

➤ Highlight Report – Session Records

Transport Research Arena 2018 Vienna
A digital era for transport

October 2018

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AustriaTech – Federal Agency for
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Raimundgasse 1/6, 1020 Vienna, Austria
FN 92873d, Vienna commercial court,
VAT Reg. No. ATU39393704
T: +43 1 26 33 444, F: +43 1 26 33 444-10,
office@austriatech.at, www.austriatech.at

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October 2018

TRA
Highlight Report
Session Records

Overview ²

Plenary Sessions ⁶

Invited Sessions ⁹

Strategic Sessions ¹⁹

Scientific/
Technical Sessions ²⁷

▼ Plenary Sessions

No.	Title
Monday	
P 1	Shaping the New Mobility Landscape – A Vision for Transport & Mobility for Europe
Tuesday	
P 2	How Digitalisation Is Transforming the Transport & Mobility System
Wednesday	
P 3	Decarbonisation & Future Growth: How to Change Our Mobility System & Remain Competitive
Thursday	
P 4	Shaping Future Transport Research in Europe

▼ Strategic Sessions

No.	Title
Monday	
STR 1.1	User-Centric Mobility Systems
STR 1.2	Towards a Truly Integrated Transport System
STR 1.3	Innovative Governance Enabling Sustainable Urban Mobility
Tuesday	
STR 2.1	New Digital Technologies Impacting Transport
STR 2.2	Safe and Efficient Transport through Connectivity and Automation
STR 2.3	Transport and Data Security in a Digital Era
Wednesday	
STR 3.1	Decarbonisation for a Competitive European Industry
STR 3.2	Optimising Logistics – Environmental and Economic Benefits
STR 3.3	Infrastructure and Decarbonised Transport
Thursday	
STR 4.1	Enabling and Implementing Research and Innovation Strategies
STR 4.2	European Transport Research in a Competitive World
STR 4.3	Skills and Professions for Future Transport

▼ Invited Sessions

No.	Title
Monday	
INV. 1	How to enable interoperable and seamless cross-border C-ITS services in Europe
INV. 2	Aviation as an integral part of the multimodal transport system – Addressing future challenges together
Tuesday	
INV. 3	The New Urban Mobility Ecosystem, CCAV and Urban Planning – Between Vision and Managing Disruption
INV. 4	Transport safety: societal challenges, research solutions – The way forward
INV. 5	Digitalisation – Opportunities for Start-ups?!
INV. 6	Digital Mobility – Where is the human?
INV. 7	Modal synergies for future mobility
INV. 8	Automated Vehicle Testing on European Public Roads
INV. 9	Deep impact of transport research and funding? How can we better understand societal impacts to foster responsible research and innovation in transport?
INV. 10	Managing the transition towards higher automation
Wednesday	
INV. 11	Infrastructure as a Service
INV. 12	Towards the zero-emission ship
INV. 13	How to Speed-up Transition towards Sustainable Urban Mobility Schemes?
INV. 14	Hidden Aspects of Autonomous Driving
INV. 15	Clean, digitalised logistics: opportunities for sustainable growth and jobs
INV. 16	Fuelling Clean Transport – Europe-wide Alternative Fuels Projections in 2030 by the JEC research collaboration including reports on three European projects on batteries for EVs
INV. 17	Circular economy and sustainable processes in the automotive and transport value chain
INV. 18	Horizon Prizes on Engines – Award of the Horizon Prize on the Cleanest Engine Retrofit & Presentation of the Horizon Prize on the Cleanest Engine of the Future
INV. 19	Legal framework in a dynamic technical environment
Thursday	
INV. 20	Towards evidence-based decision making in European road safety policies, especially for vulnerable road users
INV. 21	EU Funding Workshop: Beyond R&I Grants
INV. 22	Sustainable Multimodal door to door travel
INV. 23	Inclusion, you said?

▼ Scientific/Technical Sessions

No.	Title	No.	Title
Monday		Wednesday	
ST 1	New Apps and New Mobility Services	ST 28	Reduction of Pollutant Emissions and Improvement in Air Quality from Road, Rail and Marine
ST 2	Mobility as a Service and Mobility Management	ST 29	Response to Extreme Events & Climate Change
ST 3	Big Data Enhancing Mobility Services	ST 30	Challenges on the Electrification of Infrastructure
ST 4	Innovative Urban Freight Developments	ST 31	Impacts of Innovation on Citizens and Society
ST 5	Social Aspects of Innovative Mobility	ST 32	Chassis and Vehicle Dynamics
ST 6	Automated Transport: Enabling Methods and Technologies	ST 33	Mobility and Modal Choice
ST 7	New Urban Mobility Services	ST 34	Technologies for Clean, Efficient and Safe Vehicles
Tuesday		ST 35	Intermodal Freight Transport and Synchromodality
ST 8	Automated Transport: Scenarios, Fundamentals, Regulation	ST 36	New Materials, Constructions & Techniques for Infrastructure
ST 9	Data Management and Demand Analysis	ST 37	Reduction of CO2 Emissions and Improved Fuel Economy
ST 10	Policy, Data, Knowledge & Decision Making in Road Safety	ST 38	Transport Infrastructure Safety
ST 11	ICT, Data and Modelling Approaches to Enhance Urban Transport	ST 39	Battery Technology for Hybrid and Electric Vehicles
ST 12	Transport Infrastructure: Technology Testing and Assessment	ST 40	Marine and Railway Engineering
ST 13	Improvement of Energy Efficiency in Transportation Systems Including Intermodal	ST 41	Decarbonisation and Sustainability for Freight Transport and Logistics
ST 14	Mobility Planning	ST 42	Transport Infrastructure: Asset Management and Life Cycle Analysis
ST 15	Digitising the Transport Systems	ST 43	Travel and Transportation Planning
ST 16	Systems and Technologies towards the Physical Internet	ST 44	Road Surface, Traffic and Effect on Noise Pollution and Fuel Consumption
ST 17	Automated Transport: Modelling, Evaluation, Validation & Testing	ST 45	Road Infrastructure Analysis, Management & Improvements
ST 18	Transport Infrastructure: Application of Machine Learning	ST 46	Socio-Economic Aspects of Electrification
ST 19	Risk Assessment, Accident Analysis & Modals, Crash Mechanics & Reconstruction	Thursday	
ST 20	New Concepts of Advanced Propulsion Systems: Design & Demonstrators	ST 47	Intelligent Traffic-and Transport Management
ST 21	Automated Transport: Concepts, Applications, Results	ST 48	Infrastructure as a Part of the Mobility/ Society System
ST 22	Safety of Vulnerable Road Users	ST 49	New Concepts of Advanced Propulsion Systems: Deployment & Assessment
ST 23	Transport Infrastructure: User Centric Capacity Planning and Management	ST 50	Security, Resilience and Crisis Management
ST 24	Driving Behaviour and Safety Road Users	ST 51	Driver Needs and Expectations
ST 25	Local Accessibility, Active Mobility, Bikers and Soft Modes, Cable Car, On-Demand	ST 52	Cost of Infrastructure
ST 26	Improvement of Emissions and Efficiency of Electric and Fuel Cell Vehicles, Busses and Trains	ST 26	Improvement of Emissions and Efficiency of Electric and Fuel Cell Vehicles, Busses and Trains
ST 27	Life Cycle Assessment in Transportation	ST 27	Life Cycle Assessment in Transportation

To present the findings of the session, AustriaTech tries to give an overview of each session and presents the main statements as well as the main findings. For each session the Speakers and Moderators are presented and the main focus of the session is pointed out. Furthermore the conclusion of the speakers is highlighted and the most important take aways are summarised.

The topics covering all modes of transport as well as all twelve thematic fields are shared. Each day the plenary session gave the motto of the day. First the four plenary session are presented, followed by the invited and strategic sessions and finally all scientific and technical session are summarised. Since the setting of the scientific and technical sessions was different, the projects and the main statement of each project presentation are shown.



^ Gerd Leonhard giving an inspiring talk at the plenary session.



^ To get hold of a place in the main conference room, attendees had to be fast.

Plenary Session 1

Shaping the New Mobility Landscape – a Vision for Transport & Mobility for Europe

Speakers and Panellists

- 1 Henrik Hololei,
Director General, DG Mobility and Transport, European Commission
- 2 Chin Kian Keong,
Group Director, Land Transport Authority, Singapore
- 3 Young Tae Kim,
Secretary general of ITF
- 4 Robyn Scott,
CEO and Co- Funder of Aploitical

Moderator(s)

Alex Taylor

Discussion Focus

Ideas, concepts and strategies to best shape the mobility landscape of the future.

Main Statements

- The sessions' panellists repeatedly stressed the need for collaboration in the form of cross sectoral partnerships. Digitalisation, automated driving, sharing mobility, e-mobility and multimodality – trends like these demand the development of a comprehensive European vision. The experts have different views on citizen participation. In general it is necessary to explain governance, silent message, bias and responsibility. The process of reaching consensus is quite meaningful because consensus also means to consent.
- The session also addressed the feasibility and practicability of one universal platform.
- Innovations can emerge in an ecosystem with different roles and cross sector collaboration. In order to reach a balance between private & public sector a clear definition of goals is needed. The private sector is faster in developing innovations, but the public authority guarantees stability. Disruption always comes from the private sector not the public.

Conclusion and main takeaways of the session

- Collaboration and cross sectoral partnership are vital to shape mobility.
- Uncertainty exists about technical, political and ethical feasibility. Social, ecological and economical challenges and transformation processes require an efficient and sustainable mobility ecosystem. Artificial Intelligence will change will also change the mobility system.
- Also an equal access to self-driving cars should be ensured in the future.

Plenary Session 2

How digitalisation is transforming the transport & mobility system

Speakers and Panellists

- 1 Mathieu Dunant,
Head of Innovation, RTP Group
- 2 Georg Kapsch,
CEO of Kapsch Group
- 3 Norbert Kouvenhoven,
Head of Global Trade Digitalisation at IBM
- 4 Mika Rytönen,
HERE & Solutions EMEA, Director, invited
- 5 Despina Spanou,
Director of Digital Society, Trust and Cybersecurity, European Commission

Moderator(s)

Jacki Davis

Discussion Focus

Main focus of discussion was the effect of digitalisation on transportation. Innovative technologies like automated vehicles, blockchain and AI can enable new tools for predictive maintenance, asset management or resilience (blockchain – distributed ledger). At the same time, these developments carry enormous risks or threats in terms of data protection and cyber security. The oncoming EU GDPR addresses these threats. Another challenge is the incorporation of people who are not digitally connected.

Main Statements

- Digitalisation is nothing new; it is a process lasting decades. (Georg Kapsch)
- New business models lead to disruption. (Georg Kapsch)
- I really doubt that it is possible to protect a device against hacking. (Georg Kapsch)
- GDPR hits the wrong people. (Georg Kapsch)
- There will be platforms on top of infrastructure which will let the users decide. (Georg Kapsch)
- AVs could lead to more road traffic and less public transport. (Georg Kapsch)
- AI will help us in being more efficient. (Mathieu Dunant)
- Mobility is about inclusion. (Mathieu Dunant)
- At the moment we are living in a collaborative economy but we are transforming into an automated economy. (Ahmed Nasr)

Conclusion and main takeaways of the session

- Digitalisation brings new opportunities but also new risks and challenges. The full impact of digitalisation on transportation, economy or society remains very unclear.

Plenary Session 3

**Decarbonisation & future growth:
How to change our mobility system
& remain competitive**

Speakers and Panellists

- 1 Gerd Schuster,
Senior Vice Presidet BMW
- 2 Lena Erixon,
Director- General, Swedish Transport Administration
- 3 Clemens Förstl
CEO, ÖBB- Holding AG
- 4 Alan McKinnon,
Professor at Kühne Logistics University
- 5 José Mendes,
Deputy Environment Minister of Portugal

Moderator(s)

Jacki Davis

Discussion Focus

The focus of discussion lied on the reduction of greenhouse gas emissions, reaching decarbonisation goals, future power trains for sustainable mobility (EV, PHEV, FCEV) and the necessary charging infrastructure. In this context, alternative modes of transport, seamless intermodal transport and MaaS were also discussed. Furthermore, the role of shopping behaviour (especially online shopping) as a GHG-driving factor and the facilitation of the sharing economy were debated. Research funding in FP9 (implementation, adaption and hot topics) was also discussed.

Main Statements

- The combustion engine will have a long term future. (Gerd Schuster)
- The range problem will be solved by the industry, but not the charging infrastructure. (Gerd Schuster)
- People have to understand what the real costs are of the modes they are using. (Clemens Först)
- Reaching the 2050 decarbonisation goals for freight transport will be almost impossible. (Alan McKinnon)
- We need new taxation models for this century's technology. (Jose Mendes)
- We have to get better at road mapping. (Alan McKinnon)
- Energy and transport should be merged together in FP9. (Jose Mendes)

Conclusion and main takeaways of the session

- Convenience and price are the main factors for influencing behaviour. The number of vehicles in urban areas needs to be reduced. Actions are necessary now or it will be too late.

Plenary Session 4

Shaping future transport research in Europe

Speakers and Panellists

- 1 Anne Berner,
Finnish minister of Transport
- 2 Neil J. Pederson,
Executive Director, Transportation Research Board
- 3 Hans Joachim Schellnhuber,
Director of the Potsdam Institute for Climate Impact Research (PIK) Senior Research Fellow at the Stockholm Resilience Centre

Moderator(s)

Jacki Davis

Discussion Focus

Discussion focus lied on the challenge of decarbonising transport, the role of globalisation and industrialisation and the potential of disruptive technologies. In this context, disruptors and enablers in transport were discussed e.g. digitalisation, enormous speed of technological development, urbanization and dealing with climate change. The discussion then shifted to active mobility and safety and the necessary requirements for FP9.

Main Statements

- If decarbonisation does not start before 2025 it will be literally impossible to decarbonize the economy. (Hans Joachim Schellnhuber)
- Artificial Intelligence will completely explode with quantum computing. (Hans Joachim Schellnhuber)
- Avoided transport is the best transport. (Hans Joachim Schellnhuber)

Conclusion and main takeaways of the session

- Adherence to a strict decarbonisation path is necessary in order to meet the goals of the Paris Agreement. Since the decarbonisation goals can only be reached with very disruptive measures if we wait until 2025, pursuing this path is very urgent. Therefore, the focus in the upcoming research programmes has to be set on decarbonising transport and the economy.

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Highlight Report
Session Records

Invited Sessions ⁹

Invited Session 1

How to Enable Interoperable and Seamless Cross-Border C-ITS Services in Europe

Speakers and Panellists

- 1 Claire Depre, EC, DG Move
- 2 Martin Böhm, AustriaTech
- 3 Serge Van Dam, Rijkswaterstaat
- 4 Joost Vantomme, AVEA
- 5 Manfred Harrer, ASFINAG

Discussion Focus

Seamless C-ITS Services

Main Statements

- Interoperability is the key to make C-ITS happen. (Claire Depre)
- C-ITS comes from research; to foster this we need cooperation. (Martin Böhm)
- It's all about cooperation and efficiency. (Joost Vantomme)
- Pan-european use-cases are highly important. C-ITS has the advantage to make it ready for deployment. (Manfred Harrer)

Conclusion and main takeaways of the session

- Car manufactures and road operators have entered a new domain. It will be a self-deploying process.

Invited Session 3

The New Urban Mobility Ecosystem, CCAV and Urban Planning – Between Vision and Managing Disruption

Speakers and Panellists

- 1 Mathias Mitteregger, Vienna University of Technology
- 2 Siegfried Rupprecht, Ruppert Consult
- 3 Karin Tausz, SBB Swiss Railway Company
- 4 Adriano Allesandrini, University of Florence
- 5 Peter Sweatman, CAVita

Discussion Focus

Seamless C-ITS Services

Main Statements

- Expect a huge change of the transportation system – it will be a bumpy ride. (Mathias Mitteregger)
- There is the need for a second round of tests – this requires a respective framework. (Peter Sweatman)
- In what city do you want your children to live? (Siegfried Rupprecht)
- Go for automated transport all over – we will see how people react and how this system will get its money back. (Adriano Allesandrini)
- Each provider does cherry picking. Define your vision! (Karin Tausz)

Conclusion and main takeaways of the session

- The discussion dealt with a heaven or hell scenario for the future of transport. Sharing is a great opportunity for a heaven-scenario (popular with younger generation); nevertheless people still prefer their own vehicles.
- Large investments from public authorities are needed, to provide the required infrastructure for automated driving.

Invited Session 6

Digital Mobility – where is the Human?**Speakers and Panellists**

- 1 Hermann Knoflacher,
Vienna University of Technology
- 2 Georg Kopetz,
TTTech Coputertechnik AG
- 3 Csaba Csiszár,
Budapest University of Technology and Economics- BME
- 4 Martin Kagerbauer,
Karlsruhe Institute of Technology- KIT
- 5 Boguslaw Liberadzki,
European Parliament
- 6 Martina Zeiner,
Graz University of Technology

Moderator(s)

- Eva Hackl,
ÖVG- Austrian Society for Traffic and Transport Sciences
- Sebastian Belz,
EPTS- European Platform of Transport Sciences

Discussion Focus

The session addresses the human factor in digitisation and automation in the transport sector. Real needs and challenges of people and society regarding automation and digitisation of transport are at the centre of attention. The notion that the future of transportation is electric, shared and automated cognitively frames this session.

Main Statements

- Private car ownership must be decreased to roll out automated traffic systems. Many issues are still unsolved, especially regarding the interaction with other traffic partners. (Hermann Knoflacher)
- The social cost-benefit ratio of fully automated vehicle systems could particularly be interesting for cities and city regions. Public space can be saved with such systems and used for other issues in dense inner city areas. (Hermann Knoflacher)
- The socio-technical configuration is relevant for the technical progress of automated driving. The costs of the vehicle and the current regulatory framework for AV, i.e. UNECE No. 79, 5.4.1.1 or recent discussions in the global forum on road safety regarding the role of the driver in autonomous vehicle systems will be important factors for the future. (Georg Kopetz)
- A vision of a fully automated and shared vehicle system (robo-taxis) in cities and city regions was described. Nevertheless estimating the possible reduction of individual car traffic remains a matter of general assumptions. (Martin Kagerbauer)

- This present day there is no sufficient scientific research or modelling on how people will commute to work, go shopping, or travel for other purposes with systems like robo-taxis. (Martin Kagerbauer)
- The infrastructure side investments will be main factors. (Martina Zeiner and Eva Hackl)
- Robo-Taxis will be attractive for everyone, although individual car ownership is still stuck in our minds today. (all panellists assumed)

Conclusion and main takeaways of the session

- A cognitive frame was set-up as if such fully automated systems (robo-taxis) would be already in place or rolled out in the early future. From a technical point of view robo-taxi systems are desirable, because they are feasible in terms of electrification and are able to solve capacity problems. From a simple socio-economic perspective, the most urgent concern is user acceptance and the willingness to pay for new mobility services.
- First, the human has to stay in the centre of the system, second, traffic organisation has to be kept in mind and only third the roll-out of a new technical mobility system is relevant. From a sustainable mobility point of view people should share cars in the future to address societal needs like reducing the carbon footprint and decongest the cities with increasing mobility demand, especially people commuting within city regions. However, in order to shape a new mobility culture changing behaviour cannot be governed by command and control, but by another way of socializing people to fulfil their mobility and transport needs.

Invited Session 7

Automated Vehicle Testing on European Public Roads

Speakers and Panellists

- 1 Francois Fischer, ERTICO
- 2 Gunnar Tornmalm, Scania
- 3 Nadège Faul, VEDECOM
- 4 Aria Etemad, Volkswagen
- 5 Thomas Zach, AlpLab

Moderator(s)

Ingrid Skogsmo, European Commission

Discussion Focus

Discussing the path to connected automated driving.

Main Statements

- The emphasis is on piloting automated driving on European roads. (Aria Etemad)
- Platooning, even on Level 3 and 4, is not a new technology; we can take what's already there. (Gunnar Tornmalm)
- When looking at the autopilot concept, even without V2V or V2I, there are main areas of cooperation. (Francois Fischer)
- The lab-test phase in Paris, which is already in place, will lead directly to open-road-testing. (Nadège Faul)
- We are focussing on the test environment in Austria. (Thomas Zach)

Conclusion and main takeaways of the session

- There is no danger, only opportunities.
- We need to "test, test, test." Also, the most important stakeholder has to be included: the whole society.

Invited Session 10

Deep Impact of Transport Research and Funding? How Can We Better Understand Societal Impacts to Foster Responsible Research and Innovation in Transport?

Speakers and Panellists

- 1 Sarah Bittner- Krautsack, Austrian Federal Ministry for Transport, Innovation and Technology
- 2 Christian Böhler, European Centre for Social Welfare Policy and Research
- 3 Torsten Klimke, European Commission
- 4 Peter Kaufmann, KMU Forschung Austria
- 5 Sebastian Seebauer, Joanneum Research
- 6 Katja Schechtner, International Transport Forum
- 7 Andrea Ricci, ISINNOVA
- 8 Philippe Crist, International Transport Forum

Discussion Focus

Identifying the impacts of programme and project intervention to better and more efficiently deploy scarce resources. Describing ways to improve policy and programme learning to accelerate transformation in transport.

Main Statements

- An innovation system perspective as cognitive framework is highly relevant compared to the market failure concept of the past. Innovative lab structures are a vital approach to support research and innovation activities like the 6 urban mobility labs and the mobility transformation lab in Austria. (Sarah Bittner- Krautsack)
- The higher impact orientation of FP8 and FP9 in course or the STRIA activities and the support of the TRIMIS monitoring platform is important. It is a major programming strategy to anticipate what we want to achieve by long term planning. (Torsten Klimke)
- The task of selecting the right topics and addressing comprehensive targets is a key point. To select appropriate topics, we have to understand what was achieved already. He points out the good practice example of the ALICE mirror group. (Andrea Ricci)
- Generic monitoring and assessment tools to iteratively assess technologies and their innovation potentials are important. (Philippe Crist) →

Invited Session 11

Infrastructure as a Service

→

- We need to understand how to change the system using different incentives and forms of deployment. We need anti-disciplinary arrangements to achieve more creative programme design and implementation. It is crucial to understand the interrelations among different actors and actions. We need to be sensitive enough to improve impacts by mutual policy/ programme learning. It has to be questioned, if the increasing trend to “mediate programme development by code” is sufficient to achieve good results. Coding means simplification and reducing complexity. Another option is to support self-adaptation and learning. (Katja Schechtner)
- The main difficulties are to capture social effects of transport and mobility and to set up indicators, assess impacts and measure results. (Peter Kaufmann)
- The monitoring and assessment tool developed for the European active and healthy ageing initiative enables to ex-ante evaluate potential qualitative and quantitative impacts of health and welfare measures. (Christian Böhler)
- The question is raised if there is a high potential risk of adverse social effects, for example, due to (hidden) emotional and socio-psychological aspects. Rebound effects can extensively influence the results. Therefore they have to be considered in an early stage. (Sebastian Seebauer)

Conclusion and main takeaways of the session

- Significance of ex-ante appraisal of impacts in research and innovation programming; taking up a truly RRI perspective. Exploiting long term visions, what do we want to achieve?
- Apply and coordinate procedures at different policy levels to measure relevant impacts achieved all around the world. Developing screening tools and indicator set/ systems, i.e. a core set of indicators to measure social impacts.
- Can we find causality and correlations by coding society? How to achieve progress in result measurement and impact assessment to capture social effects in the sector.
- How to cope with non-linearity (non-causality and simple correlations) and scarce and scattered evidence? Linking to other areas and sectors like energy, health, etc. There is a need for an early and interactive assessment of potential technologies, for example by generic monitoring tools. Using lab structures for co-creating R&D space to embrace young talents and better link RTI to the educational system.

Speakers and Panellists

- 1 Tom Roelants,
Confrence of European Directors of Roads- CEDR
- 2 Marc Ribo, ABERTIS
- 3 Pascal Tebibel, COLAS
- 4 Guillaume Grolleau
Syndicat des Equipements de la Route- SER
- 5 Bruno Goncalves, GMV Innovatng Solutions
- 6 Miklos Horvath,
The European Freight and Logistics Leaders Forum- F&L

Moderator(s)

Claude van Rooten, PIARC

Discussion Focus

- There are new technologies for roads, where roads will interact with us. The technology already exists, but we have to learn how to use it to address the needs and wishes of the costumer.
- Roads will turn into a dynamic infrastructure with new functions.
- In order to ensure inclusiveness, we need regulations. However imposing too many regulations is not productive, since people might become afraid of the new technology.

Main Statements

- The road sector is already addressing these mega trends. The infrastructure will become dynamic and roads will obtain new functions (Solar Road Wattway, Flowell,...) (Pascal Tebibel)
- New technologies have to be implemented on the road (AI). A2X connectivity and bluetooth are essential needs for roads especially for the future. We have to get back to the basis and focus on safety, optimising flows and enhancing orientation services. (Guillaume Grolleau)
- We will be in a connected future and have to create the voice of the infrastructure. Roads will talk to us and tell us what to expect and what will come up in real time. (Bruno Gonçaves)
- All services are assessed by service level or service quality. The transport and logistics sector should also focus on the service quality. Not only the industry has to change, but also the people. (Miklos Horvath)
- More regulations are needed to ensure to the inclusive-ness. (Tom Roelants)

Conclusion and main takeaways of the session

- Organisations like ERF, CEDRE, F&L, etc. will occupy an intermediate role between mobility provider and costumer.
- C-ITS will be deployed through whole Europe.
- We are moving towards a universal road language (universal highway tolling system and paying per phone) and should expedite this process.

Invited Session 12

How to Speed-up Transition towards Sustainable Urban Mobility Schemes?

Speakers and Panellists

- 1 Bert van Wee, TU Delft
- 2 Cathy Macharis, VUB MOBI Research Centre
- 3 Steven Sarasini, RISE Viktoria

Discussion Focus

The framework of the Invited Session was the future JPI Call for Projects on accessibility, connectivity and urban mobility, strategies and business models. It served to further exchange on Mobility/Transport as a Service (MaaS/TaaS) as possible further input to the content of the JPI Call.

Main Statements

- Addressing the interaction between socio-economic development and accessibility, cross-sectoral mobility concepts and the aspect of the sharing economy are important. (Arian von Binvergen)
- The relevance of accessibility rather than Mobility is stressed - "Accessibility as a Service". There are key areas for examining and addressing accessibility:
- Air transport was put one side of the accessibility spectrum. Regarding the question of needing more flight connections to certain destinations the limited marginal value for raising the number of flights.
- The other side of the spectrum is "slow modes" or "active modes". People like proximity in their lives and tend to e.g. rather cycle in a certain distance radius before choosing a car. When talking about accessibility as a service, the aspect of nearness should be more researched.
- Social aspects of accessibility in the context of mobility are getting more and more important. What distribution effects does accessibility and changes to it induce, what are the effects on social exclusion?
- A trade-off between accessibility and liveability has to be made. Thereby the pain is in the change of the system – not in the outcome.
- Research needs to distinguish between desires and needs. For the accessibility analysis primary social goods need to be valued differently. (Bert von Wee)
- Smart spatial planning and compact housing also plays a vital role to reduce distances. Also teleworking and teleconferencing can decrease the need for mobility as such. Mobility as a Service (MaaS) can have positive impacts in terms of its potential for reducing car ownership, while connected automated driving could have a detrimental effect regarding more vehicle kilometres.

- Regarding data protection universities can occupy an important role as neutral data hub in between public and private interests on data. Cities thereby still need to find governance models on how to deal with transport user data and what they regulate new private mobility services coming to town. This should also be dealt with on EU-Level.
- Good transition management towards MaaS is vital. Different forms of interventions can be implemented such as strategic interventions (creating visions), tactical interventions (combining individual strategies), operational interventions (linking everyday activities to long-term visions) or reflexive interventions (monitoring of policies and practices). (Cathy Macharis)

Conclusion and main takeaways of the session

- The session provided new inputs on MaaS.

Invited Session 18

Legal Framework in a Dynamic Technical Environment

Speakers and Panellists

- 1 Chin Kian Keong,
Land Transport Authority Singapore
- 2 Sabine Kühlschelm,
Austrian Federal Ministry for Transport, Innovation and Technology
- 3 Bryant Walker Smith,
University of South Carolina

Discussion Focus

Legal Framework for automated driving

Main Statements

- An Amended Road Traffic Act was made in 2017 to permit the formulation of rules for dedicated areas/lanes for automated driving. Thereby a sandbox approach for testing automated driving in phases was chosen. Current requirements are, e.g. that a safety driver needs to be present in the vehicle. (Kian-Keong Chin)
- The Austrian Strategy for automated driving enables real life tests based on defined use cases. The Ministry for Transport, Innovation and Technology has adopted regulations, serving as the foundation for testing on specific use cases. The challenge is that the regulatory frame needs to be technology neutral and flexible enough in order not to inhibit innovation.
- A National Contact Point at AustriaTech supports the test cases and the ministry issues certificates for testing. Beyond technical and safety standards, regulating areas related to automated driving is still challenging, e.g. employee protection laws. (Sabine Kühlschelm)
- In the US roles for regulation in the context of automated driving are divided between the US government and the respective federal states. The US government regulates vehicle design also regarding safety. In the case of automated driving, requests for applying new options need different time spans to be responded, e.g. changing standards can take years to get a conclusive decision from the government. State law is in general more flexible but rather uncertain in terms on how it will further develop. For automated driving there is a wide variety of interpretation across the states.
- Automated driving blends the formerly distinctive roles between the US-government and the respective states. Roles and regulations are rather unclear, also when it comes to liability. Companies in this respect have great power now, which brings along responsibilities. Currently everybody is responsible for automated driving, but in case of an accident (e.g. UBER) no-one is really responsible.

- An approach for new legislation in automated driving could be to introduce the legal body “Automated Driving Provider” (ADP) and set criteria for what makes them “trustworthy”. (Bryant Walker Smith)
- After the presentations 3 thematic tables discussed separate topics with following outcomes:
- It is unclear if a computer can legally be considered as a driver. Also there needs to be a reason and strategy for automated driving to be integrated in a roadmap.
- A perfect world in terms of safety does not exist. While the European and the US-American discussions are different, both identify the need for a clear legal framework.
- Test cases might lead to testing the wrong aspects of automated driving. Also there is a need to clarify on how to handle the trade-off between safety and over-regulation. Safety in automated driving is a requirement but not the primary goal for introducing it.

Conclusion and main takeaways of the session

- No consensus could be reached. Rules are man-made and depend on the objective of automated driving. Further exchange between European and US-approaches should be organized. Many session participants would like to start with deployment immediately rather than testing in dedicated areas. The legal framework needs to be made fit for that. The perfectly safe world does not exist – neither with people driving nor with automated driving.

Invited Session 19

Circular Economy and Sustainable Processes in the Automotive & Transport Value Chain

Speakers and Panellists

- 1 Pierre Robert, Michelin Test Ambition Program
- 2 Hugo- Maria Schally, European Commission DG Environment
- 3 Pete Harrisson, European Climate Foundation
- 4 Jean- Luc Brossard, PFA- French Automotive Platform
- 5 Thierry Goger, FEHRL
- 6 Thilo Bein, Fraunhofer LBF, ERTRAC

Moderator(s)

Jean- Luc di Paola- Galloni, Valeo, ERTRAC

Discussion Focus

The focus of the session was set on the topic of the circular economy especially regarding automobiles, including the issue of reusability and second life products.

Main Statements

- Agreeing on worldwide certain standards regarding waste management is essential. The acceptance of circular products is by far greater in Europe than in the rest of the world (Thilo Bein)
- Circular economy is understood as a business. We must go from a single-use design to a multiple-use design” (Thierry Goger)

Conclusion and main takeaways of the session

- We need to design multiple-use products, find innovative recycling strategies and define new business models in order to develop from a linear to a circular economy.
- The board emphasised that we are in need of European and global standards, rules and regulations regarding waste management and must decide on common goals in order to reach the zero CO2 emission objective.

Invited Session 20

Beyond R&I Grants - From Research to Implementation

Speakers and Panellists

- 1 Pieter De Winne, Flemish Roads Agency, CEDR Working Group Innovation (Chair)
- 2 Tiina Jauhiainen, Finnish Transport Agency, CEDR Working Group Innovation
- 3 Lutz Pinkofsky, BAST, CEDR Working Group Innovation
- 4 Martin Böhm, AustraTech
- 5 Tom Warras, EUREKA/ TEKES
- 6 Mario Dogliani, SEA Europe

Moderator(s)

Dirk Beckers, INEA

Discussion Focus

The session dealt with the topic of a better implementation of research in Europe with a special focus on infrastructure projects within European funding schemes. The panel addressed the question how to bridge the gap between research and implementation.

Main Statements

- C-ITS services will be reality in Europe next year. (Martin Böhm)

Conclusion and main takeaways of the session

- We need to define and decide on the services we want in the future (for all modes of transport) and create a common vision to pursue.
- The C-Roads platform is an important best practice example for cross- border deployment that should be transferred to other research fields.

Invited Session 21

Sustainable Multimodal Door to Door Travel**Speakers and Panellists**

- 1 Tom Voegelé,
International Transport Forum
- 2 Monica Giannini,
International Road Transport Union- I.R.U.
- 3 Martin Müllner,
Traffic Information Austria
- 4 Keir Fitch,
European Commission
- 5 Sicco Santema,
TU Delft
- 6 Andrea Detti,
University of Rome
- 7 Takis Katsoulakos,
INLECOM

Moderator(s)

Torsten Klimke, European Commission

Discussion Focus

The discussion focus was set on the role of travel information and in this context, on the necessity of open data, National Access Points, interoperable travel information platforms and standardized data formats (like Datex II and NeTEx) as well as Prio A. Furthermore, the importance of personalized route planning and of reliable travel information was highlighted. The panel also discussed the potential of new technologies like blockchain, the implications of the upcoming GDPR and dealing with companies like Google.

Conclusion and main takeaways of the session

- Better cooperation between transport operators is necessary to enable multimodal door to door travel (for example road operators should have to offer travel information on trains as well).

Invited Session 23

Inclusion, You Said?**Speakers and Panellists**

- 1 Ariane Dupont,
French Institute of Science and Technology for Transport
- 2 Floridea Di Ciommo,
cambiaMO
- 3 Andrea Ricci,
ISINNOVA
- 4 Natasha Merat,
University of Leeds
- 5 Laurie Pickup,
Vectos
- 6 Fabienne Goyeneche,
Michelin

Moderator(s)

Maria-Cristina Marolda, European Commission

Discussion Focus

The discussion emphasised on the different aspects of social and economic inclusion in transport. Ensuring full access to the transport services to vulnerable road users or people with disabilities or low income is key.

Main Statements

- Including the excluded - More inclusion across the board is necessary. (Natasha Merat)
- It is important to pay particular attention to women in transport and address their needs.
- In addition, the digital divide poses a challenge that needs to be overcome.

Conclusion and main takeaways of the session

- Human relations should lead the future, not only new technologies.

Strategic Session 1

User-Centric Mobility Systems

Speakers and Panellists

- 1 Armando Carillo Zanuy, EURNEX
- 2 Klaus Bamberger, Head of Market and Customer Service, Wiener Linien
- 3 Mohammed Mezghani, Secretary General, UITP
- 4 Floridea di Ciommo, University Polit cnica de Catalunya, Co-founder cambiaMO
- 5 J rgen Schlaht, Technology and innovation, Siemens AG Mobility Rolling Stock
- 6 Henrik Nielsen, Vasttrafik

Moderator(s)

Alex Taylor

Discussion Focus

General discussion on user centric and demand driven mobility services. Digitalisation is a main driver of disruptive innovation in this field and plays a major role in achieving an integrated Mobility as a Service system.

Main Statements

- Automation will change everything. There will be no human drivers. We will experience seamless door to door journeys. We will use moving space which we will enter at home and leave at our destination. During the journey the moving space will be handed over from one mode to another vertically and horizontally. (J rgen Schlaht)
- We should not forget the human factor in transport. People are social beings. Relying only on technologies creates difficulties for immigrants or handicapped people to use transport. We always need to provide information channels that include groups not taking part in the digitalisation process. (Floridea Di Ciommo)
- Every trend has its anti-trend. One of the key success factors in Vienna was to trust the local transport company. In the future, trusting the transport companies will become even more important as people become more sensitive to data security (Klaus Bamberger)
- Politicians should look beyond their term of service, welcoming technological innovations and paving the way for smooth implementation. (Mohamed Mezghani)
- For regional and metropolitan authorities mobility data will be important to improve public policy and transportation planning. (Henrik Nielsen)

Conclusion and main takeaways of the session

- There is no ultimate customer since the market is highly segregated.
- Innovative methodologies should be applied to improve addressing user needs.
- Increased pan-European cooperation initiatives are recommended.
- Big data and changing analysis requirements need to be considered (EU harmonisation).
- Private business models in addition to public sector operation should be supported.

Strategic Session 1.2

Towards a Truly Integrated Transport System

Speakers and Panellists

- 1 Maja Bakran, Deputy Director- General, DG Mobility and Transport, European Commission
- 2 Mark Robinson, Professor, Director NewRail, Newcastle University
- 3 Jean Luc Di Paola Galloni, Corporate Vice- President for Sustainability and External Affairs, Valeo, ERTRAC
- 4 Andy Doherty, Chief Rail Technology Officer, Networkrail, ERRAC
- 5 Nik Delmeire, Secretary General, European Shippers' Council, ALICE
- 6 Christoph Schneider, Senior Airside Masterplanner, Munich Airport, ACARE
- 7 Christophe Tytgat, Secretary General, SEA Europe

Moderator(s)

Jacki Davis

Discussion Focus

How can European Technology Platforms (ETPs) continue working together and contribute to multimodality? What are the challenges in collaborating and are there solutions to help achieving an integrated transport system?

Main Statements

- The main challenge is to combine all modes of transport and facilitate interoperability. (Jean-Luc Di Paola-Galloni)
- ETPs have to commit themselves to working together unconditionally, also in future. (Andy Doherty)
- Transport should not be seen in different sectors but as a comprehensive process. (Nik Delmeire)
- As of yet we do not offer intramodal or multimodal transportation. We have to make people really want it. (Christoph Schneider)
- Each sector is mainly trying to solve their own problems, before looking at the overall problems that are common throughout all sectors. (Christophe Tytgat)

Conclusion and main takeaways of the session

- Transport needs a mission and should pursue clear goals. In order to achieve these goals structured dialogue and coordinated policies are crucial. At the present time we have excessive competition, therefore it is even more important to cooperate and work together. In general, sector thinking should be substituted by process thinking.
- We have to promote the win-win situations and avoid duplication. In addition, only research projects that can be implemented should be funded - priorities have to be set.

Strategic Session 1.3

Innovative Governance Enabling Sustainable Urban Mobility

Speakers and Panellists

- 1 Philippe Crist,
Administrator, Corporate Partnership Board Programme
Manager, International Transport Forum at the OECD
- 2 Malin Andersson,
Head of Department Development and International Affairs,
Urban Transport Administration, City of Gothenburg
- 3 Rafael Cuesta,
Head of Innovation, Transport for Greater Manchester
- 4 Daniel Kofler, CEO, Bikecitizens
- 5 Marcus Zwick,
Head of Innovative Mobility Solutions, Siemens
- 6 Kerstin Enochsson, Vice President Corporate Strategy and
Project Office, Volvo Cars

Moderator(s)

Karen Vancluysen, Secretary General, Polis Network, ERTRAC

Discussion Focus

Discussion focus was the arising problems and challenges for cities which go hand in hand with threats for health and well-being as well as risks of potential lock-in effects in the socio-technical system. At the same time, trends like new mobility and green mobility are emerging. Transport safety, for example in relation to digitalisation, is very important. Data science, automation and MaaS were additional topics of discussion.

Main Statements

- A multi-stakeholder approach is needed to foster innovation. (Mikael Ivari) Population growth is an enormous challenge for transportation. (Rafael Cuesta)
- Customer-centric is the main focus – if it does not benefit the people, it has no use for our city. (Rafael Cuesta)
- Increasing the number of cyclists is key to solve urban challenges. More cyclists means better data, means better cycling conditions. (Daniel Kofler)
- Volvo wants to put 1 million EVs on the road until 2025. (Kerstin Enochsson)
- The level of complexity and automation in transportation systems is increasing significantly. (Marcus Zwick)

Conclusion and main takeaways of the session

- There are huge challenges in urban areas. Technological trends and innovations can be a possible solution for these challenges. Data is essential for comparing different scenarios.

Strategic Session 2.2

Safe and Efficient Transport through Connectivity and Automation

Speakers and Panellists

- 1 Clara de la Torre, Transport Director, DG Research and
Innovation, European Commission
- 2 Herald Ruijters, Director, DG Mobility and Transport,
European Commission
- 3 Thomas Jäger, Head of Asset Management & Technology
Wagons, DB Schenker Rail AG
- 4 Sabine Kühschelm, Austrian Federal Ministry for Trans-
port, Innovation and Technology
- 5 Oskar Levander, SVP Concepts & Innovation, Rolls- Royce
Marine
- 6 Peter Sweatman, Principal CAVita
- 7 Natasha Merat, Professor, Institute for Transport Studies,
University of Leeds
- 8 Mats Rosenquist, Director External Research
Collaboration, Volvo Group Trucks Technology
- 9 Katja Schechtner, Urban Scientist, OECD, MIT

Moderator(s)

Margriet Van Schijndel, TNO

Discussion Focus

The discussion focussed on describing the potentials of connectivity and automation for a safe and efficient transport system and identifying important aspects to be considered.

Main Statements

- A whole system approach is needed and the data is crucial. (Herald Ruijters)
- Connected and automated driving is a game changer and is therefore very important for the EC. (Clara de la Torre)
- NRAs should take a leading role, so that the benefits of CAD can be harvested. (Sabine Kühschelm)
- Things tend to become more complex in the background, but it should be simple for the customers on the interface. (Katja Schechtner)
- The introduction of unmanned autonomous ships is only a matter of years, due to safety and economic reasons. A disruptive change in the marine business is expected to happen in the next 10 years. (Oskar Levander)

Conclusion and main takeaways of the session

- Cooperation between the stakeholders is vital and a whole system approach is needed, as innovation happens on the border of disciplines and transport modes. It is important to address issues related to data. Another key aspect is to consider the customers.

Strategic Session 2.3

Transport and Data in a Digital Era

Speakers and Panellists

- 1 Despina Spanou, Director for Digital Society, Trust & Cybersecurity, Communications Networks, Content and technology, European Commission
- 2 Anders Johnson, Senior Specialist Mobility, Transport & Logistics, RISE Research Institutes of Sweden
- 3 Helmut Leopold, Head of Center for Digital Safety and Security, AIT Austrian Institute of Technology
- 4 Jean- Marie Letort, Vice- President, Cybersecurity Evaluation and Consulting, Thales Group
- 5 Antonella Querci, Director, Development and Innovation, Livorno Port Authority
- 6 Juha Kenraali, Director General, Data and Knowledge, Finnish Transport Safety Agency
- 7 Sandro Berndt, Chairman of the C- Roads Task Force on Security

Moderator(s)

Jacki Davis

Discussion Focus

Cyber security was named as one of the main issues of data analytics of the coming years. The discussion focused on the resilience of data infrastructure and the urgency to make data security a viable business model. The speakers stressed the discrepancy of IT budgets getting cut and the call for data security, as IT is not recognised for its effect in preventing cybercrime. The problems of the interoperability of data services and of C-ITS were addressed as well.

Main Statements

- In respect of GDPR, the approach of “my Data” to raise user/citizen awareness of data rights and security ought to be established.
- Local car dealers need to communicate data security issues to potential buyers. What information will a device share? Users need to be empowered to take on responsibility for their own data. (Juha Kenraali)

Conclusion and main takeaways of the session

- H2020 research priorities: Rethinking traditional research: Implement large scale pilots and use the results to appropriate the requirements/framework. Testing and exploring the potentials of block chains and new sensor systems is vital.
- Invest in interoperability; FP9 is very well focused. Even more funding is needed to facilitate the interoperability of data exchange while including private and public. Funding should not only be used for technical research.

Strategic Session 3.1

Decarbonisation for a Competitive European Industry

Speakers and Panellists

- 1 Signe Ratso, Deputy Director General, DG Research and Innovation, European Commission
- 2 Stephan Neugebauer, Director Global Research Corporation, BMW, ERTRAC, EGVA
- 3 Bernard Frois, IPHE chair, IPHE International Partnership for Hydrogen and Fuel Cells in the Economy
- 4 Leigh Hudson, Renewable Fuels Manager, British Airways
- 5 Jenny N. Braat, managing Director, Danish Maritime
- 6 Wolfram Schwab, VP Regional Platform- Products & Innovation, ALSTOM Transport S.A.
- 7 Robin Nelson, Science Director, concawe

Moderator(s)

Simon Edwards, Global Director of Technology, RICARDO, Chairman of EARPA

Discussion Focus

The challenges of decarbonisation and energy efficiency and potential solutions, including the benefits of new fuels and technologies were addressed. The role of hydrogen and renewable energies as a part of future concepts was discussed with particular focus on potential impacts on the airline industry.

Main Statements

- The panellists agree that merely the focus on vehicle improvements and technical solutions is not enough; changes in behavioural, modal choice and consumer demands are needed.
- ERTRAC presented a ‘Decarbonisation Strategy for 2050’ with 4 scenarios that outline the potential pathways of decarbonised transport according to different shares of BEV and PHEV in car fleets.
- For aviation there is only a voluntary ‘Global Climate regulation scheme ICAO’ to this day. Clear and binding definitions from the administration are needed.
- The administration needs to define clear boundaries and goals: “Tell the shipyards what the emission limits are and let them figure out how to achieve those values.”

Conclusion and main takeaways of the session

- The main conclusion of this session was that efficient vehicles and decarbonised fuels alone will not suffice to reach the 2050 decarbonisation goals. Socio demographic factors need to be considered and action needs to be taken now.

Strategic Session 3.2

Optimising Logistics - Environmental and Economic Benefits

Speakers and Panellists

- 1 Elisabeth Werner, Director, European Commission
- 2 Andreas Janetzko, managing Director, DP World Logistics Europe
- 3 Vicente del Río Méndez, Director General, Fundación Valenciaport
- 4 Sophie Punte, Executive Director, Smart Freight Center
- 5 Markus Ksoll, Deutsche Bah
- 6 Charlotte Migne, Director, Développement Durable Groupe, FM Logistic

Moderator(s)

Jacki Davis

Discussion Focus

The session tries to answer the question on how Green House Gas emissions and energy consumption can be reduced by improved logistics while saving costs at the same time. The discussion contributes to understand whether and in which extent more efficient processes combined with technology improvements could make energy, GHG emissions and congestion reduction targets attainable.

Main Statements

- Decoupling industry and logistics from economic growth means we need better modal integration by finding alternatives to motorised private transport, better infrastructure through a common European network and a better use of the existing transport capacities by tackling administrative hurdles or optimising the use of vehicles.
- Digitalisation offers a wide range of means to improve logistics from eCostums, tracking and tracing of goods and vehicles or single documents submission.
- EC tools for achieving the decoupling objectives are: 1. Legislation in the area of e.g. use of e-freight documents, 2. Innovation via the support of new technologies like block chain technology and 3. Funding of digitalisation projects via the Connected Europe facility (CEF) in calls providing 450 million euros of funding. (Elisabeth Werner)
- Freight transport is a significant source of air pollution. There is no silver bullet which can contribute to its reduction. What is needed is smart leadership in the freight sector, the will to collaborate within it and company KPIs stimulating energy efficiency. (Sophie Punte)
- Comprehensive use of the available infrastructure of all modes can contribute to a significant transport efficiency increase. The internalisation of external costs is not sufficiently advanced as current profit and loss accounts do not fully reflect the environmental impact of freight transport.

- Freight forwarders have to have a long term vision as investments in durable assets determine a long-term environmental impact. (Vicente del Río Méndez)
- Deutsche Bahn (DB) aims to significantly increase the fraction of electrified railway network from the current level of about 60%. For the remaining network the use of renewable energy offers the possibility to further reduce the environmental impact of freight transport.
- The railway share in the modal split came to a halt. DB offers incentives to regain customers and volumes through improved service quality, reliability and up-to-date railway technologies. (Markus Ksoll)
- The visibility and the awareness of environmental impacts of freight transport must be ensured through the whole supply chain. Achieving this goal is challenging as freight forwarders have a limited own fleet, but subcontract freight to carriers. (Charlotte Migne)

Conclusion and main takeaways of the session

- CO2 targets are in place, nevertheless the ways to reach these targets are not defined and rely widely on the efforts of freight forwarding and carrier levels. Incentives like green logistic labels may help to change the current mind-set.

Strategic Session 3.3

Infrastructure and decarbonized transport

Speakers and Panellists

- 1 Damir Topolko,
Director, Slovenian Infrastructure Agency, CEDR Chair 2018
- 2 Jochen Holzfeind,
CTO, voestalpine Railway Systems
- 3 Detlev Majewski,
Head of Department, Meteorological Analysis and Numerical Prediction, Deutscher Wetterdienst DWD
- 4 Miguel José Segarra, Martínez,
Head of R&D and Innovation, DRAGADOS, ECTP Vice President
- 5 Vincent Piron,
Vice- Chairman of the Working Group Infrastructure & Financing, FIEC
- 6 Harald Ruijters,
Director, DG Mobility and Transport, European Commission, Investment, Innovative and Sustainable Transport

Moderator(s)

Markus Auerbach, Senior Researcher, BAST, CEDR

Discussion Focus

The discussion focus lied on the optimisation of efficiency in planning, operating and maintaining infrastructure, life-cycle analysis of infrastructure and transport, proactive asset management and on infrastructure for ITS and more efficient vehicles. Furthermore, the circular economy and the role of innovation were debated. The CEDR and EU goals for decarbonisation and global path for CO2-reduction were discussed as well. In this context, regulatory tools like road pricing for decarbonised transport were also part of the discussion.

Main Statements

- The operation of infrastructure emits the most CO2, followed by the construction phase and the maintenance. (Miguel Segarra)
- The main problem for global CO2 is not Europe. (Vincent Piron) Infrastructure needs to be complemented by services and interoperability of solutions. (Robert Missen)
- Future technologies will allow a more dynamic infrastructure. (Miguel Segarra)

Conclusion and main takeaways of the session

- Mitigation of emissions and energy use is possible for the infrastructure. Infrastructure operation has the biggest share of GHG-emissions over its life cycle. Global CO2-emissions are very strongly dependent on emerging markets such as China or India.

Strategic Session 4.1

Enabling and Implementing Research and Innovation Strategies

Speakers and Panellists

- 1 Clara de la Torre,
Transport Director, DG Research and Innovation, European Commission
- 2 Stephan Neugebauer, Director Global Research Corporation, BMW, ERTRAC, EGVIA
- 3 Andy Doherty,
Chief Rail Technology Officer, Networkrail, ERRAC
- 4 Henk Prins,
Manager R &D, Maritime Research Institute Netherlands, WATERBORNE
- 5 Uwe Möller, Head of Office Brussels, DLR, ACARE
- 6 Sergio Barbarino, Chair ALICE
- 7 Donato Zangani, R & D Manager, RINA Group, ECTP
- 8 Carlo Borghini, Executive Director Shift2Rail
- 9 Bart Biebuyck, Executive Director, Fuel cells and Hydrogen Joint Undertaking
- 10 Florian Guillermet, Executive Director, SESAR Joint Undertaking
- 11 Tiit Jürimäe, Executive Director, Clean Sky

Moderator(s)

Andrea Ricci, Vice President, ISINNOVA

Discussion Focus

The Focus of discussion was set on the role of research funding in general, the difference of public and private funding, the correlation to competitiveness/competition and the implementation of research outputs (ensuring an impact of research outputs for citizens). The emphasis of the discussion then shifted to strengthening the collaboration between different modes of transport and different instruments and the way PPPs could be a viable tool and also enable innovative technologies.

Main Statements

- Keep the instruments as simple as possible. (Stephan Neugebauer)

Conclusion and main takeaways of the session

- Public funding is needed for collaboration but not for facilitating new products. Private funding is finances the development of new products. There is disagreement on focussing public research funding on the implementation of research outputs.

Strategic Session 4.2

European Transport Research in a Competitive World

Speakers and Panellists

- 1 Signe Ratso, Deputy Director General, DG Research and Innovation, European Commission
- 2 Jean-Luc di Paola-Galloni, Corporate Vice-President for Sustainability and External Affairs, Valeo Group
- 3 Gioia Venturini, Vice-President, International Cooperation and Public Affairs R&T and Innovation SAFRAN
- 4 Aron Sørensen, Head of Maritime Technology & Regulation, BIMCO
- 5 Carl Andersen, Acting Director, Office of Corporate Research, Technology, and Innovation Management, Federal Highway Administration (FHWA), United States Department of Transportation
- 6 Administration (FHWA), United States Department of Transportation
- 7 Toshihiro Sugi, Director of Automated Driving Planning Office, National Police Agency, Japan

Moderator(s)

Jacki Davis

Discussion Focus

Key focus was a study performed in cooperation with ERTH and Wuppertal institute: "Towards a single and innovative European Transport system – international assessment and action plans". This study identifies best practices and lessons learned in integrated and sustainable transport in the countries: Brazil, China, India, Japan, South Korea and USA. It integrates findings of the SINTRAS study and derives action plans for take-up and collaboration for five focus areas across all transport modes. It presents best-practice examples among which the Smart City Challenge in the US is taken as a great example for bringing innovation forward. The panel discussion focused on European Transport Research in a competitive world.

Main Statements

- The EU flagship (international cooperation as cross-cutting issue, aviation, road automation, reduction of transport impact on air quality/enforcement of regulations, multi-modal low carbon freight and urban mobility) follows principles such as open innovation and "open to the world". Retaining competitiveness thereby is important (Signe Ratso).
- Cooperation for market penetration is important as well as the strong R&D base of Europe. (Jean-Luc di Paola-Galloni)
- Shipping is already regulated globally e.g. in terms of minimum standards for safety and the environment. Also, in April 2018 shipping was the first industry that agreed jointly to GHG reduction until 2050. (Aron Sorensen)

- The aeronautic sector is already very much involved in international cooperation, with all supply chains being based internationally. The sector is involved in international cooperation since FP6. (Gioia Venturini)
- The cooperation between the EU and the US in research and innovation is highly important. The US Department of Transportation (DOT) already cooperated in H2020 projects and calls for opening the US market to Europe and vice versa, e.g. on how to improve safety on roads and on how to rigorously innovate. (Carl Andersen)
- Cooperation on automated driving is crucial and should be further strengthened. (Toshihiro Sugi)
- A strategic approach in international cooperation is needed that at first requires understanding the aimed goals of the EU and which findings we strive for. (Gereon Meyer)
- Aviation has a very clear picture on what to achieve and what the EU wants to achieve in CO2-reduction. Existing cooperation should be strengthened and the world should be shown that cooperation brings success. (Gioia Venturini)
- ERTRAC (European Road Transport Research Advisory Council) is a good example for bringing different actors together. FP 9 will address the question what citizens want and what the benefits of R&D for citizens are. The customer shall thus be at the centre of attention. International cooperation within H2020 is encouraged but not a selection criterion. (Signe Ratso)

Conclusion and main takeaways of the session

- More cooperation in general as well as in the regulatory systems is crucial. The panellists agreed on the need for more measuring of impacts and stronger communicating of outcomes.
- For multi-lateral committees a good strategy is as well as a strategic approach is required. A key enabler is partnership between industry and government. A lot of work has been performed in a top-down manner and reach-out to public and academia needs to be strengthened. Acceptance of players that are not "homegrown" experts needs to be strengthened. Also a cultural push in the administrations is vital for example when it comes to integration of start-ups.

Strategic Session 4.3

Skills and Professions for Future Transport

Speakers and Panellists

- 1 George A. Giannopoulos, Transport Planner, Professor Emeritus Aristotle University of Thessaloniki
- 2 Nathalie Amirault, Head of Unit Expertise Development, Union Internationale des Chemins de fer
- 3 Ilse Harms, Advisor Human Factors, Connecting Mobility
- 4 Linda Napoletano, DeepBlue Italy
- 5 George Smyrnakis, Secretary General, WEGEMT

Moderator(s)

Alistair Greig, Professor University College London, UK

Discussion Focus

This discussion tries to describe how jobs will change in future, because of the current changes in the transport sector as well as the systems of education and training. How can we attract new people to the field of mobility and how do different countries and projects address these problems?

Main Statements

- Railway Talent.org is a network of professionals and academics supported by the International Union of Railways (UIC) aiming to provide a strong and sustainable foundation for fostering international cooperation amongst talents in the railway sector. (Nathalie Amirault)
- Not enough people and professions are working in the field of smart mobility. They introduced a Smart Mobility Campus to educate people from the transport sector as well as others. They created a curriculum together with the university and the industry to meet the future needs. (Ilse Harms)
- 15-20% of the unemployment rate is due to a lack of skills. Mobility has to be inclusive, seamless and include all future and technological trends. Needed Skills and Competences will be knowledge about ICT (how to work with robots), the ability to work with data technological know-how and soft skills. (Linda Napoletano)
- MATES is a Strategy for tackling skills shortage and addresses the gap between Automation and Technology-Sustainability and Diversity.
- The main goal is to mobilize the main stakeholders and address the whole community. (George Smyrnakis)

Conclusion and main takeaways of the session

- Lifetime learning and training in all sectors will be the future. Transport and mobility is a strict and unsexy, uncool sector with a lack of diversity, therefore it is hard to attract young people. Intradisciplinary would like to be achieved as well as advanced networking.
- 50% of all future jobs will be new and the other 50% will be retrained. A great challenge of the future will be generations with different values working together.

Scientific/Technical Session 1 5.1

New Apps and New Mobility Services

Projects

- 1 Analysis of the Market Actors Interests in Shift2Rail and Interoperability Framework Solutions
- 2 ATTRACKTIVE- Advanced Travel Companion and Tracking Services
- 3 Localization and Guidance of Individuals or Groups in Multi-Modal Transit Situations Using a Novel Cooperative Positioning Concept based on Differential Wi-Fi
- 4 Organizing the Multi-Modal Transport System: Addressing the Travel- Related and Organizational Challenges to Provide Seamless, Multi-Modal, Door- to- Door Journeys
- 5 Participating in Environmental Loyalty Program of Realtime Multimodal Travel Planner App: Users Need, Environmental and Privacy Motivators
- 6 ST4RT- Semantic Transformations for Rail Transportation

Chair

Yves Amsler, UITP

Discussion Focus

The presentations dealt with different approaches to provide multimodal traveller information services including some approaches also related to ticketing and booking.

Main Statements

- Mobycon, from the Netherlands, presented their approach to combine cycling and public transport in a way to exploit the advantages of both modes. This approach includes the provision of the relevant information on multimodal trip options, sharing locations and lockers for bicycles, etc. As a result, new stretched, frequent bus lines, more bike and car parking facilities, DRT (demand responsive transport) between stops, a cooperation with public taxi service and a multimodal journey planning app are available now. (Project 4)
- Afterwards, the University of Vienna presented their technical approach for localization and guidance of individuals which is an integration of Differential Wi-Fi, intelligent Check-points and indoor navigation, as well as cooperative positioning. The technology could support wayfinding, but could also be used for trajectory estimation and behavioural monitoring. (Project 3)
- HaCon presented, next to some basic facts on the Shift2rail initiative, the project Attractivite that was funded within the IP4 of Shift2rail (IT solutions for Attractive Railway Service). Attractivite is focused on trip planning, trip tracking and the development of a travel companion. The “travel companion” developed within the project is a personalized application to inform the passenger and guide him or her through the whole journey. (Project 2)

- The main focus of the ST4RT project is to lower the costs of interoperability.
- The approach of ST4RT is to develop an intelligent application to solve the customers’ problems in a very easy way. According to the presenter technological solutions exist but they are too expensive for the operators to maintain the interoperability. (Project 6)
- UITP did a survey within their membership regarding the interests of the market participants to participate in an interoperability framework. This framework is based on a semantic approach. Semantics is not a new technology, but new in transport sector. (Project 1)

Conclusion and main takeaways of the session

- Shift2rail is quite active in developing an interoperability framework. The semantic ontology used for the combination of different services is high on their agenda.
- Potentials according to the stakeholder consultation are that 70% see multimodal interoperability as relevant for their business and 80% are interested in participating in the interoperability framework. Their main reason for participation is added value for the customer.

Scientific/Technical Session 2 5.2

Mobility as a Service & Mobility Management

Projects

- 1 Developing the CIPTEC Toolbox for the Promotion of Public Transport Innovation
- 2 Improvement of Rural Mobility in European Regions Affected by Demographic Change
- 3 Perceived Action Spaces for Public Actors in the Development of Mobility as a Service
- 4 Unlocking Large Scale Access to Combine Mobility Through MaaS applications I Europe: the IMOVE Approach
- 5 Unravelling Travel Flow Dynamics: A Multi- Level Analysis of Public Transport Demand and Passenger reliability
- 6 Towards the Development of Real Time Services for an Optimized Mobility Support by Cooperative Networks and Open Data- Advances in TIMON Project

Chair

Pekka Leviäkangas, VVT, Finland

Discussion Focus

The focus of discussion was on the role the public and private actors in the introduction of MaaS with a special focus on what roles public actors could/should play.

Conclusion and main takeaways of the session

- Cities and governments often see limited action space but must raise demands in relations to private actors, they have different available instruments (strategies and action plans, collaboration, financing and regulations) which can be used in either a hard or soft fashion, how it is used often depends on the political culture.

Scientific/Technical Session 3 9.1

Big Data Enhancing Mobility Services

Projects

- 1 Assessing the Relevance of Mobile Phone Data to Estimate Origin- Destination Matrices
- 2 Big Data Analytics in E- Commerce Logistics: Findings from a Systematic Review and a Case Study
- 3 Big Data for Low Carbon Transport: an Overview of Applications for Designing the Future of Road and Air Transport
- 4 Can technologically Assisted Travel Surveys Improve Mode Choice Modelling? Differences and Improvements Compared to Travel Conventional Survey Data.
- 5 Positive Drive, a Gamified Tracking Campaign to Uncover Human Mobility Behaviour in an Urban Business District
- 6 The Transforming Transport Project- Mobility Meets Big Data

Chair

Bernd Datler, ASFINAG, Austria

Discussion Focus

- In-vehicle data collection for demand prediction (probedata based on mobile technologies)
- Changing landscape in E-commerce logistics (role of big data)
- Usage of big data or rather data-analysis for decarbonisation in transport (modelling technologies based on public available data for designing future road and air transport)
- Technology assisted travel survey - mode choice modelling (comparison between different data sources; prediction of travel times depending on the resolution of the underlying geographical model)
- Behaviour study regarding the traffic congestion problem in Luxembourg (problem with people commuting in- and out of the city)
- “Transforming Transport” – large scale big data pilot (what is the value of obtaining big data?)

Main Statements

- The focus on the consumer/customer perspective is an often neglected but very important factor in the e-commerce data environment. (Project 2)
- By using freely available and public web-data on flights (flight-scanners) it is possible to reconstruct noise level and pollutions foot-prints and models.
- “Carbon intensive air transport is a very challenging issue for the aeronautic industry”. (Project 3)
- The Austrian Institute of Technology (AIT) is undertaking an mode choice model for the TRA 2018 (technology assisted travel survey) (Project 4)

- Concept of “active spaces”: people from different origins with similar destinations have an overlapping activity space, and therefore could share their rides, even if they don’t start at the same point. About 15 % of people changed their behaviour (better numbers will be available with currently ongoing projects). (Project 5)
- Not (only) personal data per se, but also intellectual property rights could get a big issue/challenge concerning the (big) data collection for transport projects. “About 60 % of revenue at airports is made by the retail sector”
- Conclusion: Deep learning algorithms perform better than classical data analysis approaches. (Project 6)

Conclusion and main takeaways of the session

- Real Big Data applications haven’t been shown in the session, but rather different ways and approaches to “traditional” data analysis. (See question 2 for information on content)

Scientific/Technical Session 4 4.1

Innovative Urban Freight Developments

Projects

- 1 A Cross-Case Assessment of City Logistics Measures
- 2 Electric freight vehicles for urban logistics – technical performance, economics feasibility and environmental impacts
- 3 Mobile Multi-functional Urban Logistics-Platforms with Electric Drive Train
- 4 Thermal Management System for a thermally controlled food delivery electric vehicle integrating heat pump, cold storage unit, solar panels and PCT resistors
- 5 Urban freight - What about construction logistics?
- 6 Using a consolidation centre to reduce deliveries and waste collections from an urban UK shopping centre

Chair

Paola Cossu, FIT CONSULTING SRL, Italy

Discussion Focus

Various projects related to Urban Freight Developments were presented

Main Statements

- The cities themselves are to be understood as protagonists. They define the stakeholders, who come from different areas. In particular, the suppliers are of importance. Research and politics are also to be involved. Depending on the interest of the city, there can be more than 100 criteria options selected and included. Subsequently, it is assessed how well the measures perform in the various defined impact areas. By adapting to a dimensionless scale, different measures can be compared. Thus, the best solution can be identified. The challenge is in particular the availability of data and the evaluation of the indicators. (Project 1)

- Under the title: SUCCESS - Sustainable Urban Consolidation Centers for construction, the main goal is to reduce costs and negative impacts of the construction supply chain. The result of the 36-month project was that, above all, the fragmentation of the construction is the main barrier against a more sustainable supply chain. Moreover, the theme is very unique and understudied. Potentials for achieving an optimization are Construction Consolidation Centres, ICT (RFID), as well as Off-peak deliveries. (Project 5)
- The main objectives of the project were on the one hand to provide insights into the production of wastes as a result of typical commercial operations, on the other hand to investigate the impact of legislation on waste collection procedures and treatment protocols. Recommendations have emerged, on the one hand, for government to create a legal framework to support UCCs operations, to produce planning and best practice guides to support UCCs, as well as to develop a reporting framework to enable comparisons. Moreover, research should assess transport impacts from simultaneous operation of many UCCs. (Project 6)
- Under the project name FREVUE the suitability of electric freight vehicles for urban last-mile deliveries should be demonstrated. In eight European cities, over 80 pure electric freight vehicles (EFV) were deployed for over four years.
- The cars had different sizes and were used over all four seasons in different climatic regions. It turned out that a positive business case for small and medium EVs with regard to the economic for city logistics is achievable. It has been found that electric vehicles under 3.5 t are after just five years at a mileage of 60km/day, cheaper than conventional cars. The higher the daily driving performance, the faster the electric vehicle pays off. (Project 2)
- The MULE project has set itself the goal of reacting to the lower transport volume while the number of transports increases. Electrification of urban logistics by MULE (Mobile Multi-functional Urban Logistics-Platforms with Electric Drive Train) shows comparable total cost of ownership when designing the electric powertrain according to the driving cycle. Furthermore, intermediate charging is useful for the truck category - therefore high-speed charging is needed at local suppliers or logistic hubs. (Project 3)
- Thermal Management System for a thermally controlled food delivery electric vehicle integrating heat pump, cold storage unit, solar panels and PCT resistors
- 15% to 25% of the average energy demand for EVs is needed for auxiliaries, conditioning of the battery pack and passenger acclimatisation. In cold (< -10°) and hot (> 35°) periods the energy demand can be more than twice the annual average. The result was an advanced thermal system, which was designed-developed and integrated in the so called OSEM-EV. (Project 4)

Scientific/Technical Session 5 12.1

Social Aspects of Innovative Mobility

Projects

- 1 A Social Equity Analysis of Swedish and Scottish National Transport Policy
- 2 Blockchains in Mobility and Logistics
- 3 Driver De-Skilling and its Effect for Safety in Autonomous Driving
- 4 Exploring Potential Impacts of Societal Dynamics on the Development of Autonomous Cars
- 5 Social Innovations for Transitioning Toward Sustainable Mobility
- 6 A Cost Benefit Analysis of Self-Driving Vehicles on the Road

Chair

Robert Missen, EC

Discussion Focus

Social and institutional issues of mobility and transport innovation, including equity aspects, social innovation, technology assessment of blockchain in mobility and logistics, driver skills in automated driving (AD) and institutional dynamics introducing AD

Main Statements

- Systematic data is missing to better understand inequity effects of transport policies. Profound analysis is essential to enlighten these policies and to politically fight against mobility poverty and social exclusion effects. (Tom Rye)
- Social innovations are the driving force for social change in the transport sector and to address social needs and wants in this area. Social innovation is asking for multi-actor alliances supported by the public and trusted regimes to facilitate the relations. (Petra Wagner)
- Blockchain is allowing trusted peer-to-peer transactions via distributed nodes. Middleman functions like today performed by banks and other authorities are not necessary anymore. In the mobility and logistics sector it is not very obvious what additional benefits blockchain technology in comparison to normal data base solutions has. The challenge is still that multiple stakeholders are involved and it is all about data and trust concerning this novel business mediation system. (Tuomo Kalevi Kinnunen)
- There is a technical debate regarding persuasive technologies to alert the driver to retake vehicle control in automated driving. There was no sufficient research yet, what skills are capabilities are necessary to do so. The project started with an online survey to ask for driver experience and estimates in situations when steering, braking and accelerating control is taken over by the machine. In addition, automated systems in aviation were assessed. To avoid de-skilling pilots are constantly trained for take-over control situations to consolidate intuitive routines. Primary flight displays relevant for take-over situations are easy to control at one glance; →

→

- the cabin interior is designed for such take-over situations. Pilots are constantly trained for the manoeuvre to avoid deskilling. (Sandra Trösterer)
- Jens Schippl of KIT Karlsruhe presented a study based on the multilevel approach of transition theory. This research is focusing on changing socio-technical configurations at the regime level. Potential system changes/ transformations are anticipated and assessed along alternative development trajectories of fully automated vehicles (SAE5, Robo-Taxis). Changing configurations at the regime level are driven by societal triggers (e.g. megatrends). The induced institutional will accelerate or slow down the implementation of the system. The co-evolution of technology and society is always good for a surprise; co-evolutionary trajectories can wind into one or the other direction.

Conclusion and main takeaways of the session

- Social equity issues have to be implemented in AV policies, in planning and design and project appraisal. The social distribution of mobility opportunities may be corrupted by high end/ cost automated systems provided by for-profit ride haulier entrepreneurs. Equity has to be guaranteed by regulatory measures.
- The benefit of blockchain depends on establishing valid use cases, for example the user can fully trust e.g. in a blockchain system for electric charging. The middleman is a trusted institution (energy company).
- How is it possible to keep drivers skilled and attentive for sudden take-over control situations in SAE3 and SAE4 environments. Are for this case regular driver trainings to keep monitoring routines and predictive system to fail skills attentive?

Scientific/Technical Session 7 4.2

New Urban Mobility Services

Projects

- 1 Modelling and Control of Innovative Car Sharing Services based on Stackable Electric vehicles
- 2 A Network Based Method to Study Urban Sharing Mobility: The Case of Milan
- 3 Supporting Urban Integrated Transport Systems: Transferable Tools for Local Authorities (SUITS)
- 4 The European Roadmap 2025 for Mobility as a Service
- 5 The Mobility as a Service Maturity Index: Preparing the Cities for the Mobility as a Service Era
- 6 The Vehicle Relocation for Electric Free-Floating Car Sharing Services

Chair

Ivo Cré, POLIS, Belgium

Discussion Focus

The topics of this discussion included the integration and evaluation of SUMP, preparing cities for Maas (MAASiE project) and sharing mobility/car-sharing/e-Mobility. The relocation of electric-powered car sharing vehicles and stackable car-sharing vehicles (building a car convoy by coupling cars) was also addressed.

Main Statements

- With car-sharing, people tend to use more public transport and non-motorized modes of transport – (Bruno Raffaele, Project 1)

Conclusion and main takeaways of the session

- MaaS and car-sharing have several benefits and can help improve the urban mobility system. New and innovative solutions are needed to shape the future transportation system.

Scientific/Technical Session 8 8.2

Automated Transport: Scenarios, Fundamentals, Regulation

Projects

- 1 CODECS - Coordination and Support for C-ITS in Europe
- 2 Feasibility Study of Trains Involvement in Electrical Demand-Response
- 3 Going Driverless: the Legal Consequences of Making the Human Driver Redundant
- 4 Railway Cybersecurity: on the Way of a Common and Integrated Approach
- 5 Road Riding Hazardous Situations for Motorcycles
- 6 Scenarios for the Development of Self-Driving Vehicles in Freight Transport

Chair

Ingrid Skogsmo, EC

Discussion Focus

The session concentrated on automation among various modes of transport (freight vehicles, motorcycles, passenger cars, trains) tackling different topics such as traffic safety, legal aspects, connectivity and communication between vehicles (C-ITS), cost-benefit analysis, electrification and cyber security. Besides the podium presentations and a few questions raised by the audience there was no discussion.

Main Statements

- The recently happened Uber crash from Arizona was a very popular topic throughout the whole session. "The Arizona uber crash shows how many questions still need to be answered." (Nynke Elske Vellinga).
- There is still a lack of stakeholder coordination regarding the C-ITS deployment, especially between service providers (TPEG/C-ITS), OEMs and content/service aggregators. (Sandro Berndt, Project 1)
- A common approach for railway cyber security is needed, meaning "security by design" for railways. (Project 4)
- One important aspect in the presentation about legal aspects for automated driving was to define the role of the car user/driver, meaning that the drivers "need to know what their task is". Issues addressing the upcoming developments and having the background of the Geneva and Vienna Convention are currently discussed in the Global Forum for Road Safety. (Nynke Elske Vellinga, Project 3)

Conclusion and main takeaways of the session

- Within the study addressing the development of self-driving vehicles in freight transport the study authors did not go into detail regarding the road infrastructure investments. Hence, this can be tackled within future research.
- When speaking about cyber security and automated transport, also a framework for railways needs to be established. One future research needed could be the certification for "security by design" for railways.

Scientific/Technical Session 9 5.4

Data Management and Demand Analysis

Projects

- 1 Analysis of the Effects of Establishing Affordable Annual Tickets in Vienna
- 2 Combination of Traditional and New Methods for the Analysis of Travel Patterns: the Case of Nationwide Public Transport OD Matrices in Hungary
- 3 Data Standards of Interoperability of Systems and People Mobility
- 4 Impact of Public Transport Service Disruptions on Ensuing Travel Strategies and the Relevant Sources of Travel Information – a Passenger Survey Analysis
- 5 Modal Substitution in Urban Transport: a Stated Preference Approach
- 6 Quantifying the Impact of Crisis on Bus User Satisfaction and Perceptions

Chair

Mikko Räsänen, Finnish Transport Safety Agency, Finland

Discussion Focus

- In the discussion people's mobility, systems and services were addressed.
- Fact-based evidence in transport environments and the related methods, passenger surveys, ticket data collection, traveller interviews, and regular regional/national mobility pattern collections were presented.

Main Statements

- We need to get evidence on travellers' reactions to specific implementations.

Conclusion and main takeaways of the session

- A variety of methods and collected data concerning mobility questions were presented. A need for R&D exists to get evidence how travellers react to specific measures of transport policy and implementations. Little or no conclusion could be reached by the chair for the complete session.

Scientific/Technical Session 14 12.4

Mobility Planning**Projects**

- 1 Being Ready for the Next Uber: Can Local Government Reinvent Itself?
- 2 Development of an Architecture Framework for Intelligent Transport Systems
- 3 Integration vs fragmentation: alternative tactics of local mobility businesses in response to a global wave of market disruptions
- 4 Living Labs for Mobility – The Urban Mobility Labs Approach in Austria
- 5 Mobility as a Service in Practice and Urban Development – Jointly Contributing to Low-Car, and Low-Carbon and Affordable Housing – the Bremen Hulsberg Case (H2020 project SUNRISE)
- 6 User-Centric Vision for Mobility in 2030: Participatory Evaluation of Scenarios by the Multi-Actor Multi-Criteria Analysis (MAMCA)

Chair

Maria-Cristina Marolda, EC DG MOVE

Discussion Focus

Flexibility of legislation serves as a pre-condition to foster innovation. For instance urban labs are needed where legislation is suspended for testing and demonstration. Other points of discussion were transport policy versus economic policy (automobile industry versus sharing economy) and the role of governance in the change process. For instance, ministries should not be reluctant and wait for the “final solution” and take action immediately.

Main Statements

- It needs flexible legislation to demonstrate the benefits of new approaches to the travellers. (Tom Cohen)
- Governmental decisions should not be postponed along the technical development paths. (Doris Wiederwald)
- The sharing economy will change the business models, also in the car manufacturing industry, but the management of this change process has already been started in car industry”. (Michael Glotz-Richter)

Conclusion and main takeaways of the session

- The presentations revealed again, that there are no silver-bullet solutions for the mobility of tomorrow, but a series of different approaches to tackle the needs of the travellers. There are various boundary conditions for such new approaches, not only technical conditions, but also geographical, cultural, political or regulative conditions that need to be taken into account. Therefore, there will not be one single solution, but a range of specifically tailored end-user-solutions. (Maria-Cristina Marolda, European Commission)

Scientific/Technical Session 25 5.5

Local Accessibility, Active Mobility, Bikes and Soft Modes, Cable Car, On-Demand**Projects**

- 1 A Spatial Framework for Planning Station-based Bike Sharing Systems
- 2 Multi- and Intermodal Trip Chain Simulation for Individual Daily Routines, Using Bicycles
- 3 Semi-Automatic Location Planning for Urban Bike-Sharing Systems
- 4 Travel Demand Estimation for Cable Car Transport in the Urban Areas Shown for the Moderate-Sized City of Graz, Austria
- 5 Understanding Access Mobility to Railway Stations
- 6 What Makes and Breaks Active Travel? A Statistical Model for Evidence-Based Decision-Making in Transport Policy for Non-Motorized Modes

Chair

Guido Di Pasquale, UITP, Belgium

Discussion Focus

The discussion focussed on urban cable cars, which have a similar capacity compared to trams but are not affected by traffic jams. Further topics of discussion were the accessibility of railway stations, analysis of modal shares of active mobility, factors of bicycle use, optimisation of bicycle routing, user groups in cycling as well as the optimisation and optimal positioning of bike-sharing systems.

Main Statements

- Investing in cycling infrastructure does not automatically increase cycling modal share. (Clemens Raffler, Project 6)
- The determinant with the highest impact on cycling modal share is by far the optimisation of local accessibility. (Clemens Raffler, Project 6)
- Poor planning is one of the major reasons for the failure of bike sharing systems. (Ursula Witzmann-Müller, Project 1)

Conclusion and main takeaways of the session

- Active mobility is a viable solution for tackling current urban mobility problems and challenges. Unconventional solutions like cable cars as well as the already widespread bike-sharing can contribute to a sustainable urban mobility ecosystem.

Scientific/Technical Session 28 1.5

Reduction of Pollutant Emissions and Improvement in Air Quality from Road, Rail and Marine

Projects

- 1 Comparison of Real Driving Emissions and Chassis Dyno Tests on Emissions from Two Fuels in Three Euro 6 Diesel Cars
- 2 Emissions Race SSS vs. ROAD - Road versus Short Sea Shipping: Updating the 2008 Comparison of Emissions between Modes
- 3 Evaluation of Innovative Ideas for Public Transport Proposed by Citizens Using Multi-Criteria Decision Analysis (MCDA)
- 4 Particle Reduced, Efficient Gasoline Engines: A First Year Report on the PaREGEn Project
- 5 Study of Brake Wear Particle Emissions of a Minivan on a Chassis Dynamometer

Chair

Marina Kousolidou, EC and Maurizio Maggiore, EC

Discussion Focus

Transport pollution emissions have a significant impact on public health and global climate change. The purpose of the TRA session is to review the impact of pollution mitigation measures and regulations currently implemented, presenting new systems allowing the measurement under real driving conditions and to analyse non-combustion engine related sources of particular matters such as particles from braking events.

Main Statements

- Cars have to meet requirements defined by the worldwide harmonized light vehicle test cycle (WLTC) and the use of real driving emissions (RDE) test cycles for vehicle certification. A set of three Euro 6 diesel passenger cars have been tested with different exhaust after treatment technologies using two different fuels. The tested cars are able to meet RDE driving requirements for NOx and particular matters using urea-selective catalytic reduction and diesel particulate filter (DPF) technologies independently from the fuels used. (Heather Hamje, Project 1)
- Freight forwarders use different freight transport modes for their operations with different environmental impacts respectively. There is rarely a single mode trip, therefore two different combinations with a different weighting between Short Seas Shipment (SSS) and road transport have been analysed taking into account the different operational characteristics e.g. trucks carry one container while ships carry many. An analysis between 2008 and 2018 shows an (significant) improved environmental performance of both mode combinations. The results underline the importance of Euro standards for road and similar standards related to waterborne transport for reducing the environmental impact of transport. (Vanherle Kris, Project 2)

- Urban transport is changing rapidly and new forms of societal organisation and technologies are emerging, influence and redefine the needs and requirements of the modern customers of the public transport (PT) sector. The European funded project CIPTEC analyses and assesses the key market and social trends for their potential effect on public transport customers. Using innovative methodologies, like the Multi-Criteria Decision Analysis (MCDA) allows to validate and classify the opportunities and threats imply for urban public transport. (Dimitrios Nalmpantis, Project 3)
- The "PaREGEn" consortium will demonstrate a new generation of gasoline direct injection engine vehicles achieving a 15% reduction in CO2 emissions through the optimal combination of advanced engine and robust after-treatment technologies. Modelling and simulation software will be verified and used to improve the design and the capability of the engines. Two demonstration vehicles, one Mercedes E180 and one Jaguar XE, will comply with upcoming Euro 6 RDE limits with particle number emissions measured to a 10 nm diameter. (Simon Paul Edwards, Project 4)
- The contribution of exhaust and non-exhaust traffic related sources to total traffic related particular matters (PM) emissions is almost equal. The study investigates the flow of particles from the whole vehicle under different initial speeds and deceleration rates with focus on the driving conditions in urban environment. All particles have been measured, therefore no distinction between particles from tyre wear and from braking has been carried out. (Apostolos Tsakis, Project 5)
- A large fraction of the total number of particles emitted by direct injection engines are below the adopted 23 nm diameter threshold. The EU aims to regulate these emissions and impose limits for new light-duty vehicles. However, this is not yet possible due to the absence of accurate and reliable quantification methods, especially under real driving conditions. There is a lack of adequate knowledge regarding the nature of sub-23 nm particles from different engine/fuel combinations under different engine operating conditions. (Eleni Papaioannou, Project 6)

Conclusion and main takeaways of the session

- Current measurement methods are inadequate to provide information about particular matter pollution and their sources for small particles. Regulations and legislation had a positive impact in relation to overall pollution reduction.

Scientific/Technical Session 29 10.2

Response to Extreme Events & Climate Change

Projects

- 1 Adapting the German Transport System to Climate Change and Extreme Weather Events – First Case Study Results Connected to Extreme Precipitation
- 2 Assessing the Resilience of Land Transport Networks against Extreme Rainfall Events
- 3 Compilation of a Geo-Hazard Map for Slope Instabilities and Landslides Along the German Railway Infrastructure
- 4 First Steps Towards a Modelling Toolbox Suitable for Evaluating Resilience of German Inland Waterways in Context of Climate Change
- 5 Safety and Availability of Road Infrastructure During Extreme Natural and Man-Made Events
- 6 Tools and Guidance to Help National Road Administrations Address Climate Change

Chair

Andrea Nowak, AIT Austrian Institute of Technology GmbH

Discussion Focus

The session showed different approaches to deal with extreme events due to climate change. In particular, tools were presented to predict or prevent expected events.

Main Statements

- Two major climate change challenges are addressed by the tool:
- Making the business case for climate change adaptation includes the questions if there should be investigations in adaptation action and what the costs are if there aren't any. The project DeTECTor develops tools and guidance to help NRAs address climate change. At the moment there is a risk assessment and CBA tool, as well as a guidance document on including climate change in economic appraisal. Furthermore, a procurement collaboration platform and a guidance document on embedding climate change into operations and procurement processes was established.
- Kalliopi Anastassiadou - Federal Highway Research Institute, Germany
- Assessing the resilience of land transport networks against extreme rainfall events. (Sarah Jane Reeves, Presentation 1)
- The project RAINEX (Risk-based approach for the protection of land transport infrastructure against extreme rainfall) aimed to ensure the availability and quality of transport networks and to develop a "ready to use" methodology addressing security issues having an increasing impact on the resilience on transport networks. Moreover, the focus was on the vulnerability and criticality of relevant transport infrastructures as well as on the systematic application across the entire European transport network. (Presentation 2)

- Adapting the German transport system to climate change and extreme weather events – First case study results connected to extreme precipitation
- The research is included in the BMVI (Network of Experts) under "Topic 1 - Adapting the German transport system to climate change and extreme weather events". The main goals are on the one hand the integration of knowledge with regard on climatic changes in the atmosphere and ocean with practical knowledge about the modes of transport (Waterway, road, rail). On the other hand it aims to provide a basis for implementing the German Adaption Strategy. In order to achieve those goals, analysis and evaluations of climate change impacts on transport infrastructure are conducted based on impact models, maps and indices for example. (Stephanie Hänsel, Presentation 3)
- The main task was the quantification of safety and availability of road infrastructure during the occurrence of extreme events. Therefore a resilience approach had been chosen and the analysis conducted on different levels, in particular on network and object level. On the network level an abstract representation of the road network was visualised in order to show interactions. On object level an evaluation of single road infrastructure elements was made.
- The network analysis is able to identify critical nodes in the road network. Moreover, results of the network analysis can be compared with real world example scenarios. In the future the model may be extended to consider additional information. (Jörg Finger, Presentation 4)
- For the assessment of current and possible future status of inland waterway an integrated approach was chosen due to the possibility of combining different temporal and spatial scales as well as qualitative and quantitative information.
- RiNA (River Navigation Assessment Tool), a tool for data integration, evaluates the navigability in terms of potentials and normalizes spatially distributed data on a scale of 0 (worst) – 100 (best).
- It is already possible to receive a good validation through reproduction of the current state as well as robust and reproducible results. The modelling concept allows for an integrated, interdisciplinary, direct and quantifiable evaluation of inland waterways under different scenarios. Furthermore, it is part of the climate impact assessment within the "Network of Experts". (Alexander Kikillus, Presentation 5)

- The creation of a geo-hazard map for slope instabilities and landslides is based on a German-wide engineering-geological model, which considers geotechnical properties of the rocks (for example rock class, fracture favourability), properties of the hillside/slopes (e.g. slope angle, horizontal and vertical curvature), characteristics of the catchment areas (flow accumulation) as well as land use (density of vegetation cover, degree of soil sealing). There are two methods used in order to identify endangered railway sections: the knowledge-driven approach is based on algorithm/fuzzy logic, the data-driven approach on artificial neural networks. The data-driven approach only applied to the Free State of Saxony due to limited spatial availability of training data. The model is based on a geological Map 1:200.000, therefore the problem occurs that information details are not available. Hence, the recommendation is the usage of GK25 in the future. (Andreas Knobloch, Presentation 6)

Scientific/Technical Session 30 7.2

Challenges on the Electrification of Infrastructure

Projects

- 1 Business Case for Electric Roads
- 2 Charging Station Optimization for Battery Electric Vehicles on Highways
- 3 Modelling Range Extension of Electric Vehicles Using Dynamic Wireless Power Transfer
- 4 Reduced-Scale Power Hardware-In-the-Loop Simulation of a Hybrid Railway Power Substation
- 5 Techno-Economic Optimisation of Railway Power Substation Hybridization
- 6 Vulnerability Of Charging Infrastructure, A Novel Approach For Improving Charging Station Deployment

Chair

Lutz Pinkofsky, BASt Federal Highway Research Institute Germany

Discussion Focus

- First presentation: The focus was set on the challenges of hybrid (wind, solar and battery) railway power substations in France.
- Second presentation: A business case for electric roads in Sweden was presented. Charging while driving is possible via: wireless, inductive or through overhead wire.

- Third presentation: The discussion focus was set on the questions: Where to place charging stations on motorways in Austria and how many of them are necessary. The objective was to minimize the costs for building the charging infrastructure.
- Fourth presentation: The roll out of charging infrastructure in the Netherlands was presented. Furthermore the discussion was focused on the vulnerability of charging infrastructure and how to reduce the vulnerability.
- Second presentation: Case studies are important because of the learnings when you try something out in the "real world".

Main Statements

- Second presentation: Case studies are important because of the learnings when you try something out in the "real world".
- Fourth presentation: If 1 charging point is not working, 10 other charging points are affected, because of the demand shift (in urban areas).

Conclusion and main takeaways of the session

- First presentation: The model and the optimization algorithm are accomplished. Further hardware and experimental tests on the EDF Concept Grid have to be conducted.
- Second presentation: In 2019 in Germany there will be a few more projects of electric roads on public roads (Schleswig-Holstein, Hessen, Baden-Württemberg).
- Third presentation: A method for siting and sizing charging stations along motorways was proposed. The method can be adapted to other regions or countries. In the future an extension towards smaller road networks are possible. Meanwhile only motorways were taken into account.
- Fourth presentation: A novel approach to charging infrastructure robustness was setup by the use of network analysis. Policy makers can use that approach to improve the charging point deployment. In the future the approach should be extended.

Scientific/Technical Session 31 12.2

Impacts of Innovation on Citizens & Society**Projects**

- 1 Safety Culture in Maritime Cargo Transport in Norway and Greece: Which Factors Predict Unsafe Maritime Behaviours?
- 2 The Analysis of Impact of Larger Aircraft A-380 on Frequency of Flights
- 3 Key Trends and Developments in the European Port Sector: Main Implications for the Port Labour Industry
- 4 Profiling Future Air Transport Passengers in Europe
- 5 Transport Costs in Household's Budgets and their Evolution in 1985-2011 According to the Type of Space

Chair

Paola Chiarini, EC DG MOVE

Discussion Focus

- The effect of the national context on the safety culture was discussed; in particular the different attitudes and mind-sets of northern and southern European workers and how to implement innovations successfully across these differing cultures.
- The discussion focused on the new business trend of containerisation and how this forces ports to adapt to the new requirements, improve productivity, install new equipment to handle larger volumes and change the structure and organisation of employment.
- Furthermore the transport costs in household budgets dependent on urbanity were discussed and the implications of expanding metropolitan areas and less populated rural regions.

Conclusion and main takeaways of the session

- The industry is increasingly demanding new job profiles and more specialised skills while sophisticated technologies make soft skills like teamwork, problem solving, and environmental awareness more important.

Scientific/Technical Session 41 6.3

Decarbonisation and Sustainability of Freight Transport and Logistics**Projects**

- 1 A Major Pilot Study on LNG Heavy Duty Trucks: New Business Model for Enhanced Sustainability in Freight Transport Corridors for Manufacturers and Retailers
- 2 Greenhouse Gas Reduction and Fair Gain Sharing in Trusted Collaborative Transport Networks
- 3 Lean & Green Analytics
- 4 Smart Infrastructure Access Policy: A Highway towards More Efficient Road Freight Transport
- 5 The Added Value of Rail Freight Transport Demand in Belgium
- 6 TRANSFORMERS – Configurable and Adaptable Trucks and Trailers for Optimal Transport

Chair

Alain Baeyens, 300 North

Discussion Focus

Discussion focus lied on the trend and reduction of GHG-emissions in freight transport. In this context, the potential use of heavy-duty LNG-trucks in logistics was one of the key topics (most freight carriers think that CNG/LNG will be the dominant technology in the future). Further topics of discussion were influencing factors for efficient freight transport, the potential of "lean and green" transport (certification of companies based on their efforts to reduce CO₂) and the aspect of prescriptive vs. performance-based legislation approaches.

Main Statements

- With a proper developed network there will be a sustainable future – Silvana Toffolo (CNH Industrial)
- There is a reduction potential of 30% in CO₂-emissions in combined transport – Robert Boute (Vlerick Business School)
- As a rule of thumb: if there is low volume but a high amount of shipping, the supply chain is inefficient – Harsha Dijk (Connekt)

Conclusion and main takeaways of the session

- There are several possible approaches to decarbonising freight transport and logistics. Nevertheless, the necessary decarbonisation remains a huge challenge in view of the rising hauling capacities and rising kilometres travelled by freight carriers.

Scientific/Technical Session 43 5.3

Travel and Transportation Planning

Projects

- 1 A New Approach to Integrated Cross-Modal Transport – the FOX and USE-iT Experience
- 2 Comparison of Microscopic and Macroscopic Approaches to Simulating the Effects of Infrastructure Disruptions on Railway Networks
- 3 Effects of the Mandatory Validation on Bus Commercial Speed: Case Study in Torino (Italy)
- 4 Integration of Vehicle Sharing Systems into an Intermodal Journey Planner
- 5 Modelling Urban Mobility at a Metropolitan Scale: a Comparison of Paris Transportation Models
- 6 Passenger-Oriented Optimization of Lines in a Mass Transit System

Chair

Anastasios Tsaskalidis, EC

Discussion Focus

No discussion, Presentation of different projects

Main Statements

- Passenger-oriented optimization of lines in a mass transit system (Lucile Brethomé)
- Comparison of microscopic and macroscopic approaches to simulating the effects of infrastructure disruptions on railway networks (Markus Zinser)
- Effects of the mandatory validation on bus commercial speed: case study in Torino. (Cristina Pronello)
- New Approach to Integrated Cross-Modal Transport – the FOX and USE-iT Experience (Martin Lamb)
- Modelling Urban Mobility at a Metropolitan Scale: a Comparison of Paris Transportation Models (Mallory Trouve)
- Integration of vehicle sharing systems into an intermodal journey planner (Andreas Partusch)

Conclusion and main takeaways of the session

- Do delays appear only from one event/incident or from an accumulation of events? Simulations on how speed reduction changes delays (Markus Zinser, Presentation 2)
- There are different scenarios for boarding/ entering the bus with a methodology of 4 steps. The more people are at the bus stop, the shorter are the boarding times, since people do get stressed and hurry up. When boarding the bus only at door 1 or door 1 and 4, boarding time extends so much, that you need 2 additional busses to run the same interval. The situation is so unusual and unfamiliar that people are confused and boarding takes way longer. (Christina Pronello, Presentation 3)
- In analysing Cross Modal Transport 42 common challenges (no matter which transport sector) could be identified with 7 main priorities: Governance for Implementation, Digitalisation, Carbon and Environment, Security, maintenance, Cross & Multimodal Integration, Health & Safety. So far some cooperations already exist (especially in urban areas) but they could be extended by far. (Martin Lamb, Presentation 1)
- So far a multi-modal model is missing (Mallory Trouve, Presentation 4)

Scientific/Technical Session 46 12.5

Socio-Economic Aspects of Electrification

Projects

- 1 Drivers of Electric Bicycle Use in Norway - a Consumer Survey
- 2 Speeding up the Transition to Partly (Hybrid) or Fully Electric Waterborne Transportation through Education and Skills Upgrading
- 3 Electric Vehicles in Commercial Fleets: Potential and Challenges from the User Perspective in Germany
- 4 Evaluating CO₂-Reduction Potential of EV Incentives across European Cities and Regions
- 5 From H2020 Research to Political Initiatives: the "Factor 100" Campaign of the ELIPTIC Project

Chair

Robert Missen, EC DG MOVE

Main Statements

- In order to operate more ferries electrically in the future, the project has set itself the goal of closing gaps in education. The intention is to accelerate the proceeding of ferry electrification. On the one hand an understanding of the safety operation behavior must be ensured, as well as the knowledge of batteries and the battery system. On the other hand, myths and misunderstandings must be overcome. These include, for example, low range anxiety, battery life circle and thermal instability. At a first seminar course, participants were informed and knowledge was imparted in those areas. Next steps are an evaluation and the monitoring of practical appliance in order to improve the course concept further. Moreover, authorities should be provided with recommendations. (Cecilie Larsen, Presentation 1)
- From January 2014 to December 2016, 800 electric vehicles were included in the study under the title InitiativeE. The project was carried out through vehicle data assessment, online surveys as well as workshops and interviews. With regard of the use of EVs in commercial fleets results were that suitable economy sectors are industry and manufacturing, professional and administrative services, human health and social work. Further potential sectors have to be explored. Furthermore, individual analysis of mobility patterns as well as employee needs and concerns are required. EVs also can fully replace a conventional vehicle or play a complementary role. Results in the field of policy were, that regional level policy measures have to address local needs and requirements. Moreover, first incentive programs have been set up, but further measures are needed to support not only purchase but also everyday use of EVs. (Viktoriya Kolarova, Presentation 2)

- The evaluation consists of three parts: the prevailing conditions (PESTEL Framework), the behaviour (stakeholder preferences) and the city strategy (policy portfolio). Measures are examined in order to see how many additional electric vehicles are purchased and therefore how much CO₂ is saved. They are considered individually, but also combined to recognize synergy effects. (Huw Charles Davies, Presentation 3)
- The project originally had the intention to show that investing in electric buses would be more effective than in private vehicles. "Factor 100" stands for the fact that an electric bus is a hundred times as effective as a private car but the funding is not 100 times higher. The concise formulation with the slogan created a quick recognition value which ultimately led to a subsidy of 100 million euros per year for electric buses in Germany. (Michael Glotz-Richter, Presentation 4)
- Drivers of electric bicycle use in Norway – a consumer survey
- Sales of electric bicycles are growing exponentially, often without any subsidies. The consumer survey analyses which factors are influencing sales with regard to structural, psychological and demographical aspects. Regarding the structural factors it was considered, that the income might be relevant due to higher investment costs. Moreover, fitness might be of importance because of the physical requirements that even electrically assisted biking has. Also the previous transport use (bike vs. car driver) was of interest. Health and image related beliefs as well as ease of use were considered as psychological factors. Demographic factors were gender as well as age. (Christian A. Klöckner, Presentation 5)

Conclusion and main takeaways of the session

- Key results were that the benefit depends on the system of the city and that there is an effectivity bonus from bundling incentives. Depending on the measure and the effective combination higher CO₂ reduction can be achieved. Incentives need to be shaped to local policy requirements for optimal results. The evaluation is able to provide opportunity to assess policy and bundling options.
- Results showed that e-bikes recruit more from car drivers than cyclists. Furthermore, e-bikes appeal especially to middle to higher aged people and health, image and ease of use are about equally important. Normative aspects are also of importance as well as innovativeness. According to the study it appears that gender, income and fitness are not important drivers for purchase.

Scientific/Technical Session 47 9.3

Intelligent Traffic- & Transport-Management

Projects

- 1 A Probabilistic Framework for Traffic Data Quality
- 2 Asset Information Management for European Roads Using Linked Data
- 3 Big Data Value for Improving Transport Performance in all Modes, an Assessment Methodology
- 4 System-Level Evaluation of Next-Generation Radio Communication System for Train Operation Services
- 5 The waterway Danube as Smart Transport Infrastructure of the Future
- 6 Train Tracking and Train Condition Monitoring by Distributed Acoustic Sensing

Chair

Andreas Breinbauer, FH des BFI Wien, Austria

Discussion Focus

Data and Data Quality in traffic and Transport Management

Main Statements

- Traffic data quality is crucial. Therefore, incomparableness and inconsistency of results from different researchers should be avoided. Main issues thereby are different definitions of quality indicators, undefined quality requirements, dependence on a specific application and operational differences.
- A consistent understanding of traffic data quality needed. Therefore DLR developed a probabilistic framework for traffic data quality that defines quality as the "Probability of conformance to requirements". This allows more detailed information before deciding on whether to use data or not. (Rüdiger Ebdndt, Project 1)
- Main background was the INTERLINK Project that developed a European Road Object Type Library (OTL) containing a data structure everybody can agree on for exchanging data between authorities on road conditions. This OTL can be built gradually, not all information has to be delivered at once and already available information can be integrated. With the OTL, road owners can gradually evolve from document to data-driven approaches.
- "Just do it. When approaches work, take them over, rather than having a lengthy discussion on an upper generic level. (Bart Luiten, Project 2)
- The project "Big data value for improving transport performance in all modes. An assessment methodology" assesses the potential and requirements of 13 pilots to effectively demonstrate the transformation potential of big data on mobility and logistics, comprising operational efficiency, asset management, environmental quality, energy consumption, safety and economic impacts for the competitiveness of the transportation sector. Following transport domains are dealt with: Smart High-ways,

Sustainable Vehicle Fleets, Proactive Rail Infrastructures, Ports as Intelligent Logistics Hubs, Efficient Air Transport, Multi-modal Urban Mobility and Dynamic Supply Chains. (Guillermo Velazquez, Project 3)

- "System-Level Evaluation of Next-Generation Radio Communication System for Train Operation Services" is part of Shift2 Rail. It addresses the new requirements for train operation such as tele-maintenance, personal information systems, video monitoring, real-time video, automatic train control and virtual coupling. Thereby the need to prepare for a GSRM-R successor, as 3 GPP LTE (long-term evolution) exists. (Hervé Bonneville, Project 4)
- The key question dealt with in "The waterway Danube as smart transport infrastructure of the future" is how to maintain transport on a dynamic river with 2415 km length. Austria therefore introduced the "Waterway asset management system (WAMS)" that integrates a holistic approach and system with semi-automatic analysis covering all core tasks. (Markus Simoner, Project 5)
- Train tracking and train condition are monitored by Distributed Acoustic Sensing (DAS). The DAS principles are as follows: The system forms an optical unit, with optical fibre. Laser pulses are injected and the backscattered light is measured. The vibrations can be sensed in time and space.
- The DAS implementation is presented along the example of train tracking. Thereby a two stage algorithm is used - vibration detection, object identification and tracking. Following results could be made: Train tracking works in real-time, the train positions are provided every second, the accuracy of tracking is around 40 metres, all trains could be identified. (Christoph Wiesmeyer, AIT Project, Project 6)

Conclusion and main takeaways of the session

- Conclusions for setting up the OTL are that data should be liberated and linked data serves as glue. Existing standards should be utilized and the bottom-up model development and reuse are important factors.
- LTE in train environment can cope with high speed. In a high load scenario, interference is the limiting factor at cell edge. Partial frequency reuse mitigation technique provides a good compromise.
- Efficient eco-friendly multi-modal transport is crucial for success. Increasing availability and accessibility is key to achieve competitive waterway transport. The holistic waterway assessment management system takes this a few steps further. Further improvements and an extension of services on the Danube are the future goals.
- DAS is a new sensor technology with great potential. At the time potential applications are not yet fully explored.

Scientific/Technical Session 49 3.2

New Concepts of Advanced Propulsion Systems: Deployment & Assessment

Projects

- 1 Can Bus Users' Preferences Bolster Low Emission Bus Schemes? Lessons from Europe's Largest Hydrogen Bus Fleet
- 2 European Competitiveness in Commercial Hybrid and Automotive Powertrains (ECOCHAMPS): A City Bus Application
- 3 European Competitiveness in Commercial Hybrid and Automotive Powertrains (ECOCHAMPS): A Medium Duty Hybrid Vehicle to Meet the Needs of increasingly Sustainable Mobility
- 4 Future Freight Locomotives in Shift2Rail – Development of Full Electric Last Mile Propulsion System
- 5 Introduction of Battery Electric Buses in European Cities – Economic Comparison of Novel Technological Concepts
- 6 Second Life Application of Automotive Li-Ion Batteries: Ageing during First and Second Use and Life Cycle Assessment

Chair

Simone Serra, EC – Joint Research Centre, Italy

Discussion Focus

The electrification of transport asks for high investments in infrastructure and rolling stock. Public transport authorities, railways and logistics fleet owners are looking for new concepts for advanced propulsion systems and their successful deployment & assessment. Expectations are either a reduction of investment and/or running costs or allowing more flexibility in providing services to the customer.

Main Statements

- Aberdeen has the strategic aim to become a world class energy hub leading a low carbon economy and at the forefront of hydrogen technology in Europe. A fleet of 10 hydrogen busses are deployed on bus lines in Aberdeen. They carried out customer surveys assessing the utility of the hydrogen busses in comparison with bus lines serviced by conventional fuelled busses on two lines. However, in the case of hydrogen busses comfort (high) and local pollution (less) highlighted the positive contribution to environmental awareness and the significant impact of bus design on user satisfaction and as a tool to distinguish zero emission busses from the rest of the fleet.
- At the moment the used hydrogen stems from non-renewable resources; however hydrogen production will be renewable while increasing the share of renewable energy based on off-shore wind parks. (Luis Enrique Loria, Presentation 1)
- The European project ECOCHAMPS develops efficient, compact, low weight, robust and cost effective hybrid powertrains for both passenger cars and commercial vehicles

with increased functionality, improved performance, comfort, functional safety and emission levels below Euro 6 or VI. The ECOCHAMPS objectives are to improve powertrain efficiency up to 20%, to reduce powertrain weight and volume up to 20% and to reduce hybrid vehicle costs.

- MAN is working on a standard bus platform which can be equipped with different drive trains: a Hybrid Electric Vehicle (HEV) with diesel generator, a HEV with compressed natural gas (CNG) generator, a Fuel Cell (FC) and Fully electric battery system. (Tassilo Pflanz, Presentation 2)
- The European project ECOCHAMPS develops efficient, compact, low weight, robust and cost effective hybrid powertrains for both passenger cars and commercial vehicles (buses, medium duty and heavy duty trucks) with increased functionality, improved performance, comfort, functional safety and emission levels below Euro 6 or VI. The five vehicle demonstrators encompass one Class B, one Class C vehicle, one Medium Duty vehicle, one city bus and one heavy tractor. (Roberto Mantia, Giorgio Mantovani, Marco Aimo-Boot, Presentation 3)
- FFL4E (Future Freight Locomotive for Europe) aims at developing key technologies for future energy efficient freight locomotives, allowing highest operational flexibility and providing attractive and competitive rail freight services to the final customer. One key element to achieve the goals is the improvement of the efficiency of propulsion systems with hybrid technologies and energy storage systems. The successful integrations, commission and certification of powerful Li-Ion batteries is mandatory for the success. Part of the integrations is the assessment of safety as there are still no norms and standards are not available. (Andrea Mazzone, Project 4)
- The presentation focuses on the use of existing electric public transport systems (including light rail, metro, tram and trolleybus) for the electrification of multimodal mobility approaches in the urban context. Further take-up of electric vehicles can be supported cost-efficiently by integrating existing electric public transport infrastructure for multi-purpose use. (Presentation 5)
- The analysis stems from the ELIPTIC projects, which included 20 concepts within 11 cities. In Oberhausen the investment and the operational costs of a fully electric bus including the necessary charging infrastructure investment for the bus line was compared to a conventional diesel bus line. In Szeged one trolley bus was equipped with a battery, which allowed an extension of the existing bus line. In the case of Oberhausen the electrification was only competitive compared to conventional use when external costs such environmental costs are included. (Fabian Meishner, Presentation 6)

Conclusion and main takeaways of the session

- The competitiveness of new concepts for advanced propulsion systems is difficult without the internalisation of external environmental costs or through the support of regulations such as the access to city areas limited to zero emission vehicles.

