THNS2025: THE VALUE OF TRANSPORT

18th International Symposium on the Sustainable Development of Urban Transport Systems

（12th -13th, Nov, 2025, in Shanghai and on-line）

https://thns.tongji.edu.cn/

THNS2025, **the 18th International Symposium on the Sustainable Development of Urban Transport Systems,** with a main theme of "**The Value of Transport**", is aimed to reporting on recent or emerging advances in six respects-Accessiblity, Safety & Resilience, TOD & Funding Issues, Shared Transportation, Spatial Features & Mobility, CAVs, in relation to socioeconomic operations as well as to technological progress.

THNS2025 is co-organized by Tongji University & École nationale des ponts et chaussée – Institut Polytechnique de Paris (ENPC) , supported by Université Gustave Eiffel, Aristotle University of Thessaloniki,Arts et Métiers Institute of Technology,CentraleSupélec, INSA Lyon,Université Polytechnique Hauts-de-France,INSA Hauts-de-France,Ecole Spéciale des Travaux Publics,Tpower 3(Territories in Transformation for Transitions),EELISA network of technological universities in Europe,WCTRS (World Conference on Transport Research Society),World Road Association.

About THNS

The symposium got the name T-H-N-S from the theme of its first edition in 2008- **"T**ransport à **H**aut **N**iveau de **S**ervice**" (transport of high-level service).** THNS especially fosters the East-West exchange of knowledge advances: research outcomes, innovative technologies, implementation reports etc. Of primary interest to academics and consultants, it may also be of interest to specialized policy makers and business representatives (operators, constructors).

All along its successive yearly editions starting from 2008, the major THNS topic has been the development of high-quality transport solutions: high quality to people as users, combined to high quality to the environment, with special emphasis on the urban environment including the relation to local dwellers. BRT and LRT lines make a prominent theme. Beside public transit, the Forum also deals with:

- *Shared mobility services, from shared-vehicle systems, to taxicab and ride-hailing services, and up to ride-sharing.*
- *Technological solutions for better transport are of special interest: vehicle and people connectivity, automation, electrical powering, sharing schemes and applications, ride-sourcing and dynamic fleet management, traffic control at junction, link, line and network levels.*
- *Soft modes: walking and cycling, and the related infrastructural enablers (bike lanes, pedestrian streets…).*

THNS2025
Session Details

The sessions are arranged from 8:30AM-13:00PM in Paris time/15:30-20:00 in Beijing time, during 12th- 13th, November, 2025. The working language for the forum is English.

The latest version documents of program and session details are available at the official website of THNS forum: https://THNS.tongji.edu.cn

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<tr><td colspan="4">On-site venue: Sino-French Building, Siping campus of Tongji University, No.1239, Rd.Siping, Shanghai, PRC</td></tr>
<tr><td colspan="2">On-line Plenary Sessions and Stream1</td><td colspan="2">Online Stream2 (Session 3, Session6)</td></tr>
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12th, November-DAY 1

Opening Session

Time UTC+1 (Paris): 2025-11-12 08:30 - 08:50
Time (Shanghai): 2025-11-12 15:30 - 15:50

Welcome & Orientation

Prof.LI Xiangning, Vice President of Tongji University

Ms.Marie-Christine BERT, Vice President of International Relations and Corporate Partnerships, École nationale des ponts et chaussée – Institut Polytechnique de Paris (ENPC)

Prof.MA Wanjing, Party Secretary, College of Transportation, Tongji University, Co-Chairman of THNS

Prof.PAN Haixiao, Tongji University, Honorary Chairman of THNS

Prof.Fabien LEURENT, Director of Research, International Center for Environment and Development Research (CIRED) ,ENPC, Co-Chairman of THNS

Group photo - screenshot and on-site

Keynote 1: Value of Speed, Uniformity, and Safety

by Prof. WANG Junhua, Tongji University

(Moderator: Prof. SHEN Boyang,Tongji University)

Time UTC+1 (Paris): 2025-11-12 08:50 - 09:20

Time UTC+8 (Shanghai): 2025-11-12 15:50 - 16:20

WANG Junhua, Professor, Doctoral Supervisor, Department of Road and Airport Engineering, School of Transportation, Tongji University; Ph.D. in Engineering from Tongji University; Master of Engineering Management from the University of Newcastle, Australia; Visiting Scholar at the University of California, Berkeley; Shanghai Pujiang Talent. Main research directions: road operational safety, road emergency management, and application of big data in transportation. Currently serves as Secretary-General of the Ministry of Education Engineering Research Center for Road Traffic Safety and Environment; awarded Shanghai Pujiang Talent in 2017; also serves as Editorial Board Member of the “International Journal of Transportation Science and Technology” and Committee Member of the Safety and Environment Branch of the Shanghai Highway Society.

Abstract

This report focuses on the feasibility and safety of increasing the speed limits of highways. The analysis begins with the examination of geometric alignment conditions, such as lane width, curve radii, superelevation, and vertical alignment, to ensure the road can accommodate the new speed limits safely. The theoretical justification for the speed increase includes compliance with traffic regulations and vehicle dynamics, ensuring stability and safety at higher speeds. Additionally, practical investigations, including real-time speed surveys and accident data analysis, support the need for the speed increase to align with driving behavior and improve traffic efficiency. The report also includes driving simulation experiments and natural driving data collection to assess lateral displacement and vehicle stability at higher speeds. Results indicate that increasing the speed limit will enhance road utilization, overall traffic flow and safety.

Session 1: Accessibility

(Moderator: Prof. Liu LIU, CY Cergy Paris Université & LIU Xinghua, Tongji University)

Time UTC+1 (Paris): 2025-11-12 09:20 - 10:30

Time UTC+8 (Shanghai): 2025-11-12 16:20 - 17:30

A016

Title of Speech	**CREATION OF ACCESSIBLE AND FRIENDLY URBAN SPACES**
Author(s)	Caiyun Qian, Yang Zhou
Corresponding author	Yang Zhou Zhouyang0206@126.com
Photos	
Key Words	**high accessibility, friendly, urban space, optimization strategy**
Bibliography of Speaker	Caiyun Qian, a professor and doctoral supervisor at the School of Architecture of Soochow University, has held positions such as the dean of the School of Art and Design at Nanjing Tech University and the vice dean of the School of Architecture. He is also a decision-making consultation expert of the Jiangsu Provincial Government Research Office, a young academic and technical leader in Jiangsu Province, an outstanding teacher of the “Blue-Collar Project” in Jiangsu Province, a visiting scholar at the University of British Columbia in Canada, and a review expert of Shanghai City Science and Technology. He is a standing member of the Environmental Behavior Committee of the China Institute of Architects, a member of the Underground Space Committee, a member of the Elderly-Friendly Architecture Committee, and a member of the Architectural History Committee. He is also the deputy

	director of the Art and Creative Industry Committee of the Jiangsu Cultural Industry Society.
Abstract	“Constructing Friendly Urban Spaces with High Accessibility” mainly focuses on the current situation in China, where under the background of rapid urbanization, strengthening the integrated development of urban space intensification and high accessibility of transportation has become an important aspect that needs attention in low-carbon urban design and spatial environment optimization. The main content of this report includes background elaboration, measurement analysis of urban space accessibility, coupling with public needs, design optimization strategies (case studies), etc. The aim is to highlight the concept of ecological sustainability, master relevant design methods, and through the combination of theoretical research and practical case analysis, deeply explore and provide reference for related design and renewal practices.

A007

Title of Speech	**MULTIMODAL ACCESSIBILITY AND SPATIAL EQUITY IN CAEN: A PCA-BASED ASSESSMENT OF LEZ IMPACTS**
Author(s)	Kofi Bonsu
Corresponding author	Kofi Bonsu kbonsu494@gmail.com
Photos	
Key Words	**Accessibility Analysis, Equity in Mobility, Principal Component Analysis (PCA), Multimodal Transport, Low Emission Zones (LEZ)**

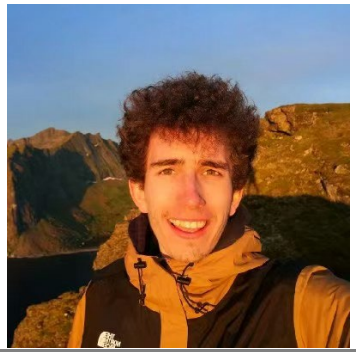
Bibliography of Speaker	Kofi Bonsu is a Postdoctoral Researcher at Université Gustave Eiffel, France, specializing in geospatial analysis and urban mobility. His research focuses on developing national-scale indicators of accessibility and mobility equity using GIS, remote sensing, and AI. With a PhD in Geography, he has published in peer-reviewed journals and presented at international conferences. His work integrates spatial modeling with urban policy, addressing sustainable mobility and the social impacts of transport transitions.
Abstract	As Low Emission Zones (LEZs) are increasingly adopted across European cities to curb pollution, they raise important questions about mobility justice. This study assesses spatial equity in Caen, France, by analyzing multimodal accessibility—via car, bicycle, and public transit—to essential services such as healthcare, education, and retail. Using Geographic Information Systems (GIS), OpenStreetMap data, and OpenTripPlanner, we computed isochrones from a fine-scale (200 m) population grid. Accessibility indicators were derived and synthesized using Principal Component Analysis (PCA), followed by hierarchical clustering to classify urban areas by accessibility patterns. The results reveal stark disparities: car travel ensures the highest accessibility, while cycling and public transit lag behind—particularly in suburban and peripheral neighborhoods. These gaps pose significant challenges for vulnerable populations, including low-income households, the elderly, and those without private vehicles, who are disproportionately affected by LEZ policies. As older vehicles are restricted, these groups may face reduced access to essential services without viable alternatives. The study highlights the spatial consequences of sustainability policies that do not fully account for transport equity. Recommendations include improving public transport frequency and coverage, enhancing cycling infrastructure, and decentralizing key services. Our open-source, replicable method offers a practical tool for identifying mobility inequalities and guiding inclusive urban policy.

A018

Title of Speech	**DECOMPOSING THE CONCEPT OF 15-MINUTE CITY IN HIGH-SPEED RAIL STATION AREAS: AN EMPIRICAL STUDY OF SHANGHAI**
Author(s)	Xinyi Wang, Haixiao Pan, Tahseen Bashir, Francesca Pagliara
Corresponding author	Haixiao Pan panhaixiao@tongji.edu.cn
Photos	
Key Words	**High-speed rail, 15-minute city, Integrated development, Station area**
Bibliography of Speaker	Xinyi Wang is a PhD candidate in the Department of Urban Planning at Tongji University and a visiting PhD student at the University of Naples Federico II in Italy. He received his M.Eng. in Urban and Rural Planning from Tongji University in 2022 and B.Eng. in Urban and Rural Planning from Beijing Jiaotong University in 2019. His research interests include the interaction between high-speed rail and the urban built environment, as well as accessibility planning in 15-minute cities.

Abstract	Over the past two decades, Chinese cities have constructed or upgraded a significant number of high-speed rail (HSR) stations. Local governments recognize the HSR stations as the potential catalysts to promote integrated urban development. HSR stations are also seen as core spaces for urban life and access to public services, and they should also adhere to the principles of the 15-minute city (15-min city) framework. However, China's HSR new town areas often encounter challenges such as underdeveloped commercial and business functions, incomplete public service facilities, and a lack of spatial vitality, which hinders residents' access to essential urban functions and living services. Nine operational HSR stations and seven central areas of Shanghai were selected for analysis. The 15-min accessible areas by walk and bike of these regions were firstly measured. The number, type, density, and spatial distribution compactness of POI facilities related to the 15-min city within this area were then evaluated. Finally, the study compared the composition of 15-min city amenities between different HSR stations and urban areas in different regions of Shanghai. The preliminary results are as follows. (1) The 15-min accessible area of either walking or cycling have great disparities in different HSR stations. Stations located in the city center are accessible for more area. (2) Except for Shanghai Railway Station and Hongqiao Railway Station, the POI density of other HSR stations is far below the average level of the downtown area and sub-centers. (3) The category and spatial distribution of POIs are different in each station. The objective of this study is to investigate the disparities between the HSR station area and the general area in realizing the 15-min city concept, identify current deficiencies in urban development around the HSR stations, and to provide scientific basis for decision-making regarding the development of China's HSR new towns.

A029

Title of Speech	**MINING BICYCLE SHARING SYSTEM STATION FUNCTIONS CONSIDERING BUILT ENVIRONMENT: A CASE STUDY IN LYON**
Author(s)	Xiaoyan Xie, Maxime Fayet, Danyang Sun
Corresponding author	Xiaoyan Xie xiaoyan.xie@dlmu.edu.cn
Photo	
Key Words	**bicycle sharing system station function, built environment, Machine Learning, Big Data, bicycle sharing system**
Bibliography of Speaker	Maxime Fayet is a graduate student in last year of transportation engineering degree at ENTPE Lyon, following in parallel a master's degree in people's regional and urban transportation, "Transports Urbains et Régionaux de Personnes" (TURP) at Université Lumière Lyon II. He had two internships as an assistant searcher, the first one at NTNU (Trondheim, Norway) and the second one at DMU (Dalian, China), during which he worked on cyclist's behaviour modelling. Xiaoyan Xie, PhD ENTPE, is actually Associate Professor at Dalian Maritime University and in charge of the Bachelor of Transport Engineering. She started her career as Research Associate at École des Ponts et Chaussées in 2014. Danyang Sun received his PhD in Transportation Engineering from École des Ponts et Chaussées. He is currently working as a Senior Data Scientist at Echo Analytics in Paris, France. His main research interests include spatio-temporal trajectory mining and the discovery of human mobility patterns.

Abstract	In the city, active modes are praised for their crucial roles in ecological transition of urban centres. Bicycles play an important role in this transition for being cheap, clean, healthy, and faster than walking. Numerous countless studies have been conducted in the last few decades. Cyclists are prone to act heterogeneously to indicators like road or bicycle infrastructure, cycling frequency, etc. Typologies such as Geller's "four types of cyclists" and the "Level of Traffic Stress" framework have guided research and urban design, yet their top-down methodologies overlook key indicators, including traffic dynamics, and risk introducing biases. With the rise of Big Data since 2010s and the rapid development of artificial intelligence in the current decade, data-driven approaches to understanding cyclist behavior have gained momentum. Studies proposing to better understand cyclist behaviors using Big Data and Machine Learning approaches are skyrocketing. As a core component of transportation systems in metropolises, the bicycle sharing system (BSS) is essential in this digital transition. BSS, now transitioning to their fourth generation, provide unprecedented opportunities to collect revealed preference data, facilitating new insights into cycling practices. To this end, this study uses an AI- based data-driven approach to explore the functional roles of Lyon's BSS stations by using a Machine Learning approach, Latent Dirichlet Allocation algorithm, based on a whole month's BSS Origin-Destination data in October 2022 in Lyon, and data from the built environment. The analysis identifies distinct station functions and services in both emission and attraction modes. Results demonstrate that the selected indicators are sufficient to cluster stations spatially without explicit geographic information, revealing recurring archetypes of bicycle trips across the network.

Keynote 2:

Mobility Organization in France, Metropolitan-Regional Express Services (SERM)

by Mr. Victor MONGAY, French Ministry of Transport, DGITM

(Moderator-Prof.Fabien Leurent, École nationale des ponts et chaussée -ENPC)

Time UTC+1 (Paris): 2025-11-12 11:10 - 11:40

Time UTC+8 (Shanghai): 2025-11-12 18:10 - 18:40

Victor MONGAY graduated as an engineer at Ecole Polytechnique in Paris and holds a master's degree in Environmental Economics from The London School of Economics and Political Science (LSE). Two years ago, he joined the French Transportation Ministry in the project team dedicated to the national policy of metropolitan regional express services (SERM) national policy and to the socio-economic impacts of investments in railways development projects. He is very interested in the challenges of decarbonizing the economy, and in particular those of the transport sector, which is the largest source of CO2 emissions in France (30%).

Abstract

Since 2019, outside Paris and Lyon urban areas, the mobility organisation is ensured by local intermunicipal cooperation and regions (13 regions in continental France), called "Mobility Organizing Authorities (AOM in French)".

Intermunicipal cooperations "AOM" are responsible for local public transport (buses, tram, metro), active and shared mobility, school transportation, on-demand transportation…

Regions "AOM" are responsible for interurban buses and regional trains.

Both level of "AOM" can levy a local tax called a "mobility payment," paid by all companies within their jurisdiction with more than 11 employees. Its rate is capped by the law, and can reach 2% of the company payroll for intermunicipal cooperation level and 0,15% for the regional level. This tax is the main source of revenue for the "AOM", and supplemented by direct budgetary subsidies from local authorities and by revenue from transport tickets paid for by users.

One major stake is to achieve proper coordination between AOMs, given people's journeys do not stop at an authority's borders. Several tools exist:

- the operational mobility contract: each region must divide its territory into mobility zones and work with local mobility authorities to define the principles governing intermodality, ticketing, pricing, and passenger information;

- AOMs can transfer their responsibilities to a joint transport authority, which is the most integrated form of cooperation, or at least join forces within a joint coordination authority whose basic mission is to develop information, ticketing, and multimodal pricing systems.

To encourage local authorities to cooperate more closely and address mass transportation issues in large urban areas, where modal shift challenges are significant, the regional metropolitan express services (SERM in French) initiative was launched in 2023, coordinated by the national Government. Local authorities are invited to work together at the level of the cities' influence areas, to consider strengthening local rail services (mainly on the existing network) and deploying a network of express buses, while also integrating express carpooling, cycling, and other forms of mobility. They must also coordinate this express transport network with land use planning issues: preventing urban sprawl and increasing density around stations.

Session 2: Safety, Resilience

(Moderator: Kang LIANG,ENPC & SUN Zhi'ang,Tongji University)

Time UTC+1 (Paris): 2025-11-12 11:40 - 13:00
Time UTC+8 (Shanghai): 2025-11-12 18:40 - 20:00

A003

Title of Speech	**DETERMINANTS OF ROAD SAFETY IN THE MUNICIPALITY OF ABOBO: AN INTEGRATED MIXED-METHODS ANALYSIS**
Author(s)	DIABATE LANCINE
Corresponding author	DIABATE LANCINE lancine.diabate@inphb.ci
Photos	

Key Words	**Road safety, traffic accidents, urban transport, informal mobility, Abobo, driver behaviour, infrastructure, transport policy, sustainable mobility, public health**
Bibliography of Speaker	Dr. DIABATE Lanciné, Institut National Polytechnique Félix Houphouët Boigny - BP 1083 - Yamoussoukro lancine.diabate@inphb.ci
Abstract	Road traffic accidents remain a critical public health concern in the municipality of Abobo, resulting in significant mortality, long-term disability, and considerable psychological, economic, and social consequences. Survivors often face substantial challenges reintegrating into the workforce and broader society, further magnifying the societal burden of road traffic injuries. Despite targeted interventions, the incidence of accidents in Abobo remains high, particularly those involving informal and underregulated transport modes such as gbakas and wôrô-wôrô. This study aims to identify the key determinants of road safety in this densely populated urban area and to inform a sustainable and targeted prevention strategy. A mixed-methods approach was adopted, combining a quantitative analysis of accident data collected from the Office of Road Safety (2017–2021) with qualitative data derived from field observations and semi-structured interviews with transport stakeholders. The expressway in Abobo served as the primary observation site, focusing on high-risk transport behaviours and conditions. Key findings include: • 30% of traffic accidents occur during weekends; 32.29% of fatalities take place between 6:00 p.m. and 10:00 p.m.; • Pedestrian–vehicle collisions account for 50.28% of road traffic deaths; • Informal and unregistered vehicles are implicated in 53% of reported accidents. In addition, the analysis reveals a higher likelihood of accident involvement among younger drivers, whereas greater driving experience is associated with reduced risk. Vehicle age is positively correlated with accident frequency. Structural deficiencies—such as deteriorated road surfaces, poor signage, inadequate lighting, and the encroachment of vehicles onto roadways and service lanes—are found to significantly increase the likelihood of accidents. This study provides a comprehensive understanding of the multifactorial nature of urban traffic safety in Abobo and lays the groundwork for policy innovation. By targeting the

	three pillars of road safety—user behaviour, vehicle regulation, and infrastructure quality—it supports • evidence-based decision-making among local authorities and transport planners. A coordinated and data-driven policy response is essential to improve road safety outcomes. Gradual, measurable interventions across these areas are necessary to reduce accident-related fatalities and injuries while fostering a culture of sustainable urban mobility.

A008

Title of Speech	**A GAME-THEORETIC ASSESSMENT OF ROAD TRANSPORT VULNERABILITY**
Author(s)	Tahseen Bashir
Corresponding author	Tahseen Bashir t.bashir@studenti.unina.it
Photos	
Key Words	**Vulnerability, Road Network Game Theory, Resilience, Transportation Planning Strategies**
Bibliography of	Tahseen Bashir is a PhD student in Civil Systems

Speaker	Engineering at the Department of Civil, Architectural, and Environmental Engineering of the University of Naples Federico II. He holds a master's degree in Transportation Engineering and Mobility (TEAM) from the University of Naples Federico II, where his thesis examined the competition between high-speed rail and air transport systems, using a game-theoretical approach. Moreover, he obtained a bachelor's degree in civil engineering from the University of Engineering and Technology at Peshawar in Pakistan. His work has been published in several peer-reviewed journals. He worked on a project related to the vulnerability and resilience of transportation infrastructure. His research focuses on high-speed rail systems and the resilience of transportation systems.
Abstract	Traditional methods for assessing urban road networks typically depend on link performance frequency distributions such as travel time, delay, and capacity. However, these networks are becoming increasingly vulnerable to unexpected disruptions that reduce mobility and access to essential services. This study focuses on the metropolitan area of the city of Naples, Italy, characterised by a dense population, complex topography, and aging infrastructure. The mobility system includes motorways, arterial roads, narrow historic residential streets, and critical links connecting residential areas to healthcare centres, education, and employment. These characteristics make the road network vulnerable to accidents, congestion, and both natural and human-induced disruptions. To inform resilient urban transport planning, this study introduces a game-based modeling framework. The methodology models a strategic interaction between two players: network users, who seek to minimise their expected trip cost by optimally selecting paths, and an adversary termed as the "demon", which aims to maximise these costs by strategically choosing adverse link performance scenarios. The result of this game is a Nash equilibrium characterized by a stable condition in which neither player can benefit from unilaterally deviating from their chosen strategy. The study aims to identify network vulnerabilities within the urban road network and inform transport planning strategies, such as infrastructure upgrades or improved traffic management, that reduce risk and enhance the resilience of the urban mobility system.

A022

Title of Speech	**ON THE VULNERABILITY OF VARIABLE SPEED LIMIT SYSTEMS**
Author(s)	Maryam Samaei, Mostafa Ameli
Corresponding author	Mostafa Ameli mostafa.ameli@univ-eiffel.fr
Photos	
Key Words	**Variable Speed Limit (VSL), Disruption, Safety, Threat model, Simulation**
Bibliography of Speaker	Maryam Samaei is a PhD student working with the City of Paris on the analysis of mobility patterns and system vulnerability using multi-agent simulation. Her research focuses on developing reliable simulation tools to predict and assess the impact of various policies and technologies on urban mobility. Prior to her PhD, she collaborated with CIRCLES research group, where she contributed to the development and calibration of traffic simulations for the MegaVanderTest experiment. She also worked at Aimsun, a company specializing in traffic modeling and simulation software. Her experience includes projects on vulnerability of intelligent transportation systems, conducted in collaboration with the University of Toronto. She received her engineering degree in Transportation from École des Ponts et Chaussées in 2024, supported by the prestigious Eiffel Scholarship from the French government. Maryam is also a member of IEEE and is actively involved as Secretary of the IEEE France ITSS Chapter

Abstract	Variable Speed Limits (VSLs) are designed to adjust speed limits dynamically in response to traffic and weather conditions. These systems are increasingly used to improve safety, mitigate congestion, and reduce the environmental impact of transportation. These benefits are achievable as long as the systems operate securely. However, VSLs are vulnerable to intentional manipulations, which could disrupt their operation and lead to unsafe traffic situations. While much of the literature has concentrated on the vulnerabilities of intelligent transportation systems, such as traffic signals, sensors, and autonomous vehicles, little attention has been given to the potential vulnerabilities of VSLs. To the best of our knowledge, no studies have specifically addressed this issue. This study aims to identify the vulnerabilities of VSLs and to assess the potential impacts of disruptions of these systems on traffic network performance and safety through both analytical and simulation-based models. First, a threat model is developed to identify vulnerabilities within the communication system of VSLs. A proof of concept is then demonstrated through a physical model, followed by a simulation test case applied to a real-world scenario: Highway 1 in Canada. The results from different simulation scenarios highlight that these systems are highly vulnerable to intentional interruptions, with significant impacts on traffic safety and network efficiency.

A027

Title of Speech	**REACTIVE POPULATION EVACUATION ROUTING UNDER UNCERTAINTY USING REINFORCEMENT LEARNING**
Author(s)	Tuan Nguyen, Mostafa Ameli, Hassan Idoudi, Mahdi Zargayouna
Corresponding author	Tuan Nguyen tranletuannguyen1509@gmail.com
Photos	
Key Words	**Transport network evacuation, Disaster management, Multi-agent Reinforcement Learning**
Bibliography of Speaker	Tran Le Tuan Nguyen received the M.S. degree in Intelligent Systems and Applications from Université Gustave Eiffel in 2024, supported by the France Excellence scholarship for selective international students. Tuan is currently pursuing a Ph.D. in Computer Science, and his research focuses on the intersection of transport simulation, disaster evacuation, and Reinforcement Learning.

Abstract	Effective population evacuation during disasters is essential to reducing casualties and mitigating harm. In evacuation planning, route optimization plays a pivotal role in improving safety outcomes, reducing total evacuation times, and alleviating traffic congestion. The literature on population evacuation has long explored routing strategies based on analytical formulations or simulation-based optimization. While these approaches provide valuable insights, they often assume complete information and static conditions, limiting their responsiveness to dynamic and uncertain disaster environments. Recent advances in Machine Learning (ML) enable the development of data-driven methodologies that can learn from historical disasters or synthetically generated scenarios to produce adaptive evacuation strategies. Such methods can explicitly account for imperfect evacuee knowledge, heterogeneous behaviours, and the potential for communication and coordination among evacuees. In this study, we propose a Multi-Agent Reinforcement Learning (MARL) framework for large-scale evacuation routing optimization. The model addresses two critical objectives in disaster evacuation: (i) minimizing travel time to shelters and (ii) avoiding hazardous areas. The evacuee population is partitioned into groups, each managed by an independent RL agent, reflecting realistic conditions in which people evacuate collectively under group-specific guidance. MARL facilitates the modelling of competition and interaction among groups, as agents seek to optimize their own group's outcomes within a shared and dynamically evolving transportation network. The proposed framework is evaluated on a high-fidelity, city-scale Manhattan road network. Results demonstrate that MARL achieves the highest survival rate and the second-lowest network clearance time among benchmark methods, including dynamic A*, dynamic user equilibrium (DUE), and C-logit stochastic user equilibrium (SUE). To the best of our knowledge, this is the first application of MARL to population-scale evacuation routing optimization. This work contributes a novel, data-driven, and behaviourally realistic approach to evacuation planning in dynamic urban networks, with potential for integration into real-time decision-support systems for disaster management.

A028

Title of Speech	**DESCARTES A PLATFORM FOR TRANSPORTATION NETWORKS RESILIENCE ANALYSIS**
Author(s)	Neila Bhouri, Mustapha Tendjaoui
Corresponding author	Neila Bhouri neila.bhouri@univ-eiffel.fr
Photo	
Key Words	**Resilience, Public Transport, Reliability, Recoverability, Robustness, RaaS**
Bibliography of Speaker	Neila Bhouri, Ph.D. HDR is a senior researcher at the University Gustave Eiffel. She obtained her Ph.D. in Automatic Control from the University Paris XI-Orsay and her HDR (Habilitation à Diriger des Recherches) from the University Paris-Est Marne La Vallée. She has been a researcher for thirty years in the field of multi-modal transportation modeling, control, and quality of service. She conducts her research at the COSYS/GRETTIA laboratory where she is co-responsible for the “modeling and simulation for sustainable and intelligent mobility”. Previously, she was a researcher at INRETS where she developed an activity on air traffic control, then an Assistant Professor at the University of Tunisia (1993–1999) where she taught Control, Operational Research, and Traffic Engineering. She was a member of the CM of the COST ARTS action. She is Vice-Chair of the IFAC Transport Committee, and a member of the Industrial Committee (ACC).
Abstract	DESCARTES (Dynamic Efficiency of the Resilience and the System Action-Reaction Pattern in Transportation Networks) is a numerical platform dedicated to the study of the resilience of public transport networks. A variety of performance metrics have been proposed in the literature, shaping the properties of the system’s resilience. Several

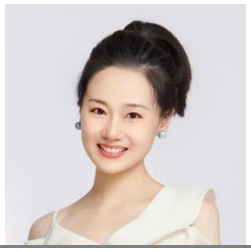
	of them are implemented in the DESCARTES platform, both on the static and dynamic levels, following the classification given in [1], the Resilience properties are categorized into three groups: 1- Robustness: Measures the physical infrastructure-related properties. It concerns mostly the topological aspect of the network and its connectivity. 2- Reliability: Infrastructure- Flow-related properties of the service; the ability of the service to absorb disruptions considering passenger flow and service infrastructure. 3- Recoverability: They are related to rapidity, resourcefulness, survivability, redundancy, adaptability and all policy-related properties for recoverability Numerous public transport networks from French cities (Rennes, Bordeaux, Paris, …) are implemented, both static and real-time data. Several disruption scenarios, at node and link level (random, targeted, isolated or multiple actions), are implemented. The presentation will focus on key performance indicators for reliability [2, 3] and recoverability, particularly the RaaS (Resilience As A Service). RaaS [4,5] proposes a collaborative approach, encouraging cooperation and resource sharing among operators to collectively address and overcome issues. It minimizes recovery time through resource reallocation agreements between mobility service providers, enabling prompt system recovery Bibliographie [1] Mahdavi, S. M. H. & Bhouri, N. (2024). A synthetic indicator for structuring resilient public transport operation. Taylor and Francis Ltd.Sustainable and Resilient Infrastructure, 1–27. https://doi.org/10.1080/23789689.2024.2346705. Journal HIndex 24. Données de transport en commun de New DELHI. [2] Bhouri, N., T. Campisi, M. Aron and S. M. H. Mahdavi (2025). Connectivity, Reliability and Approachability in Public Transport: Some Indicators for Improving Sustainability. Sustainability journal 17(2), 645; https://doi.org/10.3390/su17020645. [3] Bhouri N., S. Lakhotia, M. Aron, G. Tiwari (2021). Timetable and Headway Adherence Assessment using the Gini Coefficient and the Lorenz Curve. Transactions on Computer Research 9. 137-151. 10.37394/232018.2021.9.16. [4] Amghar R., S. Jaber, S M H. Mahdavi, N. Bhouri, M. Ameli (2024). Resilience as a Service for Transportation Networks: Definition and Basic Concepts.

Session 3: TOD & Funding Issues

(Moderator: Guillaume GARRIGUES, ENPC & Lei HAN, Tongji University) **Stream 2**

Time UTC+1 (Paris): 2025-11-12 11:40 - 12:50
Time UTC+8 (Shanghai): 2025-11-12 18:40 - 19:50

A015

Title of Speech	**TRANSIT-ORIENTED DEVELOPMENT IN THE GREATER PARIS REGION: CHALLENGES AND OPPORTUNITIES AMIDST THE GREATER PARIS EXPRESS EXPANSION**
Author(s)	LIU LIU
Corresponding author	LIU LIU liu.liu@u-cergy.fr
Photo	
Key Words	**TOD, Greater Paris Region**
Bibliography of Speaker	Liu Liu is a civil engineer and an associate professor specialising in urban and transport planning, CY Cergy Paris Université. She has extensive experience as a project leader and contributor to numerous research initiatives aimed at reducing harmful impacts of human activities on territories, and vice versa, particularly in France. Her work spans multiple temporal and spatial scales, from economic activity to cultural practices, from regional long-term project to mid-term local initiatives. Through modelling and simulating these activities and movements, she promotes the fabrication of more sustainable, healthier and happier living environment. Her primary research subjects include Transit-Oriented Development and the 15-minute city. She actively promotes these concepts through her research and teaching activities, mentoring future researchers and preparing future professionals in these fields.

Abstract	Transit-Oriented Development (TOD) is widely recognized and implemented in many Asian and American cities. However, this principle has proven challenging to be adopted in French cities, including within the densely populated Greater Paris Region (GPR). This study seeks to provide a high-resolution understanding of the barriers to apply TOD in the GPR — a principle that, in theory, offers mutual benefits for both transport operators and urban developers. This inquiry is particularly timely given the ongoing construction of 68 new train stations as part of the Greater Paris Express (GPE) project, alongside the development of 53 new districts managed by a public-private entity overseeing the railway expansion. We focus on three districts within the new GPE network, each located at the intersection of multiple railway lines. Our methodology combines fine-grained, district-level analysis – that is, within the rayon of 500 meter around train station – with broader assessments of the new networked territory at a regional level. Targeted districts are projected to become high-density, mixed-use, and oriented towards active transportation modes. By integrating quantitative modeling with qualitative analysis, we aim to uncover the local challenges that may conflict with broader regional objectives. Our preliminary findings highlight several key barriers. 1/ Land use constraints: peripheral train stations are frequently surrounded by fragmented, already-developed land, limiting opportunities for value capture and integrated planning. 2/ Governance complexity: multiple layers of planning authorities and stringent controls on land use, density, and heritage preservation hinder the flexibility and efficiency required for private-led, integrated development. 3/ Power imbalance: urban development and transit infrastructure are predominantly driven by the public sector, with private actors relegated to a secondary role. For a better GPR, while maintaining the GPE's commitment to social equity, accessibility for all, affordable housing, and the preservation of existing communities, it is crucial not to foreclose opportunities for market-driven redevelopment. Even though available brownfield or underutilized sites are often small and dispersed, our wish is to envision transformation scenarios that maximize the value of new transport infrastructure and scarce urban land for the benefit of local communities.

A014

Title of Speech	**FUNDING LOCAL MOBILITY SERVICES OUTSIDE CITIES: UNCOVERING A BLIND SPOT IN THE FRENCH DEBATE OVER MOBILITY FINANCING REFORM**
Author(s)	Anne Guillemot
Corresponding author	Anne Guillemot anne.guillemot@enpc.fr
Photos	
Key Words	**mobility services, financing reform, organizing authorities, low-density areas**
Bibliography of Speaker	Anne Guillemot is a post-doctoral researcher at Ecole nationale des ponts et chaussées (ENPC), within the International Research Center for Development and Environment (CIRED). Employing a wide range of qualitative and quantitative methods, her research focuses on the transformation of the transport sector to address climate change and the governance of such a transition toward sustainable mobility, from the local scale to the European Union scale.
Abstract	Over the last 10 years, France has set up an ambitious regulatory framework to foster the development of local public mobility services beyond urban transport, and to make sure these services are organized throughout the country, including in sparsely populated areas. However, the new regulations have not significantly revised the public transport funding framework in force since the 1970s: businesses and administrations over 11 employees, which are submitted to a “mobility tax” based on their total payroll, have remained the main source of funding for mobility organizing authorities. The appropriateness of this funding framework has been growingly questioned. On the one hand, the “mobility tax” turned out to be unfair (mismatch between tax payers and service

	beneficiaries), often ineffective (the modal share of cars remains overwhelming), and too heavy for businesses in contexts of economic stagnation. On the other hand, the amounts raised appear insufficient to meet increased financing needs for mobility investment and operation. In this contribution, we propose to add to the debate on the "mobility tax", investigating the adverse effects of the restrictive conditions for levying the tax (type of mobility organizing authority, type of services offered, population size) in the face of the diversity of local organizational patterns and mobility needs, and assessing the scale of the problem. Focusing on the Region Nouvelle-Aquitaine in South West France and using a mix of qualitative and quantitative methods, we show that this framework leaves unfunded many authorities charged with local mobility services, especially in rural areas. We provide new lines of analysis regarding the current mismatch between legal competence and access to financial resources and we describe how local authorities muddle through to secure alternative funding sources. Ultimately, we provide some recommendations to update the French regulatory framework and foster sustainable mobility throughout the country.

A019

Title of Speech	**MAAS AS CONCEPTS AND REALITIES: A 10-YEAR RETROSPECT AND SOME FORESIGHTS**
Author(s)	Sylvain Daou, Fabien Leurent
Corresponding author	Sylvain Daou daou.sylvain@gmail.com
Photos	

Key Words	**MaaS, Mobility as a Service**
Bibliography of Speaker	Sylvain Daou: PhD candidate (2022-2025) at Ecole Nationale des Ponts et Chaussées under the supervision of Fabien Leurent.
Abstract	Mobility as a Service (MaaS) has emerged in 2014 as a promising concept vowing to bridge the gap between
	multiple mobility services in order to enable seamless door-to-door multimodal trips. MaaS proponents have been predicting beneficial changes to mobility systems: greater accessibility, lower reliance on private car, reduction in energy consumption, etc. However, 10 years after the emergence of the MaaS concept and the proliferation of implementations, uncertainty remains regarding its ability to realize this idyllic vision of seamless, carbon-free multimodal mobility, both in terms of the actual benefits (e.g., MaaS uptake levels, level and nature of modal shift) and the viability of MaaS itself (e.g., public championing, economic profitability). The goal of this paper is twofold. First, it aims at building a 10-year retrospect of MaaS, in terms of both theory and practice. It does so by tracing the evolution of MaaS' theoretical definitions in academic literature as well as exploring MaaS implementations around the world. It then gives a critical analysis of MaaS' development to date. Second, it aims at proposing foresights into the possible futures for MaaS. In order to do so, it exposes different future trajectories for MaaS, ranging from a "business as usual" future consisting of generalized low-integration level MaaS in the form enhanced multimodal trip planners, to the grafting of MaaS into a larger activity-based paradigm of service delivery in the form of "super apps" that extends beyond providing solely transportation-related services, and the redefining of MaaS as a cooperation paradigm that can include deeper cooperation perspectives between mobility services.

A105

Title of Speech	**MaaS AS AN INSTRUMENT FOR COOPERATION IN THE FRENCH TRANSPORT AND MOBILITY SECTOR**
Author(s)	Pierre-André HORTH
Corresponding author and email	Pierre-André HORTH, pierre-andre.horth@cerema.fr
Photo of speaker	
Bibliography of Speaker	Pierre-André Horth is a Public Works Engineer (ITPE) and a Doctor of Spatial Planning and Urbanism. He is a researcher at MATRiS (CEREMA – CY Cergy Paris Université, France) and has a particular interest in mobility policies and the digitisation of this sector. He employs qualitative or mixed methods from the humanities and social sciences to study mobility governance mechanisms and socio-technical instruments.
Key Words	**urban traffic; wage rate; Random Forest; Multinomial Logistic Regression; taxi driver; trip indicator**
Abstract	Mobility as a Service (MaaS) was incorporated into French law through the Loi d'Orientation des Mobilités (Mobility Orientation Act) in 2019, following years of preparatory work. Positioned at the intersection of pre-existing transport policies and the MaaS model originally conceptualized in Finland, this instrument has since developed across various French territories at different scales, exhibiting varying levels of integration. An analysis of the Observatoire des MaaS database (Horth & Richer, 2025), combined with a qualitative approach (Horth, Menerault & Richer, 2022), revealed a

	predominance of locally driven MaaS initiatives. These initiatives are primarily led by public cooperative structures among territories that already had competencies in mobility organization. These MaaS platforms were initially undertaken in partnership with traditional public transport operators, thus continuing existing public transport policies. The presence of third-party operators, which are more specialised in digital mobility, is much more recent and remains limited to start-ups based in France and which are originally specialized in certain aspects of MaaS. Currently, they are still linked to local public authorities. However, to date, MaaS has not succeeded in overcoming the spatial and modal boundaries that fragment the French transport sector. This is an issue that numerous policies in the country have sought to address, albeit with limited success (Richer & Horth, 2023)." The new aspect with MaaS lies in the use of a partly technical system designed for users, rather than a legislative or planning system aimed at decentralised mobility management, as has been the case since the 1970s.

13th, November-DAY 2

Keynote 3: Transportation Multimodal Network Equilibrium Models

***by Prof. Mostafa Ameli,* University Gustave Eiffel**

(Moderator-Prof. PAN Haixiao, Tongji University)

Time UTC+1 (Paris): 2025-11-13 08:30 - 09:00

Time UTC+8 (Shanghai): 2025-11-13 15:30 - 16:00

Mostafa Ameli is an Associate Professor in applied mathematics, computer science, and transportation science at the Transportation Engineering and Computer Science Lab (GRETTIA), University Gustave Eiffel Paris, France, and is an affiliated researcher with the EECS Department and Institute of Transportation Studies, University of California, Berkeley. He received his Ph.D. degree at the University Paris-est, IFSTTAR (The French Institute of Science and Technology devoted to Transport, Planning, and Networks), Paris, France, and the University of Lyon, Lyon, France, in 2019. He is the founder of the IEEE France Section ITSS Chapter and a member of the IEEE ITS TC on Decision and Control in Transportation Systems. He is an INFORMS award winner for the outstanding paper in Urban Transportation Planning and Modeling. As a PI, he received the French national starting grant (ANR JCJC) in 2024, France-Berkeley Funding from Collège de France (2023-2024), and the I-SITE FUTURE (2023-2025).

Abstract: Transport systems are inherently dynamic, shaped by nonlinear interactions between various components and complex feedback loops between network states and user decisions. A central challenge within this dynamic is network congestion, which affects local demand distribution and overall multimodal demand by influencing route, mode, and departure time choices. This talk explores analytical and data-driven methods for interpreting congestion dynamics in large-scale networks and formulating effective control strategies for efficient transport system operation. Dr. Ameli will present approaches that incorporate game theory to model and analyze multimodal network equilibrium with respect to varying demand levels. These methods not only enhance our understanding of traffic propagation and demand patterns but also provide a foundation for designing control strategies to shift the network's current state toward the system optimum. The discussion will further examine the role of these approaches in improving network resilience under

regular conditions, disruptions, and evacuation scenarios, offering pivotal insights for urban planners and policymakers.

Session 4: Shared Transportation

(Moderator: Prof. Mostafa AMELI, University Gustave Eiffel & LAO Xingyun, Tongji University)

Time UTC+1 (Paris): 2025-11-13 09:00 - 10:20
Time UTC+8 (Shanghai): 2025-11-13 16:00 - 17:20

A004

Title of Speech	**CRISIS AND MODERNISATION IN URBAN TRANSPORT: FLEET RENEWAL CHALLENGES AND POLICY IMPLICATIONS FOR GREATER ABIDJAN'S MINIBUS SECTOR**
Author(s)	DIABATE LANCINE
Corresponding author	DIABATE LANCINE lancine.diabate@inphb.ci
Photos	
Key Words	**Urban transport, minibus fleet renewal, public policy, Abidjan, Gbaka, FDTR, transportation finance, sustainable mobility, public safety, infrastructure modernisation**
Bibliography of Speaker	Dr. DIABATE Lanciné, Institut National Polytechnique Félix Houphouët Boigny — BP 1083 — Yamoussoukro lancine.diabate@inphb.ci

Abstract	Greater Abidjan's public transportation system is currently facing a structural crisis, primarily due to the obsolescence of its "Gbaka" minibus fleet, which has an average age exceeding 20 years. This aging fleet presents critical challenges in terms of road safety, environmental degradation, public health risks, and economic inefficiencies. The prohibitive cost of acquiring new vehicles has made fleet renewal financially unattainable for most transport operators, compounding the problem. In response, the Ivorian Ministry of Transport initiated a fleet renewal programme through the Road Transport Development Fund (FDTR). The programme integrates financial support mechanisms—backed by guarantees placed with local financial institutions—to establish credit lines for transport operators. Complementary measures include stakeholder training and the enhancement of monitoring and evaluation systems. The pilot phase of the programme launched with the deployment of 40 new IVECO DAILY IVOIRE vehicles in collaboration with SOTRA INDUSTRIE. Preliminary data reveal that 99% of the 9,911 "Gbaka" minibuses in Greater Abidjan are more than 10 years old, with an average age of 22.33 years. Based on pilot phase parameters, the estimated cost of renewing the entire fleet is approximately 192.1 billion CFA francs. While the initiative offers substantial benefits—including reductions in urban air pollution, improvements in public safety, and the professionalisation of the transport sector—the FDTR's current financial capacity is insufficient to scale the programme and maximise its socioeconomic impact. Strengthening the FDTR Guarantee Fund—potentially through its transformation into a state-owned enterprise—is therefore critical. The sustainable modernisation of Abidjan's urban transport system will require a robust policy framework incorporating fiscal incentives, regulatory reforms, and diversified funding sources. These measures are essential to overcoming structural barriers and ensuring long-term viability.

A023

Title of Speech	**STOCHASTIC OPTIMIZATION FOR EFFICIENT AND SCALABLE RIDE-SHARING SYSTEMS**
Author(s)	Negin Alisoltani, Nicolas Eduardo Loayza Meneses, Latifa Oukhellou
Corresponding author	Negin Alisoltani negin.alisoltani@univ-eiffel.fr
Photos	
Key Words	**Ride-Sharing, Fleet Management, Stochastic Optimisation**
Bibliography of Speaker	Negin Alisoltani is an Assistant Professor at the GRETTIA laboratory, Université Gustave Eiffel, Paris, France, specializing in sustainable urban mobility, data‑driven transportation systems, operational research, and AI. She earned her PhD in civil engineering from the University of Lyon in 2020, focusing on simulation‑based optimization frameworks for new mobility services. Her work bridges academia and industry, informing the design of greener, more efficient transport solutions through rigorous modeling and emerging computational techniques.

Abstract	Mobility-on-Demand services have significantly altered urban transportation, offering flexible and convenient alternatives to private vehicles. However, their rapid adoption has contributed to increased congestion and emissions, especially when substituting public transport or active mobility modes. To mitigate these negative impacts, this study presents a novel fleet management framework that integrates stochastic optimisation, ride-sharing, and real-time rebalancing strategies within a Model Predictive Control (MPC) architecture. The approach explicitly considers demand uncertainty by using a probabilistic deep learning-based forecasting module to generate multiple future demand scenarios. These scenarios are incorporated into the decision-making process through a Sample Average Approximation (SAA) method, allowing for robust and anticipatory fleet control. The system is tested in a realistic simulation using historical ride-hailing data from Chicago. Experiments are focused on peak-hour demand patterns and consider community areas with high trip frequencies. Sensitivity analyses are conducted to evaluate how varying initial fleet sizes and distributions influence system performance under stochastic demand. Results show that with fewer than half the historical fleet size, the proposed method can serve more passengers, reduce waiting times, and lower total vehicle kilometers traveled by optimizing ride-sharing and rebalancing strategies. Specifically, the integration of probabilistic forecasts and scenario-based decision-making enables the system to maintain service quality even under demand fluctuations. The proposed framework thus demonstrates its potential to improve efficiency, reduce operational costs, and contribute to more sustainable urban mobility.

A024

Title of Speech	**A MILP-BASED BI-LEVEL FRAMEWORK FOR EFFICIENT CAR-**
	SHARING FLEET MANAGEMENT
Author(s)	Ali Naaman, Negin Aliso ltani, Mahdi Zargayouna
Corresponding author	Ali Naaman ali.naaman@univ-eiffel.fr
Photos	
Key Words	**Car sharing, Assignment, Relocation, Mixed integer linear program,**
Bibliography of Speaker	Ali Naaman is a PhD student at the University Gustave Eiffel in Paris, France, specializing in sustainable urban transportation systems. His research focuses on the strategic integration of shared mobility services into urban transportation systems, aiming to enhance sustainability in cities. He aims to propose innovative models that reduce environmental impact while enhancing accessibility and livability in cities. Driven by a deep passion for shaping the future of mobility, Ali seeks to bridge the gap between academic insights and real-world implementation.

Abstract	As urban populations grow and private vehicle ownership becomes increasingly unsustainable, shared mobility systems have emerged as critical components of modern transportation networks. Car-sharing, in particular, offers an alternative to individual car ownership by reducing congestion, emissions, and parking demand while promoting more efficient vehicle use. However, managing shared fleets in dynamic urban environments poses complex challenges related to vehicle availability, spatial imbalance, and fluctuating demand. This paper introduces a bi-level optimization model designed to enhance the performance of car-sharing systems through integrated vehicle assignment and relocation decisions. The model is formulated as a Mixed-Integer Linear Program (MILP) and explicitly captures real-world operational constraints such as vehicle energy levels, user time windows, walking tolerances, rental duration, and parking capacity. The upper level of the model focuses on the vehicle-to-request assignment problem with the objective of maximizing total system profit. It incorporates heterogeneous vehicle types, differentiated pricing schemes, and operational feasibility based on spatial and temporal inputs. Assignments are only permitted if the vehicle can complete the requested trip and meet all relevant constraints. The lower level addresses vehicle relocation, aiming to reduce unserved demand by repositioning idle vehicles to areas with unmet requests. Relocation is modeled as a constrained optimization subproblem, ensuring feasibility in terms of vehicle availability, energy range, and parking. To avoid inefficient moves, relocations are only accepted if expected profits outweigh associated costs. A rolling-horizon solution method is applied to simulate real-time operations. The model is tested on a case study using the Sioux Falls network, showing improved assignment coverage, reduced user waiting time, and greater operational efficiency. This work offers a rigorous and scalable optimization framework for shared mobility operators seeking to balance profitability with service accessibility in complex, time-varying urban systems.

A103

Title of Speech	**RESEARCH ON THE COMPETITION AND COOPERATION RELATIONSHIP BETWEEN SHARED E-BIKES AND PUBLIC TRANSPORTATION**
Author(s)	Jianhong Ye, Jiahao Bai
Corresponding author and email	Jianhong Ye (12107@tongji.edu.cn), Jiahao Bai (bjh0321@tongji.edu.cn)
Photo of speaker	
Key Words	Shared e-bike, Public transit, Connection behavior, Substitution behavior, Cooperation and competition
Bibliography of Speaker	Ye Jianhong, male, is a professor and doctoral supervisor at the College of Transportation Engineering, Tongji University. Focusing on the new travel service model of "Internet + Transportation," he conducts research in the field of shared mobility (including bike-sharing, car-sharing, bus-sharing, and MaaS) to study travel behavior theory and demand forecasting methods in the context of the internet and information environment. By integrating big data analysis and behavioral intention surveys, he explores multi-agent-based paradigms for travel behavior analysis and evaluates the effects of transportation economics and policies.
Abstract	The emergence and development of shared e-bikes have formed complex connection and substitution relationships with urban public transit. This dynamic not only affects the social benefits of integrated transportation systems but also poses challenges to the public transit revenue. Accurately identifying and assessing the competitive and cooperative relationships between shared e-bikes and public transit has become a critical issue in urban

	transportation research. This study proposes an innovative identification method, based on multi-source data fusion, to discriminate these relationships. Utilizing Shenyang, China, as a case study, the research applies spatiotemporal big data analysis techniques and Generalized Additive Model to systematically analyze the characteristics and influencing factors of the coopetition relationships between shared e-bikes and public transit. The results indicate that e-bike sharing trips are predominantly single-mode journeys. In multimodal conditions, they primarily function as a feeder mode to rail transit. Conversely, shared bikes and buses are the modes most substituted by SEBs, followed by private cars and walking. Furthermore, metro network layout and the proximity of e-bike sharing stations to the city center significantly influence the cooperation relationship. In contrast, business density, bus stop density, trip O/D locations, time savings, and travel distance are key factors affecting the competition relationship. This research provides empirical support for the synergistic planning and management of urban e-bike sharing systems and public transit networks.

A104

Title of Speech	**EXPLORING THE HIGH INCOME TRIP CHARACTERISTICS OF TAXIS**
Author(s)	Guangyue Nian, Haixiao Pan
Corresponding author and email	Guangyue Nian, ngyown@sjtu.edu.cn
Photo of speaker	
Key Words	**urban traffic; wage rate; Random Forest; Multinomial Logistic Regression; taxi driver; trip indicator**
Bibliography of Speaker	Guangyue Nian, postdoctoral researcher in the Department of Urban Planning at Tongji University's School of Architecture and Urban Planning. His primary research areas include smart cities, smart transportation, urban big data, inclusive cities, and the relationship between urban transport performance and the built environment.
Abstract	To improve the efficiency of taxi operation and service level, the correlation mechanism between taxi trip characteristics and taxi drivers' income per unit time(IPUT) is studied. A random forest prediction model is constructed to analyze the relative importance and significance of trip characteristics on IPUT. The results show that trip characteristics can be used to predict drivers' IPUT with good accuracy, and the relative importance of delivery speed, search time and number of long orders is the greatest in predicting the average IPUT, and the increase in search trip detour, delivery trip detour and search mileage significantly increases the probability that the ordinary benefit drivers fall to the low benefit drivers, while the increase in search trip detour, search area preference, search mileage and delivery speed significantly increase the probability that the ordinary benefit drivers rise to the high benefit drivers. High benefit

	drivers have the characteristics of being proactive in searching for passengers, not preferring specific areas, tending to anticipate short routes with high travel speeds, and favoring long orders but not deliberately pursuing them. This study bridges the gaps in previous related research on the construction of correlations between trip characteristics and benefits, the characterisation and prediction of diverse trip characteristics on IPUT, and the outlining of operating characteristics of high benefit taxi drivers. The study may provide theoretical references and technical support for urban traffic management, taxi quantity regulation and fare adjustment.

Keynote 4:

Strategical and Operational Management of Electrified Transport Systems

by Prof. XIE Chi, Tongji University

(Moderator-Sylvain DAOU, ENPC)

Time UTC+1 (Paris): 2025-11-13 11:50 - 12:20

Time UTC+8 (Shanghai): 2025-11-13 18:50 - 19:20

Professor Xie Chi is a tenured professor and doctoral supervisor at the College of Transportation, Tongji University. He has long been engaged in research on transportation system management, with a primary focus on "urban and regional transportation networks," "shared and public transportation systems," "freight transportation and logistics systems," and "electrified transportation and transportation-energy macro-systems." He excels in applying interdisciplinary methods, including operations research and management science, micro and regional economics, and cognitive and behavioral sciences, to analyze and predict economic and social phenomena within transportation systems. Additionally, he develops optimization models and provides strategic decision-making support for the planning, control, operation, and management of large-scale integrated transportation systems.

Abstract

The large-scale deployment of electric vehicles (EVs) marks a transformative milestone in the evolution of surface transportation systems in the 21st century. Governments worldwide have intensified efforts to accelerate EV adoption as a strategic initiative to stimulate economic growth, drive technological advancements, and reshape energy consumption patterns. China has been the world’s largest EV market since 2015, where transportation electrification plays a crucial role in enhancing national energy security, promoting environmental sustainability, and driving the transformation of the automotive industry. This talk provides an overview of recent advances in the planning and management of electrified transportation and logistics systems. Example topics include traffic network equilibrium under range anxiety, charging infrastructure deployment for intercity networks, time-of-use electricity pricing for vehicle-to-grid activities,

integrated routing and charging strategies for long-haul electric trucks, carsharing systems operations with battery swapping, and charging scheduling for electric bus fleets utilizing renewable energy sources. Managerial insights and policy implications drawn from these studies will be also discussed.

Session 5: Spatial features & mobility planning

(Moderator-Prof. Apostolos Papagiannakis, Aristotle University of Thessaloniki & WANG Xinyi, Tongji University)

Time UTC+1 (Paris): 2025-11-13 11:30 - 12:40
Time UTC+8 (Shanghai): 2025-11-13 18:30 - 19:40

A025

Title of Speech	**REVEALING THE DRIVING FORCES OF URBAN FORM AT THE DISTRICT SCALE USING A MULTI-GROUP ANALYSIS BASED ON THE PLS-SEM APPROACH**
Author(s)	Ming Zhong
Corresponding author	Ming Zhong mzhong@whut.edu.cn
Photos	
Key Words	**Urban Form; Urban quality; Driving factors; PLS-SEM; Multi-Group Analysis**

Bibliography of Speaker	Ming Zhong: Professor, Intelligent Transportation Systems Research Center, Wuhan University of Technology, China; Engineering Research Center of Transportation Information and Safety, MoE of China, China; Yiming Dong: Ph.D. Candidate, Intelligent Transportation Systems Research Center, Wuhan University of Technology, China; Engineering Research Center of Transportation Information and Safety, MoE of China, China Xiaofeng Pan: Assistant Professor, Intelligent Transportation Systems Research Center, Wuhan University of Technology, China; Engineering Research Center of Transportation Information and Safety, MoE of China, China
Abstract	Urban expansion has led to significant spatial and socio-economic disparities among districts/counties within each city, driven by fragmented planning and inter-district competition. While municipal authorities regulate land use and public facilities to enhance district quality, their tendency to emulate economically advanced districts often results in systemic imbalances and inefficient allocation of urban resource, such as inefficient land use, over-provisioned public facilities. Therefore, we have expanded the measurement dimensions of district quality far beyond the narrow definitions previously focused solely on economic or environmental aspects. Furthermore, we classified and analyzed districts to provide quantitative evidence for examining the heterogeneous impacts of functional form on different categories of urban quality at district/county level The study decomposes conventional urban form into two distinct dimensions: the functionality of urban form, which pertains to the spatial distribution of human-designed and built elements such as land use, transportation networks, and employment opportunities; and the quality of urban form, which relates to the spatial distribution of outcomes and effects—economic activity, equity, efficiency, and sustainability—that emerge from the interaction of functional elements. This conceptual separation allows for a more nuanced understanding of how planned interventions translate into measurable urban outcomes. Building upon this foundation, this study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to model the relationships between these two dimensions and identify the key drivers influencing urban quality at district/county level. In addition, we apply Multi-Group Analysis (MGA) to enable

	systematic comparisons of these driving factors across different district/county types. To support the MGA, we developed an advanced clustering methodology that integrates the K-Average Nearest Neighbor (KANN) algorithm with DBSCAN, optimized through Bayesian techniques for parameter tuning. Taking the City of Wuhan as a case study, this method identified eight distinct district clusters based on their urban quality indicators, revealing a concentric spatial distribution pattern. The study also finds that an increase in density of economic activities correlates with a more equal distribution of these activities. However, the agglomeration (or dispersal) of economic activities does not show a strong correlation with the density of economic activities. The MGA results demonstrate significant heterogeneity in how the functional forms influence urban quality across these district clusters. Specifically, the level of multimodal transportation shows its strongest impact on public transit share in downtown clusters, while its effect on service accessibility proves more pronounced in suburban clusters. Land use characteristics exhibit divergent importance across districts, with intensity being more influential in suburbs while size exerts greater impacts in downtown areas. The above findings carry important implications for urban planning. They suggest that standardized planning approaches may be ineffective due to inherent spatial variations in how districts respond to interventions. Instead, this study demonstrates the need for differentiated policies that account for a district's position in the urban system and its specific quality-form characteristics. The methodological framework developed in this study offers a replicable approach for analyzing intra-urban disparities, providing both theoretical insights for urban form research and practical tools for evidence- based urban planning.

A013

Title of Speech	**GOVERNANCE GUIDANCE TO ENABLE THE INTEGRATION OF MOBILITY HUBS INTO TRANSPORT SYSTEMS**
Author(s)	Vasiliki Amprasi, Panagiotis Papantoniou, Dimosthenis Pavlou, Lea Rocholl, Giel Mertens
Corresponding author	Vasiliki Amprasi v.amprasi@uniwa.gr
Photos	
Key Words	**mobility hubs, governance structures, stakeholder agreements, public-private partnerships**
Bibliography of Speaker	Vasiliki (Vasia) Amprasi is a Civil &Transportation Engineer working as a Research Associate at the University of West Attica and, at the same time, as a freelancer Transportation Engineer. She holds a Diploma in Civil Engineering (equal to MEng) from the Aristotle University of Thessaloniki and a Master of Science (MSc) on “Planning, Organization and Management of Transport Systems”. Recognized for her academic excellence, she has received 2 official distinctions, including a full scholarship from the Onassis Foundation for her postgraduate studies. Vasiliki has been involved in several transport studies and international projects covering different aspects of transport and mobility at European and national levels. Her research interests focus mainly on sustainable mobility, sustainable urban planning, citizens’ participatory processes and intelligent transport systems. Till today, she has published 26 papers in scientific journals, conference proceedings and conference presentations.

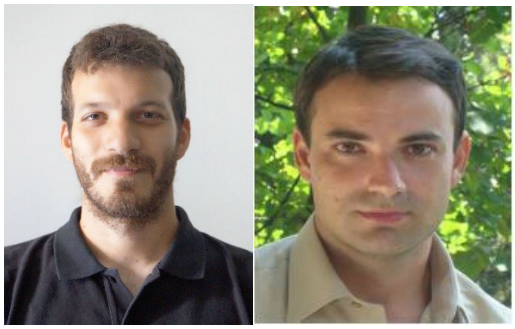
Abstract	Urban and rural mobility systems across the world face persistent service quality challenges. Urban areas suffer from congestion and noise and air pollution, while rural and peri-urban regions lack efficient, accessible, and affordable public transport options. This imbalance limits the accessibility and inclusiveness of mobility services. In response to these issues, the concept of mobility hubs has emerged representing multimodal nodes that smoothly integrate public transport, shared mobility, and other non-mobility services in a single location. This way, the overall quality of passenger and last-mile mobility services is enhanced. Aiming to promote the successful implementation and integration of mobility hubs into the existing transport systems, this study analyses the required governance models, decision-making mechanisms, and public-private cooperation frameworks drawing from good practices and thorough desktop research. The paper addresses institutional coordination, regulatory considerations, stakeholder agreements, and integration of non-mobility services to balance operational performance and increase user convenience and social impact. Starting from six Mediterranean countries (Greece, Spain, Italy, Malta, Cyprus, and Bosnia and Herzegovina), this study provides practical guidance for all policymakers, transport authorities and service providers, while adopting a participatory and context-sensitive approach. By acknowledging the importance of governance and focusing on this crucial aspect of success, local authorities, communities and stakeholders are enabled to establish and continuously operate scalable and sustainable mobility hubs improving the quality of daily commutes for citizens and visitors of the area. The study's results contribute to a shared strategy for implementation of multimodal mobility hubs that are well-planned and properly managed, aiming to shift mobility behavior and foster multimodal, inclusive urban and rural transport ecosystems.

A009

Title of Speech	**FROM WHERE I LIVE, WHERE ARE THE JOBS? HOME-TO-WORK RELATIONS, JOB BASINS AND THE RELATED "OPPORTUNITY SPECTRA" IN FRANCE AS OF 2019**
Author(s)	Kang LIANG, Fabien Leurent
Corresponding author	Kang LIANG kang.liang@enpc.fr
Photos	
Key Words	**Keywords: commuting pattern, spatial clustering, typology of urban areas, job accessibility, spectrum**
Bibliography of Speaker	2014-2018 Wuhan university, bachelor's degree in geography 2018-2020 Ecole des ponts ParisTech, master's degree in urban planning 2021-present Ecole des ponts ParisTech, CIRED laboratory, PhD in transport

Abstract	Abstract: Commuting patterns and urban typology are inherently linked, as the current definition of Functional Urban Areas (FUAs) is based on commuting flows between municipalities. This study investigates the spatial concentration of jobs across France, focusing on how it varies with distance and applying a spatial clustering approach based on the concept of the "spectrum"—a representation of both job opportunities and realized commuting flows. Descriptive statistics highlight distinct spatial distributions for jobs and workers: the working population is more spatially dispersed than jobs, with major cities exhibiting stronger centripetal attraction for both. This pattern is mirrored in the spatial distribution of commuting distances, which are longer in areas with stronger job concentration. Commuting distances are further characterized using log-distance bands, job types, and job location types. Results show that the number of accessible jobs follows a log-linear relationship with distance, that distance distributions are relatively homogeneous across job types, and that the Paris FUA displays a unique level of job attractiveness. The clustering method allowed to translate the statistical variations into geographical ones, i.e. communes with different worker density and job accessibility are classified into different categories. The grouping of the communes of different types further reveal macro spatial patterns, which presents similarity to the FUA map, thus having geographical implications for city planners. This clustering is further applied per job type and offers differentiated implications for each job type in terms of their spatial distribution, notably for farmers, executives and workmen. Overall, this study provides a novel approach that combines the spatial configuration of density and distance-based accessibility measurement to delineate macro spatial patterns, bringing insights in understanding the link between macro territorial configuration and individual commuting behaviour.

A010

Title of Speech	**INTERPRETING JOB FLOWS THROUGH SPATIAL ECONOMETRICS: LESSONS FROM CRETE, GREECE**
Author(s)	Stefanos Tsigdinos, Theodore Tsekeris
Corresponding author	Stefanos Tsigdinos distlp@mail.ntua.gr
Photos	
Key Words	**spatial econometrics, job flows, functional labour clusters, regional integration**
Bibliography of Speakers	Dr. Stefanos Tsigdinos is a Rural and Surveying Engineer (MEng) and an Urban/Regional Planner (MSc) (NTUA). He received his PhD in Transport Planning and Geography from NTUA. His research interests focus on transport geography, transport policy and economics, regional planning and development as well as on future mobility issues. He has published over 25 articles in scientific journals. Moreover, he is an editorial board member in four scientific journals dealing with spatial policy and development, while being a reviewer in over 20 scientific journals. He is now an Adjunct Lecturer at UniWA as well as a Research Associate at Centre of Planning and Economic Research (KEPE) in Athens. Dr. Theodore Tsekeris is a Research Professor in Transport Economics at the Centre of Planning and Economic Research (KEPE), Head Coordinator of the National Productivity Board of Greece, and Transportation Systems Management module tutor at the Hellenic Open University. He is a widely recognized expert (over 130 publications with more than 2000 citations) in transport with extensive (over 20 years) academic research

	experience in modelling transport systems. He has led several high-impact research projects, emphasizing the role of transport in sustainable and inclusive development.
Abstract	Understanding commuting patterns is crucial for effective spatial and transport planning, as job flows reflect the underlying dynamics of spatial interaction and labour mobility. The main objective of this study is to explore how social, spatial, economic and administrative factors influence daily work-related mobility, contributing to both theoretical and practical discussions in regional and transport economics. For this purpose, we examine the determinants of job flows across the municipal units (LAU2) of the island of Crete, Greece, using a theoretically sound spatial econometric framework, that is, the Spatial Durbin Model (SDM). The dependent variable, i.e., job flows, is analyzed as a function of several variables, such as population density, human capital, economic specialization, economic diversity, and building use mix (. Moreover, dummy variables are introduced to capture the administrative role (as a capital) and the mountainous character of each municipal unit. Spatial dependencies are incorporated through a spatial weight matrix, whose entries are expressed as a function of travel time between municipal units, so that represents actual commuting conditions and be policy relevant. Alongside the spatial econometric approach, an exploratory spatial data analysis is performed using univariate and bivariate Local Moran's I statistics to identify underlying spatial clusters. The findings indicate that job flows are influenced by a complex interplay of demographic, economic, infrastructure and geographical characteristics, highlighting the need for accessibility enhancement and coordinated spatial and economic policy approaches to reinforce the island's regional economic integration. The recognition of spatial (functional labour) clusters further enhances our understanding of commuting dynamics and potential regional disparities. This study has both academic research and policy-meaningful contributions. It explicitly offers valuable insights into spatial econometric applications, while providing evidence-based information for policymakers engaged in mobility and regional development planning, particularly in insular areas.

Session 6: CAVs

(Moderator-Prof. Negin Alisoltani, University Gustave Eiffel & ZHENG Renlong, Tongji University)

Stream 2

Time UTC+1 (Paris): 2025-11-13 11:30 - 12:40
Time UTC+8 (Shanghai): 2025-11-13 18:30 - 19:40

A021

Title of Speech	**ENHANCING RESILIENCE AND MANAGING CONGESTION: PLANNING AND FIELD EXPERIMENTS WITH CAVS**
Author(s)	Mostafa Ameli
Corresponding author	Mostafa Ameli mostafa.ameli@univ-eiffel.fr
Photos	
Key Words	**Connected Automated Vehicles, Traffic Congestion Mitigation, Resilience-as-a-Service, Bilevel Optimization, Agent-Based Simulation**

Bibliography of Speaker	Mostafa Ameli is an Associate Professor in applied mathematics, computer science, and transportation science at the Transportation Engineering and Computer Science Lab (GRETTIA), University Gustave Eiffel Paris, France, and is an affiliated researcher with the EECS Department and Institute of Transportation Studies, University of California, Berkeley. He received his Ph.D. degree at the University Paris-est, IFSTTAR (The French Institute of Science and Technology devoted to Transport, Planning, and Networks), Paris, France, and the University of Lyon, Lyon, France, in 2019. He is the founder of the IEEE France Section ITSS Chapter and a member of the IEEE ITS TC on Decision and Control in Transportation Systems. He is an INFORMS award winner for the outstanding paper in Urban Transportation Planning and Modeling. As a PI, he received the French national starting grant (ANR JCJC) in 2024, France-Berkeley Funding from Collège de France (2023-2024), and the I-SITE FUTURE (2023-2025).
Abstract	This study presents two frameworks based on deployments of Connected Automated Vehicles (CAVs), one for enhancing resilience in urban transportation networks and the other for improving congestion on highways through the integration of optimization modelling and agent-based simulation experimentation. The first framework introduces a methodological framework for Resilience-as-a-Service (RaaS) model designed to dynamically reallocate multimodal transport resources, including buses, taxis, and CAVs, in response to unplanned public transit disruptions. It employs a bi-level optimization approach that accounts for cost, availability, passenger wait times, and network constraints, ensuring service continuity while minimizing both user inconvenience and operator costs. The second framework focuses on congestion mitigation through a large-scale field experiment involving 100 CAVs deployed on a congested interstate corridor. These vehicles were equipped with adaptive cruise control algorithms governed by hierarchical speed planners and localized feedback controllers, designed to smooth traffic flow and suppress stop-and-go waves. Both frameworks are underpinned by agent-based simulations. The second one was validated through extensive field deployment. The talk will focus on how carefully coordinated CAV-based interventions can provide both proactive congestion reduction and reactive resilience enhancement, offering a replicable methodology for more efficient, adaptive, and robust urban mobility systems.

A101

Title of Speech	**SEMANTIC CODING AND ITS APPLICATIONS TO INTERNET OF VEHICLES**
Author(s)	Zuxing Li, Qi Jiang, Ningran Tao, Nishan Wu, Haiyang Liu, Yifeng Chen, Chao Wang
Corresponding author and email	Zuxing Li, zuxing@tongji.edu.cn
Photo of speaker	
Key Words	**Internet of vehicles, cooperative vehicle-infrastructure system, data compression, information theory**
Bibliography of Speaker	Zuxing Li , Assistant Professor with School of Electronics and Information Engineering, Tongji University since June 2020. He received the B.Eng. degree in information security from Shanghai Jiao Tong University, China, in 2009, the M.Sc. degree in electrical engineering from the Technical University of Catalonia, Spain, and the KTH Royal Institute of Technology, Sweden, in 2013, and the Ph.D. degree in electrical engineering from the KTH Royal Institute of Technology in 2017. He was a postdoctoral researcher with CentraleSupelec, France, in 2018-2019, and with the KTH Royal Institute of Technology in 2019-2020. His research interests include statistical inference, information theory, reinforcement learning, information security and privacy.
	Cooperative vehicle-infrastructure sensing plays an essential role in Internet of vehicles to support intelligent applications. Nowadays, massive, multimodal sensing data is collected, which results in heavy transmission load for traditional V2X communication network, complex multimodal data processing, and potential leakage of privacy-sensitive information. In this work, emerging

Abstract	semantic communication technology is developed to address those challenges by preserving cooperative sensing task-critical semantic information and masking privacy-sensitive information. Specifically, we focus on the semantic coding with side information at the receiver and prove the fundamental trade-off among data compression, source reconstruction, semantic extraction, and privacy preservation from an information-theoretic perspective. Grounded in the theoretic results, novel generative models are developed for data-driven deep semantic coding design. We demonstrate the effectiveness of theoretic results and generative models in the experiments on the standard IoV datasets as well as testbeds in Tongji campus.

A102

Title of Speech	**EXTERNAL HUMAN-MACHINE INTERFACE (EHMI) FOR BETTER INTERACTION BETWEEN PEDESTRIANS AND AVs: FRAMEWORK DESIGN AND EXPERIMENTS**
Author(s)	Ying Ni
Corresponding author and email	ying_ni@tongji.edu.cn
Photo of speaker	
Key Words	**Internet of vehicles, cooperative vehicle-infrastructure system, data compression, information theory**
Bibliography of Speaker	Ni Ying, who holds a Ph.D. in Traffic Planning and Traffic Engineering from the Technical University of Darmstadt, Germany, has been serving as a lecturer, associate professor, and tenured associate professor at the College of Transportation Engineering of Tongji University since 2010. In September 2014, she visited the University of California, Berkeley for a one-year academic exchange. Her primary research focuses on modeling and simulation of interactive behaviors in mixed traffic flow.

Abstract	To enhance the safety and efficiency of interactions between pedestrians and automated vehicles at road crossings, this study proposes an enhanced interaction strategy utilizing external Human-Machine Interfaces (eHMIs). The approach enables automated vehicles detecting pedestrians' crossing intentions and dynamically assess the real-time consistency between pedestrian and vehicle intentions based on their cooperation state. Based on this assessment, the system determines the activation of eHMI (on/off), generates the AV's decision, and when to display the eHMI, ensuring clear and timely communication. The eHMI design and validation were conducted in a CAVE-based immersive simulation platform under three experimental conditions: no eHMI, eHMI based on fixed-distance, and eHMI based on intention-recognition. Experimental results demonstrate the effectiveness of this strategy in enhancing situational awareness and promoting cooperative decision-making in mixed traffic environments.

A030

Title of Speech	**IMPROVED MULTI-AGENT DEEP REINFORCEMENT LEARNING-BASED INTEGRATED CONTROL FOR MIXED TRAFFIC FLOW IN A FREEWAY CORRIDOR WITH MULTIPLE BOTTLENECKS**
Author(s)	Lei Han, Lun Zhang, Haixiao Pan
Corresponding author	Lei Han leihan133@tongji.edu.cn
Photo of speaker	
Key Words	**Integrated traffic control, Multi-agent deep reinforcement learning, Connected and automated vehicle, Mixed traffic flow, Multi-ramp bottlenecks**

Bibliography of Speaker	Dr. Lei Han holds a Ph.D. in Transportation Engineering from Tongji University and has published extensively in the field of connected and automated vehicles. His current research interests include multi-agent systems, deep reinforcement learning, and mixed-traffic flow optimization.
Abstract	A major challenging issue related to the emerging mixed traffic flow system, composed of Connected and Automated Vehicles (CAVs) and Human-Driven Vehicles (HDVs), is the lack of adequate traffic control measures, especially in a large freeway corridor with multiple bottlenecks. Multi-agent deep reinforcement learning exhibits significant advantages, such as fast response, high flexibility, strong adaptability, low computational burden, and collaborative optimization. These features enable it to achieve superior efficiency and robustness in handling dynamically changing traffic environments and large-scale traffic control problems. Inspired by this, we propose a novel Integrated Traffic Control (ITC) strategy based on an Improved Multi-Agent Twin Delayed Deep Deterministic Policy Gradient (IPMATD3) algorithm in the mixed traffic environment (abbreviated as IPMATD3-based ITC). Specifically, the proposed IPMATD3-based ITC approach seeks to coordinate multiple Ramp Metering (RM) and Variable Speed Limit (VSL) controllers along a freeway corridor, with the objectives of improving traffic mobility and efficiency, enhancing safety, and reducing emissions. The proposed method utilized a centralized training with decentralized execution paradigm to learn the joint actions of all traffic controllers in a high-dimensional state and action spaces. A hybrid reward function is developed by synchronously considering the above objectives to optimize traffic control performance. Then, the rank-based prioritized experience replay mechanism is incorporated into the conventional MATD3 algorithm to improve learning efficiency. A real-world freeway corridor is selected to test the proposed control method. Moreover, its performance is compared with the several state-of-the-art methods. The simulation results demonstrate that the proposed method achieves remarkable control performance at a 10% CAV Penetration Rate (PR), effectively reducing the spatiotemporal extent of freeway traffic congestion. The proposed method outperforms other approaches in improving freeway traffic efficiency, mobility, safety, and environmental sustainability. Increasing the PR can improve the performance of various

	methods and benefit traffic operations. However, when the PR reaches higher levels, the marginal benefits of further increases become less pronounced.

Conclusion, Intro of previous awards & Perspectives

Time UTC+1 (Paris): 2025-11-13 12:40 - 13:00
Time (Shanghai): 2025-11-13 19:40 - 20:00

Prof.PAN Haixiao, Professor,Tongji University, Honorary Chairman of THNS

Prof.Fabien LEURENT, Professor, ENPC, Co-Chairman of THNS