Forum THNS2024:
TRANSFORMING TRANSPORT

（5th -7th, Nov, 2024, in Paris and on-line）

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

The THNS Forum is an International Symposium on the Sustainable Development of Urban Transport Systems. The forum got the name T-H-N-S from the theme of its first edition in 2008- **"Transport à Haut Niveau de Service" (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,Technological solutions, Soft modes, Transport and land-use at all spatial scales.

THNS2024 is co-organized by École nationale des ponts et chaussée – Institut Polytechnique de Paris (ENPC) & Tongji University, 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, EELISA European University,URBA2000,THALES SEC Transport, AUF (L'Agence universitaire de la Francophonie),WCTRS (World Conference on Transport Research Society)

Organizer

Supported by

THNS2024
Session Details

The sessions are arranged from 9AM-12:30PM in Paris time (16：00−19：30 in Beijing time), during 5th-7th, November, 2024. 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

<table>
<tr><td colspan="4">On-site venue: Paris-East campus by École nationale des ponts et chaussées – Institut Polytechnique de Paris (ENPC) and University Gustave Eiffel</td></tr>
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5th,November-DAY 1

Opening Session

Time UTC+1 (Paris): 2024-11-05 09:00 - 09:20
Time (Shanghai): 2024-11-05 16:00 - 16:20

Welcome & Orientation

Prof.Jérôme LESUEUR, Vice-President for Research and Education, École nationale des ponts et chaussée – Institut Polytechnique de Paris(ENPC)

Prof.LOU Yongqi, Vice President of Tongji University

Mm.Marie-Christine BERT, Vice President of International Relations and Corporate Partnerships, ENPC

Prof.MA Wanjing, Head of College of Transportation Engineering,Tongji University, Co-Chairman of THNS2024

Prof.PAN Haixiao, Tongji University, Honorary Chairman of THNS2024

Prof.Fabien LEURENT, Director of Research, International Center for Environment and Development Research (CIRED) ,ENPC, Co-Chairman of THNS2024

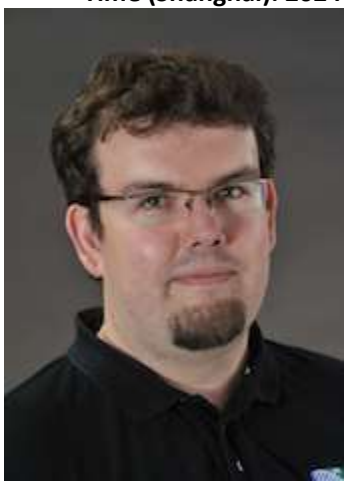
Group photo - screenshot and on-site

Keynote 1

Technological Advances in VI2E Interaction Model for the Design and Management of NextGen Transport Infrastructures

Nicolas Hautière, University Gustave Eifel

Time UTC+1 (Paris): 2024-11-05 09:20 - 10:00
Time (Shanghai): 2024-11-05 16:20 - 17:00



Nicolas Hautière, Head of COSYS Department, Université Gustave Eiffe. He graduated from Ingénieur des Ponts, des Eaux et des Forêts (2013) and received the habilitation to manage research (HDR) from the Université Paris-Est in 2011. Since the 1st September 2013, He is Project Director at the Components and Systems Department (COSYS) of the French Institute of Science and Technology for Transport, Development and Networks (IFSTTAR). After ten years of research in computer vision, his mission is now to initiate, develop and manage novel instruments of research and innovation, which allow the industrial transfer of research results in the area of the renewed intelligence of vectors and infrastructures for mobility.

Abstract
Mobility, particularly road mobility, is the focus of many of society's challenges. It is a source of greenhouse gas emissions, air pollution and land reclamation. On a daily basis, it is a source of nuisance through the noise it generates, particularly in urban areas, and the congestion it causes, especially on urban motorways. Finally, roads continue to kill and injure on secondary road networks. Nevertheless, roads remain essential for the daily mobility of many of our fellow citizens.
To meet these challenges, it is generally accepted that the challenge is to develop more sustainable, durable, safe and inclusive forms of mobility. This means developing a new range of vehicles - electric vehicles, automated vehicles - that can be used to provide new mobility services (car-sharing, on-demand, etc.). History shows, however, that these new vehicles can only become widespread if the right infrastructure is in place. From mule track to Roman road, tarmac pavement and motorway, the road must now enter its 5th phase to enable these emerging forms of mobility to become widespread and better meet the expectations of the public.

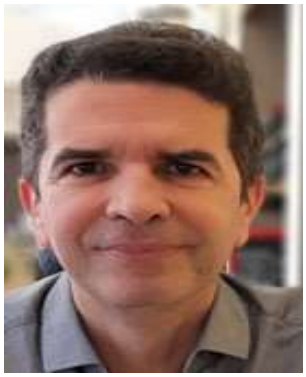
To achieve this, it needs to be increasingly ‘connected’ to its users. This means connecting the road with traffic information systems to regulate usage, but also with the operating systems of road managers to ensure maximum availability of the road, even in difficult weather conditions. This also involves energy connectivity to increase the range of low-carbon vehicles and at the same time power the various road systems and equipment, typically telecoms.

Road design should gradually move from the Vehicle-Infrastructure-Conductor (VIC) to the Vehicle-Infrastructure-Information-Energy (VI2E) interaction model. The challenge is to know if this road will be ready for the Anthropocene era, i.e. will be compatible with radical recent policies and thus to reach the multiple 'NetZeros' objectives in 2050.

Session 1:AI & road flow

Time UTC+1 (Paris): 2024-11-05 10:00 - 11:10
Time (Shanghai): 2024-11-05 17:00 - 18:10

A0010

Title of Speech	**IMPROVEMENT OF OCCUPANCY SENSOR FOSTERS HOV LANE ENFORCEMENT IMPLEMENTATION**
Author(s)	Alexis Bacelar, Frederic Aliaga, Ayoube Rami, Amir Nakib, Richard Bertoli
Corresponding author	Alexis Bacelar alexis.bacelar@cerema.fr
Photos	
Key Words	**HOV lane , occupancy sensor , evaluation , enforcement**

Bibliography of Speaker	Alexis Bacelar received the Dipl-Ing. Degree in electrical engineering from Polytec engineering school of Clermont-Ferrand University in 1991. He received Ph.D degree in acoustics from INSA de Lyon in 1996. From 1997 to 2002, he worked as a researcher in the civil engineering laboratory in Rouen. His interests include the research and applications linked to road lighting and visiblity model. In 2003, he began to work as an engineer for the French transport ministry in Lyon. His concern include traffic sensor, variable message sign and more generally all material and intelligent transport systems that can improve traffic management and people mobility. He has been working on the subject of automatic occupancy measurement for 10 years. He received Cerema Prize (2015) and ATEC congress best paper award (2016) for implementing the first European PoC of an occupancy sensor in May 2015 at Jougne (French-Swiss border). Frédéric Aliaga is a road traffic engineer at CEREMA. He got an engineering degree from ENTPE (Graduate School of Civil, Environmental and Urban Engineering), and a specialized engineer degree in urban engineering and information technology (École des Ponts ParisTech and EIVP). His areas of expertise are intelligent transport systems (autonomous vehicles), new technologies for traffic management (dynamic access control, travel time with Floating Car Data and blue tooth) and is interested in AI applications for optimization methods. He taught mathematics and statistics in medical school, and participates in computer training and traffic in engineering school. He has been working on the subject of automatic occupancy measurement for 8 years.

Abstract	With the development of carpooling and High Occupancy Vehicle (HOV) lanes in France, it is important to know the number of carpoolers traveling in a vehicle. Today, this increasingly precise counting initially informs users whether they can drive in the HOV lane. Furthermore, it verifies that vehicles present in the HOV lanes are actually authorized to be there, which is crucial for the system's credibility with the public: a high violation rate would discredit the functionality of these lanes. The current implementation in France of semi-automatic control on HOV lanes requires very precise counting. Indeed, since the image visualization is performed by a local operator, it is significant for them to have the shortest decision time. This implies highly visible images and the prior rejection of uncertain vehicles. To pursue this objective, Cerema evaluated the metrological performance of the Cyclope.ai occupancy sensor located at the roadside. The evaluation took place on the acceleration lane after the toll of Salon de Provence in the South-North direction of the A7 motorway. This motorway is managed by Vinci Autoroutes and supports traffic of 100,000 vehicles/day, including 13% heavy vehicles. The speed limit is 130 km/h for light vehicles and 90 km/h for heavy vehicles. This evaluation ended in December 2023 with very positive results: • Firstly, the system's visibility rate exceeds 87%. The Cyclope.ai device stands out for the quality of its images, which is very important for semi-automatic control ; • Moreover, out of 1000 vehicles of interest, the number of false positives can be estimated at 30, plus residual false positives due to unclassifiable vehicles, and 96.6% true positives (cheaters) detected. These results allow us to consider the semi-automatic control of HOV lanes.

A0027

Title of Speech	**TRUSTED PERCEPTION METHOD FOR TRAFFIC SIGNS THAT ARE PHYSICALLY ATTACKED**
Author(s)	Qunyao Tan, Shize Huang, Zhaoxin Zhang
Corresponding author	Zhaoxin Zhang 1910925@tongji.edu.cn

Photos	
Key Words	**automatic vehicle detection and identification systems , safety , traffic signal , vehicle–highway automation , hazard perception**
Bibliography of Speaker	Qunyao Tan received the B.S. degree in Mathematics and Applied Mathematics from Shandong University, Jinan, China, in 2023, and will receive the M.S. degree in Transportation Engineering from Tongji University, Shanghai, China, in 2026. Her research interests include traffic information trusted perception, traffic safety, and intelligent maintenance for rail transit.
Abstract	Traffic sign recognition is a crucial method by which autonomous driving systems acquire road information, and is predominantly based on deep neural networks (DNNs). However, the recognition results of DNNs are not always trustworthy for traffic signs subject to abnormal disturbance. Recently, the phenomenon of adversarial examples successfully deceiving DNNs has garnered considerable attention. Because DNN-based computer vision techniques are becoming increasingly prevalent in traffic scenarios, the misclassification of attacked traffic signs by DNN classifiers poses serious safety hazards. Although numerous methods have been proposed for crafting physical adversarial examples that are robust in the real world, most existing defense approaches focus on digital attacks, which necessitate the adversary infiltrating the embedded system; thus, it becomes challenging to obtain results. A reliable approach for defending against physical adversarial traffic signs enables autonomous vehicles to achieve trusted perception of traffic signs. In this paper, we present a deep image prior-based pipeline to defend against robust adversarial traffic signs in the real world, an approach that circumvents the need for prior

	data sets during training. Our approach protects the safety of autonomous vehicles by performing image reconstruction of captured traffic sign images. The genuine traffic sign class can be inferred by leveraging the consistency of the victim classifier's decision results for reconstructed images at different stages. Additionally, we evaluate the efficacy of our defense pipeline for detecting other potential types of physical adversarial traffic signs that may exist in the real world, thus demonstrating the generalizability of our approach.

A0028

Title of Speech	**A NEW FORMULATION AND AN EXACT SOLUTION APPROACH FOR THE TRAVELING SALESMAN PROBLEM WITH A DRONE STATION**
Author(s)	Zhiyuan Shi, Shaozhi Hong, Zeling Wang
Corresponding author	Shaozhi Hong hongshaozhi@tongji.edu.cn
Photos	
Key Words	**Traveling salesman problem , Drone parallel scheduling , Mixed-integer linear programming , Logic-based Benders decomposition**
Bibliography of Speaker	Zhiyuan Shi 2211231@tongji.edu.cn Zhiyuan Shi received the B.S. degree in traffic engineering from Tongji University, in 2022, where he is currently pursuing the Ph.D. degree in urban mobility. His research interests include air transportation, large-scale optimization, and urban logistics. He has also received the Best Paper Awards at CICTP 2024.

Abstract	The rapid growth of e-commerce has posed significant challenges for urban last-mile delivery. In this paper, we study a truck-drone collaborative delivery problem, referred to as the traveling salesman problem with a drone station (TSP-DS), which is well-suited for densely populated urban environments. The TSP-DS extends the well-known parallel drone scheduling traveling salesman problem (PDSTSP). The truck starts from the depot and can deliver packages to the drone station for drone delivery. To minimize the delivery makespan, we propose a new formulation for the TSP-DS using mixed integer linear programming (MILP). We then develop an exact algorithm based on the logic-based Benders decomposition approach. To evaluate the effectiveness of our formulation and algorithm, we perform extensive computational experiments using test instances generated from existing benchmarks. The numerical results validate the improvements offered by our formulation, including a reduction in the number of variables and constraints and shorter computation times, compared to the TSP-DS formulation in the existing literature. Our Benders approach also outperforms the state-of-the-art commercial solver Gurobi and successfully solves an instance with 101 customers to the global optimum. In addition, we perform sensitivity analyses to gain valuable management insights into the impact of critical model parameters, including the number, speed, and flight duration of drones, as well as the location of the drone station, on the performance of this delivery system. The results show that parameter configuration is essential in practical applications, as these factors can significantly affect the overall system performance.

A0046

Title of Speech	**STOCHASTIC DRIVER MODEL BASED CONTROLLER FOR HUMAN-LEAD VEHICLE PLATOONING**
Author(s)	Shuhan Wang, Jia Hu, Yiming Zhang
Corresponding author	Shuhan Wang shu_hans@tongji.edu.cn

Photos	
Key Words	**CACC , vehicle platooning , human-lead platooning , stochastic model predictive control**
Bibliography of Speaker	Shuhan Wang received the B.S. degree in traffic engineering from Southeast University, Nanjing, in 2022. She is currently pursuing the M.S. degree in transportation engineering from Tongji University. Her main research interests include planning and control of connected vehicles.
Abstract	Human-Lead Cooperative Adaptive Cruise Control (HL-CACC) stands out as a promising technology for vehicle platooning in practical applications. By employing a Human-driven Vehicle (HV) as the platoon leader, HL-CACC effectively reduces costs and enhances the reliability of perception and decision-making. However, current HL-CACC technologies face significant challenges in ensuring driving safety due to the leading human driver's uncertain behavior. This study introduces a Cooperative Adaptive Cruise Control (CACC) controller for maneuvering a human-lead platoon. The controller addresses the uncertainty associated with the human-driven leader by predicting their future driving intentions. Key to its design is the integration of stochastic prediction models for the leading vehicle's state and scenario-based stochastic model predictive control (scenario-based SMPC). The proposed controller has the following features: i) comfortable cruising in traffic with fluctuating speed; ii) safe cruising with string stability guaranteed; iii) fast computation for real-time implementation. The proposed controller is evaluated on a PreScan&Simulink simulation platform. Results reveal that the proposed controller: i) ensures comfort cruising by maintaining a stable speed and acceleration when the human platoon leader introduces

	oscillation; ii) enables the followers to anticipate the speed change of the leader vehicle and take action in advance to guarantee safety; iii) is confirmed with string stability; iv) is verified to be ready for real-time implementation.

Session 2: Transport and development

Time UTC+1 (Paris): 2024-11-05 11:20 - 12:30
Time (Shanghai) :2024-11-05 18:20 - 19:30

A0004

Title of Speech	**ACCESS TO BASIC AMENITIES VIA PUBLIC TRANSPORT IN RURAL AREAS IN THE MEDITERRANEAN. IS IT FEASIBLE AND EQUITABLE? WHAT ABOUT FUTURE PERSPECTIVES?**
Author(s)	Stefanos Tsigdinos
Corresponding author	Stefanos Tsigdinos distlp@mail.ntua.gr
Photos	
Key Words	**Accessibility , Rural areas , Equity , Public transport , Scenarios**
Bibliography of Speaker	Dr. Stefanos Tsigdinos is a Rural and Surveying Engineer (MEng) and an Urban Planner (MSc) (NTUA). He received his PhD in Urban Mobility Planning and Transport Geography from NTUA. As a research assistant at NTUA, he has participated in several projects related to sustainable urban mobility and integrated urban and transport planning. He is now a Postdoctoral Researcher at NTUA working on transport geography, transport policy,

	accessibility, equity, and future mobility issues. Moreover, he is an Adjunct Lecturer at the UniWA, teaching the core course "Urban Planning" as well as the elective courses "Regional Planning and Development" and "Coastal areas and Maritime Spatial Planning".
Abstract	Using public transport to access essential facilities such as public services/administration, healthcare, post offices, grocery stores, supermarkets, etc. should be truly embraced in the sake of sustainability and inclusivity. Urban areas are undergoing significant transformations in this direction. However, what about rural areas? Inefficient public transport services often encountered in those areas, hinder equitable access, thus cultivating “a car-dependent transport realm” for their residents. Which should be the key solutions for enhancing accessibility and equity? In this context, this research investigates the levels of public transport accessibility to basic amenities in rural areas of the Mediterranean, assessing both current conditions and future potentials through scenario testing. Additionally, the study explores the equity implications for households lacking personal motorised vehicles. The study area is the municipality of Amari in Crete, Greece, characterised by a prevalent reliance on cars in daily life. Four distinct scenarios are examined; the first assesses the existing condition, the second proposes a redistribution of basic amenities, the third explores the expansion of the public transport network, and the final one suggests both new amenities and new public transport routes. Employing spatial analysis techniques and welfare economics, helps measure accessibility and equity conditions in the study area. The findings show that implementing combined solutions could significantly enhance both accessibility and equity, potentially reducing car usage to a certain extent. However, an intriguing finding is that when implementing standalone solutions, extending public transport lines lead to more favourable conditions for households without access to personal vehicles compared to the redistribution of amenities. The study's contribution lies in its quest for key solutions tailored to rural areas, exemplified by the challenging case of Amari municipality. By identifying pathways towards improved accessibility and equity, this research intends to contribute to the development of more inclusive and sustainable rural transport systems.

A0026

Title of Speech	**EVALUATING TEMPORAL VARIATIONS IN ACCESS TO MULTI-TIER HOSPITALS USING PERSONAL VEHICLES AND PUBLIC TRANSIT: IMPLICATIONS FOR HEALTHCARE EQUITY**
Author(s)	Ziqi Yang, Yuntao Guo, Xinghua Li
Corresponding author	Yuntao Guo yuntaoguo@tongji.edu.cn
Photos	
Key Words	**Healthcare accessibility , Equity , Public transit , Personal vehicle , Temporal variations**
Bibliography of Speaker	Ziqi Yang is a Ph.D. candidate in the Urban Mobility Institute at Tongji University, Shanghai China. He received his undergraduate degree from Southwest Jiaotong University. His research interests include Transport and Land use, Travel Behaviour, Transport Geography, and Transport Economics.
Abstract	Understanding healthcare accessibility, or the ability to access healthcare services, has significant implications for both individual well-being and community equity. However, existing studies seldom account for temporally varying factors such as traffic conditions and hospital schedules, resulting in miscalculation of accessibility. This study addresses this gap by introducing a framework that evaluates accessibility to multi-tier hospitals, factoring in both spatial and temporal aspects, using public transit (PT) and personal vehicles (PVs), and assesses its impact on

	horizontal and vertical equity. Implemented in Shanghai, China, we employ the Gaussian two-step floating catchment area method for accessibility quantification and utilize map APIs for dynamic travel time data. Our analysis reveals: (i) notable temporal fluctuations in healthcare accessibility, especially for PT, and their significant impact on both horizontal and vertical equity due to varying travel times and hospital schedules; (ii) larger disparities in higher-tier hospital accessibility compared to lower-tier ones; (iii) greater horizontal equity using PV-based accessibility and higher vertical equity using PT-based accessibility. These findings highlight the need to offer customized transit to healthcare facilities, expand telehealth services, incorporate equity in healthcare resource allocation, incentivize healthcare professionals to work in underserved areas, and develop outreach programs to improve accessibility and equity.

A0032

Title of Speech	**ROAD FREIGHT TRAFFIC AND INDUSTRIAL ACTIVITY: EVIDENCE FROM THE GREEK CRISIS**
Author(s)	Theodore Tsekeris, Georgios Bertsatos
Corresponding author	Theodore Tsekeris tsek@kepe.gr
Photos	
Key Words	**Freight traffic , toll index , industrial activity , decoupling , ARDL models.**
Bibliography of Speaker	Theodore Tsekeris: He 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 recognised 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, emphasising the role of transport in sustainable and inclusive development. {URL: https://www.kepe.gr/en/user/tsek} Georgios Bertsatos: He holds a PhD in Economics from the Athens University of Economics and Business (AUEB), as well as a Postdoc from the same university. He is a Research Fellow at the Centre of Planning and Economic Research (KEPE), and member of the research team of Gulf One Lab for Computational & Economic Research (GOLCER) of Lancaster University. His research interests include applied econometrics, economics and finance, banking and sports economics. Among others, he has published in journals such as the Journal of Financial Stability, Economics Letters, Empirical Economics, and the International Review of Applied Economics. {URL: https://www.kepe.gr/en/user/gbertsatos}
Abstract	The relationship among road transport and economic activity has been long investigated and attracted increasing attention in the last decades, particularly in the light of 'decoupling' strategies aimed at improving the transport efficiency without curbing economic growth and harming the environment. This paper develops a toll index for Greece describing the traffic intensity of truck vehicles along most of the urban and interurban highway toll stations of the country. In turn, it employs Autoregressive Distributed Lag (ARDL) models at levels and error correction form (ECM) to explore the short-run and long-run impacts of the proposed toll index on the industrial/manufacturing activity, covering a period spanning the long and persistent recession of the Greek economy between 2008-2016. The findings denote that, even if the long-run impact of toll index on the industrial/manufacturing is found to be statistically weak, there are significant short-run effects in a two-month period. Specifically, in the steady state, a weak negative decoupling between truck traffic volume and industrial

	activity is observed, as the short-run toll index elasticity equals 0.16. Namely, a 1% increase in the toll index appears to temporarily increase the manufacturing index by 0.16%. The error-correction term (ECT) is found to be significant and equal to -0.37, implying a rather fast time of adjustment to equilibrium. In fact, 37% of any disequilibrium closes in the first month and it takes approximately 10 months to close 99% of the gap, if any, from the steady-state value. In terms of policy recommendations, our findings could shed more light into the intricate relationship between road freight transport and economic cycles. Particularly, it seems that the toll index could well be used for nowcasting or forecasting changes in industrial activity in the very near future. Last, the findings could potentially support environmentally and financially sustainable public policy and private investment decisions on building and expanding the capacity of the national road network.

A0035

Title of Speech	**ENVISIONING REGIONAL MOBILITY SCENARIOS IN EUROPE. A COMPARATIVE STUDY BETWEEN GREECE AND BELGIUM**
Author(s)	Stefanos Tsigdinos, Sara Tori
Corresponding author	Stefanos Tsigdinos distlp@mail.ntua.gr
Photos	
Key Words	**Accessibility , Regional transport , Equity , Scenarios , Future mobility**
Bibliography of	Dr. Stefanos Tsigdinos is a Rural and Surveying Engineer

Speaker	(MEng) and an Urban Planner (MSc) (NTUA). He received his PhD in Urban Mobility Planning and Transport Geography from NTUA. As a research assistant at NTUA, he has participated in several projects related to sustainable urban mobility and integrated urban and transport planning. He is now a Postdoctoral Researcher at NTUA working on transport geography, transport policy, accessibility, equity, and future mobility issues. Moreover, he is an Adjunct Lecturer at the UniWA, teaching the core course "Urban Planning" as well as the elective courses "Regional Planning and Development" and "Coastal areas and Maritime Spatial Planning".
Abstract	This paper aspires to identify future pathways for enhancing regional accessibility and equity within the European Union (EU), with a focused examination on Belgium and Greece. By carefully analysing formal policy documents and translating them into cohesive scenarios, this study scrutinises the current landscape and potential future developments in regional transport infrastructure and services. Through a comparative analysis of Wallonia in Belgium and the regions of Central Macedonia, Eastern Macedonia and Thrace in Greece, we unveil notable differences and commonalities between northern and southern Europe in terms of regional mobility. The findings reveal that while formal policy directions in both countries share overarching similarities, Belgium tends to articulate specific, actionable goals for regional mobility. In contrast, Greece has developed broader strategic plans with a visionary scope for future mobility and urban development. Moreover, policy documents in Greece make slight references to accessibility and equity, whereas these concepts are notably absent in the Belgian plans. This indicates a valuable opportunity for cross-learning, where each country can benefit from the other's approach to create an integrated and comprehensive vision for an accessible and equitable regional mobility landscape. The contribution of this research is manifold. It not only provides a detailed comparative analysis of regional mobility policies in two distinct EU contexts but also offers meaningful insights for policymakers and stakeholders. To be more precise, the outcomes could be useful for shaping policy decisions and strategic planning (for instance, policy

	measures providing reliable public transport for disadvantaged populations), ultimately striving towards a more inclusive and equitable regional transport system across the EU.

Session 3: Public transport development (Stream2)

Time UTC+1 (Paris): 2024-11-05 11:20 - 12:30
Time (Shanghai): 2024-11-05 18:20 - 19:30

A0005

Title of Speech	**THE INTEGRATION OF HIGH-CAPACITY TRANSPORT MODES INTO LOCAL DEVELOPMENT IN THE AGGLOMERATION OF ABIDJAN: A CASE STUDY OF BUS RAPID TRANSIT (BRT) AND THE METRO**
Author(s)	DIABATE LANCINE
Corresponding author	DIABATE LANCINE lancine.diabate@inphb.ci
Photos	
Key Words	**high-capacity transport modes , integration , master plan SDUGA , SOTRA , Gbaka , BRT and metro**
Bibliography of Speaker	DIABATE Lanciné, Ph. D. LECTURER at Institut National Polytechnique Félix Houphouët Boigny (INP-HB), Yamoussoukro (Ivory Coast) Doctor in Engineering Sciences and Technology of Université Libre de Bruxelles (ULB) Field: Transport Systems Analysis and Engineering / Transport Economics Master in Transport Management of Université Libre de Bruxelles Civil Engineer (Graduate of INP-HB

	Yamoussoukro) E-mail: lancine.diabate@inphb.ci KEY QUALIFICATIONS Transportation Engineering • Transportation planning • Analysis of problems related to mobility of people and goods Transport Economics • Financial aspects of transport infrastructure • Techno-economic analysis of transport (road, air, maritime and rail transport) • Logistics and supply chain management Civil Engineering • Urban planning • Transportation Engineering Environmental Engineering • Environmental aspects of transport infrastructure
Abstract	The integration of high-capacity transport modes into local development in the Agglomeration of Abidjan: a case study of Bus Rapid Transit (BRT) and the Metro. DIABATE Lanciné, Institut National Polytechnique Félix Houphouët Boigny — BP 1083 — Yamoussoukro lancine.diabate@inphb.ci Summary: This study aims to demonstrate the local development of the Abidjan agglomeration through the integration of high-capacity transport modes. The study area is the Abidjan agglomeration, which has been delineated by the urban master plan designated as SDUGA (Schéma Directeur du Grand Abidjan). In this zone, capacity transport is currently provided by small-scale transport and SOTRA buses. The fares of artisanal transport services vary according to the journey, the commuting patterns of the passengers, and the duration of the journey. The difficulties associated with small-scale transport can be broadly categorised into two main areas: firstly, the malfunctions that occur in the provision of the service itself, and secondly, the malfunctions that occur in the interactions between the service provider and the user. One challenge with SOTRA is that it does not extend to the first and last kilometres. Furthermore, there are events that present a threat to the continued operation of SOTRA. During periods of civil unrest, SOTRA buses are frequently vandalised and even burned. The new modes of transport are the BRT and the Métro, which are currently under construction. The analysis indicates that the average delay is 1 hour and 13 minutes. In order to facilitate local development in the Abidjan agglomeration, it is recommended that capacity transport (BRT and metro) be integrated, that small-scale transport (Gbaka) be professionalised, and that capacity transport systems be

	made interoperable. The project will primarily benefit artisanal transport operators, who will enjoy increased revenue, the elimination of illicit practices, and ultimately, enhanced customer satisfaction. Key words: high-capacity transport modes, integration, master plan SDUGA, SOTRA, Gbaka, BRT and metro.

A0036

Title of Speech	**IMPACT ASSESSMENT OF DAKAR'S REGIONAL EXPRESS TRAIN AND BUS RAPID TRANSIT USING A DYNAMIC MULTIMODAL MODEL**
Author(s)	Aly Koita, Ababacar Fall
Corresponding author	Ababacar Fall afall@ept.edu.sn
Photos	
Key Words	**Dynamic model , Mass Rapid Transit Systems , Time Savings , Greenhouse Gas Emissions**
Bibliography of Speaker	Aly Koita, a Mauritanian civil engineering graduate from the Thies Polytechnic School in Senegal, has a deep passion for sustainability, particularly within the African context. For his final year project, he developed a multimodal transport model to assess the impact of recent transportation infrastructures in Senegal. He aims to conduct a comparative study of the Mass Rapid Transit systems in Dakar and other African cities.
Abstract	The multimodal transport model developed as part of this thesis is unprecedented in Senegal. Previous models for transport planning in Senegal have been static and unable to show hourly fluctuations in travel. However, this new

	model is dynamic and addresses this gap. The chosen approach for developing this model is the multi-agent approach, where each vehicle or pedestrian acts as an agent seeking the most advantageous route, primarily considering travel time and costs. The impact assessment indicators include average travel times, average distances traveled, modal shares, and greenhouse gas emissions. The overall objective is to evaluate the short-term impact of the Dakar Regional Express Train (TER) and the potential impact of the Dakar Bus Rapid Transit (BRT). Both are Mass Rapid Transit Systems. The specific objectives are to evaluate time savings and estimate the reduction in greenhouse gas emissions due to these transport infrastructures. The results are quite promising, with travel times within the Dakar region reduced by an average of 16 minutes representing a 20 % decrease. Additionally, the combination of TER and BRT leads to a 11 % reduction in greenhouse gas emissions. Public transportation becomes much more competitive, with its modal share increasing from 24 % to 30 %.

A0101

Title of Speech	**EXPRESS COACH LINES: INTERNATIONAL COMPARISON**
Author(s)	Guillaume Garrigues, Fabien Leurent
Corresponding author	Guillaume Garrigues guillaume@garrigues.fr
Photos	
Key Words	**Techno-economic analysis; service frequency; capacity filling; production costs; fares; commercial revenue; context sensitivity; socio-economic and environmental performance.**

Bibliography of Speaker	Guillaume Garrigues teaches economics and social sciences in high school, works for the Institute of France, and graduated from Sciences Po Bordeaux and Centrale Supélec's Master's program in Environmental, Energy and Transport Economics. He is currently working on a research project at CIRED under the supervision of Fabien Leurent. His aim is to understand the conditions under which an express bus line can be a useful and efficient mode of transport, by identifying the main technical and economic characteristics of existing networks and analyzing their relationship with local areas. Fabien Leurent, bridge, water and forest engineer, is Director of Research at CIRED (Centre International de Recherche sur l'Environnement et le Développement) at École des Ponts. He models territorial systems and transport networks, with their economic and environmental impacts. He heads the Territorial Mobility Chair, a partnership between ENPC and IDFM, and also works with Renault, ECOV, RATP, SNCF, Vinci and start-ups.
Abstract	High-service coach lines exist in a number of countries: in Spain with radial access to Madrid, in Brazil, in the USA, in India, in France (among others, the Dourdan-Massy, Bordeaux-Créon, AixMarseille links). A high level of service, not only in terms of running speed but also frequency, is the “Express” feature. A line of this kind is expected to attract massive ridership and high levels of traffic, in particular by transferring traffic from the car: as a result, it will have a positive environmental impact, particularly in terms of the carbon footprint of the local mobility system. What are the typical performances of an express bus line in terms of ridership, commercial revenue and operating costs? With what levels of financial profitability, and also socio-economic profitability ? Based on existing lines, what insights can be drawn for the further development of metropolitan and intercity services in France ? Long distance public transports development is a major stake for social and territorial cohesion and to reduce our carbon footprint - which represent 30% of our total CO2 emissions in France. The suburban and long distance public transport travels are train-oriented. Yet, the rail transport production costs are too high to be widely affordable to serve medium and low density of population territories. Besides, coach lines running cost is around 4 times lower

	than train and can be put in place very quickly. We noted an upgrade of coach services that are more and more comfortable and equipped with wifi, power outlets, reclining seats. The frequency of the coaches can also reach 5 minutes in peak time in some lines and dedicated routes are developing to make coach services more and more attractive. We selected and analyzed a dozen express coach lines in the above-mentioned countries. For each, we have characterized the territorial conditions (route, ridership) and recorded the various performance indicators. We have drawn up a summary table of the lines' performance, enabling us to compare them and identify common points. By way of example, operating costs range from €3 to €5 per km travelled by a vehicle in France.

A0054

Title of Speech	**DEVELOPMENT OF A PUBLIC TRANSPORT NETWORK BY BUS IN YAOUNDé FOR A SIGNIFICANT IMPROVEMENT OF THE URBAN AND PERI-URBAN TRANSPORT OFFER**
Author(s)	Roméo DONGMO-TETCHANG, Lanciné DIABATE, Alassane Ballé NDIAYE
Corresponding author	Roméo DONGMO-TETCHANG dongmotetchang@gmail.com
Key Words	**public transport , urban transport , bus , network , mobility , planning**
Bibliography of Speaker	My name is Dongmo-Tétchang Romeo. I recently defended my Master's thesis in Transport Planning at the Ecole Nationale Supérieure des Travaux Publics de Yaoundé, on the theme: Development of a public bus transport network in Yaoundé for a significant improvement of the offer urban and peri-urban transport. I am 32 years old and I am passionate about transport issues, more specifically sustainable mobility. I am interested in the impact of
	transport on urban mobility in Africa and in Cameroon in particular and in the strategies that can be put in place to improve mobility in our cities.

Abstract	Development of a public transport network by bus in Yaoundé for a significant improvement of the urban and peri-urban transport offer DONGMO-TETCHANG Roméo Ecole Nationale Supérieure des Travaux Publics de Yaoundé dongmotetchang@gmail.com DIABATE Lanciné Institut National Polytechnique Félix Houphouët Boigny Lancine.diabate@gmail.com NDIAYE Alassane Ballé Université Libre de Bruxelles Alassane.ndiaye@ulb.be Abstract: The city of Yaoundé is facing significant demographic and urban growth which accentuates the challenges of urban mobility. With a population of 3 million inhabitants in 2017 and a projection reaching 5.6 million in 2035, the city is suffocating under the weight of an inadequate transport system which struggles to meet the needs of the population. The predominance of personal vehicles, taxis and motorcycle taxis causes congestion, pollution and a loss of quality of life for citizens. Public transport by bus represents less than 3% of trips and suffers from a lack of efficiency and reliability. Faced with this alarming situation, the establishment of an efficient and sustainable bus network is essential. It is in this context that this work takes place, the main objective of which is to develop a public bus transport network capable of capturing at least 5% of daily trips in the city of Yaoundé and its surroundings by 2027. To do this, the data necessary for characterizing transport demand and designing bus lines were collected. The bus lines were then designed using ArcGIS software. Finally, the modeling and simulation of the network on the TRANUS software made it possible to define its characteristics. The results of this research show that it is possible to set up a public bus transport network which significantly improves the transport offer. The proposed network, made up of 12 bus lines and 5 minibus lines, is capable of capturing more than 374,000 trips per day. In addition to increasing the bus modal share, the network meets the population's mobility needs with very competitive travel and waiting times. Keywords: public transport, urban transport, bus, network, mobility planning

6th, November-DAY 2

Keynote 2: Development and trend: autonomous taxis in China

Chengliang CUI

Time UTC+1 (Paris): 2024-11-06 09:00 - 09:40
Time (Shanghai): 2024-11-06 16:00 - 16:40

Chengliang CUI, an alumnus of Tongji University, working for a well-known technology company in China, is one of the earliest practitioners to participate in the development of autonomous taxis in China. He has worked as a product R&D and intelligent driving product manager, promoting the landing and operation of autonomous taxis in multiple cities, participating in policy and regulation formulation, operating autonomous taxis in cities such as Shanghai and Wuhan, and improving autonomous taxi products.

Abstract

The development of robotaxis in China is driven by the need to address issues such as traffic congestion, environmental pollution, and inefficient private car usage. With advancements in artificial intelligence, sensors, and communication technologies, the realization of autonomous vehicles has become increasingly feasible.

The driverless taxi industry in China is currently in its early stages of commercialization. Major players like Baidu's Apollo, Pony.ai, and AutoX have been actively testing and deploying their self-driving taxis in various cities. These vehicles are equipped with high-precision maps, cameras, radars, and other sensors, enabling them to navigate complex road conditions.

Despite the progress, robotaxis in China still face numerous challenges, including technical limitations, high operational costs, regulatory hurdles, and public acceptance. Ensuring the safety and reliability of these vehicles under all conditions remains a top priority. Additionally, the industry is grappling with issues such as liability in the event of accidents and the integration of robotaxis into existing transportation systems.

The future of robotaxis in China looks promising. With continuous technological advancements and policy support from the government, it is expected that these vehicles will become more cost-effective and reliable over time. As public acceptance

grows, robotaxis are likely to play an increasingly important role in urban mobility, offering a safer, more efficient, and environmentally friendly transportation option. Overall, while the path to widespread adoption of robotaxis in China is still fraught with challenges, the industry is making steady progress and holds significant potential for transforming urban transportation in the future.

Session 4: Mobility services: economics and organization

Time UTC+1 (Paris): 2024-11-06 09:40 - 11:10
Time (Shanghai): 2024-11-06 16:40 - 18:10

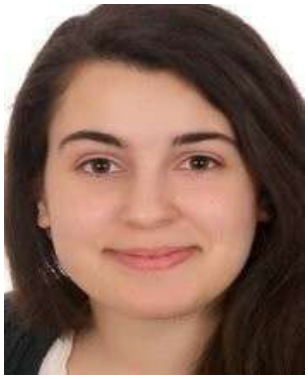
A0011

Title of Speech	**STRATEGIZING SUSTAINABILITY AND PROFITABILITY IN ELECTRIC MOBILITY-AS-A-SERVICE (E-MAAS) ECOSYSTEMS WITH CARBON INCENTIVES**
Author(s)	Haoning Xi
Corresponding author	Haoning Xi alice.xi@newcastle.edu.au
Photos	
Key Words	**Electric Mobility as a Service (E-MaaS) Ecosystem , Multi-leader multi-follower game (MLMFG) , Mobility resource allocation , Alternating direction method of multipliers (ADMM)**
Bibliography of Speaker	Dr. Haoning Xi is an Assistant Professor (AU: Continuing Lecturer) at the Newcastle Business School, The University of Newcastle, Australia. Prior to this continuing position, she served as a Research Fellow at the Institute of Transport and Logistics Studies at the University of Sydney

	Business School. Haoning received her Ph.D. degree in Transportation from the School of Civil and Environmental Engineering, University of New South Wales (UNSW) Sydney. During her Ph.D. study, Haoning was also a co-cultured Ph.D. student in the Optimization and Financial Risk Analysis research group, Data 61, at the Commonwealth Scientific and Industrial Research Organisation (CSIRO). She was awarded the prestigious “University Postgraduate Award” and “CSIRO Data 61 Top-up Ph.D. Scholarship” and was also granted the Australian “Global Talent Independent" Scheme. Before her doctoral studies, Haoning received her Master's degree from Tsinghua University, China, and Bachalor degree from Central South University, China. She was a Research Assistant at the University of California, Berkeley, USA, and a Visiting Researcher at the Hong Kong University of Science and Technology, China. Her work has been published in flagship journals in the field as the first author, such as the European Journal of Operational Research, TR Part A/B/C, CACIE, etc. Haoning has been leading and participating in several research projects in Australia, and her research was supported by government agencies such as Transport for NSW and the Department of Transport and Main Roads, QLD.
Abstract	Electric Mobility-as-a-Service (E-MaaS) emerges as a promising solution for environmentally- friendly mobility in the future, yet MaaS operators have been struggling to achieve profitability. We introduce a novel E-MaaS ecosystem where platforms can leverage carbon credits revenue from the government’s emissions reduction fund (ERF) by incentivizing travelers to choose more E-MaaS services, thereby reducing carbon emissions. In such an E MaaS ecosystem, travelers can select either electric (E)-MaaS or traditional (T)-MaaS services and submit heterogeneous service requests, such as distance, service time, tolerance for inconvenience, and travel delay budget, which are modeled as inputs. We propose a multi-leader multi-follower game (MLMFG) model where each leader (MaaS platform) competes to maximize its profits by making operational decisions such as pricing, EV acquisition ratio, and E(T)-MaaS bundle allocation while anticipating travelers’ participation levels. In response to the platforms’

	decisions, each follower (traveler) aims to minimize her travel costs by determining the participation levels for E(T)-MaaS services via multiple MaaS platforms. We develop a customized alternating direction method of multipliers (ADMM) algorithm to solve the proposed MLMFG efficiently. Comprehensive numerical experiments based on real-life data in Australia demonstrate the convergence and robustness of the proposed ADMM algorithm. Further, experimental results reveal how factors such as market size, travel demand, ERF budget, subsidy rate, and unit price boundaries impact the profits and operational strategies of different MaaS platforms. Overall, the proposed MLMFG model for the E-MaaS ecosystem provides valuable insights for MaaS operators aiming to balance profitability with environmental responsibility, navigating a future where sustainability and profitability goals could converge.

A0014

Title of Speech	**ANALYSING THE IMPACT OF EMERGING TRANSPORTATION TECHNOLOGIES AND BUSINESS MODELS ON URBAN STRUCTURE**
Author(s)	Paraskevi Sarri, Ioannis Kaparias, John Preston, DavidSimmonds
Corresponding author	Paraskevi Sarri ps2u17@gmail.com
Photos	
Key Words	**Transportation technologies , business models , urban structure , LUTI models**
Bibliography of	Dr Paraskevi Sarri is a Rural and Surveying Engineer, having

Speaker	graduated from the National Technical University of Athens (NTUA). She holds both an MSc and a PhD in transportation planning and engineering from the University of Southampton, UK. Currently, she serves as a traffic engineer at the Athens Traffic Management Centre. Dr Sarri has contributed to numerous scientific journals and conferences, with her research interests focusing on emerging transport technologies, land use and transport integration, and traffic engineering.
Abstract	This study examines the impact of technological advancements in transportation on land use, addressing a significant gap in existing research. The literature review reveals that the effects of new transportation technologies on land use have been insufficiently explored. To bridge this gap, the study presents a detailed methodology, focusing on key variables such as generalized costs, car ownership costs, road capacity, and trip rates for calibration. A new car ownership model was specifically developed and integrated into the Land Use and Transport Interaction (LUTI) model. The research utilizes the West Midlands region in the UK as a case study to design test scenarios incorporating new vehicle technologies and business models. Results indicate that the integration of these technologies and models can lead to an increase in regional population and employment. However, areas with higher financial power exhibit a decline in both population and employment, suggesting a spatial redistribution of activities. Additionally, neighboring zones experience a decrease in population and employment, highlighting the attraction of economic activity to the region due to enhanced accessibility. The methodology and results were validated through sensitivity analysis and expert validation, confirming the robustness of the findings. The study concludes that new transportation technologies and business models can significantly influence regional land use patterns, prompting shifts in population and employment dynamics. These insights are crucial for policymakers and urban planners aiming to leverage technological advancements for sustainable urban development.

A0048

Title of Speech	**CRITICAL FACTORS THAT FAVOUR OR HINDER SHARED MOBILITY ON ISLANDS**
Author(s)	Vasiliki Amprasi, Panagiotis Papantoniou, Dimosthenis Pavlou, Eleni Karakitsou
Corresponding author	Vasiliki Amprasi v.amprasi@uniwa.gr
Photos	
Key Words	**shared mobility , stakeholder perspective , stakeholder survey , AHP , island**
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 as well as a Master of Science (MSc) on “Planning, Organization, and Management of Transport Systems”. She has been awarded with two (2) official distinctions of excellence, the most important being the full scholarship received by the Onassis Foundation for her interdisciplinary postgraduate studies. Vasiliki has 6 years of experience in the implementation and management of projects and studies related to transport and mobility at European and national level. She has participated in a total of 7 research projects, being the responsible project manager of 3 of them, while she was also involved in the elaboration of electric vehicle charging plans, the development of road safety strategies, and proposal writing. Driven by continuous personal and professional growth, she took part in various seminars dealing with, among others, the effective project management, the optimal service design, the enhancement of leadership skills in which she was elected as the Team Coordinator of the working group of the 7-day

	project, etc. Till today, she has published 19 scientific papers which include 6 papers in scientific journals and book volumes, 9 full papers in conference proceedings with full paper review, and 4 in conference proceedings with abstract review. She has presented as a speaker at more than 10 scientific conferences, while she has been responsible for the organization of 4 transport events/conferences with invited speakers and participants from Greece and abroad. She is a member of the Technical Chamber of Greece, the Hellenic Institute of Transportation Engineers, and the Onassis Scholars' Association.
Abstract	Offering a sustainable mobility alternative option to commuters and urban travelers has been a major issue in European cities. Towards that direction, the shared mobility modes are on the rise, while their efficient integration into the transportation systems is prioritized. However, existing research and policy recommendations often overlook the unique characteristics of islands. This paper aims to explore the drivers and barriers of shared mobility on islands, having as starting point the North Aegean Region in Greece. In this frame, both the planning and operational phases have been investigated, aiming to outline the factors that enable or hinder the adoption and success of shared mobility systems. This research employs a methodological approach that incorporates and analyzes stakeholders' perspectives representing a mix of organizations of respondents. Interviews with 15 stakeholders from the region have been conducted and the Analytical Hierarchy Process (AHP) was utilized for a systematic evaluation of critical parameters affecting the implementation of shared mobility. By comparing these survey results with the current mobility status and identifying gaps highlighted by stakeholders, valuable insights were gained regarding the unique challenges and opportunities present in island contexts. More specifically, findings indicate that prioritizing technological advancements and enhancing user comfort can significantly increase the acceptance and efficiency of shared mobility services. Moreover, the study confirms the necessity of adapting shared mobility solutions to the specific characteristics of islands in prder to ensure operational sustainability. These insights emphasize the

	importance of a tailored approach to shared mobility in island environments, contributing to the broader goal of sustainable transportation in diverse settings.

A0051

Title of Speech	**IDENTIFYING THE FACTORS AFFECTING CITIZENS' WILLINGNESS TO USE MOBILITY AS A SERVICE**
Author(s)	Panagiota Mavrogenidou, Apostolos Papagiannakis
Corresponding author	Panagiota Mavrogenidou pmavrogenidou@aegean.gr
Photos	
Key Words	**Mobility as a Service , logistic regression , willingness to use , MaaS**
Bibliography of Speaker	In 2019, Panagiota completed her studies at the Department of Civil Engineering of the University of Thessaly, obtaining a specialization in traffic engineering. Her undergraduate thesis, entitled “Modelling the impact of ITS on traffic”, was successfully presented at the Transportation Research Board (Trb) Annual Meeting 2019. In 2022, she completed her studies in the postgraduate program “Spatial Planning for Sustainable and Resilient Development” at the Department of Spatial Engineering, Faculty of Engineering, Aristotle University of Thessaloniki. Now, she is a PhD student at the University of the Aegean under the supervision of Professor Amalia Polydoropoulou. The title of her PhD thesis is “The development of car-free urban zones based on an integrated micro-mobility system” , while at the same time she participated in the National Research Infrastructure ENIRISST Plus, as the individual responsible for the development of the “Micro-

	mobility on the islands” service.

Abstract	Mobility as a Service (MaaS) is a rapidly growing concept that provides personalized transportation packages. This study investigates the factors influencing citizens' willingness to adopt a MaaS system in Thessaloniki, while also examining MaaS possibilities for vulnerable populations, such as elders and teenagers. Thessaloniki, the second largest city in Greece, is introducing a new metropolitan railway system, creating an ideal urban environment for testing integrated and on-demand transport services. Employing a quantitative survey analysis, inferential statistics, and binary logistic regression, this study identifies key factors affecting citizens' willingness to use MaaS. The results indicate that demographic factors significantly impact citizens' willingness to embrace a MaaS scheme. Specifically, age, driving license, daily commuting time, commuting frequency as car passenger, commuting frequency by public transport (PT), household size, and MaaS familiarity are the most influential factors of citizens' willingness to use MaaS. Regarding the utilization of a MaaS scheme for more vulnerable populations, women, cost-conscious individuals and frequent PT commuters demonstrate a higher willingness to use MaaS for their eldest relatives. These findings provide critical insights into the demographic attributes that influence the adoption of MaaS, emphasizing the importance of understanding these factors for effective implementation. By highlighting significant predictors, this research contributes to a deeper understanding of urban communities' readiness to embrace innovative mobility solutions. The insights provide a robust foundation for future MaaS initiatives, offering valuable information to policymakers, urban planners, and transportation authorities.

A0057

Title of Speech	**WHAT SPATIAL MESHES TO CONTAIN AND ORGANISE MOBILITY ? SITUATION OF THE FRENCH METROPOLITAN TERRITORY IN 2020**
Author(s)	Anne Guillemot, Fabien Leurent

Corresponding author	Anne Guillemot anne.guillemot@enpc.fr

Photos	
Key Words	**Cities and crowns , Metropolitan influence , Rank-size rule , Spatial meshes , Spatial configuration**
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 adress climate change and the governance of such a transition toward sustainable mobility, from the local scale to the European Union scale.
Abstract	The geographical space of metropolitan France is unevenly populated. Cities have a range of orders of magnitude. The most important of them polarize a space around them which constitutes a “crown” based on home-work mobility. The city and its surroundings together form a City Attraction Area (AAV) which contains most of the daily mobility of people. Besides, public passenger transport is organised locally by a Mobility Organising Authority (AOM), whose territorial jurisdiction encompasses a population within a designated area. The article questions the capacity of the three types of entities (agglomerations, AAV and AOM) to contain everyday mobility, and their relationships with the network of municipalities and Departments across the national territory. We statistically characterise the distribution of each type of entity in terms of population and spatial extent, and we identify a typology of orders of magnitude (following the rank-size rule). We match the three types of spatial entities, by order of magnitude class,

	by measuring amplification factors of the population and the space covered. There are two contrasting categories of AOM, respectively urban versus rural. The urban AOM closely surround their agglomeration, but only capture 10% of their crown. Rural AOMs form larger spatial groups and are therefore more populated than AAVs of similar rank (from 200 to 700). The 50 largest metropolises, and the next 50, are overwhelmingly departmental capitals. Thus the Departments contain the metropolises and their rings, apart from the ten at the top of the ranking, and their spatial network determines a regular spatial configuration of the metropolises in France.

Session 5: Competition or coopetition?

Time UTC+1 (Paris): 2024-11-06 11:20 - 12:30
Time (Shanghai): 2024-11-06 18:20 - 19:30

A0025

Title of Speech	**UBERIZATION OF URBAN TRANSPORT IN THE CITY OF DOUALA**
Author(s)	Christ Aymard MBIA AYI, Alassane Ballé NDIAYE
Corresponding author	Alassane Ballé NDIAYE alassane.ndiaye@ulb.be
Photos	
Key Words	**Uberization , Transport , Urban , Taxi , Douala**
Bibliography of Speaker	MBIA AYI Christ, Cameroonian and Civil Engineer with a Master Degree in Transport Planning. Currently working as

	Project Management Specialist, I have 10 Years of experience road’s project design and implementation. I'm passionate of Urban Mobility, Road Transport and geotechnics
Abstract	Since 2021, the use of ride-sharing services (commonly referred to as "uberization") has significantly transformed mobility patterns in Cameroon, particularly in the city of Douala. This study examines the extent to which this phenomenon aligns with the National Urban Mobility Policy and the Urban Mobility Plan of Douala. The objective is to enhance the efficacy of numeric solutions in addressing the mobility challenges prevalent in the Sub-Saharan countries. To this end, we have conducted a study investigating the challenges and potential of digital urban transport platforms in Douala town. Our methodology involved a literature review to contextualize the state of urban transport prior to the uberization, surveys and interviews were conducted to understand the perceptions of uberization of urban transport and its impact. In the near term, several positive effects have been identified. These include increased mobility, enhanced employability for low-skilled workers, and improvements to the legal framework governing urban transportation. Additionally, the use of digital technology for economic activities, even those not directly related to transportation, has been enhanced. However, traditional transport operators have expressed significant opposition, citing unfair competition as a concern. A long-term analysis of the sector reveals that failure to implement a reorganization plan will result in a range of adverse consequences, including environmental degradation, traffic congestion, tax evasion, inadequate data management, and job insecurity, particularly among taxi drivers. In order to align the uberization phenomenon with Cameroon's vision of sustainable mobility as well as with the objectives outlined in Douala's Urban Mobility Plan, we have proposed seven major action : limiting the number of vehicles per platform, amending the labour legislation, improving operational addressing, taxing profits and advertising revenue, requiring a specific license for digital transport drivers, introducing targeted measures for vulnerable groups, and establishing a national framework for data protection.

A0034

Title of Speech	**A NON-COOPERATIVE GAME FOR ANALYSING HIGH-SPEED RAIL AND AIR COMPETITION**
Author(s)	Tahseen Bashir
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Photos	
Key Words	**High-Speed Rail , Air Transport , Competition , Game Theoretical Approach , Value of Time**
Bibliography of Speaker	1Department of Civil, Architectural and Environmental Engineering, University of Naples Federico II *Corresponding: t.bashir@studenti.unina.it Guglielmo De Lulio1 1Department of Civil, Architectural and Environmental Engineering, University of Naples Federico II e-mail: guglielmo.deiulio@outlook.com Lina Mallozzi1 1 Department of Mathematics and Applications, University of Naples Federico II email: lina.mallozzi@unina.it Francesca Pagliara 1Department of Civil, Architectural and Environmental Engineering, University of Naples Federico II email: fpagliar@unina.it
Abstract	In the literature, many contributions have been published on the direct and indirect impacts of the High-Speed Rail (HSR) system and its competition with the Air transport mode. In this contribution, the case study linked to the construction of a new HSR with a strategic hub in the city of Bucharest (Romania) has been analyzed using a Game Theoretical Approach. Specifically, the line consists of 2 main corridors. The first one called the Northern Balkans Corridor, aiming at connecting the capital of Romania,

	Bucharest, with the capital Hungary, Budapest, with stops in the stations of the cities of Brasov, Cluj- Napoca, and Debrecen. The second one named the Southern Balkans Corridor, connecting the capital Bucharest to the Greek capital Athens passing through the Bulgarian capital Sofia, which makes intermediate stops in the stations of Thessaloniki (Greece) and Pleven (Bulgaria). The HSR-Air competition issue has been studied with reference to the Bucharest-Budapest corridor (the Northern Balkans Corridor) and the Bucharest-Sofia corridor (first section of the Southern Balkans Corridor). The introduction of HSR into a market where Air transport is currently the only fast travel option between cities could significantly influence the market equilibrium. It is anticipated that HSR will attract part of the demand that previously chose Air travel between the same cities, especially among those with a higher Value of Time (VOT), while also generating new induced demand. Moreover, the entry of a competitor as HSR would lead to a reduction in air fares compared to the previous situation, where the air market had the monopoly. The introduction of HSR offers significant environmental advantages, such as the reduction of greenhouse gas emissions and lower consumption of non-renewable resources compared to Air transport. From a social perspective, HSR improves accessibility and inclusion, making travel between cities more accessible to a broader range of users. This not only enhances users' mobility but also promotes regional integration and sustainable tourism. The analysis shows how HSR can become a catalyst for economic growth and sustainable development in the regions served by the new corridors, providing an environmentally friendly and socially inclusive alternative to Air transport.

A0047

Title of Speech	**COMPETITION OR SUPPLEMENT? DECIPHERING INTERACTION BETWEEN AUTONOMOUS CUSTOMIZED BUS AND PUBLIC TRANSIT**
Author(s)	Haoran Jiang, Shaozhi Hong
Corresponding	Shaozhi Hong

author	hongshaozhi@tongji.edu.cn

Photos	
Key Words	**Autonomous customized buses , Public transit , Multivariate relationship , Non-linear effect**
Bibliography of Speaker	Haoran Jiang: PhD student Urban Mobility Insititute, Tongji University, Shanghai, He research on Autonomous Driving Public Transit and Urban Big Data.He primarily applies methods that integrate operations research optimization and machine learning Shaozhi Hong: Associate professor He major in Urban Mobility Planning, Urban Public Transportation and Policies, Airport and Aerotropolis Planning.
Abstract	Autonomous Customized Buses (ABs) are emerging as a sustainable and flexible transport mode. However, their relationships and positioning within public transit has not been well quantified. This research utilize ABs travel order data in Wuxi, China, to investigate the temporal and spatial patterns of how ABs substitute, connect, compete, or complement public transit (metro and conventional buses) and apply interpretable machine learning to explore the nonlinear interactions between them. The results reveal significant temporal variability in the relationships between ABs and public transit. Initially ABs focus on off-peak competition and blank filling. After six months, they show significant growth in peak-period connectivity, as well as increased competition, complementation with metro services, and substitution of conventional buses during off-peak periods. For conventional buses, ABs effectively substitute conventional buses in areas with moderate land use and high bus stop density, especially for peak commutes and off-peak shopping. However, ABs are not suitable for areas with high land development intensity and

	complex travel purposes due to their medium capacity and flexible travel characteristics. In areas with low road and population density, and located far from the city center, ABs should connect to metro services to enhance overall transit efficiency. This study provides targeted strategies for the sustainable development of ABs, optimizing their role within urban transportation frameworks.

Session 6: Traffic management (Stream2)

Time UTC+1 (Paris): 2024-11-06 11:20 - 12:30
Time (Shanghai): 2024-11-06 18:20 - 19:30

A0012

Title of Speech	**IN-LANE STREET HAWKING IMPACTS AND ALTERNATIVE CONTROL MEASURES**
Author(s)	Philip Alimo
Corresponding author	Philip Alimo alimokofi2020@tongji.edu.cn
Photos	
Key Words	**In-lane street hawking , Urbanization , Alternative livelihood sources , Traffic Control , Urban Sustainability**
Bibliography of Speaker	Philip Kofi Alimo is a Ph.D. candidate at the College of Transportation Engineering, Tongji University, China, majoring in Transportation Engineering. His research interests include sustainable inclusive transportation systems, transport decarbonization, and transportation system analysis. He has more than 30 peer-reviewed

	publications in reputable transportation journals and Conferences. In 2021 and 2023, he won the Tongji University President's Scholarship. He won the Best Student Research Award during THNS2022 and co-moderated the Mobility Behaviors Session in THNS2023. Philip coordinates the Transportation and Logistics Research Group of the Organization of African Academic Doctors (OAAD).
Abstract	The pursuit of smooth traffic flow methods is deeply rooted in the Sustainable Development Goal (SDG 11). Similarly, spatial-social issues and roadside frictions in the transportation system are strongly associated with SDG 8. This study provides a case study that relates to the aforementioned SDGs. In the cities of sub-Saharan Africa, one of the common mobility and spatial-social issues is in-lane street hawking. This is the traffic phenomenon where informal traders called in-lane street hawkers or traffic hawkers intermittently enter the roadway to sell groceries to passengers and drivers. It is prevalent in over 40 countries, making it a compelling problem. However, this problem has been understudied in the transportation field, making it difficult to find solutions. This study sought to investigate the impact of hawking and plausible alternative control measures. Using drone-based traffic data, secondary data, and interviews from Accra, Ghana, this study answered the following questions: (1) What are the spatial patterns and hotspot locations of hawkers in the urban road network? (2) What is the impact of hawking on intersection operations? (3) What is the plausibility of alternative control measures? It was discovered that hawkers trade near roads, at signalized intersections, and hotspots fall within the central business districts. Hawking activities increased start-up lost times by 1.874 s approximately 48% and posed injury risks to traders. Interestingly, 62% of hawkers are willing to relocate from signalized intersections. However, this is premised on policymakers providing alternative employment and training in tailoring, nursing, auto-mechanic, hairdressing, and driving. Accordingly, a consultative approach involving all stakeholders is proposed for finding sustainable livelihood sources, training, and relocation strategies in cities. Overall, this practical contribution would be useful

	for enhancing traffic control and mitigating urban poverty in countries having in-lane street hawking.

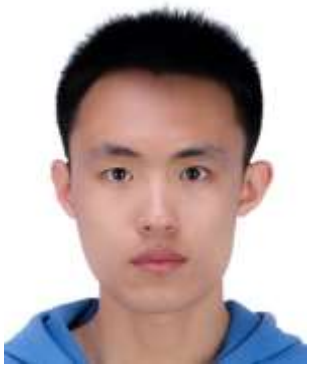
A0039

Title of Speech	**MITIGATING TRAFFIC CONGESTION ON OLYMPIA ODOS: A MICROSIMULATION APPROACH**
Author(s)	Antonia Kefala, Dimitrios Sermpis, Paraskevi Sarri, Dimitrios Roumpekas, NikolaosMexis
Corresponding author	Antonia Kefala toniakefala1998@gmail.com
Photos	
Key Words	**Traffic congestion , Olympia Odos , traffic microsimulation , Aimsun**
Bibliography of Speaker	Antonia Kefala holds a degree in Rural and Surveying Engineering from the National Technical University of Athens (NTUA) and works as a Traffic Engineer at the Athens Traffic Management Centre. Her expertise lies in traffic microsimulation and modelling, where she excels in analyzing and optimizing urban traffic flows. Antonia's work is pivotal in enhancing the efficiency of Athens' transportation network, ensuring smoother commutes and reducing congestion.
Abstract	Traffic congestion is a significant problem, leading to delays, increased fuel consumption, and elevated emissions. Identifying the underlying causes of congestion is challenging due to the complex interactions between various factors such as traffic volume, road capacity, and driver behaviour. This study focuses on the traffic congestion between the Corinth and Agioi Theodoroi toll

	stations of Olympia Odos motorway. Olympia Odos, located in the Region of Attiki (Greece), was chosen as the case study due to its high traffic volumes, strategic importance as a major transportation corridor, and frequent congestion issues, especially during national holidays. By using traffic microsimulation techniques, this study aims to pinpoint the sources of congestion and evaluate potential mitigation strategies. Traffic flows were categorised by vehicle type and collected at the toll stations, providing a comprehensive overview of traffic patterns. The Aimsun traffic simulation software was employed to model traffic flows and assess the impact of different scenarios. Two scenarios were examined: the pause of parking area operations and the addition of a fourth lane. The simulation indicates that congestion in this area is primarily influenced by shockwaves, triggered by sudden changes in traffic flow and exacerbated by high traffic volumes and limited road capacity. Using microsimulation techniques allows for detailed insights into how these scenarios could alleviate congestion. This study highlights the importance of using traffic microsimulation to understand and address traffic congestion, demonstrating that modelling different scenarios can help identify effective solutions for enhancing traffic flow on Olympia Odos. The findings underscore the potential of these techniques in developing targeted strategies to reduce congestion and improve overall traffic efficiency on motorways.

A0044

Title of Speech	**INCREASING THE CAPACITY OF SIGNALIZED INTERSECTIONS WITH UNCONVENTIONAL DESIGNS OF SHARED RIGHT-TURN LANES**
Author(s)	Zilin Shen, Chunhui Yu, Zicheng Su, Wanjing Ma
Corresponding author	Chunhui Yu hughyu90@tongji.edu.cn

Photos	
Key Words	**Shared right-turn lane , Unconventional intersection design , Dynamic lane assignment , Pre-signal**
Bibliography of Speaker	Zilin Shen received the B.S. degree in civil engineering from Tsinghua University in 2021. He is currently working toward the Ph.D. degree in the Urban Mobility Institute in Tongji University. His research interests include intelligent transportation systems, traffic signal control, and network traffic dynamics.
Abstract	Shared right-turn lanes (SRLs) are commonly designed when road space is limited at urban intersections. However, through vehicles and right-turn vehicles on the same SRL may block each other under conventional signal control strategies, which consequently reduces intersection capacity. This study proposes two unconventional SRL control strategies, namely, variable SRL (V-SRL) and pre-signal controlled SRL (P-SRL), to alleviate the potential conflict and improve the efficiency at an isolated intersection. The proposed unconventional control strategies are optimized in a unified framework, which also covers the conventional SRL control (C-SRL) strategy. The problem of the integrated design of lane allocation, signal timings, and SRL control strategy is formulated as a mixed-integer nonlinear program (MINLP), in which the potential vehicle-pedestrian conflict is explicitly taken into consideration. The arrival and departure profiles of vehicle flow are captured at the stop bar under V-SRL and P-SRL control. The model is then linearized and solved with a bi-section-based pruning algorithm. Numerical studies validate the advantages of the proposed unconventional strategies in terms of intersection capacity. Sensitive analysis shows that: 1) the advantages of both V-SRL and P-SRL control over C-SRL control increase first and then

	decrease as the right-turn proportion rises; and 2) P-SRL control is the most robust to pedestrian interference compared to C-SRL and V-SRL control.

A0056

Title of Speech	**SMART DISPATCH AND MAINTENANCE SYSTEM INTRODUCTION TO ENABLE INTELLIGENT AND GREEN METRO OPERATION**
Author(s)	Gavin GU
Corresponding author	Gavin GU lei.shi@thalessec.com.cn
Photos	
Key Words	**Intelligent scheduling , Smart Maintenance , Green operation , Dynamic regulation**
Bibliography of Speaker	Gavin Gu, male, master's degree, senior engineer, currently serves as director of Product Research and development Center of Thales SEC Transportation System Limited Company. He has been engaged in technology research and development and management in the field of subway signal control for a long time, and has rich experience in train operation scheduling, communication-based signal control system, and intelligent scheduling and intelligent operation and maintenance system development.
Abstract	Intelligent scheduling and operation and maintenance system helps the subway signal control and operation systems to be safe, reliable, efficient, intelligent and green. The intelligent scheduling system adds more diversified information perception and processing functions, making traffic scheduling and operation adjustment more

	dynamically adapt to passenger flow changes, improve passenger service level, promote green energy saving, and automatically adjust to failure delays. Intelligent prompt auxiliary decision-making function, supporting schedulers to quickly, efficiently and scientifically cope with abnormal scenarios; The intelligent operation and maintenance system is real-time condition monitoring and automatic analysis, and timely discover the hidden trouble in the system, so as to ensure the system safety and reduce the operation delay. The intelligent operation and maintenance expert system converts experience into practical suggestions, reduces the technical requirements for operation and maintenance personnel, improves the efficiency of field operations, and achieves the purpose of reducing operation and maintenance costs.

Keynote 3: Long-term urban planning strategies for Paris 2024

Cristiana MAZZONI

Time UTC+1 (Paris): 2024-11-06 12:30 - 13:10
Time (Shanghai): 2024-11-06 19:30 - 20:10

Prof.Cristiana MAZZONI: Architect, Urban designer and Professor of Architecture and Urban design in the National Architectural school of Paris-Belleville (ENSAPB), during her academic career she has been teaching as visiting professor in Italy, Germany, France, Spain, USA and China. She is the Director of the Research Center UMR AUSser, in the framework of the French Scientific Research Center (CNRS). She is the co-founder with ZHUO Jian of two Sino-French Chairs (ENSA of Strasbourg and ENSA Paris-Belleville / CAUP- Tongji University of Shanghai). Her scientific work focuses on three areas: 1. Metropolitan development, regional planning and urban design - innovative and integrated mobility, railway infrastructures and railway stations; 2. Historical courtyards blocks in European and Mediterranean cities - a typological and morphological approach; 3. Architectural and urban holistic theories - 20th and 21st centuries. In 2008 she founded the Atelier CMYT studio and she is the Senior Adviser of Comet Lab for innovative research in urban architecture. The research and professional works of the studio have been exposed in the Venice Biennale of Architecture 2018.

Abstract

The Paris 2024 Olympic Games are part of a long-term urban development strategy dating back to early metropolitan planning initiatives, such as the 1965 Île-de-France Regional Planning and Development Master Plan (SDAURIF). This foundational plan set the stage for coordinated urban growth in the Île-de-France region, influencing the vision for today's large-scale projects. Reflecting this legacy, the organizers of the 2024 Games have adopted a lifecycle approach in the design, construction, and operation of infrastructure, with a focus on repurposing facilities after the event. This strategy aims to create lasting impacts by reusing sports facilities for local communities and prioritizing the rehabilitation of existing sites over new construction.

This approach seeks to minimize environmental impacts and strengthen the integration of infrastructure within the Grand Paris metropolitan area. By considering the lifecycle of facilities, Paris 2024 continues the framework established by the Grand

Paris project, which prioritizes an interconnected and sustainable planning model for the region. Choices in materials, energy use, and resource management for the 2024 Games reflect a commitment to waste reduction and long-term investment. This exemplary project contributes to a lasting vision for the Paris region, supporting a sustainable legacy for local communities and advancing the balanced development ambitions set in motion decades ago.

7th, November-DAY 3

Keynote 4: The New Trends in Cost-Benefit Analysis: Quantifying Public Engagement and Resilience in Transportation Projects

Francesca Pagliara, University of Naples Federico II

Time UTC+1 (Paris): 2024-11-07 09:00 - 09:40
Time (Shanghai): 2024-11-07 16:00 - 16:40

Dr. Francesca Pagliara is Associate Professor in Transportation Engineering at the University of Naples Federico II in Italy. Her current main fields of research are the wider socioeconomic impacts of transportation systems investments, mainly High-Speed Rail systems; Public Engagement in the transportation decision-making process and the impact of transportation systems on the tourism market. She is author of academic books both in Italian and in English and of more than 100 papers. Since 2021 she is the promoter of the International Workshop on HSR Socioeconomic Impacts jointly organised with the International Union of Railways.

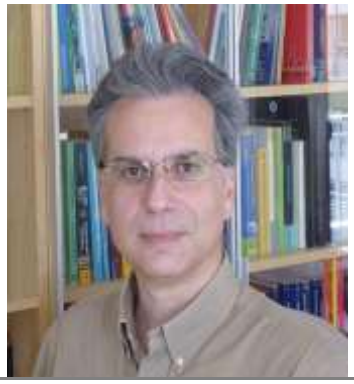
Abstract
Public Engagement (PE) is the process of identifying and embedding stakeholder concerns, needs and values in the transport decision-making process. It is a two-way communication process that provides a mechanism for exchanging information and promoting stakeholder interaction with the formal decision-makers and the transport project team. The overall goal of engagement is to achieve a transparent decision-making process with greater input from stakeholders and their support of the decisions that are taken.
The first objective of this contribution to estimate the benefits and costs of PE to be embedded within a traditional Cost-Benefit Analysis. Indeed, in the transport sector, it is consolidated that a good decision-making process foresees the involvement of the main stakeholders, but what are the benefits and costs of the SE? How to quantify these impacts and explicitly take them into account in a cost-benefit analysis? In this

contribution, an attempt to answer these questions is provided.
In a context in which the climate is constantly changing together with the increase in the occurrence of extraordinary meteorological events, infrastructures are subject to negative events. Specifically, in recent years, in certain areas, calamitous events have occurred that have caused collapses, complete or partial, within the infrastructural networks. To cope with these calamities, public administrations, associations, organizations and other bodies, collaborating with each other, aim at restoring the original performance of the systems.
In particular, the "critical infrastructures", i.e. those systems related to communications, energy, health, information technology, transport and water systems that provide basic services for the economy, security and stability of a nation, should be safeguarded from disasters.
The second objective of this contribution is to propose an application of the Cost-Benefit Analysis for providing resilience of a transport infrastructure.

Session 7: Transport and the environment

Time UTC+1 (Paris): 2024-11-07 09:40 - 11:10
Time (Shanghai): 2024-11-07 16:40 - 18:10

A0037

Title of Speech	**SIMULATING THE IMPACT OF CLIMATE CHANGE ON TRANSPORT INFRASTRUCTURE IN THE MEDITERRANEAN CITY OF THESSALONIKI**
Author(s)	Apostolos Papagiannakis
Corresponding author	Apostolos Papagiannakis apa@plandevel.auth.gr
Photos	
Key Words	**Climate change impact , Environmental simulation , Sea level rise , Urban heat island , Transport resilience**
Bibliography of Speaker	Apostolos Papagiannakis is Associate Professor of Transport Systems Planning at the School of Spatial Planning and Development, Faculty of Engineering, Aristotle University of Thessaloniki (AUTh), Greece (Dipl. in Applied Mathematics, AUTh | D.E.A. des Statistiques Appliquées, Institut National Agronomique de Paris- Université Paris XI | PhD en Modélisation des transports, I.N.A. | Post-Doctorat, Université Paris IX). His research interests focus on sustainable urban mobility, integrated spatial and transport planning, urban public transport, statistical analysis of transport systems, transport demand forecasting models, transport network and land use interaction, transport projects evaluation, transport policy and multicriteria decision making, transport resilience and climate change. He has a long-term research, project and teaching experience in

	Greece and in France with an emphasis on the interdisciplinary approach. He participated in many studies and European research projects in France as researcher associate and in Greece as senior consultant in collaboration with public transport organizations and engineering consultancies (Thessaloniki Urban Transport Authority, Centre Nationale de Recherche Scientifique, Regie Autonome des Transports Parisiens, Institut d'Amenagement Urbain de la Region Ile-de- France). He has also been a member of scientific committees of international and Greek conferences and a reviewer of many international journals. Is a member of the Hellenic Institute of Transportation Engineers.
Abstract	Long-term planning and operation of transport systems must increasingly consider climate change and extreme weather conditions. Multiple risks, such as coastal and urban flooding, sea level rise, extreme temperatures, drought, and wind, are relevant. This research project aims to achieve two objectives through two case studies: first, to assess the impacts of sea level rise to identify vulnerabilities of transport infrastructure in the Greater Thessaloniki area; second, to investigate the Urban Heat Island (UHI) effect in a typology of streets in the city's central area. The first case study covers a coastal zone 60 km long and 2 km wide across five municipalities. Using cartographic data from Climate Central's Surging Seas Risk Zone Map, land use data from Corine Land Cover, and population data from the Hellenic Statistical Authority, two scenarios of sea level rise (0.5 and 1 meter) were simulated with GIS. Under the most likely scenario of a 0.5 meter rise by 2100, 1.87% of the coastal road network will be submerged, rising to 3.07% under the worst-case scenario of 1 meter. At the same time, the disruption of the road access to the airport in both scenarios, the vulnerability of some parts of the port, and their potential inability to operate are highlighted. The second case study focuses on the simulation of microclimatic conditions and the impact of environmental street design strategies on thermal comfort in a typology of streets using the ENVI-met 5.1 software. The streets were selected using criteria such as road functional classification and orientation, land use, building height/street width ratio, the sky view factor, and the continuity/discontinuity of buildings. The results showed that a middle-aged person experiences extreme heat burden when exposed to the sun, which is the case at pedestrian crossings. The heat stress is significant

	even in shaded areas in the existing situation, but the improvement is significant when environmental urban design measures are applied. The perceived air temperature (Physiological Equivalent Temperature - PET index) can be reduced by up to 10 °C in well-shaded locations and near building corners. The combined results of the two case studies point to the need to plan and build resilient transport systems, as well as to coordinate and implement specific climate change adaptation measures for transport infrastructure in Mediterranean cities such as Thessaloniki, which already face high climate risks.

A0038

Title of Speech	**ENGINEERING-ADAPTIVE PAVEMENT MAINTENANCE DECISION-MAKING MODEL: A REINFORCEMENT LEARNING APPROACH FROM EXPERT FEEDBACK**
Author(s)	Wenyuan Cai, Yuchuan Du, Chenglong Liu
Corresponding author	Yuchuan Du ycdu@tongji.edu.cn
Photos	
Key Words	**Pavement maintenance decision-making , reinforcement learning from expert feedback , fine-grained reward model , data-knowledge driven**

Bibliography of Speaker	Wenyuan Cai received a B.S. degree in civil engineering from Beihang University, Beijing, China, in 2018 and an M.S. degree in transportation engineering from University of Illinois at Urbana-Champaign, IL, U.S., in 2019. She is currently pursuing the Ph.D. degree with the Key Laboratory of Road and Traffic Engineering of the Ministry of Education, Tongji University. Her research interests include road infrastructure management, intelligent infrastructure system, and AI techniques in transportation. Publication: [1] Cai, W., Song, A., Du, Y., Liu, C., Wu, D., & Li, F. (2023). Fine-Grained Pavement Performance Prediction Based on Causal-Temporal Graph Convolution Networks. IEEE Transactions on Intelligent Transportation Systems. [2] CAl W., Llu C. , Wu D., GAO Z., Du Y.(2024)Standards Graph System of Road Infrastructure Maintenance and Management. Journal of Tongji University(Natural Science).
Abstract	Rising highway mileage and lifespan are heightening road

A0049

Title of Speech	**IDENTIFICATION OF LAND COVER CHANGE IN HIGH-SPEED RAIL STATION AREA THROUGH LATENT CLASS ANALYSIS WITH COVARIATES: FINDINGS FOR THE YANGTZE RIVER DELTA REGION**
Author(s)	Xinyi Wang, Haixiao Pan, Ya Gao
Corresponding author	Haixiao Pan hxpank@126.com

Photos	
Key Words	**High-Speed Rail , Station area , Land cover change , Development patterns , Transit-oriented development**

Bibliography of Speaker	Xinyi Wang is a PhD candidate in the Department of Urban Planning at Tongji University. He received his M.E. in Urban and Rural Planning from Tongji University in 2022 and B.E. in Urban and Rural Planning from Beijing Jiaotong University in 2019. His research interests include the interaction between high-speed rail station and the urban built environment, as well as accessibility planning in 15-minute cities.
Abstract	High-speed rail (HSR) has been identified as an essential catalyst for urban development, but its performance varies across cities. HSR New Towns have been developed in the vicinity of HSR stations and as a stimulus for the expansion of the built-up land. This study used three metrics to evaluate the land cover change in the 50 HSR stations in the Yangtze River Delta region in China in the long term from 2008 to 2020. The three metrics include changes in built-up land amount (BULA), compactness degree (CD), and nighttime light intensity (NTLI) over the period. A latent class analysis with covariates was adopted to examine the factors influencing the heterogeneous land development of the stations. Two latent classes of station development patterns, urban renewal stations (n = 14) and greenfield development stations (n = 36), were identified based on the three land cover change metrics. Station location in terms of relative distance to the city center, station construction types, and the administrative level of the station city are explanatory factors of the two classes. The descriptive analysis further shows that 88.6% of the newly built stations (31 stations) exhibited a higher growth rate in both the amount and intensity of nighttime light in

	the station areas compared to their corresponding municipal regions, indicating that the remaining 11.4% of the newly built stations failed to show a positive development potential around them. Wuxi East Railway Station was found to have four times the average increase in both land cover amount and compactness degree compared to other stations, with 49.0% of the land converted into construction land, and the compactness degree increased by 0.57. These findings provide an empirical basis for the siting of the future HSR stations and the integrated development of the stations and their host cities.

A0053

Title of Speech	**IMPACT OF TURBULENT FLOW UNDERNEATH THE REAR COWCATCHER ON THE FLOW FIELD OF BOGIE REGION AND AERODYNAMIC NOISE CHARACTERISTICS OF HIGH-SPEED TRAIN**
Author(s)	Guanda CHENG, Jiabin PANG
Corresponding author	Jiabin PANG pang@tongji.edu.cn
Photos	
Key Words	**Railway noise , High-speed train bogie , Flow field characteristics , Flow disturbing underneath snowplough , Aerodynamic noise control**
Bibliography of Speaker	Guanda CHENG received the B.S. degree in Vehicle Engineering from Dalian Jioaotong University, Dalian, China, in 2020 and the M.S. degree in Vehicle Operation Engineering from Tongji University, Shanghai, China, in

	2023. He is currently working toward the Ph.D. degree in Energy and Power Engineering with the School of Automotive Studies, Tongji University, Shanghai, China. His research interests include vehicle aerodynamics and aeroacoustics.

Abstract	Based on the characteristics of strong flow-induced noise produced from the leading bogie of high- speed train, the influence on the characteristics of flow field development and aerodynamic noise generation around the bogie through setting the parallel dents at the rear end of the regular cowcatcher bottom is calculated and analyzed. The proposed study is obtained through adopting a simplified model of high-speed train bogie and a nose car scale model using the delayed detached-eddy simulation model based on an acoustic analogy approach. An anechoic wind tunnel test is carried out thus verifying the noise reduction effect obtained from the numerical simulation. The results show that compared with the cowcatcher with smooth bottom surface, the parallel dents underneath the cowcatcher can mitigate the proliferation of the bogie's shear layer and the flow interaction between the cowcatcher wake and the components inside the bogie cavity by producing flow disturbing. Consequently, the forming and the shedding of the large- scale vortices around the bogie structure are restrained and the aerodynamic noise produced by the wall pressure fluctuations is reduced through weakening the flow separation. The area of sound source generated from the bogie region of a scaled nose car model in the anechoic wind tunnel is reduced with the sound amplitude dropping to around 1 dB(A). Thus, the aerodynamic noise is controlled effectively.

A0006

Title of Speech	**MICROSCOPIC ACQUISITION METHOD FOR MESOSCALE IMAGES OF ASPHALT MIXTURE**
Author(s)	Ying Wang, Shuming Li
Corresponding author	Shuming Li lilylsm@163.com

Photos	

Key Words	**Macro lens , Mesoscopic-scale , Asphalt mixture , Digital camera , Image acquisition and processing method**
Bibliography of Speaker	EDUCATION Tongji University Doctoral Degree Road and airport engineering Instructor：Shuming Li Major Courses: Road engineering academic frontier, Material system modeling methods, etc. Jilin University Master Degree Road and Railway Engineering Instructor：Chunyu Liang Major Courses: Bridge Structural Dynamics, Mechanics of Composites, Higher Soil Mechanics, Comprehensive Design Theory of Subgrade and Pavement, Higher Bridge Structure Theory, Pavement Mechanics, Frozen Soil Engineering, Seismic Resistance of Engineering Structure, Finite Element Method in Civil Engineering, etc. Research Achievement(the first author except mentors. Research Papers Potential activity of recycled clay brick in cement stabilized subbase(published) Distribution characteristics of effective asphalt film in hot mix asphalt(being cast) Patent for Invention An experimental device and method for anti-scour performance of inorganic binder stabilized materials(licensed) Determination of pozzolanic reaction degree and optimum content of volcanic ash admixture in water-stabilized macadam(issued) Research Field Recycling of construction waste Research theme：The mechanism of the action of recycled clay brick aggregate in cement-stabilized gravel mixture of construction waste, including the feasibility of applying recycled clay brick aggregate to pavement structure, and the strength growth mechanism of the fine aggregate in cement mixture. Packing theory of aggregate particles Research theme：Selecting the theory which is more suitable to describe the packing of the aggregate particle in hot mix asphalt concrete, the probabilistic method is used to evaluate whether mineral

	aggregate gradation is suitable for the project. During the study, mesoscopic observation, CT scanning, three-dimensional simulation and probability statistical analysis were used to further determine whether the packing mode in hot mix asphalt was consistent with the theoretical research results.

Abstract	The paper presents an image acquisition and processing method for collecting mesoscopic-scale asphalt mixture structure information, primarily utilizing a digital camera as the main image capture device. This digital image acquisition and processing method yields images with high resolution, sharpness, and completeness of information. In high-definition images, a total of 588,513 particles were identified, with particles smaller than 0.075mm in diameter accounting for approximately 98% of the total count; whereas in ordinary images, the corresponding statistics were 17,428 particles and 45%, respectively. These two sets of data exhibit significant differences in magnitude and multiples, highlighting the method's strong capability in capturing details of mesoscopic-scale structures and further confirming its enhancement of clarity in asphalt mixture cross-sectional digital images. Regarding the statistics of particle counts for particles larger than 0.075mm in diameter, high-definition images and ordinary images demonstrate similar trends in frequency distribution, but high-definition images retain more detailed information regarding particle boundaries. The statistical results of particle counts in asphalt mixture cross-sectional images indicate that compared to ordinary images, high-definition images preserve more structural details, including particle boundaries and mesoscopic-scale particles, thereby providing a more reliable analytical basis for fine-scale research on asphalt mixture material structures and enhancing the accuracy of research analysis.

Session 8: Mobility behaviors: advanced studies (Stream2)

Time UTC+1 (Paris): 2024-11-07 09:50 - 11:00
Time (Shanghai): 2024-11-07 16:50 - 18:00

A0008

Title of Speech	**CHILDREN'S INDEPENDENT MOBILITY AND URBAN DESIGN, COMPARATIVE ANALYSIS OF DIFFERENT SETTLEMENT TYPES IN GREECE**
Author(s)	Sofia Sepetzi
Corresponding author	Sofia Sepetzi sepsof@yahoo.gr
Photos	
Key Words	**children's independent mobility , school journeys , urban design , actual mobility**
Bibliography of Speaker	Sofia Sepetzi is a Ph.D. candidate at the School of Spatial Planning and Development, Faculty of Engineering, AUTh. In her Doctoral Thesis entitled "Children's Geographies: Social, economical and environmental factors that affect school journeys", she studies topics related to children's mobilities, play and leisure, spatial justice, environmental education, intersectionality and participatory research. As part of her dissertation, she has conducted research to detect the degree of children's independent mobility in Greece. Furthermore, she has a special interest on movement of young girls and women in public spaces.

Abstract	This study investigates the impact of built environment characteristics on Children's Independent Mobility (CIM) in two settlement types within Thessaloniki's Metropolitan Area—inner city (41th Thessaloniki's Elementary School) and small town (2nd Lagada's Elementary School). The analysis focus on eight built environment attributes: cul-de-sacs, sidewalk quality, pedestrian paths, main and local roads, walkability score, intersections per square kilometer, and illegal parking. CIM data were collected
	through questionnaires from students and their parents, studing at the 41st Thessaloniki Elementary School (41st School) and the 2nd Lagada Elementary School (2nd School), targeting children aged 7-12. The results reveal that while 41st School neighborhood features better infrastructure—such as higher sidewalk quality and walkability—children in 2nd School neighborhood display a greater degree of CIM. Specifically, a higher percentage of 2nd School students hold more CIM licenses despite the poorer built environment quality compared to 41th School neighborhood. This suggests that factors beyond infrastructure (e.g., sense of community, stranger danger, fear of crime), may contribute significantly to children's independent mobility. In conclusion, the study highlights the importance of both built environment improvements and community factors in enhancing children's autonomy. The higher CIM in Lagadas despite less favorable infrastructure suggests that future research should delve deeper into how community ties and environmental perceptions impact mobility. In light of these findings, the study recommends that efforts should focus on strengthening social cohesion and enhancing the sense of safety in areas with high-quality infrastructure but low CIM. Such interventions could include community-building activities and safety measures that foster a supportive environment for children's independent mobility. Future research should examine how social and environmental factors interact to affect children's autonomy, aiming to develop comprehensive strategies that integrate both infrastructural improvements and community support to boost CIM in various urban settings.

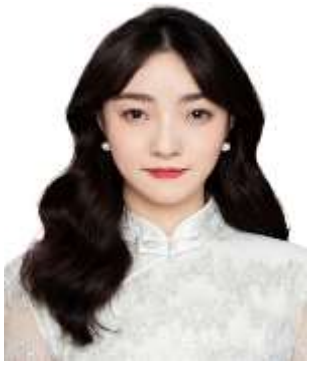
A0029

Title of Speech	**EVALUATION SYSTEM FOR URBAN TRAFFIC INTELLIGENCE BASED ON TRAVEL EXPERIENCES: A SENTIMENT ANALYSIS APPROACH**
Author(s)	Sa Gao, Qingsong Ran, Zicheng Su, Ling Wang, Wanjing Ma, Ruochen Hao
Corresponding author	Zicheng Su suzicheng@tongji.edu.cn
Photos	
Key Words	**Urban traffic intelligence evaluation , Travel experiences , Sentiment analysis , Social media data , Analytic hierarchy process**
Bibliography of Speaker	Sa Gao received the bachelor's degree in transportation engineering from Tongji University, Shanghai, China, in 2023. She is currently pursuing the master degree with the key laboratory of road and traffic engineering of the ministry of education, school of transportation engineering, Tongji University, Shanghai, China. Her current research interests include intelligent transportation, travel experiences, social media data, evaluation model and deep learning.

Abstract	Precise and comprehensive evaluation of urban traffic intelligence plays a vital role in the development of intelligent transportation systems. However, the majority of existing evaluation methods primarily rely on physical measurements, thereby overlooking the travel experiences of traffic participants. This results in a significant discrepancy between the expected outcomes of transportation design and the actual perceived travel experiences. Therefore, this study proposes a data-driven evaluation system for urban traffic intelligence based on travel experiences. In particular, the travel experiences of the public are extracted from social media data and evaluated by a sentiment analysis approach. Firstly, an indicator library is established through literature research, and it is further enhanced by a survey to ensure its comprehensiveness. After that, the text data scraped from Sina Weibo is classified into the corresponding indicators via a pre-trained language model. We then employ a lexicon-based model to conduct sentiment analysis on the classified text data. Specifically, the lexicon-based model
	can not only identify the polarity of the text data but also determine the intensity of the sentiment expressed. To address the imbalanced distribution of social media data, we employ the oversampling technique to correct the data skewness. The proposed method is tested in Shanghai, China, and the results demonstrate consistency with those obtained from the analytic hierarchy process with survey data. Furthermore, the sentiment analysis approach exhibits stable performance even when provided with a limited amount of input data. The evaluation results indicate that the information accessibility and flexibility of urban transportation in Shanghai are satisfactory. However, there is a need for further improvement in the areas of safety, comfort, and affordability based on the analysis of travel experiences.

A0030

Title of Speech	**LEARNING TO SEARCH FOR PARKING LIKE A HUMAN: A DEEP INVERSE REINFORCEMENT LEARNING APPROACH**
Author(s)	Shiyu Wang, Cong Zhao, Jing Chen
Corresponding author	Cong Zhao zhc@tongji.edu.cn

Photos	
Key Words	**search-for-parking , behavior modeling , deep inverse reinforcement learning , traffic simulation , Unity3D**
Bibliography of Speaker	Shiyu Wang received the bachelor's degree in transportation from Tongji University, Shanghai, China, in 2022, where she is currently pursuing the Ph.D. degree with the College of Transportation Engineering. Her research interests focus on the digital governance of urban transportation and include typical scenarios such as parking lots.

A0031

Title of Speech	**THE LOCAL TRAVEL CHARACTERISTICS AND DIFFICULTIES OF THE ELDERLY IN WORKERS' NEIGHBORHOOD USING GBDT MODEL——CASE STUDY IN ANSHAN XINCUN SHANGHAI**
Author(s)	Huan Dong, Haixiao Pan, Zhendong Wang, Kun Li
Corresponding	Haixiao Pan
author	hxpank@online.sh.cn
Photos	
Key Words	**The Elderly , Travel Behavior , Built Environment , GBDT Model**

Bibliography of Speaker	Huan Dong is a PhD student under the mentorship of Prof. Pan of the College of Architecture and Urban Planning at Tongji University. Her current research interest is in Inclusive Cities. In the past two years, she has had in-depth exchanges with the elderly, the disabled, and other disadvantaged groups in various projects. She hopes to discuss in depth the inclusiveness issue in the process of urban transportation transformation.
Abstract	The rapid urban development has accelerated the aging process, leading to a decline in the mobility of the elderly population, even as their travel demand remains strong. Therefore, adapting community living environments to better suit the needs of the elderly has become an urgent priority. Using micro-level survey data, this study employs a Gradient Boosting Decision Tree (GBDT) model to investigate the travel characteristics and variables leading to travel problems from the perspective of the elderly. Focusing on a typical aging neighborhood—Anshan Xincun in Shanghai—this study explores the nonlinear effects of the built environment and personal travel preferences on the travel behavior of the elderly. The findings indicate that the frequency of travel among the elderly is not reduced by the presence of a companion. The difficulties encountered during travel are linked not only to the availability of facilities but also to their maintenance and the transmission of information. The number of weekly trips for daily essential activities (DEA) and non-daily essential activities (NDEA) is a key determinant of long-distance travel mode choice. As the frequency of various essential trips increases, there is a greater tendency to opt for public transportation for long-distance travel. These results provide valuable insights into the significant factors affecting elderly travel and can guide targeted improvements in elderly-friendly urban renovations.

Session 9: Urban design and sustainable

Time UTC+1 (Paris): 2024-11-07 11:20 - 12:30
Time (Shanghai):2024-11-07 18:20 - 19:30

A0040

Title of Speech	**CLUSTER ANALYSIS OF UNDERGROUND SPACE IN THE CORE AREA OF NEW DISTRICTS FROM THE PERSPECTIVE OF URBAN MORPHOLOGY**
Author(s)	Tian-ZeZhang
Corresponding author	Tian-Ze Zhang 2410105@tongji.edu.cn
Photos	
Key Words	**Underground space planning , Urban morphology , Transit-oriented Development , New districts**
Bibliography of Speaker	Tian-Ze Zhang, Research Centre for Underground Space and Department of Geotechnical Engineering, Tongji University, Shanghai 200092, China, 2410105@tongji.edu.cn

Abstract	Urban rail transit frequently serves as an effective means of developing new districts. In this context, how to develop underground space in new districts by the construction of metro stations becomes an important topic, as it determines the sustainability of social, ecological, and economic growth to some extent. Yet insufficient attention has been paid to their morphological characteristics, resulting in a lack of sustainable and resilient underground space morphology planning and design techniques. To bridge the gap, the computational morphology indicator system pertaining to underground space was established, involving land use, spatial distribution, and street network. And hierarchical cluster analysis was adopted to investigate the morphological features of underground spaces in well-developed core areas of new districts in China. According to the results of hierarchical clustering, underground space morphology in the new district is classified into three major categories, namely, Balanced Development (BD), Resource-driven Development (RDD), and Transit-oriented Development (TOD). RDD demonstrates exceptional development intensity and functional diversity, while TOD displays a higher concentration and vitality towards rail transit. BD maintains a balance between metro services to neighbouring areas and resource requirements of ground-level development. This study offers insights into spatial utilization optimization, sustainable development strategies, enhancement of socio-economic vitality, and transfer of planning strategies for underground space planning in new districts with metro development.

A0050

Title of Speech	**HOW MOBILITY HUBS WILL UPGRADE MOBILITY CHARACTERISTICS AND URBAN ENVIRONMENT**
Author(s)	Panagiotis Papantoniou, Vasiliki Amprasi , Dimosthenis Pavlou, Lea Rocholl , Giel Mertens
Corresponding author	Panagiotis Papantoniou ppapant@uniwa.gr

Photos	
Key Words	**mobility hubs , urban areas , stakeholders mapping , road map ,**
Bibliography of Speaker	Panagiotis Papantoniou is Civil Transportation Engineer, Assistant Professor at the Department of Surveying and Geoinformatics Engineering of the University of West Attica. He has extensive knowledge of the dynamics of transport, through his active participation for more than 15 years, as an engineer, researcher, transport consultant, representative of scientific organizations and advisor in all fields of transportation planning and infrastructure. His areas of expertise include road safety, road design, sustainable urban mobility and intelligent transportation systems. He has 15 years of experience as a researcher, has participated in 31 research projects carried out for the European Commission (16), other International Organizations (6) and Greek institutions (9). He has published 25 papers in scientific journals and 98 conference papers with full paper review. Finally, Dr. Papantoniou is former President of the Hellenic Institute of Transportation Engineers (2020-2024) member of scientific organizations and committees (12), reviewer of scientific journals and conferences (18) and member of the organizing committee of Greek and International conferences (8). He is honored with 14 scientific awards, including the Seal of Excellence, from the European Commission under the Horizon 2020 program and the award "European Friedrich-List-Prize" as the best doctoral dissertation in transport in Europe for the year 2015 from European Platform of Transport Sciences.

Abstract	Mobility hubs are meeting points for shared and active mobility within the existing public transport system. They serve as places of intermodal connectivity for these transport modes. In addition, mobility- related services such as parking facilities, and non- mobility related services such as food and drink kiosks are often integrated into mobility hubs aiming is to centralize public mobility and other resources, ensuring a easy access between modes and the first- and last-mile connectivity. Mobility hubs streamline the transit experience by providing seamless connectivity between different modes of transport, thereby reducing travel time and enhancing commuter convenience. These hubs facilitate the adoption of sustainable transportation options, such as electric vehicles and bikes, through infrastructure support like charging stations and secure bike storage. Additionally, mobility hubs encourage a shift away from private car dependency, leading to decreased traffic congestion and lower greenhouse gas emissions. The present work focuses into the design and implementation strategies of successful mobility hubs, highlighting best practices and potential challenges. In order to achieve this objective a thorough literature review/ desktop research took place in parallel with stakeholders mapping that underscore the importance of stakeholder collaboration, technological innovation, and policy support in realizing the full potential of mobility hubs. Ultimately, this research illustrates that well-designed mobility hubs are instrumental in creating efficient, sustainable, and livable urban environments, setting a new standard for future urban planning and development. Moreover, public-private collaboration in mobility hubs plays an essential role for creating effective and sustainable transportation solutions. These collaborations involve partnerships between government entities and private companies to plan, develop, and operate mobility hubs. Beyond transportation improvements, mobility hubs contribute to urban revitalization by fostering vibrant, accessible public spaces. They act as catalysts for economic activity, attracting businesses and enhancing the livability of surrounding areas.

A0052

Title of Speech	**AESTHETIC CALCULATION AND OPTIMIZATION OF ROAD ENVIRONMENT ON RURAL ROADS USING MACHINE LEARNING AND DEEP LEARNING TECHNIQUES**
Author(s)	Weixi Ren
Corresponding author	Weixi Ren 2011368@tongji.edu.cn
Photos	
Key Words	**Road environment , Aesthetic calculation , Intelligent optimization , Deep learning**
Bibliography of Speaker	Weixi Ren is currently a Ph.D. candidate in Transportation Engineering at Tongji University. Her research focuses on drivers' visual perception, driving risk analysis, road aesthetics, and traffic data analysis.
Abstract	With the improvement of people's quality of life and the integration of transportation and tourism, rural roads are increasingly valued not just for their functionality but also for their aesthetic appeal. However, existing methods for

	evaluating the aesthetic quality of rural road environments are often subjective and inefficient, leading to non-targeted and suboptimal optimization efforts. To address this issue, this study introduces aesthetic computing techniques to quantitatively assess and optimize the aesthetic characteristics of rural road environments. Machine learning and deep learning algorithms are employed to build a computational model that objectively evaluates the aesthetic performance of road environments. First, an image dataset (RAD) of rural road environments is constructed using real-world driving data to support subsequent aesthetic calculations and optimizations. Semantic, color, and texture features of the road environment are analyzed and quantified to explore their aesthetic expressions, including diversity, unity, and symmetry. Aesthetic feature maps are then created to describe these characteristics. Two types of aesthetic calculation models are developed: one based on aesthetic features and the other on landscape features. The aesthetic feature-based model, using algorithms like XGBoost and SHAP, provides high interpretability and enables precise aesthetic scoring, facilitating targeted optimization. Then, this study employs deep learning algorithms for intelligent aesthetic optimization of the road environment. By leveraging overall landscape and aesthetic feature ratings generated by the calculation models, specific scenes in need of optimization are identified, and their priorities are established. A fixed diffusion model, combined with text prompts and parameter adjustments, is used to generate intelligent optimization schemes for road environment images. This study could effectively improve the overall landscape and aesthetic characteristics of the rural road environment.

A0055

Title of Speech	**ATHENS DOWNTOWN ARCHAEOLOGICAL AND CULTURAL PROMENADE**
Author(s)	Konstantinos Zekkos
Corresponding author	Konstantinos Zekkos zekkos@dromosnet.com

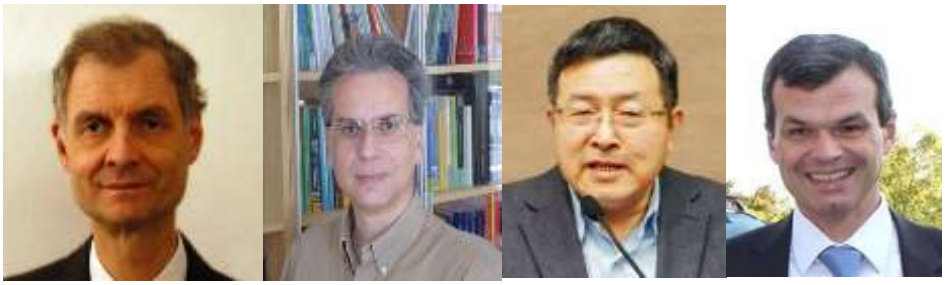
Photos	
Key Words	**active mobility , social inclusiveness , sustainability , harmonious design , mobility impaired friendly design**
Bibliography of Speaker	Konstantinos Zekkos has been COO of Dromos Consulting Group (Urban & Regional Development, Transport Planning, Traffic Engineering, Transport Infrastructure Design) since 1981. He graduated from the Civil Engineering School of National Technical University of Athens (1970) and holds a MSc degree in Transport Planning and Traffic Engineering from Northwestern University, IL, USA (1973). He has vast experience in the fields of territorial and urban planning, including a large number of urban regeneration projects and in strategic transport planning at statewide, regional or urban contexts, as well as in traffic engineering schemes and in engineering design of all transport modes infrastructure, acting for more than 50 years as chief engineer, transport planner or head of multi-disciplinary study teams. Throughout his career he has also provided technical support and experts' consultancy services to a large number of public interest bodies in the urban or regional development and in the transport sectors, including the European Commission, the Greek government and numerous regional and local governments / municipalities internationally. He has acted as chief advisor of the Transport Mobility Sector of the Organizing Committee of Athens 2004 Olympic Games throughout the preparatory period of this mega event and during the Olympic and Paraolympic games period, having provided as well traffic engineering services to the special purpose public body responsible for the Archeological Sites Unification Program in Athens. He is currently involved among others as deputy head of the study team for the major urban regeneration

	project of Faliron Gulf Coastal Zone, which is the principal outlet to the sea of the entire Metropolitan Athens, cofinanced by the European Commission, in close cooperation with DG Regio and the Regional Government of Attica Prefecture.
Abstract	Athens downtown encompasses numerous of the world-famous and UNESCO heritage archaeological and cultural sites including Acropolis, Ancient Agora, Zeus Temple, Zappeion Palace and Panathenaic Marble Stadium (1st Contemporary Olympic Games of 1896 and ending point of the Original Marathon Race). A special purpose legal entity established in 1995 for the realization of an ambitious 10-year program of the Archaeological Sites' Unification has only partially been achieved, despite the extension of the implementation period to 2014, curtailing a major segment of the overall improvement plan, due to insurmountable obstacles posed by interruptions of connectivity related to multiple transverse crossings of heavy loaded arterials. A gap in critical attention of the Unification Program had been the underestimation of possibilities provided by significant variations of the natural relief, that could lead to effective solutions of the problem stated. Thorough elaboration of this parameter has been performed along with analysis of trip attraction features of the venues. Alternative options have been evaluated using multicriteria analysis based on NEB values, considering impaired persons' mobility, sustainable and socially inclusive development of the transport system, walkability, harmonious adaptation to the urban landscape, respect of archaeological sites' sensitive environment. The project deals with promoting walkability in the natural and build environment of downtown Athens, it includes a new adequately shaded 1.8 km-long spinal promenade comprising new and existing segments, along with its infrastructural enablers, being safe and free from vehicular traffic conflicts. Nine nodes along the spinal, appropriately selected and configured function both as intermediate stops for relaxation and as focal points of walkways, radiating towards locations of archaeological, cultural and/or public interest throughout the entire central city area, bridging historical and contemporary Athenian civilization. The design fosters easy accessibility and multi-

	sensory holistic cultural explorations addressed to all visitors, enhancing connectivity and improving the urban environment with multiple beneficiary impact versus the partially completed Unification Program. Proximity and interconnection of the spinal promenade with all public transit modes contributes to integration of active mobility in intermodal transport, mitigating issues around “last mile” challenges.

Conclusion & Perspectives

Time UTC+1 (Paris): 2024-11-07 12:30 - 12:50
Time (Shanghai): 2024-11-07 19:30 - 19:50



Jean-François JANIN, Lifetime Honorary Chairman of THNS

Apostolos Papagiannakis, Associate Professor, Aristotle University of Thessaloniki, Scientific Committee Member of THNS2024

Prof.PAN Haixiao, Professor,Tongji University, Honorary Chairman of THNS2024

Fabien LEURENT, Professor, ENPC, Co-Chairman of THNS2024