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Technology Watch Report

ITS WORLD CONGRESS COPENHAGEN

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DESCRIPTION

- **Objet :** Report on the visit of ITS World Congress
- **Location:** Copenhagen – Denmark
- **Date:** 18 to 20 September 2018
- **Web site:** https://itsworldcongress.com/
- **Participant:** Anthony Auert, Cluster Manager – AutoMobility, Luxinnovation
- **Report version:** version #1

OBJECTIVES

- Improve market intelligence in emerging technologies in the field of vehicle-connectivity, autonomous driving, smart city and smart infrastructure.
- Participation in congresses related to above-mentioned topics.
- Visit technical exhibition; detect new technologies that could contribute to the development of the Luxembourg automotive eco-system.
- Connect with targeted prospects that could lead to R&D collaboration with the Luxembourg automotive eco-system.

SUMMARY

The ITS Congress represents the largest vitrine of mobility services deployment. It underlines the importance of Intelligent Transport Systems (ITS), and raises the awareness of smart mobility solutions among policy makers, experts and the visitors.
Connected and Automated Driving (CAD) was a key topic for discussion as it is expected to increase safety, maximise user experience (comfort & convenience), and generate new business development perspectives in the coming years. Additionally, innovations such as 5G, IOT and artificial intelligence that are contributing to the acceleration of CAD deployment were well represented through technical exhibitions and life demos.

Through numerous conferences, high-level experts from the mobility sector and beyond discussed latest development status of automotive connectivity, autonomous shuttles, smart infrastructures, and much more. Modelling, simulation & testing of CAD technologies were major concerns highlighted by the scientific community. Over the past years, increasing interests and investment in the research and development of innovative applications of connected/automated vehicles (CAV) have taken place. Most of CAV studies apply simulation for evaluation, yet conference speakers emphasised the rather limited validity of evaluation results due to model inaccuracy and simulation assumptions exacerbated by limited field data.

Industry and public authority urgently demand affordable advanced testing, validation & homologation of both software & hardware. The emergence of those new competences will open new market opportunities and will therefore provide huge opportunities for job growth. Fast execution and certification by regulatory authorities will guarantee significant competitive advantage to front-runners.

Recent implementation of ITS projects in Luxembourg such as the LU-DE-FR digital cross-border test bed and two autonomous shuttle pilots have significantly contributed to the international recognition of the Luxembourg automotive eco-system. Companies like Navya, Savary or Vedecom have expressed their willingness to collaborating with local actors.

ABOUT THE ITS WORLD CONGRESS

The world largest ITS Congress, which is organised by ERTICO, showcases the latest Intelligent Transportation Systems (ITS) achievements from world leading companies, innovative start-ups and cities.
Hosted in a different location each year, the ITS World Congress is an international meeting point for the mobility sector, rotating between Europe, the Americas and Asia Pacific.
The ITS Congress consists of three main areas:

- Conferences about the latest developments in ITS
- Demonstrations – showcases of current ITS technology being developed and deployed throughout the world
- Technical exhibition

For this year edition, a focus was put on multimodality and the journey to achieving true seamless transportation. Besides, cooperative, connected and automated mobility, legal and safety aspects were highlighted as well.

ATTENDED CONFERENCES

1. SIS17 - EVOLUTION FROM CURRENT AUTOMOTIVE CONNECTIVITY AND ITS DEPLOYMENTS TO 5G AND 5G C-V2X THE WORLD

- **Speakers:**
  Johannes Springer, Deutsche Telekom AG,Germany
  Takehiro Nakamura, NTT DOCOMO, Japan
  Julius Muller, AT&T, United States
  Stefano Sorrentino, Ericsson, Sweden
  Jovan Zagajac, Ford, United States
  James Misener, Qualcomm, United States
  Joerg Plechinger, Director, Audi, Germany
- **Abstract:**
  A number of connectivity technologies that are relevant for ITS in general, and for the automotive industry in particular, are or will soon be available:
  5G – the next generation of mobile communication systems is on the verge of its deployment, the first commercial 5G deployments are expected from 2019 onwards.
  5G will contain numerous features that appeal to the automotive / transportation industry to include enhanced mobile broadband, ultra-high reliability and low latency for direct and network communications, and massive IoT.
  It will include concepts like network slicing, (edge) cloud computing, localization improvement, and new radio technology. 5G, including 5G C-V2X, is the first network that has potential to connect all road users -- vehicles, riders, pedestrians – and the road infrastructure. This ubiquitous connectivity will play an important role in road transport automation.

2. SIS23 - DEPLOYMENT OF AUTONOMOUS SHUTTLES ON PUBLIC ROADS – EXPERIENCES FROM DIFFERENT COUNTRIES

- **Speakers:**

Karl Rehrl, Salzburg Research, Austria
Johannes Liebermann, Wiener Linien, Austria
Markus Riederer, Swiss Federal Roads Office (FEDRO), Switzerland
Thomas Huber, Deutsche Bahn Regio Bus, Germany
Patrick Walker, RAC WA, Australia
Birger Löfgren, RISE Viktoria, Sweden
Peter Hafmar, Nobina Technology, Sweden

- **Abstract:**
  Autonomous shuttles are a promising way to bridge the first/last mile in public transport.
  Early adopters around the world have started trials to test autonomous shuttles on public roads. The SIS sheds light on the question, how the process of deploying an autonomous shuttle on a public road in mixed traffic is currently handled in different countries. Speakers from Austria, Australia, Germany, Sweden, Switzerland shared their experiences concerning the following aspects: getting a test permission, national or local regulations, role of road authorities, adaptations to the vehicles in order to be compliant with national regulations, adaptations to the physical or digital infrastructure, applied test procedures, overall deployment process, best practices and learnings.

3. SIS42 - AUTOMATED SHUTTLES – LESSONS FROM TRIALS AND THE PATH TO DEPLOYMENT

- **Speakers:**
  Andrew Mehaffey, HMI Technologies Pty Ltd, Australia
  Randell Iwasaki, Contra Costa Authority, USA
  Kian Keong Chin, Land Transport Authority, Singapore
- **Abstract:**
  With the proliferation of automated shuttle trials around the world, this session focused on the lessons learnt from trials in New Zealand, Australia, California, USA, and Singapore.

4. TS37 - CROSS-BORDER SOLUTIONS

- **Speakers – Host session:**
  - National Access Points: Challenges for Success - Peter Lubrich, BASt, Germany
  - Oresund Metro, Linking Copenhagen and Malmö with an automated driverless metro line - Jarl Zinn, City of Copenhagen, Denmark
  - The importance of standards in cross border ITS-solutions Example from EasyGo becoming an international service within the framework of EETS - Søren Rasmussen, Sund & Bælt Holding A/S, Denmark
  - Collaboration cross borders for ITS excellence - Jonas Ivarsson, Trafikverket, Sweden
  - Linking of services: Fostering the shift towards flexible and seamless mobility in Europe - Alexander Hausmann, AustriaTech, Austria
  - Cross-Border ticketing, the different approaches: Belgium at the crossroad of technologies - Pierre-Paul Bertieaux, Belgian Mobility Card, Belgium
  - Queensferry Crossing: Bridging the data gap - Douglas Cairns, Amey, United Kingdom

5. SIS56 - PREPARING NEXT GENERATION MOBILITY

- **Speakers:**
  Mathew Click, HNTB, United States
  Noboru Kondo, East Nippon Expressway Company Limited, Japan

Christophe Boutin, ASFA - Association of French toll motorway operators, France
Gilles Carabin, European Commission, DG MOVE, Belgium
Pierpaolo Tona, INEA, Belgium
Paul Wadsworth, Capita, United Kingdom
Roberto Arditi, SINA, Italy

- **Abstract:**

Mobility challenges are a worldwide priority. Mobility means access to jobs, education, culture, leisure, health care and quality of life. Mobility is also a political necessity, since it is so closely connected to social inclusion. The whole world is undergoing an industrial revolution, and for the transport industry, digitalization means a revolution in mobility services. Society is changing, and we can see new ways of consuming mobility services through car-sharing, co-modality, and new mass transit services. Main megalopolis are all working, in ways specific to their context, on jointly optimizing high speed network and heavy transit systems as well as promoting multimodality, clean infrastructure, and connected and autonomous vehicles. Through that lens, worldwide experts shared their ideas that works as well as failures, experiences, solutions to provide new options to boost mobility services with equal access to all users. New skills and knowledge for the future of the European economy are also crucial. Speaker of the sessions presented a set of approaches and solutions applied to various mode of transport, in addition to focusing on urbanization trends within major metropolitan worldwide with example of implementation as well as to provide answers on training and education to prepare ourselves for future transport challenges.

6. TS44 – TESTING AND SIMULATIONS

- **Speakers – Hosts session:**

- Methodology for design of test facilities for self-driving vehicles and smart mobility - Stefan de Vries, Applus IDIADA Group, Spain
- On a reliable and efficient simulation-based platform for connected and intelligent vehicles systems testing and validation; PV-AEB case study - Nacer Eddine Chelbi, University of Sherbrooke, Canada
- Development of an Automated Vehicle as an Innovation Platform - Johan Scholliers, VTT Technical Research Centre of Finland, Finland
- The research of traffic density extraction method under Vehicular ad hoc network environment - Zhang Yiming, Tongji University, China
- A Platform to Evaluate Connected Vehicle Applications Using Hardware-in-the- Loop Simulation - Srinivasa Sunkari, Texas A&M Transportation Institute, United States
- Towards the legal admission of connected / automated vehicles - Gerben Feddes, RDW, the Netherlands

7. ERTICO WORKSHOP "THE ROLE OF 5G IN AUTOMATION"

- **Speakers:**

Francois Fischer, ERTICO – ITS Europe, Belgium
Maciej Muehleisen, Ericsson Research, Germany
Jovan Zagajac ?, Ford, United States

- **Abstract:**

5G is expected to provide breakthrough mobility models and new innovative applications and services that match user needs and societal challenges transforming the transport sector towards a global

Digital Smart Mobility. The workshop discussed 5G key technologies to be deployed in the next generation 5G networks and discussed how they contribute towards Automated Driving innovations.

8. SIS73 - CONNECTED VEHICLE CERTIFICATION

- **Speakers:**
  Mike Brown, Southwest Research Institute, USA
  Dmitri Khijniak, 7Layers, United States
  Dave Miller, Siemens, United States
  Bob Frey, Tampa Hillsborough Expressway Authority, United States
  Richard Michalski, Sirius XM, United States
  Kevin Henry, ESCRYPT, Canada
- **Abstract:**
  Understanding what each other is saying is critical to successful communication. Using common terminology along with a clear definition of the terminology ensures communications are proper and understood. In the world of Connected Vehicles, communication between vehicles is crucial to vehicles knowing where other vehicles are and their intentions. Certification of Connected Vehicle devices was established to ensure that all Connected Vehicles devices regardless of manufacturer communicate and interpret messages from other Connected Vehicle devices. But what about tomorrow and the future? Will there be a need to enhance or even perhaps redefine what certification is and does? The expert panel discussed how certification has evolved to date and express their viewpoints on where certification is going in the future.

9. TS62 - MODELLING AND SIMULATION

- **Speakers – Hosts session:**
  - A Cooperative Autonomous Road-vehicles Security Evaluation Methodology - Sammy Haddad, Oppida, France
  - Verifying automated driving systems in simulation: framework and challenges - Zeyn Saigol, Transport Systems Catapult, United Kingdom
  - Method for validation of conditional and highly automated driving systems - Walter My, Bosch Automotive Products (Suzhou) Co. Ltd., China
  - A Model Based System Engineering Methodology for an Autonomous Driving System Design - Asma Charfi Smaoui, CEA France, France
  - A VISSIM based ADAS simulation platform to complement the UKCITE real world connected vehicle test environment - Olivier Haas, Coventry University, United Kingdom

TECHNICAL EXHIBITION & PROSPECTS VISITS

1. SAVARI

- **Contact details:**
  Savari builds software and hardware sensor solutions for automotive car manufacturers, the automotive aftermarket and smart cities. Savari seeks to make the world's roadways and vehicles automated and safer by deploying advanced wireless sensor technologies and software. The company is the leader and pioneered V2X radio technology, which is crucial for vehicles to achieve Level 4 and Level

5 of automation. The technology allows vehicles to share data with other vehicles, traffic lights and smartphones.
http://savari.net/

- **Main products:**
  - Savari SW-1000 Road-Side-Unit (RSU)
  - Savari MobiWAVE On-Board-Unit (OBU)
- **Potential collaborations with the Luxembourg automotive eco-system:**
  - Project based on the usage & deployment of V2X technology (e.g. autonomous driving supported by smart infrastructure).
  - Experimentation of V2X technology on the LU-DE-FR digital cross-border test bed.

2. VEDECOM

- **Contact details:**
  Created in February 2014, VEDECOM is an Institute for Energy Transition ('ITE'),dedicated to individual, carbon-free and sustainable mobility, established as part of the French 'governmental plan, 'Investment for the future'. It contribute to the 'Autonomous vehicle plan', which was recently incorporated into the Solution for Future Industry Program alongside Eco-mobility; both of which are part 'Nouvelle France Industrielle', the government's plan to invigorate the country's industry.
  http://www.vedecom.fr/?lang=en
- **Main products:**
  - Vehicle electrification
  - Self-driving and connectivity
  - Shared mobility and energy
- **Potential collaborations with the Luxembourg automotive eco-system:**
  - Deployment of collaborative projects on the LU-DE-FR digital cross-border test bed.

3. NAVYA

- **Contact details:**
  NAVYA is a leading French name in the autonomous vehicle market. With more than 220 employees (France + USA), NAVYA develops, manufactures and commercializes driverless and electric vehicles. Since 2015, NAVYA is the first to market and put into service a range of autonomous mobility solutions: AUTONOM SHUTTLE (September 2015), of which 100 have already been produced and more than 87 sold worldwide (June 2018), and AUTONOM CAB (November 2017), whose first road tests will start shortly.
  http://navya.tech/en/
- **Main products:**
  - AUTONOM SHUTTLE
  - AUTONOM CAB
- **Potential collaborations with the Luxembourg automotive eco-system:**
  - Project based on the usage of V2X technology supported by smart infrastructure.

4. EASYMILE

- **Contact details:**
  EasyMile is a pioneer in driverless technology and smart mobility solutions. The fast-growing start-up develops software to automate transportation, revolutionizing passenger and goods transportation. It

has already deployed over 100 driverless projects with more than 300,000 people transported over 200,000 km. Clients include the world's largest transport operators, city authorities, airports, corporations, business parks, and universities. EasyMile has a global presence with headquarters in Toulouse (France) and regional offices in Denver (USA), Berlin (Germany), Melbourne (Australia) and Singapore. The Company employs over 130 highly-skilled employees.
http://www.easymile.com/

- **Main products:**
  - EZ10 DRIVERLESS SHUTTLE
- **Potential collaborations with the Luxembourg automotive eco-system:**
  - Project based on the usage of V2X technology supported by smart infrastructure.

5. ENGIE

- **Contact details:**
  Engie is a French multinational utility company active in nearly 70 countries. With a strong leadership in the energy sector, Engie is successfully conducting the transition towards greener energy. Now, the company is positioning as a reliable partner of major cities and tackles the urban challenges in mobility, safety, energy efficiency and operational excellence. Engie provides integrated mobility services, better transportation solutions, intelligent and adaptive infrastructure operated from an unified system that makes exploitation and administration simple and accurate.
  https://www.engie.com/en/
- **Main products:**
  - Electricity
  - Natural gas
  - Energy Services
  - Facility Management
  - Hydrogen
  - District heating and cooling systems
  - Microgrids
  - Green mobility
  - Energy Trading and risk management
- **Potential collaborations with the Luxembourg automotive eco-system:**
  - Greater Region hydrogen congress scheduled on 21 February 2019.

GENERAL IMPRESSIONS

The 25th ITS World Congress demonstrated how transport and mobility solutions can improve the quality of life in our cities by placing users and their needs at the heart of the mobility system.
More than 10,000 participants from over 100 countries could learn from ITS experts from across the globe how best practices & latest technologies can leverage smart mobility solutions to enhance people's lives.
The 2018 ITS World Congress topics were mobility services from transport to mobility; ITS and the environment; Connected and automated transport; Next generation goods delivery; Satellite technology applied to mobility; Transport networks evolution; and the host topic, Cross-border mobility solutions.

The technical exhibition and real life demos showcased technologies that are vital for better & greener mobility. In addition to initiatives to reduce traffic congestion and eliminate traffic accidents, which are the main goals of

ITS, the exhibitors also displayed various communication technologies and last mile electrified mobility solutions that are friendly to the environment.

Example of life demo: Olli by Local Motors

A joint demonstration between US-based Local Motors by LMI and Danish firm, Autonomous Mobility; the Olli demonstration allowed attendees to experience autonomous technology first-hand while exploring related topics such as autonomous system safety and sustainability.

Example of life demo: Navya Autonom Cab

At the heart of the smart city, AUTONOM CAB provides an intelligent transport service for individual trips in urban centers. Able to carry 1 to 6 passengers, AUTONOM CAB is a fluid, continuous and effective solution that answers user expectations in terms of service before, during and after their trip. Available as either a private or shared service, AUTONOM CAB places an emphasis on conviviality and comfort. On board, passengers can for example choose to work, benefiting from fully connected technology, or partake in an interactive cultural visit of the city. They can also choose a playlist, or buy their cinema or museum tickets.