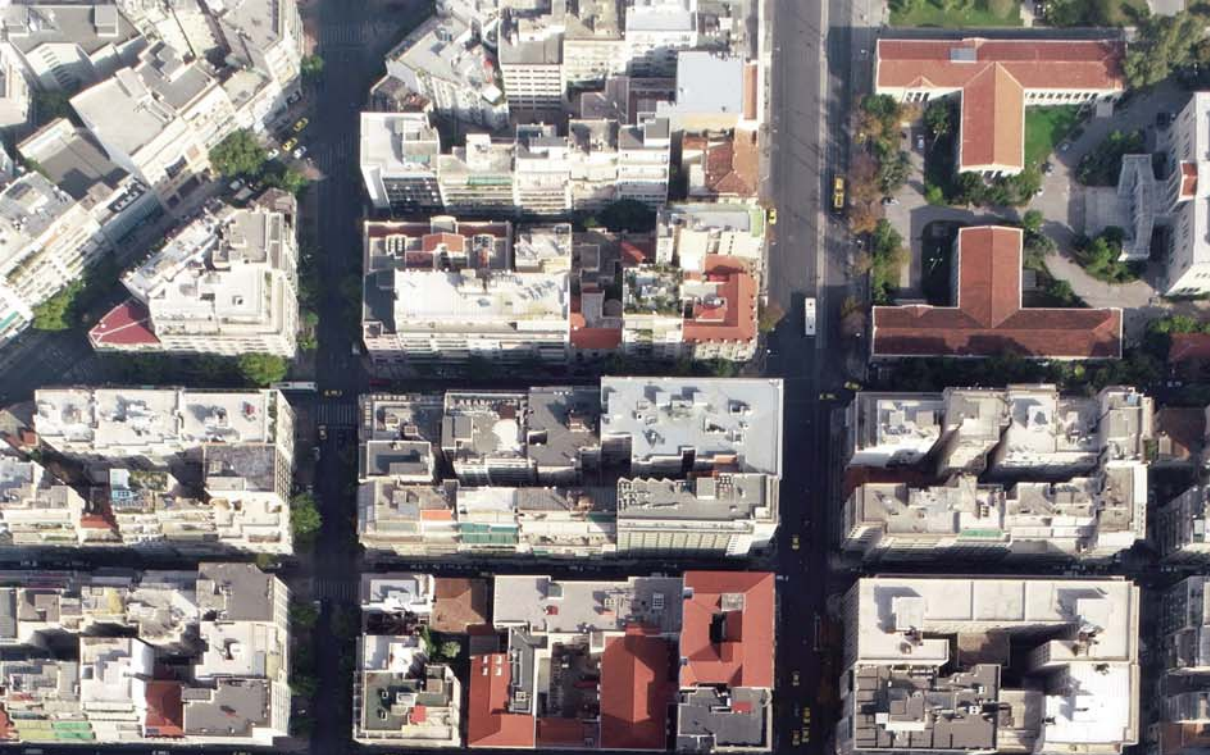
***A Continuous Model for Coordinated Pricing of Mixed Access Modes to Transit***

– N. Fournier, E. Christofa, E. Gonzales

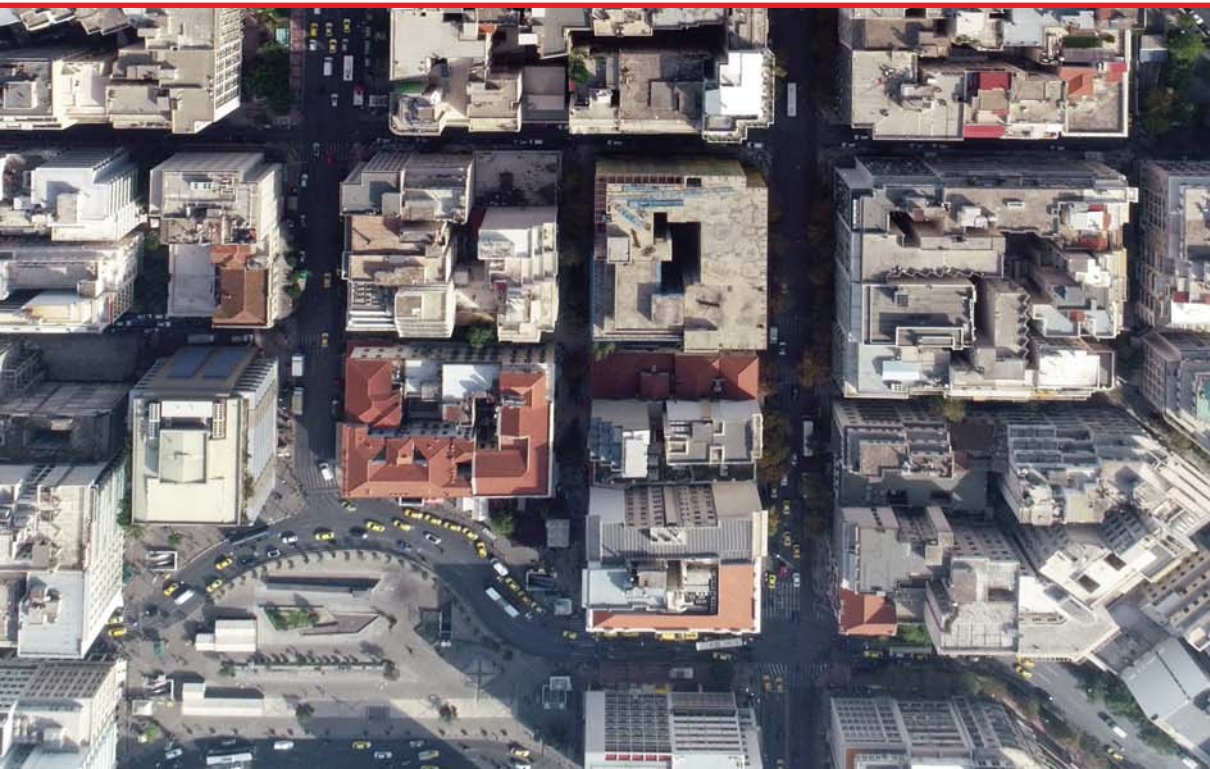
**16:00 – 23:50** **Conference Excursion and Gala Dinner**







FRIDAY  
July 26<sup>th</sup>, 2019





JULY 26, 2019  
**FRIDAY**  
MORNING

**08:00 – 12:00** ISTTT23 Registration Open

**08:30 – 10:30** SESSION 7: Network Design and Control  
Session Chair: Prof. Soyoung Ahn

*An entropy maximizing approach to the ferry network design problem*

– M. Bell, J.J. Pan, C. Teye, K.F. Cheung, S. Perera

*Adaptive Railway Traffic Control using Approximate Dynamic Programming*

– T. Ghasempour, B. Heydecker

*Centralised and decentralised signal timing optimisation approaches for network traffic control*

– A. H.F. Chow, R. Sha, S. Li

*An Integrated and Personalized Traveler Information and Incentive Scheme for Energy Efficient Mobility Systems*

– C. Xiong, M. Shahabi, J. Zhao, Y. Yin, X. Zhou, L. Zhang

**10:30 – 11:00** Coffee Break

**11:00 – 12:30** SESSION 8: Connected and Autonomous Vehicles  
Session Chair: Prof. Francesco Viti

*Cooperative Adaptive Cruise Control for Connected Autonomous Vehicles by Factoring Communication-Related Constraints*

– C. Wang, S. Gong, A. Zhou, T. Li, S. Peeta

*Stabilizing Mixed Vehicular Platoons with Connected Automated Vehicles: An H-infinity Approach*

– Y. Zhou, S. Ahn, M. Wang, S. Hoogendoorn

*A Hierarchical Approach For Splitting Truck Platoons Near Network Discontinuities*

– A. Duret, M. Wang, A. Ladino

**12:30 – 14:00** Lunch

JULY 26, 2019  
**FRIDAY**  
AFTERNOON

**14:00 – 15:30** **SESSION 9: Multimodal Network Management**  
Session Chair: Prof. Michiel Bliemer

*Modeling double time-scale travel time processes with application to assessing the resilience of transportation systems*

– R. Zhong, X. Xie, J. Luo, T. Pan, W. Lam, A. Sumalee

*A Pareto-improving and revenue-neutral scheme to manage mass transit congestion with heterogeneous commuters*

– Y. Tang, H. Yang, B. Wang, J. Huang, Y. Bai

*Responsive bus dispatching strategy in a multi-modal and multi-directional transportation system: a doubly dynamical approach*

– F. Zhang, W. Liu

**15:30 – 16:00** **Coffee Break**

**16:00 – 17:00** **SESSION 10: Vehicular Traffic Flow**  
Session Chair: Prof. Yafeng Yin

*On the value of relative flow data*

– P. van Erp, V. Knoop, S. Hoogendoorn

*A Behavioral Microeconomic Foundation for Car-following Models*

– S. Hamdar, V. Dixit, A. Talebpour, M. Treiber

**17:00 – 17:45** **CLOSING SESSION**  
Session Chair: Prof. William Lam







**EPFL**

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**IFSTAR**