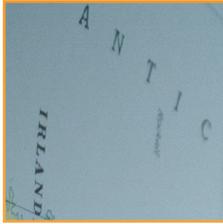




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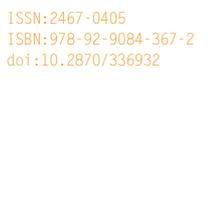


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## What role for digitalization in order to achieve an intermodal level playing field?

Editors: Matthias Finger, Nadia Bert, David Kupfer

### Highlights

*Digitalisation is transforming all aspects of society and the economy - including transport. A series of innovations are fundamentally changing the operation and distribution of transport services.*

*On the occasion of the 4th Florence Intermodal Forum, stakeholders from industry, regulators and new businesses discussed the intermodal dimension of this transformation: as digitalisation is changing some transport modes faster and more profoundly than others, the Forum discussed the role of digitalisation in order to achieve an intermodal level playing field.*

*Among other things, it emerged that a new vision of mobility has to be formulated: self-driving vehicles will soon be a reality as will be the prevalence of the “platform economy” or “servicisation” of transport. The availability of these new means can change transport patterns (and the modal share) in various directions. As yet, it is unclear how. It needs to be ensured that innovations can develop in a beneficial way in all the transport modes and that undesired effects are identified and prevented early on.*

# In the era of digitalization and in order to achieve an intermodal level playing field, do we need to regulate?

A comment by MATTHIAS FINGER | FSR-Transport Director

There is currently clearly no level playing field in the competition between the different transport modes: railways complain that the road sector – the private cars and the trucks – does not pay for all their costs, whereas the road sector complains that rail is subsidized. Both complain that air transport is too cheap, and air transport, in turn, complains that it has to comply with costly security regulations which do not apply to rail and road

But even between operators in the same transport mode there is no level playing field:

truck owners and drivers in Western Europe are complaining about dumping prices from Eastern and from outside Europe. Rail operators are complaining about distorting subsidies in the different countries. Not to mention research and development subsidies which are distributed selectively.

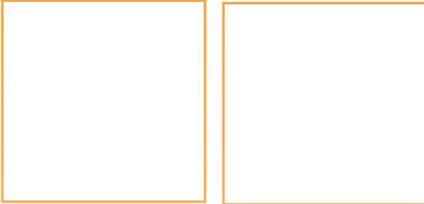
Therefore, even without and before considering the digital dimension, there is a clear need for an intermodal level playing field. And this in particular in two areas: on the one hand, in terms of interoperability and interoperability regulation inside the different transport modes, something which is significantly impeding the creation of European modal transport markets; on the other hand, in terms of consistency of financing of the different transport modes.

The above two issues a level playing field among the different transport modes would probably have continued for many more years. However, the disruptive effects of the Information and Communication Technologies (ICTs) now give rise to a new intermodal reality. Indeed, thanks to the ICTs, mobility now transforms into a service. In other words, the mobility needs of the users can ever more easily be satisfied by the combination of cross-modal services offered by different providers and even by new market entrants. Also, and because of the ICTs, customers are now changing the way they deal with their own mobility needs, from travel planning to payments. This so-called “digitalization of transport” gives rise to “mobility platforms”, i.e., companies that collect the various data of the different transport operators across the different modes, analyze and package them and sell as more or less integrated and comprehensive mobility services at local, regional, national or even European levels.

But, rather than creating a level playing field, these integrated mobility platforms – such as MaaS.fi or smile-einfachmobil.at, just to mention a few – are exacerbating the distortions among the different transport modes, or, at



the least, they are bringing the existing distortions into the open. Thus the question: is there a need for regulation? And if there is a need, what exactly needs to be regulated? The traditional transport modes? Intermodality itself? Or digitalization as related to mobility? The 4th Florence Intermodal Forum tried to bring some clarity to these questions.



From our discussions, it emerged clearly that the main contribution to creating an intermodal level playing field will indeed result from the intelligent regulation of the digital dimension. The following aspects need to be seriously considered, since, without them, the benefits of digitalization for a more efficient and more customer-friendly European wide (intermodal) mobility may well never see the light of the day. However, it is not clear yet, whether the regulatory initiative should always come from the EU.



1. First and foremost, **data need to be harmonized**: the different owners and infrastructure operators (railways, roads, ports, airports, waterways) all have data, yet in different formats which make them useless for mobility platform operators and consumers. Many of these data need to be made available in formats that allows others to analyze and use them.



2. This type of (data harmonization-) regulation comes indeed before the whole issue of data **accessibility** and **openness of data** (but of course data harmonization and data accessibility are not unrelated). Such is the second big regulatory issue, which however is of different nature, as this pertains to data ownership and firm strategy. This will be a big challenge for the European Commission as the different (even public) owners and operators will strongly object to giving access to real-time data. Such regulation will therefore have to be proportionate to the benefits and it will only make sense if it can actually be enforced. If not, it will distort the mobility market even further.



3. The regulation of **privacy** and **data security** remains an ongoing issue and is not specific to the transport and to the different transport modes, as it concerns the entire digital economy, including banking, health care, electricity, etc. Once general principles of data protection and privacy are agreed upon at the EU level, their application to the transport sector should not cause controversy.



4. There remains the question as to whether emerging integrated **mobility platforms** need to be regulated, and if yes how? Two regulatory issues will become particularly acute, namely first the issue of **competition** among these mobility platform operators, along with corresponding market distortion resulting from privileged access to or exclusive contracts with transport operators. The second issue will be **consumer protection and liability**, as the European Commission will have to clarify who exactly is responsible for the service and for the transaction: is the liability with the platform operator or the transport service provider?



# Innovation and digitalisation in transport

FRANCESCO DIONORI, United Nations Economic Commission for Europe

Attention is often focused on how to improve modal split and encourage the use of more sustainable modes of transport through the use of appropriate policies and regulations but rarely this is done through the use of technology and innovation.

Innovation is the key to ensure transport meets the needs of a changing marketplace but also to changing customer requirements. However, according to the BCG Global Innovators Survey of 2014, only the automotive sector of the inland transport community features within the Top 50 most innovative companies, taking 10 of the 50 slots available<sup>1</sup>. Furthermore there seems to be a tendency for transport innovation projects to fail more than other innovations. At the recent Workshop “Intermodality leads to Sustainability” at the Working Party on Intermodal Transport and Logistics (WP.24) at the United Nations Economic Commission for Europe (UNECE), innovation was a key topic of discussion. In particular, the level of success in transport innovation was discussed with a large number of (non-automotive related) projects failing even though the concepts had significant potential (including, for example, the first prototype of the foldable container). Also, the well known principle of the “First mover advantage” in transport often became the “First mover disadvantage” with those companies or transport authorities seeking to implement an innovation often coming up against the extremely risk averse nature of the local regulators who ask for more stringent safety and regulatory requirements than are, in some cases, necessary.

The main areas that are identified as leading to a failure in transport innovation are not strictly related to the availability of funds or financial contributions to innovation, but are more closely related to the alignment of incentives both within companies and between companies in the transport chain. For example: a mismatch between supply and demand; actors within the sector having a lower propensity to pursue innovative solutions (often because of the size of individual businesses who struggle to see how the benefits of innovation outweigh the initial costs) and internal management policies not always favouring resource investment in innovation. Furthermore, if an innovation is pushed through financial incentives, it won't “take off” if this innovation is not considered to be competitive in fine (that is after the financial incentives have been phased out). All these failures are perpetuated when there is no reliable data at the core of the project from which to build success.

1. [www.bcgperspectives.com/content/articles/innovation\\_growth\\_digital\\_economy\\_innovation\\_in\\_2014/](http://www.bcgperspectives.com/content/articles/innovation_growth_digital_economy_innovation_in_2014/)

Positive results can be achieved in this area with better coordination of activities in innovation. For example, the likelihood of success increases when a terminal operator's incentives are aligned with infrastructure needs in all phases of the project (initiation, development and implementation)<sup>2</sup>. The solutions that are developed need to have the buy-in of all the key players seeking to ensure active collaboration between all parties.

Innovation is being driven by digitalisation and significant work has been done across transport modes on this with the automotive industry leading the way. There is concern, however, about the consequences of unchecked digitalisation in terms of cyber security, data protection and the use of big data and it is the industry itself that has asked UNECE to step in and provide framework regulations for the sector. The informal character of “digitalization” may create difficulties as this digitalization is often not institutionalized. Its informal character implies a heterogeneous approach to development (e.g. smartphone apps), while institutions would need to deliver a stable and sustainable transport system including digitalization and their corresponding innovations. The challenge of policy makers is to integrate digitalization in the transport system with the aim of ensuring that the benefits of these new technologies can be captured without compromising safety, privacy, security and interoperability (which are, in part, “pre-digitalization” achievements of the transport system).

Discussions in this area will also need to balance the needs of the producers of the data (usually the end consumer using a smartphone or driving a car) with the desires of the information community to make the most of the data available. For example a recent study undertaken by the FIA showed that while 76% of people are interested in the connectivity of their car, 90% said that it was their data and 91% said that they wanted the ability to turn off the data stream when they wanted<sup>3</sup>.

Innovation and digitalisation are therefore fundamental to ensuring a sustainable future for transport. The transport industry needs to ensure that it is efficiently pushing those innovations with the highest success rate whilst ensuring that these innovations and efforts towards digitalisation are of the highest benefit to the freight and passenger transport users.

2. Presentation by Christa Sys of the University of Antwerp at the UNECE session of WP.24: [www.unece.org/fileadmin/DAM/trans/doc/2015/wp24/ECE-TRANS-WP24-2015-Pres04.pptx](http://www.unece.org/fileadmin/DAM/trans/doc/2015/wp24/ECE-TRANS-WP24-2015-Pres04.pptx)

3. [www.mycarmydata.eu/](http://www.mycarmydata.eu/)

## 4th Florence Intermodal Forum Summary of discussions

Discussions at the 4th Florence Intermodal Forum looked at several aspects of digitalisation in the different transport modes and discussed them in the context of the goal of an intermodal level playing field. In particular, the focus was on ground transportation.

The Forum addressed four discussion questions:

- How does digitalization affect transport and the competition between transport modes
- Automation is transforming the different transport modes at a different pace: how does this affect the level playing field?
- What is the potential of new Business Models in transport: how will they affect intermodal competition?
- Supporting innovation effectively without distorting competition: which role for regulation? which role for the EU?

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

The first discussion round looked at the general situation of digitalization of the transport sector as well as at some concrete examples of the effect of digitalization on the various transport modes, and put these cases in the context of intermodal competition.

The effect of digitalisation on the railway sector has many facets, which have also been discussed at previous Florence Forums. Digitalization is, however, changing the entire transport system and three aspects of this change can be distinguished:

- Generally speaking, a “digital layer” is added to the otherwise constant physical chain of production and distribution. This digital replication of physical activity is used to improve the overall efficiency.

- The different pace of digitalisation in the different transport modes has an impact on the competitive position of each mode of transport vis-à-vis the other modes.
- At the same time, user habits change with the availability of digital tools.

As the overall characteristics of the transport system are called into question by rapidly evolving technology it becomes necessary to develop an overall vision of the desired future mobility system in order to be able to steer technological development in this direction.

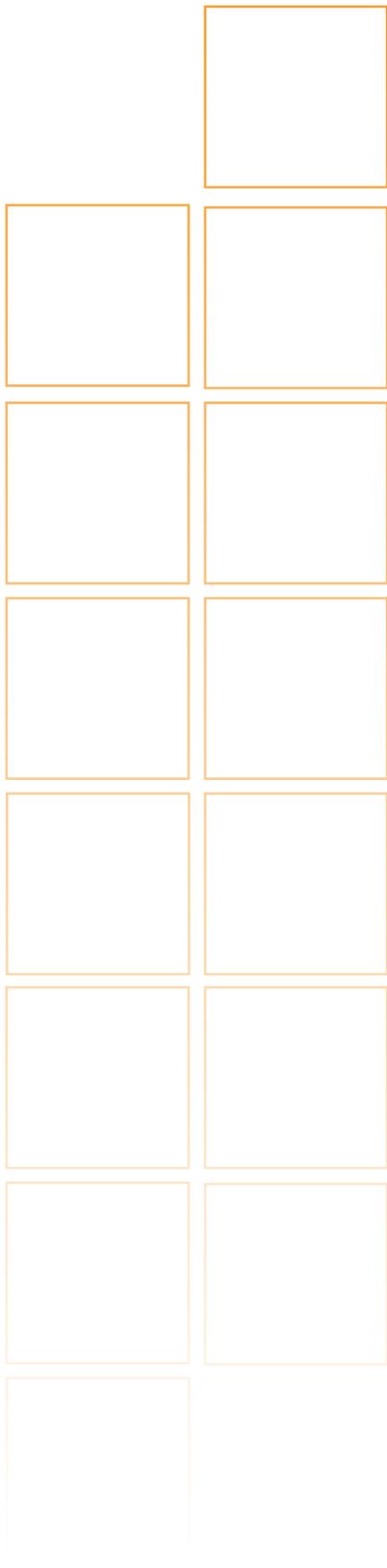
Without a framework, some initiatives might have some unforeseen effects in the long term. If, for instance, all mobility needs of a city are largely covered by a large number of self-driving taxis, ordered and paid for by smartphone apps, this would completely change the role of public transport. An example of an undesired effect was made: with existing regulation, automated trucks have the potential to make road transport even more cost-efficient than rail transport, exacerbating the negative environmental impact of road freight transport.

Tackling the issue in a wider perspective, it was stressed that common standards are hard to attain on the global level. UNECE is currently fighting for the digitalization of customs procedures: this would allow shippers to clear customs before arriving at a border and massively reduce waiting time.

Besides long-term visions, the first panel also looked at some concrete initiatives that are already in place.

Currently digitalisation can help to improve public transport: some of the most interesting examples referred to the possibilities of improving the user experience with the use of smartphone apps to collect instant customer feedback. These new means of service evaluation do not, however, always meet the unconditional support of the public transport operators.

Gamification may become a more widely known concept in transport policy: an app was presented that collects data about urban cycling



by challenging commuting cyclists to compete with each other over mileage travelled by bike. This has proven to be a success in many aspects. Among other things, the collected data may improve cycling infrastructure in the future. It can be quite surprising for urban planners to compare a map illustrating the actual paths cyclists take with those foreseen during the planning of urban cycling lanes.

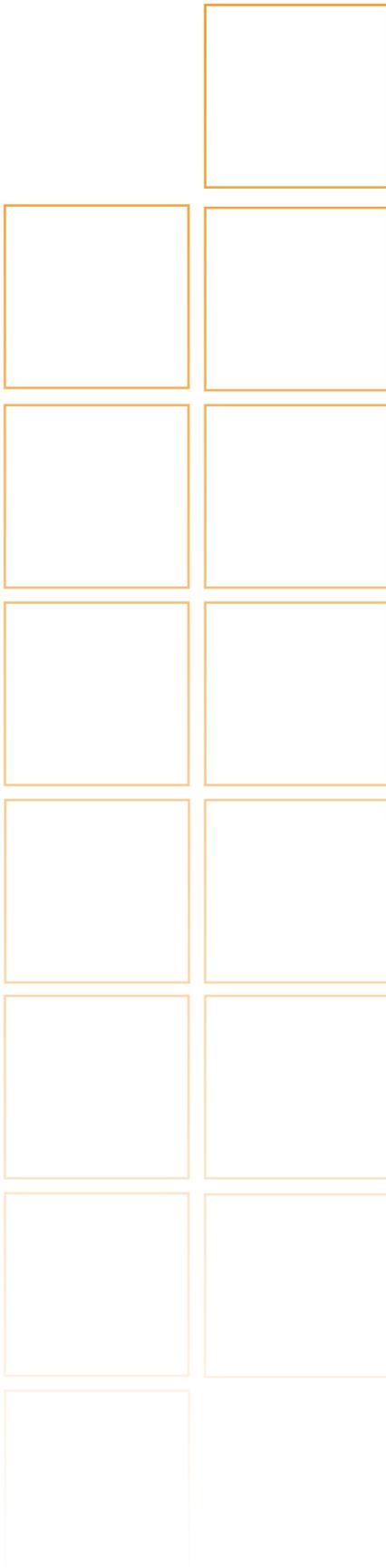
Looking at a concrete example of intermodal transport, namely combined rail freight, there are hopes that digital tools can help the sector to catch up with the competitive advantages of road transport. For instance, digital consignment notes could make the operations more efficient. Especially intermodal terminals can improve their efficiency with the help of digital tools. The crucial element is, however, access to data and interoperable data standards. Combined Transport (CT) operators lack access to data to improve their operations. While Railway operators and Infrastructure Managers exchange data with each other, the CT operators have no means of, for instance, receiving prior information about train delays and plan accordingly.

Trains in Japan have an outstanding reputation for their quality of service and punctuality; however, even there concern is growing that there is currently a lack of digital applications to improve the travellers' experience. So far this has not undermined the competitive advantage of high speed rail over other forms of long distance travel but the trains are lagging behind when it comes to digital tickets, wifi on board, and customized marketing.

***Automation is transforming the different transport modes at a different pace: how does this affect the level playing field?***

The discussion generally considered automation as a subset of digitalisation and sometimes addressed both issues at the same time. Looking at the state of play of automation in road and in rail transport some interesting points emerged.

Automation in road transportation is advancing more rapidly than in railways and is gaining far more public attention. This is well known but also puzzling as the controlled environment of rail would make automatization far less challenging for this transport mode. The discussion showed, however, that automation is actually on the rise also in rail transport - as long as one focuses on metro lines. Numbers presented showed that there is a strong trend especially where new metro infrastructure is built, to choose automated systems.



But automation is also increasing in other areas of railways (outside the driver's cabin), most importantly in the area of train control.

In Switzerland self-driving busses are actually already in operation. In spite of their small size and low speeds these "Büssli" still have the potential to frighten some citizens; public acceptance of self-driving vehicles is more of an issue for road transportation than it is for railways. Driverless metro lines are well accepted where they are in place.

As automation is progressing in both private and public transport on the road and on rail the next big conflict is emerging quite clearly: both automated train operations and intelligent transport solutions for road transport depend on the allocation of powerful radio frequencies; these are now turning into a precious commodity. From the public transport side an imbalance was pointed out: despite benefitting far fewer travellers, ITS has far more effective lobbying for frequencies than public transport operators due to their stronger financial situation.

***What is the potential of new business models in transport and how will they affect intermodal competition?***

Besides the more "physical" aspect of driverless vehicle operation, digitalisation gives rise to various new business models. On the one hand, new players on the transport market shake up the industry; on the other hand, established transport operators are looking at new business models to make use of digitalisation.

Since the vision of "Mobility as a Service" was presented at the previous Florence Intermodal Forum, several business models that were already taking this direction have made significant advances. In Berlin an application combines 15 different operators from taxis to bike sharers and lets the user book and pay the transport services through the app. Ideally such mobility platforms will work cross regionally and internationally in the future. It was pointed out that new business opportunities are not open just for new entrants: in fact, business travellers would be willing to use public transport more often and even pay an above average fare if they had easy access to travel times and tickets. There were controversial views as to whether additional services and price differentiation could be a real possibility for public transport operators.

In spite of the potentials, some possible negative side effects of digitalisation and automation were identified. Namely "rebound effects" that could occur were frequently discussed: driverless cars can actually lead to more vehicles on the road intensifying the negative side

effects of road traffic. New business models like Uber and other ride sharing apps might deprive the public transport system of its passengers forcing an adjustment of capacity and fare prices.

### ***Supporting innovation without distorting competition: which role for regulation? which role for the EU?***

The final panel discussed opportunities and challenges as well as the role of regulation for innovation. According to the arguments raised, there could be two main purposes for regulation in the field of digital innovation in transport: firstly, to ensure that innovation actually unfolds (by funding research and creating the legal requirements for their practical application), and, secondly, to counter any negative side effects.

On the one hand, too early regulation can be harmful for further innovation. On the other hand, if standards come too late, interoperability cannot be ensured and technological fragmentation would prevent further efficiency gains. A prominent example for this problem is the electronic collection of road fares: there are various technological solutions for road charges collection in place, but no common European system exists even though most freight transport operations are cross-borders. In this case letting national forerunners develop their own systems has led to a fragmented European system that is delivering far fewer benefits than it could if it was harmonized.

It was pointed out that similar problems are also emerging for new technologies: for instance, there is already a different standard for connected cars in the US and in the EU.

The regulatory answer to the challenge of possibly increasing road traffic is not really a new one: the principle of internalisation of external cost (or, more concretely, polluter pays and user pays

principle) needs to be enforced. Digitalisation should increase the possibilities of applying this principle.

In private cars the innovation is already quite advanced but to reap the full benefits an effort by regulators is needed: allowing some degree of automation is easily feasible from a regulatory point of view. However, even if not automated, cars will ideally be able to communicate with other cars and their environment in the future. In order for this vision of connected cars to become a reality a higher degree of standardization ideally on a global level is needed.

The case for deregulation was also raised. Some basic steps require first of all the removal of at least some rules. Most fundamentally perhaps, in order for driverless cars to become a reality the rule that cars need to have a driver, as established by the Vienna Convention, would need to be lifted.

On several occasions parallels and comparisons to other sectors were drawn. For instance, in Spain AirBnB is cooperating with regulators to develop a system to correctly tax those users that use the platform to run a professional commercial operation. New economic actors and those that develop innovative products and services are not against regulation. But it is important for regulators to acknowledge the different environment they're dealing with in the digital world.

## Further readings

[Florence School of Regulation Transport Area, 2016, 4th Florence Intermodal Forum Summary of presentations](#)

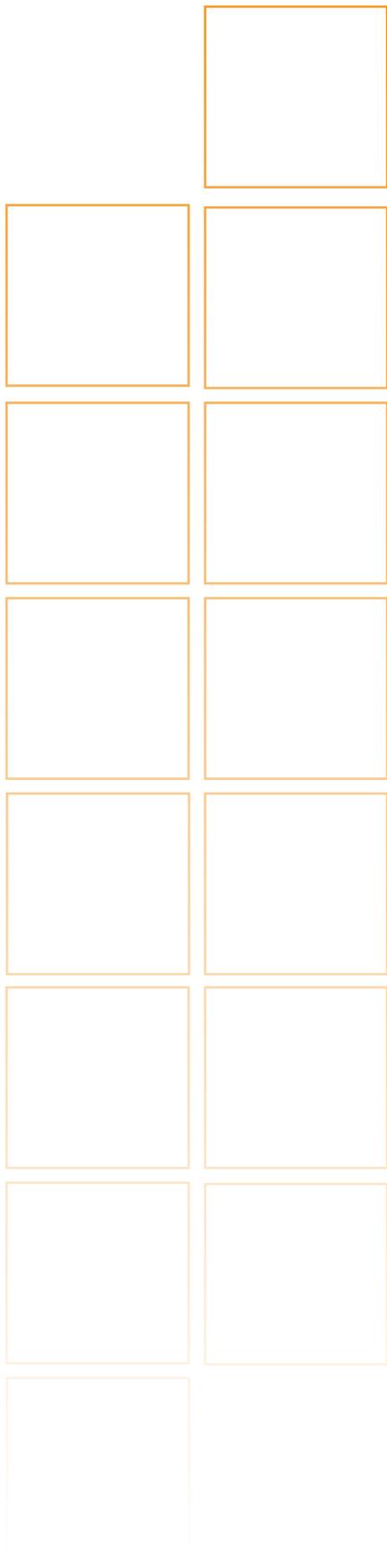
This document offers summaries of the presentations given by the participants of the 4th Florence Intermodal Forum “What role for digitalization in order to achieve an intermodal level playing field?”

The workshop built on the discussion we had at the 11th Florence Rail Forum (Digital Single European Railway Area), widening the scope in an intermodal perspective. The following questions have guided the representatives of the European institutions, local authorities, operators, manufacturers, regulators present at the Forum:

- How does digitalization affect transport and the competition between transport modes?
- Automation is transforming the different transport modes at a different pace: how does this affect the level playing field?
- What is the potential of new Business Models in transport? How will they affect intermodal competition?
- Effectively support innovation without distorting competition: which role for regulation? which role for the EU?

[Florence School of Regulation Transport Area, 2015, “Digital single European railway area: how do we get there?”, European Transport Regulation Observer, n. 2015/04](#)

This issue of the European Transport Regulation Observer reflects upon the issues discussed at the 11th Florence Rail Forum dedicated to the Digital Single European Railway Area. In this document, thoughts expressed by regulators, operators, associations and academics are analysed and reported as to define the current state of play and challenges of the digitalization of railways. What emerges is that the digital transformation offers more opportunities than challenges for the sector and alters the role of regulation. Both companies and regulators urgently need rules for the treatment of data and for the functioning of an ever more “digital” transport sector. However, where regulation cannot keep pace with innovation, it risks being an obstacle for it.



Florence School of Regulation Transport Area, 2015, “Mobility-as-a-service: from the Helsinki experiment to a European model?”, European Transport Regulation Observer, n. 2015/01

The 3rd Florence Intermodal Forum brought together decision makers and stakeholders from the European Commission, national authorities, and operators to discuss the new mobility paradigm of Mobility-as-a-Service. It did so by discussing the concept, and what it could develop into in the context of congestion problems and changing mobility patterns. Existing obstacles to intermodality as well as past experiences with intermodal offers by operators have been discussed. Given the new trends and possibilities of a more connected society it appears that regulation has to pave the way for these trends to translate into a smarter mobility system.

Pillath, Susanne, 2016, “Automated vehicles in the EU”, Briefing of the European Parliamentary Research Service

Automation, and in particular digitalisation, of driving will change road transport in a way which is viewed as a revolution in the field of mobility: first and foremost, driving which is automatically controlled by a computer is expected to make future road transport safer and more secure; furthermore, it has the potential to be more environmentally friendly, efficient and accessible.

Worldwide, automobile manufacturers and technology firms are working on driving system innovation. Agreement by all stakeholders on the desired deployment of the new technologies will provide developers with the certainty they need for investments. For an effective communication between the technological and political spheres, categorisation and terminology are being developed which define different levels of vehicle automation.

The technical requirements as well as international traffic rules are agreed at United Nations level and are currently in the process of being assessed with a view to the increasing automation of vehicles. The European Union and its Member States participate in international working groups which are revising the regulations as prerequisites for the deployment of automated vehicles. Furthermore the European Union is funding research on automated road transport as a priority in the Horizon 2020 Transport Research programme. Some key elements of the discussions on political and technical aspects are the questions of how data protection and cyber security can be secured and liability issues can be solved.

acatech (Ed.), 2015, “New autoMobility. The Future World of Automated Road Traffic”, acatech POSITION PAPER

Owing to developments in the field of assistance systems and automated driving, vehicles are taking over more and more elements of the driving tasks hitherto incumbent on the driver. Thus, automation and connectivity are under way of revolutionising the road transport system. In the present position paper, the project group “New autoMobility”, a joint initiative by the German Federal Ministry of Transport and Digital Infrastructure and acatech, develops a target scenario of a world of automated road traffic in a future beyond 2030. It provides a set of usage scenarios addressing the challenges of our present mobility system. On the basis of these scenarios, the project group worked out specific policy recommendations for implementation in politics and society. They describe what steps must be taken to set the course towards automated road traffic and how best to take advantage of its ecological, economic and social benefits to promote public welfare.

[European Parliament, 2016, Research for the TRAN Committee – The World is changing. Transport, too.](#)

The (more and more urban) European population is growing and ageing. Mobile information and communication technologies are developing rapidly. Global competition and the fight against climate change are pressing. These developments all have an impact on transport as a whole. As this paper shows, mobility needs and patterns evolve; new transport services/systems emerge; transportation technologies aim to become more ‘environmentally-efficient’. This transformation challenges the existing transport sector’s structure and governance and calls for major changes in the regulatory framework.

Part III of this report provides an in-depth analysis of the role of regulation in preparing transport for the future. It notably underlines the regulatory implications of the current challenges affecting different transport modes and the mobility system as a whole.



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## FSR-Transport

The Florence School of Regulation (FSR) is a project within the European University Institute (EUI) focusing on regulatory topics. It works closely with the European Commission, and is a growing point of reference for regulatory theory and practice. It covers four areas: Communications and Media, Energy (Electricity and Gas), Transport and Water.

The FSR-Transport Area's main activities are the Florence Transport Forums, which address policy and regulatory topics in different transport sectors (Rail, Air, Urban, Maritime, Intermodal transport and Postal and delivery services). They bring relevant stakeholders together to analyse and reflect upon the latest developments and important regulatory issues in the European transport sector. These Forums inspire the comments gathered in this European Transport Regulation Observer.

Complete information on our activities can be found online at: [fsr.eui.eu](http://fsr.eui.eu)