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The Future of Transportation is a study and conference on the subject of What Next. The conference will bring together world transportation leaders from automotive manufacturers and their suppliers, transportation authorities and city planners, rail and public transportation technology firms and operators along with inventors of new and disruptive global mobility solutions, all with the common goal of devising better solutions for the increasingly demanding challenge of providing safe, efficient, sustainable transportation for the world in 2030 and beyond.

TWO DAYS, NINE CONFERENCE STREAMS...



STREAM 1 URBAN AIR MOBILITY

How autonomous aerial vehicles and personal airborne transportation solutions will revolutionise urban mobility



STREAM 2 URBAN MOBILITY & SMART CITIES

Intelligent urban mobility solutions for smart megacities of the future



STREAM 3 LEGAL & REGULATORY CHALLENGES OF AUTONOMOUS VEHICLES

Building international standards and a legal framework for successful implementation of highly automated vehicles



STREAM 4 THE CHALLENGE FOR RAIL

How new technology can help modernise railways and help operators meet the challenge from new mobility solutions.



STREAM 5 MOBILITY AS A SERVICE

Is MaaS the next industrial revolution for transportation and urban mobility?



STREAM 6 QUANTUM SHIFTS

Examining new concepts and changes that would radically transform surface congestion



STREAM 7 SUSTAINABILITY IN TRANSPORTATION

Developing zero-emission transportation and sustainable mobility solutions for future generations



STREAM 8 CHANGING LANDSCAPE FOR THE AUTOMOTIVE INDUSTRY

Vehicle manufacturers will see big changes including the probable effects of reductions in vehicle ownership, new ways of selling vehicles to a different ownership profile and challenges from new, highly competitive mobility solutions



STREAM 9 INFRASTRUCTURE & PROJECT FUNDING

Reviewing successful private funding and joint funding partnerships and how these may be able to be expanded in the future. Who will the players be?

STREAM 1 URBAN AIR MOBILITY



DAY 1 / TUESDAY 19 JUNE

THE ARRIVAL OF URBAN AIR MOBILITY

1

The electric VTOL revolution

Mike Hirschberg, executive director, AHS International - The Vertical Flight Technical Society, USA

Over the past five years, there has been a groundswell of interest in electric- and hybrid-electric-powered vertical take-off and landing (VTOL) aircraft for personal air vehicles, urban air taxis and even military missions. Electric VTOL obviates the need for mechanical power transmission, allowing new aircraft design freedom through approaches such as distributed electric propulsion. More than 50 companies are developing electric VTOL designs today, with many now in advanced stages of flight testing. This presentation will detail the status of the electric VTOL revolution to date, and analyse trends for the future.

The value chain of urban air mobility

Andreas Thellmann, project executive, economics of urban air mobility, Airbus, GERMANY

The vision of Airbus for urban air mobility is to enable urban transportation in the third dimension for everyone by providing a convenient, safe and affordable service solution. This presentation gives a comprehensive overview of the entire value chain of urban air mobility and highlights the biggest challenges for the technical and economic domains. Furthermore, the interactions between the different value blocks are discussed. An outlook is given on what the future of urban travel in the third dimension could look like.

Lilium Jet – the world's first fully electric vertical take-off and landing jet

Dr Remo Gerber, chief commercial officer, Lilium Aviation, GERMANY

Lilium is the German aviation company developing the world's first all-electric jet capable of vertical take-off and landing (eVTOL), which has received over US\$100m in funding to date. In April 2017 Lilium achieved a world first when the full-size prototype successfully performed its most complicated manoeuvre – transitioning between hover mode and horizontal flight. The Lilium Jet's electric jet engines are highly efficient and ultra-low noise, allowing it to operate in densely populated urban areas, while also covering longer distances at high speed with zero emissions. With the jet requiring no significant infrastructure, Lilium will be able to bring high-speed transportation services to small cities and villages as well as large city centres for the first time. The Lilium

Jet will be able to travel at up to 300km/h for one hour on a single charge, meaning an example 19km journey from Manhattan to JFK Airport could take as little as five minutes. The jet's economy and efficiency mean flights are predicted to cost less than the same journey in a normal road taxi.

Autonomous, on-demand shared mobility – up in the air

Florian Reuter, chief executive officer, e-volo GmbH, GERMANY

The ever-growing demand for mobility in the megacities of today leaves only one solution: going up in the air and making use of the free lower airspace. Battery-powered, quiet, super-safe drone technology will finally allow the dream of flying for everyone to become a reality within five years. Integrated into the public transport system, autonomous air taxis give great flexibility not only to passengers, but also to the municipality, as they can function as on-demand infrastructure.

Autonomous aerial vehicle defines good order of urban air mobility

Derrick Xiong, co-founder and chief marketing officer, EHang, CHINA

When people head into the new world of urban sky, it's time to rethink what kind of flying vehicle and mechanism can lead us to a better order of urban mobility than today. With this question, the presentation will introduce EHang184, the world's first autonomous aerial vehicle, globally launched at CES in early 2016, leading the emerging industry of urban air mobility with a trillion RMB-level market. EHang184 sticks to three core technical concepts: absolutely safe by design; automation, sync flight management platform; committed to delivering a safe, eco-friendly, smart solution for urban aerial transport in good order.

eVTOL – the promise of large-scale, on-demand urban air mobility

Diana Siegel, programme manager, eVTOL aircraft, Aurora Flight Sciences, USA

eVTOL aircraft promise an entirely new form of urban mobility by taking transportation to the air. Flying instead of travelling on the ground is not a new idea. However, it took the convergence of several technologies to bring this idea within reach: high-

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performance electric powertrains, vehicle autonomy and ubiquitous connectivity. Although the technology has come a long way, several challenges remain. To fulfil the promise of large-scale transportation, eVTOLs will need to operate at levels of autonomy beyond today's transport aircraft or cars. Aurora Flight Sciences has been developing the underlying technologies over the course of several programmes, including the Autonomous Aerial Cargo/Utility System (AACUS) or the robotic co-pilot.

How can we build infrastructure for a future that we can't easily predict?

Karthik Balakrishnan, head of Project Altiscope, A3 by Airbus, USA

The presentation will discuss what the skies might look like 30-40 years from now, and how we can solve the challenge of building fundamental infrastructure for applications for missions that we want to enable today as well as those that can't even be imagined yet. The speaker will look back to the development of the internet and see how we can pull lessons from the way that it was built and architected to be flexible and grow with technological advances. He will also draw parallels with questions being asked during the development of systems for autonomous flight.

DAY 2 / WEDNESDAY 20 JUNE

1 **ENABLING TECHNOLOGY & OVERCOMING THE CHALLENGES FOR URBAN AIR MOBILITY**

Electric aviation – the vehicle and infrastructure challenge

Darrell Swanson, principal consultant, AviaSolutions and a board member of the British Aviation Group, UK

This presentation will examine the key characteristics of fixed-wing electric aircraft and eVTOL and assess their operating characteristics against current and future aviation infrastructure. Drawing on previous presentations, we summarise the operating economics of electric aviation route potential and ask, "Can we afford the vertiport infrastructure needed to support eVTOL flights sustainably?" We will look at fixed-wing electric aircraft and specifically the challenge of the last 50 miles and the cost of operating at various airports for these aircraft. Additionally we ask the question, "Do electric aircraft need to access hub airports?"

Urban air mobility: real-world lessons

Uma Subramanian, CEO, Voom, an Airbus company, USA

The urban air mobility movement has gained an immense amount of momentum in a short period of time. At Voom and Airbus, we too believe that urban air travel will be a major part of the future transportation equation. That said, there are many questions around the market's viability. Is there demand for short-haul air travel? What is the right vehicle configuration? How will the regulatory environment respond? Airbus is taking an experimental approach with Voom, with a goal of answering these questions. Uma will share what has been learned from operating one of the first global urban air mobility companies.

Regulatory aspects regarding drones supporting urban mobility

Yves Morier, principal advisor to the flight standards director, European Aviation Safety Agency, GERMANY

This presentation will outline the state of play in the European regulatory framework for drones, focusing on the open and specific categories (e.g. operation of small drones). The presentation will outline further regulatory developments such as the work on standards, the drafting of an NPA in the certified category (e.g. operations of large and complex drones) and the preparation of regulations for drone traffic management (unmanned aircraft traffic management or U-Space in Europe). The presentation will conclude with the spin-offs of drone technology from manned aviation.

UTM traffic management activities at DFS

Ralf Heidger, VE/U, DFS Deutsche Flugsicherung GmbH, GERMANY

The presentation will discuss the drone market and air navigation service providers (ANSPs); the European context of U-Space; drone-related activities of DFS as an ANSP; UTM evolution; U:CON project of DFS and Deutsche Telekom; some achievements and results of the project; further prospects for enabling drone operations business.

Regulatory challenges for urban air mobility

Gerhard Deiters, lawyer/partner, BHO Legal, GERMANY

Everyone is talking about urban air mobility in general and drone taxis in particular. In the general perception, passenger transport by drone taxis is not a question of whether or not, but of when and how. However, among other things, the current legal framework itself has to evolve, regulatory requirements for the certification of urban traffic management systems have to be established and liability/insurance issues have to be solved, before business can take off. The presentation provides a brief overview of the current legal framework and the legal/regulatory challenges ahead.

The challenges of regulating flying taxis

Paul Rigby, CEO, Consortiq, UK

Urban air mobility has huge benefits in Industry 4.0 but flying robots need to play nicely with aeroplanes and helicopters. Big data and AI can be used to take a dynamic, real-time, performance-based regulatory approach enabling a paradigm shift in how we currently regulate air traffic.

Mobile networks speed up low-altitude airborne traffic

Dr Michael Lipka, researcher, Huawei European Research Institute, GERMANY

Developments of current drones are just a step towards intensive air traffic at low altitudes, including cargo and surveillance drones

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as well as autonomous passenger eVTOLs. A UTM ensuring safe air traffic utilising air space resources effectively is essential and cannot be realised by traditional air traffic control systems. LTE 4G networks can already provide the capability to support drone control, tracking and HD video transmission but they will reach their limits in mass application. Therefore a future-proof 5G cellular radio network, offering safety-relevant low latency and enough bandwidth to support entertainment applications in 'flying taxis' is proposed.

NexTerm – a global innovation collaborative ecosystem for air travel

Jim Robinson, managing director, Pegasus Aviation Advisors, FRANCE

The presentation will offer a briefing on the NexTerm initiative – a global innovation collaborative ecosystem designed to bring together early-adopter airports, airlines, government authorities and technology providers to address trends in technology advancement such as blockchain technology, cloud computing, hyper-personalised connectivity, robotics and autonomous vehicles, the Internet of Things and other emerging technologies. The objective of NexTerm is to develop end-to-end urban mobility and air transport outcomes that streamline the traveller's experience. The focus will be on the opportunities and challenges in leveraging digital technology, addressing: multi-airport/airline collaboration challenges; future-proofing the planning and development process; from proof of concept to delivery.

FLEXCRAFT – VTOL hybrid aircraft for flexible operation

José Rui Marcelino, CEO, Almadesign Lda, PORTUGAL

FLEXCRAFT is a VTOL aircraft concept to support passenger and logistics markets. The project focuses on developing three technological building blocks addressing mobility challenges for the future: flight and operation, including VTOL capability and hybrid-electric propulsion; versatility and usability, including innovative multimodal interfaces and disruptive interior design approaches; materials and production processes, to enable low-cost production technologies. The FLEXCRAFT consortium includes industry partners and R&D institutes – Almadesign, Embraer Portugal, IST, INEGI, SETsa – and support from Embraer in the fields of industrial design and mobility, aeronautical engineering, process engineering and aircraft manufacturing.

Finding the power for the electric revolution

Dr Steve Wright, senior lecturer, avionics and aircraft systems, University of the West of England, UK

Electrical storage and power technologies have made a breakthrough in capability to create a new industry of unmanned aerial vehicles, and the usage envelope has expanded such that personal transport systems are being proposed. However, the very technology that made this breakthrough conceivable is its major weakness: hydrocarbon fuels have provided a gift to the engineer for nearly two centuries now, and the energy storage capacity is proving hard to beat. We have the power, but where will the energy come from? This talk will review the scientific underpinnings of this question, and the technologies that might provide the answers.

Hydrogen fuel cell and battery hybrid system for aviation applications

Prof Josef Kallo, head of energy systems integration, Deutsches Zentrum für Luft- und Raumfahrt (DLR), GERMANY

Urban air mobility becomes very interesting for individual transport by introducing new electric, low-noise, propeller-driven propulsion systems. The electrical energy needed is strongly limited by battery system technology and weight. At the DLR, battery hybrids – including a hydrogen fuel cell system – show interesting potential for efficient, high-energy storage components. This presentation will show the improvement during the last 12 months of development, and discuss future potential.

Autonomous operation of aircraft – facts and challenges

Ali Baghchehsara, R&D lead engineer, VDev Systems and Services, GERMANY

The role of today's digital world is critical for our transportation visions in 2025 and 2050. Autonomous flight, smart maintenance and connectivity of aircraft are all exciting for the future. But we are not allowed to forget safety and security. Who takes care of that and how, in such a fast-growing world of big data? Are humans able to fight against system hacks? How do big companies view these milestones? Will the pilots lose their jobs, and will people be prepared to fly in aircraft without pilots? These topics will be discussed in this presentation.

Distributed propulsion – electric aviation going forward

Robert Vergnes, chairman, Neva Aerospace, UK

Robert Vergnes, chairman and CEO of Neva Aerospace, the original inventor of 3D distributed propulsion in 2009 and static-thrust electric turbines (high-efficiency electric ducted fans) will provide an insight into the advance of electric propulsion systems for UAV/UAS and MAV using distributed propulsion and electric turbines. As a myth buster, Robert will provide clarity on the differences and limitations of electric propellers, caged propellers and turbines, then what can be expected in the near future for aero-in-city transportation, and finally an overview of the long-term technological challenges and opportunities for the industry.

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STREAM 2 URBAN MOBILITY & SMART CITIES



DAY 1 / TUESDAY 19 JUNE

MOBILITY IN CITIES OF THE FUTURE

2 Key changes in the automotive ecosystem: urbanisation, digitisation, sustainability – what's in it for me?

Jörg Astalosch, CEO, Italdesign, ITALY

The automotive world is standing on the edge of three big revolutions: urbanisation: less ownership, more shared economy; digitisation: less self-driving, more machine-piloted objects; sustainability: fewer combustion engines and more locally zero-emission engines. All this around a more human-focused approach, a less cookie-cutter mentality. But where do we think this will lead us as an industry for our customers, and what could happen next?

A new era of smart cities

Valerie von der Tann, engagement manager, McKinsey & Company Inc, GERMANY

After a wave of criticism following the initial hype around smart cities in 2008-12, the concept of the smart city is having a comeback right now. In fact, we're finding ourselves at the beginning of a new era of smart cities, an era that will be different in major ways and finally has the chance to realise the potential that technology has to improve cities. As part of a new global study on smart cities for the McKinsey Global Institute, we have measured the impact of smart city applications and found that cumulatively, they can improve key dimensions of citizen quality of life, e.g. health, safety, environmental quality, by a substantial amount with minimum capex required. However, there are substantial differences in the ways in which smart city applications should be prioritised – what works in one city might not work in another.

How blended mobility technologies are revolutionising urban transportation

Dr John Michel, managing director, executive director, chairman, Switch Mobility, Skyworks Global, DemandTrans, USA

Urban transportation is undergoing an unprecedented transformation fuelled by the convergence of mass urbanisation, changing sociological dynamics and new 'smart' technologies. Today, the elegant fusion of on-demand transportation options, urban VTOL air taxi proliferation, and real-time micro-transit options is enabling the creation of a personalised, seamless door-to-door trip chain that provides consumers with an unprecedented

level of economic freedom of movement and promises to reshape the entire economics of mobility as we currently know it. Learn the five ways urban consumers will benefit from this transformation that promises to create over US\$1.5tn in new value for society by 2030.

Towards seamless integrated mobility in smart cities

Andrey Berdichevskiy, director, global lead automotive mobility solutions, Deloitte Consulting, HONG KONG

The emergence of a new mobility ecosystem could offer faster, cheaper, cleaner, safer, more accessible and customised experiences for consumers travelling within or between cities. However, the benefits of the future of mobility model are far greater than enhanced transportation. City infrastructure and people's lives will also be revolutionised by greater connectivity and convenience achieved. The session explores the evolution of smart cities with examples from the fast-growing programme in China, plus the possibility of and priorities for integrated mobility solutions.

Technology push versus human demand – driving and being driven

Prof Jelte Bos, researcher, TNO, NETHERLANDS

The development of transportation is largely driven by technological and economic challenges. Apart from what people intrinsically want, these developments (automated vehicles, hyperloops) also pose certain challenges to human safety, health and comfort, which may be pivotal to successful acceptance by the general public. In that respect it should be reckoned that human and technological evolution do not keep up. We may, for example, have realised a hundredfold increase in pace of self-motion over the past 100 years, but that of our hearts has remained the same. Are we still putting the cart before the horse?

Mobility in the city of tomorrow

Paulo Humanes, head of strategic business development, PTV Group, GERMANY

The presentation focuses on the impacts that mobility will have on the city of tomorrow based on the ITF 'Lisbon study', and how these will have a profound impact in the same way that the motorcar did in the early 1900s.

The time has come to consider urban mobility as truly integrating intelligent mobility in cities across all transport platforms and between different stakeholders

Alexander Lewald, chief technical officer, Kapsch TrafficCom AG, AUSTRIA

In the past decades, mobility, mainly in urban areas, followed a linear development trend to 'go faster, go further, go longer'. Stepping into the digitisation era, urban mobility has the potential to become holistic and multi-modal. To face traditional transportation means and tackle mobility access issues, alternative ways of moving have emerged, transforming them into innovative concepts, such as ride hailing, bike sharing, carpooling and parking guidance. Connectivity and data availability are breaking the limits, barriers and silos and creating new business models, services and means of putting these into place.

Airport autonomy: future-proofing for turbulent technological, regulatory and market skies

Derrick Choi, principal, Populous, USA

Airports have long been at the forefront of industrial-orientated autonomy, with simple closed-loop robotic applications for everything from parking shuttle services to airport people movers and baggage handling systems. But as the future of autonomous transport and mobility solutions pushes further ahead – beyond the boundaries of the airport – questions immediately emerge that cast doubt on the airport's preparedness for the dynamic conditions and indeterminacies of everything from handling human-centric factors and customer service challenges, to the retrofitting of traditional facilities to handle the potential increase in driverless vehicles from the kerb to the tarmac. Through various case studies, the audience will explore how tomorrow's airport system is learning to leverage the potential of proven closed-loop autonomy in an uncertain market, and the regulatory skies ahead.

The future of cities and urban mobility

Josef Hargrave, associate director - global foresight manager, Arup, UK

The future of transport is fundamentally shaped by the future of cities. Trends such as population growth, ageing, liveable cities, infrastructure resilience and changes in land-use patterns are all reshaping how people and goods move across the urban environment. This talk will explore some of the key trends shaping the future of cities, highlight global benchmarks, and explore implications for the future of mobility in terms of technologies, system design, experience and urban integration.

Meeting London's transport challenge

Steve Kearns, stakeholder manager, Transport for London, UK

Long-term planning: adoption of the Mayor's transport strategy; need to change the way people travel; healthy streets approach; modal target of 80% of trips by sustainable mode by 2041; a good public transport experience; need to accommodate new homes and jobs; new technology has the potential to shape the vision. Short-term action: Mayor's Clean Air Action Plan; emissions surcharge; changes to Congestion Charging scheme; emerging proposals for Ultra Low Emission Zone; role of zero- and low-emission vehicles; public transport, cycling and walking upgrades.

Smart urban mobility: challenges and chances for public transport

Dr Rainer Schwarzmann, managing director, TransportTechnologie-Consult Karlsruhe (TTK), GERMANY

If new technology will create new solutions for urban mobility, we must ask what role 'conventional' public transport will play in a smart and digitised environment. This presentation will make an attempt to identify the challenges on the one hand, and the opportunities on the other, as it is likely that new technology alone will not solve the fundamental problems such as a lack of space for parking and infrastructure for driving. It will discuss whether public transport is still the major way forward and aim to identify possible adaptations in public transport solutions.

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DAY 2 / WEDNESDAY 20 JUNE

SMART CITIES & THE GLOBAL MOBILITY CHALLENGE

2 Flow as driver form – smart emerging station types

Anouk Kuitenbrouwer, architect and urban planner, KCAP
Architects & Planners, SWITZERLAND

The design opportunity for stations is their increased integration in the flow and the activity of the city and to connect neighbourhoods through the station. These heavy infrastructures need to become permeable for the city. A key aspect for the transition between city and station is the creation of high-quality public space that provides a high stay quality. The pedestrian flow is a mould for both the build space and the open space. For a series of station areas we have designed the interface between the station and the urban environment to accommodate upcoming transformations.

Seamless, self-assembling transit: redesigning mobility

Sigma Dolins, senior researcher, Rise Viktoria, SWEDEN
Dr Arwed Schmidt, senior researcher, Rise Viktoria, SWEDEN

Forget first- and last-mile solutions. We reimagine transportation as a system, from how we plan our journeys, to how the data cloud and retailers can help us organise our trips, to what kind of comfort and services we expect from public transport, and how autonomous vehicles can unlock potential for new uses of space. We will present the 'self-assembling transit' concept: using a variety of vehicle types in autonomous deployment for daily trips, using the cloud to more effectively manage the flow of services and goals, and how diversified vehicle types will create personalised mobility.

Smartness of urban mobility and quality of life in Vienna

Hermann Knoflacher, university professor, Vienna University of Technology, AUSTRIA

Eight years ago, the city of Vienna was ranked first in the Mercer Quality of Living Survey. It has held this top position ever since. The roots of this position in the global competition are much older than the history of Mercer studies. The concept of 'smartness' is based on expectation. 'Quality of life' is based on experience. The learning process between expectation and experience in Vienna was accompanied by scientific analyses over many decades. The paper will give a comprehensive insight into the content of the studies of the processes based on the experience and data.

E-fast park Murcia

Jaime Ruiz Huescar, e-mobility manager of Murcia city (Spain), Ayuntamiento de Murcia, SPAIN

This presentation will outline an innovative project that aims to foster e-mobility in Murcia by offering 60 reserved car-parking spaces for EVs in the most valued spots in the city (as a result of a car-park distribution study) and managing the parking in these spots through an APP that uses a powerful new sign recognition technology that is much faster than QR codes. This APP enables e-vehicle drivers to check which places are available, allows them to reserve places and provides useful information to us in order to monitor occupancy and demand.

Global urban mobility management – the role of the private sector

Rafael Moreno Cela, O&M manager, OHL Concesiones, SPAIN

The presentation will discuss urban mobility experiences driven by technological development, the important changes aimed at discouraging the use of private vehicles, and the integration of various modes of transport. We will analyse the role of the private sector along with possible business models for this new environment.

Achieving commercial success in new mobility

Ashish Khanna, partner and co-lead of L.E.K.'s global new mobility practice, L.E.K. Consulting, UK

Consumer mobility is undergoing a seismic shift along three key dimensions: sharing, electrification and autonomy. New mobility entrants are disrupting decades-old car ownership patterns in developed nations and leapfrogging ownership altogether in developing nations. There is no doubt that the commercial prize is huge and market participants have a strategic imperative to get it right. However, nascent technology, the regulatory environment and consumer demand present many challenges for innovators and investors. L.E.K. shines a light on six key areas players need to focus on in order to crack the new mobility world and maximise their chances of commercial success.

Working together towards the future of urban mobility

Dr Mike Galvin, COO, Flit Technologies, UK

Cities are increasingly congested and polluted by cars, both privately owned and from the new crop of on-demand car services. To find better solutions there's a need for all the actors in the mobility space to look at ways to work together instead of just competing. We believe that by working with city regulators, current mass transit and car operators, we can ultimately come up with better solutions by connecting and leveraging the strengths of all the different actors. At Flit Technologies we're building a state-of-the-art mobility ecosystem consisting of a global transparent marketplace for ground transport with a complementary suite of technologies and products. With this ecosystem, companies in urban mobility are enabled to build and operate extraordinary mobility services to transport people and deliveries. Flit Technologies is backed by RCI Bank and Services, the financial services provider for Groupe Renault brands worldwide and for Nissan Group brands in Europe. It has 100 employees in its London, Paris and New York City offices, and its mission is to make mobility better and more sustainable for everyone. Flit Technologies mobility exchange operates under the brand Karhoo.

Case study: developing the next generation of CAVs

Raphael Ani, head of intelligent mobility at Wayra, Telefónica, UK

In 2017, Wayra, in partnership with Transport Systems Catapult, launched the Intelligent Mobility (IM) Accelerator programme, designed to attract disruptive startups with high growth potential

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into the UK transport industry, while helping them grow into world-leading companies. The programme focuses on intelligent mobility, including areas such as connected and autonomous vehicles, connected infrastructure, customer experience, and transport data and analysis. Its goal is to develop companies that will create solutions for the most pressing transport problems facing the world today, improving day-to-day life for millions of travellers while creating new UK-based industry leaders in a £900bn global transport systems market.

Parking cars autonomously with machine/deep learning

Dr Brian Holt, head of autonomous driving, Parkopedia, UK

The size and diversity of the data available today allows researchers to build models to not only accurately find parking and then predict space availability but also to start enabling fully autonomous parking. Learn how machine learning and deep learning can be used extensively for everything from ingesting and processing billions of data points per day, to reading parking signs, to enabling autonomous parking: (1) Accurate global static data (satellite imagery/street imagery); (2) Real-time and predictive space availability information (ingestion/pre-processing/USS/FCD/transaction data/on- and off-street RT sensors); (3) Ability to pay for/reserve a parking space; (4) Indoor mapping and navigation.

Why smart cities should start with smart public transit

Dennis Mica, business development manager, 2gether, NETHERLANDS

This presentation will give an overview of the state of current self-driving technology, its challenges and the experience of 2gether. It will also explain what the impact will be. If a city or region truly wants to benefit from self-driving technology, it should aim for smart public transport first. Self-driving sustainable public transit is ready to be implemented today and truly reduces the number of vehicle movements and parking needs, offering an alternative to the private (self-driving) car. In addition, it is important to keep the (dis)advantages of mixing with all other traffic in mind due to the effect on transportation value.

The challenges of sustainable public transportation systems in the Arabian Gulf

Dr Elnazir Ramadan, assistant professor, Sultan Qaboos University, OMAN

The Arabian Gulf cities are growing. The Gulf Council Cooperation Countries (GCC) are among the richest and most urbanised in the world. As a major focus of sustainable cities, sustainable transportation attempts to reduce city energy consumption by providing a public transport system that has greater environmental responsibility and social equity. The importance of the study is that it highlights the challenges of the public transport sector in the city of Muscat. The study findings revealed that public transport systems face real challenges in Muscat and in the Gulf in general. Moreover, there are also cultural and social issues that hinder progress



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STREAM 3 LEGAL & TECHNICAL ISSUES OF AUTONOMOUS VEHICLES



DAY 1 / TUESDAY 19 JUNE

LEGAL & REGULATORY CHALLENGES OF AUTONOMOUS VEHICLES

3

Policy labs: multi-stakeholder iterative processes for developing policies for automated and connected driving – a Swedish case study

Maria Schnurr, senior researcher, RISE Research Institutes of Sweden, SWEDEN

In the transport sector, vehicle automation challenges current regulation and policy as relevant policies simply do not exist. However, to keep up with technological development and actually benefit from its diffusion, these challenges need to be overcome more quickly than conventional policymaking may allow. Policy labs can be seen as an appropriate means of speeding up policymaking and increasing its quality and acceptance, especially in light of complex, dynamic technological change. Illustrated by two cases in Sweden, we describe policy lab interventions and early lessons learned regarding their relevance, usefulness and acceptance for future European transport policies.

Are you (still) in the driver's seat? A global view on the future of mobility

Patrick Ayad, partner, Hogan Lovells, GERMANY

Autonomous, connected, electric and shared vehicles are transforming the automotive industry like no other innovation in decades. The latest industry trends present a wide range of challenges for traditional and new automotive and mobility companies, but they also offer exciting opportunities for those that manage to enhance their business model from automotive manufacturer to solution and service provider. Reducing exposure to risk and managing the various commercial and legal challenges requires organisations to anticipate and be prepared to navigate through the emerging legal risks. This presentation explores the major trends affecting the automotive market. The impact of these developments on some legal areas will be identified and then mapped to the business changes that will result.

Law Commissions' review of UK regulation of automated vehicles

Jessica Uguccioni, lawyer, Law Commission of England and Wales, UK

The Government's Centre for Connected and Autonomous Vehicles (CCAV) has asked the Law Commissions to undertake a far-reaching review of the UK's regulatory framework for automated vehicles. With plans for significant public engagement,

the three-year project, starting in early 2018, aims to promote public confidence in the safe use of automated vehicles. The Law Commissions will identify pressing problems in the law that may be barriers to the use of automated vehicles, and their application as part of existing public transport frameworks and innovative on-demand passenger services. In the presentation we introduce the project, some challenges and our approach.

Regulatory considerations for fleet-based self-driving operations

Matt Burton, legal director II, regulatory development, Uber, USA

As development and testing of self-driving vehicles continues to advance, there is an increasing recognition that the early use cases for such vehicles will be in the context of fleet-based deployment, such as ridesharing/for-hire operations. Although regulators have acknowledged that the deployment spectrum will include these uses, some early proposals still assume a more traditional owner-operator deployment paradigm, which may unintentionally delay introduction of these life-saving technologies. The presentation will discuss possible approaches for achieving regulatory and safety objectives in the context of such fleet-based self-driving operations.

European road traffic legislation and conditional automation (SAE Level 3)

Dr Mathias Schubert, lawyer, MNS Law & More, GERMANY

How will automated vehicles impact the determination of liability for accidents? Germany was first to address this in 2017. Non-driving activity, notably in the context of conditional automation, was one of the hotly debated topics. In the UK, the Automated and Electric Vehicles Bill is pending in Parliament. This bill would impose liability on the insurer of an 'automated vehicle' that causes an accident 'when driving itself'. Just what constitutes an 'automated vehicle'? The ABI leans towards reserving this notion for SAE Level 4 and 5, thus eclipsing Level 3 technology. Are we facing an exercise of squaring the circle?

Cybersecurity regulation in vehicles and its impact on civil liability

Dr Philipp Egler, counsel, Bird & Bird LLP, GERMANY

Dr Simon Assion, specialised lawyer, Bird & Bird LLP, GERMANY

The more IT is integrated into vehicles, the higher the relevance of IT security regulation. When IT is controlling critical parts of vehicles, security and safety are essential. This is also reflected in the legal requirements for effective cybersecurity, which will be discussed from both a regulatory and a civil liability perspective. Regulatory requirements for cybersecurity in vehicles have four sources: general product security and safety rules; general cybersecurity requirements (arising inter alia from the new General Data Protection Regulation (GDPR), from the Network and Information Security (NIS) Directive and from EU telecommunications regulation); type approval procedures for vehicles and their components; and regulations for the infrastructure on which the vehicles rely. Against this regulatory backdrop, a great variety of civil liability questions arise that will become relevant in case of accidents due to cyberattacks. Significant financial risks could result therefrom for all players active in the automotive industry. The multitude of parties involved in the production of vehicles (and especially the onboard software) and the novelty of the subject result in legal uncertainty. We will provide valuable guidance on the direction in which the case law may develop.

The driverless safety paradox and criminal law

Luciano Butti, affiliated professor of international environmental law, University of Padua (I) - Department of Environmental Engineering, ITALY

In our driverless future, we will face a safety paradox: far fewer accidents, but also some new kinds of accidents, due to technological failure. Who will be criminally liable? The answer will partly depend on how artificial intelligence algorithms are being designed, in the context of deep learning. Criminal law will need to be gradually moved from the Newtonian universe where it was first raised, towards a probabilistic approach. This will give new life to the traditional theories on legal necessity. At the end of this process, not just our lifestyle will change, but also our anthropological relationship with cars.

Roads to driverless – the future law of highways

Alex Glassbrook, barrister, Temple Garden Chambers, UK

Autonomous vehicles will have profound effects on the environments in which they operate. Alex Glassbrook (British barrister and writer on the law of driverless cars) explores the development of the laws of roads during the century since the emergence of motor vehicles in the UK, and asks how roads and laws might evolve to cope with new species of vehicles.

DAY 2 / WEDNESDAY 20 JUNE

3 UNDERSTANDING CORPORATE RISK, PRODUCT LIABILITY, RECALLS & DATA

RESPONSIBILITY CONCERNS OF CAVS

Leading from the front: delivering a diverse autonomous mobility service

Peter Sorgenfrei, CEO, Autonomous Mobility, DENMARK

Conceptualising and developing autonomous vehicles is difficult. Getting them on the road or up in the air might prove even more difficult. Manufacturers, lawmakers, customers, road authorities, cities, municipalities and decision makers are a dizzying maelstrom of stakeholders to organise. Danish company Autonomous Mobility is so far the only company in the world that will tie all the components together and deliver autonomous mobility on demand. What are the opportunities and barriers for introducing autonomous mobility solutions in societies unfamiliar with the technology? What is Autonomous Mobility doing today to ensure success in an increasingly competitive and confluent environment?

From Job 1 to Lawsuit 1: the legal lifecycle of an OEM whose innovation gets ahead of the legislation

Alex Geisler, partner, Duane Morris, UK

This presentation follows the fortunes of Big Auto, a fictitious OEM. Big Auto has a simple three-word strategy: Get In Front. Its mission is to develop and release its autonomous features in every possible market, ahead of the competition. But how will Big Auto achieve this, and is it sound strategy?

Where do autonomous vehicles fit into automotive law and regulation?

Anthony Cooke, vice president for policy and regulation, Luminar Technologies Inc, USA

Automotive law and regulation in the USA is a mature and

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complex legal body and practice. How will autonomous vehicles fit into the world of automotive standards, recalls, product liability, class actions and even traffic rules? This technology will undoubtedly change the way vehicles are designed, operated and even owned, but will it also change the way regulators, the courts and society regard consumer products and transportation?

Data rights and responsibilities: access, competition and product liability

Dr Thomas Funke, partner/lawyer, Osborne Clarke, GERMANY

Ulrich Bäumer, partner/lawyer, Osborne Clarke, GERMANY

Business models and innovation depend on access to the in-vehicle systems. Data from connected and autonomous vehicles is becoming essential for repair and servicing markets. European competition and type approval law mandates non-discriminatory access to certain data. But how can competition and safety be balanced? Who is responsible for data hacks, or liable for accidents caused by autonomous vehicles? This session explores the impact of the evolving EU legal framework for the automotive aftermarket, motor insurers, component suppliers and innovative service providers.

Understanding corporate risk in a connected world

Andrew Atkins, chief engineer - technology, Ricardo, UK

Connectivity between systems in the transport space represents huge opportunity in service provision, mobility system optimisation and built environment improvement. However, this same interconnectivity and large-scale movement of data creates risks in terms of management of personal data, financial security and ensuring safe system performance. This paper will explore, through examples, best-practice approaches to determining corporate exposure to these emerging challenges to enable the benefits to be embraced.

CAVs – trust or bust!

Dr John McCarthy, associate director, Arup, IRELAND

Successful deployment of CAVs is contingent on two equally important and interdependent elements. One of these is the vehicle, obviously, but arguably as important is trust in the data being shared that generates services and information for user and operator alike. Trust between the various elements in the CAV ecosystem (public/private, etc.) is the single biggest blocker to establishing an interoperable, network-efficient deployment of CAVs. Arup proposes the establishment of a GRC (governance/risk/compliance) data arbitration layer that sits above the data aggregators and validates information exchange across all parties and offers consistency/reliability/scalability of services for the customer, manufacturer and road operator.

Legal challenges with protecting, owning or sharing car data

Stephan Appt, partner / lawyer, Pinsent Masons LLP, GERMANY

Data is the new oil but who owns it, who protects it and who must potentially share it with others? The presentation describes the legal framework around car data with (partly contradictory) requirements that have an effect on the business cases of various players within automotive, and challenges established concepts with respect to data protection laws, e-privacy law, liability and the supply chain.

How to regulate technologies in automated vehicles?

Azra Habibovic, senior researcher, RISE Research Institutes of Sweden, SWEDEN

To ensure that the development of automated vehicles is going in a desirable direction for society, regulatory bodies must take on the challenge of evolving the necessary regulatory instruments. This presentation addresses how current regulatory processes could manage automated vehicles and how these processes may need to evolve to address the dynamic technological development in a complex socio-technical system. Based on an in-depth review of research and regulatory theories and an extensive series of interviews with various stakeholders, it focuses on how to define and verify requirements on the technology in automated vehicles from a safety perspective without inhibiting innovation.

How to prepare our roads to support autonomous vehicles

Michael Dan Vardi, co-founder and CBO, Valerann, UK

As autonomous vehicles (AVs) assimilate into traffic, the role of authorities as traffic operators, regulators and enforcers will remain, but the tools required will change. AVs create two new sets of risks that may happen at scale/simultaneously: system malfunctions (and cyberattacks) and integration risks. Authorities will require independent monitoring capabilities, to ensure rapid response. Unfortunately, tech traffic monitoring today is an expensive tool limited to few roads. Regulation and long sale cycles mean that few innovations can thrive. Supporting local authorities means supporting innovation by creating routes for startups to test and provide much-needed solutions for our roads.

NETWORKING EVENING PARTY

TUESDAY 19 JUNE 2018

All delegates, speakers and exhibitors are invited to attend our complimentary networking evening.



STREAM 4 THE CHALLENGE FOR RAIL



DAY 1 / TUESDAY 19 JUNE

4 HOW CAN RAIL STAY COMPETITIVE AGAINST AUTONOMOUS VEHICLES & NEW SMART MOBILITY SOLUTIONS?

Rail systems as the backbone of multimodal sustainable mobility

Carlo M Borghini, executive director, Shift2Rail Joint Undertaking, BELGIUM

As the world's resources become scarcer and climate change poses an ever-increasing threat, the future of Europe lies in embracing sustainable development strategies and investing in sustainable solutions to meet its long-term challenges. Despite the progress achieved in recent years, one of the most critical sectors – transport – is still 'off track' to sustainability, producing one quarter of Europe's greenhouse gas emissions and pollution, which is set to nearly double in the next 25 years. Established under Horizon 2020, the Shift2Rail Joint Undertaking is a public-private partnership designed to carry out strategic rail sector objectives and encourage a modal shift to rail.

Quantum shifts in mobility – impact on business models and society

Alexei Korn, senior strategy manager, Swiss Federal Railways, SWITZERLAND

Mobility systems will experience major efficiency leaps in years to come. Self-driving vehicles in passenger and freight transport will more efficiently utilise infrastructure capacities, and considerably reduce transportation cost and parking search traffic. Smart cities will improve mobility with smart traffic management, strict demand management, mobility platforms and new mobility services. Furthermore, rail will improve considerably. What advantages will this bring for society, land use and sustainability? What cities are leading the way in mobility platforms, P2P/B2C sharing, e-hail, ridesharing, AVs and smart mobility? How will the business models of automotive OEMs, public transport companies and new mobility players be impacted?

How to increase the attractiveness of rail for customers

Libor Lochman, executive director, CER - the Voice of European Railways, BELGIUM

The competition for rail passengers as well as in the rail freight market promises to provide customers with the expected benefits: higher levels of service for a lower price. However, this is only

possible when – besides the sector internal innovation – the framework legislative conditions are set accordingly, allowing not only a fair intramodal competitive environment but also ensuring the correct intermodal level playing field. Alongside the implementation of the 4. Railway Package, the sector expects the elements of the Europe On The Move initiative to contribute to it, together with the further boost of the rail infrastructure investments as part of the MFF.

Future-proofing rail to improve passenger satisfaction

Fraser Brown, director, Heathrow Express, UK

Continuous innovation is key to passenger satisfaction. In the UK, how can train operating companies work with Network Rail, which owns the tracks, to maintain excellent service? Passenger service is at the centre of business strategy – from recruitment and training, to price strategies and marketing, how to ensure customer service is at the centre of the business and that all teams can work together for the right solutions? Communicating excellence – are train companies being heard? Trains – leading the way in sustainable transport.

Real-time demand-based operation for urban rail

Alvaro Urech, innovation manager, Alstom, SPAIN

Optimet passenger demand-based regulation is based on a new approach to operation: matching passenger demand with transport supply in real time. On one hand, Optimet dwell-time optimiser detects the completion of the passenger exchange phase, as well as the platform overcrowding situation. This data is then stored for subsequent timetable optimisation or sent to the ATS for use in real-time operation. Optimet, by Alstom, provides a regulation module capable of calculating, in real time, the optimum dwell times and journey times between stations, according to the density of passengers on the platform at any given moment.

Future horizons – setting passenger expectations for new experiences

Paul Priestman, designer and chairman, PriestmanGoode, UK

With the rapidly changing landscape of future transport, Paul will look at new forms of high-speed transport such as hyperloop

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and the opportunities presented by autonomous vehicles and passenger drones, and discuss the impact they will have on passenger experiences.

Next-generation trains are virtually coupled

Dr Joachim Winter, senior scientist - Institute of Vehicle Concepts, DLR - German Aerospace Center, GERMANY

There is political will worldwide to increase the freight transport volume on cargo railways. To achieve this goal the travel speed of goods has to be significantly increased. One key issue is more automation of production processes to sustain much faster cargo handling. This will aggravate the existing bottleneck of available railway lines in some areas, for example on harbour-hinterland routes. Especially with mixed traffic of passenger and freight trains, the traffic may stagnate. The technical solution for future operation could be more flexible moving block signalling (or direct train-to-train communication) and virtual coupling, even of different train types. This would allow for significantly increased utilisation of the existing railway network.

Reimagining the rail experience

Jeremy White, transport director, SeymourPowell, UK

The seismic impact that emergent technologies will have on passenger needs and behaviour pose very challenging questions for rail companies looking to the future. Rigid infrastructure and long investment cycles bring with them an inherent inflexibility, leaving rail companies vulnerable to disruptive new technologies and business models. Although the specifics of how AV and MaaS will affect our world remain uncertain, rail executives facing investment decisions today must prepare for the convenience, affordability and intense competition that the advent of robots will bring. Can rail companies compete in this world? If so, how must they adapt? What strategies must they adopt? Through hard-nosed imagination and ambitious innovation, we see robust business opportunities ahead for rail companies operating within the mobility ecosystem of the future. We believe this will be rooted in the elevated passenger experience, but we must innovate to get there. These topics will be

explored, unpacked and illustrated with examples and anecdotes to demonstrate how human-centred design, innovation and visionary thinking can allow rail businesses to think further ahead and ambitiously define their future for themselves.

How you might be the barrier to innovation in rail

River Tamoor Baig, CEO and founder, Hack Partners, UK

The UK rail industry needs to innovate or it will die. Many people will question this. After all, the UK rail industry has one of the best safety records in Europe, customers keep paying rail fares and customer satisfaction keeps going up. However, customers now expect the same level of service from rail that they do from their taxi app, broadband provider or takeaway delivery service. We have identified five key barriers to innovation for this presentation: (1) Procurement frameworks; (2) Data access; (3) Non output-driven funding landscape; (4) A resistant rail culture; (5) The franchising system.

Methodological disruptions to anticipate the future rail market and policy needs

Ming Chen, senior consultant/project manager, TNO, NETHERLANDS

In the coming decade, disruption innovations will bring significant changes to the traditional structures of the economic and social system. These disruptions will also drastically change the stakeholder arena in different sectors. At the same time, methodologies to anticipate the future are often based on historical data (so historical patterns) and input from the current stakeholders. A general methodological paradigm shift is needed to solve this contradiction. For the rail sector this leads to the need to adjust and a careful assessment of the traditional, generally accepted methodologies; new risks but also new possibilities should be anticipated. The presentation will be based on experiences from the H2020 Smart Rail project and a TNO project on 'disruptive innovations and improved forecasting methodologies' (DISMOD).

DAY 2 / WEDNESDAY 20 JUNE

4 INNOVATION, NEW TECHNOLOGY & DIGITISATION - THE FUTURE FOR RAIL

Shift2Rail is driving EU innovation into the rail system

Giorgio Travaini, head of research and innovation, Shift2Rail Joint Undertaking, BELGIUM

Shift2Rail is the first European Union initiative joining the rail sector and public funding to deliver focused R&I and market-driven solutions by accelerating the integration of new and advanced technologies into innovative rail solutions. It is a €1bn initiative that looks beyond R&I towards a plan for system deployment of its solutions; a forward-looking rethinking of the future of the railway system. The R&I work from blue-sky research to the highest TRLs is conducted in an integrated programme structured in five asset-specific innovation programmes (IPs) and one horizontal activity (CCA) that deliver technology demonstrators.

Service design to make rail prevail

Klaus Garstenauer, head of commuter and regional traffic, ÖBB-Personenverkehr AG, AUSTRIA

In recent years, rail passenger traffic has made substantial progress throughout emerging and developed markets. Yet modal split still remains widely unaltered in favour of private motor vehicles. To win over passengers, rail services will not only need to be frequent and reliable but also smart, stylish and compatible with a contemporary lifestyle. Digitisation may help greatly but first and foremost, hardware (i.e. trains and stations) has to be fixed and services produced with high standards of quality. Based on these requirements, connectivity and available onboard content may provide a USP over competing modes.

4

Railway stations as catalysts for regeneration

Jonathan Chatfield, head of policy, Rail Delivery Group, UK

RDG research on the contribution of railway stations to local communities has shown how they can support economic growth and commercial development, enable housing delivery and enhance the quality of a place. Stations have the potential to be catalysts for change and regeneration. They are deeply entwined with their local communities and act as gateways to both town and railway.

Shaping the digital future of transport

Russell Goodenough, client managing director - transport sector, Fujitsu, UK

Russell believes that the future of transport lies in digital technologies. From the infrastructure our trains roll on, the safety of the people using and working on the rail to the systems improving passenger experience, digitisation will provide abundant efficiencies for rail organisations and opportunities for commercialisation while improving the customer experience. Explore how digital is driving operational efficiency, employee productivity and business growth and how innovations such as MaaS, account-based travel, hyper-connectivity and AI will shape the future of transport. Learn about the technologies that will disrupt the transport industry and what you can do to stay ahead of the curve.

Designing a resilient metropolitan rail service

Dr Selby Coxon, director Mobility Design Lab, Monash University, AUSTRALIA

This presentation discusses the work of the Monash University Mobility Design Lab based in Melbourne, Australia, concerning the design of resilient rolling stock for high-capacity city networks. Rolling stock procurement and operation is an enormously expensive undertaking. Using cutting-edge design methodologies and strategies, interior accommodation can be created to be adaptable and updatable in a variety of ways. The use of 3D printing of components, asset protection from vandalism and passenger load management are part of a 'resilient' approach to rolling stock design researched by the Monash University Mobility Design Lab.

Forecasting railway markets – how to picture the future?

Karl Strang, senior consultant, SCI Verkehr GmbH, GERMANY

Since 1994, SCI Verkehr GmbH has been specialising in strategic consultancy services, monitoring and forecasts in the global railway markets for use by manufacturers, financiers and operators. In 2003, the first worldwide forecast of the markets for products and services of railway technology was published. Valid information on future developments requires broad and profound knowledge on technology, operation, macroeconomics and business administration. New and disruptive developments in the railway and consulting industries are challenging methodology and skills. This presentation summarises the state of the art and the next steps to be expected in railway market forecasting.

The benefits of above-rail competition in Europe

Nick Brooks, board director, Allrail (Alliance of Rail New Entrants), BELGIUM

Allrail represents new passenger rail companies, whose success

and growth solely depends on keeping passengers happy and ensuring that they keep coming back to rail. We will show how existing cases of competition between different operators on the same tracks has achieved: (1) Better quality and service; (2) Lower prices; (3) Modal shift to rail; (4) Less taxpayer subsidy. It has also benefited the environment. Where there is no real competition, as in France, rail passenger traffic has reduced by 6% since 2011. Where there is competition, growth of up to 100% over five years has been recorded on the routes concerned.

Promoting a European single rail area in ticketing

Neil Murrin, general counsel and director, regulatory affairs, Trainline, UK

The European Commission has taken the bold step of introducing legislation in the form of various railway packages that are designed to open up the EU passenger rail market to increased competition. Trainline fully supports these objectives. We believe that independent digital rail platforms like ourselves (and others) providing innovative and impartial rail information and booking services to consumers, are fully aligned with this goal. We will explain how a viable, independent and impartial retail market for train tickets is fundamental to the success of these policy objectives.

Autonomous LRT operation

Nils Jänig, director - transport, Ramboll, GERMANY

LRT operation in urban environments is challenged by a great deal of interaction with other traffic modes. Automatic or autonomous operation is difficult to achieve compared with metros. Current driver assistance systems can be seen as a first step for LRT. Based on the BOSTrab, this presentation provides an overview of the technical, regulatory and safety aspects that need to be dealt with for future automatic LRT operation in cities.

How to cut the CO₂ of existing diesel trains by 25%

Johannes Wilhelmer, railway engineer - developing future rolling stock, Stadler Rail, AUSTRIA

Diesel trains are widely used on less-frequented tracks, where electrification is uneconomical. Is it possible to improve the energy efficiency of existing rolling stock, propelled by diesel engines, through hybridisation of the drivetrain, to achieve a 25% reduction in CO₂ emissions? The presentation will show what is possible using simulation-based design methods. Utilising an energy-based model, fuel consumption can be minimised without harming the performance of the vehicle.

ESSI – development vision for rail services in southern Finland

Christoph Krause, traffic planner, Ramboll Finland Oy, FINLAND

The project aims to develop traffic service strategies for 2025 and 2040 for the commuter train services in the southern part of Finland. The description of needed investments for rail infrastructure, signalling and rolling stock over the next 25 years enabled the Finnish Transport Authority and several other stakeholders to establish the long-term strategy of the railway system in southern Finland ready for the future's increased traffic demand. The size and level of detail of the analysis make it one of the biggest railway strategy projects that has been undertaken in Finland.

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STREAM 5 MOBILITY AS A SERVICE



DAY 1 / TUESDAY 19 JUNE

5 MOBILITY AS A SERVICE - THE FUTURE OF TRANSPORTATION?

Unifying the different futures of mobility

Mariana Avezum, researcher, TU München, GERMANY

Whether it's self-driving cars, electric, shared mobility or hyperloops, the future of mobility is bound to be very exciting, fast and data driven. Although many different approaches are currently being studied to solve part of the transportation problem, it is still rare to see multimodal services, where different providers collaborate to offer different parts of the same trip. Through data sharing and analysis, new collaborations will be necessary so that the commuters of the future can take advantage of the individual benefits of each different means of transport, and thus have private and public modes during the same trip.

Mobility as a Service and how it changes cities for good

Sampo Hietanen, CEO, MaaS Global, FINLAND

Imagine if all your daily travel needs could be covered with one simple app, with one simple payment – directly from your mobile. Travel as much as you like with a flat fee, or pay as you go, with buses, trains, taxis, cars and more. MaaS provides you with the ultimate way to move around. MaaS Global's revolutionary mobile app, Whim, liberates people from timetables, fixed routes, parking worries and the high costs of owning a car. Born out of a need to be spontaneous, it gives people access to a huge variety of transport options. MaaS Global is bringing into reality the concept of Mobility as a Service (MaaS), by building the world's first mobility ecosystem. The presentation will give you a deep dive on how to make MaaS reality by joining together public and private transportation providers. Collaboration and integration of services will create a seamless and compelling travel experience for everyone, locally and globally.

Mobility as a Service: implications for urban and regional transport

Suzanne Hoadley, senior manager, Polis, BELGIUM

Mobility as a Service has been marketed as a new transport concept that may change or disrupt current models of transport provision, particularly in urban areas. Discussion of MaaS, driven partly by business and technology priorities, is beginning to have an impact on policy thinking, including at EU level. It is important that city and regional authorities, who play a key role in regulating and/or providing transport services, contribute to this debate. This presentation aims to gain clarity on what is MaaS and looks into the best role for cities and regions in the MaaS environment. It brings forward their views on MaaS to ensure the debate is not entirely business or technology driven. It also looks into the integration of new and traditional mobility services with city and regional transport policies, notably the principles of multimodality and active travel and the key objective of modal shift.

MaaS – the way forward in the Middle East and North Africa

Zeina Nazer, managing director/secretary general, Innova Consulting/ITS Arab, UK

There is clear interest in the region for intelligent transport systems and integrated MaaS solutions for the cities of Dubai, Abu Dhabi, Doha and Riyadh. These cities have already begun sharing data to develop intelligent urban mobility solutions, including automation and electrification of the vehicle fleet. MaaS puts users – both travellers and goods – at the core of transport services, offering them tailor-made mobility solutions based on their individual needs. This means that, for the first time, easy access to the most appropriate transport mode or service will be included in a bundle of flexible services.

NETWORKING EVENING PARTY

TUESDAY 19 JUNE 2018

All delegates, speakers and exhibitors are invited to attend our complimentary networking evening.



Understanding the business

Hans Arby, CEO, UbiGo, SWEDEN

MaaS is hot and hyped, but that interest is not matched by an understanding of the business conditions for offering an attractive service to households and companies. MaaS has the potential to contribute to more sustainable cities, but nothing will happen if no-one can run a sustainable business offering the service. Creating value in a low- to zero-margin mobility market is key for attracting suppliers and customers. Public transport authorities are a special case. In Sweden they are finally opening up for digital resellers, but these need to show that they can attract new customers and still be in line with public policy. This is what we want to prove when we relaunch the UbiGo service in Stockholm in spring 2018 together with Fluidtime as the platform provider.

Next steps in MaaS evolution based on hands-on experiences

Anton Fitzthum, sales/business development, Fluidtime, AUSTRIA

The current mobility ecosystem is going through a substantial change. A long list of new players is entering the mobility market, introducing innovative approaches to tackle end users' mobility pain. In combination with the political will to tear down 'silos' and the changing mindset of the users from 'owning' towards 'using', new business models are generated. Based on hands-on experiences of MaaS projects in Stockholm (UbiGo) and Helsinki (Helsinki Business Hub), this development is visualised.

The blockchain for public transport: unlock the possible

Stephanie Priou, transport and mobility consultant, Ubiquity Consulting, SPAIN

Blockchain technology can be seen as an actual game-changer

for the urban transport sector: ticketing, data sharing, smart contracts, P2P transactions – concepts such as integration and property are being redefined, facilitating citizens' mobility while challenging management at a city level. For cities, getting a better understanding of the possibilities to implement the blockchain system is key. Exemplified by implemented systems, this presentation will give an overview of the technology's capacities and limitations for the transport sector.

Future of mobility – multimodal transport and P2P carsharing

Jan Charouz, CEO, SmileCar AS, CZECH REPUBLIC

In today's rapidly changing environment, established business models are quickly becoming extinct. The classic model of buying a car for personal use is becoming less and less popular as people are starting to prefer renting over owning. Mobility is quickly turning into an on-demand service. At SmileCar and LEO Express (SmileCar's parent company and a major transport company in the CEE region) we believe in multimodal transport. Book a taxi to get to the train station, travel by train and then rent a car from locals at your destination – all through one app/interface.

Dynamic shuttles – the future of buses

Peter Soutter, founder/CEO, Good Travel Software, IRELAND

Dynamic shuttles are an emerging trend within shared mobility (e.g. www.chariot.com). The idea is that passengers are able to book a seat on a shuttle bus along either a predetermined fixed route or a dynamic route based on passengers' pick-up and drop-off locations. Technology and demand prediction tools are at the forefront of this revolution. Customers use the service as a cheaper alternative to ride hailing services such as Uber or as a more reliable alternative to traditional buses. Dynamic shuttles will transform cities and provide a popular alternative to car ownership. We are at the beginning of a revolution!

DAY 2 / WEDNESDAY 20 JUNE

5 DEVELOPING A SUCCESSFUL COOPERATIVE MULTIMODAL TRANSPORTATION ECOSYSTEM

Autonomous driving mobility platforms – knowing the destination.

Mark Thomas, vice president of marketing, RideCell, USA

Autonomous driving has been focused on the complete experience of teaching cars how to drive themselves. But where and how will these cars know where to go? Autonomous vehicles' primary use case won't be for private vehicle ownership with an owner punching in a destination and then tuning out. The real revolution with autonomous vehicles is that the vehicles themselves can be used as a service, rather than pure individual ownership.

- Autonomous vehicles will need a platform to direct where and who they pick up.
- A platform will need to verify who is entering and exiting the vehicle when the vehicle is not being used exclusively by an owner.
- Autonomous vehicles will need extensive fleet management to keep them on the road. Predictive maintenance platforms to understand potential wear issues, automated towing should the vehicle break down, automated recharging, and automated cleaning, detection of left items and acceptable levels of exterior dirt are all

elements to keep autonomous vehicles operating reliably.

- Entering the carsharing and ridesharing services today are the best way for vehicle manufacturers to best position themselves for the coming autonomous service revolution.

MaaS – the ecosystem approach

Piia Karjalainen, senior manager, MaaS Alliance, BELGIUM

The presentation will focus on the ecosystem approach in MaaS. Critical success factors for MaaS will be presented. Open IT architecture and standardised sub-element features, such as payment, ticketing, authentication and security, will be enablers to maximise the development of the MaaS market. While designing and establishing the MaaS ecosystem, the principles of openness and inclusivity should be fully respected, meaning that the ecosystem should be open to all service providers and inclusive for all different kinds of users. To build attractiveness and public acceptance for MaaS, the whole value chain should respect high standards of sustainability.

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MaaS – solving the first/last mile

Richard Harris, director Europe, HMI Technologies, UK

Three hot topics dominate current transport thinking: connected automated vehicles and driving, Mobility as a Service, and the sharing economy and air quality. Integrating services through smart MaaS solutions puts users at the heart of the transport network, offering tailor-made travel services based on preferences. However, tackling the crucial first and last mile of journeys remains a major obstacle. The deployment of local services like electric bikes, automated electric shuttles and ridesharing will help address this challenge. Combining MaaS with first- and last-mile solutions will help secure policy outcomes including tackling air quality issues in our cities and regions.

Analysis of MaaS to identify policy/regulation issues

Andy Taylor, director of strategy, Cubic Transportation Systems, USA

MaaS is touted as being the solution to urban transport congestion and optimisation of individuals' travel profiles. The technology to set up a solution is becoming increasingly widespread, with single account solutions for multi-mode transport, and trip planning and tracking applications. But what is stopping widespread adoption and acceptance? This presentation provides an assessment of MaaS and analyses the political, economic, social, technological, legal and environmental assessments to help identify the issues that are preventing the movement towards MaaS.

Emerging mobility, incumbent providers: new partnership models for on-demand transit

Jan Lüdtkke, director of business development Europe, Via Transportation, GERMANY

Innovative IT tools enable new on-demand mobility modes. Transport providers can benefit: by matching supply and demand, they can improve efficiency and reach new customer types. But who's best equipped to deliver these new services? Providers like LA County do it themselves, using their own operators and vehicles while partnering with private IT players for the required software. Conversely, Finland strives for consumers creating the market, letting the private sector deliver new modes and compete. In this session, drawing upon Via's expertise delivering IT products and end-to-end micro-transit systems, we will explore the considerations involved under both models.

Mobility as a Service also includes a human assembly line

Marco Maréchal, strategic (communication) advisor, Connected Strategic Change Processes, NETHERLANDS

With the arrival of EMA (European Medical Agency) to the city of Leiden in the Netherlands, The Bio Science Park has around 106 dedicated medical life sciences companies and institutions, the

largest number of bioscience startups in the Netherlands, and several multinationals and internationally acclaimed research institutes. Mobility is an issue, with 10,000 people arriving each day to go to work or to the university. Mobility as a Service seems to be an answer. For several years the plan to get a human assembly line from the Central Station to the park has been an idea (within MaaS). Will it work?

Orchestrating multimodal mobility

Alvaro Urech, innovation manager, Alstom, SPAIN

The digital revolution is enabling new mobility solutions and new ways to experience mobility. However, these new solutions compete with traditional transit, which is good for passengers as they have more options, but wouldn't it be better if they cooperated? Coordination among mobility solutions is paramount to achieve multimodal mobility and new paradigms like MaaS. To do so, Alstom is bringing MASTRIA, the multimodal orchestrator, to help cities and operators coordinate and manage their mobility. Situational awareness, multimodal incident resolution, diagnostics, predictive and prescriptive analytics, hub and connection management – MASTRIA will give all this in a flexible and coordinated manner.

Enabling autonomy across all mobility use cases

Zain Khawaja, founder and lead technologist, Propelme, UK

Propelme has developed a world-first patent-pending technology that provides AVs with the richest scene understanding to perceive their environment. Scene understanding derived from perception plays a key role in the autonomy stack and is the most challenging task in enabling L5 autonomy. Our technology is sensor and vehicle agnostic and segments any obstacle irrespective of its type, size, shape, position or appearance, and finds the driveable free space on highways, urban roads, off-road and on roads without lane markings, enabling AVs to drive 'mapping-free' on roads they haven't been on before, just like people.

Future success drivers for mobility operators – what's next?

Michael Lange, head of sales and marketing, Invers, GERMANY

Common forms of mobility offerings as well as the onboarding and adoption processes for end users are currently being disrupted by new mobility players and new forms of sharing technology. From user attraction to onboarding, verification, trip data management and monetisation, what challenges does the future hold for mobility operators to stay ahead of the competition? New ways of working based on third-party APIs and integrated reservation platforms are necessary – and a lot more.

NETWORKING EVENING PARTY

TUESDAY 19 JUNE 2018

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STREAM 6 QUANTUM SHIFTS



DAY 1 / TUESDAY 19 JUNE

6 **REVOLUTIONARY WAYS OF THINKING ABOUT TRANSPORTATION**

Towards one integrated transport system

Lars Hesselgren, director research, PLP Architecture, UK

Every radical rethink of systems is based on new technologies. The next revolution will come when everything around us becomes intelligent – the Internet of Things (IoT). Sustainability will push us towards a new energy revolution – and it will be based on electricity. The opportunity with autonomous electric vehicles (AEVs) is enormous, redefining our concepts into systems fit for the 21st century. Our expectation is that a transport system based on two principles – on-demand (OD) transport and point-to-point transport (PoP) – will define this new era. Cars will morph into digital trains and this will change all urban concepts.

Designing and building the future of transportation

Paul Direktor, head of business, WARR Hyperloop, GERMANY

Preparing a future for transportation in a transforming world requires us to break frontiers and find new solutions. The students of today must have the drive and enthusiasm to create this future. A group of students at the Technical University of Munich, including the speaker, formed an engineering team and entered SpaceX's Hyperloop competition, setting a new speed record for Hyperloop trains. Their incredible performance won them first place at the competition and the attention of Elon Musk. As they are hoping to beat their own record, they are developing a new prototype for the next competition.

Maglev transport: a paradigm shift initiated by Asia?

Johannes Klühspies, president, The International Maglev Board, GERMANY

Today, the international railway industry is focused on traditional business models that profit from friction, wear and tear of steel-wheel systems. But maglev systems have begun to challenge

those traditional business concepts. Maglev is a fundamentally different concept of transport, which might explain the reluctance, even ignorance, that maglev systems continue to face. But Japan already leapfrogs and will complete a €50bn high-speed maglev line between Tokyo and Nagoya by the year 2025. China and South Korea are boosting urban maglevs. Russia is investing in cargo maglevs. Some entrepreneurs even call for 'hyperloops'. When will the West find its role?

Mobility 4.0 – Panasonic's Silicon Valley perspective

Hakan Kostepen, executive director - strategy and innovation, Panasonic, USA

The presentation will look into the shifting mobility segment around people, goods/devices, energy and information, and the impact on life. This review will examine all aspects of contextual intelligence, enabling contextual mobility and personalisation from a Silicon Valley perspective.

Revolutionising the future of transport at the speed of sound

Tim Houter, CEO and co-founder, Hardt Hyperloop, NETHERLANDS

Hear from the winners of Elon Musk's Hyperloop Pod Competition to develop a super-fast hyperloop transport technology. Compare the benefits of this transportation system of the future with other clean transport options. Understand the timeline of the development and implementation, safety aspects and potential of this concept. Learn about the impact of the hyperloop on our daily lives. Indulge yourself with this motivating and inspiring story of a team changing the future of transportation.

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Decentralising high technology, starting with the hyperloop

Breanna Faye, experience design lead and architect, rLoop, USA

rLoop is a crowdsourced organisation utilising blockchain technology as a foundation on which to build smart, mobility-focused advanced engineering solutions and decentralise high technology, starting with the hyperloop. The hyperloop is a mode of transportation that will change the way people work, live and travel, giving them the ability to travel greater distances and on demand with unprecedented frequency and capacity than ever before. With a community of over 1,200, rLoop has built the first hyperloop pod capable of supporting complete levitation inside

and outside a partial vacuum tube. Key topics: multi-modal transit, data-driven metrics, IoT integration, weather-immune infrastructure, blockchain-enabled hardware, on-demand.

Einride – next-generation road transport

Robert Falck, CEO / founder, Einride, SWEDEN

Einride is the next generation's disruptive road transport solution: safe, cost-efficient and emission free. By rethinking the foundation of transport, Einride's T-pod is the first transport vehicle designed and developed for self-driving electric propulsion. Einride's mission is to be a major contributor to a sustainable society by lowering the carbon dioxide emissions of the transport industry.

DAY 2 / WEDNESDAY 20 JUNE

THOUGHTS FOR DISRUPTIVE CHANGE AT MULTIPLE LEVELS

6

Kicking cars out of city centres – then what?

Wouter Haspeslagh, urbanist and mobility researcher, Granstudio, ITALY

In search of more livability, many cities are restricting car usage in their centres. We certainly need places to breathe, to dwell, to live and to move as human beings. However, a place without a car is not essentially a better place; it only carries the potential of being one. The key is to not only focus on new vehicles or their surroundings, but on their mutual coexistence. Granstudio's newly developed mobility concept addresses exactly this approach.

Transforming the rigid rail into a smart container distribution network

Paul van Bers, Ir., BersCo Consultancy, NETHERLANDS

To obtain a significant modal shift from road to rail, it is necessary for rail to offer the same performance as trucks. But by its very structure with containers, the train is basically unable to be flexible, customer friendly and fast in its performance. All improvement actions have been equivalent to flogging a dead horse. They have all resulted in marginal success or no success at all. With the introduction 'smart rail wagons' or rAGVs, we add a new modality that offers the container forwarder performance that is equal to that of trucks, at a more attractive price. This will be presented, including the motivation and business case.

Autonomous driving in the context of the city

Claudius Schaufler, researcher, Fraunhofer IAO, GERMANY

Nora Fanderl, senior researcher at the Competence Center, Fraunhofer IAO, GERMANY

Fraunhofer IAO is conducting a study on the upcoming technology of autonomous cars and analysing the potential effects on the urban realm in terms of availability and quality of space. Interviewing representatives of the leading European car manufacturers, cities and research institutions, this study gives a first insight into the most important agents of change that could lead to a new paradigm of urban movement, freeing up huge amounts of space for alternative uses. Hence, the presentation sets autonomous driving in its spatial context and opens the debate on the variety of use cases autonomous cars could be used for.

The potential of truck platooning to modernise road-based freight transport

Dr Hans Moonen, management consultant, CGI, NETHERLANDS

Truck platooning comprises a number of trucks equipped with state-of-the-art driving support systems. Platoons of trucks, closely following each other while electronically linked, can improve traffic safety, reduce congestion and lower fuel consumption and CO₂ emissions through the constant speeds. The foreseen large-scale application of truck platooning in the Rotterdam area in the Netherlands (500+ trucks planned for 2020) opens up opportunities for logistical optimisation, such as dramatically improving fill rates and reducing empty mileage, while boosting reliability. This presentation will introduce the topic, and report on the larger potential of platooning to revolutionise road transport.

Impact of new mobility services on airport infrastructure

Tine Haas, senior transportation engineer, Dornier Consulting International GmbH, GERMANY

Airports face major changes in the coming years, inspired by innovative new approaches to passenger transportation. New business models focusing on networked transport are being developed; these, together with the emergence of self-driving vehicles, will create a widely differentiated range of options for travellers, which in the medium term will make the use of private cars redundant. This talk explores the effects of these developments on the airport infrastructure in the short and medium term and then examines the challenges for airport operators.

STREAM 7 SUSTAINABILITY IN TRANSPORTATION



DAY 1 / TUESDAY 19 JUNE

BUILDING SUSTAINABLE TRANSPORTATION NETWORKS FOR FUTURE GENERATIONS

7 Pioneering sustainable, ethical and zero-emission travel

Jonny Goldstone, managing director, Green Tomato Cars, UK

How do technology firms, city planners, automotive manufacturers and on-demand transportation titans partner to deliver clean, green, zero-emission transportation on demand? This presentation shows how each and every one can play their part to accelerate our path to a green and clean future.

Energybility – combined energy and mobility solutions are the key to a sustainable future

Dr Frank Meyer, senior vice president B2C/B2SME solution management and innovation, E.ON SE, GERMANY

Energybility describes the ability to combine clean energy with e-mobility – E.ON [Drive] provides both. Holistic offerings are being made available to customers (B2B/B2C/B2M), containing 100% renewable energy plus e-mobility solutions. Modern consumers want to know where their energy comes from – it's no longer just 'out of the plug', it's about transparency. The concept of ownership is changing: young drivers want to use mobility on demand, not own it. The cleaner, the better. Energybility is the key concept to make e-mobility a success and foster its impact on overcoming climate change.

BMW Vision E³ Way – An innovative urban mobility concept

Dr Rainer Daude, project director mobility concepts, BMW AG, GERMANY

The world of individual and sustainability mobility faces enormous challenges in conurbations. As urbanisation progresses, more and more people are crowding into cities, so conventional mobility

concepts and local public transportation are reaching the limits of their capability. Congestion and high levels of air pollution are the result, which in turn leads to constraints on the quality of life. The BMW Vision E³ Way project shows a visionary mobility concept that is designed not just to specifically address the challenges faced by megacities but to provide a solution that is both simple and effective. It consists of an elevated road concept for electrically powered two-wheel vehicles which links key traffic hubs in urban conurbations. The three E's stand for 'elevated', 'electric' and 'efficient' – the concept's defining properties.

Reducing CO₂ emissions in transport

Giorgio Delpiano, general manager strategy and portfolio, Shell, UK

The world needs to reduce CO₂, and transport is a critical component of this. Shell believes that a mosaic of solutions can help achieve material reductions, and there are different economics that need to be factored in if we want to achieve a material reduction.

Electrified heavy-duty powertrains

Dr Steven Wilkins, senior research scientist, TNO, NETHERLANDS

From national and European projects, various options are being considered for the greening of heavy-duty commercial vehicles. As we approach 2050, the urban and inter-urban transport of freight and people needs to transition towards more sustainable technologies and energy carriers. Furthermore, optimisation of powertrains and infrastructure needs a more holistic systems approach to enable an energy transition. A perspective is drawn on approaches, opportunities and challenges from the portfolio of projects, from the viewpoint of TNO, the Netherlands organisation for applied scientific research.

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Sustainability – embracing waste as a future energy stream

Andrew Atkins, chief engineer - technology, Ricardo, UK

Natural resources are limited. Growing population and increased urbanisation create increasing need for conveniently packaged energy that has low environmental impact. Allied to this there are growing challenges with waste management, air quality and space, leading to pressure on our urban green spaces. This paper aims to explore these challenges in the complex systems of the future, and seeks possible synergistic solutions.

Intelligent technology for renewable mobility

Jens Winkler, head of sustainable energy systems, Enercon GmbH, GERMANY

With reference to the Paris goal to reduce global warming to 2°C, it is obvious that the energy used in future mobility will have to be generated only by renewable sources. Whether it's going to be BEV or hydrogen, a scalable, cost-effective and decentralised infrastructure is key for success. Enercon has developed a concept for future charging stations and will introduce the main components and strategies.

DAY 2 / WEDNESDAY 20 JUNE

MEETING THE ENERGY REQUIREMENTS OF TRANSPORTATION

7

Towards zero-emission public transport

David Yorke, new technology, training and projects manager, Tower Transit Operations Ltd, UK

With all major cities tackling two of the most important issues in the world today – climate change and air quantity – public transport must take the lead in confronting the problem. Currently there are only two options for operating zero-emission buses: plug-in electric and hydrogen fuel cell. Using Tower Transit's extensive experience, this presentation will explore and assess these different technologies, taking into account the technical issues of running zero-emission buses, alongside the practical operational challenges that will arise. The discussion will also feature current and future innovative trends in the international bus industry.

The future of fuelling in the age of EVs

Christopher Burghardt, managing director Europe, ChargePoint, GERMANY

Systemic concerns that national power supply infrastructure will be unable to cope with the projected demand caused by rising EV sales have come to a head recently. The number of EVs on Europe's roads will rise exponentially in the next two decades. Both government and public opinion recognise that we need to swing away from the status quo, with its poor air quality, traffic-clogged roads and increasing journey times. The power networks, auto industry and battery technologists, and charging infrastructure providers need to all advance together, collaboratively, with funding from private investors and industry, and the state.

Duality of power grid and energy storage on EV infrastructure

Miguel Fragoso-Recio, managing partner, Syrma Associates, UK

As the number of electric vehicles on the road continues to grow, private and publicly accessible charging infrastructures are under pressure to keep up with growing demand. This is particularly challenging as consumer recharging patterns tend to cluster around specific time-windows, hence creating peaks in power demand that risk overwhelming grid power capacity. Alternative strategies to pure growth in power grid infrastructure are required to provide a timely, economically attractive alternative to an inevitable upcoming surge in recharging power demand. The presenter will discuss the significance of upcoming developments in battery technology and their relevance to the power grid.

Battery charging speed – solving an over-constrained problem through modularity

Jean-Baptiste Segard, founder and CEO, EP Tender, FRANCE

The path to reaching 100% EV sales by 2040 (if not 2030) is still unclear. We need to set two variables: the battery size and the charging power. The equations are, the car is: profitable, non-subsidised, price competitive = small battery; long-distance capable = large battery and fast, synchronous charging; minimised carbon footprint = small battery and slow residential demand-response charging. Several equations, two variables: no solution. The paradigm to break is the monobloc car. By introducing modularity, we get two solvable problems: EV for 98% usage, shared add-on power bank trailer for 2% usage.

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Transformative research in transport, land use and urban planning

Harald Frey, project leader, Vienna University of Technology, AUSTRIA

Transformative research (TR) in the fields of transport and urban planning is a key factor for the future of cities and the transport system. TR in transport sciences can contribute to sustainable development by changing the way of knowledge production and showing how science is accountable to society. The engineering disciplines, which change our environment dramatically, need a much more profound education concerning awareness and responsibility for the effects of engineering interventions. TR can be supported by providing long-term resources, enlarging the group of stakeholders who are integrated in research and by balancing academic knowledge and practical experiences.

Fast-charging electric vehicles without upgrading the electricity grid

Stephen Voller, CEO, ZapGo Ltd, UK

Drivers of gasoline and diesel cars are used to a five- or ten-minute visit to a filling station to fill up. To provide five to ten

minutes' charging of an electric vehicle requires 350kW high-rate DC chargers and EVs equipped to charge much more quickly than the current generation of batteries. ZapGo has developed Carbon-Ion, a replacement for lithium, which can be used to both buffer the grid and provide fast charging on the vehicle. It has already developed an autonomous vehicle that can be recharged in 35 seconds. This means 350kW chargers can be installed without billions invested in new electricity infrastructure.

CO₂-neutral long-distance transportation: how it can be done

Koen Reybrouck, general manager, Reycon, BELGIUM

High-volume transportation has been mainly powered by fossil fuels since steam boats replaced sailing boats 200 years ago. The emerging electrification of vehicles might lower the overall CO₂ emissions, but will not eradicate them. Reycon presents an ambitious and innovative mass-transport system for the future. People and freight could be moved over long distances, powered by the abundant energy contained in high-altitude winds. Design properties, needed infrastructure, energy balances and application details will be discussed, as well as questions still to be answered and the steps ahead.

STREAM 8 CHANGING LANDSCAPE FOR THE AUTOMOTIVE INDUSTRY



DAY 1 / TUESDAY 19 JUNE

8 STREAM 8 DISRUPTIVE TECHNOLOGY & THE CHALLENGES FACING THE GLOBAL AUTOMOTIVE INDUSTRY

Automotive value chain 2025+ industry outlook

David Coleman, director strategy and operations, Deloitte Consulting GmbH, GERMANY

The automotive industry is in the midst of a historic change right before our eyes. Nearly every day we read in the news about an actual or future shake-up in the market, new business models or a new value chain. The question is how to deal with this change. Through this uncertainty, automotive leaders are required to make investment decisions today, to build expertise, and have the right design and operational capabilities in place once markets demand them. We will discuss making such decisions using scenario-based business modelling, examining four plausible setups an OEM's value chain might have in the year 2025, and their implications for the decisions OEMs must face today.

New technologies and mobility models – challenges for the auto industry

Susanne Marczian, manager sustainable mobility, Ford Motor Company, GERMANY

The presentation will discuss the regulatory environment for car manufacturers, from city zero-emission roadmaps to EU carbon-neutral strategies, plus the challenges they face to start a transition to meet customers' future needs. The speaker will also outline Ford's vision of the City of Tomorrow, as well as different ways to be a sustainable future car manufacturer and mobility provider.

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The road to zero-emission mobility

Stephan Herbst, general manager business strategy, Toyota Motor Europe, BELGIUM

We are facing significant challenges in the transport sector and there is not one company or sector that can address these challenges by itself. New approaches and collaborations are required in the areas of decarbonising transport, increasing efficiency, utilising connectivity as well as shared economy and in their respective interactions with each other. This presentation will focus on these challenges and how Toyota is addressing them.

The pace of EV adoption – how fast?

Roland Irlé, CEO and partner, EV-volumes.com, SWEDEN

Assessing the future adoption of EVs is still a daunting task for auto analysts and market experts. Future predictions spread by orders of magnitude and are under frequent revision, mostly upwards. Mobility services and self-driving vehicles add further dynamics. The paper will show an approach that leads to more accurate and plausible forecasts of the long-term market penetration of EVs.

How the automotive revolution is speeding up

Kersten Heineke, partner, McKinsey & Company Inc, GERMANY

The presentation will analyse how quickly disruption is reshaping the personal-mobility landscape, and what new value pools will look like as the ecosystem evolves. The four disruptive, technology-driven industry trends are gaining significant momentum, e.g. 80% of the top 10 OEMs have plans for highly autonomous technology to be ready for the road by 2025; US\$32+ bn disclosed investment in ridesharing startups alone (to date). The share of revenue from disruptive business models could increase from about 1% in 2016 to up to 25% by 2030. Although about 20% of revenue in new vehicle sales could shift to disruptive technologies (e.g. AV), traditional products and services (e.g. fleet management) may still account for over 60% of the total value in new Mobility as a Service business models. The divergence of key technology adoption and global growth rates in national markets and city archetypes requires even more granular perspectives that put consumers at the centre. Disruptive developments require us to redefine our view of the industry structure towards a personal mobility landscape focusing on the consumer.

Driveless emotions: which car brands should rethink their future?

Filip Vasic, marketing lead, Neoris, CZECH REPUBLIC

The objective is to provoke a debate about the consequences that autonomous vehicles and various emerging smart technologies will inevitably have for the positioning of many prominent car brands that traditionally promise a premium driving experience. Although human driving will not evanesce any time soon, connected and ever-smarter cars and better-controlled roads will likely affect the emotional and social appeal of driving. As a result of technological trends, many brands will feel the need for market repositioning or dramatic virtualisation of driving. The effect will be a shift that might fundamentally shake the entire value chain of the car industry.

Driving systemic change in mobility for a sustainable future

Hans-Martin Düringhof, chief innovation officer, NEVS, SWEDEN

NEVS, founded in 2012, has been focusing from day one on the vision 'to shape mobility for a sustainable future'. The world is suffering from extreme pollution, climate change and heavily congested cities, but solutions to solve these problems are around the corner or, to a certain extent, already here. This presentation will explain how NEVS plans to contribute to getting the solutions in place through an innovative product offering that is emerging from a unique Chinese-Swedish partnership.

The future of automotive – how to succeed in a digital hyper competition?

Dr Andreas Gissler, managing director, Accenture, GERMANY

Within the next 10 years, disruptive trends will converge simultaneously. Connected car, autonomous driving, electro- as well as shared mobility will change the entire industry even more than in the last 50 years. New digital technologies force disruption and the convergence of industries and market players, enabling innovative new business models in the context of mobility services and beyond. This development is a major threat for OEMs but could be a tremendous opportunity at the same time. The market potential of innovative new business models will grow exponentially. Therefore OEMs need to rethink their current business model now, if they want to ensure future profitability. Dr Gissler will show different scenarios as well as strategic options based on latest market research and insights.

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DAY 2 / WEDNESDAY 20 JUNE

8 STREAM 8 DIGITAL TRANSFORMATION & NEW TECHNOLOGY - OPPORTUNITIES & FUTURE BUSINESS MODELS

How connected car startups are disrupting the automotive market

Noaa Barak, 4YFN strategy manager, 4YFN, Mobile World Capital Barcelona, SPAIN

Over the next five years, the connected car is expected to disrupt the entire automotive ecosystem and the consumer market. Two hundred and twenty million cars are expected to be connected by 2020, representing a €141bn business opportunity. With a fund of €2.1m, IMPACT Connected Car helps SMEs and startups across Europe capture this business opportunity. In this presentation, 4YFN, the startup business platform of Mobile World Capital Barcelona, will present the latest trends and disruptive concepts brought forward by startups and SMEs from all across Europe under its H2020-funded IMPACT Connected Car programme.

Digital transformation of the automotive industry

Moritz Bedenk, consultant, mobility group, Europe & Israel, Frost & Sullivan, GERMANY

As technology advances in mobility at a rapid pace, the digital offerings from the automotive industry will be the future differentiators across brands, both at the front end but also at the back end, including connected supply chains and the Industrial Internet of Things. Whether through digital retailing, financing, or connected and automated driving-related content, digitisation is becoming a key topic for OEMs.

The automotive endgame – a different perspective

Wolf-Dieter Hoppe, associate director, Arthur D. Little, GERMANY

The future of automotive mobility has begun. Automotive industry incumbents and new technology and mobility players are trying to develop the proposition within the drastically changing automotive pyramid. But many of their strategies are built on wrong assumptions: overall vehicle market development estimated too low, role and impact of cities underestimated, insufficient paradigms on future vehicle concepts applied and propulsion scenarios too narrow. The presentation reflects on frequently overlooked key challenges to plan and execute a winning transformation strategy towards the new era of mobility.

The paradigm shift in automotive retail and the evolution of 'digital'

Christian Zamet, partner and global automotive retail, dealers, distribution and aftersales leader, Ernst & Young GmbH, GERMANY

Dr Federica Pinucci, senior manager, Ernst & Young GmbH, GERMANY

The presentation will discuss: future trends and impacts/ changes affecting the automotive industry as well as dealer network strategy; automotive business model for OEMs as well as dealers, and introduction of new competitors (e.g. Tesla or

energy and telecommunication providers); customer experience and expectations including new job/role profiles to meet evolving customer expectations; integration of new services into the dealer business model for being sustainably competitive and profitable (e.g. achieving partnerships with cities for offering carsharing services, etc.); lessons from other industries.

What you need to know about blockchain and decentralised AVs

Noam Copel, co-founder and CEO, DAV Foundation, SWITZERLAND

The secret to making autonomous vehicles (AVs) mainstream and optimising the global AV economy isn't found in the world of transportation, but in the world of digital currencies. Today's internet allows anyone to exchange information directly. Blockchain, the technology underlying cryptocurrencies like Bitcoin, makes possible an 'internet of transportation' to exchange anything directly; a decentralised AV transportation marketplace on a free, open-source, blockchain software platform. AVs will cooperate to complete missions seamlessly. Anyone will be able to innovate and monetise AVs and associated services using a dedicated digital currency. Decentralised autonomous vehicles (DAV) is the ultimate disruption for the transportation industry.

Impact of disruptive technology in the automotive industry

Daron Gifford, partner, Plante Moran, USA

Based on research by Plante Moran, disruptive technologies in personal transportation and mobility will have far-reaching effects on the traditional automotive industry. Projections developed through 2050 illustrate how OEMs, suppliers and new mobility services will be dramatically changed in the automotive industry through their approaches to manufacturing, electrification, autonomous capabilities, connectivity and sharing. Convergence of these mobility technologies will drive new requirements to compete in the changing world of transportation. A framework and approach for strategies to address these future challenges will be highlighted.

Employment in the mobility transition in Germany

Dr Wolfgang Schade, CEO/scientific director, M-Five GmbH, GERMANY

Mobility is changing, and so is the automotive industry. Shared and self-driving electrified cars will change the business models of the mobility industries. The presentation will set out two mobility scenarios for Germany until 2035 – with levels of car ownership of 400 and 250 cars per 1,000 inhabitants down from today's 570 – and will elaborate on the consequences for mobility, value-added and employment. The analysis will look at the sectoral level as well as the regional level.

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STREAM 9 INFRASTRUCTURE & PROJECT FUNDING



DAY 1 / TUESDAY 19 JUNE

STREAM 9 PLANNING, INVESTMENT & POLICIES TO SUPPORT THE FUTURE OF TRANSPORTATION INFRASTRUCTURE

Governance innovation for transport infrastructure

Robert Missen, Directorate-General for Mobility & Transport, European Commission, BELGIUM

Most of the breakthroughs in transport infrastructure come from the technological development of vehicles and the new forms of communication. Infrastructures should then be considered a public service to allow smooth introduction and functioning of innovative vehicles and mobility patterns for the benefit of customers and society. Public administrations and private companies can provide the necessary framework to facilitate the seamless implementation of innovation, together and/or in partnership or separately. But new partnership schemes may possibly be needed. It is necessary to rethink how these services will be funded, who will have the responsibility of delivery, what are the acceptable costs for the users, as well as how to ensure a comprehensive socially inclusive system.

Capturing value from station-related development and regeneration to finance front-loaded infrastructure costs – case studies

John McNulty, infrastructure programme director HS2 Growth Partnership, LCR, UK

LCR (London & Continental Railways Ltd) has delivered pioneering station developments and regeneration at the stations on the High Speed 1 (HS1) railway it delivered for UK's DfT – in particular St Pancras/King's Cross Central and Stratford. As well as maximising the economic benefits from the high-speed rail investment, it has created and captured great value from these major developments, which are retained by the public sector to offset infrastructure costs. LCR is now supporting cities on the High Speed 2 (HS2) and Northern Powerhouse Rail (NPR) routes, in defining and delivering major station development and regeneration programmes at the high-speed stations. You will see how these programmes are building on HS1 successes to maximise benefits from efficient rail hubs, high-quality development and retail, public realm and place-making, and also long-term value capture to finance front-loaded infrastructure costs.

Development and financing of the railway infrastructure in Germany

Marco Wilfert, head of special investment programmes, Deutsche Bahn Netz AG, GERMANY

To manage the predicted growth of railway traffic volume and to increase the capacity and quality of its railway network, DB Netz had to develop a long-term investment strategy that contained the realisation of new lines, enhancement and renewal projects in accordance with the transport policy objectives of the German Federal Government. In the past decade, several new financing instruments have been developed and introduced to enable DB Netz to implement these strategies. Furthermore, the Federal Government initiated a substantial increase in subsidies for railway infrastructure projects. Due to these elementary changes, the number of railway infrastructure projects increased considerably.

Building sustainable infrastructure through urban integration and capturing value

Peter Morley, principal, Hassell, HONG KONG

Most major cities around the world are investing in railway metro systems. In Asia the pace of change is astonishing (Shenzhen will have a metro network more than twice the size of London's by 2030). But just building the lines is not enough to make them viable and sustainable. Using case studies from Hong Kong, Shenzhen, London and Sydney, a case is made for the benefits of network and station planning for urban integration that can support superdensity and a car-free, public transport-orientated lifestyle for the communities they serve.

The role of INEA in supporting transport research, innovation and deployment including infrastructure, smart grids and smart cities

Alan Haigh, head of department, Horizon 2020 Energy and Transport, INEA Executive Agency, European Commission, BELGIUM

Sofia Papantoniadou, project manager - Innovation and Networks Executive Agency (INEA), European Commission, BELGIUM

The European Commission's Innovation and Networks Executive Agency (INEA) supports various research, innovation and deployment programmes with an operational budget in excess of

€34bn, most notably the Horizon 2020 Research and Innovation programme (H2020) and the Connecting Europe Facility (CEF). An overview of the role of the agency will be presented and details of each funding programme elaborated. The H2020 programme supports research and new technology development in many transport modes and also supports innovation and pilot and demonstration project deployment. An overview of past and future funding opportunities will be given, as well as example projects such as automated road transport, aviation, innovative infrastructure and developing intermodal technologies. The CEF programme supports a wide variety of actions including rail infrastructure and management systems, intelligent transport systems and flagship cross-border infrastructure projects. Funding opportunities and innovative technologies will be highlighted as well as examples in various transport modes. Speakers from both programmes will be available for further information at the conference.

Is the 'new-era transportation infrastructure' ready for private investment?

Reiner Schrankler, partner and member iCON investment committee, iCON Infrastructure, GERMANY

Who are the investors (from private equity to pension funds to dedicated infrastructure funds)? What are their economic investment requirements (deal volumes, holding period, return and yield objectives)? What is their risk appetite? Where can the project cash flow come from to satisfy investors' needs? What are the relevant 'new-era infrastructure' subsectors for investors? This presentation will deal mainly with e-mobility, including whether e-mobility infrastructure can be financed by investors, and the obstacles for private investors to invest in new-era transportation infrastructure. The session will describe and explain how private investors like iCON Infrastructure work, and what needs to happen to get such investors involved in funding new-era infrastructure.

The value of infrastructure and its influence on project planning

Aernout van der Bend, director general, NGInfra (Next Generation Infrastructures), NETHERLANDS

Infrastructure is more than adding lines to our networks. It's about

the service we can offer on the networks. In the Netherlands we've surveyed the value of infrastructure (12% of the GNP; but what's that?) Mostly that's expressed in euros. More interesting is to change the focus to infrastructure's societal benefits: climate change, inclusion, labour and happiness. Therefore it's about adding value not only to your own network but specifically also cross-sectoral to the other networks (roads, waterways, railways, main ports, power and gas, etc.) and to society.

Why 'smart' infrastructure investment, now?

Tricia Nelson, partner, head of transport sector and advisory talent leader, EY, UK

By 2050 more than two-thirds of the world's population will live in urban areas, which will put pressure on existing infrastructure and city finances. At the same time, cities need new solutions to infrastructure investment models and service delivery to keep pace with growing demand and ageing existing infrastructure. The time is ripe for new 'smart' infrastructure investment. Resilience: cities need to build infrastructure that is resilient to shocks and stresses, as this has the potential to bring long-term economic, social and physical benefits. Alternative financing models: smart technologies increasingly shape the way infrastructure is designed, built, operated and owned, so how can cities secure investments when that infrastructure increasingly integrates smart technologies?

Digital technology: a catalyst or a hurdle for securing funding?

Boris Galonske, managing director, Silverbergh Partners, SWITZERLAND

Transportation 4.0 is starting to take shape. The integration of digital technologies into transportation assets is accelerating. New digital business models are evolving. Successes and setbacks can be perceived. What does this mean for funding? What are the challenges and where are the opportunities? Addressing the needs of investors, operators and customers will be key to matching capital supply with investment opportunities. New investment opportunities can also be identified. The session will shed some light on digital value levers from a funding perspective. The status quo, potential opportunities and approaches to deal with the evolution of technology will be discussed.

DAY 2 / WEDNESDAY 20 JUNE

9 STREAM 9 SMART, CONNECTED TRANSPORTATION INFRASTRUCTURE TO SUPPORT FUTURE URBAN MOBILITY SOLUTIONS

European Investment Project Portal – a transparent project pipeline

Michael Feith, policy officer, European Commission, LUXEMBOURG

The European Investment Project Portal (EIPP), an initiative of the European Commission, is a multilingual online platform providing greater visibility and transparency about infrastructure projects within the EU. It is a key instrument of the Investment Plan for Europe, and aims to support the financing of investment projects

across the EU, enabling project promoters to reach potential investors worldwide. It covers all sectors of the economy, including transport.

'Predict and provide' or 'disrupt and react'

John D'Arcy, transportation development director, Mott MacDonald, UK

Within our Future Mobility initiative, we have identified a suite of infrastructure development areas that could shape a future

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integrated transport network. Taking each of these in turn (and building on our experience gained in working with leading transport organisations globally) we will explore whether the balance of evidence points to demand leading to and shaping supply or to the area being subject to disruptive forces that then demand a reaction. In each case we will identify our view of the enablers and barriers and offer key questions and areas that need to be addressed.

People-led modelling and design for successful urban places

Anna Rose, director, Space Syntax, UK

Anna Rose will introduce the unique modelling and design approach Space Syntax has applied internationally over the last 25 years. She will explain how Space Syntax can be applied to analyse and understand the complexities of the relationship between urban form and mobility, and how this can also be applied to the creation of innovative walking and cycling strategies and infrastructure projects. Case studies will look at applications in urban design projects as well as in integrated urban modelling platforms, which create algorithms that can predict the combined impact of urban network, population/development distribution and public transport attraction on mobility patterns. The understanding generated through this approach has helped Space Syntax create evidence-based policy approaches that directly support the uptake of active travel, walking and cycling.

Using planning to support infrastructure in UK city-regions

James Harris, policy and networks manager, Royal Town Planning Institute, UK

This presentation will use examples from the UK to demonstrate how planning policy and legislation can help reduce infrastructure costs, generate funding for new infrastructure, and ensure that investments meet wider economic, social and environmental objectives. It will explore how city leaders are using data and technology to plan infrastructure more effectively, and the critical need for governance structures that can drive collaboration across administrative and sectoral boundaries.

The road to being smart – enabling smart infrastructure

Steve Birdsall, CEO, Gaist Solutions Ltd, UK

A smart system uses a feedback loop of data, providing evidence to inform decision making. The system can monitor, measure, analyse, communicate and act, based on information captured from sensors. Gaist has developed a data-led smart system approach that is helping asset owners in government and the private sector to build a much richer and smarter understanding of the condition of their infrastructure assets. These insights are helping to increase responsiveness, drive down maintenance costs and inform the big infrastructure investment decisions about how we evolve our highways to ensure they can facilitate the new transport revolution.

The bumpy road to smart infrastructure

Friedemann Brockmeyer, principal, Civity Management Consultants, GERMANY

The trend of new mobility services is often seen to be disruptive, changing our behaviour and the way we move from A to B. But

to what extent will, for example, autonomous driving require a dedicated and improved infrastructure to fully unlock its potential? Significant investments are needed in order to make infrastructure smart. On the other hand, a significantly more intelligent use of resources also leads to lower land consumption. How does this demand fit with the existing situation of infrastructure, its management and funding? Based on our experience with public- and private-sector projects we will explore what cities' needs are, how big the infrastructure and funding challenge is, and if city authorities are ready to face it.

Controlling environment, traffic and services on motorways, expressways and turnpikes with an IoT infrastructure in a C-ITS context

Francesco Mazzola, CEO, T.net Italia SpA, ITALY

Congestion cost is a major issue for any nation in terms of fuel consumption and travel time. ITS and connected car technology are transforming mobility and safety on highways by avoiding crashes and reducing fatalities. To have a full C-ITS you need the IoT subsystems and the V2X infrastructure to talk to each other. The ITS framework we've developed for motorway concessions takes all of this into account using software-defined radio concepts and geo-broadcast packet forwarding.

Connectivity agenda for Western Balkans: investments in infrastructure and policy

Mate Gjorgjievski, transport policy and law expert, South East Europe Transport Observatory, SERBIA

The Western Balkans Six Connectivity agenda has been somewhat successful in supporting concrete cross-border and regional infrastructure projects that bring highest value on the Trans-European Transport Networks (TEN-T). Moreover, it started shifting the paradigm from pure infrastructure-driven to connectivity reform projects and new areas of interventions in the transport sector, which are likely to have benefits for the whole society. The presentation will offer sound analysis of how the infrastructure development depends on the efficiency of setting and/or reinforcing the regulatory and institutional framework that should enable the Western Balkans to reap the full benefits of the investments in infrastructure.

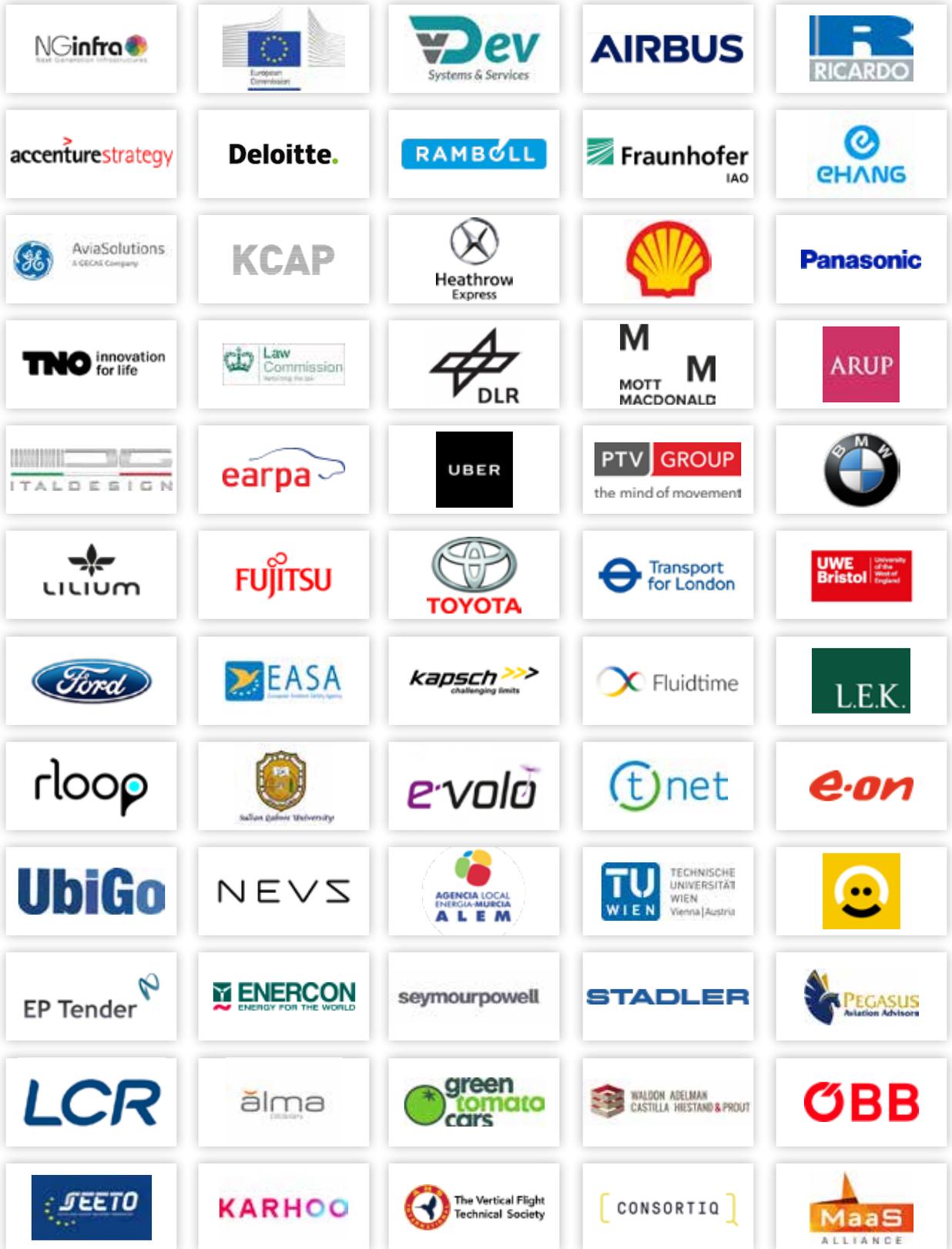
How to create engagement platforms for engineering sustainable infrastructure projects

Otto Schepers, business unit manager traffic and roads, Witteveen+Bos, NETHERLANDS

We are used to creating mobility by engineering large projects, planned by the government using time-consuming administrative procedures. We as engineers think there is an alternative: offering engineering skills to the crowd; creating engagement platforms for communities to engineer and experience (mobility) solutions in their own neighbourhoods; using the latest technology like AR/VR, parametric design modelling, blockchains and open data; empowering citizens to create bankable and sustainable solutions. Designed by the crowd, developed by the community, validated by engineering experts. In this presentation we will share our dreams, our prototypes and our first successful experiences.

This programme is subject to change

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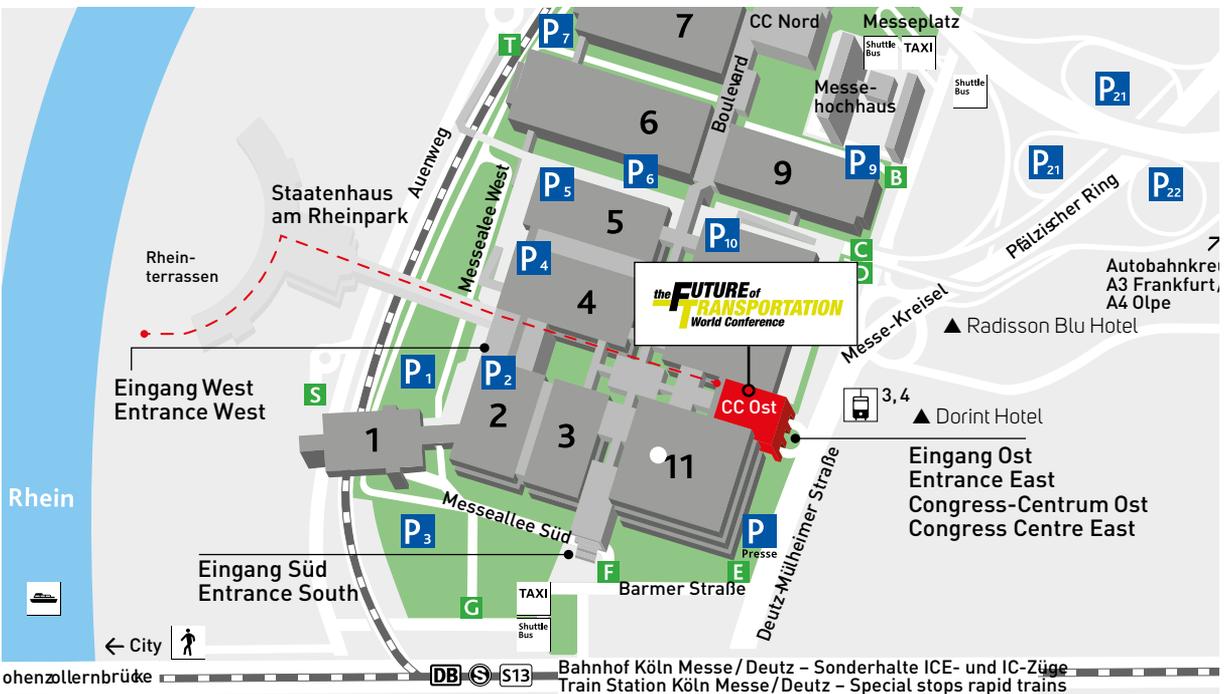


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Cologne-Bonn Airport is a 20-minute taxi ride or a 15-minute train ride from the exhibition centre. Düsseldorf Airport also has direct rail links to Cologne with 50-minute travel time. Intercity Express, regional and suburban trains, for example the S-13 S-Bahn (suburban train) operate regularly from Cologne-Bonn Airport and stop directly at the exhibition centre station (Köln-Deutz), five minutes' walk from the venue. See the website for details.



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