SINGAPORE 2019

26th ITS World Congress
21–25 October

Smart Mobility, Empowering Cities

Organised by:

Land Transport Authority
We Keep Your World Moving

ITS Singapore

Co-hosted by:

ITS Asia-Pacific

ITS America

ERTICO ITS Europe

PROGRAMME

www.itsworldcongress2019.com

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WELCOME MESSAGES

Ngien Hoon Ping
Chairman,
ITS World Congress Singapore 2019 Steering Committee

Chief Executive,
Land Transport Authority

THE CONGRESS CHAIR

It is my honour to invite you to join the 26th Intelligent Transport Systems (ITS) World Congress from 21 to 25 October 2019 at the Suntec Singapore Convention & Exhibition Centre.

The Land Transport Authority of Singapore (LTA) and ITS Singapore are delighted to be co-hosting the World Congress in Southeast Asia for the first time.

The 2019 Congress theme, "Smart Mobility, Empowering Cities", reflects Singapore's commitment to creating a liveable smart city with a higher quality of life and a connected community. Singapore is well-known for being a choice Asia-Pacific destination for business events where valuable ideas are shared and developed. I am excited about the potential for creative and innovative ideas at this Congress that we can all take back to improve our own communities. The Congress is attracting strong interest and active participation from the region and beyond, and opens doors to fast-growing markets such as China, India and Southeast Asia.

With a comprehensive format of plenary and interactive sessions, and a dynamic exhibition with technical demonstrations and tours, the World Congress 2019 is an opportunity to network and share ground-breaking transport technology to further unleash the power of Intelligent Transport Systems.

I am sure we will forge mutually beneficial partnerships at the Congress with your active participation and support.

Andrew Chow
Deputy Chairman,
ITS World Congress Singapore 2019 Steering Committee

Co-Chair,
ITS World Congress Singapore 2019 Working Committee

President,
ITS Singapore

ITS SINGAPORE PRESIDENT

It was in 2015 that Singapore was accorded the honour to host the 26th ITS World Congress, the first ever in Southeast Asia. Ever since, the Steering and Working Committees with its many sub-committees, comprising Singapore Government Agencies led by the Land Transport Authority of Singapore and volunteer members from the industry and academia, worked earnestly as Team Singapore to make this event a success.

Over the five days, the ITS World Congress will provide a great platform for sharing, networking and showcasing the latest technologies, innovations and ideas for the advancement of Intelligent Transportation Systems around the world.

While in Singapore, we hope you take time to enjoy the attractions of our Lion City, immerse in our multi-racial atmosphere, the rich tapestry of arts and culture, and the diversity of our culinary experience.

Welcome to Singapore and we wish you a wonderful and memorable time at the 26th ITS World Congress.

Hajime Amano
Secretary General
ITS Asia-Pacific

ITS ASIA-PACIFIC

On behalf of ITS Asia-Pacific, I would like to invite you to the 26th ITS World Congress in Singapore.

Rapid penetration of innovative technologies in transportation, such as electrification of power trains, big data collection and analysis, and automated driving, are accelerating drastic changes in industries, regulatory framework and behaviors of people. In other words, we can no longer develop and deploy new technologies without thorough investigation of societal implications.

Expectations and concerns are mixed as 'singularity' seems to be quickly approaching. Innovative mobility services are emerging and brought about by new breed of ambitious people. On the contrary, established industries are searching for empirical evidences showing the direction for them to invest their resources to survive.

There are a lot of opportunities for cross-cutting discussions. Based on the achievements and experiences in ITS, we have to quantitatively evaluate both potential benefits and risks of the innovative technologies and social innovations.

Under the theme of 'Smart Mobility, Empowering Cities', ever expanding diversity of participants is anticipated to share views and experiences across the academic disciplines, across the industrial sectors and across the jurisdictions.

I'm looking forward to having you with us in Singapore.

Shailen Bhatt
President and Chief Executive Officer
ITS America

ITS AMERICA

On behalf of the Intelligent Transportation Society of America (ITS America), welcome to the 26th ITS World Congress in Singapore! ITS America is proud to join with ITS Asia-Pacific and ERTICO – ITS Europe in organizing this exciting event, and congratulations to ITS Singapore and the Land Transport Authority of Singapore for their efforts to bring the ITS world together in the coming days.

As you know, the theme is "Smart Mobility, Empowering Cities," which completely aligns with Singapore's reputation as one of the world's smartest cities. It promises to be an exciting conference, and one in which you will have an opportunity to delve into the technical program's eight themes: crowdsourcing and big data analytics; cybersecurity and data privacy; innovative pricing and travel demand management; intelligent, connected and automated vehicles; multimodal transport of people and goods; policies, standards and harmonisation; safety for drivers and vulnerable users; and sustainable smart cities.

At ITS America, our vision is a better future transformed by intelligent mobility – one that is safer, greener and smarter. We advance the research and deployment of intelligent transportation technologies to save lives, improve mobility, promote sustainability, and increase efficiency and productivity. Our members, along with other industry stakeholders, are eager to engage with others around the world who share these same goals. The 2019 World Congress in Singapore is the venue in which we can make important connections with policymakers, entrepreneurs, researchers, academics, investors, and many others. I am confident it will be as exciting and valuable for you as I know it will be for me. Have a great week, and I look forward to seeing you in Singapore!

Jacob Bangsgaard
Chief Executive Officer
ERTICO – ITS Europe

ERTICO - ITS EUROPE

On behalf of ERTICO – ITS Europe and our network of Partners, it is my pleasure to welcome you to the 26th ITS World Congress in Singapore.

ERTICO – ITS Europe is proud to co-organise this event with ITS Asia-Pacific and ITS America, and join our hosts ITS Singapore and the Land Transport Authority of Singapore, in their ambition to promote smart mobility solutions and services.

I am particularly glad that the Congress is hosted in Singapore, which is a global finance and transport hub, widely recognised as one of the world's smartest and most technologically advanced cities. Singapore also has one of the highest standards of living in Asia. Singapore truly reflects the Congress theme "Smart Mobility, Empowering Cities", which places cities and urban agglomerates at the heart of the conversation and looks at more sustainable and smarter mobility services for everyone.

The ITS World Congress is one of the most significant events globally, bringing together all sectors of the transport industry, public and private, to present and discover more about the latest ITS innovations. The 2019 Congress will look in particular at connected and automated mobility; multimodal transport for people and goods; policies, standards and harmonisation; and cybersecurity and data privacy – all areas which ERTICO drives forward through our activities and projects. We are excited to work with our partners and continue to collaborate in deploying and promoting intelligent transport and services across the world.

I look forward to meeting many of you and having the chance to share ideas at this amazing event for the entire mobility community.

ABOUT THE ORGANISERS

LAND TRANSPORT AUTHORITY

Formed in 1995, by merging four public sector entities to streamline its operation and regulatory works, Land Transport Authority (LTA) is responsible for planning, operating, maintaining and regulating the whole of Singapore's land transport infrastructure and systems. Its vision is to create a people-centred land transport system with the mission to connect people and places, and enhancing travel experience.

One of the main thrusts of our transport strategies is to make public transport a choice mode, or a viable alternative to the car. We aim to provide a quality public transport system to support the growth of travel demand in future. This includes expanding our rail network, improving the quality of bus services and making sure that the whole system is well-integrated, while ensuring that the system is financially sustainable.

Another strategy is to optimise our road network through the use of policies and technology. Apart from increasing the capacity of the road network, we have put in place vehicle ownership policies to keep the car population at levels supportable by road infrastructure development, and have introduced congestion charging to better manage congestion along the heavy corridors. We also leverage technology to enhance the efficiency of road operations, optimise our road capacity and provide information on road conditions to drivers.

Thirdly, we seek to provide for the diverse needs of our society and contribute to a quality, liveable environment. This includes implementing initiatives that will provide better access for various diverse groups such as the elderly, mobility challenged and families with young children.

Please visit www.lta.gov.sg for more information.

INTELLIGENT TRANSPORTATION SOCIETY SINGAPORE

The Intelligent Transportation Society (ITS) Singapore is a non-profit association with the aim to bring together the professional interests of those in public and private organisations, practitioners, academics and researchers related to ITS, and create opportunities for networking and interaction. Its missions are:

- To promote & support the development of the ITS Industry in the interests of Singapore
- To represent Singapore and support the activities & interests of the ITS AP & ITS WC entities
- To champion, promote & protect the interests of companies, business organisations, educational and research institutions, firms, partnerships & other entities legally organised for ITS business in Singapore
- To act as the advisory, consultative & coordinating body for the ITS Industry
- To promote, organise, manage & stage seminars, conferences, exhibitions & other events relevant to the ITS Industry

Please visit www.itssingapore.org.sg for more information.

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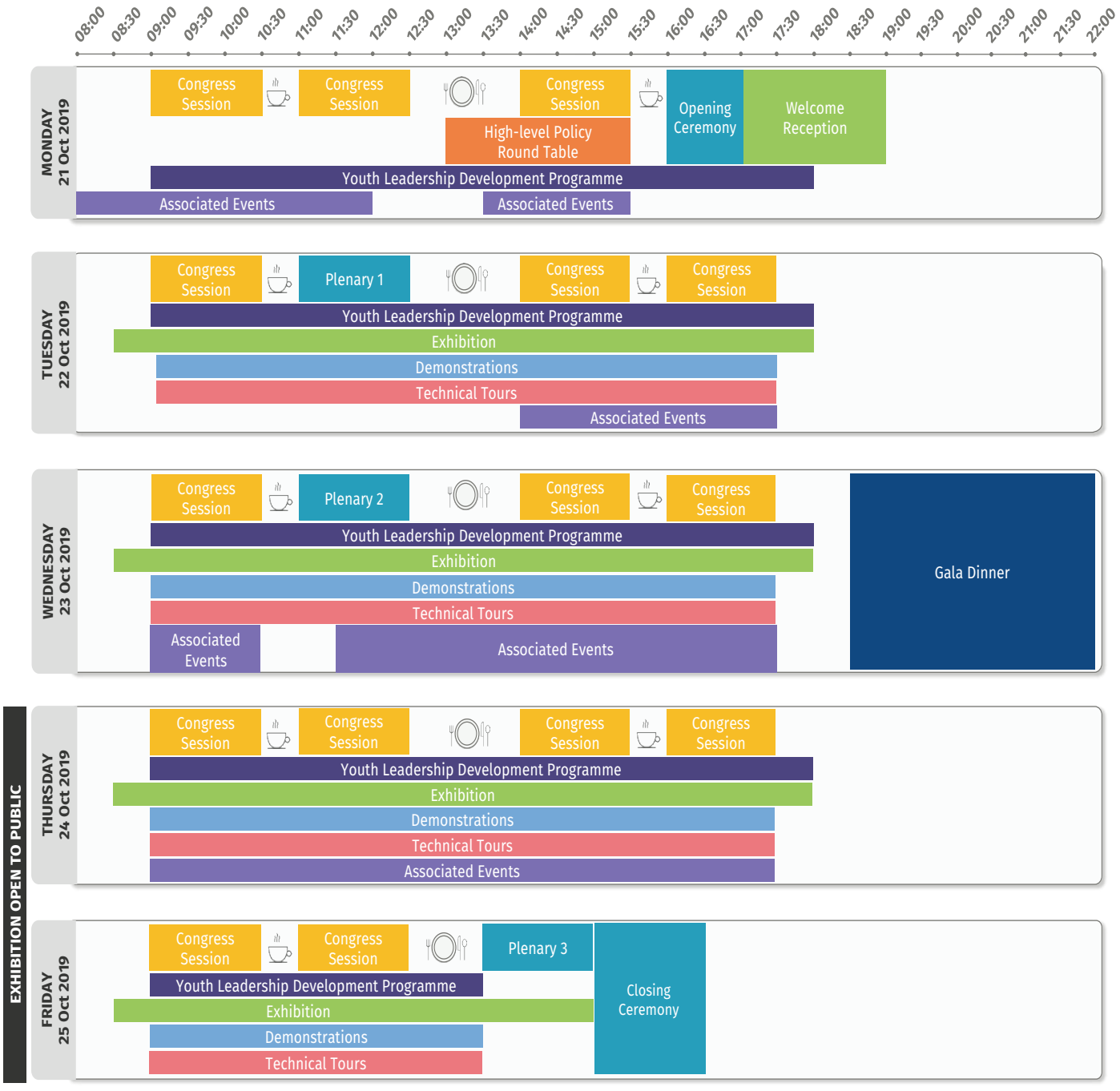
PROGRAMME

PROGRAMME AT A GLANCE



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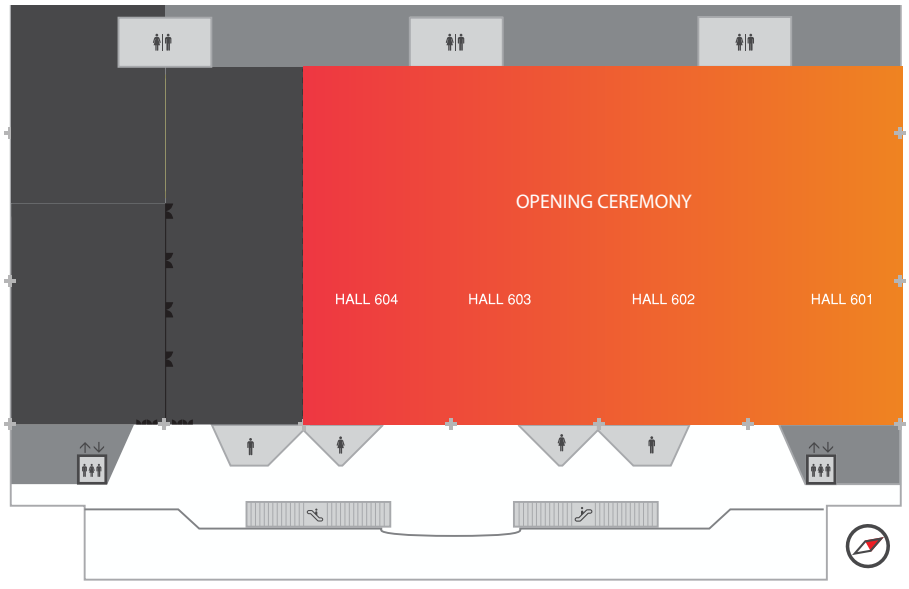
SUNTEC CONVENTION AND EXHIBITION CENTRE LEVEL 3

Meeting Rooms

SUNTEC CONVENTION AND EXHIBITION CENTRE LEVEL 6



Halls

SESSIONS AT A GLANCE

Monday, 21 October 2019

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10:30 - 11:00	BREAK										
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13:30 - 15:30	**AE 02 C-level Forum on Mobility Solutions for Smart Cities** Nicoll 3										
15:30 - 16:00	BREAK										
16:00 - 17:00	**Opening Ceremony** Level 6, Hall 601 - 604										
17:00 - 19:00	**Welcome Reception** Level 4, Hall 401 - 406										

Tuesday, 22 October 2019

Time															
09:00 - 10:30	**ES 01** Technology and Safety Issues for Connected and Automated Driving Nicoll 3	**AP 01** Asia Pacific High Level Forum on New Transportation Infrastructure Nicoll 2	**SIS 09** Challenge of integrating Automated Vehicles into the digital infrastructure Room 325	**SIS 10** Complex Self Driving Field Operational Tests using evolved IT infrastructures Room 326	**SIS 11** Sustainable ITS Asset Management Strategies Meeting Technology Challenges Room 327	**SIS 12** Intelligence as a foundation for smart mobility through smart traffic signals Room 328	**SIS 13** Inclusive and sustainable shared, personalised, automated and connected mobility in smart cities Room 329	**SIS 14** Road infrastructure concerning ADS Room 330	**TS 11** V2X Communication Technologies & Cooperative Systems I Room 308	**TS 12** Innovative Data Use in ITS Applications Room 309	**TS 13** Traffic Management Platforms and Tools Room 310	**TS 14** Towards automated driving with connected vehicle trials Room 311	**TS 15** Safety Aspects of Human Machine Interface Design & Evaluation Room 312	**TS 16** Innovative parking management to manage demand and enable smarter and efficient parking Room 324	**SP 01** Use of connected ITS data for safety, traffic management and improving energy efficiency Room 320
10:30 - 11:00	BREAK														
11:00 - 12:30	**PL 01** Advancing Connected & Automated Mobility Deployment Summit Room														
12:30 - 14:00	LUNCH														
14:00 - 15:30	**ES 02** Autonomous Vehicles Testings - How do we address legislation discrepancies? Nicoll 3	**AP 02** Advanced technologies for operation and maintenance of ITS facilities Nicoll 2	**SIS 15** Autonomous Vehicle Challenges and Opportunities in Asia-Pacific Room 327	**SIS 16** New business models deriving from higher automation levels in freight and logistics Room 328	**SIS 17** Advanced Weather Response Systems Room 329	**SIS 18** Learning lessons from C-ITS early adopters Room 330	**TS 17** Incorporating mobility trends and reframing of behaviour for management of multimodal transport Room 308	**TS 18** ITS Infrastructure for Automated Vehicles I Room 309	**TS 19** Prediction and Analytics for ITS applications Room 310	**TS 20** Traffic Control & Operations I Room 311	**TS 21** Preventative & Active Safety Systems Room 312	**TS 22** Policy framework for connected & automated vehicles Room 324	**TS 23** Automated driving trials and performance assessment of key technologies Room 325	**SP 02** AI, data analytics and advance optimization methods for demand studies, traffic prediction and incident detection Room 320	**AE 03** Global Forum on MaaS Nicoll 1	**AE 04** Cyber-security Room 326	**AE 05** Synergising the Greater Bay Area with Smarter Mobility Room 321
15:30 - 16:00	BREAK																
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Intelligent, Connected & Autonomous Vehicles
Sustainable Smart Cities
Safety for Drivers & Vulnerable Users
Innovative Pricing & Travel Demand Management
Crowdsourcing & Big Data Analytics
Multimodal Transport of People & Goods
Policies, Standards & Harmonisation
Cybersecurity & Data Privacy

PL: Plenary Session **ES:** Executive Session **AP:** Asia-Pacific Regional Stream **SIS:** Special Interest Session **TS:** Technical Session **SP:** Scientific Paper Session **CP:** Commercial Paper Session **AE:** Associated Events

SESSIONS AT A GLANCE

Wednesday, 23 October 2019

Time																
09:00 - 10:30	**ES 04** Freight Ports and Crossings Nicoll 3	**AP 04** The role of government for deploying connected and automated vehicle in Japan Nicoll 2	**SIS 23** Testing of Automated Driving on public roads: challenges and first lessons learned Room 325	**SIS 24** Sustaining Smart City Safety and Mobility Through Traffic Incident Management Room 326	**SIS 25** TFMI Part I: Efficient and Sustainable Operation of Commercial Vehicles on Highways Room 327	**SIS 26** How Road Usage Charging and Urban Vehicle Access Regulations Converge? Room 328	**SIS 27** The role and benefits of Mobility On Demand in the multimodal journey Room 329	**SIS 28** Crowd-sourced Data Analytics Improving Network-wide Traffic Management, Operations and Safety Room 330	**TS 31** Connected & Automated Vehicle Deployment & Field Operations Tests II Room 308	**TS 32** Modelling & Simulation Studies for Automated Vehicles I Room 309	**TS 33** Traffic Control & Operations III Room 310	**TS 34** Mobility as a Service (MaaS) and Mobility on Demand Room 311	**TS 35** Safety for vulnerable users Room 312	**SP 04** Harnessing Big Data Analytics for enhancement of tracking, route decision and transport operations Room 320	**CP 03** Sustainable traffic management solutions for enabling smarter cities Room 321	**AE 06** C-ITS V2X workshop Room 324
10:30 - 11:00	BREAK															
11:00 - 12:30	**PL 02** Promoting Innovative Mobility Services Summit Room															
12:30 - 14:00	LUNCH															
14:00 - 15:30	**ES 05** Transforming MaaS from Imagination to Reality Nicoll 3	**AP 05** Testing and validating autonomous vehicles using traffic simulation Nicoll 2	**SIS 29** 5G for ITS: the future baseline for inter-modal mobility and automated driving Room 326	**SIS 30** TFMI Part II: Connected and Automated Vehicles, and Truck Platooning Room 327	**SIS 31** Mobility Data Collection, Analysis and Sharing: Challenges and Overcoming the Challenges Room 328	**SIS 32** Strategy of Practical Implement of V-I Cooperative Systems for Traffic Accident Avoidance Room 329	**SIS 33** Mobility-as-a-Service Beyond Western Cities: Rural Areas, Developing Countries and Megacities Room 330	**TS 36** Modelling & Simulation Studies for Automated Vehicles II Room 308	**TS 37** Application of AI, including Deep Learning in Automated Vehicles Room 309	**TS 38** Data Analytics for Traffic Monitoring & Management Room 310	**TS 39** Traffic Control & Operations IV Room 311	**TS 40** ITS for Rail and Port Systems Room 312	**SP 05** Connected Vehicle Data for Optimization of traffic management Room 320	**CP 04** Sustainable ITS Solutions for Smarter and Greener Cities Room 321	**AE 07** Future Mobility International Working Group 3.0 Nicoll 1	**AE 08** 5G and IoT Boosting the Digital Transformation of the Automotive Sector Nicoll 1
15:30 - 16:00	BREAK															
16:00 - 17:30	**ES 06** Managing Urban Space Nicoll 3	**AP 06** Autonomous Driving Intelligence System & Future Challenges of ADAS in Urban Environments Nicoll 2	**SIS 34** Impact Assessment of Automated Vehicles on Traffic flow and Environment Room 326	**SIS 35** TFMI Part III: Smart Multimodal Urban Freight and Logistics Room 327	**SIS 36** Connecting Vehicle and Infrastructure Around the World Room 328	**SIS 37** Citizens in Motion: Who's driving your future? Room 329	**SIS 38** Implementation Programs of Connected Automated Shuttle as Urban Public & Shared Mobility Room 330	**TS 41** Advanced Collision Avoidance Systems for CAVs Room 308	**TS 42** Road pricing as an effective tool to manage travel demand Room 309	**TS 43** Application of Data Analytics to traffic demand and congestion management Room 310	**TS 44** Future Transport Systems Room 311	**TS 45** Strategies for regulation and enforcement Room 312	**SP 06** V2X data for improving autonomous vehicle navigation and perception Room 320	**CP 05** Innovative Solutions for Pricing & Travel Demand Management Room 321	**AE 07** Future Mobility International Working Group 3.0 Nicoll 1	**AE 08** 5G and IoT Boosting the Digital Transformation of the Automotive Sector Room 324

Thursday, 24 October 2019

Time																
09:00 - 10:30	**ES 07** Moments of Truth in MaaS Implementation Nicoll 3	**AP 07** Crowd movement analysis and modelling Nicoll 2	**SIS 39** Integrating 3D mobility in the MaaS ecosystem Room 325	**SIS 40** Sharing data for traffic information between road authorities and service providers Room 326	**SIS 41** Delivering on Proactive Congestion Management Room 327	**SIS 42** MaaS: Should Mobility Choices, City Goals and Private Sector Opportunities be Balanced? Room 328	**SIS 43** Digital Transport Infrastructure - Definitions, Elements and Functions Room 329	**SIS 44** AI and Cloud Computing Drive the Digital Transformation of ITS Traffic Management Room 330	**TS 46** Application of Data Analytics & Modelling in Traffic Management Room 308	**TS 47** Mode shift strategies and inclusive mobility Room 309	**TS 48** Safety for Pedestrians, Cyclists & Vulnerable Users Room 310	**TS 49** Case studies that help define policy and strategy Room 311	**TS 50** Improving Safety of Vulnerable Road Users Room 312	**SP 07** Passenger and freight travel demand studies and optimization applied to ITS Room 320	**AE 09** Autonomous Mobility Summit Summit Room	
10:30 - 11:00	BREAK															
11:00 - 12:30	**ES 08** Today's Mobility: Accessibility, Inclusivity and Safety Nicoll 3	**AP 08** Challenges and opportunities for Personal Mobility Devices in Smart Cities Nicoll 2	**SIS 45** Planning, Design and Application for Autonomous Mobility: International Perspectives Room 325	**SIS 46** An In-Depth Update on the United States First Smart City: Columbus, Ohio Room 326	**SIS 47** Putting ITS in its Place: place centric approach to technology deployment Room 327	**SIS 48** Towards a sustainable technology driven port city Room 328	**SIS 49** Circular Economy - How to Apply "Reduce, Reuse, Recycle" Principles to Transportation and Asses the Impacts Room 329	**SIS 50** Possible actions for Public Authorities to facilitate Automated Driving Room 330	**TS 51** Transport Modelling and Forecasting Room 308	**TS 52** New multimodal modes and integrated digital platform covering scheduling, routing and priority Room 309	**TS 53** Management and Optimization of Logistics & Freight movement Across a region or country Room 310	**TS 54** Technology & System for Safety and Enforcement I Room 311	**TS 55** Tolling systems for road Room 312	**SP 08** Data and models for safety, navigation, and vehicle operations Room 320	**AE 09** Autonomous Mobility Summit Summit Room	
12:30 - 14:00	LUNCH															
14:00 - 15:30	**ES 09** Is Proliferation of new technologies creating a level playing field? Nicoll 3	**AP 09** Beyond predictive analytics Nicoll 2	**SIS 51** Testing Methodologies for Automated Driving Systems Room 326	**SIS 52** New Organization Paradigm for Fostering Cooperation Between Organizations Room 327	**SIS 53** International Citizens' debate on automated mobility: what do the Citizens' want? Room 328	**SIS 54** Towards an Optimised Mobility System: Integrating Traffic Management and MaaS Room 329	**SIS 55** Prospects of a 5G Reference Framework for CCAM Room 330	**TS 56** Electromobility & EV Charging Infrastructure Room 308	**TS 57** V2X Communication Technologies & Cooperative Systems II Room 309	**TS 58** Technology & System for Safety and Enforcement II Room 310	**TS 59** Funding strategies, Framework and Innovative Business Models Room 311	**TS 60** Innovative Use of Technologies for Travel Demand Management Room 312	**TS 61** Advanced Driver Assistance Safety Systems - Detection and simulation Room 324	**TS 62** Technology and Testbeds for Connected Automated Vehicles Room 325	**SP 09** Leveraging on new modes of data for improving perception, routing, parking and road management Room 320	Youth Development Presentation Room 303	**AE 09** Autonomous Mobility Summit Summit Room

Intelligent, Connected & Autonomous Vehicles
Sustainable Smart Cities
Safety for Drivers & Vulnerable Users
Innovative Pricing & Travel Demand Management
Crowdsourcing & Big Data Analytics
Multimodal Transport of People & Goods
Policies, Standards & Harmonisation
Cybersecurity & Data Privacy

PL: Plenary Session **ES:** Executive Session **AP:** Asia-Pacific Regional Stream **SIS:** Special Interest Session **TS:** Technical Session **SP:** Scientific Paper Session **CP:** Commercial Paper Session **AE:** Associated Events

SESSIONS AT A GLANCE

Thursday, 24 October 2019 *(continued)*

Time																
15:30 - 16:00	BREAK															
16:00 - 17:30	**ES 10** Driving ITS through the Power of Data Nicoll 3	**AP 10** Optimising Supply Chains Using Data: Some Practical Examples and Recommendations Nicoll 2	**SIS 56** Accessible and Equitable Mobility: Can this be Accomplished with MaaS? Room 326	**SIS 57** Collaborative ITS – Challenge for the future integrated mobility Room 327	**SIS 58** The power of shared mobility to make cities more livable Room 328	**SIS 59** Pathway to Automation Room 329	**SIS 60** Secure ITS Framework – Standardized Secure Communications for All ITS Use Cases Room 330	**TS 63** Business Intelligence and Data Analytics for ITS applications Room 308	**TS 64** Sustainability in Transportation I Room 309	**TS 65** ITS Infrastructure for Automated Vehicles II Room 310	**TS 66** Safety considerations for future ITS systems Room 311	**TS 67** Secure architectures to defend against cyberattacks & jamming and spoofing prevention Room 312	**TS 68** ITS for Emergency Room 324	**TS 69** Use of data for improving ITS solutions Room 325	Youth Development Presentation Room 303	**AE 09** Autonomous Mobility Summit Summit Room

Friday, 25 October 2019

Time																
09:00 - 10:30	**ES 11** Freight Movement for Smart Cities Nicoll 3	**SIS 61** Traffic Signal Control & Management for Connected & Automated Driving Systems Room 327	**SIS 62** 5G with Satellite Communication – Delivering Resilience and Reach Room 328	**SIS 63** ITS for Life II Room 329	**TS 70** Sensors & Perception Methods for Automated Vehicles Room 309	**TS 71** Probe Data Collection Technology and innovative use of mobile data Room 310	**TS 72** Electromobility and environmental impacts Room 311	**TS 73** Lessons Learnt from Mobility as a Service (MaaS) deployments Room 312	**CP 06** Policy, Technology and Pricing challenges in management of new emerging techonologies Room 320	**CP 07** Shared Mobility Solutions enabling efficient Multimodal Transport of People & Goods Room 321						
10:30 - 11:00	BREAK															
11:00 - 12:30	**ES 12** Demand Management Strategies and Practical Considerations Nicoll 3	**SIS 64** Realizing Benefits of C-ITS in Everyday Life Room 327	**SIS 65** How does AI Fit into the Transportation Ecosystem Room 328	**SIS 66** Global Harmonization of Safety Assurance for Highly Automated Vehicles Room 329	**TS 74** Case studies of Mobility as a Service (MaaS) Deployments Room 309	**TS 75** Use of crucial big data for traffic management Room 310	**TS 76** Sustainability in Transportation II Room 311	**TS 77** Enhanced Safety with Driver Health Monitoring Room 312	**CP 08** Personalised mobility services and shared mobility solutions Room 320							
12:30 - 13:30	LUNCH															
13:30 - 15:00	**PL 03** Intelligent Mobility Solutions for a Sustainable Smart City Summit Room															
15:00 - 16:30	**Closing Ceremony** Summit Room															

Intelligent, Connected & Autonomous Vehicles
Sustainable Smart Cities
Safety for Drivers & Vulnerable Users
Innovative Pricing & Travel Demand Management
Crowdsourcing & Big Data Analytics
Multimodal Transport of People & Goods
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CONGRESS FORMAT

"SMART MOBILITY, EMPOWERING CITIES"

The 2019 Congress theme "Smart Mobility, Empowering Cities" reflects Singapore's commitment to create the most liveable smart city in support of a higher quality of life and an ever-connected community. With a comprehensive format of plenary and interactive sessions, as well as a dynamic exhibition with technical demonstrations and tours, the 26th ITS World Congress will be an opportunity for our participants to network, discuss and share ground-breaking transport technology, and forge mutually beneficial partnerships to further unleash the power of ITS.

PLENARY SESSIONS

All attendees are welcome to join the Opening and Closing Ceremonies as well as Plenary Sessions dedicated to key ITS issues addressed by major personalities.

EXECUTIVE SESSIONS

In these sessions, high-level industry executives, public officials and academia from around the world will draw from their experiences to share their views on ITS achievements, issues and challenges.

SPECIAL INTEREST SESSIONS

Organised at the request of groups of experts developing and deploying ITS, these interactive, tailor-made sessions provide the opportunity to focus on specific topics of interest.

COMMERCIAL PAPER SESSIONS

Commercial Papers describe an activity aimed at generating or improving a specific product, device or idea for the market. Papers will be presented in groups and facilitated by a moderator.

TECHNICAL/SCIENTIFIC SESSIONS

These sessions comprised presentations by international experts on a variety of topics encompassing practical, economic, technological, organisational and societal aspects of ITS. They aim to encourage the exchange of information on deployment ranging from improving the operational use of systems and services to research & development in support of new applications. Scientific papers submitted for publication in the Journal IET Intelligent Transport Systems will be expected to show scholarship, innovation and analysis of new types of problems and/or solutions rather than different approaches to areas that have already been researched.

ASIA-PACIFIC REGIONAL STREAM

Held at this year's 26th ITS World Congress in collaboration with ITS Asia-Pacific, this special Asia-Pacific Regional Stream is organised to cover various topics that are especially relevant for the Asia-Pacific region. These interactive sessions will provide delegates an opportunity to hear and understand more about some of the collaboration opportunities and challenges in various mobility-related initiatives that the Asia-Pacific countries have.

Programme Topics

Intelligent, Connected & Automated Vehicles

Crowdsourcing & Big Data Analytics

Sustainable Smart Cities

Multimodal Transport of People & Goods

Safety for Drivers & Vulnerable Users

Policies, Standards & Harmonisation

Innovative Pricing & Travel Demand Management

Cybersecurity & Data Privacy

PLENARY SESSIONS

OPENING CEREMONY

Monday, 21 October 2019 | 16:00 - 17:00 | Level 6

In keeping with tradition, the Opening Ceremony will start with the official welcome by the organisers, Land Transport Authority of Singapore and Intelligent Transportation Society Singapore, and co-hosts representing Asia-Pacific, Americas and Europe.

Celebrations at the opening ceremony include the presentation of the 'Hall of Fame - Lifetime Achievement' award and entertainment that encapsulates the charms of the host city Singapore. The opening ceremony will be followed by the Official Exhibition Launch and the Welcome Reception at the Exhibition Hall.

PL 01: ADVANCING CONNECTED & AUTOMATED MOBILITY DEPLOYMENT

Focus on multi-intermodal autonomous mobility, infrastructure and policy.

Tuesday, 22 October 2019 | 11:00 – 12:30 | Summit Room

Connected and Automated Mobility is poised to transform the movement of people and goods, vehicle ownership and mobility services. The recent leap in technology, enabled by progress in AI, new sensors and computing power is helping us to approach this new frontier faster. It could potentially bring huge benefits by making transportation safer, more accessible and sustainable. However, the path to achieve a harmonious transportation eco-system that can speed up the proliferation of Connected and Automated Mobility in a seamless manner is littered with many challenges that need to be first overcome.

- What are the top few salient points that we should focus on for Connected and Automated Mobility standardisation to encourage deployment?
- How should we design a viable and progressive live-testing approach to validate the safety of the technologies without stemming growth?
- What level of infrastructure support should we develop for automated vehicles and how should this infrastructure interact with the vehicles?
- Can self-driving vehicles really help to ease traffic congestion, or do they make it worse?
- How should we craft out a framework to address ethical and liability issues when responsibility of driving is transferred to vehicles? How should an automated vehicle react to an accident that could not be avoided and what criteria should be used to determine a vehicle's decision?
- How can we find the right balance between sharing public and private data which would enable fair and effective competition and ensure sufficient data protection?
- Should we use new transportation modes and services (e.g. car-sharing, Mobility as a Service, etc.) to speed up the acceptance of Connected and Automated Mobility?

Keynote Speaker:

Swan Gin Beh, Chairman, Economic Development Board, Singapore

Moderators:

Saurav Bhattacharyya, Chief Executive Officer, Quantum Inventions, Singapore

Speakers:

Young-Jun Moon, Research Fellow and Director of ITS R&D, The Korea Transport Institute (KOTI)

Seleta Reynolds, General Manager, Los Angeles Department of Transportation, USA

Carlo des Dorides, Executive Director, European GNSS Agency (GSA), Czech Republic

PLENARY SESSIONS

PL 02: PROMOTING INNOVATIVE MOBILITY SERVICES

Focus on challenges and ideas for realising innovative or integrated mobility services such as Mobility on Demand and MaaS.

Wednesday, 23 October 2019 | 11:00 – 12:30 | Summit Room

Traditionally, transport authorities have always been looking for ways to make public transport more attractive and increase patronage through conventional means. With the emergence of new transport modes, e.g. ride-sharing, shared taxis, bike-sharing, car-pooling, demand-responsible transport, there is a great opportunity to complement the classic public line transport and enable this shift to meet the increasing and diverse user mobility demands. However, to enable a truly integrated multi-modal and a just in-time mobility service that brings together public authorities, new transport service providers, travel brokers, public transport operators and other stakeholders, there is a need to consider new innovative ideas and address the key challenges in the current transportation framework.

- How should we promote the fair use of public and private open big data without stifling competition? How should we promote crowdsourcing and collaboration and help monetise data for all stakeholders?
- Do we need investments in new transport infrastructure, equipment and operation systems to enable this new just in-time framework?
- How should we enhance our e-ticketing system or encourage open payment methods to cater for this new paradigm shift?
- What changes should we make to our legal and regulatory framework to ensure sustainability of service quality and ease the inclusion of new entrants?
- What business models should the various non-conventional and conventional stakeholders adopt to ensure sustainability? Are business models based on Open Data sustainable in the long term?
- Which approach to public and private partnership model is feasible?

Keynote Speaker:

Ping Soon Kok, Chief Executive, Government Technology Agency, Singapore

Moderator:

Lina Lim, Chief Transport Planner, Group Director, Policy and Planning, Land Transport Authority, Singapore

Speakers:

Mu-Han Wang, Director General, Department of Science and Technology Advisory, Ministry of Transportation and Communications, Chinese-Taipei

Roger Millar, Secretary, Washington State Department of Transportation, USA

Henrik Hololei, Director General, DG MOVE, European Commission

PL 03: INTELLIGENT MOBILITY SOLUTIONS FOR A SUSTAINABLE SMART CITY

Focus on providing people with intelligent mobility solutions, multi-modal options and preferred mode choices.

Friday, 25 October 2019 | 13:30 – 15:00 | Summit Room

As cities expand, they are faced with inherent problems related to mobility such as high emissions, noise pollution, congestion, accidents and accessibility to transport. Capitalising on these problems and increasing user demands, we have witnessed new entrants to the mobility sector offering alternative transport modes with improved fuel efficiency and automation to plug the gaps. These new mobility trends will have to complement mass transit that will continue to be the most attractive option for economical, safe, clean and sustainable mobility. A well-functioning and comprehensive system, with timely and real-time information updates, and easily accessible public transport systems are keys to achieving global targets on sustainability. To address the challenges of a sustainable mobility system for a smart city, we would need to take a more entrepreneurial and innovative look into the transport eco-system.

- What new ideas and innovations can we introduce to achieve a more sustainable urban mobility solution?
- How can we provide access to safe, affordable, accessible and sustainable transport systems for all, including persons with special needs, women, children and older persons?
- How can we capitalise on the new emerging modes to make it easier and attractive to board collective means of transport?
- How can we introduce innovative use of energy and traffic management approaches to reduce environmental impact of transport?
- What new policies, regulations and business models can we use to better leverage the new emerging transport modes to benefit the masses?

Keynote Speaker:

Chong Kheng Chua, Deputy Chief Executive (Infrastructure & Development), Land Transport Authority, Singapore

Moderator:

Men Leong Chew, Chief Marketing Officer, ST Engineering, Singapore

Speakers:

Claire Thurston, Director SCATS, New South Wales Government, Australia

Steve Morriss, President, Design and Consulting Services, AECOM, USA

Leen Balcaen, Senior Director Industry Solutions, HERE Technologies, Belgium

CONCLUSION AND CLOSING CEREMONY

Friday, 25 October 2019 | 15:00 - 16:30 | Summit Room

The conclusions, including key developments and pointers for the future, will be presented by Professor Eric Sampson, Chief Rapporteur, based on inputs prepared by a team of Rapporteurs drawn from all regions. The Closing Ceremony will summarise key moments that made the 26th ITS World Congress unique. It will include among others, official closing keynote speeches from the organisers, Land Transport Authority of Singapore and Intelligent Transportation Society Singapore, the Singapore 2019 highlights video, best session and paper awards, Youth Leadership Development Programme Grand Challenge awards, video presentations and invitations by the 27th ITS World Congress (Los Angeles 2020), the 28th World Congress (Hamburg 2021) and 29th World Congress (Suzhou 2022) and Passing of the Globe Ceremony.

EXECUTIVE SESSIONS

ES 01: TECHNOLOGY AND SAFETY ISSUES FOR CONNECTED AND AUTOMATED DRIVING

Tuesday, 22 October 2019 | 09:00 – 10:30 | Nicoll 3

It is crucial to have a shared planning framework including a harmonised approach towards safety validation and roadworthiness testing, as well as open platforms to enable data sharing. Deployment will only be possible if future users understand the basics of the new technologies and the benefits they can bring as well as the need for behavioural changes. What are we doing to achieve this? What "living labs", deployment sites do we have or are being planned? What is the focus? How are we sharing lessons learned? How do we ensure automated vehicles will live up to its promise of improving road safety? How soon can we achieve this? What safety technologies are needed? Can human errors be a thing of the past? Besides technology, what other considerations are needed to ensure zero accidents?

Moderator:

Angelos Amditis, Research Director & ERTICO Chairman, Institute of Communication & Computer Systems (ICCS), Greece

Speakers:

Toshihiro Sugi, Director for Automated Driving Planning Office, National Police Agency, Japan
Ed Bradley, Program Manager, Toyota North America, Board Member, ITS America, USA
Tony Kratofil, Chief Operations Officer and Chief Engineer, Michigan Department of Transportation (MDOT), USA
Andree Hohm, Director Driverless Mobility, Continental, Germany

ES 02: AUTONOMOUS VEHICLES TESTING - HOW DO WE ADDRESS LEGISLATION DISCREPANCIES?

Tuesday, 22 October 2019 | 14:00 – 15:30 | Nicoll 3

Autonomous Vehicle testing facilities have existed for several years. Real world testing in live traffic has started across the world and there have been some challenges in this testing. Connected Automated Vehicle (CAV) legislation has a big impact on Autonomous Vehicle testing. For example, in the USA, the legislation is not uniform and there are some states that have enacted legislation, some have issued executive orders, some have both in place, and some have none. What about the rest of the world? What is being done to ensure that testing and deployment of Autonomous Vehicles will be done in a safe and expeditious manner so that CAV systems can be designed to operate globally?

Moderator:

Shailen Bhatt, President and Chief Executive Officer, ITS America, USA

Speakers:

Kirsten McKillop, Manager Automated Vehicles, National Transport Commission, Australia
Jennifer Cohan, Secretary, Delaware Department of Transportation, USA
Ken Leonard, Director, Intelligent Transportation Systems, ITS Joint Programs Office, U.S. Department of Transportation, USA
Phil Blythe, Chief Scientific Advisor, UK Department for Transport, UK
Claire Depré, Head of Unit Sustainable and Intelligent Transport, DG MOVE, European Commission

ES 03: AUTONOMOUS VEHICLES IN PUBLIC TRANSPORTATION – SEPARATING HYPE FROM REALITY

Tuesday, 22 October 2019 | 16:00 – 17:30 | Nicoll 3

The introduction of Autonomous Vehicles in public transportation will bring significant benefits/impacts to customers, society, transit systems, other travel modes and transportation networks. Not knowing when a fully autonomous vehicle will be in use, industry experts have worked to envision a future that may not necessarily match what ends up being a reality; e.g. autonomous vehicles will signal end of public transportation or a portion of transit network may be replaced by ride-sharing services such as Uber or Lyft. This session will bring together the industry/public experts to discuss when and how the autonomous vehicles shall be introduced into the public transportation systems and what efforts must be made to ensure that customer expectations and current transportation planning activities are aligned with the enabling of autonomous vehicle capabilities.

Moderator:

Mara Bullock, ITS & Technology Planning Lead, WSP Canada, Canada

Speakers:

Katsuya Abe, Director, Ministry of Land, Infrastructure, Transport and Tourism, Japan
Malcolm Dougherty, Senior VP and National Practice Lead for Transportation, Michael Baker International, USA
Rossella Panero, Director General/ President, 5t/TTS Italia, Italy
Mahmood Hikmet, Head of Research and Development, Ohmio Automotions, New Zealand

ES 04: FREIGHT PORTS AND CROSSINGS

Wednesday, 23 October 2019 | 09:00 – 10:30 | Nicoll 3

With increasing global freight movements from manufacturer to end user, ITS is important for every step of the goods movement process. This session will focus on two often overlooked aspects of the global journey: ports and international border crossings. Technology is needed now more than ever to rapidly manage the increases in freight and associated data that allow for just-in-time, next day, and two-hour 'guaranteed' deliveries that are expected from consumers. The ports, as well as border crossings are often bottlenecks in the logistics chain due to regulatory, safety, and bureaucratic processes. Innovative technology strategies are changing long border queues and extensive port delays and turning them into highly efficient and rapid handoffs. This Singapore Executive Session is the first in a series of ITS World Congress sessions dedicated to specific aspects of the goods movement process that starts globally and ends at the consumer's doorstep. Los Angeles (2020) and Hamburg (2021) will each explore a different aspect of the freight journey and showcase how ITS is making a difference from the global down to the local vantage point.

Moderator:

Richard Easley, President and Founder, E-Squared Engineering, USA

Speaker:

David Foo, Director Ops-Tech, Maritime and Port Authority, Singapore
Xinming Wang, Deputy Director, Suzhou City Transport Bureau, China
Lance H. Kaneshiro, Chief Information Officer, Port of Los Angeles, USA
Phanthian Zuesongdham, Head of Digital and Business Transformation, Hamburg Port Authority, Germany

ES 05: TRANSFORMING MAAS FROM IMAGINATION TO REALITY

Wednesday, 23 October 2019 | 14:00 – 15:30 | Nicoll 3

With rapid urbanisation, Mobility as a Service (MaaS) offers the prospect of integrating shared and diverse transport modes that breaks down silos, reduces waste, pollution, congestion and costs for community-wide travel for both people and goods. It encourages more variability into the supply side of transportation, and could transform current transportation system into one that is significantly more flexible. While the vision is promising, securing these outcomes depends on the operational and business models which in turn require a cooperative framework where data and information are shared, policy outcomes are achieved and the public and private sectors working together for the benefit of the entire community. What roles should authorities play and what governance options should be put forth? Should authorities become a MaaS operator, joint venture with the private sector or assign full control of MaaS operation to the private sector? How can the relevant stakeholders cooperate to jointly build a cooperative eco-system that would ensure the success of MaaS and help unlock its true potential?

Moderator:

Jacob Bangsgaard, Chief Executive Officer, ERTICO - ITS Europe, Belgium

Speakers:

Shu-Chuan Chang, Deputy Director of Transportation Bureau, Kaohsiung City Government , Chinese-Taipei
Roger Millar, Secretary, Washington State Department of Transportation, USA
Maximilian Eichhorn, Vice President and global Head of Advanced Traffic Management Solutions and Mobility Operating Systems, Siemens Mobility GmbH, Germany
Chris Bennetts, Executive Director Digital Products Delivery, Transport for New South Wales, Australia

ES 06: MANAGING URBAN SPACE

Wednesday, 23 October 2019 | 16:00 – 17:30 | Nicoll 3

The management of urban space is already difficult– passenger and freight traffic competing for access, finding space for active modes such as walking and cycling, and incorporating parking. These are all "2D problems" and are likely to grow as individual transport modes become more interconnected, physically and digitally, and MaaS-style services expand including the equivalent in freight, Delivery as a Service (DaaS). However the future looks even more complex as cities are starting to get requests for 3D solutions: making urban space available for both manned and unmanned drones. The scope of urban traffic management will need to expand beyond road vehicles to cover all modes including cycling and walking, and beyond ground transport to integrate drones. Because the new services are able to share knowledge on their origin, destination and position cities and traffic management will get new tools to optimise the operations in the transport system and achieve their policy goals. How do we want urban traffic management to develop?

Moderator:

Johanna Tzanidaki, Director Innovation & Deployment, ERTICO – ITS Europe, Belgium

Speaker:

Chien-Pang Liu, Section Chief of Office of Science and Technology Advisors, Ministry of Transportation and Communications, Chinese- Taipei
Wai-leung Tang, Deputy Commissioner Transport Department, Hong Kong
Andy Taylor, Director of Strategy, Cubic Transportation Systems, USA
Tassilo Wanner, Head of Public Affairs, Lilium, Germany
Augusto González, Adviser to the Director EU Satellite Navigation Programmes, DG GROW European Commission

EXECUTIVE SESSIONS

ES 07: MOMENTS OF TRUTH IN MAAS IMPLEMENTATION

Thursday, 24 October 2019 | 09:00 – 10:30 | Nicoll 3

MaaS is often considered the holy grail of Servicification of Mobility. MaaS truly makes mobility mode independent by making any mode of transportation which makes the journey faster, cheaper and better available to commuters at a click of a button. However, implementation of MaaS involves creating an entire new eco-system by integrating each mode of mobility which currently operates in their own silos. What have made MaaS solutions attractive, and are these transplantable or do there need adaptation to suit different parts of the globe? If so, what are these adaptations? What have been the challenges so far and how have these experiences been shared?

Moderator:

Brian Negus, Ambassador, ITS Australia, Chair, Collaborative ITS Consulting Australia, Australia

Speakers:

Colin Lim, Chief Executive Officer, mobilityX, Singapore
Neil Pedersen, Executive Director, Transportation Research Board (TRB), USA
Devrim Kara, Director UK & Ireland, PTV Group, UK
Christof Schminke, MD Commercial, Trafi, Germany

ES 08: TODAY'S MOBILITY: ACCESSIBILITY, INCLUSIVITY AND SAFETY

Thursday, 24 October 2019 | 11:00 – 12:30 | Nicoll 3

Currently, there are global discussions about issues associated with women's mobility, including safety, access in terms of social equity, and the lack of women in the transport industry in general. For example, in many countries around the world, a majority of women do not feel safe while travelling by public transport. Further, in addition to safety, access to transport can be limited for women (e.g., the so-called "pink tax"), resulting in women not having the same opportunities as men in terms of employment, healthcare and other critical life activities. Finally, the lack of women in key senior positions in the transport industry has meant that the issues of safety and inclusivity are not necessarily addressed by public and private transport service providers. This session will not only explore these challenges, but also how these challenges are being addressed by the top women in the transport and ITS industries. Lastly, this session will discuss the ways in which these leaders are making transport accessible to all people through the policies they help to establish and implement.

Moderator:

Carol Schweiger, President, Schweiger Consulting LLC, USA

Speakers:

Susan Harris, Chief Executive Officer, ITS Australia, Australia
Amy Ford, Director, Mobility on Demand Alliance, ITS America, USA
Nicola Yates, Chief Executive Officer, Connected Places Catapult (CPC), UK
Leslie Richards, Secretary, Pennsylvania Department of Transportation, USA

ES 09: IS PROLIFERATION OF NEW TECHNOLOGIES CREATING A LEVEL PLAYING FIELD?

Thursday, 24 October 2019 | 14:00 – 15:30 | Nicoll 3

Disruption created by the proliferation of new technologies is redefining the rules of the game in every field especially in ITS. What are these new technologies that are permeating in the entire eco-system? While cars are getting more connected and automated, what needs to be done with the road infrastructure to make the system truly smarter and connected? What and how have new technologies open up the opportunity for entry of new players from emerging field who erstwhile didn't have any access to the transportation value chain? In this session, experts will share on the effectiveness of new technologies such as AI and Blockchain, the role of new players in the eco-system and what are the various scenarios that will arise out of them.

Moderator:

Dean Zabrieszach, Chief Executive Officer, HMI Technologies Pty Ltd / Ohmio Automation Ltd, Australia

Speakers:

Deog-cheon Jang, Mayor, Bucheon City, Republic of Korea
T. Russell Shields, Chair, Ygomi LLC, USA
Ramin Massoumi, Senior Vice President & General Manager, Iteris, USA
Jeffrey Davis, Senior Director, Connected Transportation, BlackBerry, USA

ES 10: DRIVING ITS THROUGH THE POWER OF DATA

Thursday, 24 October 2019 | 16:00 – 17:30 | Nicoll 3

Recent years have highlighted the value and power of using data in ITS and mobility solutions. What are the roles of the government, academia and industry to establish an open data environment for the sharing of ITS data? Should governments solely take up roles that are for the civic good, while leaving the private industry to focus on how they can monetise data? This session will focus on what roles each of government, academia and industry should play to establish robust and wide-reaching data sharing environments. In addition, transportation executives will discuss future initiatives, including embracing Industry 4.0, integrating data and analytics with cloud computing, Internet of Things (IoT), intelligent machines and big data techniques to identify potential areas where such an environment might deliver results while still addressing key considerations such as privacy, security and accountability for managing the data.

Moderator:

Young-Jun Moon, Senior Research Fellow, The Korea Transport Institute (KOTI), Republic of Korea

Speakers:

Syahrunizam Samsudin, Chief Executive Officer, Touch 'n Go Sdn Bhd, Malaysia
Jarrett Wendt , Executive Vice President, Panasonic Corporation of North America, USA
Klaas Rozema, International Research Director, Dynniq, The Netherlands
Carlos Braceras, Executive Director, Utah Department of Transportation, USA

ES 11: FREIGHT MOVEMENT FOR SMART CITIES

Friday, 25 October 2019 | 09:00 – 10:30 | Nicoll 3

Ports and hubs are key part of the transport network of a city, a region or a country but have the common challenges of meeting increasingly strict environmental regulations, new requirements for sustainable land-use and a general push to reduce impacts on traffic, air quality and energy consumption. In this Session freight managers, city authorities and other stakeholders will address innovative and sustainable strategies for the port city of the future and show how ITS can help to manage the arrival of cargo from the marine side, its transit through the city in parallel with passenger traffic, and integration with wider freight networks. A key to success for both passengers and freight is collaborative planning and execution of operations both at port level and also in the city.

The Session will review how ITS solutions can enable mutually beneficial working between actors such as port and city authorities, terminal operators, infrastructure managers, logistics services providers, ICT companies and end users, and strengthen local and international freight transport networks. We will discuss traffic management standardisation and interoperability, and some new approaches to the development and pilot deployment of linked digital information systems for networks and corridors. We will also consider whether "out of the box approaches" are needed – and if so what they might look like.

Moderator:

Zeljko Jeftic, Deputy Director - Innovation & Deployment, ERTICO - ITS Europe, Belgium
Introduction and wrap up of the session given by Fotis Karamitsos, Senior Advisor, shipping, road transport, ITS, logistics

Speakers:

Gary Dolman, Head of Bureau, Department of Infrastructure, Transport, Cities and Regional Development, Australia
Kevin Thibault, Secretary, Florida Department of Transportation, USA
Lars Anke, Head of Sales Projects, Hamburger Hafen und Logistik Aktiengesellschaft (HHLA), Germany
Daniela Rosca, Head of Unit for Ports and Inland Navigation, DG MOVE, European Commission

ES 12: DEMAND MANAGEMENT STRATEGIES AND PRACTICAL CONSIDERATIONS

Friday, 25 October 2019 | 11:00 – 12:30 | Nicoll 3

Expanding the road network to meet growing travel demand is now recognised as unsustainable. It is necessary to manage travel demand and road pricing is an option to do this. There are several possible forms of road pricing - from fixed to variable time-of-day pricing based on fixed points, cordons or distance travelled. What are the considerations for deciding the form of pricing that is best suited for a community? What are the technological, infrastructure and financing needs for the various forms of road pricing? What complementary measures are needed to influence road users to change their travel behavior? How important is the payment medium for effective road pricing? Would it be better to have payments made at point-of-use (using stored-value smartcards) or have post-payment arrangements based on credit cards and other back-end payment systems?

Moderator:

Stephen Hewett, Business Director – Transport Advisory Global, Beca Ltd, New Zealand

Speakers:

Kian Keong Chin, Chief Engineer, Road and Traffic, Land Transport Authority, Singapore
Xiaojing Wang, Chairman, China ITS Industry Alliance, China
Pete K. Rahn, Secretary of Transportation, Maryland Department of Transportation, USA
Soren Tellegen, Executive Vice President, Kapsch, Austria

SPECIAL INTEREST SESSIONS

SIS 01: HIGHLY CONNECTED AND AUTOMATED MULTIMODAL URBAN SYSTEM

Monday, 21 October 2019 | 09:00 - 10:30 | Room 327

We know that our roads are increasingly congested and often dangerous. Many people would argue that the burgeoning industry around automated vehicles is the way forward. By taking out human error, we have the potential to make our roads safer than they have been since cars first appeared in the late-19th century. However, automated vehicles are just one solution. To truly mitigate the risks of driverless cars and to seize the opportunities offered by new technologies, we need to implement systems where all elements of the environment are communicating and reacting to one another. We need to bring together the transport network as a whole to enable growing cities' populations to move through easily, and most importantly, safely. Using sensors, we can connect cars, bikes, traffic lights, intersections, pedestrian movement and even the footpaths. This allows us to see all road users, not just those in vehicles. We are not simply giving cars right of way, instead we are looking at transport solutions for all users at the points in time when they interact with one another. What also makes this exciting is the technology's ability to evolve. It is "intelligent connectivity" with potential to adapt as our cities grow and infrastructure changes. This special session is devoted to multimodal highly connected and automated urban projects.

Organiser:

Majid Sarvi, The University of Melbourne, Australia

Moderator:

Nobuyuki Ozaki, Toshiba Infrastructure Systems & Solutions Corporation, Japan

Speakers:

Nobuyuki Ozaki, Toshiba Infrastructure Systems & Solutions Corporation, Japan
Peter Sweatman, Cavita, USA
Hwasoo Yeo, KAIST, Republic of Korea
Majid Sarvi, The University of Melbourne, Australia

SIS 02: RADIO COMMUNICATION TO REALISE CONNECTED VEHICLES

Monday, 21 October 2019 | 09:00 - 10:30 | Nicoll 3

World Radiocommunication Conference 2019 (WRC-19) Agenda Item 1.12 is on global or regional spectrum harmonization of ITS Applications. V2X communications, Vehicle to Vehicle (V2V) Communication and Vehicle to Infrastructure (V2I) Communication have been deployed in Japan. Cooperative ITS (C-ITS) and automated driving will also be introduced soon in North America and Europe. This session features representatives from ITU-R, Japan, Europe, United States, etc., who will discuss ITS radio communication policies, standards, and technologies. The session will also include a discussion on current issues and solutions of international harmonisation of ITS radio communication standards toward WRC-19.

Organiser:

Shin-ichiro Ebara, Ministry of Internal Affairs and Communications, Japan

Moderator:

Satoshi (Sam) Oyama, Association of Radio Industries and Business, Japan

Speakers:

Nikolai Vassiliev, International Telecommunication Union, Belgium
Koji Hara, Ministry of Internal Affairs and Communications, Japan
Niels Peter Skov Andersen, Car to Car Communications Consortium, Demark
Gerhard Menzel, DG JRC, European Commission, Belgium
Jovan Zagajac, FORD (Smart Mobility), USA
John Kenney, Toyota InfoTechnology Center, U.S.A., Inc., North America, USA
Teodor Buburuzan, Volkswagen, Germany

SIS 03: COMMUNICATING THE BENEFITS OF INNOVATIVE TECHNOLOGY

Monday, 21 October 2019 | 09:00 - 10:30 | Room 329

When deploying innovative and new technology, it is crucial that the right message is formed and communicated to the traveling public and media. This session will have panelist from the Americas, Asia-Pacific, and Europe. A discussion of what it takes to communicate the benefits of that technology to customers, stakeholders, the media and other audiences will take place. Each panelist will describe the challenges of learning what the innovative technology is, forming a message about the technology that is understandable to the average person, and sharing the message via various media and social media outlets. Each media and social media platform required a variant on the message that targeted the specific audience for the platform.

Organiser:

Sue Chrzan, Tampa Hillsborough Expressway Authority, USA

Moderator:

Bob Frey, Tampa-Hillsborough County Expressway Authority, USA

Speakers:

Sue Chrzan, Tampa Hillsborough Expressway Authority, USA
Brent Cain , Arizona Department of Transportation (ADOT), USA
David Alderson, Cooperative and Automated Vehicle Initiative (CAVI), Australia
Markus Wiederer, Siemens Mobility, Germany

SIS 04: AUTOMATED SHUTTLE SYSTEMS FOR REAL MOBILITY ISSUES OF CITIES AND USERS

Monday, 21 October 2019 | 09:00 - 10:30 | Room 330

In public discussion and industry debate on automated vehicle fleets in urban areas , the concepts of automated, shared, on-demand and sustainable are often confused. Moreover, the operational design domain of the different levels of automation and thereby the feasibility of automation in different environments is regularly misunderstood, as is the expected impact of automated vehicle systems on traffic safety, traffic demand and public space. For automated vehicle systems to be effective and mutual beneficial, real city mobility issues and needs of different user groups must be the basis. Level 4 automated shuttle systems have proven to be ready for (pre-)commercial deployment and able to offer a mobility solution for different use cases. The panel will present the state-of-the-art in automated shuttle systems based on applications which are in full operation today, and address concept definitions, operational design domain constraints and societal impact.

Organiser:

Jaap Vreeswijk, MAP traffic management, The Netherlands

Moderator:

Jaap Vreeswijk, MAP traffic management, The Netherlands

Speakers:

Randell Iwasaki, Contra Costa Transportation Authority, USA
Daniel Ruiz, Zenzic, UK
Alfred Hamstra, 2getthere, The Netherlands
Niels de Boer, Nanyang Technological University, Singapore
Tsuneki Kaiho, SB Drive, Japan

SPECIAL INTEREST SESSIONS

SIS 05: VERIFICATION AND VALIDATION OF AI FOR AUTONOMOUS DRIVING

Monday, 21 October 2019 | 11:00 - 12:30 | Room 327

AV systems make use of AI for vision and prediction for their decision making mechanisms. These mechanisms target "better than human" decisions for safe behaviour of the AV. This SIS is approaching the AI for AV from safety point of view. First, new safety requirements relevant to the intelligent systems are elaborated and why new standards considering AI must address safety of the intended functionality (SOTIF) is explained. Relationship between AI-predictable misuse and new safety concept in the example of one of the automotive Tier 1 World Leaders is shared. Second, adequacy of the existing testing, inspection and certification methods is questioned. Common approach for Deep Learning (DL) systems is to collect large amounts of data and tweak parameters until an acceptable error rate is achieved. Traditional testing methods for safety don't scale well to DL as error cases are unbounded. New methods are needed to quantify and mitigate risk. Several promising approaches aiming unpredictability of AI performance are under development. Third, the exponential increase in cyber security threats that are enabled by the rise in AI is evaluated. With the advancement of research on adversarial attack, a carefully designed noise that only changes few pixels of the image could totally change the prediction of the perception system. One way to tackle this problem is to make the perception system more interpretable. Algorithms offering premising possibilities for predictability of AI are mentioned. Last, role of interpretability and explicability of AI in public acceptance is considered. Besides the accepted economic value, the way for the mass deployment of AV's needs to tackle public acceptance. An important element is the ethical question of which decision by AV is acceptable in case of accident. Ethical aspect is closely linked with liabilities and regulations. Interpretable and explainable AI lays the foundation of its regulation.

Organiser:

Eley Querner, TUV SUD Asia Pacific Pte Ltd, Singapore

Moderator:

Justin Dauwels, Nanyang Technological University, Singapore

Speakers:

Letao Liu, Nanyang Technological University, Singapore
Eley Querner, TÜV SÜD Asia Pacific, Singapore
Arnaud Lago, Robert Bosch GmbH, Singapore
Martin Saerbeck, TÜV SÜD Asia Pacific, Singapore

SIS 06: AUTOMATED DRIVING: AUTOMATED VEHICLE & INTEGRATED SYSTEM OF CONNECTED AUTOMATED VEHICLES AND HIGHWAYS

Monday, 21 October 2019 | 11:00 - 12:30 | Room 328

Driven and influenced by technologies such as 5G, Edge Computing, and AI, Connected and Automated Vehicle Highway (CAVH) Systems have become one of the forefront areas in transportation research and development. CAVH will comprehensively improve the efficiency, safety, and sustainability of the road traffic, and bring significant social and economic benefits, thanks to the support from the smart vehicle and the smart road/infrastructure together. Transportation is a complex system, and the individual vehicle's intelligence is incomplete, which means that the coordination is urgently required. The Working Committee on Automated Driving (WCAD) of China Highway & Transportation Society (CHTS) invites speakers from policy making authority, research institute, university, representative enterprise etc from China and Europe to share their research achievement, experience, understanding etc. and network with the delegates to promote enhance the communication, cooperation and industry development.

Organisers:

Jian Zhang, Research Center for Internet of Mobility, Southeast University, China

Xiuqin Duan, China Highway & Transportation Society (CHTS), China

Moderator:

Nina Guan, China Highway & Transportation Society (CHTS), China

Speakers:

Neil Pedersen, Transportation Research Board (TRB), USA
Hao Hu, Huawei, China
Tony Qiu, ,University of Alberta, Canada
Weifeng Wang, China Design Group Co., Ltd, China
Xiaopeng Song, Zhejiang Provincial Institute of Communications Planning, Design & Research Co., Ltd., China
Rong Li, Plus.ai, China

SIS 07: AT THE END OF PAVED ROAD

Monday, 21 October 2019 | 11:00 - 12:30 | Room 329

Current light vehicle and truck automation companies are all focused on a structured environment that is paved and is preferably well marked. While full full-scale deployment of AVs is still a long way away, there is a segment of the road infrastructure that gets little focus: unpaved roadways. Within the United States ~65% of the roads are paved. For deep penetration of AVs to occur outside the urban area new techniques will need to be developed to handle unpaved roads. Many of the currently utilised sensors and mapping techniques will struggle in that environment as it changes significantly with the seasons and the visual cues radically vary. The session will focus on the challenges that need to be solved. Session would have 2-3 min "opening statement" (no slides) and then roundtable.

Organiser:

Chris Mentzer, Southwest Research Institute (SwRI), USA

Moderator:

Steve Dellenback, Southwest Research Institute (SwRI), USA

Speakers:

Mark C. Kopko , Pennsylvania Department of Transportation (PennDOT) USA
Xiaofeng GU, China ITS Industry Alliance/Tencent Dadi Tongtu (Beijing) Technology Co. Ltd, China
Bernhard Morys, Mercedes-Benz, China
Chris Mentzer, Southwest Research Institute (SwRI), USA

SIS 08: INTELLIGENT MOBILITY FOR CONNECTED TWO-WHEELERS SAFETY

Monday, 21 October 2019 | 11:00 - 12:30 | Room 330

A more intelligent transportation system could enhance driving safety in order to achieve Vision Zero target. From the development of ADAS to autonomous vehicle, automobiles are capable of recognizing the surrounding environment to achieve active safety. However, there is a lack of safety assistance mechanism on two-wheelers such as motorcycles and bicycles. To ensure the driving safety of two-wheelers, the future intelligent transportation system should be able to identify automobiles and two-wheelers through the roadside detectors, and the detected information could be communicated among roadside units, automobiles and motorcycles. Also, Deep learning technologies have been developed to identify the automobiles and two-wheelers. The OBU could alert the driver at dangerous crossroads, and remind the driver about the situation in the front to avoid accidents when appropriate. In this session, we will focus on intelligent ITS system, AI applications on intelligent driving and connected motorcycle driving safety and some related topics.

Organiser:

Henry Meng, Smart System Network Institute, Institute for Information Industry (III), Chinese-Taipei

Moderator:

Mu-Han Wang, Ministry of Transportation and Communications (MOTC), Chinese-Taipei

Speakers:

Yasuhiro Aoyama, Panasonic Corporation, Japan
Ivy Kuo, National Cheng Kung University, Chinese-Taipei
Maxime Flament, 5G Automotive Association, Belgium
Henry Meng, Smart System Institute, Institute for Information Industry, Chinese-Taipei
Tony Lin, AEON, Chinese-Taipei

SPECIAL INTEREST SESSIONS

SIS 09: CHALLENGE OF INTEGRATING AUTOMATED VEHICLES INTO THE DIGITAL INFRASTRUCTURE

Tuesday, 22 October 2019 | 09:00 - 10:30 | Room 325

Digitisation of road transport and emergence of Automated Driving brings together different challenges in particular the need for data exchange between vehicles and the infrastructure. What data is needed to support Automated Driving? How should the automated vehicle be integrated with the digital infrastructure currently under development? Will the traffic be managed differently? What data quality and security do we need? Answer to these questions is one key for defining an optimal automated transport system. This session brings together speakers from different organisations and/or standardisation body with expertise about digital infrastructure / traffic management, Automated Driving and data services. The ambition of this session is to share our knowledge about need for data and propose a way forward for cooperation between OADF and Traffic Management as part of the digital Infrastructure.

Organiser:

Jean-Charles Pandazis, ERTICO - ITS Europe

Moderator:

Jean-Charles Pandazis, ERTICO - ITS Europe

Speakers:

Johanna Tzanidaki, ERTICO - ITS Europe
Nico Glorius, NDS Association, Germany
Matthias Unbehaun, TISA, Belgium
Prokop Jehlicka, HERE Technologies, Germany
Satoru Nakajo, Center for Spatial Information Science, The University of Tokyo, Japan
Stephane Dreher, ERTICO - ITS Europe

SIS 10: COMPLEX SELF DRIVING FIELD OPERATIONAL TESTS USING EVOLVED IT INFRASTRUCTURES

Tuesday, 22 October 2019 | 09:00 - 10:30 | Room 326

Field Operational Tests (FOTs) are being used to evaluate complex safety-relevant functions of self-driving vehicles using sensor fusion and SLAM technologies supported by evolved digital infrastructure. These FOTs are designed to assess the impact of the next generation IT infrastructure including cloud and mobile-edge computing, IoT and enhanced connectivity through next generation mobile networks. New types of data from IoT-connected heterogeneous sensors and bigger datasets, provided and managed by complex cloud and mobile-edge infrastructure, raise novel challenges. FOTs also play an important role in evaluating new business models and issues such as data privacy and liability that are central to self-driving. In this session, experts will present how Field Operational Tests handle some of these complexities and answer some interesting questions: How far can the current FESTA be used for FOTs? How does big data contribute to self-driving evaluation? How must user experience be considered in self-driving vehicles?

Organiser:

Francois Fischer, ERTICO - ITS Europe

Moderator:

Rita Bhandari, ERTICO - ITS Europe

Speakers:

Francois Fischer, ERTICO - ITS Europe
Álvaro Arrúe, Applus IDIADA, Spain
Hyun Seo Oh, Electronics and Telecommunications Research Institute (ETRI), Republic of Korea
Louis Calvin Touko Tcheumadjeu, German Aerospace Center (DLR), Germany
Sebe Vogel, Rijkswaterstaat, The Netherlands

SIS 11: SUSTAINABLE ITS ASSET MANAGEMENT STRATEGIES MEETING TECHNOLOGY CHALLENGES

Tuesday, 22 October 2019 | 09:00 - 10:30 | Room 327

ITS asset management has been an emerging and challenging research area. Rapid changes and evolution in technology further add to the challenges, as existing ITS technologies become obsolete they are required to be upgraded or replaced more frequently. To optimise the reliability, availability and maintainability of ITS and rationalise the investment in ITS asset maintenance and management, continuous effort has been made on the ITS asset performance and condition monitoring, and identification of strategies and tools. Australian and New Zealand road agencies have been leading the development of national ITS asset strategy framework, ITS performance evaluation methodology, reliability-centred maintenance (RCM) and ITS device certificate and testing etc. The session will include a global view and share best practices amongst ITS asset managers from Australia, New Zealand, Canada, US and Singapore.

Organiser:

Clarissa Han, Australian Road Research Board, Australia

Moderator:

Clarissa Han, Australian Road Research Board, Australia

Speakers:

Qudus Wazirzada, Smart Sustainable Solutions, Australia
Dean Parker, Auckland Motorway, New Zealand
Clarissa Han, Australian Road Research Board, Australia
Francois Thibodeau, Service de l'urbanisme et de la mobilité, Canada
Mun Onn Cheong, Land Transport Authority, Singapore
Scott Marler, Iowa Department of Transportation, USA

SIS 12: INTELLIGENCE AS A FOUNDATION FOR SMART MOBILITY THROUGH SMART TRAFFIC SIGNALS

Tuesday, 22 October 2019 | 09:00 - 10:30 | Room 328

Traffic control on arterial roads and city streets makes an important contribution to keeping smart cities moving. The continuous optimisation decisions made by control systems can only be as intelligent as the data they receive. This session explores how cities around the world are realising benefits from emerging data sources from Connected and Automated Vehicles as well as Bluetooth and Wifi to better inform real-time optimisation control. What roles do the richness of the data sources and the confidence in the provided data play in achieving good outcomes?This session will feature both practical real-world examples and strong interaction between speakers and the audience. It explores real progress being made now with an eye to the opportunities of the future. There will be an emphasis on proven results and proven progress to complement the discussion around the excitement of the possible.

Organiser:

Andrew Somers, Transoptim, Australia

Moderator:

Andrew Somers, Transoptim, Australia

Speakers:

Thomas Riedel, Adaptive Traffic Control AG and Verkehrs-Systeme AG, Switzerland
David Johnston, Intelligent Transport Services, Australia
Kwok June Johnny Leung, Synergistic Traffic Consultancy, Australia

SPECIAL INTEREST SESSIONS

SIS 13: INCLUSIVE AND SUSTAINABLE SHARED, PERSONALISED, AUTOMATED AND CONNECTED MOBILITY IN SMART CITIES

Tuesday, 22 October 2019 | 09:00 - 10:30 | Room 329

Mobility in urban and suburban areas faces significant challenges with respect to accessibility, safety, security, environment, service quality of public transport and financing. Shared and automated mobility services have the potential to address these challenges and to offer concrete solutions which are not technically or economically feasible with conventional public transport systems. This session will report on expectations from local authorities to meet policy goals in cities, strategies developed by transport authorities to facilitate integration of automated vehicles and associated shared mobility services in existing public transport systems, and lessons learnt from trials and commercial operations by public transport operators and mobility service providers.

Organiser:

Guido Di Pasquale, Union Internationale des Transports Publics - UITP, Belgium

Moderator:

Guido Di Pasquale, Union Internationale des Transports Publics - UITP, Belgium

Speakers:

Guido Di Pasquale, Union Internationale des Transports Publics - UITP, Belgium
Ulla Tikkanen, Forum Virium Helsinki, Finland
Tom Alkim, European Commission RTD, Belgium
Ong Hui Guan, Land Transport Authority, Singapore
Scheherazade Zekri, Keolis, France

SIS 14: ROAD INFRASTRUCTURE CONCERNING ADS

Tuesday, 22 October 2019 | 09:00 - 10:30 | Room 330

How should a road administrator consider road traffic lanes that are authorized for ADS (Automated Driving System)? In general, ADS requests a road administrator to improve road maintenance, rehabilitation and management, in order for automated vehicles to run safely and smoothly. Moreover, some ADSs require V2I communication systems in order to ensure a specified level of safety.

In this session,
(i) the role of road administrators,
(ii) the ideal service level of road infrastructure; and
(iii) the additional infrastructure requirements for V2I communication
will be discussed based on feasibility studies and field operation tests of ADS.

Organiser:

Masato Ohta, Ministry of Land, Infrastructure, Transport and Tourism, Japan

Moderator:

Hironao Kawashima, Keio University, Japan

Speaker:

Martin Böhm, AustriaTech, Austria
Robert Dingess, Mercer Strategic, USA
Scott Kuznicki, Modern Traffic Consultants, USA
Masato Ohta, Ministry of Land, Infrastructure, Transport and Tourism, Japan

SIS 15: AUTONOMOUS VEHICLE CHALLENGES AND OPPORTUNITIES IN ASIA-PACIFIC

Tuesday, 22 October 2019 | 14:00 - 15:30 | Room 327

Traffic environment in the Asia-Pacific region is significantly different from elsewhere in the world, as trucks, buses, scooters, bicycles, and pedestrians all navigate on the road simultaneously in densely-populated cities from Bangkok to Taipei. Such mixed traffic flow is the challenge for autonomous vehicles (AV) developers. What works in the West may not adapt to Asia-Pacific region. AVs have to learn different skills—or perhaps learn differently—to respond to the dynamic driving situations and live peacefully with local drivers. On the other hand, would this give rise to technical advantage and business opportunities for regional players? Would the region be the cradle for new R&D, funding, and market development models? In this session, AV researchers, engineers, and operators are invited to share their stories of localised technologies and market expectation, from sensor fusion to deep learning, and from vehicle manufacturing to test ride. And you are mostly welcomed to share your insight in this unstoppable trend.

Organiser:

Men-Feng Wu, China Engineering Consultants Inc., Chinese-Taipei

Moderator:

Murphy Sun, Sunsky International, Chinese-Taipei

Speakers:

Richard Harris, Real ITS Global, UK
Wentao Che, Kokusai Kogyo Co., Ltd., Japan
Huei-Ru Tseng, Industrial Technology Research Institute, Chinese-Taipei
David Shen, Turing Inc., Chinese-Taipei

SIS 16: NEW BUSINESS MODELS DERIVING FROM HIGHER AUTOMATION LEVELS IN FREIGHT AND LOGISTICS

Tuesday, 22 October 2019 | 14:00 - 15:30 | Room 328

Freight and logistics are witnessing rapid technological changes due to connectivity and automation. At the same time, new business models are emerging which purportedly have the potential to revolutionise the freight transport sector. It is increasingly argued that automation has the capability to cut operation costs, however, it still remains unexplored whether this will be the case. In addition, most of the cost savings are believed to be derived from a reduction in the labour required. However, this raises several questions on whether the role of the driver, and his/her respective skillset, will remain essential and relevant in the years to come. The session objectives are to shed light on this growingly important questions on the interaction of automation and freight transport, and take a deep dive in order to assess if and how emerging business models can materialise and thrive in the sector.

Organiser:

Zeljko Jeftic, ERTICO - ITS Europe

Moderator:

Fernando Liesa, ALICE - Alliance for Logistics Innovation through Collaboration in Europe, Belgium

Speakers:

Matthias Kliché, Continental, Germany
Niels Dekker, Rotterdam World Gateway, The Netherlands
Mats Rosenquist, Volvo Group Trucks Technology, Sweden

SPECIAL INTEREST SESSIONS

SIS 17: ADVANCED WEATHER RESPONSE SYSTEMS

Tuesday, 22 October 2019 | 14:00 - 15:30 | Room 329

Advanced weather-responsive traffic management strategies increase the effectiveness of traffic operations during adverse road weather conditions, and weather-responsive maintenance management strategies help reduce costs associated with winter maintenance. Twenty-one percent of crashes occur during adverse weather conditions. On average, nearly 6,000 people are killed and over 445,000 are injured in weather-related crashes each year. Likewise, the delays associated with weather can be profound, resulting in significant losses in efficiency. Advanced weather response systems provide relevant and timely information to agencies on the need for appropriate traffic intervention methods to mitigate the impacts of weather-related road and traffic conditions. The result is improved mobility, reduced delays, and safer travel during inclement weather.

Organiser:

John Barton, HNTB, USA

Moderator:

John Barton, HNTB, USA

Speakers:

Carlos Braceras, Utah Department of Transportation, USA
Roger Millar, Washington Department of Transportation, USA
Leslie Richards, Pennsylvania Department of Transportation, USA
Valerie Briggs, USDOT FHWA Office of Transportation Management, USA

SIS 18: LEARNING LESSONS FROM C-ITS EARLY ADOPTERS

Tuesday, 22 October 2019 | 14:00 - 15:30 | Room 330

In the UK, we are developing mechanisms to support the implementation of C-ITS technologies on the road network and ensure that best practice is captured and disseminated. We are providing central government funding for "learning for all" support networks to ensure dissemination and learning happen. Funding for C-ITS comes with a requirement to evaluate what is done but the challenges encountered and lessons learnt from evaluations are rarely published. Published evidence from field operational trials is scarce, meaning there are no templates to follow when developing an evaluation approach. In this session we will share experience of C-ITS rollout and evaluation by looking at the InterCoR programme and the UK Department for Transport's competition to promote C-ITS in English Local Authorities. We will also bring in experience from elsewhere around the globe to show what other 'best practice' initiatives are taking place in disseminating C-ITS learning.

Organiser:

Darren Capes, Department for Transport, Institution of Engineering and Technology, UK

Moderator:

Darren Capes, Department for Transport, Institution of Engineering and Technology, UK

Speakers:

Gary Crockford, Department of Transportation, UK
Steve Dellenback, Southwest Research Institute (SwRI), USA
Rong Su, Nanyang Technological University, Singapore
Timothy Gammons, Ove Arup & Partners, UK
Zeljko Jeftic, ERTICO - ITS Europe

SIS 19: CRIMINAL LIABILITY SCHEME FOR AV ACCIDENT

Tuesday, 22 October 2019 | 16:00 - 17:30 | Room 327

Automated driving technology is becoming real. In the very near future, automated vehicle will join into our world. We will soon face an intermixed traffic. Automated driving vehicles will contribute to reduce traffic accident but not all of them, and they could possibly lead a new type of accident. Our legal system could make any contribution to this era? We will discuss about criminal liabilities for automated vehicle accident and seek reasonable way to be settled.

Organiser:

Masayuki Satoh, ITS Japan, Japan

Moderator:

Masayuki Satoh, ITS Japan, Japan

Speakers:

Takeyoshi Imai, Hosei University, Japan
Julie Van Dort, Department of Transport, Victoria, Australia
Eric Landot, Avocat au barreau de Paris, France

SIS 20: ALTERNATES TO DIGITAL MAPS (CANCELLED)

Tuesday, 22 October 2019 | 16:00 - 17:30 | Room 328

There has been significant discussion of the development and usage of high definition digital maps to aid the movement of automated vehicles. While these maps work exceedingly well in pristine environments they are not as effective when road environments change seasonally or are covered by snow. The emerging technologies being developed to provide localization with non-traditional approaches will be discussed. Speakers would make 12-15 minute presentation (with slides) along with Q/A.

SIS 21: USING ITS TO FACILITATE DYNAMIC CURB/CITY SPACE ALLOCATION AND PRICING/CHARGING

Tuesday, 22 October 2019 | 16:00 - 17:30 | Room 329

In the 4th Mobility as a Service Summit held during the 2018 ITS World Congress, there were numerous discussions about how mobility in cities could be improved by using specific locations for different purposes during various times of day. For example, a specific curb could be used during rush hour as a pick-up or drop-off point for ridesourcing vehicles, and as a recreational space during the rest of the day. Further, there could be a charge for using curb space for ridesourcing vehicles. Similarly, at one time of day, city space could be used for parking, and at other times, it could be used for another purpose. This session will explore the use of ITS to facilitate dynamic space allocation and pricing/charging.

Organiser:

Carol Schweiger, Schweiger Consulting LLC, USA

Moderator:

Carol Schweiger, Schweiger Consulting LLC, USA

Speakers:

Shaleen Srivastava, Immense Simulations, USA
Richard Easley, E-Squared Engineering, USA
Zeina Nazer, University of Southampton, UK
Gabriel Sanchez, PTV Group, Germany

SPECIAL INTEREST SESSIONS

SIS 22: ENABLING AUTOMATED AND INTEGRATED URBAN PUBLIC TRANSPORT SERVICE

Tuesday, 22 October 2019 | 16:00 - 17:30 | Room 330

This session addresses the organisational, functional and technical challenges to enable and implement automated and integrated public transport services, focusing on the integration of new kinds of vehicles and services on the roads. Traditional traffic controls ask for radical rethinking to balance the new automated on-demand transport modes within urban road traffic flows, without requesting major modifications of existing infrastructure. The most obvious changes happen on the vehicular side and through the increasingly complete connectivity of the fully integrated transport system. Distribution and protection of information, together with system security, become crucial elements and need increased. The session discusses these aspects against the background of international cases with a focus on technological and functional aspects. Cross-sector discussions are initiated by presentations by international professionals from agencies, industry and academia. Part of the research, touched in this session, is supported by the National Research Foundation of Singapore, under its CREATE programme.

Organiser:

Fritz Busch, Technical University of Munich, TUMCREATE Ltd Singapore, Germany

Andreas Rau, TUMCREATE Ltd Singapore, Singapore

Moderator:

Robert Bertini, University of South Florida, USA

Speakers:

Malika Meghjani, Singapore-MIT Alliance for Research and Technology (SMART), Singapore
Sascha Westermann, Hamburger Hochbahn AG, Germany
Fritz Busch, Technical University of Munich, TUMCREATE Ltd Singapore, Germany
Thomas Walbrun, Siemens Mobility GmbH, Germany
Anupam Chattopadhyay, Nanyang Technological University; TUMCREATE Ltd Singapore, Singapore

SIS 23: TESTING OF AUTOMATED DRIVING ON PUBLIC ROADS: CHALLENGES AND FIRST LESSONS LEARNED

Wednesday, 23 October 2019 | 09:00 - 10:30 | Room 325

Today, automated driving technology has matured to a level motivating tests on public roads. These tests will answer key questions before market introduction: what is happening both inside and outside the vehicles, how vehicle security can be ensured, evaluating societal impacts and emerging business models. In Europe, the large-scale research project L3Pilot brings 1,000 drivers in 100 vehicles to tests across 10 countries. First results show that studying automated driving is as much methodology development as measuring driver and vehicle behavior. With the implementation of automated driving technologies in Asia, we can see emerging new businesses and opportunities for drivers, the industry and society. The USA show little constraints for the introduction of self-driving vehicles resulting in diverse testing activities. Today's session introduces these international perspectives providing insights on methodological questions on test design, subjects and data management, safety and other societal impacts and constraints in assessing them.

Organiser:

Aria Etemad, Volkswagen Group Research, Germany

Sarah Metzner, EICT GmbH, Germany

Moderator:

Angelos Amditis, Institute of Communication & Computer Systems (ICCS), Greece

Speakers:

Aria Etemad, Volkswagen Group Research, Germany
Satu Innamaa, VTT Technical Research Centre of Finland Ltd., Finland
Giannis Karaseitanidis, Institute of Communication & Computer Systems (ICCS), Greece
Shinji Itsubo, National Institute for Land and Infrastructure Management, Ministry of Land, Infrastructure, Transport and Tourism, Japan
Jane Lappin, Toyota Research Institute, USA
Jukka Laitinen, VTT Technical Research Centre of Finland Ltd., Finland

SIS 24: SUSTAINING SMART CITY SAFETY AND MOBILITY THROUGH TRAFFIC INCIDENT MANAGEMENT

Wednesday, 23 October 2019 | 09:00 - 10:30 | Room 326

Traffic incidents continue to severely impact transportation safety and efficiency in cities throughout the world. The purpose of this session is to emphasize the criticality of Traffic Incident Management (TIM) to sustaining safety and mobility in smart cities. The coordinated multidiscipline and multifaceted approach to responding to roadway emergencies, illustrates the need for the session to also present a deliberate and balanced integration of smart technology, data, people and training for managing traffic incidents successfully. Technology and Intelligent Transportation Systems, has always been foundational to effective TIM. Today, rapid advancements in vehicle and roadway automation and smart city technologies are enabling vehicles to be connected with each other and roadway infrastructure. As these advancements take place, it remains critical to engage the roadway operators, particularly those from the public safety community, to understand their unique needs and challenges for responding to traffic incidents, particularly those involving electric and automated vehicles.

Organisers:

Robert Murphy, AECOM, UK
Steven Cyra, HNTB Corporation, SA

Moderator:

Robert Fischer, Geospatial Transportation Information Management Association (GTiMA), USA

Speakers:

Valerie Briggs, USDOT FHWA Office of Transportation Management, USA
Brad Freeze, PE, Tennessee Department of Transportation, USA
Robert Murphy, AECOM, USA
Joseph Sagal, Maryland Department of Transportation, State Highway Administration, USA
Yeo Se Lay, Land Transport Authority, Singapore
Jan Willem Tierolf, Rijkswaterstaat, The Netherlands

SIS 25: TRANSFORMING FREIGHT MOVEMENT THROUGH ITS (TFMI) PART I: EFFICIENT AND SUSTAINABLE OPERATION OF COMMERCIAL VEHICLES ON HIGHWAYS

Wednesday, 23 October 2019 | 09:00 - 10:30 | Room 327

Road freight transport faces several main challenges: (1) greening, reducing GNG emissions and fossil fuel dependency, (2) managing an increasing flow of heavy vehicles on existing infrastructure, (3) extending the lifetime of ageing road infrastructure exposed to longer and heavier trucks, (4) financing the maintenance and operation of the infrastructure and collecting the fair price for the infrastructure use. Combined ITS solutions can resolve these challenges. They include smart infrastructure, access programs, electric road systems, high capacity vehicles, advanced heavy traffic monitoring and direct enforcement, routing and monitoring of connected vehicles, free flow tolling and tax per kilometer. Infrastructure and fleet managers, carriers and regulatory bodies are the main actors, which need to build together and implement these solutions. A feedback of the best practices in Europe, North America and Asia will be reported, and the panel discussion will identify the most promising ways and solutions for the near future.

Organisers:

Chris Koniditsiotis, Transport Certification Australia, Australia
Bernard Jacob, IFSTTAR, France

Moderator:

Olivier Quoy, Atlandes, France

Speakers:

Les Bruzsa, National Heavy Vehicle Regulator (NHVR), Australia
Carl K. Andersen, U.S. Department of Transportation, Federal Highway Administration (FHWA), USA
Rein Juriado, Trafikverket, Sweden
Paulo Humanes, PTV Group, Germany
Bernard Jacob, IFSTTAR, France

SPECIAL INTEREST SESSIONS

SIS 26: HOW ROAD USAGE CHARGING AND URBAN VEHICLE ACCESS REGULATIONS CONVERGE?

Wednesday, 23 October 2019 | 09:00 - 10:30 | Room 328

How will Mobility management handle the convergence of RUC and UVARs? Both of these are intended to address a range of issues including but not limited to air quality, reduction in congestion, fairer alternative to fuel taxes and modal shift. The next few years will likely see the rollout and implementation of RUC (as replacement of fuel excise taxes and for travel demand management) in addition to current or future UVAR projects. This session will address the different technical approaches as well as regulatory and fiscal aspects, e.g. what has worked well; what has not? This Special Interest Session will bring together a panel of experts from both public and private sectors to explore this issue. Experts and government representatives working on this issue in the USA, Europe and Asia-Pacific will help us understand the potential convergence of road usage charging and urban vehicle access regulations.

Organiser:

Steve Morello, D'Artagnan Consulting, USA

Moderator:

Steve Morello, D'Artagnan Consulting, USA

Speakers:

Andrew Pickford, Transport Technology Consultants Ltd, UK
Tilly Chang , San Francisco County Transportation Authority, USA
Scott Wilson, D'Artagnan Consulting, Australia
Claire Depre, DG MOVE, European Commission
Suzanne Hoadley, Polis Network, Belgium

SIS 27: THE ROLE AND BENEFITS OF MOBILITY ON DEMAND IN THE MULTIMODAL JOURNEY

Wednesday, 23 October 2019 | 09:00 - 10:30 | Room 329

Public transport is the most efficient way of moving large numbers of people while creating sustainable environments where communities want to live, travel, connect. However not everyone has access to public transport close to their home, and finding options for that first and last mile connectivity is critical if we want to encourage mode shift.With the advances made in technology, Mobility On Demand now has the potential to play a relevant role in this multimodal journey, as it can give access to a wider range of shared mobility options to local communities and improve the accessibility to public transport. Through this session we will hear experts discuss concrete ways of getting the full benefit of Mobility On Demand and examples where these types of services have increased the use of shared mobility solutions and to change people's perceptions by adapting to their mobility needs.

Organiser:

Segolene Deeley, Keolis Downer, Australia

Moderator:

Sue Wiblin, Keolis Downer, Australia

Speakers:

David Adelman, Via, USA
Chen Cai, DATA61|CSIRO, Australia
Joshua Brydges, Go Get, Australia

SIS 28: CROWD-SOURCED DATA ANALYTICS IMPROVING NETWORK-WIDE TRAFFIC MANAGEMENT, OPERATIONS AND SAFETY

Wednesday, 23 October 2019 | 09:00 - 10:30 | Room 330

The combination of crowd-sourced data, cloud computing and on-line data analytics is enabling network-wide applications – region-wide, statewide and nationwide – that are improving road safety, reducing network delays and increasing the cost-effectiveness of transportation investments. This session will highlight several key recent advancements from leading organisations in three different countries where crowd-sourcing and big data analytics are making positive impacts. Each advancement presented is capable of scaling to other regions, states and countries, worldwide.

Organiser:

Rick Schuman, INRIX, USA

Moderator:

Terri Z. Johnson, P.E., INRIX, USA

Speakers:

Darren Capes, Department for Transport, UK
Leslie Richards, Pennsylvania Department of Transportation, USA
Rick Schuman, INRIX, USA
Yang Laitu, Cennavi Technology Co. Ltd, China

SIS 29: 5G FOR ITS: THE FUTURE BASELINE FOR INTER-MODAL MOBILITY AND AUTOMATED DRIVING

Wednesday, 23 October 2019 | 14:00 - 15:30 | Room 326

The initial deployment of 5G - the next generation of mobile communication systems hast just started. 5G contains numerous features that appeal to the transportation industry, enhanced mobile broadband, ultra high reliability and low latency, and massive IoT - just to name a few. Building on the successful SIS on 5G during the ITS Congress in Copenhagen, the goal of this session is to elaborate on how different stakeholders in the ITS community are planning to employ and benefit from 5G technology, and where they see risks and opportunities.

Organiser:

Tim Leinmüller, Denso Automotive Deutschland GmbH, Germany

Moderator:

Tim Leinmüller, Denso Automotive Deutschland GmbH, Germany

Speakers:

Eetu Pilli-Sihvola, Finnish Transport and Communications Agency, Finland
Jim Misener, Qualcomm, USA
Jovan Zagajac, Ford, USA
Satoshi Nagata, NTT Docomo, Inc., Japan
Olle Isaksson, Ericsson, Sweden
Jamie Smith, Telstra, Australia

SPECIAL INTEREST SESSIONS

SIS 30: TRANSFORMING FREIGHT MOVEMENT THROUGH ITS (TFMI) PART II: CONNECTED AND AUTOMATED VEHICLES, AND TRUCK PLATOONING

Wednesday, 23 October 2019 | 14:00 - 15:30 | Room 327

This session will present the latest technological developments and deployment of truck platooning around the World. The remaining technical locks and emerging or implemented solutions will be presented. Platooning and operation of trucks at different levels of automation will be discussed, from level 1-2 (driver helped) to level 4 (driver on-board but not driving in a platoon or in some other circumstances) and even level 5 (no driver on-board). E.g. stand-alone trucks operating driverless is a concept under investigation in Japan, China and U.S.The role of the infrastructure (equipment, sensors, data, I2V and V2I communication, etc.) will be addressed. Impacts and benefits of platooning, scenarios and guidelines for implementation, business models and standardization, regulation and certification issues will be discussed.

Organisers:

Bernard Jacob, IFSTTAR, France
Richard Easley, E-Squared Engineering, USA

Moderator:

Richard Easley, E-Squared Engineering, USA

Speakers:

Young Tae Kim, OECD - International Transport Forum
Marika Hoedemaeker, TNO, The Netherlands
Steven Shladover, the University of California PATH Program, USA
Stephen Boyd, Peloton Technology, USA
Bastiaan Krosse, TNO, The Netherlands
Richard Bishop, Bishop Consulting, USA

SIS 31: MOBILITY DATA COLLECTION, ANALYSIS AND SHARING: CHALLENGES AND OVERCOMING THE CHALLENGES

Wednesday, 23 October 2019 | 14:00 - 15:30 | Room 328

Data collection, analysis and sharing continues to be vital for improving mobility and tools that facilitate mobility, such as MaaS. However, public entities can be challenged to obtain operational data from private mobility providers, such as ridesourcing companies (e.g., Uber, Lyft). This data is critical to understanding not only the market share of various mobility services in a city or region, but also the impact that these services have on transport in general. Other aspects of data such as data management, privacy and governance are equally important. This session will explore exemplary local and regional governments' policies and programs that address data issues. Further, this session will describe how the Finnish Act on Transport Services addresses the more efficient use of data and open data requirements. Finally, this session will describe how the City of Columbus addressed data security and privacy policies to protect information across several USDOT Smart Columbus Projects, and how ridesourcing, taxi, carsharing, the US National Renewable Energy Lab (NREL) and Ohio Bureau of Motor Vehicles partnered with Smart Columbus to collect, analyze and share vehicle and trip data.

Organiser:

Carol Schweiger, Schweiger Consulting LLC, USA

Moderator:

Carol Kuester, Metropolitan Transportation Commission, USA

Speakers:

Laura Eiro, ITS Finland, Finland
Chen Cai, DATA61|CSIRO, Australia
Sherry Kish, HNTB, USA
Mandy Bishop , City of Columbus, USA
Morgan Kauffman, Columbus Yellow Cab, USA

SIS 32: STRATEGY OF PRACTICAL IMPLEMENT OF V-I COOPERATIVE SYSTEMS FOR TRAFFIC ACCIDENT AVOIDANCE

Wednesday, 23 October 2019 | 14:00 - 15:30 | Room 329

It is the most important problem through many countries to prevent road traffic users from having traffic accident, especially critical accident, which are negative products in motorized societies. Many of traffic accidents are occurred by human error. In order to make the traffic environment even safer, adopting advanced technologies, including automated driving technologies, is expected as one of the key tools. Japanese Police is developing and deploying the V-I Cooperative systems that avoid traffic accidents and contribute to deployment of highly automated driving systems. These kind of systems are also developed and deployed by US and EU and attract people's attention. This session aims to introduce the development and deployment of V-I Cooperative systems and to discuss some technological and political subjects of V-I Cooperative systems for traffic accidents avoidance.

Organisers:

Nakaba Izumoto, National Police Agency, Japan
Takashi Kimura, UTMS Society of Japan, Japan

Moderator:

Takashi Oguchi, The University of Tokyo, Japan

Speakers:

Nakaba Izumoto, National Police Agency, Japan
Shintaro Watanabe, UTMS Society of Japan, Japan
Yuichi Takayanagi, UTMS Society of Japan, Japan
Andras Csepinszky, NNG Llc., Hungary
Robert Rausch, TransCore, USA

SIS 33: MOBILITY AS A SERVICE BEYOND WESTERN CITIES: RURAL AREAS, DEVELOPING COUNTRIES AND MEGACITIES

Wednesday, 23 October 2019 | 14:00 - 15:30 | Room 330

Mobility as a Service (MaaS) has gained tremendous attention since it was introduced in ITS Europe Congress in Helsinki 2014. Its common definition has been expanding to cover all innovative new mobility services and embrace the disruption as a whole. This works well in western cities, where the new services, aided by digitally-able clientele, the availability of travel data and infrastructures, as well as public-private collaboration mechanisms, find their natural habitat.However, the world outside western cities seems not to be yet touched by the magic of MaaS. This session aims to explore the applicability of MaaS to the other three segments in a quadrant consisting of western cities, rural areas, developing countries and megacities in developing countries. Baseline and needs are clearly very different, but is there something in the thinking behind the MaaS concept that could be picked up and transferred, perhaps slightly modified, to ease the challenges in those areas? As a result of this session, we will have a better understanding of the aspects needing attention when developing MaaS for rural and developing areas.

Organiser:

Lidia Signor, ERTICO - ITS Europe

Moderator:

Zeljko Jeftic, ERTICO - ITS Europe

Speakers:

Ivan Reutener, Royal HaskoningDHV, South Africa
Valerie Lefler, Feonix Mobility Rising, USA
So Morita, Tokyu Group, Japan
Paulo Humanes, PTV Group, Germany

SPECIAL INTEREST SESSIONS

SIS 34: IMPACT ASSESSMENT OF AUTOMATED VEHICLES ON TRAFFIC FLOW AND ENVIRONMENT

Wednesday, 23 October 2019 | 16:00 - 17:30 | Room 326

Automated vehicle is expected to improve traffic flow and reduce traffic congestion and environment impact, but it can have negative impact depending on running performance of the vehicle or its deployment scenario. This session invites speakers from Europe, the US and Asia Pacific to introduce projects related to impact assessment of automated vehicles on traffic flow and environment and exchanges views on how should we introduce the new technology into the real world.

Organisers:

Takashi Oguchi, The University of Tokyo, Japan
Daisuke Oshima, Pacific Consultants Co., Ltd., Japan

Moderator:

Masao Kuwahara, Tohoku University, Japan

Speakers:

Jaap Vreeswijk, MAP traffic management, The Netherlands
Steven Shladover, the University of California PATH Program, USA
Nour-Eddin El Faouzi, IFSTTAR, France

SIS 35: TRANSFORMING FREIGHT MOVEMENT THROUGH ITS (TFMI) PART III: SMART MULTIMODAL URBAN FREIGHT AND LOGISTICS

Wednesday, 23 October 2019 | 16:00 - 17:30 | Room 327

This session will present how ITS are changing urban freight operations and policies. Technological developments facilitate the optimisation of urban supply chains, especially the Internet of Things and tracking & tracing, automation and connectivity (in the warehouses as well as for freight vehicles), e-mobility, and on-demand delivery services. New technologies for the design and construction of logistics facilities in urban environments make it easier to consolidate urban freight flows and provide better tools for increasingly faster omni-canal deliveries. Traffic, parking and enforcement management systems open the way for more innovative and sustainable urban freight policies, effectively integrating freight into the smart city. Companies, from start-ups to very large groups, are designing new vehicles to deliver goods in cities, from cargo-bikes to urban barges to drones. Examples from around the world will be presented, showing the achievements but also the challenges of these new developments

Organisers:

Bernard Jacob, IFSTTAR, France
Wen-Tung Chiu, Urban Redevelopment Authority, Singapore

Moderator:

Laetitia Dablanc, IFSTTAR, France

Speakers:

Andre Romano Alho, Singapore-MIT Alliance for Research and Technology, Singapore
Wen-Tung Chiu, Urban Redevelopment Authority, Singapore
Jee Sun Lee, Korea Transport Institute, Republic of Korea
Joëlle van den Broek, TNO, The Netherlands
Matthias Winkenbach, MIT Megacity Logistics Lab, USA

SIS 36: CONNECTING VEHICLE AND INFRASTRUCTURE AROUND THE WORLD

Wednesday, 23 October 2019 | 16:00 - 17:30 | Room 328

This session discusses how Connected Vehicle deployments around the world have been implemented. The session will focus on lessons learned, data volumes, security, and converging technologies (i.e., DSRC and C-V2X/5G). Each deployment will share what worked, did not work, and what they would do again or change if they could. As one would expect, these deployments are generating massive amounts of data. Deployments will discuss how they are currently handling the data volumes now and what future techniques they are considering for the future as the data volumes grow. Deployments will discuss the aspects of implementing security and challenges of making it work not only locally and nationally. Finally, as technologies are evolving, it is important that Connected Vehicle deployment work with providers to determine the path forward for integrating, merging, and migrating the technologies.

Organiser:

Steve Novosad, HNTB Corporation, USA

Moderator:

Steve Novosad, HNTB Corporation, USA

Speakers:

Bob Frey, Tampa-Hillsborough County Expressway Authority, USA
Marcus Welz, Siemens Mobility Inc., USA
Kyle Connor, Cisco Systems, USA
John Hibbard , Georgia Department of Transportation (GDOT), USA
Robert Rausch, TRANSCORE, USA

SIS 37: CITIZENS IN MOTION: WHO'S DRIVING YOUR FUTURE?

Wednesday, 23 October 2019 | 16:00 - 17:30 | Room 329

The panel discussion will cover key findings from different global regions/cities based on Arcadis' Citizens in Motion report including current connected and autonomous vehicles (CAV) activities and initiatives, challenges and opportunities, lessons learned and best practices, recommendations, potential approaches, and common themes. The research takes a practical look at 14 global cities (Asia – Dubai, Hong Kong, Singapore; Australia – Melbourne, Sydney; Europe – Amsterdam, Berlin, Brussels, Edinburgh, London, Paris; North America – Los Angeles, New York, San Francisco) to see how CAV might enable them to improve their mobility. The panelists are from different global regions – North America, Europe and Asia – providing local and valuable insights in their CAV eco-systems. The panel provides a strong platform for conversations that can lead to further exploration and influence for CAV planning by these and other global cities.

Organiser:

Michelle Long, ARCADIS, USA

Moderator:

Akhil Chauhan, ARCADIS, USA

Speakers:

Pete Costello, Iteris, Inc., USA
John Batten, ARCADIS, Hong Kong
Mark Keppens, ARCADIS, Belgium
Jeroen Borst, TNO, The Netherlands
Raj Ponnaluri, Florida Department of Transportation (FDOT), USA
Jeffrey Davis, Blackberry, USA

SPECIAL INTEREST SESSIONS

SIS 38: IMPLEMENTATION PROGRAMS OF CONNECTED AUTOMATED SHUTTLE AS URBAN PUBLIC & SHARED MOBILITY

Wednesday, 23 October 2019 | 16:00 - 17:30 | Room 330

This session demonstrates the worldwide programs of on going programs in the cities with connected automated shuttle bus for utilizing first and/or last mile connectivity between different type of zones as a public or shared transport. Recently it is reported that there are more than 50 cities in the world which have adopted a kind of automated driving shuttle to be tested as a new urban mobility to upgrade their conventional public transport systems. The potential feasibility of the connected automated shuttle bus would be discussed in this session with comparisons of different cases in the world in terms of connected and automated functions, mobility purposes, infrastructure cooperations, policies with regulation and legislation, etc

Organiser:

Young-Jun Moon, The Korea Transport Institute (KOTI), Republic of Korea

Moderator:

Sangsun Lee, Hanyang University, Seoul, Republic of Korea

Speakers:

Young-Jun Moon, The Korea Transport Institute (KOTI), Republic of Korea
David Shen, Turing Inc., Chinese-Taipei
Charles Karl, Australian Road Research Board, Australia
Young Gi Song, SpringCloud Inc., Republic of Korea
Seesung Chae, Pine S&S Co., Republic of Korea
Joanne Yu, Tmoney Co. Ltd., Republic of Korea

SIS 39: INTEGRATING 3D MOBILITY IN THE MAAS ECOSYSTEM

Thursday, 24 October 2019 | 09:00 - 10:30 | Room 325

Some of the most disrupting and upcoming transport means are Drones. In a near future, flying or even hybrid taxis may become an important means to transport both people and goods. This session discusses the possible blocking factors and impact of Drones integrated in the urban mobility of tomorrow. This mobility will be largely based on the Mobility as a Service paradigm where travellers won't own the transport system but rather use it as a service. The session will focus on the impact of robotized traffic systems such as Drones and automated vehicles on the planning of MaaS in the future urban and sub-urban regions. This evolution in transport systems also has a large impact on the infrastructure which must be available in a city. Finally, user acceptance but also privacy issues are important topics which will be discussed in this session.

Organiser:

Piia Karjalainen, ERTICO - ITS Europe

Moderator:

Piia Karjalainen, ERTICO - ITS Europe

Speakers:

Sascha Westermann, Hamburger Hochbahn AG, Germany
Tero Vuorenmaa, Robots Expert Finland Oy, Finland
Fabien Nestmann, Volocopter, Germany
Thiago Tavares, VVA, Belgium
Claire Depre, DG MOVE, European Commission

SIS 40: SHARING DATA FOR TRAFFIC INFORMATION BETWEEN ROAD AUTHORITIES AND SERVICE PROVIDERS

Thursday, 24 October 2019 | 09:00 - 10:30 | Room 326

Traffic data is the basis for exploring new ways of using traffic information as a tool for traffic management and for exploring new possibilities in relation to connected and automated vehicles, MAAS and smart cities with the aim of improving traffic safety and mobility. Road authorities and service providers have different goals, roles and business models in relation to traffic data. Road authorities typically have information on incidents on the roads and attach importance to all drivers receiving both safety related traffic information and information on incidents as quickly and correctly as possible in order to reduce the risk of accidents and improve mobility. Service providers develop traveler services and integrate a variety of different data sources. Service providers add significant value to the traffic information received from road authorities and provide drivers with a wide range of traffic and travel related services.

Organiser:

Charlotte Naumanen Holstrøm, Danish Road Directorate, Denmark

Moderator:

Charlotte Vithen, Danish Road Directorate, Denmark

Speakers:

Nicholas Cohn, TomTom, USA
Rick Schuman, INRIX, USA
John Wall, Austroads, Australia
Thomas Møller Thomsen, Federation of Danish Motorists - FDM, Denmark
Charlotte Naumanen Holstrøm, Danish Road Directorate, Denmark

SIS 41: DELIVERING ON PROACTIVE CONGESTION MANAGEMENT

Thursday, 24 October 2019 | 09:00 - 10:30 | Room 327

Over the last two decades we have seen a shift to a more multimodal approach towards traffic management, but the complexity and impacts of these challenges increase. In August 2018, the NSW government announced a $123m investment into Intelligent Congestion Management Program (ICMP), targeting integration of operational information of all modes, increasing coordination and information available to end users. This session includes speakers involved in the delivery of the ICMP project including Transport for NSW, Cubic Transportation Systems and WSP. The discussion will also focus attention on the wider challenges being experienced globally in our cities, and will include perspectives from Australia, USA, New Zealand and Scandinavia.

Organiser:

Scott Benjamin, WSP, Australia

Moderator:

Scott White, Transport for NSW, Australia

Speakers:

Chris Bax, Cubic Transportation Systems Ltd., Australia
Matthew Gallaugher, WSP Australia, Australia
Andy Hooper, WSP-OPUS, New Zealand
Stefan Myhrberg, Ericsson, Sweden

SPECIAL INTEREST SESSIONS

SIS 42: MAAS: SHOULD MOBILITY CHOICES, CITY GOALS AND PRIVATE SECTOR OPPORTUNITIES BE BALANCED?

Thursday, 24 October 2019 | 09:00 - 10:30 | Room 328

With the focus of Mobility as a Service (MaaS) being primarily on customers, how can a city or region be sure that customers will make mobility choices that meet the city's goals? Further, is it the city or region's job to provide an environment in which the private sector can compete in offering either a mobility platform or mobility services, such as bikesharing. It has been suggested that this balance should be part of the eventual governance of MaaS, but there is not enough evidence to support this premise yet. This session will discuss the positive and negative aspects of this balance and whether such a balance should be considered in the future.

Organiser:

Carol Schweiger, Schweiger Consulting LLC, USA

Moderator:

Carol Schweiger, Schweiger Consulting LLC, USA

Speakers:

Yosuke Hidaka, MaaS Tech Japan, Japan
Sami Sahala, Forum Virium, City of Helsinki, Finland
Gabriel Sanchez, PTV Group, Germany
Carol Kuester, Metropolitan Transportation Commission, USA
Andy Fremier, Metropolitan Transportation Commission, USA

SIS 43: DIGITAL TRANSPORT INFRASTRUCTURE - DEFINITIONS, ELEMENTS AND FUNCTIONS

Thursday, 24 October 2019 | 09:00 - 10:30 | Room 329

The ITS sector is actually confronted with an advent of new transport technologies and solutions. AI, automation, multimodal platforms, micro-mobility and many more. Infrastructure will still be our common baseline. What kind of new functions are needed to match those new demands in an effctive way. How do we digitalize our infrastructure or even build a new Digital Transport Infrastructure (DTI) layer?The session will come forward with a common definition of our future DTI. It will also highlight specific goals and ambitions of industries, operators and on policy level. How is the alignment and prioritisation of goals handled in different regions (e.g. Infrastructure-Fitness, sector-coupling (ICT, energy, ..), robusteness, ready for automation)How could a future proofed functional framework look like – what should be the basic/core elements, functionalities and applications.The participants will share good practice (technically, organisational, financing) and discuss a common way & outreach for future initiatives

Organiser:

Martin Russ, AustriaTech, Austria

Moderator:

Martin Böhm, AustriaTech, Austria

Speakers:

Martin Russ, AustriaTech, Austria
Marjid Sarvi, The University of Melbourne, Australia
Saturo Nakajo; University of Tokyo, Japan
Ahmed Nasr, HERE, Belgium
Stephane Dreher, ERTICO - ITS Europe

SIS 44: AI AND CLOUD COMPUTING DRIVE THE DIGITAL TRANSFORMATION OF ITS TRAFFIC MANAGEMENT

Thursday, 24 October 2019 | 09:00 - 10:30 | Room 330

Time lost in lengthy commutes wastes energy and the valuable time of citizens and businesses, negatively impacting an economy and lowering overall productivity. The digital transformation to cloud-based technologies can help resolve these challenges, improving the attractiveness of cities to inward investment and improve the quality of life for everyone living or visiting the city. As populations continue to grow and the trend to city migration continues, the topic of transportation and urban mobility becomes one of the largest challenges faced by civic leaders to the sustainable economic growth of their urban centers.Siemens, Microsoft and Dell are 3 market leading companies active in their individual domains driving the future of the ITS industry and enabling the digital transformation of Urban Mobility to provide innovative business and technology answers to the aforementioned challenges.

Organiser:

Hendra Tjioe, Siemens Mobility Pte Ltd, Singapore

Moderator:

Fred Kalt, Siemens Mobility Pte Ltd, Singapore

Speakers:

Sebastian Althen, Siemens Mobility GmbH, Singapore
Charles Sevior, Dell EMC, Australia
Holger Kenn, Microsoft, Germany

SIS 45: PLANNING, DESIGN AND APPLICATION FOR AUTONOMOUS MOBILITY: INTERNATIONAL PERSPECTIVES

Thursday, 24 October 2019 | 11:00 - 12:30 | Room 325

This session will address the planning, design and application for autonomous mobility from integrated and international perspectives. From Singapore, the session will feature the planning, design, and simulation of an “autonomous district” including: understanding how autonomy might impact urban form and how urban design and planning can steer the impact of autonomy in planning a new city; details of simulation modeling approaches designed to understand autonomy’s impacts on vehicle ownership, travel behavior, parking and residential choices; the latest integrated urban design experiments and agent-based land-use sketch planning. The application of dynamic autonomous rapid transit (DART) in Singapore as well as Toyota ePalette in Japan will also be discussed. From European perspective, the session will address the planning for automated vehicles. Finally, from USA, the session will feature an initial analysis of a new data set on how the top 600 cities in the USA are exploring the issue of autonomy.

Organiser:

Bingran Zuo, SMART Future Urban Mobility, Singapore

Moderator:

Chris Zegras, MIT, USA

Speakers:

Chris Zegras, MIT, USA
Ravi Seshadri, SMART Future Urban Mobility, Singapore
Pieter Fourie, SEC Future Cities Lab, Singapore
Tanvi Maheshwari, SEC Future Cities Lab, Singapore
Zain Ul Abedin, TUMCREATE, Singapore

SPECIAL INTEREST SESSIONS

SIS 46: AN IN-DEPTH UPDATE ON THE UNITED STATES FIRST SMART CITY: COLUMBUS, OHIO

Thursday, 24 October 2019 | 11:00 - 12:30 | Room 326

At a high level, most people understand the various technologies that comprise a "smart city". But how should these solutions be deployed and integrated into the communities in which we live? This session will examine the disruption caused by these solutions, and how cities and regions can plan for the deployment of these technologies, regardless of their current level of technology adoption. The session will include an in-depth look at Columbus, OH and the approaches they have taken in deploying their smart city projects, including the role of public private partnerships in deployment and sustainability.

Session Format: The session will include short presentations from each speaker, followed by 30-40 minutes of moderated discussion and open audience question and answer.

Topics for Presentation:

1. Dealing with Disruption:
   Speaker | Jim Barbaresso, HNTB
2. Challenges and Lessons Learned from the U.S. First Smart City
   Speaker: Mandy Bishop, City of Columbus, Ohio
3. Sustainability is Adaptability
   Speaker: Christian C Lemire, Genetec Inc.

Organiser:

Diane Newton, HNTB, USA

Moderator:

Diane Newton, HNTB, USA

Speakers:

Jim Barbaresso, HNTB, USA
Mandy Bishop, City of Columbus, USA
Christian Chenard-Lemire, Genetec Inc., Canada

SIS 47: PUTTING ITS IN ITS PLACE: PLACE CENTRIC APPROACH TO TECHNOLOGY DEPLOYMENT

Thursday, 24 October 2019 | 11:00 - 12:30 | Room 327

We as an industry are preoccupied with chasing the latest new technology. But isn't focussing on improving people's lives and the places where we live, work and play more important? And that is what happens when you take a Place lens to looking at Intelligent Transport Systems (ITS). In our session, we will use Place as an ordering principle to consider ITS. This means adopting a cumulative view of ITS technologies anchored in place and anchored in what makes sense for people. We will explore multimodal transport for people and transport in a place-setting, to consider – how do we plan and design future ready places?

Organiser:

Graham Pointer, WSP Australia, Australia

Moderator:

Graham Pointer, WSP Australia, Australia

Speakers:

Mary Haverland, WSP Australia, Australia
Colin Lim, MobilityX, Singapore
Jeff McCarthy, Transport for NSW, Australia

SIS 48: TOWARDS A SUSTAINABLE TECHNOLOGY DRIVEN PORT CITY

Thursday, 24 October 2019 | 11:00 - 12:30 | Room 328

Ports play a substantial role in the European economy and development, as nearly 75% of trade is handled in ports. However, their low adaptation level to future expansion and intensified interactions with the hinterland, hinders them from realising their full growth potential. The constant evolving port development makes it necessary to shift economies and social structures towards more sustainable models. The goal of this session is to bring ports and public authorities around the world together, to identify means that will facilitate the transition of ports to a more sustainable profile. The session will offer the opportunity to debate on current needs and future challenges and gather key insights on disruptive innovations in port-city operations and on possible means for boosting multi-modality. In particular, the session will delve into current trends and technological innovations which can lead to a sustainable relationship between ports and their surrounding cities.

Organiser:

Thomas Desseilles, ERTICO - ITS Europe

Moderator:

Angelos Amditis, Institute of Communication & Computer Systems (ICCS), Greece

Speakers:

Alexio Picco, CIRCLE S.p.A, Italy
Alexandr Tardo, CNIT, Italy
Phanthian Zuesongdham, Hamburg Port Authority, Germany
Meng Lu, Dynniq, The Netherlands
Tiam Her Tan, PSA International, Singapore
Marcel Huschebeck, PTV Group, Germany
Michael Pal, Fremantle Ports, Australia

SIS 49: CIRCULAR ECONOMY - HOW TO APPLY "REDUCE, REUSE, RECYCLE" PRINCIPLES TO TRANSPORTATION AND ASSESS THE IMPACTS?

Thursday, 24 October 2019 | 11:00 - 12:30 | Room 329

The transport sector still has a good way to go to be in tune with circular economy and sustainable development principles. But solutions are emerging, including clean fuels, multimodal and shared mobility solutions and streamlining the whole production chain according to Circular Economy's "reduce, re-use and recycle" principles. In particular Mobility-as-a -Service, (MaaS), aiming at optimisation and more efficient use of transport systems can be as a comprehensive response to the call of the circular economy – it builds on the existing services, but upgrades the ways they are combined, integrated and consumed reducing inefficiencies in the system. This session discusses MaaS and other potential streams of transport sector (shared mobility services, fuels from recycled materials, resource efficient manufacturing) in the Circular Economy framework, introduces some of the services and business models available and explores how they should be approached in policy-making. It also explores how the environmental impacts and compliance could be assessed and discusses the need of creation of harmonised framework for the evaluation of the impacts.

Organiser:

Piia Karjalainen, ERTICO - ITS Europe

Moderator:

Piia Karjalainen, ERTICO - ITS Europe

Speakers:

Krista Huhtala-Jenks, MaaS Global, Finland
Shen Shiyu, DiDi Global, China
David Adelman, Via, USA
Jean-Charles Pandazis, ERTICO - ITS Europe
Patrick Mallejacq, PIARC - AIPCR, France
Andy Fremier, Metropolitan Transportation Commission, BAY AREA METRO, USA

SPECIAL INTEREST SESSIONS

SIS 50: POSSIBLE ACTIONS FOR PUBLIC AUTHORITIES AND CITIES TO FACILITATE AUTOMATED DRIVING

Thursday, 24 October 2019 | 11:00 - 12:30 | Room 330

Most roadmaps and action plans published by policy makers and national authorities that aim at bringing automated driving to the roads are predominantly focussing on expected benefits that AD will bring. AD under real life conditions however, especially when dealing with mixed traffic, poses serious challenges and many authorities are exploring how they can anticipate and facilitate a successful transition. Cities in particular remain cautious due to uncertainties about market uptake, the overall impact on mobility and their influence on AD developments.The EC-funded CARTRE and ARCADE projects have collected and analysed a large selection of roadmaps, action plans, pilots and test sites to identify areas where strategic alignment across governments and stakeholders could be beneficial. Public authorities and city representatives will discuss the findings, their own approaches and suggested actions in an interactive setting with the audience, to prioritise them and identify which actions will have the largest impact.

Organiser:

Stephane Dreher, ERTICO - ITS Europe

Moderator:

Tom Alkim, European Commission DG Research & Innovation

Speakers:

Jaap Vreeswijk, MAP traffic management, The Netherlands
Martin Russ, AustriaTech, Austria
Toshihiro Sugi, National Police Agency, Japan
Suzanne Hoadley, Polis Network, Belgium
Bill Sowell, IRF ITS Committee, USA
Geoff Allan, NTC Australia, Australia

SIS 51: TESTING METHODOLOGIES FOR AUTOMATED DRIVING SYSTEMS

Thursday, 24 October 2019 | 14:00 - 15:30 | Room 326

There are many testing approaches being investigated to assess the performance of ADS to include hardware/software in-the-loop, virtual environment simulation, scenario based testing, and real world mileage accumulation. Each has advantages and disadvantages. This session will explore several of these testing approaches from different parts of the world.

Organiser:

Ryan Lamm, Southwest Research Institute (SwRI), USA

Moderator:

Ryan Lamm, Southwest Research Institute (SwRI), USA

Speakers:

Siddartha Khastgir, Warwick Manufacturing Group, UK
Peter Burns, Transport Canada, Canada
Hitoshi Watanabe, Yamaha Motor Co., Ltd., Japan
Blaine Leonard, Utah Department of Transportation, USA

SIS 52: NEW ORGANIZATION PARADIGM FOR FOSTERING COOPERATION BETWEEN ORGANIZATIONS

Thursday, 24 October 2019 | 14:00 - 15:30 | Room 327

There is a need to quickly cooperate as we rapidly deploy disruptive technologies for mobility, transport systems, smart cities, and sustainable transportation. Consequently, there is a convergence between public and private sector decisions that impact our communities and our institutions that require new policy-making mechanisms, greater cooperation, and new tools to deal with the societal impact. What are the new organizational paradigms needed to address these changes? Some questions we might ask are: How can we create an environment that promotes cooperation, collaboration, and research for deploying safe and secure ITS systems? How can we improve better coordination and work across multiple organizations and stakeholders? This special interest session will engage speakers and attendees in an interactive format. We'll start with an expert panel and their observations. The facilitator will then engage the audience in the discussion. Come prepared with your ideas and questions.

Organiser:

C Douglass Couto, Independent Consultant, USA

Moderator:

C Douglass Couto, Independent Consultant, USA

Speakers:

Mark C. Kopko, Pennsylvania Department of Transportation (PennDOT), USA
Craig Hutton, Transport Canada, Canada
Renee Autumn Ray, Conduent Transportation, USA
Tracy Larkin Thomason, Nevada Department of Transportation, USA
Colin Lim, MobilityX, Singapore

SIS 53: INTERNATIONAL CITIZENS' DEBATE ON AUTOMATED MOBILITY: WHAT DO THE CITIZENS' WANT?

Thursday, 24 October 2019 | 14:00 - 15:30 | Room 328

Citizens, as the main stakeholders affected by the impact of Connected and Automated Driving are rarely included in discussions aimed at defining roadmaps, strategies and policies from cities or authorities. Several debates organised last year in France have shown that the expectations and requirements from citizens are often far away from those formulated by experts and not necessarily in line with strategies defined by authorities.This session will present the first results of a series of Citizens debates organised in about 40 cities in Europe, US, Canada and Singapore, as well as the views from cities and the findings from research activities and workshops carried out in the frame of the EC funded projects CARTRE and ARCADE. Selected informed citizens will discuss with representatives from authorities and other stakeholders in an interactive setting about the needs, expectations, fears, and the "red lines" for citizens on the future of mobility.

Organisers:

Yves Mathieu, Missions Publiques, France
Stephane Dreher, ERTICO - ITS Europe

Moderator:

Yves Mathieu, Missions Publiques, France

Speakers:

Stephane Dreher, ERTICO - ITS Europe
Martin Russ, AustriaTech, Austria
Lynette Cheah, Singapore University of Technology and Design, Singapore
Scheherazade Zekri, Keolis, France
Henriette Cornet, TUMCREATE, Singapore
Mahmud Farooque, Arizona State University, USA

SPECIAL INTEREST SESSIONS

SIS 54: TOWARDS AN OPTIMISED MOBILITY SYSTEM: INTEGRATING TRAFFIC MANAGEMENT AND MAAS

Thursday, 24 October 2019 | 14:00 - 15:30 | Room 329

Traffic Management is the task of managing and optimising road capacity: the speed, volume and direction of traffic. With technological and organisational developments brings new opportunities to manage all types of traffic better, namely closer cooperation between service providers and road operators. This collaboration is predomintatly limited to re-routing of traditional car traffic but cities are increasingly developing multimodal transport systems and better information and re-routing functionalities for all transport modes and users is required. As such, the need for more integrated multimodal traffic management becomes clearer. But what is needed and by whom to make this a reality? What are the differences and similarities region to region? This session will explore how the TM2.0 and MaaS concepts can support one another and enable better optimised mobility systems. In addition, the associated bottlenecks and enablers of building such synergies will be discussed, bringing a new perspective on MaaS and TM2.0.

Organiser:

Stephanie Leonard, TomTom, Belgium

Moderator:

Johanna Tzanidaki, ERTICO - ITS Europe

Speakers:

Stephanie Leonard, TomTom, Belgium
Piia Karjalainen, ERTICO - ITS Europe
Mohit Sindhwani, Quantum Inventions, Singapore
Gabriel Sanchez, PTV Group, Germany
Jan willem Tierolf, Ministry of Infrastructure and Water Management, The Netherlands
Carol Schweiger, Schweiger Consulting LLC, USA

SIS 55: PROSPECTS OF A 5G REFERENCE FRAMEWORK FOR CCAM

Thursday, 24 October 2019 | 14:00 - 15:30 | Room 330

5G will boost Cooperative, Connected and Automated Mobility (CCAM) with Cellular V2X (C-V2X) and network slicing enabling delivery of targeted 5G New Radio features for CCAM through a dedicated automotive slice. 5G will not only extend the reach of connectivity (including via satellite) it will also make it more flexible through features like ultra-Reliable Low Latency Communications (uRLLC) for safety-critical services (e.g. cooperative manoeuvres, autonomy failures, cyberattacks, remote-intervention needs); massive Machine Type Communications (mMTC) for seamless integration of CAVs into massive-IoT; enhanced Mobile Broadband (eMBB) for infotainment needs. Dynamic connectivity is pivotal in creating business cases using 5G technologies for CCAM. The emerging business models will require a 5G framework provisioning dynamic and flexible connectivity for the diverse CCAM services. With commercial deployments of 5G networks starting in 2019, communication and road infrastructures and the automotive industry must be ready to meet the disruptive demands of the envisioned CCAM technologies.

Organiser:

Ralf Weber, Qualcomm, Germany

Moderator:

Francois Fischer, ERTICO - ITS Europe

Speakers:

Ralf Weber, Qualcomm, Germany
Ashweeni Beeharee, Satellite Applications Catapult, UK
Ning He, Shenzhen Genvict Technology, China
You-Jun Choi, Korea Automotive Technology Institute (KATECH), Republic of Korea
Richard Bishop, Bishop Consulting, USA

SIS 56: ACCESSIBLE AND EQUITABLE MOBILITY: CAN THIS BE ACCOMPLISHED WITH MAAS?

Thursday, 24 October 2019 | 16:00 - 17:30 | Room 326

While many discussions about the future of mobility say that it is shared, electric, autonomous and connected, accessibility and equity are often omitted from this utopian view. It is imperative that mobility - regardless of how it is powered and how it is integrated - is accessible to all (including persons with disabilities and older persons), and equitable, meaning it is available to all irrespective of a traveler's demographic. This session will explore how accessibility and equity are being considered in the new mobility ecosystem, particularly in schemes that are technology-enabled, such as Mobility as a Service (MaaS). Examples include providing methods by which the "unbanked" or those without smartphones can access MaaS, as well as ensuring that the "complete trip" offered by MaaS will be fully accessible to persons with disabilities and older persons.

Organiser:

Carol Schweiger, Schweiger Consulting LLC, USA

Moderator:

Carol Schweiger, Schweiger Consulting LLC, USA

Speakers:

Rob Lake, Great Community Transport, Australia
Renee Autumn Ray, Conduent, USA
Piia Karjalainen, ERTICO - ITS Europe
Sadao Horino, Research Institute for Well-informed and Risk-free Transportation (KU-WIRF), Kanagawa University, Japan

SIS 57: COLLABORATIVE ITS – CHALLENGE FOR THE FUTURE INTEGRATED MOBILITY

Thursday, 24 October 2019 | 16:00 - 17:30 | Room 327

The SIS are organised at the request of groups of experts developing and deploying ITS, these interactive, tailor-made sessions provide the opportunity to focus on specific topics of interest.According to the three Congress pillars – Programme, Exhibition and Demonstrations the Shift2Rail JU Executive Director Carlo Borghini and the Chairman of the Shift2Rail JU States Representatives Group Miroslav Haltuf would like to present how the railway research and innovation community the railway operation community and rail supply industry contribute to the cooperation and integration of the entire railway sector into ITS based on principles of multimodality and interoperability. These are the main objectives based on which the Shift2Rail JU is working in close collaboration with ERTICO - ITS Europe on Request of a dedicated SIS.

Organiser:

Miroslav Haltuf, H-Comp Consulting / Shift2Rail, Czech Republic

Moderator:

Miroslav Haltuf, H-Comp Consulting / Shift2Rail, Czech Republic

Speakers:

Jacob Bangsgaard, ERTICO - ITS Europe
Miroslav Haltuf, H-Comp Consulting / Shift2Rail, Czech Republic
Esther Bravo, Shift2Rail Joint Undertaking, Belgium
Riccardo Santoro, Ferrovie dello Stato Italiane S.p.A, Italy
Martin Pichl, Ministry of Transport, Czech Republic

SPECIAL INTEREST SESSIONS

SIS 58: THE POWER OF SHARED MOBILITY TO MAKE CITIES MORE LIVABLE

Thursday, 24 October 2019 | 16:00 - 17:30 | Room 328

Public transport agencies and operators are facing increased competition from the boom in new mobility. To make matters worse, most new mobility entrants prioritize on-demand private rides – not shared – which has overwhelmed cities with increased congestion. This session will demonstrate that partnerships between technology companies and public transport concessionaires are the key to reversing ridership losses and combating congestion. Featuring leaders from Via, Keolis, Go-Ahead, HP Transportes, and MaaS Alliance, the panel will explore how global transport operators are turning to innovative mobility technology solutions to reimagine their services for future sustainability. The objectives of this presentation will be to:

1) Present a new wave of on-demand transit P3s around the world;

2) Discuss insights from the massive amounts of data being analysed;

3) Help operators become more competitive in a rapidly shifting environment; and

4) Discuss how these projects work towards a vision of Mobility as a Service (MaaS).

Organiser:

David Adelman, Via, USA

Moderator:

Sami Sahala, Forum Virium, City of Helsinki, Finland

Speakers:

David Adelman, Via, USA
Thiago Araújo, HP Transportes Coletivos, Brazil
Scheherazade Zekri, Keolis, France
Michael Debono, Head of Mobility, Debono Group, Malta

SIS 59: PATHWAY TO AUTOMATION

Thursday, 24 October 2019 | 16:00 - 17:30 | Room 329

With an increasing number of automated vehicle deployment programs, a dialogue is needed on what is different and similar for these deployment efforts. The session will focus on how the deployment of truck automation is different from light vehicle automation which is different from shuttle deployment. Session would have 2-3 min “opening statement” (no slides) and then roundtable. Deployment leaders from around the world will compare and contrast the different types of deployments. Time will be devoted to discuss what’s next in the rollout of this technology once the trials are complete.

Organiser:

Ryan Lamm, Southwest Research Institute (SwRI), USA

Moderator:

Ryan Lamm, Southwest Research Institute (SwRI), USA

Speakers:

Paul Jennings, University of Warwick, UK
Chunmin Zhang, Neusoft Reach, China
Bobby Hambrick, AutonomouStuff, LLC, USA
Scott Marler, Iowa Department of Transportation, USA

SIS 60: SECURE ITS FRAMEWORK – STANDARDIZED SECURE COMMUNICATIONS FOR ALL ITS USE CASES

Thursday, 24 October 2019 | 16:00 - 17:30 | Room 330

Secured, trusted interoperability for Cooperative ITS is vital. Until now, there has been tension between trust in the reliability, security, and privacy of systems, versus access and sharing data between services. Deployers have been required to develop ad-hoc solutions with little support, making it hard to deploy robust systems and hindering the ability of ITS to live up to its potential.The solution -- an architecturally coherent, globally standardized approach to access control security -- is now defined in standards. The ramifications for ITS are significant. In this panel, international experts (Knut Evensen, Q-Free; William Whyte, OnBoard Security; Gianmarco Baldini, JRC; Jonathan Harrod Booth, Consultant; Dick Schnacke, Transcore) will explain the value, the user experience, the necessary support services, and the global reach of this new approach. Attendees will gain an understanding of the approach and how they can use it to enable new services of their own.

Organisers:

Knut Evensen, Q-Free ASA, Norway
Jonathan Harrod Booth, Harrod Booth Consulting, UK

Moderator:

Dick Schnacke, Transcore, USA

Speakers:

Gianmarco Baldini, European Commission's Joint Research Centre, Ispra, Italy
William Whyte, On board Security, USA
Knut Evensen, Norwegian Public Roads Administration, Norway
Jonathan Harrod Booth, Harrod Booth Consulting Limited, UK

SIS 61: TRAFFIC SIGNAL CONTROL & MANAGEMENT FOR CONNECTED & AUTOMATED DRIVING SYSTEMS

Friday, 25 October 2019 | 09:00 - 10:30 | Room 327

This session will discuss how to develop the technologies for the next generation traffic signal control and management for connected and automated driving systems (CADS) utilising information and communication technology to detect the vehicles approaching the intersections instead of the conventional detectors. The detection technology might include the connected vehicle with V2X communication and a few promising sensors installed in the infrastructure. New hardware and software systems are integrated with an innovative concept of control and management algorithms. A methodology of how to test a system on the road will be discussed in terms of performance measures to be evaluated and validated.

Organiser:

Young-Jun Moon, The Korea Transport Institute (KOTI), Republic of Korea

Moderator:

Young-Jun Moon, The Korea Transport Institute (KOTI), Republic of Korea

Speakers:

Sangsun Lee, Hanyang, Republic of Korea
Jungran Wee, The Korea Transport Institute (KOTI), Republic of Korea
Jae Hyung Park, Meta, Republic of Korea
David Park, MaaS Korea, Republic of Korea
Yunhee Cho, Chemtronics, Republic of Korea

SPECIAL INTEREST SESSIONS

SIS 62: 5G WITH SATELLITE COMMUNICATION – DELIVERING RESILIENCE AND REACH

Friday, 25 October 2019 | 09:00 - 10:30 | Room 328

Deploying robust ITS services that work seamlessly irrespective of the users location – whether rural or urban - poses an interesting challenge for ITS connectivity. With 5G and new satellite constellations in the near future, along with the convergence of terrestrial and satellite technology, the provisioning of seamless connectivity on the move – in urban, rural and wilderness - will become a reality and pave the way for richer ITS services. 5G has the ambition to enable harmonious integration of heterogeneous networks whether terrestrial and satellite. It is forecasted that by 2025 around 27.2% of automotive use cases will use satellite connectivity. Through its global reach, satellite communication plays a key role in creating a seamless and affordable connectivity fabric for both infrastructure and vehicles. Such connectivity is sufficient for the deployment of essential ITS services such as emergency calls, fleet management, remote diagnostics and road tolling.

Organiser:

Ashweeni Beeharee, Satellite Applications Catapult, UK

Moderator:

Ashweeni Beeharee, Satellite Applications Catapult, UK

Speakers:

Choi You-Jun, Korea Automotive Technology Institute (KATECH), Republic of Korea
Yanjun Shi, Dalian University of Technology, China

SIS 63: ITS FOR LIFE II

Friday, 25 October 2019 | 09:00 - 10:30 | Room 329

ITS is an enabler – not just for improving transportation, rather, for improving 'life'. The explosion of data, the numerous data sources that have emerged, the incredible number of information distribution systems in existence today provide us with a revolutionary means to positively affect life well beyond just transportation. The second session in this series will continue to explore how we enter a gateway where we can marry the myriad of underutilized transportation data with life's everyday needs to make life altering decisions.

Organiser:

Janneke van der Zee, ITS Canada, Canada

Moderator:

Richard Easley, E-Squared Engineering, USA

Speakers:

Richard Easley, E-Squared Engineering, USA
Mara Bullock, WSP, Canada
Steve Dellenback, Southwest Research Institute (SwRI), USA

SIS 64: REALIZING BENEFITS OF C-ITS IN EVERYDAY LIFE

Friday, 25 October 2019 | 11:00 - 12:30 | Room 327

Various C-ITS projects have currently been launched and conducted around the world to improve safety, mobility, and sustainability.Along with this global trend, Korea completed the master plan for C-ITS introduction in 2013 and the pilot was immediately launched, conducted for the following three years. As the follow-up, C-ITS demonstration has been ongoing in expressway and major cities in 2018 and will be expanded gradually.In addition, the related preparation for C-ITS implementation is underway. In 2018, the first K-PlugTest was held in Korea for the first time to verify interoperability between C-ITS devices and will be held continuously.In this session, we will share what Korea has learned from our experience and listen to other countries' cases on C-ITS. Based on this sharing, we can address the challenges and discuss the ways how we can proceed with C-ITS for the people to benefit from it.

Organiser:

Young-Kyun Lee, ITS Korea, Republic of Korea

Moderator:

Young-Kyun Lee, ITS Korea, Republic of Korea

Speakers:

Jaewon Jung, MOLIT, Republic of Korea
Ji-Seok Kim, Korea Expressway Corporation, Republic of Korea
Maxime Flament,5G Automotive Association, Belgium
Steve Novosad, HNTB Corporation, USA

SIS 65: HOW DOES AI FIT INTO THE TRANSPORTATION ECOSYSTEM

Friday, 25 October 2019 | 11:00 - 12:30 | Room 328

The improvement in hardware/software to exploit machine learning has fueled the use of Artificial Intelligence (AI) in transportation solutions. Traditionally road agencies have not had significant experience in using AI technologies, this session will explore what city, regional, state and national leaders should be doing to prepare for incorporate AI based systems in future deployments. (USDOT participation)

Organiser:

Josh Johnson, Southwest Research Institute (SwRI), USA

Moderator:

Josh Johnson, Southwest Research Institute (SwRI), USA

Speakers:

Sondra Rosenberg, PTP , Nevada Department of Transportation, USA
Chris Mentzer , Southwest Research Institute (SwRI), USA
Mahmood Hikmet , Ohmio, New Zealand
Carl K. Andersen, U.S. Department of Transportation, FHWA, USA
Napat Jatusripitak, Siametrics, Thailand

SIS 66: GLOBAL HARMONIZATION OF SAFETY ASSURANCE FOR HIGHLY AUTOMATED VEHICLES

Friday, 25 October 2019 | 11:00 - 12:30 | Room 329

The ITS World Congress has convened the ITS industry since 1994. This Special Interest Session celebrates the success of the ITS WC with presentations describing the work of the three regions towards global harmonization of safety assurance for highly automated vehicles. Representatives from PEGASUS, JAMA, PFA, and the US Alliance of Automobile Manufacturers will discuss their regional work towards the development of safety assurance protocols, followed by a discussion among the panelists about their work together and the opportunities for global harmonization.

Organiser:

Jane Lappin, Toyota Research Institute, USA

Moderator:

Jane Lappin, Toyota Research Institute, USA

Speakers:

Kelly Kay , Toyota Research Institute, USA
Satoshi Taniguchi, Toyota Motor Corporation, Japan
Lutz Eckstein , Institute for Automotive Engineering ika at RWTH Aachen University, Germany
Jean-Francois Sencerin , Renault/French Automotive Platform (PSA), France
Niels de Boer, Nanyang Technological University, Singapore

ASIA-PACIFIC REGIONAL STREAM

AP 01: ASIA PACIFIC HIGH LEVEL FORUM ON NEW TRANSPORTATION INFRASTRUCTURE

Tuesday, 22 October 2019 | 09:00 - 10:30 | Nicoll 2

As the fastest growing economy and contributing to half of the world's population (4 billion people), Asia-Pacific with its ever evolving socio-economic fabric presents us with many unique and challenging characteristics. Three out of five of its population are millennials, which have been known to have very different views and preferences for mobility solutions. Asia Pacific is also starting to make strong inroads in the forefront on innovation as observed from the increased numbers of unicorn start-up companies. With its population's propensity to consume information and online services, which also correlates to the fact that Asia Pacific has the largest amount of data transferred on the Internet, Asia Pacific region is expected to have increasing demand and expectation to improve and provide diversity of mobility solutions. In 2017, the Asian Development Bank reported that an investment of USD 1.7 trillion/year in infrastructure was required to sustain the economic growth in this region. In this same report, the transport sector investment was ranked as the second after the energy sector. To support continuous economic growth, the investment in infrastructure of the transport sector was identified as an essential investment to mitigate congestions and traffic accident, which are still common issues in this region. In this session, distinguished speakers from the prominent international institutions are invited to discuss and provide their perspective on the necessary technologies, infrastructure, innovation eco-system, international and national cooperation, policy making and financing schemes to support the expected growth.

Organiser:

Kian Keong Chin, Land Transport Authority, Singapore

Moderator:

Kian Keong Chin, Land Transport Authority, Singapore

Speakers:

Young Tae Kim, International Transport Forum-ITF
Bambang Susantono , Asian Development Bank-ADB
Bernard Tay, Federation International de l'Automobile Region 2 (Asia Pacific Countries), Singapore

AP 02: ADVANCED TECHNOLOGIES FOR OPERATION AND MAINTENANCE OF ITS FACILITIES

Tuesday, 22 October 2019 | 14:00 - 15:30 | Nicoll 2

ITS deployment has been widely spread for past decades in both developed and developing countries. The operation and maintenance of ITS facilities has become more and more important since it hurts social benefit considerably once a major function failure occurs. Effective and efficient maintenance is also important for road operators to save the cost to conserve ITS facilities. There are a number of advanced technologies and methods through data analysis and/or sensor technology developed for preventing failure. This session will cover both of social and technical aspects. Speakers from Japan, Singapore and Malaysia will present the most recent research to estimate social economic loss by the failure of ITS facilities and their advanced preventive maintenance projects. Audience can share the significance, technologies and field practices of the maintenance with speakers.

Organiser:

Takahiro Azuma, West Nippon Expressway Facilities Company Limited, Japan

Moderator:

Masao Kuwahara, Tohoku University, Japan

Speakers:

Kazuya Okada, West Nippon Expressway Company Limited, Japan
Yap Hwee Kheng, Land Transport Authority, Singapore
Daijiro Mitzutani, Tohoku University IRIDes, Japan
Masashi Watanabe, West Nippon Expressway Engineering KANSAI Co., Ltd., Japan
Mitsuru Nakanishi, West Nippon Expressway Company Limited, Japan
Khairil Anwar Abu Kassim, Malaysian Institute of Road Safety Research (MIROS), Malaysia

AP 03: TRAFFIC STATES AND ENVIRONMENT SENSING BY VARIOUS MANNERS

Tuesday, 22 October 2019 | 16:00 - 17:30 | Nicoll 2

Traffic states and environment sensing is the key for traffic monitoring. Conventionally traffic volume sensing is the focusing point for traffic flow control. Although sensing devices from road side unit are the main and reliable tool for volume estimation, various types of probe data from vehicles, not only using GPS location data and vehicle data such as speed, are becoming popular by deploying statistical approaches to historical probe data. There need discussions how to incorporate probe data into reliable road side data. However, various indirect factors such as bikes disturbing traffic, pedestrian flowing out from events to roads, abnormal unexpected weather and limited traffic information after disasters must be also considered. This session will try to bring various sensing approaches to detect traffic states or environment which effect traffic flow and to discuss in wider range their advantages and disadvantages how they will benefit for drivers

Organiser:

Nobuyuki Ozaki, Toshiba Infrastructure Systems & Solutions Corporation, Japan

Moderator:

Nobuyuki Ozaki, Toshiba Infrastructure Systems & Solutions Corporation, Japan

Speakers:

Ya-Wen Chen, Advanced Public Transportation Research Center, Chinese-Taipei
Ryota Horiguchi, i-Transport Lab. Co., Ltd., Japan

AP 04: THE ROLE OF GOVERNMENT FOR DEPLOYING CONNECTED AND AUTOMATED VEHICLE IN JAPAN

Wednesday, 23 October 2019 | 09:00 - 10:30 | Nicoll 2

Automated driving keeps innovating with the progress of ICT and big data utilization internationally. Recently, the private sectors carry out demonstrations of automated driving systems on public roads, while the administrators are unveiling the new policies and regulations one after another. With the policy of “Public Private ITS Initiatives & Roadmaps” in 2014, and the ITS related ministries and the private sectors in Japan have shared the future vision, and demonstrated the various future mobilities to the society. One of the government-backed R&D projects called SIP-ADUS (Cross-ministerial Strategic Innovation Promotion Program - Automated Driving for Universal Services) has been conducted since 2014 under the strong public-private cooperation, and the large scale FOTs on an expressway are underway. This session will cover a wide variety of activities conducted by the Japanese government to encourage sharing the advanced ITS in the society in the country and also the world.

Organiser:

Takehiko Barada, ITS Japan, Japan

Moderator:

Hajime Amano, ITS Japan, Japan

Speakers:

Yohei Harada, Cabinet Secretariat, Japan
Yasuyuki Koga, Cabinet Office, Japan
Toshihiro Sugi, National Police Agency, Japan
Hirokazu Igarashi, Ministry of Internal Affairs and Communications, Japan
Kenji Ueki, Ministry of Economy, Trade and Industry, Japan
Katsuya Abe, Ministry of Land, Infrastructure, Transport and Tourism, Japan
Takahiro Hirasawa, Ministry of Land, Infrastructure, Transport and Tourism, Japan

ASIA-PACIFIC REGIONAL STREAM

AP 05: TESTING AND VALIDATING AUTONOMOUS VEHICLES USING TRAFFIC SIMULATION

Wednesday, 23 October 2019 | 14:00 - 15:30 | Nicoll 2

Before testing connected and autonomous vehicles (CAVs) in real traffic on public test areas such as in Karlsruhe, Germany, virtual testing of those test areas using traffic simulation accelerates the development. Advanced traffic simulation models simulate all modes, such as individual human drivers, cyclists, pedestrians and different CAV behaviour, which allows testing under different vehicle/driver populations.

Organiser:

Summer Chew, PTV Group, Singapore

Moderator:

Omid Ejtemai, PTV Group, Australia

Speakers:

Niels de Boer, Nanyang Technological University, Singapore
Thomas Benz, PTV Group, Germany
Andrey Berdichevskiy, Deloitte Hong Kong
Yuichi Kitagawa, Toyota Motor Corporation, Japan
Omid Ejtemai, PTV Group, Australia

AP 06: AUTONOMOUS DRIVING INTELLIGENCE SYSTEM AND FUTURE CHALLENGES OF ADAS IN URBAN ENVIRONMENTS

Wednesday, 23 October 2019 | 16:00 - 17:30 | Nicoll 2

As an innovation of driver assistance technology, this main core of the session is based on the research project aiming to develop "Autonomous Driving Intelligence System" to prevent risk of accidents and enhance driving safety for elderly drivers in order to improve QoL and vitalise the aged society. The session is also planned to integrate the related researches in wide international spectrum in order to exchange the latest information from speakers about the advanced technology development and technical challenges in the context of advanced driver assistance systems.

The key technologies in the session include

1. sensor fusion and localisation;

2. risk prediction; and

3. human machine interface.

Challenges in crash avoidance in complex scenario, e.g. intersections will be addressed and Field operational test (FOT) in urban area will be shown. HMI design to realise good cooperation with ADAS is also an important issue to increase driver acceptance.

Organiser:

Pongsathorn Raksincharoensak, Tokyo University of Agriculture and Technology, Japan

Moderator:

Pongsathorn Raksincharoensak, Tokyo University of Agriculture and Technology, Japan

Speakers:

Shintaro Inoue, Toyotar Motor Corporation, Japan
Hideo Inoue, Kanagawa Institute of Technology, Japan
Takuma Ito, The University of Tokyo, Japan
Yiik Diew Wong, Nanyang University of Technology, Singapore
Roman Henze, Technical University of Braunschweig, Germany
Shengbo Li, Tsinghua University, China
Xiupeng Shi, Nanyang Technological University, Singapore
Chai Chen, Tongji University, China

AP 07: CROWD MOVEMENT ANALYSIS AND MODELLING

Thursday, 24 October 2019 | 09:00 - 10:30 | Nicoll 2

Urban cities have known a significant increase in their number of inhabitants in the last years. Managing the movement of large masses of travellers on a daily basis is a true challenge for any traffic agency that needs to provide reliable and timely public transport modes, easy pedestrian access and walkable paths and good interconnectivity and flexibility for both public and private travel trips. This session aims at presenting innovative methods for modelling the public transport movement (mode and route choice), analysing the pedestrian walking movement and the impact of public transport disruptions on the travel mode selection. Predicting the number of affected passengers under major public transport disruptions represents a high priority for any traffic management centre which needs to better plan any efficient replacement services. The session addresses these challenges by inviting various international experts in crowd movement and predictive solutions applied to large urban areas.

Organiser:

Adriana-Simona Mihaita, DATA61|CSIRO, Australia

Moderator:

Chen Cai, DATA61|CSIRO, Australia

Speakers:

Christopher Bentley, DATA61|CSIRO, Australia
Mo Li, School of Computer Science and Engineering, Nanyang Technological University, Singapore
Muhamad Azfar, A*STAR, Singapore
Paul Rybicki, DSpark, Australia
Saptarshi Saradindubasu, Continental AG, Singapore

AP 08: CHALLENGES AND OPPORTUNITIES FOR PERSONAL MOBILITY DEVICES IN SMART CITIES

Thursday, 24 October 2019 | 11:00 - 12:30 | Nicoll 2

Personal mobility devices (PMDs) have been regarded as sustainable transportation for catering the first-and-last mile trip in many cities. In this session, we invite experts from the academia, industry and government to share their insights and experiences regarding its challenges and opportunities. For example, PMD users and pedestrians often share the same space due to existing provisions and infrastructure, hence accidents on the footpaths have continued to rise. PMDs can also be provided by a third-party operator and shared with the general public. It would require not only an intelligent reservation system to fulfil the inherent supply and demand problem, but also an innovative solution to address the redistribution issue, especially during peak hours and in areas with high traffic volumes. Through a discussion of relevant stakeholders, this session promises to come up with a better mobility experience in future smart cities.

Organiser:

Marcel Mayer, Schaeffler, Singapore

Moderator:

Justin Dauwels, Nanyang Technological University, Singapore

Speakers:

Jo-Yu Kuo, Nanyang Technological University, Singapore
Benaya Christo, Schaeffler, Singapore
Jasmine Saini, Scootbee, Singapore
Kai Sim, Ctrlworks, Singapore
Anna Qiu, MobilityX, Singapore

ASIA-PACIFIC REGIONAL STREAM

AP 09: BEYOND PREDICTIVE ANALYTICS - HARNESSING THE POWER OF OPEN BIG DATA AND PRESCRIPTIVE ANALYTICS TO ENHANCE TRANSPORTATION OPERATING MODELS AND TRAFFIC MANAGEMENT

Thursday, 24 October 2019 | 14:00 - 15:30 | Nicoll 2

Leveraging the wave of digitalisation, the transport industry can now tap on the availability of diverse datasets, including probe data from vehicles, road sensors, traffic signals, video and telco geo-location data, to enable new mobility services and to gain insights for service and operations improvements. How can we tap on data fusion of public and private data to provide new open big data possibilities to enable innovation of mobility and traffic management technologies? As the industry is moving up the analytics value chain, from using business intelligence tools to visualise historical data trends, to predicting traffic congestion or detecting any anomalous traffic condition, the next paradigm shift is to consider how to move towards prescribing the best transportation operating model or executing an effective strategy to improve service delivery. How can we optimise the deployment of public transportation based on predicted demand and real-time traffic conditions on the road? How can we improve human traffic flow and queue wait times at transport service hubs by prescribing the matching of demand and supply? This session addresses how we can harness the power of crowdsource data and prescriptive analytics for the transport industry. Speakers will share relevant case studies and project experiences around open big data and analytics, and discuss the potential challenges in implementation.

Organiser:

Soo Kiat Loo, NCS Pte Ltd, Singapore
Masafumi Kobayashi, Sumitomo Electric Industries Ltd, Japan

Moderator:

Howie Sim, NCS Pte Ltd, Singapore

Speakers:

Soo Kiat Loo, NCS Pte Ltd, Singapore
Masafumi Kobayashi, Sumitomo Electric Industries Ltd, Japan
Andy Pang, Tibco Software Inc., Singapore
Nicholas Cohn, TomTom, USA

AP 10: OPTIMISING SUPPLY CHAINS USING DATA: SOME PRACTICAL EXAMPLES AND RECOMMENDATIONS

Thursday, 24 October 2019 | 16:00 - 17:30 | Nicoll 2

Our supply chains stand to benefit greatly from the ever-increasing availability of data, yet for the most part this is not yet happening. The sheer volume of data, knowing what is useful, and finding ways to fairly and securely access the data are just some of the challenges that have stood in the way.

Presented by iMOVE Australia, the independent national centre for transport R&D in Australia, this session looks at a number of recent initiatives including

i. an Australian requirements study that understood and refined the needs of industry into key recommendations to inform a national government freight strategy

ii. The successful Transport Network Strategic Investment Tool (TraNSIT), a state-of-the-art model for assessing and optimising infrastructure investments and,

iii. the Transport for NSW Freight Data Hub, which aims to use data to inform and spur innovation and economic growth by delivering freight policy and infrastructure more effectively and efficiently.

Organiser:

Jacqueline King, iMOVE Australia, Australia

Moderator:

Cecilia Warren, IAG, Australia

Speakers:

Chris Chillcott, CSIRO, Australia
Gary Dolman, Bureau of Infrastructure, Transport & Regional Economics, Department of Infrastructure, Regional Development and Cities, Australia
Ian Christensen, iMove, Australia

TECHNICAL SESSIONS

TS 01: HUMAN FACTORS & INTERFACE DESIGN FOR AUTOMATED VEHICLES

Monday, 21 October 2019 | 09:00 – 10:30 | Room 308

Moderator: Morimichi Nishigaki, Honda R&D Innovative Research Excellence, Japan

AP-TP1950	Driver State and Driving Maneuver Analysis in Take-over from Automated to Manual Driving	**Akihiro Abe** Shibaura Institute of Technology, Japan
AP-TP1977	Analysis of Takeover Time for Autonomous Vehicle on a Freeway Using a Driving Simulator	**Sungho Park** Ajou University, Republic of Korea
EU-TP1746	Investigation of the Influence of Multitasking on Drivers' Takeover Performance in Highly Automated Vehicles	**Phil Blythe** University of Newcastle upon Tyne, UK
EU-TP1932	Investigating consumers' intension to adopt private autonomous driving vehicles	**George Dimitrakopoulos** Harokopio University of Athens (HUA), Greece
EU-TP2067	Innovative Human Machine Interaction for automatised car: Analysis of drivers needs for recommended design	**Annie Pauzie** Ifsttar/Lescot, France

TS 02: ANALYSIS, PREDICTION AND MANAGEMENT OF DEMAND FOR PUBLIC TRANSPORT

Monday, 21 October 2019 | 09:00 – 10:30 | Room 309

Moderator: Chris Bax, Cubic Transportation Systems, Australia

AP-TP2118	A Multi-variate Deep Learning Neural Network for Short-term Travel Demand Prediction on Public Transport	**Hoang Nguyen** DATA61|CSIRO, Australia
AP-TP2120	The Transformation of Private Vehicle Users to Public Transport Users (Case Study: Bali, Indonesia)	**Dewa Ayu Putri Mahadewi** BPPTD Bali, Indonesia
AP-TP2179	Identifying Potential Point-to-point Customized Bus Routes via Smart Card Transaction Data and Open Source Travel Time Data	**Cheng Cheng** Tongji University, China
AP-TP2196	The Variation Features of Bus Ridership after the Opening of New Metro Lines: a Case Study in Xiamen, China	**Zhe Li** Tongji University, China
AP-TP2290	Lesson Learn from TRANS SERASI: Innovating Concept of Travel Demand Management (Student Travel)	**Juan Benedict Rore** BPPTD Bali, Indonesia

TECHNICAL SESSIONS

TS 03: SUSTAINABLE TRAFFIC MANAGEMENT TOOLS

Monday, 21 October 2019 | 09:00 – 10:30 | Room 310

Moderator: Young-Kyun Lee, ITS Korea, Republic of Korea

EU-TP2043	The CROCODILE corridor: Successful DATEX II deployment in a cross-border setting	**Martin Nemec** ASFINAG Maut Service GmbH, Austria
EU-TP2115	The Connected Cloud as a vital building block for automated public transport	**Ian Smith** Dubai Government - Road & Transport Authority, United Arab Emirates
EU-TP2303	Comprehensive urban traffic management	**Willem van Leusde** ARS T&TT, The Netherlands
AP-TP2287	The Implementation of ITCS with "M2M" Technology - Case Study in Indonesia	**Haris Muhammadun** Indonesian Traffic Expert Association, Indonesia
AP-TP1820	Whangapara Dynamic Lanes	**Joanne Payne** Aurecon, New Zealand

TS 04: ITS FOR INTERSECTION SAFETY I

Monday, 21 October 2019 | 09:00 – 10:30 | Room 311

Moderator: Judith Villegas, Tampa Hillsborough County Expressway Authority, USA

AM-TP1942	The evolution of traffic management is powered by AI	**Soledad Alborno** Intel, USA
AM-TP2022	Advanced Pedestrian Crosswalk Performance Measures Using Video Detection	**Sajad Shiravi** Miovision Technologies, Canada
AP-TP1886	Evaluation of the impact of a vehicle trajectory on traffic by utilizing all vehicle trajectory data observed on expressway	**Norihito Shinkai** Regional Futures Research Center, Japan
AM-TP2330	Cycle-by-Cycle Crash Risk Prediction at Signalized Intersections by Using Spatial-Temporal LSTM	**Mohamed Abdel-Aty** University of Central Florida, USA

TS 05: NATIONAL ITS SYSTEMS PLANNING AND DEPLOYMENT

Monday, 21 October 2019 | 09:00 – 10:30 | Room 312

Moderator: Peter Bentley, CICA, Australia

AP-TP2308	Bridging the Policy to Implementation Gap to drive Innovation	**Scott Benjamin** WSP, Australia
AP-TP2062	NZTA Transport Technology Integration Framework	**Ian Leach** New Zealand Transport Agency, New Zealand
AP-TP2306	An innovative and Sustainable ITS Policy and Strategy Planning in Taiwan	**Francis Chang** CECI Engineering Consultants, Inc., Chinese-Taipei
AP-TP2159	Determining End of Utility Dates for Existing ITS on Australian Road Network	**Qudus Wazirzada** Smart Sustainable Solutions, Australia
EU-TP1843	How Intelligent, Really, Is the Transport Industry? Analysis of Investments in Digitalisation in Finland and Australia	**Pekka Leviäkangas** VTT Technical Research Centre of Finland, Finland

TS 06: RICH CONTEXTUAL MAPS & POSITIONING TECHNOLOGY

Monday, 21 October 2019 | 11:00 – 12:30 | Room 308

Moderator: Stephanie Leonard, TomTom, Belgium

AM-TP1752	Development of Mapping Technique for Lane Geometry for Vehicle-to-Infrastructure Communication Based Applications	**Carl K. Andersen** U.S. Department of Transportation, FHWA, USA
AP-TP1831	Curb and Lane Tracking using Local Cues for Autonomous Vehicles	**Saurab Verma** Institute for Infocomm Research, Agency for Science, Technology and Research (A*STAR), Singapore
AP-TP2071	Large-scale Image Geo-Localization Based on Multiple Nearest Neighbors With Global Evaluation	**Wenquan Deng** Tsinghua University, China
AP-TP2082	Usage of Road Alignment Data to support Automated Driving	**Hiroyuki Kameoka** Central Nippon Expressway Company Limited, Japan
AP-TP2243	Implementation and Evaluation of Moving Sensor Detectable Code by Color Markers for Vehicle Position Estimation	**Daiki Sakakibara** Aichi Prefectural University, Japan

TECHNICAL SESSIONS

TS 07: DATA GATHERING, SHARING AND FUSION TECHNOLOGIES

Monday, 21 October 2019 | 11:00 – 12:30 | Room 309

Moderator: Pattara Kiatisevi, Metamedia Technology Co., Ltd., Thailand

EU-TP2198	Design framework for Big Data analysis of Internet-of-Things and crowdsourced data for Intelligent Transport Systems	**Evgenia Adamopoulou** Institute of Communication and Computer Systems, Greece
AP-TP1878	Future Mobility Sensing (FMS): An Adaptive System for Data Collection, Fusion and Visualization	**Fang Zhao** Singapore-MIT Alliance for Research and Technology, Singapore
AP-TP1906	Establishment of Quantitative Criteria for Stages of Gentrification Using Multivariate Normal Distribution	**Sebin Oh** Seoul National University, Republic of Korea
EU-TP2225	Data Chain for Automotive Function Verification and Validation	**Stefan Kaufmann** Ibeo Automotive Systems GmbH, Germany
AP-TP1993	Study on analysis of vehicle dynamics using probe data of ETC2.0 in Japan.	**Norihiko Kato** The University of Tokyo, Japan

TS 08: TECHNOLOGIES FOR TRAVEL DEMAND MANAGEMENT

Monday, 21 October 2019 | 11:00 – 12:30 | Room 310

Moderator: David Ungemah, WSP USA, USA

AM-TP2182	A Cooperative Demand Management Approach to Alleviating Long-Holiday Induced Massive Demand Surges and Severe Traffic Congestion using the Metropia Massive Mobility Management Platform	**Ta-Chun Lin** FarEasTone Telecommunications, Chinese-Taipei
AP-TP2039	How today's journey compares - will dynamically changing text colour help or hinder?	**Peter Bathgate** Resolve Group Ltd, New Zealand
AP-TP2045	Evaluation of Traffic Demand Management Policies Using License Plate Data: Case Study of Shenzhen, China	**Qixiang Huang** Shenzhen Urban Transport Planning Center Co. Ltd., China
AP-TP2209	Intelligence System for Supporting Human-Computer Interaction (HCI) in Transport Demand Management (TDM)	**Resdiansyah Resdiansyah** Pembangunan Jaya University/Research and Application Affair of ITS Indonesia, Indonesia
AP-TP1909	Unlocking Shared Mobility Through New Parking Paradigms	**Stacey Ryan** ITS Australia, Australia
AP-TP1732	Examination of Location Identification Using GNSS on Japanese Expressways	**Kazuki Wakabayashi** Highway Toll Systems Co., Ltd., Japan

TS 09: NEW INNOVATIONS IN MULTIMODAL TRAVEL INFORMATION & PLANNING SERVICES

Monday, 21 October 2019 | 11:00 – 12:30 | Room 311

Moderator: Stephen Owens, Intelematics, Australia

AP-TP1855	Decision Mining in Public Transport Question Answering Data Based on LDA-KG	**Hao Sun** Zhengzhou Tiamaes Technology Co., China
AP-TP1881	Study on time accessibility of regional public transportation	**Lingyang Meng** Beijing University of Technology, China
AM-TP2156	Toward a Standard Multimodal Data Specification Solution	**Renee Ray** Conduent, USA
AP-TP1931	An Adaptive Approach towards Predicting Arrival Times of Commuter Buses in Real Time	**Vikash Kumar** New Zealand Transport Agency, New Zealand

TS 10: ITS FOR INTERSECTION SAFETY II

Monday, 21 October 2019 | 11:00 – 12:30 | Room 312

Moderator: Thomas Desseilles, ERTICO - ITS Europe, Belgium

AP-TP2129	Effect of V2X Motorcycle Safety Warning System on Approaching Speed at Intersection	**Chin-Hung Liu** Institute of Civil Eng. National Taiwan University, Chinese-Taipei
AP-TP2136	Synergistic Traffic Intersection	**Kwok June Johnny Leung** Synergistic Traffic Consultancy, Australia
AP-TP2206	Prediction Model of the Trajectory of Motorcycle Movement for V2V Collison Avoidance System at Intersection	**Taiyi Zhang** Institute of Civil Engineering. National Taiwan University, Chinese-Taipei
AP-TP2031	Deployment of the Smart Cooperative Collision Avoidance System for Intersection Safety	**Yusan Chiang** Transportation Bureau, Taichung City Government, Chinese-Taipei

TECHNICAL SESSIONS

TS 11: V2X COMMUNICATION TECHNOLOGIES & COOPERATIVE SYSTEMS I

Tuesday, 22 October 2019 | 09:00 – 10:30 | Room 308

Moderator: Jinling Hu, China ITS Industry Allliance/Gohigh Data Networks Technology Co., Ltd., China

AM-TP2141	A comparison of the SCMS and C-ITS proposals for V2X PKI	**Kevin Henry** ESCRYPT, Canada
AM-TP2187	Enabling Technologies for Future Transportation Systems: an End-to-End Performance Evaluation	**Onur Altintas** Toyota Motor North America, USA
AM-TP2188	Comparison of DSRC and LTE-V2X PC5 Mode 4 Performance in High Vehicle Density Scenarios	**Takayuki Shimizu** Toyota InfoTechnology Center, U.S.A., Inc., USA
AP-TP2027	C-ITS Pilot Project Status and Future Prospect in Korea	**Ohyong Kwon** University of Seoul, Republic of Korea
EU-TP1815	Pan-European deployment of C-ITS: the way forward	**Meng Lu** Dynniq, The Netherlands

TS 12: INNOVATIVE DATA USE IN ITS APPLICATIONS

Tuesday, 22 October 2019 | 09:00 – 10:30 | Room 309

Moderator: Ed Seymour, Texas A&M Transportation Institute, USA

AP-TP1825	Study for Advance of the Prediction Model for Macroscopic Congestion Using Neural Network	**Yukako Watanabe** Japan Road Traffic Information Center, Japan
AP-TP1928	Moving Millions A Day: IoT and Cloud Driving ITS	**Tengku Omar Zainal Abidin Tengku Mohd Azzman Shariffadeen** TERAS Teknologi Sdn Bhd, Malaysia
AP-TP1949	Mining Sequential Patterns of Driving Events and Identifying Driving Styles from Vehicular Dynamic Data	**Wei-Hsun Lee** National Cheng Kung University, Chinese-Taipei
AP-TP2029	Monitoring air quality to predict fire occurrence for health and safety in Meru-Menora Tunnel using ANN	**Ahmad Afiq Noor Zainee Shah** PLUS Malaysia Berhad, Malaysia
AP-TP2055	An Exploratory Study Using Big Data for Improved Safety and Operational Efficiency: A New Zealand Case Study	**Gareth Robins** EROAD, New Zealand

TS 13: TRAFFIC MANAGEMENT PLATFORMS AND TOOLS

Tuesday 22 October 2019 | 09:00 – 10:30 | Room 310

Moderator: Sascha Westermann, Hamburger Hochbahn AG , Germany

AM-TP2253	Mobility Management and Breaking Barriers between Agencies: The California I-210 Integrated Corridor Management System and Buenos Aires SGIM Examples	**Aritza Aldama** Kapsch TrafficCom USA, USA
AP-TP1943	ET City Brain System - Innovative Solution to Traffic Management Optimization	**Yuelong Su** AutoNavi Software Co, Beijing, China
AP-TP2309	Next-Generation Traffic Management Platform	**Mohit Sindhwani** Quantum Inventions, a company of Continental Corporation, Singapore
AP-TP2343	Traffic States Estimation - Deploying Tight Coupling Logics of - -- On board unit-based Image Recognition and Cloud-based Estimation --	**Nobuyuki Ozaki** Toshiba Infrastructure Systems & Solutions Corporation, Japan
EU-TP2316	Traffic management in the digital age - a perspective and call to action for service providers and road managers	**Hans Nobbe** Ministry of Infrastructure and Water Management, The Netherlands

TS 14: TOWARDS AUTOMATED DRIVING WITH CONNECTED VEHICLE TRIALS

Tuesday, 22 October 2019 | 09:00 – 10:30 | Room 311

Moderator: Steve Kuciemba, WSP USA, USA

EU-TP1720	Pilot V2I field operational test in Slovenia	**Jure Pirc** Q-free Traffic design, Slovenia
EU-TP1756	Next generation C-ITS services to support automated driving	**Peter Meckel** ASFINAG Maut Service GmbH, Austria
EU-TP2059	A new era for traffic management: the C-Roads Italy project and the implementation of C-ITS systems towards automated driving	**Ilaria De Biasi** Autostrada del Brennero SpA, Italy
AP-TP2220	Study on Longitudinal Control for Fuel Saving Efficiency in Platooning of Heavy-Duty Trucks	**Toshiyuki Sugimachi** Tokyo City University, Japan
EU-TP2324	Assessment results from urban C-ITS deployment study	**Jaap Vreeswijk** MAP traffic management, The Netherlands

TECHNICAL SESSIONS

TS 15: SAFETY ASPECTS OF HUMAN MACHINE INTERFACE DESIGN & EVALUATION

Tuesday, 22 October 2019 | 09:00 – 10:30 | Room 312

Moderator: Scott Belcher, SFB Consulting, LLC, USA

EU-TP1852	Neurocognitive and traffic based handover strategies	**Horst Wieker** Hochschule für Technik und Wirtschaft des Saarlandes - htw saar, Germany
AP-TP1718	Car-driving Interface with Load Cells for Upper-extremity-disabled People	**Yoshitoshi Murata** Iwate Prefectural University, Japan
AP-TP2030	A rear view monitor system for a motorcycle using Wi-Fi direct	**Tomotaka Nagaosa** Kanto Gakuin University, Japan
AP-TP2106	Developing an Effective Human Machine Interface for the On-Board Unit for a Traffic Management System	**Mubaraka Bvavnagarwala** Land Transport Authority, Singapore
AP-TP2260	Influence of focal distance of head-up display and three-dimensional sound on danger avoidance behavior of drivers	**Li Huang** The University of Tokyo, Japan

TS 16: INNOVATIVE PARKING MANAGEMENT TO MANAGE DEMAND AND ENABLE SMARTER AND EFFICIENT PARKING

Tuesday, 22 October 2019 | 09:00 – 10:30 | Room 324

Moderator: Kim Siah Ang, ST Engineering Electronics, Singapore

AP-TP2214	How to deploy an innovative mobile services for ITS? A practical case of smart parking O2O in Taiwan	**Shaonung Chang** National Taiwan University of Science and Technology, Chinese-Taipei
EU-TP2295	SOSPES On-street Smart Parking Solution	**Willem van Leusde** ARS T&TT, The Netherlands
AP-TP2128	The reservation and allocation model of shared parking lots considering multiple factors	**Ji Bao** Tsinghua University, China
AP-TP2177	Toward to the Evolution on The Future of Smart Car-parking Searching System: An Industrial Perspective	**Shaonung Chang** National Taiwan University of Science and Technology, Chinese-Taipei
AP-TP2191	A New Shared Parking Strategy Based on Temporal-Spatial Matching Method	**Yue Yang** Tongji University, China

TS 17: INCORPORATING MOBILITY TRENDS AND REFRAMING OF BEHAVIOUR FOR MANAGEMENT OF MULTIMODAL TRANSPORT

Tuesday 22 October 2019 | 14:00 – 15:30 | Room 308

Moderator: Patrick Son, AASHTO, USA

EU-TP1811	How to Accelerate Cycling Through ITS and Technology	**Marianne Weinreich** Ramboll, Denmark
AP-TP2092	Resident's Travel Frequency and Its Influential Factors in Large-Scale Residential Areas on the Megacity Periphery: Case Study of Shanghai, China	**Kai Zhang** Graduate School at Shenzhen, Tsinghua University, China
EU-TP1721	MaaS: searching for user demand	**Michael Kieslinger** Fluidtime Data Services GmbH, Austria
AP-TP1747	SimMobility Freight: An innovative framework for agent-based urban freight modelling	**Andre Romano Alho** Singapore-MIT Alliance for Research and Technology, Singapore
EU-TP1884	Urban Mobility Demand Management strategies - Options for Modern Cities	**Jose Carlos Riveira** Kapsch TrafficCom, Spain

TS 18: ITS INFRASTRUCTURE FOR AUTOMATED VEHICLES I

Tuesday, 22 October 2019 | 14:00 – 15:30 | Room 309

Moderator: Xiaofeng Gu, China ITS Industry Allliance/Tencent Dadi Tongtu (Beijing) Technology Co. Ltd, China

AP-TP1841	A Study of Digital Twin for C-ITS utilizing mobile technology	**Gyuri Yun** Pukyong National University, Republic of Korea
AP-TP1847	An interim report on joint research in developing technology for the realization of next-generation C-ITS	**Shin Sakaki** National Institute for Land and Infrastructure Management, MLIT, Japan
AP-TP1860	Development of a Monitoring and Evaluation System to support Singapore Autonomous Vehicles Initiatives	**Thomas Tong** Land Transport Authority, Singapore
AP-TP1910	Operations of Automated Heavy Vehicles in Australia and New Zealand	**Charles Karl** Australian Road Research Board, Australia
AP-TP2047	An analysis of propagation characteristics on infrastructure radar system using 79GHz band under snowfall environment	**Toshiteru Hayashi** Panasonic Corporation, Japan

TECHNICAL SESSIONS

TS 19: PREDICTION AND ANALYTICS FOR ITS APPLICATIONS

Tuesday, 22 October 2019 | 14:00 – 15:30 | Room 310

Moderator: Andrew Pearce, Jacobs Engineering Group, UK

AM-TP2347	Leveraging the general transit feed specification real-time (GTFS-RT) for traffic signal coordination in a connected vehicle environment	**Tony Qiu** University of Alberta, Canada
AP-TP1748	A Smart Concrete Pavement Weigh-in-Motion System Based on the Deep Learning Method	**Dengjiang Wang** Beijing Wanji Technology Co., Ltd., China
AP-TP1762	A Traffic Information System for Long-term Travel Time Prediction	**Kuen-Rong Lo** Chunghwa Telecomunication Laboratories, Chinese-Taipei
AP-TP1834	Travel Time Prediction Based on a Spatial-Temporal Algorithm Using a Deep Learning Technique	**Eun Hak Lee** Seoul National University, Republic of Korea
AP-TP1875	A framework including traffic diffusion for short-term traffic prediction	**Xuefang Zhao** Tsinghua University, China

TS 20: TRAFFIC CONTROL & OPERATIONS I

Tuesday, 22 October 2019 | 14:00 – 15:30 | Room 311

Moderator: Beth Kigel, HNTB Corporation, USA

AP-TP2006	PaSO: A Path-based Signal Optimization Model for Signalized Intersections with Mixed Traffic Flows in Taiwan	**Ming Te Tseng** Innovation Traffic Technology Co., Ltd, China
AM-TP1787	A Case Study in Progressing Traffic Incident Management from Good to Great	**Steven Cyra** HNTB Corporation, USA
AM-TP2327	Development and Field Evaluation of Minnesota Adaptive Ramp Metering System	**Eil Kwon** University of Minnesota Duluth, USA
AP-TP1735	Traffic Signal Control with Fewer Detectors Using Probe Data	**Toshiya Yoshioka** Sumitomo Electric Industries, Ltd., Japan
AP-TP1786	Application of Deep Learning to Traffic Signal Control considering Accountability	**Kiyomitsu Tsuda** Shiga Prefectural Police Headquaters, Japan

TS 21: PREVENTATIVE & ACTIVE SAFETY SYSTEMS

Tuesday 22 October 2019 | 14:00 – 15:30 | Room 312

Moderator: Cheol Oh, Hanyang University, Korea

AP-TP2208	Effects of Road Geometry on Relationship Between Dangerous Driving Behaviors and Crashes of Commercial Vehicles	**Sedong Moon** Seoul National University, Republic of Korea
EU-TP2072	Designing an On-Board Driving Scene Monitoring Sensory System for Preventing Terrorist Attacks with Road Transport	**Oihana Otaegui** Vicomtech, Spain
EU-TP2143	Automatic warning light approach to improve train visibility	**Anne Silla** VTT Technical Research Centre of Finland Ltd., Finland
EU-TP1964	Investigation of pothole detection using in-vehicle data for cooperative applications	**Chris Huijboom** HAN University of Applied Sciences, The Netherlands
EU-TP1998	New Ways Towards Wrong-Way Driver Avoidance: Implementation and Scientific Evaluation of ITS-based Wrong-Way Driver Detection Systems	**Christoph Maget** Center for Traffic Management, Germany

TS 22: POLICY FRAMEWORK FOR CONNECTED & AUTOMATED VEHICLES

Tuesday, 22 October 2019 | 14:00 – 15:30 | Room 324

Moderator: Anthony Ferguson, Department for Transport, UK

AP-TP1888	User Perception of Autonomous Vehicle: a Comparison between Singapore and the United Kingdom	**Katherine Cai** Land Transport Authority, Singapore; Tongji University, China
AM-TP1902	Connected and Automated Vehicles – Preparing a Region for a Revolution in Mobility	**Mara Bullock** WSP, Canada
EU-TP2349	Regulatory framework state of the art for truck platooning	**Carlos Luján** IDIADA Automotive Technology S.A, Spain
AP-TP2281	Institutional Review for operating 5G-based Automated Driving Services: A Methodology Research	**JeongAh Jang** Ajou University, Republic of Korea

TECHNICAL SESSIONS

TS 23: AUTOMATED DRIVING TRIALS AND PERFORMANCE ASSESSMENT OF KEY TECHNOLOGIES

Tuesday, 22 October 2019 | 14:00 – 15:30 | Room 325

Moderator: Paul Potters, Monotch, The Netherlands

AP-TP2244	Visual Mapping and Localization for Autonomous Vehicle Field Trials in Singapore	**Zheng Wu** Panasonic R&D Center Singapore, Singapore
EU-TP2060	Assessment of GNSS receiver performance in varied multipath environments with innovative real-time multipath simulation system	**Todor Trionski** Spirent Communications. UK
EU-TP1973	Setting up Experimental Procedure for Level 3 Automated Driving Pilots	**Merja Penttinen** VTT Technical Research Centre of Finland Ltd., Finland
EU-TP2070	Methodological challenges related to real-world automated driving pilots	**Satu Innamaa** VTT Technical Research Centre of Finland Ltd., Finland
EU-TP2216	Assessing mobility impacts of automated driving in L3Pilot	**Satu Innamaa** VTT Technical Research Centre of Finland Ltd, Finland

TS 24: FREIGHT, FLEET MANAGEMENT & LOGISTICS MOVEMENT ACROSS A REGION OR COUNTRY

Tuesday, 22 October 2019 | 16:00 - 17:30 | Room 308

Moderator: Timothy Gammons, Ove Arup & Partners, UK

EU-TP1757	Trinational Automated Mobility	**Horst Wieker** Hochschule für Technik und Wirtschaft des Saarlandes - htw saar, Germany
EU-TP2239	PESTS assessment of the potential of a dry-port	**Nina Elter** EROAD Ltd, USA
EU-TP2103	Cooperative delivery concepts for compliant city logistics: Case Study in Graz, Austria	**Martin Reinthaler** AIT Austrian Institute of Technology GmbH, Austria
AP-TP1858	Validity verification of the support service for vehicle logistics management using ETC2.0 probe data	**Yuna Maki** National Institute for Land and Infrastructure Management, MLIT, Japan
EU-TP2083	Early lessons learnt from Connecting Austria – C-ITS-focused level 1 truck platooning	**Andreas Kuhn** AnData, Austria

TS 25: CONNECTED & AUTOMATED VEHICLE DEPLOYMENT & FIELD OPERATIONS TESTS I

Tuesday 22 October 2019 | 16:00 – 17:30 | Room 309

Moderator: Sanghoon Bae, Pukyong National University, Republic of Korea

AM-TP2291	A Mobile Infrastructure to X Experimental Platform for Connected and Automated Vehicle Technology	**Zhitong Huang** Leidos, USA
AP-TP1739	Automated Driving Service Design for Low-Speed Mobility in Resort Facilities	**Sachiyo Araki** Yamaha Motor Co., Ltd., Japan
AP-TP1783	"A Structured Approach on Capabilities Required to Develop and Deploy Automated Driving", How and where will Urban Level 4 Automated Driving Emerge?	**Serge Lambermont** Autobotik, Singapore
AP-TP2044	Automated system for traffic scenario classification and trajectory evaluation of autonomous vehicles	**Chee Wei Ang** Institute for Infocomm Research, Agency for Science, Technology and Research (A*STAR), Singapore
AP-TP1907	Safety Management Plans for Automated Vehicle Trials	**Charles Karl** Australian Road Research Board, Australia

TS 26: TRAFFIC CONTROL & OPERATIONS II

Tuesday, 22 October 2019 | 16:00 – 17:30 | Room 310

Moderator: Blair Monk, ITS New Zealand / Aurecon, New Zealand

AP-TP1824	Introduction of new traffic signal control method to address partial Congestion	**Kohei Nishijima** Tokyo Metropolitan Police Department
AP-TP1830	On the development of event-responsive pedestrian adaptive control	**Yoshitaka Yanagida** Metropolitan Police Department, Japan
AP-TP1846	Study of Probe Imperfections on Vehicle Movement Prediction at a Signalized Intersection	**Ming Zhao** Institute for Infocomm Research, Agency for Science, Technology and Research (A*STAR), Singapore
AP-TP1956	Coordinated Ramp Metering and Urban Road Dynamic and Real-time Traffic Control with Mixed Traffic conditions	**Ta-Chun Lin** Transportation Bureau, Taichung City Government, Chinese-Taipei
AM-TP1753	Improving Smart City Mobility by Applying Real-Time Performance Measures	**Robert Edelstein** AECOM, USA

TECHNICAL SESSIONS

TS 27: DRIVER BEHAVIOUR & DRIVER SIMULATION MODELS

Tuesday, 22 October 2019 | 16:00 – 17:30 | Room 311

Moderator: Zeina Nazer, University of Southampton, UK

AP-TP1792	Exploratory analysis of the relationship between kinematic indicators and driving behaviour	**Mo Zhou** National University of Singapore, Singapore
AP-TP1954	The study for the optimum display colours on the road information boards with consideration for colour vision barrier free	**Shinji Nishino** Honshu-Shikoku Bridge Expressway Company Limited, Japan
AP-TP2131	A Study of Effect of Driver's Individual Difference Based on Car Following Reaction Time	**Jianlin Jia** Beijing University of Technology, China
EU-TP1862	Virtual Infrastructure Simulation & Evaluation - VISE	**Katja Miklič** PNZ d.o.o., Slovenia

TS 28: NEXT GENERATION STANDARDS: OPPORTUNITY TO IMPROVE ON PRIOR SUCCESS

Tuesday, 22 October 2019 | 16:00 – 17:30 | Room 312

Moderator: Yasuhiko Nakano, DENSO TEN EUROPE GmbH, Germany

AP-TP1781	A brief analysis of the current situation and development strategies of intelligent transportation standardization in China	**Wei Wang** China Academy of Transportation Sciences, China
EU-TP2318	ITS Framework architectures as tools for modern transport systems in a networked society – the FRAME NEXT project	**Martin Böhm** AustriaTech, Austria
EU-TP2286	Prioritisation of traffic management using RSMP (Roadside Messaging Protocol).	**Martin Kaliszczuk** The Danish Road Directorate, Denmark
EU-TP2314	Local Authority Mobility Platform (LAMP) Framework	**Marcel Pooke** Connected Places Catapult, UK
AP-TP1835	Pavement markings for machine vision	**Julien Marr** WSP Australia, Australia

TS 29: PRIVACY AND SECURITY CHALLENGES FACED BY CONTENT TRANSMISSION IN TRANSPORTATION

Tuesday 22 October 2019 | 16:00 – 17:30 | Room 324

Moderator: Mario Toscano, Drive Engineering, USA

EU-TP2178	New tool for evaluating the Cybersecurity level of connected vehicles: CIVICO PROJECT	**Alejandro Manilla Gonzalez** IDIADA, Spain
EU-TP1731	Decentralised Databases in Port Management: Technology Implementation Experiences	**Kristian Hegner Reinau** Aalborg Universitet (AAU), Denmark
AP-TP2172	Ten considerations in framing government access to ITS data	**Peter Carr** EROAD Ltd, New Zealand
AM-TP2288	Protecting Location Privacy of Connected Vehicles: A Note on Adaptive Silent Period Strategy	**William Whyte** Onboard Security, USA

TS 30: STANDARDS, POLICIES AND FRAMEWORKS FOR TESTING AND VALIDATING SAFETY OF AUTOMATED VEHICLES

Tuesday, 22 October 2019 | 16:00 – 17:30 | Room 325

Moderator: Stephanie Barton, WSP Global Inc., UK

EU-TP1992	Scaled Test Environment for Testing ITS Applications	**Chris Huijboom** HAN University of Applied Science, The Netherlands
AP-TP2329	A safety assurance process for automated driving systems	**Jacobo Antona-Makoshi** Japan Automobile Research Institute, Japan
EU-TP2229	A framework for consistent safety assessment of Connected and Autonomous Vehicle systems	**Camilla Fowler** TRL, UK
EU-TP1866	Connected vehicles and driver distraction – disentangling the ethics	**Ian Patey** WSP, UK
EU-TP2265	Quality of life impacts of connected automated driving - Case: AVP	**Elina Aittoniemi** VTT Technical Research Centre of Finland Ltd, Finland

TECHNICAL SESSIONS

TS 31: CONNECTED & AUTOMATED VEHICLE DEPLOYMENT & FIELD OPERATIONS TESTS II

Wednesday, 23 October 2019 | 09:00 – 10:30 | Room 308

Moderator: Raj Ponnaluri, Florida Department of Transportation (FDOT), USA

AP-TP2124	Technical challenges found in the FOTs of LSAD Service in Rural Depopulated Areas	**Satoshi Sawai** National Institute for Land and Infrastructure Management, MLIT, Japan
AP-TP2207	Planning and Design of a New Dynamic Autonomous Public Transport System: The DART System in Singapore	**Andreas Rau** TUMCREATE Ltd Singapore, Singapore
AP-TP2274	Consideration of road operations for long term deployment of Autonomous vehicles	**Yan Mei Bernadette Lee** Land Transport Authority, Singapore
EU-TP2051	Specifications for Multi-Brand Truck Platooning	**Alessandro Coda** CLEPA, Belgium
EU-TP1877	Self-driving car ISEAUTO for research and education	**Raivo Sell** Tallinn University of Technology, Estonia

TS 32: MODELLING & SIMULATION STUDIES FOR AUTOMATED VEHICLES I

Wednesday, 23 October 2019 | 09:00 – 10:30 | Room 309

Moderator: Vivek Vaidya, Frost & Sullivan, Singapore

AP-TP1848	An Integrated Simulator for Testing and Validation of Autonomous Vehicle Applications with Physics-based Rendering Sensors	**Pranjal Vyas** Nanyang Technological University, SIngapore
AP-TP2087	Modelling Merging Behavior Joining a Cooperative Adaptive Cruise Control Platoon	**Jia Hu** College of Transportation Engineering, Tongji University, China
AP-TP2109	On the Need for Novel Tools and Models for Mixed Traffic Analysis	**Jordan Ivanchev** TUMCREATE, Singapore
AP-TP2154	Scaling social rules to multi-party traffic negotiations	**Surabhi Gupta** The University of Melbourne, Australia
AP-TP1807	A Novel Symmetric Intersection Design to Accommodate Autonomous Vehicles and Cross-Street Pedestrians at Four-arm Signalized Intersections	**Bao Wang** Southwest Jiaotong University, China

TS 33: TRAFFIC CONTROL & OPERATIONS III

Wednesday, 23 October 2019 | 09:00 – 10:30 | Room 310

Moderator: Suku Phull, Department for Transport, UK

AP-TP1793	Traffic signal control optimization under severe incident conditions using Genetic Algorithm	**Tuo Mao** University of Technology Sydney, Australia
AP-TP2065	Cooperative Traffic Signal Control with V2X Data	**Masafumi Kobayashi** UTMS Society of Japan, Japan
AP-TP2091	Cross Boundary Incident Management on a Multi-Party Managed Motorway Road System	**Sui Yong** Department of Transport, Australia
AP-TP2104	i-transport 2.0	**Kok Wee Oh** Land Transport Authority, Singapore
AP-TP1818	Network Operations is Design Led Thinking	**Blair Monk** Aurecon, New Zealand

TS 34: MOBILITY AS A SERVICE (MAAS) AND MOBILITY ON DEMAND

Wednesday, 23 October 2019 | 09:00 – 10:30 | Room 311

Moderator: Tongkarn Kaewchalermtong, ITS Thailand - Chulachomklao Royal Military Academy, Thailand

EU-TP1728	Simulation-based shared on-demand service design using Chicago taxi data	**Raphael Gindrat** Bestmile, Switzerland
EU-TP2003	Mobility as a Service in Small and Medium-sized Cities	**Jernej Vozelj** PNZ d.o.o., Slovenia
EU-TP2121	Accelerate and unlock the scalability of Mobility as a Service	**Guido Di Pasquale** Union Internationale des Transports Publics - UITP, Belgium
EU-TP2040	Deployment and Testing of the Helsinki Metropolitan Area MaaS Platform	**Pekka Eloranta** Sitowise Oy, Finland

TECHNICAL SESSIONS

TS 35: SAFETY FOR VULNERABLE USERS

Wednesday, 23 October 2019 | 09:00 – 10:30 | Room 312

Moderator: Toshio Ito, Shibaura Institute of Technology, Japan

AM-TP1777	A Self-Monitoring Network to Support Situation Awareness and Navigation for the Visually Impaired in GNSS Unfriendly Environments	**Chen-Fu Liao** University of Minnesota, USA
AM-TP2323	Deep learning methods to leverage traffic monitoring cameras for pedestrian data applications	**Weijia Xu** The University of Texas at Austin - Texas Advanced Computer Center, USA
AP-TP2110	Safety Enhancement for Personal Mobility Device: Modelling Rider's Gaze Features for Manoeuvre Prediction	**Jo-Yu Kuo** Nanyang Technological University, Singapore
EU-TP2009	Development of a traffic safety program for cyclists between 11 and 14 years in Germany with a focus on metacognitive abilities	**Franz Lambrecht** University of Kassel, Germany
EU-TP2302	Radar system for bicycle - a new measure for safety	**Thanh Hai Bui** RISE Research Institutes of Sweden, Sweden

TS 36: MODELLING & SIMULATION STUDIES FOR AUTOMATED VEHICLES II

Wednesday, 23 October 2019 | 14:00 – 15:30 | Room 308

Moderator: John Hibbard, Georgia Department of Transportation (GDOT), USA

AP-TP2173	Integrated Traffic Simulation Platform for Connected-Vehicle Applications	**Hai Heng Ng** Institute for Infocomm Research, Singapore
AP-TP2238	Computer Graphic Simulator for AI Automotive Algorithm Development	**Karthikk Subramanian** Panasonic R&D Center Singapore, Singapore
EU-TP1871	Novel Approaches for Analysing and Testing the Effect of Autonomous Vehicles on the Traffic Flow	**Jacqueline Erhart** ASFINAG Maut Service GmbH, Austria
EU-TP1953	Automated Driving Development & Deployment via Continuous Integration and Digital Twin	**Igor Passchier** Siemens PLM Software, The Netherlands
EU-TP2015	Micro- and macroscopic simulation and impact assessment of the coexistence of automated and conventional vehicles in European cities	**Suzanne Hoadley** Polis Network, Belgium

TS 37: APPLICATION OF AI, INCLUDING DEEP LEARNING IN AUTOMATED VEHICLES

Wednesday, 23 October 2019 | 14:00 – 15:30 | Room 309

Moderator: Emily Webb, Dock, Inc., USA

EU-TP1985	Concept Proposal - A Holistic Approach to Utilize Machine Learning in Autonomous Driving Applications	**Julia Nitsch** Ibeo Automotive Systems GmbH, Germany
EU-TP2296	Scene danger ranking using deep neural network	**Remy Bendahan** IMRA Europe SAS, France
AP-TP1958	Application of Stochastic Resonance to Convolutional Neural Network	**Mohd Hafiz Hilman Mohammad Sofian** Shibaura Institute of Technology, Japan
EU-TP1769	Safety analysis approach for machine learning in automated vehicle software	**Michael Ellims** Ricardo, UK
AP-TP1821	Application of LSTM Multivariable time-series model to predict highway bus arrival time	**Chung-Yi Lin** Chunghwa Telecom Research Laboratories, Chinese-Taipei

TS 38: DATA ANALYTICS FOR TRAFFIC MONITORING & MANAGEMENT

Wednesday, 23 October 2019 | 14:00 – 15:30 | Room 310

Moderator: Soren Tellegen, Kapsch, Australia

AP-TP2133	AI-based Machine Vision for Intelligent Transport System Applications	**Shao Qiang Tang** Sopra Steria Asia, Singapore
AP-TP2137	A Hybrid Model for Short-termTraffic Volume Multistep Forecast Based on the Spatiotemporal Vector	**Xinchao Chen** Shenzhen Urban Traffic Planning and Design Research Center, China
AP-TP2169	Identifying Traffic Congestion Precursors by Object Detection with Deep Learning	**Takamasa Koshizen** Honda R&D Co., Ltd., Japan
AP-TP2184	Using Data Analytics in Singapore's Traffic Operations Control Centre	**Germaine Tay** Land Transport Authority, Singapore
AP-TP2231	Using mobile network data for road asset management: challenges and opportunities	**David Lupton** David Lupton & Associates, New Zealand

TECHNICAL SESSIONS

TS 39: TRAFFIC CONTROL & OPERATIONS IV

Wednesday, 23 October 2019 | 14:00 – 15:30 | Room 311

Moderator: Andrew Mehaffey, HMI Technologies, Australia

EU-TP1707	Adaptivity vs. predictability at controlled intersections	**Thomas Riedel** Adaptive Traffic Control AG and Verkehrs-Systeme AG, Switzerland
EU-TP1981	A discrete event traffic model for passenger demand-dependent train control in a metro line with a junction	**Florian Schanzenbacher** RATP, France
EU-TP2125	Cloud-based traffic control for interaction between autonomous vehicles and emergency vehicles	**Lei Chen** RISE Viktoria, Sweden
AP-TP2011	Application of intelligent traffic control system in Hong Kong	**Candy C.Y. Ho** Transport Department of Hong Kong Special Administrative Region Government, Hong Kong
EU-TP1994	Deep Reinforcement Learning Approach with Hybrid Policy for Traffic Signal Timing Optimization	**Abdullah KARAAĞAÇ** Erciyes University, Turkey

TS 40: ITS FOR RAIL AND PORT SYSTEMS

Wednesday, 23 October 2019 | 14:00 – 15:30 | Room 312

Moderator: Nobuyuki Ozaki, Toshiba Infrastructure Systems & Solutions Corporation, Japan

AP-TP1743	Design and Test of a Fuzzy Grey Immune PID Controller for Automatic Train Operation System	**Pengzi Chu** Tongji University, China
AP-TP1790	Evaluation Index of Train Arrangement for Machine Learning	**Takayuki Matsumoto** East Japan Railway Company, Japan
AP-TP2222	Analysis of waiting time in urban rail transit station based on IC card data	**Zhixian He** Beijing Key Laboratory of Traffic Engineering, Beijing University of Technology, China
AP-TP2255	Town Navigation by Upgrade of LRV Location Service	**Hitoshi Morita** University of Nagasaki, Japan
EU-TP2235	PESTS Assessment of the Potential of a Dry-port	**Nina Elter** EROAD Ltd, USA

TS 41: ADVANCED COLLISION AVOIDANCE SYSTEMS FOR CAVS

Wednesday, 23 October 2019 | 16:00 – 17:30 | Room 308

Moderator: Jean-Michel Henchoz, DENSO Belgium N.V., Belgium

AP-TP1836	A Study of Space Reservation Algorithm by Adopting Microscopic Autonomous Car Control	**Boogi Park** Pukyong National University, Republic of Korea
AP-TP1941	Modular Controller Box for Autonomous Personal Mobility	**Muhammad Zulfaqar Azmi** Shibaura Institute of Technology, Japan
AP-TP1947	Instantaneous Prediction of Vehicle Outlines Conflict Using the High-Frequency and High-Precision Position Information	**Jianbei Liu** CCCC First Highway Consultants Co., Ltd., China
AP-TP1974	Object recognition by LiDAR using stochastic resonance	**Masahiro Shikahama** Shibaura Institute of Technology, Japan
AP-TP2085	An Optimal control based truck platooning algorithm with automated steering	**Yiming Zhang** College of Transportation Engineering, Tongji University, China

TS 42: ROAD PRICING AS AN EFFECTIVE TOOL TO MANAGE TRAVEL DEMAND

Wednesday, 23 October 2019 | 16:00 – 17:30 | Room 309

Moderator: Efi Tzoura, Highways England, UK

AM-TP2064	Congestion Pricing in Vancouver, Canada	**Dirk van Amelsfort** WSP Sverige AB, Sweden
AP-TP2299	20 Years Evolution of Electronic Road Pricing	**Wee Ping Koh** Land Transport Authority, Singapore
AP-TP2012	Electronic Road Pricing Pilot Scheme in the Central Business District of Hong Kong	**Calvin W.K. Yeung** Transport Department, Hong Kong
AM-TP2210	The United States' journey towards Road User Charging	**Nina Elter** EROAD Ltd, USA
AP-TP1853	Predictive Distance-based Toll Optimization Under Varying Demand Levels	**Antonis F. Lentzakis** Singapore-MIT Alliance for Research and Technology, Singapore

TS 43: APPLICATION OF DATA ANALYTICS TO TRAFFIC DEMAND AND CONGESTION MANAGEMENT

Wednesday, 23 October 2019 | 16:00 – 17:30 | Room 310

Moderator: Christoph Kautz, European Commission, DG GROW, Belgium

AP-TP1995	Understanding The Structure Of Bus Travel Demand Using A Low-rank And Sparse Matrix Decomposition Method	**Zhe Li** Tongji University, China
AP-TP2000	A Hierarchical Traffic Control Policy for Managing the Congested Bottlenecks on a Commuting Corrior Due to Heavy Accessing and Merging Flows	**Ming Te Tseng** Innovation Traffic Technology Co., Ltd, Chinese-Taipei
AP-TP2100	Data-dependence in traffic forecasting	**Christopher Bentley** DATA61|CSIRO, Australia
AP-TP2114	A Study on the Efficient Installation of Auxiliary passing lanes on Two-Way Two-Lane Highways	**Akira Harao** Nippon Expressway Research Institute Company Limited, Japan
EU-TP2016	Prediction of Post-Accident Road Network Recovery Time	**Leanne Pienaar** Ove Arup & Partners, UK

TECHNICAL SESSIONS

TS 44: FUTURE TRANSPORT SYSTEMS

Wednesday, 23 October 2019 | 16:00 – 17:30 | Room 311

Moderator: Janine Härtel, ITS Hamburg 2021, Germany

EU-TP1874	Future mobility: the impact of changing working patterns	**Stephanie Barton** WSP, UK
EU-TP1897	The Impact of Artificial Intelligence and Machine Learning Interfaces on Customer Experience at Transit Stations	**Steffen Reymann** Cubic Transportation Systems, UK
EU-TP2050	Smart Tallinn - real case studies from future transport solutions	**Jaagup Ainsalu** Tallinn City Government, Estonia
EU-TP2317	Modern tendencies of intelligent transport systems as our reality - the case of Serbia and the world	**Nataša Tomić-Petrović** University of Belgrade, Serbia
AP-TP2249	Transdisciplinary Research on Future Transport System: Town Meeting in a Rural Island of Japan	**Tatsuki Yamanami** Scheme Verge, Japan

TS 45: STRATEGIES FOR REGULATION AND ENFORCEMENT

Wednesday, 23 October 2019 | 16:00 – 17:30 | Room 312

Moderator: Sisinnio Concas, Autonomous & Connected Mobility Evaluation (ACME) Center for Urban Transportation Research University of South Florida, USA

AP-TP1911	The Effects of Drivers' Characteristics and Violation Attributes on Duration of Traffic Law Recidivism	**Garyoung Lee** Seoul National University, Republic of Korea
AP-TP2046	Investigating the time-varying effect of punishment on driver's traffic infringements: A survival analysis approach	**Yang-Jun Joo** Seoul National University, Republic of Korea
AP-TP2250	The Regulation of small Unmanned Aircraft System for recreation or hobby purpose in Indonesia	**Zulaichah Zulaichah** Ministry of Transportation, Indonesia
AP-TP2289	Overloaded Vehicle Detection System (OVDS): Automatic detection of overloaded vehicles on the move in Singapore	**Alvin Kwang** Land Transport Authority, Singapore
AM-TP1885	Evolution of Commercial Vehicle Enforcement	**Lauri Brady** Kapsch TrafficCom USA, USA

TS 46: APPLICATION OF DATA ANALYTICS & MODELLING IN TRAFFIC MANAGEMENT

Thursday, 24 October 2019 | 09:00 – 12:30 | Room 308

Moderator: Noam Maital, Waycare, USA

EU-TP2112	England's National Traffic Information Service; an overview	**Rob Kidney** Network Information Services, UK
EU-TP2258	Making the World Move Developing Smart Mobility with Traffic Data Analysis	**Ralf-Peter Schäfer** TomTom, The Netherlands
AP-TP2105	Travel Time Modelling using Support Vector Regression in Mixed Traffic Conditions	**Ravishankar K.V.R.** National Institute of Technology, Warangal, India
EU-TP1996	ViaRODOS – use BIG DATA to create dynamic mobility model in CZ	**Karel Feix** Kapsch Telematic Services, Czech Republic
EU-TP2223	England's National Traffic Information Service; data challenges and solutions	**Rob Kidney** Network Information Services, UK

TS 47: MODE SHIFT STRATEGIES AND INCLUSIVE MOBILITY

Thursday, 24 October 2019 | 09:00 – 10:30 | Room 309

Moderator: Pongsak Lasang, Panasonic R&D Centre, Singapore

AP-TP1722	Travel Demand Management Programme – Delivery Strategy	**Bill Cheng** Aurecon, New Zealand
AP-TP2080	Using Public Transport Smart Card Transaction Data for Active Mobility Infrastructure Planning	**Songyu Wang** Urban Redevelopment Authority, Singapore
EU-TP2139	No Ticket To Ride - Are People With Disabilities Left Behind?	**Brian Huang** SkedGo, UK
AP-TP2145	Feasibility for DRTS Based on Autonomous Vehicle in Taiwan	**Ping-Yen Tsai** Feng Chia University, Chinese-Taipei
AP-TP1935	Public Transport Priority in Melbourne, Australia	**Anthony Fitts** VicRoads, Australia

TECHNICAL SESSIONS

TS 48: SAFETY FOR PEDESTRIANS, CYCLISTS & VULNERABLE USERS

Thursday, 24 October 2019 | 09:00 – 10:30 | Room 310

Moderator: Nixon Ng, ST Engineering, Singapore

AM-TP2138	DSRC Congestion Control for Pedestrian Communications and Beyond	**Hongsheng Lu** TOYOTA InfoTechnology Center, U.S.A., Inc., USA
AP-TP1822	Influences of vehicles' exterior lighting system on the behaviors of cyclists	**Bo Yang** The University of Tokyo, Japan
AP-TP1972	Electric Wheel Chair Control by AR Marker Detection and Object Recognition from Smartphone Image	**Fumiaki Sato** Toho University, Japan
AP-TP2037	Adopting Connected Vehicle Technology to Improve Bus Service Accessibility for Blind and Visually Impaired Passengers	**Hsu-Feng Cheng** MaxWin Technology, Chinese-Taipei
AP-TP2081	Improvement of accuracy of UWB Positioning System within the intersection using Kalman Filter	**Yuki Noda** Department of Applied Electronics, Tokyo University of Science, Japan

TS 49: CASE STUDIES THAT HELP DEFINE POLICY AND STRATEGY

Thursday, 24 October 2019 | 09:00 – 10:30 | Room 311

Moderator: Alvin Lee, HERE Technologies, Singapore

AP-TP2093	Transit Captivity Large-Scale Residential Areas on The City Periphery: Case Study of Jinhexincheng, Shanghai, China	**Jinping Guan** ITS Lab, Dept. of Civil & Environmental Engineering, Massachusetts Institute of Technology, USA
EU-TP2285	Hamburg's ITS Strategy: Change to Mobility 4.0	**Sebastian Troch** Ministry of Economy, Transport and Innovation, Free and Hanseatic City of Hamburg, Germany
AP-TP2096	Automated and Zero Emissions Vehicles Infrastructure – an Australian Perspective	**Jonathan Spear** Infrastructure Victoria, Australia
AP-TP1919	Public Acceptance of Autonomous Road Public Transport in Singapore	**Lynette Cheah** Singapore University of Technology and Design, Singapore
AP-TP1912	Developing an ITS Road User Communications Roadmap for Transurban	**Hossein Parsa** Transurban, Australia

TS 50: IMPROVING SAFETY OF VULNERABLE ROAD USERS

Thursday, 24 October 2019 | 09:00 – 10:30 | Room 312

Moderator: Pete Costello, Iteris, Inc., USA

AP-TP2232	Trade-offs between vehicular efficiency and pedestrian safety on conversion of traffic light phasing to protected only: A modelling approach	**Francis Kian Seng Tay** Land Transport Authority, Singapore
EU-TP1759	Improving safety of Vulnerable Road Users by addressing barriers of current Autonomous Emergency Braking (AEB) systems. The project PROSPECT (PROactive Safety for PEdestrians and CyclisTs).	**Guillermo Mur** IDIADA Automotive Technology, Spain
EU-TP2328	Perception of safety and safety risks of driverless shuttles	**Helga Jonuschat** Dornier Consulting International GmbH, Germany
AP-TP1929	Green Man + : Making it easier for vulnerable road users to cross roads in Singapore	**Francis Tan** Land Transport Authority, Singapore
AP-TP1751	Physiological Magnetic Stimulation Applying Small ELF Magnetic Field on Elderly Car Driver's Spine Brought Down Blood Pressure in Hypertension during Driving	**Kaneo Mohri** Nagoya Industrial Science Research Institute, Japan

TS 51: TRANSPORT MODELLING AND FORECASTING

Thursday, 24 October 2019 | 11:00 – 12:30 | Room 308

Moderator: Serene Sia, ORACLE Singapore, Singapore

AM-TP2233	Analysing by microsimulation of externalities on public transport Due to the operation of goods on peak hours	**Andres Felipe Gavilan Orozco** Herr, Germany
AP-TP1922	Resilience of urban road networks: a case study of Auckland	**Zoe Chen** Stantec, New Zealand
AP-TP1927	Trip Table Estimation and Prediction for Dynamic Traffic Assignment Applications	**Adriana-Simona Mihaita** DATA61|CSIRO, Australia
AP-TP2057	The Development and Trial of an Integrated Real-Time Traffic Simulation and Prediction System for Singapore	**Zhen Hong Ho** Land Transport Authority, Singapore
AP-TP2261	The Improvement of Traffic Demand Forecasting Model Based on Four-step Method under the Background of Large New Era	**Xiaoling Liu** Shenzhen Urban Transport Planning Center, China

TECHNICAL SESSIONS

TS 52: NEW MULTIMODAL MODES AND INTEGRATED DIGITAL PLATFORM COVERING SCHEDULING, ROUTING AND PRIORITY

Thursday, 24 October 2019 | 11:00 – 12:30 | Room 309

Moderator: Janneke Van Der Zee, ITS Canada, Canada

AP-TP2192	Examination of Enhancement of Bus Priority Control in Next-Generation Urban Transport Systems	**Toru Mabuchi** UTMS Society of Japan, Japan
AP-TP1754	Multi-objective path generation method based on neural network	**Zonghan Yao** Beijing Key Laboratory of Traffic Engineering, Beijing University of Technology, China
EU-TP2075	BIG IoT – Interconnecting IoT Platforms from different domains – Final Results	**Thomas Jell** Siemens Mobility GmbH, Germany
AP-TP1933	An Evaluation of Autonomous Vehicle Shuttles to improve 'first km-last km' transport journeys	**Doug Wilson** The Univeristy of Auckland, New Zealand
AM-TP2354	A Metaheuristic Algorithm For Multi-Objective Service Timetabling In BRT Type Mass Transportation Systems	**Luis Miguel Escobar Falcón** Integra S.A., Colombia

TS 53: MANAGEMENT AND OPTIMIZATION OF LOGISTICS & FREIGHT MOVEMENT ACROSS A REGION OR COUNTRY

Thursday, 24 October 2019 | 11:00 – 12:30 | Room 310

Moderator: Mark Talbot, Redflex, USA

AP-TP2084	Research on Large Data Analysis and Decision-Making of Non-truck operating common carrier	**An Ran** China Academy of Transportation Sciences, China
AP-TP2167	Exploring benefits of cargo-cycles versus trucks for urban parcel deliveries under different demand scenarios	**Giacomo Dalla Chiara** University of Washington, USA
EU-TP1778	Evaluation of activity chain optimization algorithm benefits	**Domokos Esztergár-Kiss** Budapest University of Technology and Economics, Hungary
EU-TP1801	Predictive Analytics for Parking Occupancy applied to Highway Truck Parking	**David Montgomery** Siemens Mobility, Germany
EU-TP1944	Intelligent transport systems in the Republic of Tatarstan: Integrated solutions of Weight Control, Toll Roads and video enforcement	**Rifkat Minnikhanov** "Road Safety" State Company, Russia

TS 54: TECHNOLOGY & SYSTEM FOR SAFETY AND ENFORCEMENT I

Thursday, 24 October 2019 | 11:00 – 12:30 | Room 311

Moderator: Eric Sampson, ERTICO - ITS Europe, Belgium

AM-TP2345	Cooperative ADAS Using On-Board Sensing and V2V	**Tim Leinmueller** DENSO International America, Inc., USA
AP-TP1869	A Method of Traffic Safety Structured System -A proposal of A Traffic Accidents' Data Analysis System	**Noriyuki Tsukada** SUBARU Corporation, Japan
AP-TP1952	Development and operation of the wrong-way driving avoidance system	**Naoki Mitsuhashi** Honshu-Shikoku Bridge Expressway Company Limited, Japan
AP-TP2023	AI-Powered Enforcement Technology Preventing Illegal Parking and Improving Pedestrian Safety at Bus Loading Zone	**Beng-Neng Lu** Transportation Bureau of Taichung City Government, Chinese-Taipei
AP-TP1723	Actionable Incident Detection Alarming	**Fiona Swan** Transurban, Australia

TS 55: TOLLING SYSTEMS FOR ROAD

Thursday, 24 October 2019 | 11:00 – 12:30 | Room 312

Moderator: Ning He, China ITS Industry Allliance/ Shenzhen Genvict Technology Co., Ltd., China

AP-TP1711	Design of MLFF RSU controller based on DSRC protocol	**Weixing Wang** Beijing Wanji Technology Co., Ltd., China
AP-TP2153	Tolling Development in Malaysia	**Syed Mohd Faizal bin Said Ahmad** Malaysian Highway Authority, Malaysia
AP-TP2275	From Plaza Tolling to Multi-Lane Free Flow	**Gabriel Makki** Kapsch TrafficCom AG, Austria
AP-TP1903	Development of Simplified and portable ETC system for distance-based toll collection method in Japan	**Yukinori Matsushita** East Nippon Expressway Company Limited, Japan
AP-TP1737	Application and Future Prospects of Toll and Route Search Systems	**Shotaro Ishigaki** Highway Toll Systems Co., Ltd., Japan

TECHNICAL SESSIONS

TS 56: ELECTROMOBILITY & EV CHARGING INFRASTRUCTURE

Thursday, 24 October 2019 | 14:00 – 15:30 | Room 308

Moderator: Janine Härtel, ITS Hamburg 2021, Germany

AM-TP1812	The Future of Electro Mobility in China	**I-Yun Lisa Hsieh** Massachusetts Institute of Technology, USA
AP-TP1797	Grid Power Management by PHV Remote Charging Control	**Hironobu Kitaoka** Toyota Motor Corporation, Japan
AP-TP1965	Automatic Construction of Prediction Models for Energy Consumption of Various Electric Vehicles under Various Driving Conditions	**Arika Fukushima** Toshiba Corporation, Japan
AP-TP2193	A Simulation Based Approach to Developing a Full Scale Bus Electrification Strategy for Singapore	**Paul Booij** TNO Singapore, Singapore
AP-TP2150	Evaluation of a Practicability of Frequent and Super-Quick Charging Electric Bus Operation in Tropical Climate	**Katsuyoshi Suzuki** Toshiba Infrastructure Systems & Solutions Corporation, Japan

TS 57: V2X COMMUNICATION TECHNOLOGIES & COOPERATIVE SYSTEMS II

Thursday, 24 October 2019 | 14:00 – 15:30 | Room 309

Moderator: Sue Bai, Honda R&D Americas, Inc., USA

AP-TP2151	A Study on Improving Communication and Ranging Performances of the System Combines UWB Radar and Inter-Vehicle Communication	**Shohei Fukatsu** Tokyo University of Science, Japan
AP-TP2217	A Study on Network Requirements for Remote Driving via Cellular Network	**Shuntaro Kashihara** KDDI Research.Inc., Japan
AP-TP2218	Ipswich Connected Vehicle Pilot: Cloud-Hosted Central Facility	**Nigel Nielsen** WSP, Australia
EU-TP1876	Testing Cooperative Automation: the Truck Platooning Use Case	**Álvaro Arrúe** Applus IDIADA, Spain
EU-TP1883	The Using of C2X in the Mobile Telematics System on Highway	**Tomas Tichy** ELTODO, a.s., Czech Republic

TS 58: TECHNOLOGY & SYSTEM FOR SAFETY AND ENFORCEMENT II

Thursday, 24 October 2019 | 14:00 – 15:30 | Room 310

Moderator: Ryota Horiguchi, i-Transport Lab. Co., Ltd., Japan

AP-TP2004	Safety evaluation modeling of diverging influence area in freeway interchange based on driving workload theory	**Lucheng He** Beijing University of Technology, China
EU-TP2025	Connecting Vehicles to a Digital Twin	**Ian Patey** WSP, UK
EU-TP2076	On the Galileo and EGNOS Test Campaign for eCall: Motivation, Methodology and Overall results	**Karen Boniface** European Commission's Joint Research Centre, Ispra, Italy
AP-TP2066	Operational safety at close-proximity intersections	**Mash Devaser** Land Transport Authority, Singapore
EU-TP1960	New opportunities in assessing tunnel safety risk	**Ian Patey** WSP, UK

TS 59: FUNDING STRATEGIES, FRAMEWORK AND INNOVATIVE BUSINESS MODELS

Thursday, 24 October 2019 | 14:00 – 15:30 | Room 311

Moderator: Thomas Desseilles, ERTICO - ITS Europe, Belgium

AP-TP1827	Joint Punishment and Transportation Credit Score: An Empirical Research on China's Credit Transportation Policy	**Jin Jin** China Academy of Transportation Sciences, Ministry of Communications, China
AP-TP2201	To invest now or later? – That is the question	**Martin Leak** Resolve Group Ltd, New Zealand
EU-TP2298	Practitioners' experiences on building co-funded innovation ecosystems	**Juho Kostiainen** City of Helsinki, Finland
AP-TP1938	Independent Third Party Risk Assessment for Automated Vehicles	**Oliver Klaus** Insurance Australia Group, Australia

TS 60: INNOVATIVE USE OF TECHNOLOGIES FOR TRAVEL DEMAND MANAGEMENT

Thursday, 24 October 2019 | 14:00 – 15:30 | Room 312

Moderator: Mick Spiers, Cubic Transportation Systems, Singapore

AP-TP1845	Development of Laser Scanning Type Vehicle Detector	**Yusuke Ibuki** Mitsubishi Heavy Industries Ltd, Japan
AP-TP1861	Development of Automated Vehicle Classification System Utilizing Machine Learning Technology	**Yusuke Ibuki** Mitsubishi Heavy Industries Ltd, Japan
AP-TP2152	Vehicle type classification technology by non-contact sensor	**Kousuke Kawai** Nippon Expressway Research Institute Company Limited, Japan
AM-TP2144	The Wonderful World of Multi Protocol Transponders Built into Vehicles	**Alice Klemashevich** TRANSCORE, USA
AP-TP1775	A new allocation and pricing model for shared parking lots	**Xin Zeng** College of Transportation Engineering, Tongji University, China

TECHNICAL SESSIONS

TS 61: ADVANCED DRIVER ASSISTANCE SAFETY SYSTEMS - DETECTION AND SIMULATION

Thursday, 24 October 2019 | 14:00 – 15:30 | Room 324

Moderator: Anthony Ferguson, Department for Transport, UK

AP-TP1802	Application of cyber information in the warning of vehicle running safety	**Zeyu Shi** Key Lab of Transportation Engineering of Beijing, Beijing University of Technology, China
AP-TP2341	ThinNet: Object Detection Using a Slim and Lightweight Net-work Architecture	**Pongsak Lasang** Panasonic R&D Center Singapore, Singapore
AP-TP2116	Forklift Proximity Safety System	**Winfred Quek** Singapore Institute of Technology, Singapore
AP-TP2211	Millimetre-Wave Radar System for Pedestrian and Vehicle Perception in Intelligent Traffic Surveillance	**Jun Wang** School of Electronic and Information Engineering, Beihang University, China
AP-TP1963	Research on key technologies to deploy Automated Driving in long highway tunnels	**Baofeng Su** Beijing University of Technology, China

TS 62: TECHNOLOGY AND TESTBEDS FOR CONNECTED AUTOMATED VEHICLES

Thursday, 24 October 2019 | 14:00 – 15:30 | Room 325

Moderator: Thomas Walbrun, Siemens Mobility GmbH, Germany

EU-TP1715	The Future of IEEE 802.11p V2X Standard: NGV Proposals for Performance Improvement while Ensuring Backwards Compatibility	**Vincent Martinez** NXP, France
AP-TP1763	Design and Implementation of Intelligent Vehicle-Infrastructure Cooperation System	**Zhiwei Qu** Technology Co., Ltd., China
AP-TP2241	Development and Field Demonstration of an Automated Transit Platform in Urban Environment	**Andy Jeng** Industrial Technology Research Institute,Chinese-Taipei
AP-TP2089	Improving Communication Performance of DS-CDMA IVC Allocating PN Codes on the Road and Comparison with CSMA/OFDM IVC in Urban Environment	**Makoto Itami** Tokyo University of Science, Department of Applied Electronics, Japan

TS 63: BUSINESS INTELLIGENCE AND DATA ANALYTICS FOR ITS APPLICATIONS

Thursday, 24 October 2019 | 16:00 – 17:30 | Room 308

Moderator: Hamed Benouar, Sensys Networks, USA

AP-TP1879	Validation of Effectiveness on Integration of Private Sector Probe Data	**Akira Tsukamoto** Vehicle Information and Communication System Center, Japan
AP-TP1828	Practical research of purchasing power reflecting movement data	**Tomoki Kobayashi** East Japan Railway Company, Japan
AP-TP1930	A PLUS Geospatial Journey in ITS	**Adil Budiman Akhasan** PLUS Malaysia Berhad, Malaysia
AP-TP2212	Big data analysis for transport systems	**Sahan Herath** Sopra Steria Asia, Singapore
AP-TP1738	Short-term travel time forecast using machine learning approach and well-tuned spatial-temporal input ranges	**Kentaro Takaki** Sumitomo Electric Industries, Ltd., Japan

TS 64: SUSTAINABILITY IN TRANSPORTATION I

Thursday, 24 October 2019 | 16:00 – 17:30 | Room 309

Moderator: Hiroyuki Kumazawa, Osaka Sangyo University, Japan

AP-TP2155	Effectiveness evaluation of air traffic management technical support system based on ADC-IAHP	**Peng Li** Shenzhen Urban Transport Planning Center, China
AM-TP2304	Build Connectivity and Sustainability - Lessons Learned From 10 Years of Transit Signal Priority in New York City	**Robert Rausch** TRANSCORE, USA
AP-TP1800	Supporting Smart Transport Development in Gui'an New District, Guizhou, People's Republic of China	**Susan Lim** Asian Development Bank, Philippines
AP-TP2282	Analysis of the influence of community opening on road capacity	**Huang Heye** Tsinghua University, China
AP-TP1962	Study on the Evaluation Method of Electric Bus Performance in Operation and Case Analysis in China's Typical City	**Zhenguo Qian** China Academy of Transportation Sciences, China

TECHNICAL SESSIONS

TS 65: ITS INFRASTRUCTURE FOR AUTOMATED VEHICLES II

Thursday, 24 October 2019 | 16:00 – 17:30 | Room 310

Moderator: Takashi Kouyama, Mitsubishi Heavy Industries Machinery Systems, Ltd., Japan

AP-TP2048	Approach for realization of merging point support system as Cooperative ITS	**Masayuki Yamamoto** Mitsubishi Heavy Industries Machinery Systems, Japan
AP-TP2181	Taiwan's Tainan Shalun Self-driving Test Site	**Hung Tien** CECI Engineering Consultants, Inc., Taiwan, Chinese-Taipei
EU-TP1856	Elements of Operational Design Domain (ODD) of highly automated vehicles, and their unit costs	**Risto Kulmala** Traficon Ltd, Finland
EU-TP2033	Catalonia Living Lab: a one-stop-shop for development and testing of connected and automated vehicles in Europe	**Stefan De Vries** Applus IDIADA, Spain
EU-TP2267	Aurora - The Intelligent Test-Bed for Snowtonomous Driving	**Reija Viinanen** Aurora Snowbox Ltd., Finland

TS 66: SAFETY CONSIDERATIONS FOR ITS SYSTEMS

Thursday, 24 October 2019 | 16:00 – 17:30 | Room 311

Moderator: Kazunori Inoue, Panasonic Corporation, Japan

AP-TP1705	Analysis of Achievable Benefits by Advanced Driving Assistance Systems (ADAS) Based on Microscopic Traffic Simulations	**Cheol Oh** Hanyang University, Republic of Korea
AM-TP1772	Analysis of thermal dynamics of hydronic de-icing system designs by means of control-oriented thermal models	**Ali Saberi Derakhtenjani** Concordia University, Canada
AP-TP1795	A Evaluation of Relative Lane Decision Method Using Path History on V2X Communication Systems	**Yuji Hamada** Mitsubishi Electric Corporation, Japan
AP-TP1961	A Pedestrian Detection Method based on 24-GHz Band Radar for Driving Safety Support Systems	**Atsushi Higashi** Sumitomo Electric Industries, Ltd., Japan
AP-TP2147	Does speeding make a difference to travel time in urban areas	**Gareth Robins** EROAD, New Zealand

TS 67: SECURE ARCHITECTURES TO DEFEND AGAINST CYBERATTACKS & JAMMING AND SPOOFING PREVENTION

Thursday, 24 October 2019 | 16:00 – 17:30 | Room 312

Moderator: Tim Leinmueller, DENSO AUTOMOTIVE Deutschland GmbH, Germany

AP-TP1905	Use of ANPR camera to complement GPS location accuracy for vehicles	**Wee Han Lim** NCS Pte Ltd, Singapore
AP-TP1785	Challenges and solutions to the Internet of vehicles in China	**Zhuo Wei** Huawei Singapore Research Center, Singapore
AP-TP2008	Rail System Anomaly Detection via Machine Learning Approaches	**Huaqun Guo** Institute for Infocomm Research, Agency for Science, Technology and Research (A*STAR), Singapore
EU-TP2228	Using Collective Perception for position verification in VANETs	**Prachi Mittal** Denso Automotive Deutschland GmbH, Germany

TS 68: ITS FOR EMERGENCY

Thursday, 24 October 2019 | 16:00 – 17:30 | Room 324

Moderator: Steven Cyra, HNTB Corporation, USA

AP-TP2190	Emergency vehicle priority at signalised junctions	**Mohamad Farhan Sukri** Land Transport Authority, Singapore
EU-TP1740	"GLONASS+112" emergency management system of the Republic of Tatarstan	**Bulat Ismagilov** Ministry of Information and Communication of the Republic of Tatarstan, Russia
AP-TP1817	Improving Tunnel Evacuation Outcomes Through Targeted Flash Messages	**Jeff Dusting** Transurban, Australia
AP-TP1854	Disaster Management of a Tunnel on the Metropolitan Expressway	**Kohta Minami** Metroporitan Expressway Co. Ltd., Japan
AP-TP2097	Synergising the Project Safety Review Process and the Use of Intelligent Transport Systems in Managing Road Tunnel Fires	**Alfred Loh** Land Transport Authority, Singapore

TS 69: USE OF DATA FOR IMPROVING ITS SOLUTIONS

Thursday, 24 October 2019 | 16:00 – 17:30 | Room 325

Moderator: Chung Chin-shin Edward, The Hong Kong Polytechnic University, Hong Kong

AP-TP2107	A Modelling framework and identification of Urban Road Network Traffic Condition	**Chong Chee Chung** ST Engineering Electronics, Singapore
AP-TP1936	The simplified measuring system for congestion at a rest area	**Akiyuki Ohkawa** Central Nippon Highway Engineering Nagoya Co., Ltd., Japan
AM-TP1773	Hierarchical Analysis of Speeding Behaviour, Violations, and Crashes Using Real-Time Speed Data from the National Performance Management Research Data Set in the United States	**Jaeyoung Lee** University of Central Florida, USA
AP-TP2266	Pedestrian detection and analysis: applications on smart lamp-post	**Xiaoyong Zhang** Shenzhen Urban Transport Planning Center Co. Ltd, China
EU-TP1706	Finding traffic quality measures with signal change data only	**Thomas Riedel** Adaptive Traffic Control AG and Verkehrs-Systeme AG, Switzerland

TECHNICAL SESSIONS

TS 70: SENSORS & PERCEPTION METHODS FOR AUTOMATED VEHICLES

Friday, 25 October 2019 | 09:00 – 10:30 | Room 309

Moderator: François Fischer, ERTICO - ITS Europe

AP-TP1745	Ultra-low Field Magnetic Guidance System Operatable in Harsh Weather Conditions	**Dereck Harrison** Aichi Steel Corporation, Japan
AP-TP1799	Development of Parking Space Detection Function for Parking Assist System Using Cameras	**Yasutaka Okada** DENSO TEN Limited., Japan
AP-TP1829	Multi-LiDAR Calibration and Synchronization for Autonomous Vehicles	**Kun Zhang** Institute for Infocomm Research, Agency for Science, Technology and Research (A*STAR), Singapore
AP-TP1979	Object Detection Under Heavy Rain Conditions for Autonomous Vehicles	**Prabhu Shankar Mahendran** Nanyang Technological University, Singapore

TS 71: PROBE DATA COLLECTION TECHNOLOGY AND INNOVATIVE USE OF MOBILE DATA

Friday, 25 October 2019 | 09:00 – 10:30 | Room 310

Moderator: Mohit Sindhwani, Quantum Inventions, Singapore

AP-TP1918	The Development of Road Closure Calculating Algorithm by Analyzing Vehicle Probe Data Adopting Poisson Probability	**Xin Jin** Toyota Motor Corporation, Japan
AP-TP1988	Processing Algorithm for Highway Fog Data Collected by Probe Vehicles	**Hyeonjeong Sim** The Korea Transport Institute (KOTI), Republic of Korea
AP-TP1709	Evaluating the potential support of BRT lines for commuting based on large-scale mobile phone signaling data	**Shichao Sun** Dalian Maritime University, China
AP-TP2284	5G READINESS FOR REAL-TIME MOBILE DATA IN TRANSPORT MODELLING: FORECASTING AND ANALYTICS BIG DATA	**Okkie Putriani** Universitas Atma Jaya Yogyakarta, Indonesia
AP-TP1916	Data about 'movement' and 'place' is the new oil – using big data analytics in NSW to better plan and manage the road transport network	**David Scott** Road and Mar, Australia

TS 72: ELECTROMOBILITY AND ENVIRONMENTAL IMPACTS

Friday, 25 October 2019 | 09:00 – 10:30 | Room 311

Moderator: Hiroko Mori, Aichi Shukutoku Unversity, Japan

AP-TP2038	Assessing the impacts of Land Use on Subway Ridership: Identifying a Suitable Sustainable Transport Policy	**Reuben Tamakloe** The University of Seoul, Republic of Korea
AP-TP2095	Beyond Operational Improvement: A Qualitative Study on User Preferences for Public Transport in Singapore	**Penny Kong** TUMCREATE Ltd Singapore, Singapore
AP-TP1842	An area-wide estimation model of road traffic air pollution: application to assessing environmental impacts of urban traffic control	**Hwasoo Yeo** KAIST, Republic of Korea
EU-TP1766	Methods and tools for public bus fleet electrification in the area of sustainable city transportation	**Olaf Czogalla** ifak Magdeburg, Germany

TS 73: LESSONS LEARNT FROM MOBILITY AS A SERVICE (MAAS) DEPLOYMENTS

Friday, 25 October 2019 | 09:00 – 10:30 | Room 312

Moderator: Piia Karjalainen, ERTICO - ITS Europe

EU-TP1727	Realtime Traffic Information beyond administrative borders: traffic management and multimodal journey planning for all of Austria	**Tobias Schleser** ASFINAG Maut Service GmbH, Austria
EU-TP2256	High Quality Road Network Data as Success Factor for Multimodal Journey Planning	**Andreas Unterluggauer** Verkehrsverbund Ost-Region (VOR) GmbH / ITS Vienna Region, Austria
EU-TP2297	Carpooling potential and barriers: results and lessons learned from piloting in Espoo	**Juho Kostiainen** City of Helsinki, Finland
EU-TP2320	Traffic Management as a Service	**Ivana Semanjski** Ghent University, Belgium
EU-TP2346	Paving the Way for Commercialization of Autonomous Aerial Taxis in Dubai: Key Lessons Learnt From Early Testing and Requirements Definition	**Ruba Fayez Abdelal** Transportation Systems Department, Dubai, United Arab Emirates

TECHNICAL SESSIONS

TS 74: CASE STUDIES OF MOBILITY AS A SERVICE (MAAS) DEPLOYMENTS

Friday, 25 October 2019 | 11:00 – 12:30 | Room 309

Moderator: Makoto Miwa, NEC Solution Innovator, Japan

AP-TP1750	Design and Implementation of a Novel Business Model on the Integration of MaaS and Consuming Service in China: A Case Study of Guangzhou	**Xianglong Liu** China Academy of Transportation Sciences, China
AM-TP1899	Trust as a Service - Managing Rider's Confidence in the Sharing Economy	**Andy Taylor** Cubic Transportation Systems, USA
AP-TP2034	The strategic roadmap for MaaS Service in Taiwan	**Chien-Pang Liu** Ministry of Transportation and Communications, Chinese-Taipei
AP-TP2108	Application of Project Management System on MaaS Development- A Case Study of Kaohsiung City in Taiwan.	**Wei-Yen Lin** Feng-Chia University, Chinese-Taipei

TS 75: USE OF CRUCIAL BIG DATA FOR TRAFFIC MANAGEMENT

Friday, 25 October 2019 | 11:00 – 12:30 | Room 310

Moderator: Cai Chen, DATA61|CSIRO, Australia

AP-TP2292	Tourists Identifycation Using Unlabelled Cellular Signalling Data: A Case Study of Shanghai, China	**Chen Qian** Tongji University, China
AP-TP1805	An intelligent traffic flow estimation system for traffic planning in Macau	**Ngoc-Vai Chiang** Transport Bureau, Macau
AP-TP1823	How Big Data and New Technology Influence Future Transport Systems: Research in Guangzhou as an Example	**Ming Li** China Center for Urban Development, China
EU-TP2226	Utilizing ITS and Big Data to Develop a 3D Smart City Platform as a Planning and Operations Tool	**Terry Smith** Surface Mobility, United Arab Emirates
AP-TP2111	Surrogate safety analysis of uncontrolled intersections in mixed traffic conditions	**Ravishankar K.V.R.** National Institute of Technology, Warangal, India

TS 76: SUSTAINABILITY IN TRANSPORTATION II

Friday, 25 October 2019 | 11:00 – 12:30 | Room 311

Moderator: King W. Gee, AASHTO, USA

AP-TP2185	A Study on The Use Intentions of Potential Users to Public Bicycle Services in a University Campus	**Chien-Hung Wei** National Cheng Kung University, Chinese-Taipei
EU-TP1784	Generic Validation Approach for Microscopic Traffic Simulation and Drivetrain Simulation in the District of Aachen	**Yiqun Xia** Institute for Automotive Engineering (ika) RWTH Aachen University, Germany
AP-TP2101	Smart Street Lighting System	**Say Yaw Foo** Land Transport Authority, Singapore
AP-TP2126	Implementation Strategies to Make Cities Sustainable Through emphasizing TOD concept: Indian Context	**Prashanth Shekar Lokku** National Institute of Technology, Warangal, India
EU-TP2127	Answering to cities' mobility needs – public-private-partnerships fostering innovative AV development	**Ulla Tikkanen** Forum Virium Helsinki, Finland

TS 77: ENHANCED SAFETY WITH DRIVER HEALTH MONITORING

Friday, 25 October 2019 | 11:00 – 12:30 | Room 312

Moderator: Koji Oguri, Aichi Prefectural University, Japan

EU-TP2219	Real-Time Evaluation of the On-Board Comfort of Standing Passenger in Bus Transit Services	**Nicoletta Rassu** University of Cagliari, Department of Civil Engineering, Environment and Architecture, Italy
EU-TP1764	"Companion": ASFINAG's Driver Support System on Personal Devices	**Martin Nemec** ASFINAG Maut Service GmbH, Austria
AP-TP2020	Study of Drivers Health Monitoring System in The Expressway Rest Areas Using Toilet	**Kouji Yamamoto** Central Nippon Expressway Company Limited, Japan
AP-TP1970	Detection of Driver's Awakening Level	**Hayato Shinobu** Shibaura Institute of Technology, Japan
AP-TP1968	Effect of driver's task for keeping awakening level high in automated driving	**Ryo Furuya** Shibaura Institute of Technology, Japan

SCIENTIFIC PAPER SESSIONS

SP 01: USE OF CONNECTED ITS DATA FOR SAFETY, TRAFFIC MANAGEMENT AND IMPROVING ENERGY EFFICIENCY

Tuesday, 22 October 2019 | 09:00 – 10:30 | Room 320

Moderator: Masahiko Ikawa, Mitsubishi Electric Corporation, Japan

AM-SP1895	Intelligent Vehicle Control at Signal-Free Intersection Under Mixed Connected Environment	**Hao Yang** TOYOTA InfoTechnology Center, U.S.A., Inc., USA
EU-SP2183	Towards Dynamic Zero Emission Zone Management for Plug-in Hybrid Buses	**Marcin Seredynski** E-Bus Competence Center, Luxembourg
AM-SP2335	Cyber-Physical Identification of Connected Vehicles with V2V Shared Sensing Data	**Kyungtae Han** Toyota InfoTechnology Center, U.S.A., Inc., USA
AM-SP2342	Traffic Signal Control Systems at Connected Vehicle Corridors: Theories and Implementation	**Li Zhang** Mississippi State University, USA
EU-SP1708	Predicting Traffic Phases from Car Sensor Data using Machine Learning	**Chris Huijboom** HAN University of Applied Sciences, The Netherlands

SP 02: AI, DATA ANALYTICS AND ADVANCE OPTIMIZATION METHODS FOR DEMAND STUDIES, TRAFFIC PREDICTION AND INCIDENT DETECTION

Tuesday, 22 October 2019 | 14:00 – 15:30 | Room 320

Moderator: Von Lopez-Levine, Vertix Asia Pacific, Singapore

AP-SP1730	Arterial incident duration prediction using a bi-level framework of extreme gradient-tree boosting	**Adriana-Simona Mihaita** DATA61|CSIRO, Australia
AP-SP1908	Data Driven Next Destination and ETA Prediction for Urban Delivery Fleets	**Bing Zhao** Institute for Infocomm Research, Agency for Science, Technology and Research (A*STAR), Singapore
AP-SP1967	A Convolutional Neural Network (CNN) Based Traffic Incident Detection Method for Urban Networks on Microscopic Simulation Platform	**Danwei Wang** Nanyang Technological University, Singapore
AP-SP2205	Travel Speed Prediction with a Hierarchical Convolutional Neural Network and Long Short-Term Memory Model Framework	**Wei Wang** Atkins, UK

SP 03: COLLISION AVOIDANCE, RISK ESTIMATION AND COMMUNICATION TECHNIQUES TO ENHANCE SAFETY OF AUTONOMOUS DRIVING

Tuesday, 22 October 2019 | 16:00 – 17:30 | Room 320

Moderator: Robert Dingess, Mercer Strategic, USA

AM-SP2339	Collision avoidance trajectory planning for multi vehicle	**BaekGyu Kim** Toyota InfoTechnology Center, USA
AP-SP1804	Identification Driving Riskiness of Lane-Changing for Automated Vehicles Applying Spectral Analysis	**Chandle Chae** The Korea Transport Institute (KOTI), Republic of Korea
AP-SP1833	Queue Length Estimation at Signalized Intersections in a Connected Vehicle Environment Based on Artificial Neural Network	**Azadeh Emami** The Department of Infrastructure Engineering, The University of Melbourne, Australia
EU-SP2322	Autonomous driving in enclosed car-parks using heterogeneous communication	**Horst Wieker** Hochschule für Technik und Wirtschaft des Saarlandes - htw saar, Germany

SP 04: HARNESSING BIG DATA ANALYTICS FOR ENHANCEMENT OF TRACKING, ROUTE DECISION AND TRANSPORT OPERATIONS

Wednesday, 23 October 2019 | 09:00 – 10:30 | Room 320

Moderator: Venkat Nallamothu, AASHTO, USA

AP-SP2056	Route Choice Behavior Considering Travel Time Reliability of Traveler Groups	**Shin-Hyung Cho** Seoul National University, Republic of Korea
AP-SP1857	Using Bayesian Network to Model Incident in Freight Transportation Operation	**Thananut Phiboonbanakit** Japan Advanced Institute of Science and Technology, Thailand
EU-SP1734	Big Spatio-Temporal Data Mining for Emergency Management Information Systems	**Igor Anikin** Kazan National Research Technical University named after A. N. Tupolev - KAI, Russia
AP-SP2294	Harnessing ITS Data Sources for Big Data Analytics and Structural Equation Modelling to Interpret Public Transport Performance	**Wee Ping Koh** Land Transport Authority, Singapore
EU-SP1891	Object detection and tracking in urban street video in Kazan city	**Alisa Makhmutova** Kazan National Research Technical University named after A. N. Tupolev - KAI, Russia

SCIENTIFIC PAPER SESSIONS

SP 05: CONNECTED VEHICLE DATA FOR OPTIMIZATION OF TRAFFIC MANAGEMENT

Wednesday, 23 October 2019 | 14:00 – 15:30 | Room 320

Moderator: Thanh Nguyen, Highways England, UK

EU-SP2251	Building a Data Management Toolchain for a Level 3 Vehicle Automation Pilot	**Nisine Osman** Università di Genova, Italy
EU-SP1986	Methodology for Assessment and Optimisation of Traffic Signal Synchronisation with Real-Time Bus Priority and Driver Speed Advisory	**Gaetano Fusco** Sapienza Università di Roma, Italy
AP-SP2227	Analysis of Vehicle Information Sharing Performance in terms of the V2V OBU Penetration Rate	**Yusuke Takatori** Kanagawa Institute of Technology, Japan

SP 06: V2X DATA FOR IMPROVING AUTONOMOUS VEHICLE NAVIGATION AND PERCEPTION

Wednesday, 23 October 2019 | 16:00 – 17:30 | Room 320

Moderator: Jaya Shankar s/o Pathmasuntharam, Institute for Infocomm Research, Singapore

EU-SP2333	Accidents with Automated Vehicles	**Gunnar Jenssen** SINTEF Buildings and infrastructure, Norway
EU-SP2270	Embedded Context-aware Machine Learning for Autonomous Vehicles	**Konstantinos Demestichas** Institute of Communication and Computer Systems, Greece

SP 07: PASSENGER AND FREIGHT TRAVEL DEMAND STUDIES AND OPTIMIZATION APPLIED TO ITS APPLICATIONS

Thursday, 24 October 2019 | 09:00 – 10:30 | Room 320

Moderator: Michael Rudge, ITS New Zealand / Stantec, New Zealand

AP-SP2079	Passenger-Freight Demand Responsive Transport Services: A Dynamic Optimisation Approach	**Stephan Winter** The University of Melbourne, Australia
AP-SP2117	Evaluating Impacts of Comprehensive Urban and Socio-economic Variables on Bike Sharing Ridership Variability in the City of Seoul Using Revealed Preference GPS Trajectory Data	**Christian Kapuku** Seoul National University, Republic of Korea
AP-SP1768	Will the vehicle restriction policy maintain long-term deterrent effect?	**Zhiyong Liu** Tsinghua University, China
AP-SP1838	A Station-based Taxi Demand Forecast: using Recurrent Neural Networks	**Chung-Yi Lin** Chunghwa Telecom Laboratories, Chinese-Taipei
AP-SP1982	A Three-Step Revised Dynamic Origin-Destination Flows Estimation Method for Signalized Arterials Based on Kalman Filtering	**Yi Gang LI** Beijing University of Civil Engineering and Architecture, China
EU-SP1780	On-board intelligent management functionality for improving the driving of highly automated vehicles	**George Dimitrakopoulos** Harokopio University of Athens (HUA), Greece

SP 08: DATA AND MODELS FOR SAFETY, NAVIGATION, AND VEHICLE OPERATIONS

Thursday, 24 October 2019 | 11:00 – 12:30 | Room 320

Moderator: Kyoka Nakagawa, Honda R&D Co., ltd. Digital Solution Center, Japan

AP-SP2086	The research on the construction of spatial driving conditions of left-turn vehicles at intersections	**Shuyuan Luo** Tongji University, China
AM-SP2098	Vehicle Assisted Connected Eco-driving with Less-Than-Perfect SPaT Information under Adaptive Traffic Signal Control	**Hasan M. Moonam** KLD Engineering, P. C., USA
AP-SP1917	Analyzing Bus Trips of the Overlapping O-D Pairs to Enhance Efficiency of Bus Operations	**Jeongwook Seo** Seoul National University, Republic of Korea
AP-SP2176	Feasibility and Accuracy Study of Cell Transmission Model for Real Time Traffic Prediction in Signalized Urban Networks	**Cherry Ye Aung** Institute for Infocomm Research, Agency for Science, Technology and Research (A*STAR), Singapore
EU-SP1758	An Approach to Estimate the Risk of Deer-Vehicle Collision	**Kevin Seipel** University of Kassel, Germany

SCIENTIFIC PAPER SESSIONS

SP 09: LEVERAGING NEW MODES OF DATA FOR IMPROVING PERCEPTION, ROUTING, PARKING AND ROAD MANAGEMENT

Thursday, 24 October 2019 | 14:00 – 15:30 | Room 320

Moderator: Tobias Brzoskowski, ITS Hamburg 2021, Germany

EU-SP1951	The Industrial Internet, Big Data, Open Data: What Can Be Achieved in a Winter Road Management Ecosystem?	**Toni Lusikka** VTT Technical Research Centre of Finland Ltd., Finland
AP-SP2213	Analysing efficiency performance of a signalized intersection using UAV data	**Prakash Ranjitkar** University of Auckland, New Zealand
AP-SP1714	A Fast Map-Matching Algorithm based on a Global Measure and Dynamic Programming for Sparse Probe Data	**Takayoshi Yokota** Tottori University, Japan
EU-SP1983	Routing a fleet of electric modular vehicles using an enhanced evolutionary method	**Wassila Aggoune-Mtalaa** LIST, Luxembourg
EU-SP2132	Street Parking Strategy Sensitivity Analysis	**Jean-Sébastien Gonsette** AISIN AW, Belgium

COMMERCIAL PAPER SESSIONS

CP 01: SOLUTIONS LEADING TO THE DEPLOYMENT OF CONNECTED & AUTOMATED VEHICLES

Monday, 21 October 2019 | 09:00 – 10:30 | Room 320

Moderator: Sadahiro Kawahara, JTEKT Corporation, Japan

AP-CP2146	Optimising a production 4G LTE network for low-latency Cellular V2X	**Gilbert Oppy** Telstra, Australia
AP-CP1813	Autonomous vehicles in public transit	**Thomas Walbrun** Siemens Mobility GmbH, Germany
EU-CP2204	IDIADA's Connectivity Lab. Testbed for connected and automated vehicles	**Álvaro Arrúe** Applus IDIADA, Spain
AP-CP2119	Connected Vehicles - application of real life case studies	**Philip Manning** Siemens Mobility, Australia
AP-CP2005	A Completed Mass- Production Level Solution for Dongfeng Commercial Intelligent Connected Vehicles	**XueFeng Jiang** Dongfeng Commercial Vehicle Co. Ltd., China
AM-CP2332	Applying Dynamic Tire Anomaly Detection to Driver Safety	**Rish Malhotra** International Road Dynamics Inc. (IRD), Canada

CP 02: CROWDSOURCING AND BIG DATA ANALYTICS TECHNOLOGIES APPLIED TO ITS SOLUTIONS

Monday, 21 October 2019 | 11:00 – 12:30 | Room 320

Moderator: Errol Kruger, Silicon Billabong, Australia

AP-CP2315	HERE Revitalizes Automotive Navigation with Navigation on Demand	**Peter Hawkins** HERE Technologies, Singapore
EU-CP2165	How object tracking and remote validation can improve capacity management, revenue analytics and the passenger experience	**Steffen Reymann** Cubic Transportation Systems, UK
AP-CP1925	Leapfrogging ITS Technology for Tomorrow	**Zulkefle Idris** TERAS Teknologi Sdn Bhd, Malaysia
AP-CP2171	Societal insights from movement and economic factors	**John Cardoso** Intelematics, Australia
AP-CP2162	AI-driven VaaS Applications of Connected Vehicles to Empower Smart City	**Paul Jiang** Banma Network Technology, China
AP-CP1840	Machine Learning Technologies applied to ITS	**Pablo Ruiz** SICE, Australia
AP-CP2042	Meet Matilda: The world's smartest transit hub	**Damian Hewitt** SAGE Automation, Australia

COMMERCIAL PAPER SESSIONS

CP 03: SUSTAINABLE TRAFFIC MANAGEMENT SOLUTIONS FOR ENABLING SMARTER CITIES

Wednesday, 23 October 2019 | 09:00 – 10:30 | Room 321

Moderator: Junji Eguchi, Honda R&D Europe (Deutschland) GmbH, Germany

EU-CP2069	Triplesign Solar VMS a sustainable traffic management tool	**Hans-Ivar Olsson** Triple Sign System AB, Sweden
AP-CP1713	Sitraffic One – The new 1Watt Technology and signal heads that significantly reduce the carbon footprint of traffic signals	**Michael Duesterwald** Siemens Mobility GmbH, Germany
AP-CP1850	Simulation Analysis of TrafficSens Adaptive Mode and Fixed Time Traffic Signal Strategies	**Fatin Ayuni Aminzal** Sena Traffic System Sdn Bhd, Malaysia
EU-CP1867	Using Artificial Intelligence to improve Traffic Flow at Intersections	**David Borst** Siemens Mobility, Germany
EU-CP2041	RTO, A new era of adaptive traffic control	**Gary Cox** Siemens Mobility ITS, UK
EU-CP2313	How the world's leading airport operator manages vehicle traffic	**Anna Michael** Sensefields, Spain

CP 04: SUSTAINABLE ITS SOLUTIONS FOR SMARTER AND GREENER CITIES

Wednesday, 23 October 2019 | 14:00 – 15:30 | Room 321

Moderator: Fred Kalt, Siemens Mobility Pte Ltd, Singapore

AP-CP2340	Realite: an end to end integrated solution for smarter transport	**Justin Lu** Real Time Traffic, Australia
EU-CP1984	Cycling4Trees – A gamification approach to strengthen cycling in cities	**Astrid Kellermann** Siemens Mobility GmbH, Germany
EU-CP2237	Large scale agent-based simulation to assess regional development	**Jof Ruxton** Immense Simulations, UK
EU-CP2134	Berlin as an urban test-bed for digitized and sustainable city traffic	**Martin Sölle** Berlin Agency for Electromobility eMO, Germany
EU-CP2246	Hybrid Driver Coaching (HDC): an eco-driving coaching system for hybrid car owners	**Thierry Castermans** AISIN AW, Belgium
EU-CP2053	Autonomous and intelligent mobility solutions need more than applied science to achieve their full potential	**Nicolas De Cremiers** Villeurbanne, France

CP 05: INNOVATIVE SOLUTIONS FOR PRICING & TRAVEL DEMAND MANAGEMENT

Wednesday, 23 October 2019 | 16:00 – 17:30 | Room 321

Moderator: Pankaj Lunia, IBM, Singapore

EU-CP1915	Delivering in vehicle signage to connected cars	**Chris Bax** Cubic Transportation Systems, UK
EU-CP1890	Public Transport Mobility Management Ecosystem	**Aare Laponin** FiscalAdmin, Estonia
EU-CP2052	Capital of first free public transport nation	**Allan Alaküla** Tallinn City Government, Estonia
AM-CP2334	Advanced Axle Classification for Toll	**Rish Malhotra** International Road Dynamics Inc. (IRD), Canada
EU-CP2272	Additional use cases for sensor combining ANPR and vehicle classification	**Björn Crona** Kapsch TrafficCom, Sweden
EU-CP1814	Applying digitalization and big data to prioritize cyclists in urban environments	**Michael Duesterwald** Siemens Mobility GmbH, USA

CP 06: POLICY, TECHNOLOGY AND PRICING CHALLENGES IN MANAGEMENT OF NEW EMERGING TECHONOLOGIES

Friday, 25 October 2019 | 09:00 – 10:30 | Room 320

Moderator: Der-Horng Lee, National University of Singapore, Singapore

EU-CP2017	Public authorities as regulatory service providers in the MaaS ecosystem	**Michael Kieslinger** Fluidtime Data Services GmbH, Austria
AP-CP2236	Artificial Intelligence in Mass Public Transport	**Clémence Morlet** International Organisation of Public Transport - UITP, Hong Kong
AP-CP2248	Rethinking risk, liability and insurance for CAV mobility	**Cecilia Warren** IAG, Australia
AP-CP1808	Digitizing Mobility for Sustainable Smart Cities – The Touch 'n Go Experience	**A.Azmi Jafar** Touch 'n Go, Malaysia
AP-CP1779	Pricing Mobility as a Service for Success	**Henry Wu** JYW Consulting, Australia
AM-CP2142	Tolling for Mobility as a Service	**Yousuf Kamal** TRANSCORE, USA

COMMERCIAL PAPER SESSIONS

CP 07: SHARED MOBILITY SOLUTIONS ENABLING EFFICIENT MULTIMODAL TRANSPORT OF PEOPLE & GOODS

Friday, 25 October 2019 | 09:00 – 10:30 | Room 321

Moderator: Takaaki Sugiura, Mitsubishi Research Institute, Inc., Japan

EU-CP2245	Business and operational aspects of deploying autonomous commercial vehicles in urban mobility	**Rodrigo Caetano** Scania, Sweden
EU-CP2279	Business Opportunities arising from Automated and Autonomous Vehicles in Public Transportation	**Sophie Hassan** RATP Dev, France
EU-CP1971	How Demand-Responsive Transit bridges the gap between Public Mass Transit and Individual Mobility in a Mobility as a Service Ecosystem	**Lukas Foljanty** Moovel Group GmbH, Germany
EU-CP2305	Managing all corporate mobility requirements through a single platform	**Kerem Tiryakioglu** Flexigo, Turkey
EU-CP1729	7 steps for public transit operators to win the last mile with new mobility services	**Gary Patterson** Bestmile, Switzerland
EU-CP2307	Autonomous vehicles and fleet management in logistics: the crossing between the worlds of AGV & people movers	**Victor Ramiro** EasyMile, France

CP 08: PERSONALISED MOBILITY SERVICES AND SHARED MOBILITY SOLUTIONS

Friday, 25 October 2019 | 11:00 – 12:30 | Room 320

Moderator: Andreas Rau, TUMCREATE Ltd, Singapore

AP-CP2163	Trials of Multi-modal Mobility Service 'my route' in Fukuoka City	**Hiroshi Majima** Toyota Motor Corporation, Japan
EU-CP2263	App based mobility – lifeblood for operators and travellers	**Geert Vanbeveren** Siemens Mobility GmbH, Germany
AP-CP2230	Tourism Bike Sharing: Behaviour Change Through New Experience In Exploring Cities	**I Gede Putu Rahman Desyanta** Indonesia Bike, Indonesia
EU-CP1803	Operide: An intelligent fleet management solution applied to e-bike sharing	**David Montgomery** Siemens Mobility GmbH, Germany
AP-CP1844	Explore the Izu Peninsula with the IZUKO app	**Christoph Stadler** Moovel Group GmbH, Germany
AP-CP2035	Increased Options for Public Transport within the Sharing Economy: Exploring the concept of Mobility as a Service (MaaS)	**Stephen Owens** Intelematics, Australia


Welcome to the Future
Singapore's Transport Network
Touch to begin
Singapore's Transport Network

SHOWCASES

TECHNICAL TOURS

How does Singapore stay on top of the game amidst rising transportation demands and changing mobility landscape? Register for these back-of-house tours designed to provide delegates with knowledge and new perspectives on Singapore's best-in-class transportation systems.

General Guidelines

- **Dress code**: Smart Casual
- **Departure and arrival**: Technical Tour Assembly Point @ Level 1 pick-up area, Suntec Singapore Convention and Exhibition Centre
- **Pre-registration** required via the Congress Registration System
- **Note:** Please arrive at the Technical Tour Assembly Point at least 5 minutes before scheduled time. The shuttle service will depart on schedule.

INTELLIGENT TRANSPORT SYSTEM (ITS) OPERATIONS CONTROL CENTRE (OCC) AND SINGAPORE MOBILITY GALLERY

Brought to you by: Land Transport Authority

As part of this tour, delegates will visit the Intelligent Transport Systems Operations Control Centre as well as the Singapore Mobility Gallery housed at the Land Transport Authority.

Intelligent Transport System (ITS) Operations Control Centre (OCC)

The ITS OCC is the nerve centre that manages traffic in Singapore. It operates 24/7 throughout the year and has an overview of traffic flow along our roads. The OCC readily swings into action to manage road traffic incidents that may impact traffic flow along key corridors to keep Singapore on the move.

Leveraging the ITS systems, ITS OCC has the capability of incident detection, sense making, ground resources deployment, and coordination and information dissemination via an Integrated Platform.

Delegates will also get to understand Singapore's electronic road pricing (ERP) system and how it is being used as an effective demand management measure, to manage congestions in Singapore. This tour to the Operations Control Centre will allow delegates to appreciate:

a. Concept of road traffic operations
b. ITS systems to manage traffic in Singapore efficiently; as well as
c. Incident management

Singapore Mobility Gallery

The gallery offers a glimpse of Singapore's dynamic and complex land transport system, challenges in balancing efficiency, liveability and inclusivity and how new technologies are harnessed to create a user-centric, future ready land transport system.

Singapore Mobility Gallery provides a behind-the-scenes look at how Land Transport Authority plans, designs and builds our land transport system.

Tour Schedule:

- Wednesday, 23 October 2019: 09:30 – 13:00
- Wednesday, 23 October 2019: 14:30 – 18:00
- Thursday, 24 October 2019: 09:30 – 13:00
- Thursday, 24 October 2019: 14:30 – 18:00

PREDICTIVE MAINTENANCE FOR NORTH EAST LINE (NEL) MRT

Brought to you by: SBS Transit

This tour takes participants to the MRT depot of Singapore's North East Line (NEL).

Since 2017, NEL remains the most reliable MRT line in Singapore. To sustain high levels of reliability, the focus is on developing predictive maintenance capabilities to pre-empt failures before their occurrence through condition monitoring of equipment and application of data analytics.

To develop the preparedness and competency of staff in train driving during an emergency on the NEL and DTL, SBS Transit commissioned a pair of train simulators as well as four sets of compact simulators.

The simulators offer various methodologies for training. For eg, the compact simulator which offers flexibility in meeting training demands, allows staff to learn and practice driving procedures. Equipped with a "Learning Assistance Tool" for trainee-initiated sessions, individual pop-up windows explain the correct procedures required to perform a task. They also tests staff knowledge through a quiz. After repeated sessions where the trainee gains confidence, they move on to the full simulators where their performance is assessed by a trainer.

To this end, the visit will comprise:

a. An introduction to the suite of predictive maintenance capabilities
b. A showcase of selected condition monitoring and data analytics applications
c. A demonstration at the Integrated Maintenance and Diagnostics Centre (IMDC), the nerve centre for predictive maintenance
d. A demonstration of the use of train and compact simulators to train staff in responding safely and effectively in emergency scenarios.

Tour Schedule:

- Tuesday, 22 October 2019: 09:30 – 13:00
- Thursday, 24 October 2019: 14:00 – 17:30

UNDERSTANDING THE DYNAMICS OF THE TAXI INDUSTRY IN SINGAPORE

Brought to you by: ComfortDelGro

ComfortDelGro Taxi, a leading point-to-point transport operator for over four decades, manages and maintains the largest fleet of taxis in Singapore. Delegates attending the tour will be given an overview about Singapore's taxi industry, and a tour of its Driver Recruitment Centre and taxi maintenance workshop.

Tour Schedule:

- Tuesday, 22 October 2019: 14:00 – 17:00

TECHNICAL TOURS

TESTING AND RESEARCH OF AUTONOMOUS AND CONNECTED VEHICLE DEPLOYMENT ON PUBLIC ROADS

Brought to you by: Nanyang Technological University – CETRAN

To ensure safe and seamless integration onto public roads, Autonomous Vehicles (AVs) need to be tested on their communication and interaction with other vehicles, road infrastructure and elements as well as dispatch and routing systems. The CETRAN AV Test Centre is a 2-hectare test facility that was launched on 22 November 2017 to support the testing of AVs navigation controls in a real-world environment. It is designed to replicate the different elements of Singapore's roads, with common traffic schemes, road infrastructure, and traffic rules. The circuit also features a rain simulator and flood zone to test AVs' navigation abilities under different weather conditions.

Whilst, the NTU-NXP Smart Mobility Test Bed is a campus-wide V2X (vehicle to everything) communication facility for the ITS community to collaborate in developing and testing next-generation transportation innovations that enhance commuter safety and transportation services. The V2X technology allows vehicles to communicate with each other, pedestrians, personal mobility devices (PMD) and roadside infrastructure for a safer and more efficient driving experience.

Key highlights of the tour include:

a. A guided tour and introduction to the CETRAN AV Test Centre
b. An overview and demonstration of the tests performed in the Singapore Milestone 1 assessment
c. A demonstration of the interaction between an AV and smart traffic light
d. Use cases of cooperative localisation
e. Live demonstrations of V2X use cases in the real world scenario within the NTU test bed
f. A demonstration of the use of 60GHz radio for V2X communication applications

Note: *Demonstrations are performed outdoor in an open air, unshaded environment.*

Tour Schedule:

- Tuesday, 22 October 2019: 09:00 – 13:00
- Tuesday, 22 October 2019: 13:45 – 17:45
- Wednesday, 23 October 2019: 09:00 – 13:00

VISIT TO BULIM BUS DEPOT

Brought to you by: Tower Transit Singapore Pte Ltd

Note: High-visibility vests to be worn at all times while on Level 1 of the Depot

Tower Transit is a young and innovative transport operator with fresh ideas and a wealth of experience in bus franchising. Established in the UK in 2013, Tower Transit operates some of the busiest bus routes in central London on behalf of Transport for London, and leads the way in new technology trials of zero-emission buses in London. The Group also owns boutique bus and coach operations: Whippet in Cambridge and Impact Group in West London.

In 2015, competing with some of the world's biggest bus operators, Tower Transit was awarded the Singapore government's first competitively-tendered bus contract for 26 routes. The Group, together with its sister company Transit Systems in Australia, has completed 20 successful operator transitions and works with governments to bring clean, reliable, efficient and personable bus services to the world's top cities.

This visit to Tower Transit will cover the following:

a. An introduction to Tower Transit Singapore
b. Bus Contracting Model
c. A guided tour and overview of the Bus Depot operations

Tour Schedule:

- Wednesday, 23 October 2019: 14:00 – 18:30

PSA SINGAPORE PORT TOUR

Brought to you by: PSA Corporation Ltd

PSA Singapore is the world's largest container transhipment hub. It handled 36.31 million Twenty-foot Equivalent units (TEUs) of containers in 2018. It is a fully-owned subsidiary of PSA International, a leading global port group and a trusted partner to cargo stakeholders around the world. With flagship operations in Singapore and Antwerp, PSA's portfolio comprises a network of over 50 coastal, rail and inland terminals in 17 countries.

PSA is sharpening its competitive edge with extensive development and implementation of port automation technology and intelligent inter-connected systems at its Pasir Panjang Terminals and the future Tuas Port.

The tour to Singapore Port includes:

a. A video presentation and panoramic overview of PSA port
b. A visit to the Automated Crane Operations Centre, where the automated rail-mounted gantry crane system is managed
c. A visit to the PSA Living Lab Gallery, where the automated guided vehicle or AGV system is live-tested
d. A tour of the Pasir Panjang Terminal

Tour Schedule:

- Tuesday, 22 October 2019: 09:30 – 12:30
- Tuesday, 22 October 2019: 14:00 – 17:00

VISIT TO KIM CHUAN MRT DEPOT

Brought to you by: SMRT Corporation

Spanning an area of 11 hectares – 800 metres long, 160 metres wide and 23 metres deep – Kim Chuan Depot is the world's largest underground depot. This tour will take you through the four-storey depot which hosts a two-level underground structure that provides stabling as well as operations and maintenance support for trains.

Kim Chuan Depot houses SMRT's Rail Operations Centre for the North-South, East-West and Circle Lines. It is able to monitor the trains that run through the stations. The depot also houses equipment such as overhead cranes, a train wash plant and an under-floor cleaning plant. Another notable feature of Kim Chuan Depot is its automatic storage and retrieval system. At 23 metres high, it is the tallest underground automated warehouse system in Singapore and it can store up to 2,000 pallets and 22,000 bins.

Tour Schedule:

- Thursday, 24 October 2019: 09:30 – 12:30

TECHNICAL TOURS

SINGAPORE MARITIME GALLERY TOUR

Brought to you by: Maritime and Port Authority of Singapore

The Singapore Maritime Gallery is a contemporary gallery that tells the story of Singapore's transformation from a small trading post into a premier Global Hub Port and leading International Maritime Centre today, where visitors get to discover the stories that led to Singapore's growth and strategy for the future.

Divided into four main zones, the gallery explores Singapore's rich maritime heritage and the vital link between the maritime industry and our daily lives. Find out how Singapore maintains her voice in the international maritime area, and how she stays abreast amid global change by remaining technologically-driven and future ready.

The gallery also commemorates Singapore's achievements, as well as inspires future generations to be part of the vibrant, vital and resilient industry that is Maritime Singapore.

As the world's busiest port in shipping tonnage, with connections to 600 ports in over 120 countries and over 1,000 vessels calling at the port at any one time, visitors will be able to understand the thriving ecosystem that makes up Maritime Singapore, and find out what makes Singapore a bustling maritime nation.

Key highlights:

- Engaging guided tour to discover the story of Maritime Singapore
- Close interaction with the team from Vessel Traffic Management and Port Systems Operations & Support
- Hands-on experience with the ship handling stimulator

Tour Schedule:

- Wednesday, 23 October 2019: 14:00 – 16:00

ST ENGINEERING AUTONOMOUS SHUTTLE PUBLIC TRIAL IN SENTOSA

Brought to you by: ST Engineering

Experience the future of public transportation with ST Engineering today.

This tour takes participants to Sentosa, where they'll get to ride on Singapore's first on-demand autonomous shuttle bus. A collaboration between ST Engineering, the Ministry of Transport and Sentosa Development Corporation, this autonomous shuttle service is part of a three-month public trial. Experience first-hand how the bus navigates mixed traffic situations in an urban setting, communicates with road users and commuters, while providing a safe and smooth ride.

Participants will also be given a behind-the-scenes introduction to ST Engineering's proprietary Autonomous Vehicle Management System (AVMS), which monitors the real-time operational status of the autonomous buses and optimises their utilisation.

Tour Schedule:

- Thursday, 24 October 2019: 13:30 – 15:45
- Thursday, 24 October 2019: 14:30 – 16:45

RESEARCH INTO FUTURE MOBILITY SOLUTIONS

Brought to you by: CREATE – Campus for Research Excellence And Technological Enterprise

The tour will feature on-going research into future mobility carried out in Singapore by TUMCREATE (a research centre at CREATE between the Technical University of Munich and the Nanyang Technological University), SMART Future Urban Mobility (a research centre of the Massachusetts Institute of Technology at CREATE) and SEC-FCL (the Future Cities Laboratory of the ETH Centre at CREATE.

These research centres are funded by the Singapore National Research Foundation under its Campus for Research Excellence and Technological Enterprise (CREATE) programme. The tour will feature research in each of these three centres.

SMART FM will showcase their first-last mile autonomous mobility on demand vehicles; display the autonomous vehicles' use case in every day from hospitals, tourist attractions to urban environments; and lastly, the autonomous capabilities of their vehicle will be demonstrated on campus in a pedestrian environment.

TUMCREATE will showcase its research into the ultimate public transport system. This will showcase research work into a future autonomous road transit system that features AVs operating in platoons with right-of-way controlled by novel sensor technology. The tour will include simulation and virtual reality experiences of the public transport system and vehicles with demonstrations of vehicle design tools, vehicle charging models and other demonstrations.

ETH FCL will showcase various systems in its Value Laboratory and other display sites.

Key takeaways of this tour include:

a. The state-of-the-art autonomous vehicle capabilities of SMART's AVs
b. New concepts in road-based autonomous public transport
c. The infrastructure support for AVs in Singapore.
d. The current challenges and potential solutions for large-scale AV deployments

Tour Schedule:

- Wednesday, 23 October 2019: 09:00 – 13:30
- Thursday, 24 October 2019: 09:00 – 13:30

NCS CENTRE OF DIGITAL EXCELLENCE (CODE-X)

Brought to you by: NCS Pte Ltd

NCS CODE-X is an innovative co-development workspace that combines NCS' technology implementation experience with deep expertise in emerging technologies to help companies reimagine their future, perform agile prototyping of innovative concepts and unlock new growth opportunities that allow companies to compete in this new era of a data-driven digital economy.

Join us at CODE-X tour to

- Experience a conducive environment that will ignite creative sparks, promote collaboration & co-creation and boost productivity
- Learn the best practices when scaling your AI and advanced analytics efforts
- Enjoy a free hands-on workshop to apply the principles of design thinking that focuses on user-centricity

Tour Schedule:

- Friday, 25 October 2019: 09:30 – 12:30

TECHNICAL TOURS

SINGAPORE CITY GALLERY AND URA'S DIGITAL PLANNING LAB

Brought to you by: Urban Redevelopment Authority

Planning a city requires an understanding of how factors such as the economy, environment, built infrastructure and social needs affect and shape the ways in which people live, work and play. As Singapore's land use planning and conservation authority, the Urban Redevelopment Authority (URA) actively explores and leverages new digital technologies to transform and improve our planning processes. Geospatial and data analytics allow our planners to gain deeper insights into current and future scenarios, helping them to plan in a more precise manner to cater to the needs of the population in both the short and long term.

Our drive to find innovative urban solutions led to the creation of a suite of in-house digital planning tools. It also sparked joint collaboration projects with academic, research and industry partners to further enhance our planning processes.

Discover how our planners apply advanced geospatial simulation and visualisation methods to their work and observe how various datasets over time and space are layered to efficiently guide planners on existing land use and infrastructure developments.

Next, experience a free guided tour of the revamped Singapore City Gallery, which showcases the nation's dramatic transformation over the past 50 years. Here, discover how various stakeholders have contributed to shaping our city and, through various interactive and immersive exhibits, learn more about Singapore's planning challenges and the innovative solutions found to tackle them.

Tour Schedule:

- Tuesday, 22 October 2019: 14:30 – 18:00
- Wednesday, 23 October 2019: 14:30 – 18:00

SINGAPORE BUS TRAINING AND EVALUATION CENTRE

Brought to you by: SMRT Frontier

As a leading and premier Public Transport Operator in Singapore, SMRT Roads is focused on delivering the safest, most reliable, caring and comfortable transport service to achieve the highest customer service standards. SMRT Roads is a two-time winner of Land Transport Excellence Awards 2017 and 2019 for Best Service Partner.

Established in 2015 by SMRT Roads, the Singapore Bus Training and Evaluation Centre (SG BTEC) is a state-of-the-art simulation training centre for bus professionals. We aim to hone safe driving skills, develop drivers' competencies and provide team-based training to enhance bus service reliability.

SMRT leverages on PROLEARN that uses data analytics to monitor driving behaviour and flag out at-risk drivers. The PROLEARN provides an evidence-based approach to develop safe driving habits and proactively reduces accident risk. PROLEARN shapes and improves driving behaviour, resulting in safer (lesser passenger mishaps) and more comfortable rides. With lesser accidents, the reliability of bus services is enhanced. PROLEARN system is a modular and flexible system, which can be easily customised to fit other transport operators.

The PROLEARN has won awards over the years:

2019- Land Transport Excellence Awards - Most Innovative/ Effective Safety Programme by PT Operator

2017 - SMRT Buses won Certification of Recognition in the UITP Awards 2017 in the Operational and Technological Excellence category

2016 - Singapore Business Review Listed Companies Award -SMRT Buses won in the Technology category

From this technical tour, you will

- Understand how and why SG BTEC was set up to conduct simulation training
- Learn how SMRT Buses leverages on Data Analytics to customise preventive training for drivers at risk

Tour Schedule:

- Tuesday, 22 October 2019: 14:30 – 17:30

VISIT INNOSUITE - UNCOVER HOW EMERGING TECHNOLOGIES HELP SOLVE COMPLEX MOBILITY AND SMART CITIES CHALLENGES

Brought to you by: ST Engineering Electronics Ltd

Come on board at InnoSuite as we share and discuss innovative ideas and solutions for smart, safe and sustainable cities. You will experience and learn how technology is making a quiet yet lasting impact for organisations and cities, and its citizens. From Data-driven Traffic Management Platform to Smart Metro Control Centre, from the world's smallest 2 factor authentication data storage to our suite of in-house developed Cybersecurity products, from enabling district-wide sensing network to lamppost-as-a-platform, and a portfolio of our satellite and public safety and security solutions, the ability to harness technology will advance and effect the change, to make the world a better place.

Tour Schedule:

- Friday, 25 October 2019: 09:00 – 12:00

VISIT TO IBM STUDIO SINGAPORE - INNOVATION WITH THE IBM WAY!

Brought to you by: IBM Singapore Pte Ltd

IBM Studios Singapore, a new design center to help clients reinvent their business for the digital age and develop individualised experiences through a combination of cognitive capabilities and experience design.

Located in the Marina Bay Financial Centre, IBM Studios Singapore will serve as the regional hub and will host more than 100 designers and digital experts from IBM iX (Interactive Experience). IBM iX provides next-generation services dedicated to digital reinvention and transformational outcomes. Clients will work side-by-side with teams of IBM creative designers, researchers, digital strategists, analytics and cognitive solution experts to analyse their business challenges and co-create new business models and offerings.

IBM applies the principles of IBM Design Thinking, which takes a rapid prototyping approach to user-centric product development, as well as IBM Design Language, a framework to inspire bold and engaging experiences.

IBM Studios Singapore joins the growing network of 30 IBM Studios across the globe, including locations such as Austin, Atlanta, Bangalore, Boston, Chicago, Dubai, Toronto, Groningen, Melbourne, Mexico City, Hursley, London, New York, Dallas, Prague, Sao Paolo, Madrid and Shanghai.

Delegates will get to learn about digital transformation strategy, cognitive experience design and development, mobile and omni-channel applications, and digitally enhanced customer journeys, and the success stories of some IBM's transportation industry clients leading from the IBM Studio.

Tour Schedule:

- Friday, 25 October 2019: 09:30 – 13:00

TECHNICAL TOURS

POST CONGRESS TECHNICAL VISIT TO JOHOR, MELAKA, PUTRAJAYA AND KUALA LUMPUR, MALAYSIA

Brought to you by: ITS Malaysia

This 3-Day-2-Night Post Congress Tour will bring delegates across the Causeway to Kuala Lumpur, via Iskandar Malaysia (Johor) and the UNESCO World Heritage City of Melaka. Delegates will start their journey at the designated pick-up point at the Suntec Singapore Convention & Exhibition Centre, at 8am on 26 Oct 2019. The tour will be by coach to Kuala Lumpur with an overnight stay in Melaka. The return journey to Singapore will be via Malindo Air.

On Day 1 (26 Oct), we will visit Iskandar Malaysia, which is the test bed for smart city deployment in Malaysia. This will be followed by a visit to the Malaysian Institute of Road Safety Research (MIROS) Crash Safety Engineering Unit for a crash safety demonstration, before adjourning for the evening for an overnight stay in the historic city of Melaka. The more adventurous delegates may wish to take this opportunity to experience the Melaka river cruise, night market at Jonker's street, the Taming Sari revolving gyro tower, as well as local cuisines, and/or various other attractions.

On Day 2 (27 Oct), we will continue the journey via the North-South Expressway, with a stopover and a tour of the Federal administrative capital of Putrajaya. Some of the highlights include the 240m cable-stayed bridge – the Seri Wawasan bridge, the Putra Mosque constructed with rose-tinted granite, and the majestic Putra Perdana - office of the Malaysian Prime Minister, the flower gardens and the Putrajaya lake. This will be followed by a visit and briefing at the PLUS North-South Expressway Traffic Monitoring Centre in Subang, before checking in for a night stay at a 4-star hotel in the Kuala Lumpur City Centre for a free-and-easy evening. Delegates will be staying in the Golden Triangle area, which features the popular shopping and culinary districts of Bukit Bintang, Kuala Lumpur City Centre and Chinatown.

On Day 3 (28 Oct), the post congress tour will be completed with a visit to the Stormwater Management and Road Tunnel (SMART) and Control Centre. The 9.7km long, 13m diameter tunnel diverts flood water away from the central Kuala Lumpur, with the middle portion of the tunnel of about 3km in length serving as a double deck motorway. In year 2011, the SMART Tunnel won the UN Habitat Scroll of Honour Award, being recognised for its innovative and unique management of stormwater and peak hour traffic. After lunch, delegates will depart for the Kuala Lumpur International Airport (KLIA) for the return flight to Singapore. Scheduled departure from KLIA is at 5pm on 28 Oct 2019.

The tour fee includes coach transportation from Singapore to Kuala Lumpur; a single-room accommodation at 4-star hotels for the scheduled 1-night stay in Melaka and Kuala Lumpur respectively, and a one-way economy flight ticket from Kuala Lumpur to Singapore. The fee excludes meals other than lunches, travel visa to Malaysia, travel insurance and any other expenses not specifically included or described in the final tour itinerary.

Tour Schedule:

- Saturday, 26 October 2019: 18:00 – Monday, 28 October 2019: 15:00

POST CONGRESS TECHNICAL VISIT TO JAKARTA AND BALI, INDONESIA

Brought to you by: ITS Indonesia

As one of the countries that is catching up with other advanced Asian countries in transportation-technology-supported tourism industry, ITS Indonesia has arranged a 3-Day-2-Night Post Congress Technical Tour to two important destination cities in Indonesia; Jakarta and Bali.

The first day (26 Oct) will be started early in the morning with your flight by Garuda Airways from Singapore to Jakarta. A transport by bus will be arranged for delegates upon arriving Jakarta to the Jakarta's first subway station, the MRT Main Station. Supported by JICA, this is the first Indonesia's subway station that marks Jakarta city's ambitious plan to transform its transportation to mass transport system supporting 15 million Jakarta residents. Delegation will have a short tour to the facility and MRT officials will be ready to answer questions. The tour will not be complete without the ride, hence the delegates will take a ride on the MRT line towards center line.

After getting out at GBK (Gelora Bung Karno) station, delegates will be shown on how MRT can accommodate any big sports exhibitions and events held in one of the biggest sport complexes in Asean – -which can host events from football to tech expo. Integrated with this MRT station is the well-known Bus Rapid Transport, Transjakarta. Delegates will continue the journey with a bus ride on Transjakarta to City Hall for a social lunch with Jakarta city and Ministry of Transportation officials.

To get back to Soekarno Hatta International Airport, delegate will be taking a ride on Airport Raillink train that directly carries passengers from city centre to the Airport. The delegates' day will be ended in Bali, traveling from a busy city life to a serene tropical beauty.

On the second day (Sunday, 27 Oct), delegates will experience government efforts to support Travel Industry in transportation sector, beginning with visits to Bali Toll Roads command center that manages private buses and vehicles in major tourist destinations such as Garuda Wisnu Kencana (GWK) and Pura Uluwatu. GWK is a 112-meter tall Hindu Statue made from Bronze, overlooking the Bali island scenery. Pura Uluwatu is what people see in Bali postcards, however much better in reality and experience. The second night will be ended with seafood dinner at the beach dining Jimbaran.

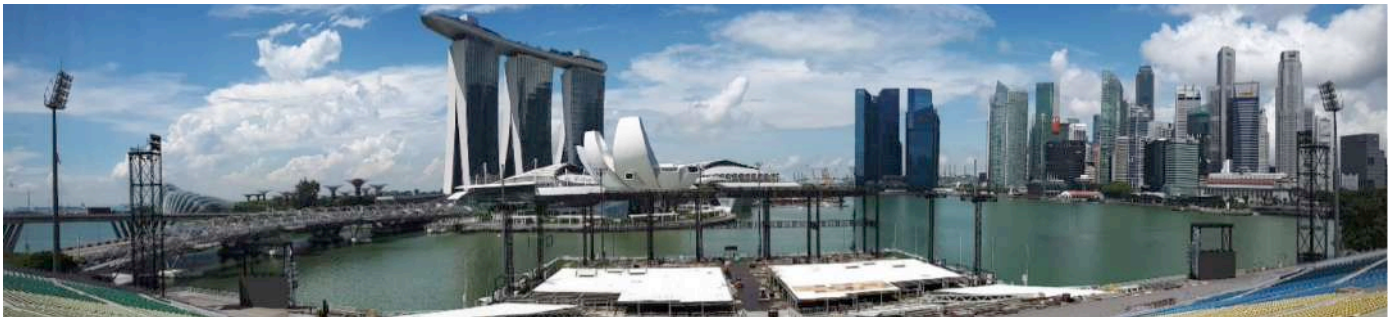
On the third day (Monday, 28 Oct) , our staff will collect luggage of the delegates that are checking out, as the next visit will be the transportation academy BPPTD that educates and trains future transportation executives, regulators and operators. BPPTD will gladly share the local experience and learn from delegates on the international world of transportation technology.

The tour fee covers airline ticket from Singapore to Jakarta and Bali, all group transportations, delegate's premium hotel stay, three day group breakfast and lunch, excluding dinner. We will assist delegate who wish to extend the itinerary, and for delegates that are returning home, we will provide shuttle bus to the airport.

Tour Schedule:

- Saturday, 26 October 2019, 05:30 – Monday, 28 October 2019, 12:00

DEMONSTRATIONS

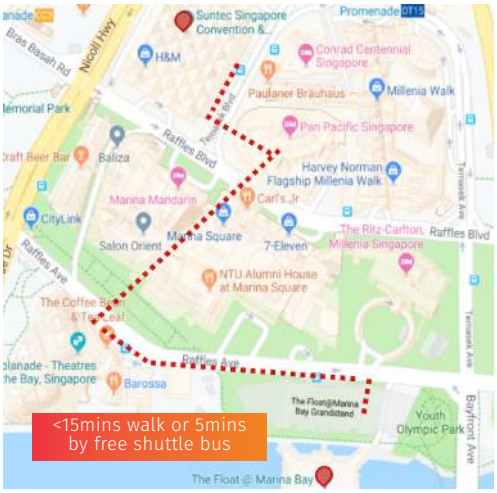


Hot activities – Do remember to sign-up early for these demonstrations and be the first to experience new technologies on the road in Singapore, held at the nearby Float @ Marina Bay - the world's largest floating stage, accompanied by an impressive skyline view of Singapore.

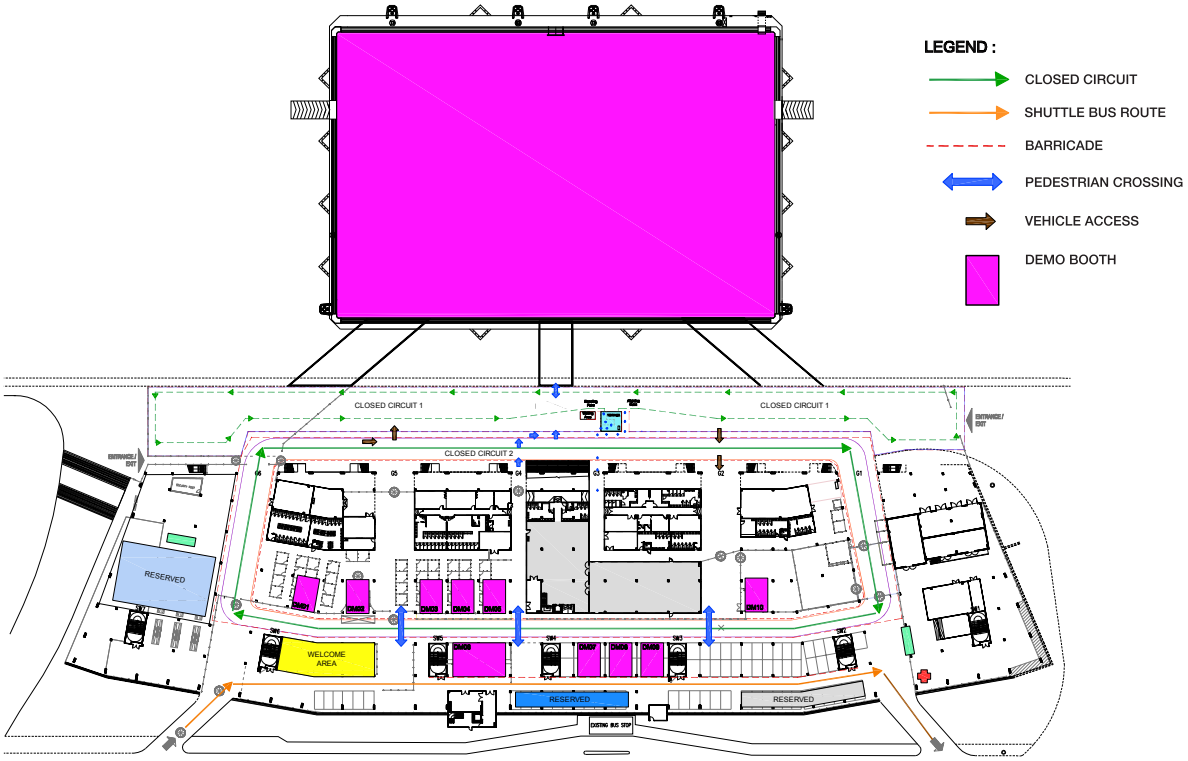
The demonstrations at the ITSWC 2019 will bring together companies and organisations that are showcasing their developmental vehicles, systems and concepts, some of which are already on trial or are being test-bedded in Singapore.

General Guidelines

- **Demonstration booking:**
  via Congress Mobile App (launched closer to the event) or at the Demonstration desk @ Suntec
- **Demonstration hours:**
  Tuesday, 22 – Thursday, 24 October: 09:00 – 17:30
  and Friday, 25 October: 09:00 – 14:00



THE FLOAT@MARINA BAY



LAND TRANSPORT AUTHORITY, SINGAPORE – CONCEPT SMART PUBLIC BUS OF THE FUTURE

Brought to you by: Land Transport Authority

This demonstration aims to:

1. Highlight some of the features that youths think the smart bus of the future could have.

In 2017, LTA organised the Smart Bus Challenge where youths were invited to rethink and co-create concepts that can change the way commuters travel on public buses. After the conclusion of the Challenge, selected ideas from the submissions were chosen to be integrated into a single bus to showcase what the public bus of the future could potentially look like through the lenses of the youths.

2. Share some proof of concept features that LTA is co-creating with the industry

LTA regularly works with the industry to co-create improvements to our public buses. Some of these improvement and features will also be shared in this demonstration.

AI ROBOTICS – TECHNOLOGY TRANSFORMING VEHICLES TO ROBOTS ON WHEELS

Brought to you by: Ai Robotics Pte Ltd

Ai Robotics will exhibit our cutting-edge technology, which transforms any vehicle into an autonomous robot. Mimicking the actions of human beings, our computer vision software uses cameras to localise and manuvere itself. By presenting the retrofitted vehicle with various obstacle scenarios, we will showcase our technology's ability to effortlessly and safely avoid hazards.

COMFORTDELGRO – EZ10: THE SMART SHUTTLE FOR FUTURE MOBILITY

Brought to you by: ComfortDelGro Corporation Limited

The future is now! Singapore-based ComfortDelGro, one of the world's largest land transport companies, and its partners Inchcape Singapore and EasyMile, will be showcasing the EasyMile EZ10 Autonomous Shuttle at the 26th Intelligent Transport System World Congress 2019. Visitors will get to board and experience first-hand what it feels like to be ferried around in one of the most widely deployed autonomous vehicles in the world.

DEMONSTRATIONS

ST ENGINEERING LAND SYSTEMS – COME ABOARD THE NAVYA AUTONOM SHUTTLE, THE ELECTRIC AND AUTONOMOUS MOBILITY SERVICE AND THE AUTONOMOUS FUTURE: STROBO BUS

Brought to you by: ST Engineering

Come aboard the AUTONOM SHUTTLE and discover an autonomous and fluid travel, with neither a steering wheel nor pedals. AUTONOM SHUTTLE fleets improve private sites, ease road congestion in urban centres and guarantee autonomous transport performance for the first and last mile. Discover through this service an application of our shuttles and enjoy a pleasant trip while making the most of your travel time.

ST Engineering, an established player in the autonomous bus segment has raised its autonomous vehicles capabilities another notch with the rollout of new AV platforms. The group's STROBO portfolio brand of autonomous bus platforms will be unveiled at the ITS World Congress 2019 in Singapore. On display at the Floating Platform will be the STROBO Bus Series 7. Designed to meet urban traffic requirements and weather conditions, the Series 7 will offer customers more choices based on their operational requirements.

QUANTUM INVENTIONS / CONTINENTAL – IMPROVING ROAD SAFETY FOR FLEETS AND DRIVERS THROUGH CONNECTED, ADVANCED DRIVER ASSISTANCE SYSTEMS USING V2X

Brought to you by: Quantum Inventions, A Company of Continental Corporation

Crash-free driving will be the norm in the future. At the demonstration site, the company will showcase the use of V2X technologies for improved communication and safety on the road. The demonstration leverages V2X to form ad-hoc networks of connected vehicles that alert other road users about collision risks. It also detects driver fatigue events and communicates this to nearby vehicles to increase awareness and minimize accidents. Visual interfaces dedicated to communicating blind spots can also be disseminated to further enhance road safety.

MOOVITA, PIONEER & SMRT - URBAN TOWN SHUTTLE SERVICE

Brought to you by: MooVita, Pioneer & SMRT

Come and experience one of Singapore's first autonomous shuttle solutions by MooVita. Ride through with a first hand view of how the shuttles navigate a fixed route, responding to scenarios such as point to point navigation (Bus Stops), obstacle detection and avoidance, traffic light adherence and automated parking/docking.

NTU-VOLVO-SMRT - WORLD'S FIRST ELECTRIC AUTONOMOUS BUS

Brought to you by: Energy Research Institute @ Nanyang Technological University Singapore

The first organisation to trial an autonomous vehicle on Singapore roads, Nanyang Technological University, Singapore (NTU Singapore) is at the forefront of autonomous vehicle (AV) technologies since 2013. Apart from test-bedding autonomous buggies and utility vehicles, NTU is also developing the world's first full-size 12-meter electric and autonomous bus on its Smart Campus.

NTU researchers have designed and developed the AV software controller stack necessary for localisation, navigation and object detection, and classification using different sensor-based hardware that include, 3D LIDARs, RADARs, cameras, GPS and IMUs. This is also available in the form of AV kits which incorporate hardware and software implementations that convert manually-driven vehicles into complete level 4 and level 5 fully-autonomous vehicles.

A unique controller algorithm is required to mimic the normal manual driving capabilities of a human driver, enabling autonomous or driverless vehicle operation along any specific routes. Cutting-edge artificial intelligence (AI) systems are integrated in the AV Bus platform to facilitate autonomous object detection and classification, ensuring a seamless and reliable ride.

VOLOCOPTER – VOLOPORT BY VOLOCOPTER IN COLLABORATION WITH SKYPORTS – SHOWCASE OF THE WORLD'S FIRST FULL-SCALE AIR TAXI VERTIPORT PROTOTYPE

Brought to you by: Volocopter GMBH and Skyports Limited

VoloPorts are the physical landing pads for so-called eVTOL (electric take-off and landing) aircraft or air taxis. This ground-based infrastructure is critical to the success of future Urban Air Mobility (UAM), particularly air taxi operations in congested cities. Vertiports are the only physical infrastructure required for air taxis to commence operations in cities in the near future. This VoloPort prototype allows the two partners, UK-based global vertiport owner and operator Skyports, and air taxi pioneer Volocopter to perform real-life testing of the customer journey and showcase operational processes. VoloPorts are designed to provide passengers with a seamless air taxi experience that is safe, secure, and relaxing. They will merge with their surroundings, allowing passengers and passers-by to see through the whole structure. VoloPorts are a crucial step in making UAM a reality. A full-scale model of the Volocopter 2X air taxi will be on display in the VoloPort prototype.

SOCIAL EVENTS

SOCIAL EVENTS

WELCOME RECEPTION

Date and Time: Monday, 21 October 2019, 17:00 – 19:00

Venue: Exhibition Hall, Level 4, Suntec Singapore Convention and Exhibition Centre

Tickets: Included in Delegate Registration

Following the opening ceremony, join your colleagues at the Welcome Reception held at the exhibition hall. The Welcome Reception is an excellent opportunity to meet with peers from the industry and network with our commercial partners and exhibitors.

GALA DINNER

Date and Time: Wednesday, 23 October 2019, 18:30 – 22:00

Venue: Flower Field Hall, Gardens By the Bay

Tickets: SGD 250 per pax to be purchased at the time of registration

Join us on a truly immersive dinner experience at the World's Largest Greenhouse (Guinness World Record 2015) – Flower Dome at Singapore's Gardens by the Bay.

The evening will begin with a cocktail reception at the Waterview room followed by sit down dinner at the Flower Field Hall that is nestled within the Flower Dome of the Gardens and overlooking the periodically changing Flower Field display on one side, and a spectacular view of the Marina Bay skyline on the other. The special LED lights that adorn the ceiling add to the enchanting setting, captivating guests with its picturesque backdrop of perpetual spring.

As the evening unfolds, guests will enjoy good company, captivating performances and great music to dance the night away.

ASSOCIATED EVENTS

ASSOCIATED EVENTS

NOTE: *Participants of the Associated Events (AE 01 - AE 09) must be registered for the ITS World Congress 2019 as a delegate (full congress or one day pass for the given day), speaker, moderator, student or media personnel. If you are registered an exhibition visitor, accompanying person, exhibition stand personnel or demonstrator, you will not be able to access the session rooms.*

YOUTH LEADERSHIP DEVELOPMENT PROGRAMME

(by invitation only)

The Youth Leadership Development Programme – a part of the 26th ITS World Congress – is a fully-hosted 8-day programme that will be held from 18 to 25 October 2019.

The programme is designed to arouse the awareness of the tertiary students with respect to advanced intelligent transport technologies and concepts and inspire their creative and innovative ideas that solve real ITS problems.

Participants will get a chance to engage and mingle with entrepreneurs, investors and business leaders from the ITS industry. Ideation mentorship and professional training will also be conducted during the programme, which will provide young leaders with an excellent platform to showcase their creative ideas

Youth leaders will work together in groups in an ideathon to ideate on "Grand Challenge" topics and present to a distinguished panel during the 26th ITS World Congress 2019. The best work will be awarded at the ITS World Congress Closing Ceremony.

Organised by: Youth Development Sub-committee, 26th ITS World Congress

Date: 18 - 25 October 2019

Time: 09:00 – 18:00 on all days except Friday, 25 October where the Programme ends at 13:30

Contact Person: Leon Ng (youthleadership@itsworldcongress2019.com)

THE 54TH ISO/TC 204 PLENARY AND WORKING GROUP MEETINGS

(by invitation only)

ISO/TC 204 Intelligent Transport Systems is the technical committee for ITS standardisation within the International Organization for Standardization (ISO). It has been leading the ITS standardisation globally for over two decades since its inception, and there are currently twelve active working groups. The committee holds two plenaries annually, and the next 54th ISO/TC 204 Plenary and Working Group Meetings will be held in Singapore, 14-18 October 2019. Plenary, working group meetings and technical workshops will be organised through the week. All meetings are open to ISO/TC 204 members and invited guests only. National delegates and participants are required to complete their registration through their national standards bodies by 27 September 2019.

Organised by: ISO/TC 204 Intelligent Transport Systems

Date: 14 - 18 October 2019

Time: 09:00 - 18:00 on all days

Contact Person: Adrian Guan, Committee Manager of ISO/TC 204 (adrian.guan@sae.org, +1.202.721.4236)

ASSOCIATED EVENTS

AE 01 : AASHTO INTERNATIONAL DAY

Now in its 16th year as an integral part of the ITS World Congress, AASHTO International Day is presented by the American Association of State Highway and Transportation Officials in partnership with the US Department of Transportation. It brings together transportation officials from around the world to take on topics of consequence addressing the transportation challenges and opportunities facing public agencies.

The 16th Annual AASHTO International Day (AID) will focus on the 2019 ITSWC theme "Smart Mobility, Empowering Cities" and the latest ITS solutions and mobility technologies from around the world. Topics will include:

- MaaS, MoD, Ride Share, Livability and Active Transportations
- AV and CV – Policy, Legislative and Regulatory
- Digital Infrastructure – telecommunications – 5.9 GHZ and 5G
- Digital Infrastructure – Big Data and Infrastructure Readiness for CAV
- Cyber Security

Presentations will be offered by policy experts and practitioners representing each of the three ITS regions (ITS America, ITS Europe (ERTICO), and ITS Asia Pacific) and from Singapore, the host of this year's World Congress.

All who are participating in the ITS World Congress are welcome to attend this event!

Organised by: American Association of State Highway and Transportation Officials in Partnership with the US Department of Transportation

Date: Monday, 21 October 2019

Time: 08:00 - 12:00

Venue: Room 325, Suntec Singapore Convention and Exhibition Centre

Contact Person: Venkat Nallamothu (vnallamothu@aashto.org) or Tom Kern (tkern@transportationops.org).

AE 02: C-LEVEL FORUM ON MOBILITY SOLUTIONS FOR SMART CITIES

In line with the Congress theme "Smart Mobility, Empowering Cities", this high-level session provides a platform for companies to share solutions that can enable cities to improve the well-being of residents living or working there. Smart transportation solutions are key to making cities function effectively, but these solutions have to be tailored to the unique transport needs of individual cities. The panel of speakers at this session will share their views on what smart mobility means to them and share possible solutions to make this possible.

Date: 21 October 2019

Time: 13:30 - 15:30

Venue: Nicoll 3, Suntec Singapore Convention and Exhibition Centre

Contact Person: Sha Idris (spex.mgt@itsworldcongress2019.com)

AE 03: GLOBAL FORUM ON MAAS

The MaaS Forum is part of the ITS World Congress 2019 which will be held in Singapore. It explores how MaaS can enable greater and more efficient use of public and shared transport in cities with dense public transport landscapes. In this context, this forum intends to delve into three aspects of doing so, from strategy to implementation. These are, namely, the viability of MaaS business models and their potential for integration within and across various sectors; the ways in which MaaS can operate and integrate and the challenges that will be faced in such cities; and the technological challenges and solutions in the implementation of MaaS in these cities. This discussion thus aims to unearth potential benefits and hurdles with regard to whether MaaS products will be transformative additions to the overall transport offerings in such cities.

Organised by: Land Transport Authority, Singapore

Co-organised by: ITS America, ERTICO – ITS Europe and ITS Australia

Date: Tuesday, 22 October 2019

Time: 14:00 - 17:30

Venue: Nicoll 1, Suntec Singapore Convention and Exhibition Centre

Contact Person: Weisen Ong (ONG_Weisen@lta.gov.sg)

AE 04: CYBER-SECURITY WORKSHOP

Cyber-security is the state or process of protecting and recovering networks, devices, and programs from any type of cyber-attack. Cyber-attacks are an evolving danger to organizations, employees, consumers AND the safe operation of CAV vehicles. They may be designed to access or destroy critical data and communications to prevent CAVs from operating safely.

In these two workshops, experts from around the world will focus on the issue of cyber-security on the development of CAV vehicles and how cyber-security attacks can be prevented by the use of smart technology.

Workshop 1

Moderator: Eric Sampson, Newcastle University (UK)

Introduction: The Hon. Jaala Pulford, Minister for Roads, Minister for Road Safety and the TAC – Victorian State Government Minister, Australia

Speakers: Ziv Levi, Chief Executive Officer Arilou (Israel)
Christian C Lemire, Intelligent Mobility Practice Lead Genetec (USA)
Josh Johnson, Director Critical Systems Department SWRI (USA)
Andrew Gurr, Managing Director Fusion Networks (New Zealand)

Workshop 2

Moderator: Steve Dellenback, Southwest Research Institute (USA)

Introduction: The Hon. Jaala Pulford, Minister for Roads, Minister for Road Safety and the TAC – Victorian State Government Minister, Australia

Speakers: Giannis Karaseitanidis, Technical Director of I-SENSE Group (Greece)
Doug Couto, Senior Fellow, Centre for Digital Government e.Republic (USA)
Eetu Pilli-Sihvola, Chief Advisor Connected and Automated Driving Traficom (Finland)
Fiammetta Diani, Head of Market Development at European GNSS Agency (GSA)
Shao Fei Huang, Chief Information Security Officer LTA (Singapore)

Organised by: ITS Australia and ITS New Zealand

Date: Tuesday, 22 October 2019

Time: 14:00 - 15:30 *(Workshop I)*; 16:00 - 17:30 *(Workshop II)*

Venue: Room 326, Suntec Singapore Convention and Exhibition Centre

Contact Person: Dean Zabrieszach (dean.zabrieszach@hmitechnologies.com.au)

AE 05: SYNERGISING THE GREATER BAY AREA WITH SMARTER MOBILITY

The strategic development of the Guangdong-Hong Kong-Macao Greater Bay Area (Greater Bay Area) is one of the key initiatives of China's national development blueprint, which brings together the two Special Administrative Regions of Hong Kong and Macao and nine municipalities in Guangdong Province. With a combined population of approximately 70 million people and GDP of US$1.5 trillion, through synergising the collective strengths of the municipalities with coordinated economic development and technological innovation, the Greater Bay Area is fully geared to soon become a leading global economic zone. Although cities such as Hong Kong, Shenzhen and Guangzhou are already international metropolis with their own world-class transport and smart city infrastructure, the challenge is to further boost the connectivity of strategic transport systems of the municipal cluster through enhanced infrastructure and forefront technologies, so as to bring forth the synergised economic strength and maximum development potential of the Greater Bay Area. As Asia's world city, Hong Kong will take up the principal role in spear-heading the Greater Bay Area Development, and by leveraging its wealth of strengths including modern infrastructure and technology expertise, Hong Kong is well positioned to drive the closer integration of the mega-metropolis with stronger transport connectivity and smarter mobility infrastructure. Intelligent Transport Systems Hong Kong will showcase the latest development plans for ITS implementation in Hong Kong and their applicability to the Greater Bay Area, and the immense potential offered to ITS professionals in the coming decades.

Organised by: Intelligent Transport Systems Hong Kong (ITS-HK)

Date: Tuesday, 22 October 2019

Time: 14:00 - 16:00

Venue: Room 321, Suntec Singapore Convention and Exhibition Centre

Contact Person: Lilian Pun (lilian.pun@polyu.edu.hk)

ASSOCIATED EVENTS

AE 06: C-ITS AND V2X WORKSHOP

The promise of improved safety, network management, and information services, and reduced environmental impact, is driving the rapid development of Connected ITS. In this workshop we will look at what existing V2X services are being deployed, the new services that are close to the market including long- and short-range cellular communications and hybrid solutions, and different approaches to data platforms. As well as the technology aspects we will consider alternative business models and some aspects of security. We will review different approaches to system architectures designed to ensure interoperability of C-ITS services across borders, interoperability testing, and recent developments with the US–Europe collaboration on C-ITS architectures

Organised by: ERTICO – ITS Europe
Date: Wednesday, 23 October 2019
Time: 09:00 – 10:30
Venue: Room 324 , Suntec Singapore Convention and Exhibition Centre
Contact Person: Zeljko Jeftic (z.jeftic@mail.ertico.com)

AE 07: FUTURE MOBILITY INTERNATIONAL WORKING GROUP 3.0

(by invitation only)

Formerly known as the Intelligent Vehicle Testing Symposium, the event will bring together leaders from industry, government and academia from across the globe to discuss collaboration on policy regulations and standards for the development, testing and deployment of intelligent vehicle and transportation technologies.

Organised by: Michigan Economic Development Automotive Office, U.K. Centre for Connected and Autonomous Vehicles and Zenzic
Date: Wednesday, 23 October 2019
Time: 11:30 – 16:30
Venue: Nicoll 1 , Suntec Singapore Convention and Exhibition Centre
Contact Person: Nathan Fergus (fergusn@michigan.org)

AE 08: 5G AND IOT BOOSTING THE DIGITAL TRANSFORMATION OF THE AUTOMOTIVE SECTOR

IoT has contributed tremendously to advancing the Connected and Automated Mobility (CAM) goals of safety, traffic efficiency and comfort. 5G, with its promise of a highly flexible architecture and extended reach of communication, can amplify IoT-CAM use cases in unprecedented ways. There are boundless economic benefits of using 5G's network slicing model for IoT service provision. Harnessing fully the potential of IoT and big data solutions powered by 5G requires a collaborative approach towards a global market vision. In this symposium, experts from Europe, Asia and the Americas will present perspectives on how 5G and IoT can bridge the gap to fully automated and on-demand mobility. The discussion will centre on:

1) technological trends and research and innovation strategies;
2) new business models for automated mobility, particularly data sharing along a large value chain involving diverse stakeholders supplying solutions; and
3) policy and regulation approaches across the three regions.

Organised by: ERTICO – ITS Europe
Date: 23 October, Wednesday
Time: 14:00 - 17:30
Venue: Room 324, Suntec Singapore Convention and Exhibition Centre
Contact Persons: François Fischer (f.fischer@mail.ertico.com) or Rita Bhandari (r.bhandari@mail.ertico.com)

AE 09: AUTONOMOUS MOBILITY SUMMIT

As part of the Intelligent Transport Systems World Congress in Singapore, the Land Transport Authority of Singapore will be organising an Autonomous Mobility Summit on 24 October 2019. This full-day Summit will gather global thought leaders from the government, industry and academia to discuss the latest developments in autonomous mobility. Through various panel discussions, fireside chats and keynotes, the Summit will examine the current state of the art with respect to autonomous driving, assess its potential to shape the future of our cities, explore the key drivers that would accelerate the uptake of autonomous mobility globally as well as consider investor perspectives on the sector. For more information on the Summit, please go to www.amsummit.sg

Organised by: Land Transport Authority, Singapore
Date: Thursday, 24 October 2019
Time: 09:00 - 17:30
Venue: Summit Room, Suntec Singapore Convention and Exhibition Centre
Contact Person: Benjamin Chia (Benjamin_CHIA@lta.gov.sg)

SPONSORED SESSIONS

BREAKFAST SESSIONS

NOTE: *Participants of the Sponsored Sessions must be registered for the ITS World Congress 2019 as a delegate (full congress or one day pass for the given day), speaker, moderator, student or media personnel. If you are registered an exhibition visitor, accompanying person, exhibition stand personnel or demonstrator, you will not be able to access the session rooms.*

BS 01: CYBERSECURITY IN RAIL

Tuesday, 22 October 2019 | 07:30 – 08.30 | Room 308

Whether it's artificial intelligence or the Internet of Things (IoT), rail operators are turning to technology to boost capacity, reduce infrastructure costs and improve the passenger experience. And a growing number are looking ahead to the revolutionary potential of autonomous trains. Digitalisation is making railways faster, safer and more comfortable. But it also exposes rail operators to cybersecurity risks. The challenge is amplified by the scale and complexity of our customers' rail operations. Networks contain thousands of field elements. Each one is a potential weak spot. The threats facing rail operators are real. Hackers can disrupt rail services and steal customer data, with serious economic and reputational consequences. Even passenger safety is at risk.

Beyond reducing risks, better cybersecurity improves efficiency, enhances the visibility of assets, enables operators to use shared networks and allows our customers to move towards the digital railway with confidence.

Host:

Thales, Singapore

BS 02: ENABLING COGNITIVE AND CONNECTED TRANSPORTATION SYSTEMS

Tuesday, 22 October 2019 | 07:30 – 08.30 | Room 312

As artificial intelligence (AI), automation, Internet of Things (IoT), autonomous vehicles, blockchain and 5G become pervasive, travel and transportation agencies and organisations have an unprecedented opportunity to elevate existing intelligent transportation systems (ITS) to new heights by harnessing the potential of cognition.

Join IBM at this breakfast session to hear about enabled next-generation transportation systems that reduces congestion, improves safety, and provides a greener environment.

Host:

IBM Singapore

BS 03: DIGITAL ROAD, SMART MOBILITY

Wednesday, 23 October 2019 | 07:30 – 08.30 | Room 308

Huawei will showcase our cutting-edge ICT technologies such as, AI cameras, cloud computing, 5G and C-V2X at the upcoming ITSWC 2019.

With strong believe in working on Eco System, to provide innovative applications for ICT industry through openness, innovation, and mutually beneficial cooperation with our partners, we will embrace the promising future of fully-connected, digital roads.

Host:

Huawei International Pte Ltd, Singapore

BS 04: BLOCKCHAIN IN ACTION: HOW TO TRANSFORM DATA SHARING AND CREATE A NEW BUSINESS MODEL

Wednesday, 23 October 2019 | 07:30 – 08.30 | Room 309

Blockchain and distributed ledger technologies have the potential to disrupt most industry verticals, yet businesses struggle to find, validate or deploy real-life use cases. Join HPE Pointnext experts and hear how HPE has worked with Continental to build a platform for sharing and monetizing vehicle sensor data based on Blockchain technology and on an edge-to-cloud architecture. This session will look at how your organization can adapt Blockchain now, prepare for roadblocks and how you can capitalize on the technology with your own use cases.

Host:

Hewlett Packard Enterprise (HPE) Singapore

BS 05: HOW CAN CITIES AND OEM SHAPE URBAN ELECTRIC MOBILITY TOGETHER? CHALLENGES AND OPPORTUNITIES DISCUSSED AT THE EXAMPLE OF HAMBURG

Thursday, 24 October 2019 | 07:30 – 08.30 | Room 309

The megatrend of urbanisation is causing a number of challenges cities are facing. One of the most urging challenges is urban mobility as air pollution and congestion increase, just to mention two out of many problems.

Today's car manufacturers, often seen as part of the problem, are transforming their business towards electric vehicles and sustainable mobility in order to become part of the solution.

This session outlines how cities and car manufacturers can jointly tackle the challenges of urban electric mobility by collaboration. The example of the City of Hamburg, the host city of ITS World Congress 2021, shows how the strategic partnership with Volkswagen Group supports the common goal of becoming a leader in urban electric mobility. What lessons are learned, what can be transferred to other cities and where are chances and opportunities, but also challenges and limits – all that is going to be discussed by this well-chosen panel of experts.

Host:

Volkswagen Group, Germany

STAKEHOLDER WORKSHOPS

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SW 01: FUELING TRANSPORTATION WITH AI AND INTELLIGENCE AT THE EDGE

Tuesday, 22 October 2019 | 09:00 – 10:30 | Room 321

Intel is bringing together the ecosystem to build the city of dreams. Technologies like IOT, Artificial Intelligence (AI), 5G and Visual Solutions are coming together to provide the services needed for transportation to become smarter, safer and more accessible for everyone.

In this session, we will show practical use cases implemented for traffic management, passenger terminals, transportation systems, vehicles, smart kiosks and more. Guests from different companies will talk about their experience in the implementation of different technology and the impact in the digital transformation. We will demonstrate how intelligence is brought to the edge and is available today and how Intel can help you scale your business and transform the industry to become the new fuel for transportation.

Host:

Intel Corporation, USA

SW 02: BRAND INTELLIGENCE: SEE THE WORLD THROUGH YOUR CUSTOMERS' EYES

Tuesday, 22 October 2019 | 09:00 – 10:30 | Nicoll 1

What are the key emerging trends within the transportation space? What do your customers want, need and expect? When major transport incidents occur, how are consumers reacting and what are their sentiments? In this track, you will learn how to think beyond Traditional Marketing and utilize Digital Intelligence for smarter decision-making.

In a world that is increasingly digital, real-time knowledge of your consumers in this space is crucial.

Amobee Brand Intelligence is an online media monitoring dashboard that can perform real-time multi-source data analysis. By measuring digital consumption, which focuses on what is read, seen and watched, which is distinct from online chatter, we are able to provide a holistic view of the silent majority and surface key trends in the minds of the consumers.

Brand Intelligence insights empower organizations and companies to confidently execute marketing strategy, public relations, or communications approach based on reliable, real-time insights into audience interests, profiles and behavior.

Host:

NCS Group

SW 03: CYBERSECURITY: OT/IT SECURITY

Wednesday, 23 October 2019 | 09:00 – 10:30 | Nicoll 1

Plants, industrial asset in general, are fragile environments on a cybersecurity point of view: more and more software and applications are on-boarded on these critical processes. Based on a physical scale model of a plant, our expert will illustrate the main threats and the possible solutions available.

Host:

Sopra Steria Asia Pte Ltd, Singapore

SW 04: HOW TO HARMONIZE URBAN MOBILITY

Wednesday, 23 October 2019 | 16:00 – 17.30 | Room 325

HERE and Siemens believe that the next-generation of mobility solutions will deliver a city-focused, international & integrated user-centered platform, democratizing mobility while solving cities transit issues for people and goods.

In this ITS workshop we will explore some of the remaining business challenges and understand how location intelligence can help solve these with new user-centric service models.

The workshop will showcase how to maintain a sustainable competitive advantage by using big-data capabilities such as visualization, analytics, archiving, event processing, map & services enrichment, and data monetization.

Host:

HERE Technologies, Singapore

SW 05: COMPUTING AT THE ROADSIDE

Thursday, 24 October 2019 | 09:00 – 10:30 | Room 324

Distributed computing and the associated connectivity technologies have the potential to improve traffic flow and safety, enable advanced ITS services, and simplify the maintenance and operations of the physical road infrastructures.

This session will present a roadside cloud architecture including MEC, 5G, C-V2X, and IoT. It will also discuss the various roles road operators, mobile network operators, and governments will play in this architecture.

Different use cases covering, for example, V2X and infrastructure management will be shown to illustrate how computing at the roadside can help prepare road operators for the future of mobility and transportation.

Host:

Nokia, Finland

SW 06: FUTURE TRENDS ON TUNNEL AND HIGHWAY MANAGEMENT REFLECTED ON THE NORTH SOUTH CORRIDOR IN SINGAPORE

Thursday, 24 October 2019 | 11:00 – 12:30 | Room 324

Insights from an Operator (LTA), an Engineering Firm (AECOM), and a Solution Provider (Siemens Mobility). The continuing increase in traffic volumes coupled with growing mobility demands and the need to take some of the burden off inner-city streets are shifting the focus towards the construction of tunnels and highways. Yet tunnels must meet particularly high requirements in terms of operational availability and safety.

A recent example of such an ambitious project is the 21.5 km long North South Corridor in Singapore with its 12.5 km tunnel where LTA, AECOM and SIEMENS MOBILITY work together to provide one of the most advanced inner-city expressways.

This session will illustrate how digitalization and the utilisation of IoT will not only offer road users and operators a maximum of safety, system reliability and sustainability, but also decrease the total cost of ownership.

Host:

Siemens Mobility, Singapore

STAKEHOLDER WORKSHOPS

SW 07: MODERNISING INTELLIGENT TRANSPORT SYSTEM WITH EVENT EXCHANGE DRIVEN BY EVENT MESH

Thursday, 24 October 2019 | 16:00 – 17:30 | Room 320

Digital technologies are transforming the way we live, work and play. A Smart Nation is a leading economy powered by digital innovation, IoT, connected cars and vehicles. A city/nationwide data exchange event driven backbone allows various ministries and industries to process data in real time with the efficient collection and distribution of real-time data. This the mission-critical foundation of connected vehicle initiatives, and Solace uniquely meets that need.

Solace will share how successful organizations achieve the visibility, optimisation and innovation by establishing "always on" connections with tens of millions of vehicles and IoT devices. Rather than having a duplicate infrastructure, smart exchange provides increased value at reduced cost with the latest Event Mesh from Solace. It is a foundational architectural layer for streaming IOT events, smart city events, aviation events as a core data exchange fabric.

With demos, case studies and an interactive panel discussion with the experts from the industry, this session will cover:

- Strategies for balancing the free access of information with the controls required around sensitive information
- Choices around open standards ensuring technology is not obsolete before it's realised
- Governance – how to align system capability with policy across organisational boundaries
- A demonstration of event exchange scenarios

Host:
Solace Corporation, Singapore

SW 08: ORCHESTRATING MOBILITY IN SMART CITIES

Thursday, 24 October 2019 | 16:00 – 17:30 | Room 321

Cities need a masterful orchestration of transport modes to deal with the most pressing mobility challenges: congestion, environmental impact and road safety. How can cities make use of technological advancements? How can they embrace the era of multimodality? Classic modeling approaches, in combination with the use of real-time data, provide powerful systems that enable authorities to optimize mobility as a whole. This workshop will provide state-of-the-art real-world examples in a short presentation, followed by a moderated discussion with international experts to update the progress being made and highlight the challenges remaining. At the end of this session will be an opportunity to network and socialize with speakers and participants.

Host:

PTV Group, Germany


Suntec
SINGAPORE
Convention & Exhibition Centre
LG
Life's Good

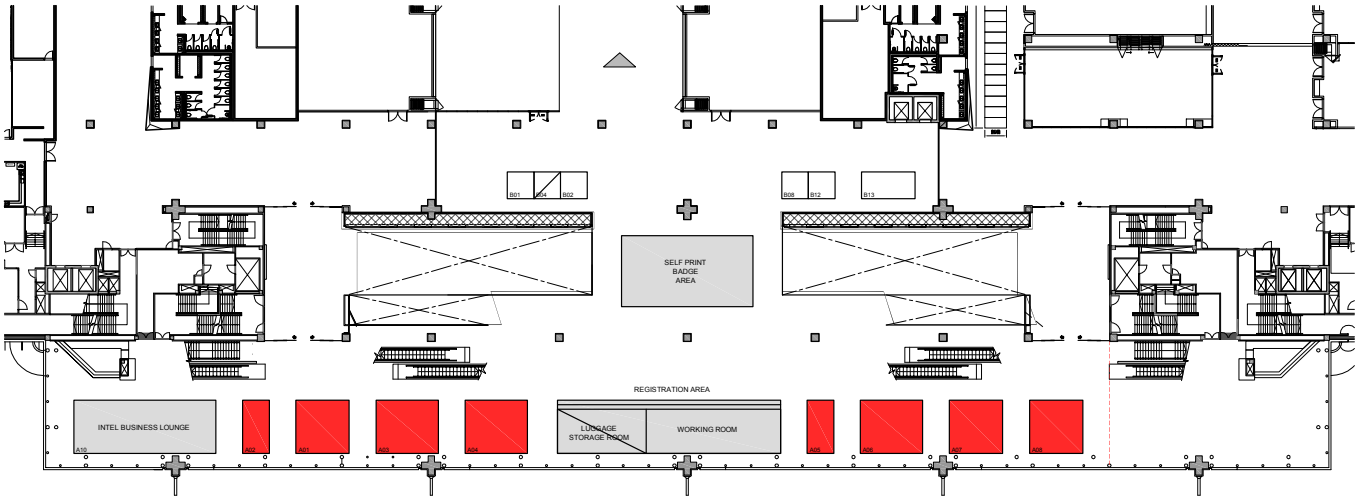
EXHIBITION

EXHIBITION FLOOR PLAN

The 2019 ITS World Congress will showcase more than 300 commercial exhibitors, public administrations and other organisations dedicated to ITS technology and services.

The main exhibition hall will be located on level 4, halls 401 – 406 and with additional exhibition showcases on level 3. To view participating exhibitors and exhibition floor plans, visit www.itsworldcongress2019.com/exhibition/

Suntec Convention and Exhibition Centre - Level 3 Exhibition



Suntec Convention and Exhibition Centre - Level 4 Exhibition

- Premium Booths
- Standard Booths

2GETTHEREASIA PTE LTD (CO-EXHIBITOR AT SG PAVILION)	#335
3M TECHNOLOGIES (S) PTE LTD	#441
4ICOM (CO-EXHIBITOR AT TTS ITALIA)	#350
5G CARMEN (CO-EXHIBITOR AT ITS EUROPEAN PAVILION)	#375
5G CROCO (CO-EXHIBITOR AT ITS EUROPEAN PAVILION)	#375
5G MOBIX (CO-EXHIBITOR AT ITS EUROPEAN PAVILION)	#375
5GMF (THE FIFTH GENERATION MOBILE COMMUNICATIONS PROMOTION FORUM) (CO-EXHIBITOR AT JAPAN PAVILION)	#287
5T (CO-EXHIBITOR AT TTS ITALIA)	#350
A.D. ENGINEERING INTERNATIONAL (CO-EXHIBITOR AT ITS AUSTRALIA)	#73
ADASIS (CO-EXHIBITOR AT ITS EUROPEAN PAVILION)	#375
ADEC TECHNOLOGIES AG	#218
AGD SYSTEMS PTY LTD	#217
AICHI STEEL CORPORATION (CO-EXHIBITOR AT JAPAN PAVILION)	#287
AIMSUN	#323
AISIN GROUP	#143
ALDRIDGE TRAFFIC CONTROLLERS PTY LTD (ATC/BRAUMS)	#75
ALLIANZ FUER DIE REGION GMBH (CO-EXHIBITOR AT ITS DEUTSCHLAND & CITY OF HAMBURG)	#501
ANDATA (CO-EXHIBITOR AT AUSTRIAN PAVILION)	#93
APPLUS IDIADA	#200
ASEAN PAVILION (LAND TRANSPORT AUTHORITY)	#339
ASFINAG (CO-EXHIBITOR AT AUSTRIAN PAVILION)	#93
ATTC AUSTRIAN TRAFFIC TELEMATICS CLUSTER (CO-EXHIBITOR AT AUSTRIAN PAVILION)	#93
AUSTRIAN FEDERAL MINISTRY FOR TRANSPORT, INNOVATION AND TECHNOLOGY (CO-EXHIBITOR AT AUSTRIAN PAVILION)	#93
AUSTRIATECH (CO-EXHIBITOR AT AUSTRIAN PAVILION)	#93
AUTONOMOUSTUFF (CO-EXHIBITOR AT HEXAGON)	#126
AUTOTOLL LIMITED	#98
AVL (CO-EXHIBITOR AT AUSTRIAN PAVILION)	#93
AXIS COMMUNICATIONS (S) PTE LTD	#467
AXIS COMMUNICATIONS (S) PTE LTD (CO-EXHIBITOR AT ITS NORDIC PAVILION)	#97
BAULTAR (CO-EXHIBITOR AT QUEBEC CANADA)	#393
BERCMAN TECHNOLOGIES (CO-EXHIBITOR AT ITS NORDIC PAVILLION)	#97
BERLIN PARTNER FOR BUSINESS AND TECHNOLOGY GMBH	#A01
BERLINER AGENTUR FÜR ELEKTROMOBILITÄT EMO (CO-EXHIBITOR AT BERLIN PARTNER FOR BUSINESS AND TECHNOLOGY GMBH)	#A01
BESTMILE	#233
BOUVET (CO-EXHIBITOR AT ITS NORDIC PAVILLION)	#97
BRISBANE CITY COUNCIL (CO-EXHIBITOR AT ITS AUSTRALIA)	#73
BRISK SYNERGY (CO-EXHIBITOR AT QUEBEC CANADA)	#393
BUCHEON CITY / BUCHEON CITY URBAN CORPORATION (CO-EXHIBITOR AT ITS KOREA)	#190
BUSINESS FRANCE (ITS FRANCE)	#493
CABINET OFFICE (CO-EXHIBITOR AT JAPAN PAVILION)	#287
CARRIDA TECHNOLOGIES	#235
CARTRACK TECHNOLOGIES SOUTH EAST ASIA PTE LTD (CO-EXHIBITOR AT SG PAVILION)	#335
CENTRAL NIPPON EXPRESSWAY COMPANY LIMITED (CO-EXHIBITOR AT JAPAN PAVILION)	#287
CEPTON TECHNOLOGIES	#B04
CESTEL (CO-EXHIBITOR AT HAENNI INSTRUMENTS INC.)	#452
CGI FINLAND (CO-EXHIBITOR AT ITS NORDIC PAVILLION)	#97
CHAINZONE TECHNOLOGY (FOSHAN) CO., LTD	#473
CHEMTRONICS CO. LTD (CO-EXHIBITOR AT ITS KOREA)	#190
CHINA ITS INDUSTRY ALLIANCE / 2022 WORLD CONGRESS ON ITS, SUZHOU	#425
CISCO (CO-EXHIBITOR AT ITS AUSTRALIA)	#73
CITILABS, INC	#216
CITILOG S.A.S. (CO-EXHIBITOR AT AXIS COMMUNICATION (S) PTE LTD)	#467
CITY OF HELSINKI (CO-EXHIBITOR AT ITS NORDIC PAVILLION)	#97
CITY OF TAMPERE (CO-EXHIBITOR AT ITS NORDIC PAVILLION)	#97
CIVIL AVIATION AUTHORITY OF SINGAPORE (CO-EXHIBITOR AT MOT FAMILY PAVILION)	#251
CLK ENTERPRISE (CO-EXHIBITOR AT ITS NORDIC PAVILION)	#97
COHDA WIRELESS (CO-EXHIBITOR AT ITS AUSTRALIA)	#73
COMMSIGNIA LTD	#531
CREATE	#326
CSIRO (DATA 61)	#128
CUBIC TRANSPORTATION SYSTEMS (CO-EXHIBITOR AT ITS AUSTRALIA)	#73
DATEL (CO-EXHIBITOR AT ITS NORDIC PAVILLION)	#97
DB ENGINEERING & CONSULTING	#318
DENSO CORPORATION	#204
DOPPELMAYR SEILBAHNEN GMBH (CO-EXHIBITOR AT AUSTRIAN PAVILION)	#93
DRIVE SWEDEN	#B02
DYNAROADS GMBH	#332
DYNNIQ (CO-EXHIBITOR AT ITS EUROPEAN PAVILION)	#375
EAST NIPPON EXPRESSWAY COMPANY LIMITED (CO-EXHIBITOR AT JAPAN PAVILION)	#287
EASYMILE PTE LTD	#536
EBE (CO-EXHIBITOR AT AUSTRIAN PAVILION)	#93
EBERLE DESIGN, INC (CO-EXHIBITOR AT NORTH AMERICAN PAVILION)	#401
ECONOLITE (CO-EXHIBITOR AT NORTH AMERICAN PAVILION)	#401
ENGINE (CO-EXHIBITOR AT TTS ITALIA)	#350
ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE, INC (ESRI)	#122
ERTICO - ITS EUROPE (CO-EXHIBITOR AT ITS EUROPEAN PAVILION)	#375
ESCRYPT (CO-EXHIBITOR AT ITS CANADA)	#497
ETHERWAN SYSTEMS, INC	#124
EZ-LINK PTE LTD (CO-EXHIBITOR AT SG PAVILION)	#335
FAURECIA	#A06
FISCALADMIN (CO-EXHIBITOR AT ITS NORDIC PAVILLION)	#97
FLIR SYSTEMS CO. LTD	#116
FLOWBIRD (CO-EXHIBITORS AT ITS FRANCE)	#493
FLOWLY (CO-EXHIBITOR AT ITS FRANCE)	#493
FORMOLIGHT TECHNOLOGIES, INC.	#231
FORUM8 CO., LTD	#333
FRAUNHOFER-INSTITUT FÜR OFFENE KOMMUNIKATIONSSYSTEME FOKUS (CO-EXHIBITOR AT BERLIN PARTNER FOR BUSINESS AND TECHNOLOGY GMBH)	#A01
FUJITSU LTD. (CO-EXHIBITOR AT JAPAN PAVILION)	#287
GEMINIPTC (CO-EXHIBITOR AT BERLIN PARTNER FOR BUSINESS AND TECHNOLOGY GMBH)	#A01
GENETEC (CO-EXHIBITOR AT QUEBEC CANADA)	#393
GENETEC ASIA PACIFIC PTE LTD (CO-EXHIBITOR AT CITILOG/AXIS)	#467
GEOSAT (CO-EXHIBITOR AT ITS FRANCE)	#493
GEWI (CO-EXHIBITOR AT ITS EUROPEAN PAVILION)	#375
GEWI (CO-EXHIBITOR AT ITS AUSTRALIA)	#73
GOSWIFT (CO-EXHIBITOR AT ITS NORDIC PAVILLION)	#97
GRAPHMASTERS GMBH (CO-EXHIBITOR AT ITS DEUTSCHLAND & CITY OF HAMBURG)	#501
GRIDSMART TECHNOLOGIES, INC	#472
GSA GALILEO	#147
GUANGDONG RONGWEN ENERGY SCIENCE AND TECHNOLOGY GROUP CO. LTD.	#457
HAENNI INSTRUMENTS INC.	#452
HANGZHOU GOLONG TECHNOLOGY CO. LTD	#448
HANSHIN EXPRESSWAY COMPANY LIMITED (CO-EXHIBITOR AT JAPAN PAVILION)	#287
HELSINKI BUSINESS HUB (CO-EXHIBITOR AT ITS NORDIC PAVILLION)	#97
HERE TECHNOLOGIES	#95
HEWLETT PACKARD ENTERPRISE	#215
HEXAGON	#126
HIGHWAY INDUSTRY DEVELOPMENT ORGANIZATION (CO-EXHIBITOR AT JAPAN PAVILION)	#287
HIKVISION SINGAPORE PTE LTD	#137
HITACHI SOLUTIONS,LTD. (CO-EXHIBITOR AT JAPAN PAVILION)	#287
HONDA MOTOR CO., LTD	#385
HOUSTON RADAR LLC	#437
HUAWEI TECHNOLOGIES CO., LTD	#90

EXHIBITION FLOOR PLAN

IBEO AUTOMOTIVE SYSTEMS GMBH #345
IFSTTAR (CO-EXHIBITOR AT ITS FRANCE) #493
IHI CORPORATION (CO-EXHIBITOR AT JAPAN PAVILION) #287
IMOVE AUSTRALIA (CO-EXHIBITOR AT ITS AUSTRALIA) #73
INIT (CO-EXHIBITOR AT SG PAVILION) #335
INTELEMATICS (CO-EXHIBITOR AT ITS AUSTRALIA) #73
INTELLIGENT TRANSPORT SOCIETY, SINGAPORE (SG PAVILLION) #335
INTELLIGENT TRANSPORT SYSTEM ASSOCIATION OF MALAYSIA (ITS MALAYSIA) #517
INTELLIGENT TRANSPORTATION SOCIETY OF TAIWAN #106
INTERCOMP COMPANY #461
INTERNATIONAL ROAD DYNAMICS (CO-EXHIBITOR AT ITS CANADA) #497
INVEST IN TOULOUSE (CO-EXHIBITOR AT ITS FRANCE) #493
ISMARTWAYS TECHNOLOGY INC. #541
ITERIS (CO-EXHIBITOR AT NORTH AMERICAN PAVILION #401
ITK ENGINEERING GMBH (CO-EXHIBITOR AT ITS DEUTSCHLAND & CITY OF HAMBURG) #501
ITRON #529
ITS AUSTRIA #93
ITS AMERICA (NORTH AMERICAN PAVILION) #401
ITS ASIA PACIFIC (CO-EXHIBITOR AT ITS AUSTRALIA) #73
ITS AUSTRALIA #73
ITS CANADA #497
ITS CENTRAL EASTERN CONGRESS 2020 (CO-EXHIBITOR AT ITS EUROPEAN PAVILION) #375
ITS ESTONIA (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
ITS EUROPEAN CONGRESS 2020 (CO-EXHIBITOR AT ITS EUROPEAN PAVILION) #375
ITS FACTORY TAMPERE (CO-EXHIBITOR AT ITS NORDIC PAVILION) #97
ITS FINLAND (CO-EXBHITOR AT ITS NORDIC PAVILION) #97
ITS HAMBURG 2021 GMBH (CO-EXHIBITOR AT ITS DEUTSCHLAND & CITY OF HAMBURG) #501
ITS INDONESIA #283
ITS INFO-COMMUNICATIONS FORUM (CO-EXHIBITOR AT JAPAN PAVILION) #287
ITS JAPAN (CO-EXHIBITOR AT JAPAN PAVILION) #287
ITS KOREA #190
ITS NEW ZEALAND (CO-EXHIBITOR AT ITS AUSTRALIA) #73
ITS NORWAY (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
ITS PERCEPTION (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
ITS SWEDEN (CO-EXHIBITOR AT ITS NORDIC PAVILION) #97
ITS SWITZERLAND (CO-EXHIBITOR AT ITS EUROPEAN PAVILION) #375
ITS TECHNOLOGY ENHANCEMENT ASSOCIATION (CO-EXHIBITOR AT JAPAN PAVILION) #287
ITS WORLD CONGRESS 2021 (CO-EXHIBITOR AT ITS EUROPEAN PAVILION) #375
IT-TELECOM CO. LTD #532
ITS VIENNA REGION (CO-EXHIBITOR AT AUSTRIAN PAVILION) #93
JAPAN DIGITAL ROAD MAP ASSOCIATION (CO-EXHIBITOR AT JAPAN PAVILION) #287
JEJU SPECIAL SELF-GOVERNING PROVINCE (JEJU MUNICIPAL POLICE BUREAU TRAFFIC INFORMATION CENTER) (CO-EXHIBITOR AT ITS KOREA) #190
JTEKT CORPORATION (CO-EXHIBITOR AT JAPAN PAVILION) #287
KAPSCH TRAFFICCOM #359
KAPSCH TRAFFICCOM (CO-EXHIBITOR AT ITS NORDIC PAVILION) #97
KDDI CORPORATION (CO-EXHIBITOR AT JAPAN PAVILION) #287
KEDACOM #433
KEOLIS #94
KISTLER GROUP #322
KONGSBERG NORCONTROL (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
KOREA EXPRESSWAY CORPORATION (CO-EXHIBITOR AT ITS KOREA) #190
KOREA INSTITUTE OF CIVIL ENGINEERING AND BUILDING TECHNOLOGY (CO-EXHIBITOR AT ITS KOREA) #190
KOREA ROAD TRAFFIC AUTHORITY (CO-EXHIBITOR AT ITS KOREA) #190
KOREA TRANSPORATION SAFETY AUTHORITY (CO-EXHIBITOR AT ITS KOREA) #190
KOREA TRANSPORT INSTITUTE (CO-EXHIBITOR AT ITS KOREA) #190
KYLAND TECHNOLOGY CO. LTD. #229
KYYTI (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
LAND TRANSPORT AUTHORITY (CO-EXHIBITOR AT MOT FAMILY PAVILION) #251
LECIP (SINGAPORE) PTE LTD #515
LEDDARTECH (CO-EXHIBITOR AT QUEBEC CANADA) #393
LIANYUNGANG JARI ELECTRONICS CO. LTD. (MINGTU) #462
LIFTANGO #221
LINDSAY TRANSPORTATION SOLUTIONS #320
LUMINATOR TECHNOLOGY GROUP (LTG SWITZERLAND GMBH) #213
MAAS ALLIANCE (CO-EXHIBITOR AT ITS EUROPEAN PAVILION) #375
MAPKING INTERNATIONAL LIMITED #214
MAXTENA #453
MARITIME & PORT AUTHORITY OF SINGAPORE (CO-EXHIBITOR AT MOT FAMILY PAVILION) #251
MARBEN PRODUCTS SAS #120
METROPOLITAN EXPRESSWAY COMPANY LIMITED (CO-EXHIBITOR AT JAPAN PAVILION) #287
MICRO CONNECT (CO-EXHIBITOR AT ITS AUSTRALIA) #73
MICWARE CO., LTD #316
MINISTRY OF ECONOMY, TRADE AND INDUSTRY - METI (CO-EXHIBITOR AT JAPAN PAVILION) #287
MINISTRY OF INTERNAL AFFAIRS AND COMMUNICATIONS (CO-EXHIBITOR AT JAPAN PAVILION) #287
MINISTRY OF MOVEMENT PTE LTD (CO-EXHIBITOR AT SG PAVILION) #335
MINISTRY OF LAND, INFRASTRUCTURE, TRANSPORT AND TOURISM (CO-EXHIBITOR AT JAPAN PAVILION) #287
MINISTRY OF TRANSPORT (CO-EXHIBITOR AT MOT FAMILY PAVILION) #251
MINISTRY OF TRANSPORT AND COMMUNICATIONS (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
MIOVISION (CO-EXHIBITOR AT ITS CANADA) #497
MITSUBISHI ELECTRIC CORPORATION (CO-EXHIBITOR AT JAPAN PAVILION) #287
MITSUBISHI HEAVY INDUSTRIES ASIA PACIFIC PTE LTD #279
MOBILE MARK ANTENNA SOLUTIONS #542
MOBILITYX PTE LTD (CO-EXHIBITOR AT SG PAVILION) #335
MOPRIM LTD (CO-EXHIBITOR AT ITS NORDIC PAVILION) #97
MOVEX INNOVATION #393
NAVIGATION DATA STANDARD - NDS (CO-EXHIBITOR AT ITS EUROPEAN PAVILION) #375
NAVINFO (CENNAVI) #485
NAVTECH RADAR #442
NCS PTE LTD #259
NEC CORPORATION (CO-EXHIBITOR AT JAPAN PAVILION) #287
NEDAP NL #129
NEOLOGY INC. #A08
NETWORK FOR ELECTRONIC TRANSFERS (SINGAPORE) PTE LTD #528
NEURON MOBILITY (CO-EXHIBITOR AT SG PAVILION) #335
NIRA DYNAMICS AB #516
NNG (CO-EXHIBITOR AT ITS EUROPEAN PAVILION) #375
NOKIA #527
NORWEGIAN COASTAL ADMINISTRATION (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
NORWEGIAN PUBLIC ROADS ADMINISTRATION (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
NORWEGIAN RAILWAY AUTHORITY (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
NOVACOS CO., LTD (CO-EXHIBITOR AT ITS KOREA) #190
NXP SEMICONDUCTORS #91
OKI ELECTRIC INDUSTRY CO., LTD. (CO-EXHIBITOR AT JAPAN PAVILION) #287
ONECONNECT FINANCIAL TECHNOLOGY #544
OMRON SOCIAL SOLUTIONS CO., LTD. (CO-EXHIBITOR AT JAPAN PAVILION) #287
OPAL - RT (CO-EXHIBITOR AT QUEBEC CANADA) #393

ORANGE BUSINESS SERVICE (CO-EXHIBITOR AT SG PAVILION) #335
OUSTER #538
PANASONIC CORPORATION #179
PARIFEX (CO-EXHIBITOR AT ITS FRANCE) #493
PCI PRIVATE LIMITED #76
PENTA SECURITY SYSTEMS INC. #450
PLANETM (CO-EXHIBITOR AT NORTH AMERICAN PAVILION #401
PLUSERVICE (CO-EXHIBITOR AT TTS ITALIA) #350
PMG TECHNOLOGIES (CO-EXHIBITOR AT QUEBEC CANADA) #393
POPSCOOT SINGAPORE (CO-EXHIBITOR AT SG PAVILION) #335
PROPULSION QUEBEC (CO-EXHIBITOR AT QUEBEC CANADA) #393
PTV GROUP #367
PTV GROUP JAPAN LTD (CO-EXHIBITOR AT JAPAN PAVILION) #287
Q-FREE #151
QUALCOMM TECHNOLOGIES, INC #505
QUANTUM INVENTIONS PTE LTD/CONTINENTAL #155
QUEBEC CANADA #393
QUEBEC OFFICE IN SINGAPORE (CO-EXHIBITOR AT QUEBEC CANADA) #393
RAI AMSTERDAM BV / INTERTRAFFIC #533
RAMBOLL (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
REACH-U (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
REPUBLIC OF TATARSTAN #B13
REXGEN CO., LTD #B08
RFI TECHNOLOGY SOLUTIONS #232
RIDANGO (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
ROADCLOUD (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
RYTLE GMBH (RTYLE ASIA PACIFIC PTE LTD) #B12
SAMS (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
SBG SYSTEMS (CO-EXHIBITOR AT ITS FRANCE) #493
SC SOFT PTE. LTD. #B01
SCANIA GROUP (CO-EXHIBITOR TO ITS GERMANY) #501
SENSORIS (CO-EXHIBITOR AT ITS EUROPEAN PAVILION) #375
SENSYS GATSO GROUP (CO-EXHIBITOR AT ITS NORDIC PAVILION) #97
SHANGHAI GUIMU ROBOT COMPANY #A03
SHENZHEN DIANMING TECH CO. LTD. #240
SHENZHEN GENVICT TECHNOLOGIES CO., LTD #465
SICE #71
SIEMENS MOBILITY #343
SIGNON (CO-EXHIBITOR AT AUSTRIAN PAVILION) #93
SILICON BILLABONG (CO-EXHIBITOR AT ITS AUSTRALIA) #73
SINGAPORE TECHNOLOGIES ENGINEERING LTD #163
SINTEF (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
SITOWISE (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
SKYLAB SERVICES PTE LTD (CO-EXHIBITOR AT SG PAVILION) #335
SKEDGO PTY LTD #539
SMARTMICRO #314
SMRT CORPORATION LTD (CO-EXHIBITOR AT SG PAVILION) #335
SOLACE #242
SOPRA STERIA PTE LTD #247
STAR SYSTEMS INTERNATIONAL #438
STMICROELECTRONICS ASIA PACIFIC PTE LTD #A04
SUMITOMO ELECTRIC INDUSTRIES, LTD. (CO-EXHIBITOR AT JAPAN PAVILION) #287
SWARCO (CO-EXHIBITOR AT AUSTRIAN PAVILION) #93
SYNTONY GNSS #219
T.NET (CO-EXHIBITOR AT TTS ITALIA) #350
TALLINN CITY (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
TALTECH (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
TARTU CITY (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
TECNOSITAF (CO-EXHIBITOR AT TTS ITALIA) #350
THE NETHERLANDS ORGANIZATION FOR APPLIED SCIENTIFIC RESEARCH (TNO) (CO-EXHIBITOR AT SG PAVILION) #335
THE UNIVERSITY OF MELBOURNE – AIMES (CO-EXHIBITOR AT ITS AUSTRALIA) #73
THE UNIVERSITY OF TOKYO (CO-EXHIBITOR AT JAPAN PAVILION) #287
TØI (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
TOM TOM INTERNATIONAL BV #417
TONLEX GLASS TECHNOLOGY CO., LTD (MINGTU) #121
TOSHIBA INFRASTRUCTURE SYSTEMS & SOLUTIONS CORPORATION (CO-EXHIBITOR AT JAPAN PAVILION) #287
TOYOTA MOTOR CORPORATION #234
TOYOTA TSUSHO CORPORATION #A05
TRAFFIC DATA SYSTEMS GMBH (CO-EXHIBITOR AT ITS DEUTSCHLAND & CITY OF HAMBURG) #501
TRAFFIC MANAGEMENT FINLAND GROUP (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
TRAFFIC TECH PTY LTD #534
TRAFFIC TECHNOLOGY SERVICES, INC. #447
TRAFICOM (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
TRANSATEL (CO-EXHIBITOR AT ITS FRANCE) #493
TRANSCORE #A07
TRANSPORT FOR NEW SOUTH WALES (CO-EXHIBITOR AT CSIRO/DATA 61) #128
TRAVELLER INFORMATION SERVICES ASSOCIATION - TISA (CO-EXHIBITOR AT ITS EUROPEAN PAVILION) #375
TRIPLE SIGN SYSTEM AB (CO-EXHIBITOR AT ITS NORDIC PAVILION) #97
TTS ITALIA #350
UNDERSTAND.AI #540
UNISECU #460
U.S. DEPARTMENT OF TRANSPORTATION (CO-EXHIBITOR AT NORTH AMERICAN PAVILION #401
UK PAVILION #407
UPSTREAM MOBILITY (CO-EXHIBITOR AT AUSTRIAN PAVILION) #93
UTMS SOCIETY OF JAPAN (CO-EXHIBITOR AT JAPAN PAVILION) #287
VALEO (CO-EXHIBITOR AT ITS FRANCE) #493
VANJEE TECHNOLOGY #475
VECTOR INFORMATIK GMBH #449
VEHICLE INFORMATION AND COMMUNICATION SYSTEM CENTER (CO-EXHIBITOR AT JAPAN PAVILION) #287
VIA (CO-EXHIBITOR AT NORTH AMERICAN PAVILION) #401
VIATICK PTE LTD (CO-EXHIBITOR AT SG PAVILION) #335
VIRTA (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
VIVOTEK INC #456
VOLKSWAGEN AG (CO-EXHIBITOR AT ITS DEUTSCHLAND & CITY OF HAMBURG) #501
VTT (CO-EXHIBITOR AT ITS NORDIC PAVILLION) #97
VZGLYAD, LLC/MATSUR & CO, LTD #445
WAVETRONIX #543
WEST NIPPON EXPRESSWAY COMPANY LIMITED (CO-EXHIBITOR AT ITS JAPAN) #287
WORKPLACE SOLUTIONS GMBH (CO-EXHIBITOR AT ITS DEUTSCHLAND & CITY OF HAMBURG) #501
XEE (CO-EXHIBITOR AT ITS FRANCE) #493
YAHAM OPTOELECTRONICS CO., LTD. #464
YOGOKO (CO-EXHIBITOR AT ITS FRANCE) #493
ZENRIN CO., LTD. (CO-EXHIBITOR AT JAPAN PAVILION) #287

EXHIBITION OPENING HOURS

Monday, 21 October 2019	**17:00 – 19:00**	**Wednesday, 23 October 2019**	**08:30 – 18:00**
Tuesday, 22 October 2019	**08:30 – 18:00**	**Thursday, 24 October 2019**	**08:30 – 18:00**
		Friday, 25 October 2019	**08:30 – 15:00**

GENERAL INFORMATION

TRAVEL

Most people arrive in Singapore by air. Its status as a major airline hub in Asia makes Singapore a natural starting or ending point for a multi-country tour of Southeast Asia. Most large international airlines have routes to Singapore, in addition to the island's own highly regarded airline, Singapore Airlines.

VISAS

Most foreigners coming into Singapore do not require visas for entry and may be given social visit passes for up to 30 days upon their arrival in Singapore. However, it is best to consult your local consular office for the latest information. Please note that visa processing may take up to four weeks. We recommend you to apply as early as possible before the World Congress.

GETTING TO THE CITY

City Shuttle

The City Shuttle will bring passengers to most downtown hotels at a rate of SGD9 per adult or SGD6 per child (below 12 years of age). The City Shuttle departs every 15 minutes during peak hours, and up to 30 minutes during non-peak hours. The Shuttle can be booked via the 24-hour Ground Transport Concierge at the Arrival Halls or online at www.cityshuttle.com.sg/cityshuttlepublic/

Airport Transfer

Choose from the two vehicle options below based on your needs:

- 4-seater limousine: SGD55.00* per departure from the airport
- 7-seater large taxi: SGD60.00* per departure from the airport

Airport transfers can be booked via the 24-hour Ground Transport Concierges at the Arrival Halls.

Train

To get to the City, take the train from Changi Airport MRT Station (CG2) to Tanah Merah MRT Station (EW4), then transfer to the East West Line towards Tuas Link MRT Station (EW33).

Alternatively, take the train from Changi Airport MRT Station to Expo MRT Station (CG1/DT35), then transfer to the Downtown Line towards Bukit Panjang MRT Station (DT1).

First train from Changi Airport MRT Station to Tanah Merah MRT Station:

- Monday to Saturday: 05:31
- Sunday and public holidays: 05:59

Last train:

- Connecting to Tuas Link: 23:18, daily
- Connecting to Pasir Ris: 00:06, daily

Single-ride tickets and EZ-link cards can be purchased at all train stations.

Other than buying a travel card, you can also tap your contactless credit/debit card ^ (MasterCard®, Visa and mobile wallets) at the MRT fare gates as you would usually do with a travel card.

Public Bus

Terminals 1, 2 and 3: Bus stops are located at the basement bus bays. You can take buses 24, 27, 34, 36, 53, 110 and 858 from there.

Terminal 4: At the bus stop next to Car Park 4B, you can take buses 24, 34, 36 and 110. At the bus stop near the SATS Inflight Catering Centre 1, you can take buses 27, 53 and 858.

Please prepare the exact fare for your trip as no change will be given.

You can also tap your contactless credit/debit card^ (MasterCard®, Visa and mobile wallets) at card readers on board buses at the point of boarding/alighting and you are good to go!

^For foreign-issued credit/debit cards, administrative charges and other fees may apply. Visit simplygo.com.sg for more information.

Taxi

Taxis are available for hire at the taxi stands in the Arrival areas of each Terminal. A ride to the City takes about 30 minutes and costs between S$20 and S$40. All fares are metered. There is an additional Airport Surcharge for all trips originating from the Airport:

- Fri–Sun (17:00 - 00:00): S$5 Airport Surcharge
- All other times: S$3 Airport Surcharge
- Midnight surcharge (00:00 - 06:00): 50% of final metered fare
- Peak-hour surcharge (06:00 - 09:30, Mon–Fri and 06:00 - 00:00, Mon–Sun): 25% of final metered fare

TRAVEL

CONGRESS AND EXHIBITION VENUE

Suntec Singapore Convention & Exhibition Centre is the world's leading meetings and conference centre, located at the heart of Asia's most integrated meetings, conventions and exhibitions hub.

With great versatility featuring 42,000m² of flexible customisable space, free WiFi, digital signage, an excellent range of culinary choices and a dedicated team of service experts, this award-winning facility can cater to events from 10 to 10,000 persons.

Only 20 minutes from Changi International Airport, Suntec Singapore is conveniently located in the Central Business District and just minutes from the city's entertainment and cultural attractions. Suntec Singapore offers direct access to 5,200 hotel rooms, 1,000 retail outlets, 300 restaurants, 6 museums and Esplanade – Theatres on the Bay.

Suntec Singapore Convention and Exhibition Centre
1 Raffles Boulevard, Suntec City
Singapore 039593

www.suntecsingapore.com

GETTING TO THE CONGRESS CENTRE

Train

Suntec Singapore is easily accessible by three MRT stations - Esplanade or Promenade via the Circle Line, and City Hall via the East West Line.

- From CC3 Esplanade MRT Station (3 minutes): Take Exit A and follow the signage to the Centre
- From CC4 Promenade MRT Station (5 minutes): Take Exit C, walk through Suntec City Mall and follow the signage to the Centre
- From EW13 City Hall MRT Station (8 - 10 minutes): Walk through City Link Mall and then Esplanade Exchange to get to the Congress Centre

Bus

Depending on which bus service you are taking, you may choose to board or alight at the following stops around the Centre:

- Suntec Singapore:
  36, 36B, 70A, 70M, 97, 97E, 106, 111, 133, 162M, 502, 502A, 518, 518A, 700A, 857, 868E
- Opposite Suntec Singapore:
  36, 36A, 36B, 97, 97E
- Suntec Tower Two:
  107M
- Suntec Tower Three:
  36, 36A, 36B
- Nicoll Highway next to Suntec City Mall:
  10, 10E, 14, 14A, 14E, 16, 70, 70A, 70M, 196, 196A

Taxi

If you're taking a taxi to Suntec Singapore, alight at the driveway of the Centre in front of The Big Picture on Level 1.

For taxi or private car bookings:

- Comfort and CityCab: 6552 1111
- TransCab: 6555 3333
- SMRT Taxi: 6555 8888
- Prime Taxi: 6778 0808
- Premier Taxi: 6363 6888
- Grab (downloadable via App Store or Play Store)
- GOJEK (downloadable via App Store or Play Store)

Car

If you're driving to Suntec Singapore, choose from the following routes for access to the carpark:

- Nicoll Highway
- Raffles Boulevard (from Bras Basah Road)
- Temasek Avenue (from Raffles Boulevard)
- Rochor Road exit from East Coast Expressway (ECP)

GENERAL GUIDELINES

REGISTRATION DESK HOURS

The Registration Desk will be situated at Concourse 4 on Level 3 of the Suntec Singapore Convention & Exhibition Centre.

The opening hours are as follows:

Sunday, 20 October 2019	**14:00 – 18:00**
Monday, 21 October 2019	**08:30 – 19:00**
Tuesday, 22 October 2019	**08:30 – 18:00**
Wednesday, 23 October 2019	**08:30 – 18:00**
Thursday, 24 October 2019	**08:30 – 18:00**
Friday, 25 October 2019	**08:30 – 18:00**

LANGUAGE

English is the official language of the Congress. All presentations, printed material and online information will be available in English only.

INTERNET ACCESS

Free WiFi will be available in all areas of the Congress centre. Participants can connect to: FREE_WiFi@SuntecSingapore.com. No password is required.

LIABILITY AND INSURANCE

The Conference Secretariat and Organisers will not be liable for personal accidents, loss of or damage to private property of participants and accompanying persons. Participants are advised to subscribe to their own personal travel and health insurance.

PROFESSIONAL DEVELOPMENT

Professional Engineers and Chartered Engineers from Singapore attending the 26th ITS World Congress will be eligible for Professional Development Units.

Event Date	PDUs for Chartered Engineers	PDUs for Professional Engineers
21 October 2019	**7.5**	**3**
22 October 2019	**6.5**	**4**
23 October 2019	**6.5**	**4**
24 October 2019	**6.5**	**6**
25 October 2019	**5**	**3**

IMPORTANT NOTE

Programme is correct at time of publishing. Any changes will be updated periodically.

DOWNLOAD THE ITS WORLD CONGRESS 2019 MOBILE APP

Get up-to-date Congress information at your fingertips with the ITS World Congress 2019 mobile app.

Login details will be available 2 weeks before the event

WHILE YOU'RE ON THE APP, HERE ARE A FEW COOL FEATURES YOU MUST EXPLORE :

SCHEDULE
Find everything you need related to Congress programme here.

DEMOS
Reserve your demo rides in advance though the Congress app.

CALENDAR
Plan your schedule for the Congress days through the app by adding sessions, demos and meetings to your in-app calendar.

LEADS
Keep track of who you met, make notes within the app and email it to yourself directly from the app.

MEETINGS
See who else is at the Congress and make appointments with potential business leads.

EXHIBITORS
Search for exhibitors and locate them on the floor plan with one easy tap

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SINGAPORE 2019

26th ITS World Congress
21–25 October

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