European University Institute | ROBERT SCHUMAN CENTRE FOR ADVANCED STUDIES | FLORENCE SCHOOL OF REGULATION

4TH FLORENCE INTERMODAL FORUM

"WHAT ROLE FOR DIGITALIZATION IN ORDER TO ACHIEVE AN INTERMODAL LEVEL PLAYING FIELD"

A SUMMARY OF THE PRESENTATIONS

Florence, 29th February 2016

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Forum Summary Document

PROGRAMME

08.30-09.00	**INTRODUCTION TO THE FORUM** **Matthias Finger** | Director of FSR-Transport and of the Chair of Management of Network Industries, EPFL **Keir Fitch** | Head of Unit Research and Innovative Transport Systems, DG MOVE
09.00-10.45	**HOW DOES DIGITALIZATION AFFECT TRANSPORT AND THE COMPETITION BETWEEN TRANSPORT MODES?** **Francesco Dionori** | UNECE, Chief of Transport Networks & Logistics Section **Giuseppe Liguori** | SRM Bologna, EU Projects Manager **Ichiro Takahashi** | JR EAST, Head of EU Brussels Office Round Table Discussions
10.45-11.15	Coffee break
11.15-13.00	**AUTOMATION IS TRANSFORMING THE DIFFERENT TRANSPORT MODES AT A DIFFERENT PACE. HOW DOES THIS AFFECT THE LEVEL PLAYING FIELD?** **Eric Feyen** | UIRR, Technical Director **Michael Bueltmann** | HERE, Managing Director **Martina Mueggler** | Car Postal, Head of Innovation **Gautier Brodeo** | UITP, Urban Rail Expert Round Table Discussions
13.00-14.00	Lunch break
14.00-15.45	**WHAT IS THE POTENTIAL OF NEW BUSINESS MODELS IN TRANSPORT - HOW WILL THEY AFFECT INTERMODAL COMPETITION?** **Juan Montero** | UNED Madrid, Associate Professor **Veronica Bocci** | District for Rail Technologies, High Speed, Safety & Security Consortium **Steffen Schaefer** | SIEMENS, Senior Principal City IT Solutions Round Table Discussions
15.45-16.00	Coffee break
16.00-16.45	**ROUND TABLE DISCUSSIONS WITH ALL PARTICIPANTS: SUPPORTING INNOVATION EFFECTIVELY WITHOUT DISTORTING COMPETITION: WHICH ROLE FOR REGULATION? WHICH ROLE FOR THE EU?**
16.45-17.00	**CONCLUSION** **Matthias Finger** | Director of FSR-Transport and of the Chair of Management of Network Industries, EPFL **Keir Fitch** | Head of Unit Research and Innovative Transport Systems, DG MOVE)

The present document summarises the content of the presentations delivered during 4th Florence Intermodal Forum, and the following paragraphs offer short summaries of each presentation, illustrating the main points made and matters treated. The thoughts and opinions reported do not necessarily reflect the views of the contributors, as they have been collected by the authors of this Summary.
To open the presentations, go to florence-school.eu, choose "transport" from the "Areas" in the top menu bar and select "Transport Forums" among the activities on the right side bar. Clicking on the title of the Forum will take you to the relevant page. Alternatively, by clicking on a presentation's icon you may activate an internet link taking you to the full presentation, when available. Presentations are hosted on the FSR website by permission of the authors.

Introduction to the 4th Florence Intermodal Forum

Nadia Bert, Coordinator of FSR-Transport, EUI

The (European) transportation system is changing rapidly, and new social trends and technological developments are emerging. In her introduction to the 4th Florence Intermodal Forum, Ms Nadia Bert pointed at some of the most relevant elements of the current situation:

- **Congestion** is becoming the most compelling problem in many cities with serious environmental, economic and social consequences. This is closely linked to the trend of **urbanization**: the United Nations estimate that in the 1950s 30% of the world's population lived in urban areas; in 2014 this figure was 54%; by 2050 it could reach 66%. In 2010, 64% of all kilometres travelled were made within urban environments; by 2050 today's number is expected to triply.
- Differently from industry, residential consumption, commercial and institutional use, agriculture forestry and fisheries, transportation is the only sector where GHG emissions today are higher than in 1990. It has to be acknowledge that some improvements have been done since 2010, yet it is necessary to reverse this trend and **decarbonize** transport.
- Transportation **infrastructure capacity** is reaching its limits, while it is not always optimally used. The traditional way of dealing with mobility problems (i.e. building capacity by way of new, costly and slow-to-be-built infrastructure) can no longer be the preferred choice of decision makers.
- Being one of the priorities of the Juncker Commission, the broader "**digital transformation**" has started also in the transport sector. There is great potential for the ICTs to innovate

transportation: on the one hand, thanks to new transport technologies city planners as well as policy makers discover new ways of making more efficient use of existing **infrastructure**; on the other hand, ICTs affect the **management** of the urban infrastructure systems offering efficiency gains, empowerment of the customer, new services.

The elements that characterize the digital transformation of the transport sector can be summarized as follows:

- **Automation** is affecting both transport and other sectors. This could have many advantages: for instance in the road sector, as human error is the main cause of accidents, automation is expected to make driving safer, more secure and even more environmentally friendly.
- **Digital customer access** is replacing the traditional physical interaction between companies and the end customer. Individual customers can already buy tickets online via different providers as interfaces are becoming digital.
- **Connectivity** is evolving thanks to communication technologies. The result of this process had been termed the "internet of things": for example smart cars are capable of interacting with other cars.
- There is an exponentially growing availability of **digital data**: this is an important characteristic of digitalization that has still unexplored implications and potential.
- The ability to process this data relates to the ever increasing **computing power**, which is another central element of the digitalization process.

Because of digitalization, the very **nature of the transportation system is changing**. The physical transportation system is replicated by a digital dimension that not only replicates but also, potentially, optimizes the transportation system offering new services. Therefore, **mobility can now be seen as an information service with physical transportation products**, rather than a transportation product with additional services. The end user is both a physical traveler and a digital customer.

Most importantly for this 4th Florence Intermodal Forum, **digitalization affects all transport modes and their interaction**. Therefore, the need to start a systematic reflection on the role of digitalization when it comes to creating an intermodal level playing field. Discussions during the day follow four guiding questions:

- How does digitalization affect transport and the competition between transport modes?
- How does automation affect this level playing field?
- How will new business models affect this level playing field?
- Supporting innovation without distorting competition: what role for (EU-driven) regulation?

What role for digitalization in order to achieve an intermodal level playing field?

Keir Fitch, Head of Unit Research and Innovative Transport Systems, DG MOVE
European Commission

Introducing the 4th Florence Intermodal Forum Mr Fitch presented the policy objectives of the European Commission in the field of digitalisation and intermodality and some of the considerations on the discussion questions of the Forum.

The overall interest of the Commission is to maintain the competitiveness of the transport sector both for its own sake and for the rest of the European industry that very much builds on this sector. Furthermore, there is the goal to promote decarbonisation and a higher degree of safety. The central question is how digitalisation and the innovations that lie behind this process can be used to achieve these goals.

Mr Fitch stressed that it is important for the Commission to receive inputs from the stakeholders both on the question of what is actually happening in terms of digitalisation in the sector and on what the EU might do about it in terms of focussing research money and designing regulation.

How does digitalization affect transport and the competition between transport modes?

Digitalisation has to be looked at in two different ways. On the one hand, automation is transforming the different modes internally. In road transport automated driving is certainly the most prominent issue and it will trigger one of the most profound changes in the sector. From there it has to be asked how this development affects also the other modes. Electronic ticketing for passenger transport and digital consignment systems in freight transport are changing the information flow within a transport mode.

On the other hand, the cross modal perspective has to be taken into consideration: the combination of automation and digitalisation of information gives raise to new business models as reflected by the concept of Mobility as a Service (MaaS) concept.

When consequently followed the MaaS approach would dramatically reduce the private car ownership. In conjunction with the prospective of self-driving vehicles there could be a system of self-driving taxis that largely replaces the need for private car ownership. This may have some possible adverse effects: if MaaS really reduces car ownership it could negatively impact the car manufacturing industry. Road automation could also lead to individual car transport becoming more popular again as some of the disincentives towards car use (wasted time driving, frustration and perhaps cost of parking) would disappear. Longer commutes may become acceptable again possibly intensifying problems of urban sprawl and also congestion and emissions. According to the results of forecasts by the US Department of Energy automated cars could lead to doubling or tripling of the number of miles travelled by car.

Furthermore the changes in the area of private transport could have substantial impacts on public transport. Automated cars simply do not have the capacity to replace very intensively used mass transport or rail systems into city centres, but in more peripheral areas they could undermine the viability of already marginal public transport options. While new business models like Uber may reduce the cost of taxi services there would still be people unable to afford them. Alternatively however, automated vehicles providing a last mile solution in combination with an efficient mass transport system could deliver great increases both in the efficiency and cost effectiveness of the overall system.

A similar range of scenarios exist for freight services: simply automating road freight transport and thus limiting or eliminating the cost of drivers would further undermine the already difficult economics of other inland transport modes. But conversely fully integrated consignment data flows, and automation of *all* transport modes and intermodal hubs, could lower the costs and improve the reliability of intermodal freight transport, leading to a more optimal and sustainable use of all transport infrastructure.

Which role for regulation?

Access to data is a primary concern for innovators. Especially when the data concerned is about public transport it should be considered a public good and made available to a wide range of players. This approach has to go along with the protection of privacy and, especially for automation, cyber security. Access to data generated by automated cars also raises important issues. Certain data should not be shared, to protect the privacy of the vehicle user or ensure the secure operation of the car. But the sharing of other data is vital to obtain the full system optimisation and safety benefits of connected driving, and to allow the development of a broad range of information services.

Ultimately, it has to be debated what the role of regulation is in addressing both changes and possible side effects of that change.

On the one hand one may argue for deregulation for instance by removing the principle that a car needs to be operated by a driver, and to give scope for individual companies to try out innovative solutions..

On the other hand there is also the case for more regulation. Firstly to address the adverse effects and secondly to ensure that change really happens. Transport has to be viewed as a system and regulation has to take into consideration both vehicles and infrastructure that need to correspond. For automated cars the question is whether we will simply have autonomous vehicles – replacing human drivers by robotics relying on sensors on the vehicles, but not interacting with other vehicles more than at present, or whether in the future a functioning system of communicating vehicles can be created. Only this latter vision – while more demanding to deliver – provides the possibility of fundamentally changing our transport system for the better.

How does digitalization affect transport and the competition between transport modes?

Francesco Dionori, Chief of Transport Networks & Logistics Section, Sustainable Transport Division, UNECE

Mr Dionori presented the work of the Sustainable Transport Division of UNECE (United Nations Economic Commission for Europe) focussing on the aspects related to intermodality and their work towards the achievement of an intermodal level playing field among transport modes.

UNECE is one of five regional divisions of the UN system. UNECE has the widest regional coverage. It extends far beyond Europe and its conventions are often applied globally. One example for this is Vienna Convention on road signs. The UNECE Sustainable Transport Division mainly looks at technical regulation across the inland transport sector, aiming at increasing the economic, social and environmental sustainability of transportation. Several UNECE agreements on intermodal transport regulate the network, infrastructure standards and benchmarks for performance of international transport by rail, road and inland waterways.

An important field of activity relates to the creation of a unified railway law: this is aimed at improving the competiveness of the rail sector as a whole across the entire UNECE-region. One of the issues is the existence of different consignment notes for freight transport that UNECE aims at harmonizing. A second step is the digitalisation of these to make them readily available to users. It has to be borne in mind that while western countries are usually quite advanced with digitalisation, this is far less the case further in the east. Therefore minimum requirements have to be set at a level that all UNECE member States can achieve cost effectively. UNECE collaborates actively with the European Commission and Member States on this.

A regularly updated online database helps in the exchange of best practices in national policies on intermodality. This is an important tool for governments to better understand the sector and efficiently incentivise the use of intermodal transport.

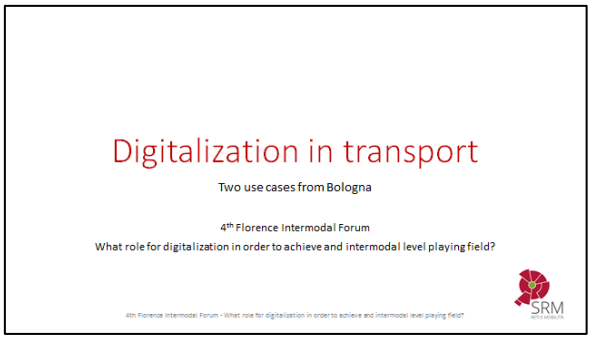
Mr Dionori presented that innovation in the transport sector is relatively difficult and innovation projects are less likely to succeed in transport than in other sectors. The main reason for this is the lack of coordination at a national level but also within the industry.

Another relevant aspect of UNECE's work is the TIR-convention. The convention is an

international border crossing facilitation agreement that reduces the time freight transport operations have to spend at borders. The aim here is to digitalize and thereby simplify customs procedures. As a result products could be cleared by customs more efficiently.

Finally Mr Dionori presented UNECE's activities in ITS: Most importantly UNECE addresses standards for the vehicle industry and has started to look in more detail at networked cars. The sector is very dynamic and frequently new innovations emerge. Nevertheless the industry itself is currently asking for common technical standards in order to prevent an ineffective form of competition that limits the competiveness of the network as a whole. With "CItS" in Europe and "V2V" in the US two conflicting standards for connected vehicles already exist and they should be harmonized in the future.

Seeking to harmonize does however not mean to oblige anyone to use a certain standard, which would – eventually – hinder competition. It rather means to set underlining framework on which different add-ons can be built based on a common standard.



Digitalisation in transport: two use cases from Bologna

Giuseppe Liguori, Project Manager – SRM Bologna (Public Transport Authority)

The presentation of Mr Giuseppe Liguori at the 4th Florence Intermodal Forum was aimed at presenting the role of the **Bologna local authority for public transport** (SRM Bologna) and especially the contribution that it can offer in terms of innovation for the city as a whole.

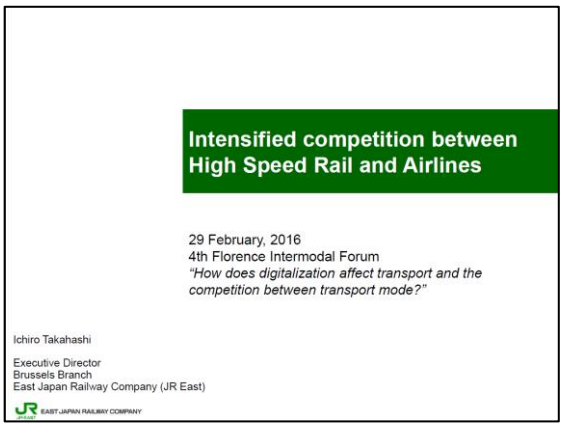
SRM Bologna is primarily concerned with: the preparation and management of the tenders for public transport and parking services; the award of the public transport services; the management of service contracts and their financial flows; the monitoring activity of the awarded operators that deliver the services; the management and planning of real estates directly owned. In their daily activity that also includes supporting the local bodies in mobility planning and managing European Projects on mobility issues, SRM Bologna supports intermodality and sustainable mobility.

SRM Bologna is part of different European, national and regional networks that are aimed at favoring the exchange of best practices among local bodies to improve governance and operation management. With the ultimate goal of improving the city's transport environment, SRM Bologna has joined several **European projects** regarding **intermodality** and **digital innovation**, and Mr Liguori presented two of them: the European Cycling Challenge (within Civitas Mimosa) and TIDE. ICTs are at the core of these projects, and they have been used to: support behavior change campaigns; support the planning and assessment of cycling lanes and the users' behavior; improve the quality of public transport services.

As first, Mr Liguori illustrated the MIMOSA project, out of which the **European Cycling Challenge** (http://cyclingchallenge.eu/) was born. The European Cycling Challenge, which continues now after the end of the EU funded project, is based on gamification to cycling in cities where participants (commuters and travelers for leisure – not sport workout) track their trips competing each other on mileage. The data collected from the Challenge can be analyzed and exploited by city planners in several ways: for instance, it is now possible to compare urban planning vs. real user experience, it is possible to analyze the points of origin and destination of the cyclists before installing new bike racks or put bike sharing facilities, it is possible to make an impact assessment of the investments on infrastructures comparing the data from one year to the other on specific new streets/bike lanes.

Another example based on ICTs showed by Mr Liguori is **DegustiBus** (www.degustibus.bo.it/en/home), the main output for Bologna of the EU project **TIDE** (www.tide-innovation.eu/en). DegustiBus is a web app for user satisfaction on the quality of public transport operation in Bologna – based on EU standard UNI EN 13816 and put at the disposal of all the customers. Despite the great potential for improvement of the service that the app has, one of the main weaknesses of this experience is related to the participation and especially to the limited support given by the operator and the Municipality itself.

To conclude, drawing on the experience of these two case studies as well as on the overall experience of SRM Bologna, Mr Liguori stated that **digitalization can have an impact on the transportation system**: first and foremost, in a *win-win scenario* digitalization affects transport and favors the **integration between transport modes** generating overall **positive competition**. Secondly, as data gathering and exploitation are strictly related to the quality of service delivered, a **good use of data available can improve the use of existing infrastructure and service**; last but not least, public authorities should have the task to **facilitate digitalization at local level** (introducing measures such as seamless payments, advanced integration of public services, open data, etc.) **thinking in a global perspective** (standards, benchmarks, etc.) and overcoming any lack of know-how with the help of experiences made in other similar contexts.



Intensified competition between High Speed Rail and Airlines

Ichiro Takahashi, EJRC, Executive Director of the Brussels Branch

Mr Takahashi focussed his presentation on the competition between High Speed Rail and Airlines in Japan and the recent effects of digitalisation.

As a background Mr Takahashi presented a map of Japan's high speed rail network. 200 railway companies operate in Japan, JR East being the biggest. The Shinkansen network is operated by four railway companies with a current maximum speed of 320 km. There are also over 100 airports in Japan with an average of 2 airports in each of the 50 Prefectures of Japan.

Mr Takahashi presented four examples to illustrate the intensified competition between high speed rail and domestic air travel.

After a part of the Shinkansen line from Tokyo to Yamagata started operation in 1992, the number of airline passengers decreased by 40% until 1995. Currently and with the whole line in operation, the rail market share is 97%.

In 2002, a part of the Shinkansen line from Tokyo to Aomori started operation. After that, the number of airline passengers decreased by 35% until 2009 and is currently at 79% after the whole line opened in 2010.

When the Shinkansen line from Tokyo to Kanazawa opened in 2015, the number of the airline passengers decreased by 35%.The market share of Shinkansen is currently about 50% and airlines are now reducing their capacity.

In March 2016 the Shinkansen line to Hakodate will open, yet the airlines will not change their services and expect the demand for their services to remain constant.

Market analyses give some information about the relationship between market share, travel time, travel distance and other factors. It shows that the market share is mainly affected by travel time and not so much by other elements like price or vicinity of an airport. Given this interpretation it can be predicted that the market share of the Shinkansen will remain stable in the future.

Yet there may be disadvantages for the Shinkansen as regards some of the digital features that improve customer satisfaction. This includes E-ticketing, on board wifi, milage programs and client identification for marketing, which are available for air travel but not for high speed rail. There is a risk that wealthier customers might move to aviation for these reasons on the longer distances in the future.

In his final point Mr Takahashi stressed that digitalization is very relevant for customer satisfaction and therefore market position. Using this potential it is important for JR East that the use of their data is secured and appropriately protects sensitive information.

Automation in road-rail combined transport

Eric Feyen, Technical Director – International Union for Road-Rail Combined Transport (UIRR)

The presentation of Mr Feyen focused on the topic of automation from the point of view of the International Union for Road-Rail Combined Transport, which is the European Association aimed at promoting combined techniques between road, rail and also waterborne transport.

First of all, Mr Feyen stated that Combined Transport (CT) is only dealing with freight, a market sector where not only the actors but also the functions are rapidly changing. The current and traditional CT chain is composed of two main elements: on the "road side" road haulers and logistics companies are the actors that take the goods and loading units from the owners (shippers and consignors) to the terminal managers; on the "rail side" rail traction service providers/operators have to optimize their operations dealing with wagon-keepers and rail infrastructure managers. However, major changes are affecting the sector and the actors themselves are changing as they internalize several functions.

Mr Feyen stressed the need for interoperable systems and standards to integrate all freight players in the logistic chain and make CT able to compete with pure road transport. Digitalization is one of the means to achieve this goal: freight e-document, real-time data sharing and access to European-wide reference files are essential features of an integrated and competitive freight system.

Which elements could be automated in CT?

- On the "rail side", there will be first of all automation in rolling stock: on the one hand, automation of traction equipment will support the train drivers especially in functions at the border cross, on the other hand automation for intelligent freight wagon will be relevant throughout the entire trip (but not for automatic coupling, as there is more and more fixed composition of the trains). Secondly, automation in the marshalling yard will bring great advantages. However, with regard to this, Mr Feyen stressed that CT is currently changing some of its traditional functions: for instance automation in the marshalling yard will probably be more relevant for conventional rail rather than CT (which is becoming an operation from terminal to terminal without marshalling yard). Thirdly, automation in the CT terminal (pre-

departure and arrival controls, transshipment operations, check-in/out controls) will be of utmost importance to accelerate the process inside the terminals. Last but not least, automation could bring great advantages in one of the biggest barriers for the railways (and the rail side of CT) that is automation in the train controlling.

- On the "road side" Mr Feyen identified three aspects for automation: automation in the road vehicles (as to have fully autonomous trucks delivering goods between terminals and logistic depots), automation in boxes (this means having automatic handling of boxes thanks to the use of modular units) and automation in packaging and handling of goods (as to optimise unit capacity and use of pallets).

Mr Feyen gave more details on the examples of CT automation, and raised one major concern on automation in pure road transport: initiatives to fully electrify road networks with autonomous driving capabilities (platooning) was criticized as undesirable given the alternative of rail transport.

To conclude, Mr Feyen stressed that automation can be considered a huge opportunity for improvement but might also become a huge barrier for further rail freight development if additional requirements are imposed just on the rail and not on the road part of the CT; if the correlation between investments and benefits in research and new technologies remains unclear; if operators will be forced to use single solutions; and, most importantly, if the princes on the rail side of CT will continue to increase and those on the rail side will decrease.

What role will digitalization play in achieving an intermodal level playing field?

Michael Bültmann
Managing Director - HERE

Mr Bültmann presented the company HERE and made several observations on the question of regulation.

HERE is a location cloud provider, enabling real-time location applications and experiences for consumers, vehicles, enterprises and cities. Its most well-known product is its digital map, used for in-car navigation systems. Although originally a daughter of Nokia the company has been a supplier to brands such as Samsung and Apple and, after a recent acquisition, now belongs to a consortium of German car manufacturers Daimler, Audi and BMW. It is expected that further companies, not necessarily from the car industry, will continue to join the consortium.

HERE employs about 6500 people worldwide and is focussed on software development. Its main product is successful across the entire car industry and not only by the consortium members but other global OEM's.

Mr Bültmann pointed out the disruptive effect he believes digitalisation will have on mobility and the car industry, putting pressure on value chains across the entire sector.

In the future there will be a stronger focus on mobility solutions. Reducing the emphasis on silos and considering the entire mobility ecosystem, will be key to success. As part of this, software and operating systems will become more important factors: young people for example prefer products that are compatible with the operating systems they use on their phones and other devices.

As autonomous driving becomes the norm, the way in which cars are used will also change: during the time a car is not in use by its owner it could be used for transporting other people or goods. The modular approach to transport will break down, as will the present notion of what a car is. With high levels of automation and the growth of car sharing, the car could eventually become something closer to public transport.

The shift to fully autonomous vehicles and digitalisation, however, is a major challenge. While Europe is mainly concerned with its risks (data protection, cyber security), players in the US, especially Silicon Valley, are more focussed on the opportunities. Digitalisation requires a completely new approach to data that takes into consideration both the opportunities and risks. It

requires a fully implemented “open data” culture, which allows access to publicly owned data. Existing laws and regulations around ownership and the ability to exclude others will not work in a truly digital society. For innovation to occur the industry needs simple models and platforms that allow easy access to data.

Standardization is not fast enough to keep up the speed of innovation in Europe. It has to be borne in mind that the market itself can agree a standard once a successful product is introduced for the mass market. HERE has picked up that approach and proposed standards for sensor ingestion to the industry. These discussions have been successful and are being continued globally.

"SmartShuttle Sion" – automated vehicles in the city of Sion

Martina Müggler, Head Mobility Development – Car Postal

Ms Müggler started her presentation by pointing out Car Postal's longstanding experience in public transport with bus services provided in Switzerland for over a hundred years and serving over 140m customers per year. She presented several initiatives and developments that have moved the company into a competitive system towards a more broadly operating mobility provider that is active abroad (like France, where Car Postal is the 4th biggest bus operator) and along the entire mobility chain. In fact, Car Postal has a strong position in the competitive bus market in Switzerland but also invested in other areas and new markets such as internalization of IT-system services (ticket controlling, passenger counting and money collecting), bike sharing and ride sharing.

Ms Müggler then presented some mobility trends and market developments, highlighting some limits to the current service offered by Car Postal and possible solutions. The demand for mobility services is expected to grow up to 30% by 2030. However, the system is still partly **inefficient**: for instance, tickets have the same price throughout the day and there is no adjustment for peak hours. This means that a lot of investment has to be made in infrastructure and transport capacity which is used for just a few hours. In fact, the average occupancy of a long distance train is around 30% only.. This is not compatible with an increasing **cost pressure** and cut of public funding. To answer new **customer needs** as well as to compete with **new entrants**, Car Postal has to develop and invests in new technologies.

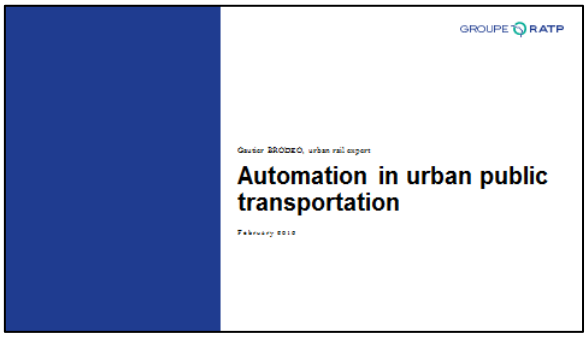
One of the flagship initiatives in the field of new technology is the project "SmartShuttle": two completely **automated vehicles** are already running on a test ground in the city of Sion in the Canton of Valais and they have been presented to the media in December 2015. Since then, they have attracted national and international attention. In terms of innovation, Ms Müggler stressed that this project demonstrates that it is not always true that Europe is slow in understanding and introducing novelties in the mobility sector: this Smart Shuttle is the practical example that Car Postal took the risk (when the project started it was not even sure that the Public Authority would authorize the test) and investing money in something that has still unknown potential.

To complete the next testing phases, there are still many obstacles to overcome though: Car Postal is facing **technological, legislative, social and managerial challenges**.

- On the technological side, one of buses is supposed to run on a hill with 20% slope, and technical guarantees have to be put in place.
- On the legal side, Car Postal is currently discussing with three Federal Offices to get the necessary approvals for the test that should take place in a mixed environment (with pedestrians, bicycles, cars…) on two pre-identified routes in the city centre of Sion.
- On the social aspect people still need to get used to seeing and actually also using driverless vehicles.
- The traditional business model for public service management will yet have to be developed.

Smart Shuttle is owned by Car Postal but it is the result of a joint effort of different partner companies, including EPFL (University and Research Unit for the Mobility Lab) for the research, Bestmile (start-up company and software provider) for the software, and Navya (manufacturer) for the hardware.

To conclude, Ms Müggler stressed that there are different **market segments** where Smart Shuttle could be used: B2B (private companies, airports, campuses, new shopping centres owners of big private grounds) and B2C (public transport to connect peripheral regions, auto-free tourism stations). Yet a lot is still to be done to move from the – so far successful – testing phase to implementation.



What role for digitalization in order to achieve an intermodal level playing field?

Gautier Brodeo, UITP, Group RATP

In his presentation Mr Brodeo gave an overview of automation in urban public transport and illustrated some of the current challenges.

Achievements

Mr Brodeo outlined the achievements in train automation by first giving an overview of the different steps in automation and then outlining the history of automation of the Paris metro network. The process builds on a history of innovation that started already in the 1950s. 1998 the first fully automated large capacity metro became operational. Overcoming many technical and operational barriers in the following years a large number of lines have become fully automated today. One of the features of the modern system is a new generation of system architecture in which four separate contracts with system providers are concluded instead of relying on just one. This improves the independence and can bring down costs.

Advantages

Mr Brodeo listed the achievements that automation of Metro systems has brought:

- Better safety: So far there have been zero accidents with automated metros
- Better functional performance: automated trains offer for instance increased capacity and better adaptability to changes in demand
- Better environmental performance: features like intelligent brake systems optimize the energy use

Evolution

Presenting the ever growing numbers of automated metro systems around the world Mr Brodeo predicted there would be 2328 Km of automated network in the near future. In fact of all newly opened metro lines around 50 percent are automated.

Finally Mr Brodeo presented a challenge automated metro systems are currently facing: Firstly he noted the central importance of the communication based train control system (CBTC) the current market standard for signalling systems. CBTC needs strong radio frequencies that are receivable in tunnels as well as in open air, they need to be resilient and robust to perturbations, and they need a dedicated bandwidth. In several countries CBTC is used with radio communication

channels assigned to them. The frequency ranges are given to the operators on a limited duration licensing scheme. Currently there is however a competition emerging from the ITS Sector. Telematics and connected cars also depend on a strong communication between cars and between cars and infrastructure. UITP perceives that the industry behind ITS invests a lot in lobbying for the same CBTC frequencies and these efforts can't be matched by the public transport sector – even though it is the far more relevant sector when looking at the number of people transported. In UITP's view automated metros are essential to meet the needs of future mobility scenarios. Therefor UITP published a common working paper addressing the issue of conflicting bandwidth allocation.

The role of online platforms to achieve an intermodal level playing field

Juan Montero, Associate Professor – UNED Madrid

The presentation of Prof Montero focused on the role of online platforms in the provision of transport services, as they are a fast growing impact on the transport sector as a whole.

Defining the context, Prof Montero stressed that online platforms such as Uber (urban transport) or Blablacar (intercity transport) are expanding at a steady pace and are disrupting the traditional transport industry. The very concept of "online platform" is under debate, and DG CNECT (Communication Networks, Content & Technology) has conducted a public consultation on the regulatory environment for platforms, online intermediaries, data and cloud computing and the collaborative economy. The Commission defines online platforms as "an undertaking operating in two (or multi)-sided markets, which uses the Internet to enable interactions between two or more distinct but interdependent groups of users so as to generate value for at least one of the groups." Examples of transport services that fall under this definition are Uber, Blablacar whereas examples from other sectors include, AirBnB, eBay, but also Google, Facebook and Tripadvisor.

From the legal point of view, Prof Montero presented the open debate on the online platforms that are operating in the transport sector: the debate is based on the classification of the service as the legal regime applicable will be determined by whether online platforms are providing transport services (thanks to digital means – so they are subject to transport regulation) or digital services (with transport-related products – therefore they are regulated under the directive on electronic commerce).

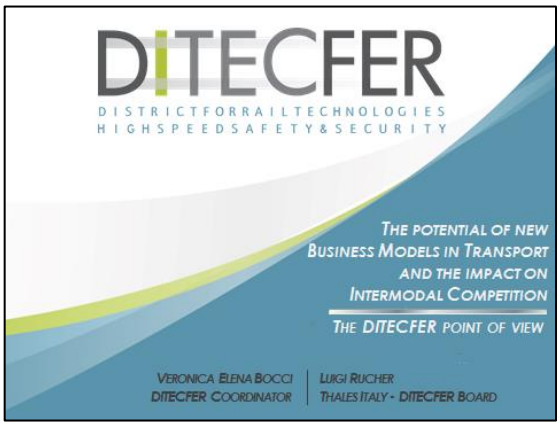
- In the first case, Member States could impose restrictions on online platforms (= transport providers) established in other Member States (ie Uber is established in the Netherlands and Blablacar in France. They provide services from their country of establishment to other countries, the so-called "recipient countries"). Courts and Administrations from the recipient Member State (as it was the case of Uber in Spain, Portugal, and Italy) might ban the provision of services on the basis of sector specific legislation.
- If the service provided through an online platform is considered an information society service, the freedom to provide services would apply as stated by the art. 56 TFEU, the Service Directive and the E-Commerce Directive. The E-Commerce Directive defines a very

strict regime for the protection of information society services' provision, and it includes a closed and very limited list of reasons for restrictions (such as national security, national health impact) that can be imposed by recipient Member States. Therefore the possibility for a recipient Member State to regulate (and eventually block) the service is extremely limited.

Prof Montero then presented the innovative characteristics of online platforms. The most important one is that online platforms reduce transaction costs, and this is particularly relevant for intermodal transport, yet there are many more:

- Non-professional providers can get into the market and start providing a service in the way of "collaborative economy".
- Efficiency is increased as under-used assets are exploited with more intensity.
- Congestion is reduced as well as the use and the ownership of vehicles.
- Reduction of passengers in collective traditional transport (buses, trains, taxis) especially on medium-distance service on specific routes and dates.
- Impact on public service obligations, as new entities do not have any such obligation.
- New services offered through the online platforms could be combined to traditional services (for instance to cut down the costs for passengers connecting to the airports/stations) or, more in general, to reach hubs.

To conclude, Prof Montero reflected upon the possible evolution of the role of online platforms and left some open questions on how things could develop in the future. One can foresee that online platforms will eventually favor the increase of collective transport: it will become more attractive as it will be easier and – in the long term – users will own fewer private cars. Furthermore, multimodal trips will be enhanced by the lower transaction costs yet it is not clear whether and how the multimodal trip could be contracted between the service(s) provider(s) and the customer. Who will play the role of interface for the entire multimodal trip (whether it will be the online platform or one of the traditional service providers) is not clear yet.



The potential of new business models in transport and the impact on intermodal competition

Veronica Elena Bocci, Coordinator DITECFER and Luigi Rucher, Technical Director – Thales Italy

For the first time at the Florence Transport Forums, the Tuscan District for Rail Technologies (DITECFER - a cluster of more than 100 enterprises, 3 universities, the National Research Council, and Laboratories specialized in the railway sector) was present as speaker and provided the DITECFER point of view on the impact of new technologies on intermodal competition.

To begin with, Ms Bocci illustrated the current intermodal transport system highlighting its main weaknesses. Multiple single-modal networks exist and they have some contact points. However, there is a **lack of integration between the transport services** they offer, and this is undermining the performance of intermodal transport in several aspects: schedules are scarcely coordinated, short distance services are poor, tariffs are not integrated, there are no joint marketing initiatives and information is incomplete. Another barrier that is currently preventing intermodality is the **inadequate level of the intermodal transfer point**, which mainly has to do with unclear (or lack of) information to passengers, inadequate architectonical and functional design of the terminals (passengers and freight), inadequate governance structure of the transfer point, bureaucracy and inefficiency at the transfer point itself.

Ms Bocci then identified three main **challenges of the current intermodal transport business**:

- Business challenges: each company has to be self-sustainable and bases its offer on a value proposition related to the benefits delivered to the customer;
- Societal challenges: there is an increasing need to remove physical barriers especially for the European ageing population, to offer new intermodal services, and to provide sustainable and green transport;
- Institutional challenges: different support policies exist between countries and between transport modes.

All these aspects together become the hardest challenge identified by Ms Bocci: the **end-user (passengers, users of infrastructures, public administrations, enterprises…) have different and ever higher expectations**. These expectations have actually to be the main drivers for

defining the companies' new long-lasting business models.

Taking advantage of emerging digitalization, big data, open data, web, cloud and internet of things, **intermodality** and **new technologies** are the two key aspects for the creation of new successful business models. Their combination can offer the necessary added-value-services answering the abovementioned societal challenges as well as enabling new business opportunities. Concretely, Mr Rucher mentioned some of the new services based on technology that can be used to achieve better intermodality:

- Integrated e-ticketing and ticketing as a service. This would favor seamless intermodal trips, substitution of physical tickets with title accounting and better knowledge of the passengers;
- Customized & real-time passenger information available for the customers using the infrastructure. Infrastructure is not self-sustainable so new added value services have to be created in order to optimize the use (and building and maintenance) of infrastructures;
- New services, analytics and business opportunities for operators, end users and community based on big data.

In conclusion, it was then stressed that the use of single infrastructure will never produce the same level of service of a fully operational intermodal network. Therefore, the solutions provided by new services can and should even allow cooperation and synergies among different transport infrastructures and operators to create added-value opportunities for all. How to implement this principle? A new suggestion is the promotion of a "TEN-S" (Trans-European Service Network) policy based on the experience of the TEN-T (Trans-European Transport Network). This would drive an intermodal and trans-European era of transport e-services with high efficiency levels for end-users and real business value for providers.

What role for digitalization in order to achieve an intermodal level playing field?

Steffen Schäfer, Senior Principal Mobility IT Solutions, Siemens

Mr Schäfer focussed his presentation on two central questions: 'What is the potential of new Business Models in transport?' and 'How will they affect intermodal competition?'

Starting his presentation Mr Schäfer pointed out that the concept of multimodal transport platforms was actually normality: it is essentially the same business that classical travel agencies follow. Siemens has developed a platform that allows traveller to book a taxi, book public transport, and parking. The revenue is shared among all the participating partners.

The concept of Mobility as a Service that was presented in Florence in the previous year really points to a new business model in transport. The essence of this business model is a mobility package for different user types with a fixed price. It has to work across several regions or ideally internationally in order to be attractive. Instead of dealing with a variety of transport operators the customer would make all his mobility transactions through one mobility provider that he chooses and that he trusts. This can be considered the vision of Siemens in their approach and there has been a lot of progress towards it.

The platform that has been build is today live and in operation. It includes 15 different service providers (several car and bike sharing providers, garage operators, taxis and public transport operators). The platform offers real-time travel information, allows booking and payment and offers a live map that displays all available mobility options. The application has been consequently developed from a pure research project to its entry into productive use.

Siemens also has a business internal application for corporate travel: by promoting easy access to public transport for business travellers it saves cost. From this a new market could actually emerge. Given the high price difference between public transport and taxis many business travellers would actually be willing to pay more than the regular price for a public transport ticket if the access was made easier: easier access to the ticket and easier availability of travel information. A corresponding offer to this business need could be a growth opportunity for public transport operators.

In his final note Mr Schäfer stressed the growing importance of demand responsive transport as a new business model. It has existed for a while but with the proliferation of smart phones it can now effectively be put into practice. It is possible today to bundle submitted transport requests and optimize routes. Only 5 to 10 years ago not computers but call centre operators were handling such requests. When the potentials of demand responsive transport are effectively applied public transport can actually improve its business using the same technics like Uber.

FSR-Transport: Events 2016

Presentations and summaries from past events are available on the FSR website: **www.florence-school.eu**

Date	Title
29 February 2016	4th Florence Intermodal Forum
9 March 2016	Executive Seminar on Air Traffic Management
2 May 2016	12th Florence Rail Forum
24 June 2016	5th Annual Conference on the Regulation of Infrastructures
23 September 2016	6th Florence Urban Forum
21 October 2016	8th Florence Air Forum
25 November 2016	13th Florence Rail Forum

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