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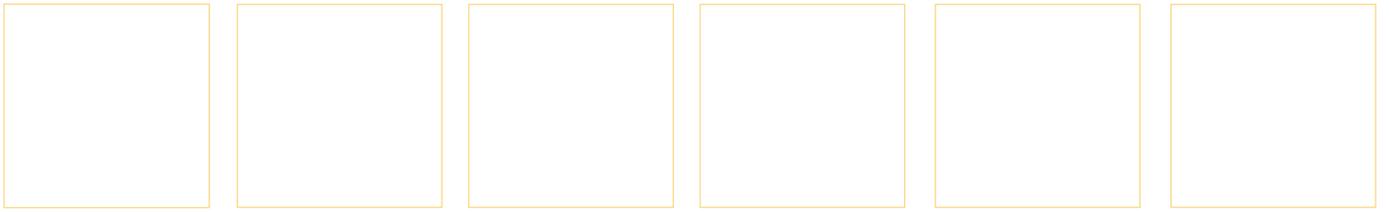
Which Role for Railway Undertakings in the Mobility of the Future

*Matthias Finger, Nadia Bert, Kathryn Bouchard,
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Highlights

Thanks to digitalisation railways are becoming just one element of a complex mobility system that is increasingly integrated, connected, efficient and user-friendly, providing customers with seamless end-to-end journeys and combining all modes of transport available. While the Mobility as a Service paradigm seems to be driving the future of transportation, railway undertakings – as mass transportation providers – have a lot to win (or to lose) in this shift from transport device ownership to mobility access and usership. Data is key to this development, which comes with risks, among which (cyber) security and the integrity of personal data of individual passengers. Clear rules on how to handle various types of data are needed to fully make use of the vast potential data analysis can offer.

The 14th Florence Rail Forum brought together a group of relevant stakeholders, decision makers and academics to discuss this topic from a European perspective.



This *European Transport Regulation Observer* reflects upon the discussions at the 14th Florence Rail Forum

‘Which Role for Railway Undertakings in the Mobility of the Future’ that took place in Florence on 22 May, 2017

Railways in the Age of Digitalisation?

A Comment by Matthias Finger

In this Forum, we had a systematic and bold look at what digitalisation does to railways. Of course, digitalisation does not affect railways specifically. Rather, digitalisation is a pervasive technology that affects all industries, and it is precisely as such that we have to discuss it in the case of railways. We built on the experience of previous Florence discussion yet we focused, for the first time in Florence, on the role of Railway Undertakings (RUs). The Forum showed that there is still much confusion as to what digitalisation and what it does concretely. The purpose of this paper therefore primarily is to clarify our thinking in this matter. In that respect, a clear distinction must be made between (1) what digitalisation does to railways in particular and to mobility more generally and (2) the specific new reality created by digitalisation for RUs (and all other transport operators).

Digitalisation: From Railways to Mobility Chains

As to the first point, it is obvious that digitalisation places railways within a broader mobility chain. Indeed, for the users (passengers) railways becomes one of several transportation modes which can be combined to provide a seamless and fully integrated transportation experience / solution. In their search for a way to go from A to B, customers use a digital interface where mobility is treated as a service provided through different modes. To be clear, this is not unique to passengers and the exact same thing happens for goods /freight/cargo, even though, at this Forum, we did not much talk about it. And this very new reality has profound consequences for railway undertakings as well as for regulation.

- All RUs can no longer simply consider themselves as being “only railway” undertakings, being it for passengers or for cargo. Rather, they must

now see themselves as becoming integrated and multimodal mobility services providers. Consequently, they all seek to enlarge their activities to cover the last mile, as well as to become active at the urban level, where such integrated mobility is much more prevalent.

- But this new intermodal reality also has profound implications for regulations, as became clearly apparent at the Forum: it becomes questionable whether regulation of the different transport in isolation from one another, in particular the regulation of railway undertakings separately, continues to make sense. Rather, the new multimodal reality calls for regulation of mobility as such with particular attention being paid to the definition of the level playing field and the distortion of competition among the transport modes along with a redefinition of what public service (and ‘Public Services Obligations’ for that matter) means in the new multimodal mobility world.

Digitalisation: Data Layer(s) and Platforms

Everybody agrees: the new (digital) reality is mainly characterised by the emergence of a so-called digital or data layer. Yet, it became evident that there is still a lot of confusion about what that data/digital layer exactly is. For a start, a distinction needs to be made between the debate on data availability, and the debate on (data/digital) platforms:

- As for data availability, different transport operators generate and possess numerous data, which must clearly be distinguished. A helpful categorisation was proposed at the Forum by SBB distinguishing in particular between (a) open, (b) restricted (contractual arrangements) and (c) closed data. Depending, such data can or cannot be made available openly or to selected partners.
- Yet, such data are different from those possessed by platforms where such data are analyzed (by algorithms) so as to extract value from them leading to (commercial) services. Much of the discussions focused on what such platforms exactly are and how they operate and it was concluded that more thinking is needed in order to understand them better.

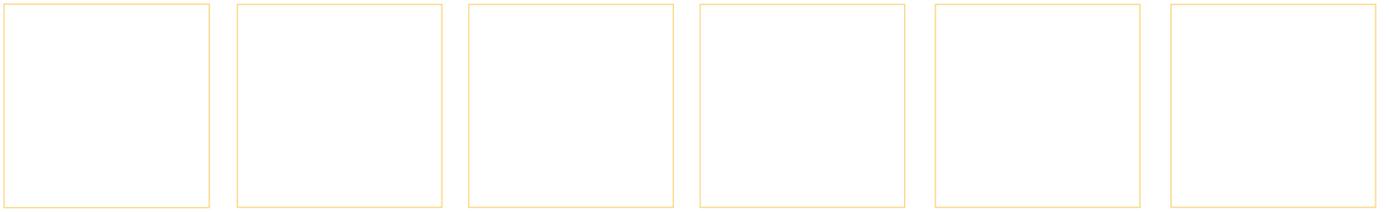


Digitalisation: What Consequences for Railway Undertakings and Regulation?

Railway undertakings, as said, possess numerous data. The question is whether they can or should be forced to make some of these data publicly available, mainly by virtue of being publicly owned. Another question is whether, railway undertakings should see such data and corresponding platforms as being a new business opportunity, for example when becoming integrated mobility services providers.

Regulation of data and especially of platforms is a different matter altogether: the underlying reality is one of platform economics, which should guide the theory and practice of regulation. Yet, it still remains unclear how such platforms should be regulated and some question whether they should be regulated at all.

Still, there is general agreement on two issues: first, digital platforms lead to a 'winner-takes-all' situation. Secondly, **value appropriation** by platforms that redirect value-added and profit to platform owners and operators might remove revenue from much needed investments into rail and other infrastructures. Probably both such consequences of digital platforms will have to be regulated at some point, the question being primarily how, at which level and by whom. This is notably where the European Commission comes in: in our mind, the EC does not necessarily need to come in as a regulator, but rather as a body capable of thinking the regulation of both access to data and of platforms through in a proper way. Indeed, the regulation of such platforms should respect subsidiarity and keep in mind that digitalisation leads to integrated mobility chains, which such (digital mobility) platforms precisely enable ... or not.



Which Role for Railway Undertakings in the Mobility of the Future?

A Summary of Discussions

14th Florence Rail Forum
Florence, 22 May 2017

Mobility and transport are rapidly evolving in the era of digitalisation. Railway undertakings are facing numerous challenges as they aim to make maximum use of digitalisation to improve their operations and customer services. Meanwhile, competition is arising in the form of new mobility services and platforms potentially disrupting traditional railway business.

Following the usual format of the Florence School of Regulation, the 14th Florence Rail Forum addressed these issues by discussing the following questions:

- What are the consequences of digitalisation on mobility services?
- What is the impact of new mobility services on the rail sector and its regulation?
- Which strategies for railway undertakings to address Mobility as a Service?
- Data sharing among mobility operators: legal obligations, voluntary cooperation and external disruptions

What Are the Consequences of Digitalisation on Mobility Services?

The 14th Florence Rail Forum built on real evidence: digitalisation is dramatically changing the transportation sector. On the one hand, the Information and Communication Technologies (ICTs) have enabled the development of new mobility solutions, often embraced by citizens and customers, that are becoming alternatives to traditional mobility modes, such as rail. On the other hand, the ICTs are also transforming the traditional mobility modes, by making them potentially safer, more user-friendly and more reliable. As a side effect, digitalisation creates an enormous flow of data that are actually necessary to implement these two sets of changes.

However, digitalisation is not a goal in itself but rather a means to an end. Indeed, discussions at the Forum looked at digitalisation as a means to achieve a transport system that is sustainable from a social, economic, and

environmental point of view. Everybody agrees that there is room for improvement of the current transport system, both in terms of operation and of legislation. Everybody wants to optimise the mobility system, yet naturally more stakeholders are looking after their own interests than are working for the better functioning of the mobility system as a whole. For this reason, it was stressed that the European Commission has to be the actor that approaches the transport sector with a holistic view, and seek agreement among stakeholders in all modes of transport.

Indeed the discussion at the beginning focused on the right governance of the mobility of the future that will be characterised by trends such as Mobility as a service and automation.

There was consensus that transport that is the most effective in both operational and environmental terms should be encouraged. Regarding Mobility as a Service (MaaS), an approach that builds on the complete integration of all available transport modes, there seems to be a conflict for urban public transport operators that rightfully fear that such an approach could cannibalise parts of their business and result in the decline of a well-functioning integrated system of public transport.

Many new mobility trends such as, for instance, app based car and bike sharing are developing outside the sphere of public transport. If public transport would ignore the MaaS trend though, this may lead to an increasing attractiveness of individual modes which could then lead to further deterioration of the public transport system as an alternative to them.

With regard to this latter scenario, a parallel was drawn to the introduction of the car in the 20th century. When individual car ownership gained massive popularity road infrastructure was continuously increased (and consequently saturated) while public transport was somewhat diminished. When this led to massive problems with congestion and pollution, public transport was again seen as a way to improve this situation and public transport was again improved.

The combination of autonomous driving and shared mobility may lead, once again, to an increased use of individual modes vis-à-vis public transport.



What is the Impact of New Mobility Services on the Rail Sector and its Regulation?

Public Service Obligations (PSO)

Railways are in large part financed with public money. Most railway lines receive public funding and run under PSO. The Forum discussed the question of how the logic of subsidised railway transport can be compatible with new mobility trends connected to digitalisation. It was stated that PSO is probably an old fashioned model that, at least theoretically speaking, could be organised differently. However, it was also pointed out that the current system is offering transport as a public service at a fair price for everyone. It has to be clear whether this is still desired in the future before discussing ways in which it could be improved. In this sense, the real question from the regulatory point of view is, whether the current system of PSO is the most effective way or whether it actually leads to overinvestments and underperformance. Regulators are therefore working on several questions: What are eligible costs for determining cost base for PSO provision? What is pertinent and what is not? How to assess efficiency? What are the efficient costs? And how to identify efficiency targets? Furthermore, there is the need for better comparability. In order to improve PSOs, the performance of PSO service providers across Europe needs to be assessed more coherently. This could also include performance in the area of sustainability. Quality of services also needs to be made more comparable.

A practical aspect is the difficulty of railway companies to provide WiFi on trains, which is challenging on many routes for technical reasons, especially on long distance routes. For PSO trains it is not prescribed in the orders from transport authorities.

Platforms and Mobility Apps

Railway companies are using digital means to address a wider set of challenges. At the Forum, it was mentioned that railway companies need to react to trends such as the rising importance of metropolitan areas but also new mobility patterns such as a strong trend towards cycling. Railway companies pointed out the various ways in which they are integrating new mobility modes into their offer and use a digital application to improve their

distribution. The next panel discussed the Mobility as a Service paradigm in more detail.

Which Strategies for Railway Undertakings to Address Mobility as a Service?

Is Mobility-as-a-Service Something New?

The Florence Transport Forums have debated the concept of Mobility as a Service in the past ([4th Florence Intermodal Forum, March 2016](#)). In short, the concept foresees the “servicisation” of transport, making it possible to bundle different transport services into mobility packages that are then sold to customers. Enabled by digital technology such an approach becomes possible in a highly integrated system. As an effect, the approach has the potential to challenge private car ownership on a large scale.

At the Rail Forum however, it was also discussed whether defining mobility as a service is really a new approach. The basic parameters of passengers have not changed in the age of digitalisation. They consider time, money, comfort and make the choice for the best offer available to them. (Traditional) transport operators have always been in the business of satisfying those needs and are now discovering new ways of doing so. Railway companies are making use of digital tools in various ways in order to become more attractive to their customers and to compete with other transport modes.

Yet railway companies realise that what is new and disrupting is that actors that are not actually providing any physical transportation services are entering the transportation market. They provide intermediation services such as providing information and selling tickets with the use of a smart application.

Are Railway Operators Becoming Mobility Providers? Are They Becoming a Platform?

The argument was raised that platforms are more than digital ticket distribution systems. The debate on the platform economy has shown that platform operators’ most important function is that of making intelligent matches between different market actors. By reaching a significant scale, digital platforms create value through network effects without owning or producing a good themselves.



It was recognised that some railway operators are already taking an active role and even the leadership in providing customers with mobility platforms. For example, incumbents (SBB, DB and ÖBB) have experimented with different solutions for apps and agreements to become real platforms.

But can railway companies really become platforms? In fact, it was also discussed who could be the ideal platform provider. It was acknowledged that the matchmaking approach of platforms follows a different business model than that of individual transport operators. However, the active involvement of railway companies, most importantly the provision of data, is essential. After the development phase, the question may come up whether platforms are actually natural monopolies. In the long run, it seems that the preferred model is something of an oligopoly. As examples such as Uber or Airbnb are showing, platforms have a tendency to become monopolies as their attractiveness depends on having an extremely large user base. However, as some extent of competition will be useful, even at the platform level, it should not be assumed that the ideal approach is having a sort of monopoly regulation for platforms. It was also recalled during the discussion that regulation, in either shape, can always be an obstacle for further innovation.

Especially when it comes to integrating public transport, the option was discussed whether the transport authority should be the platform provider in a given region.

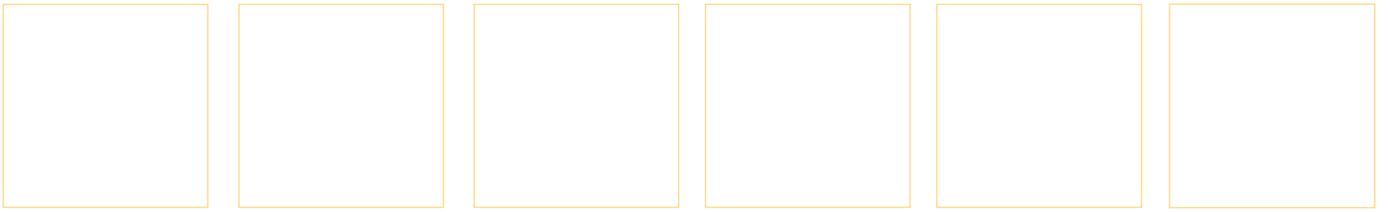
It seems necessary to clarify the questions pertaining to the nature of mobility platforms before making a concept for their regulation on the technical side.

Data Sharing Among Mobility Operators: Legal Obligations, Voluntary Cooperation and External Disruptions

Data availability is one of the core conditions for new developments in transport. The discussion on data sharing sought to clarify definitions of various types of data. There may be the need for different rules for operational data, timetable data, data on customer flows, revenues and others which all have different degrees of confidentiality from the perspective of the data owner. There is, finally, a category of data that includes any kind of personal data that is covered by data protection laws and should not be 'shared' in any way.

The discussion also addressed the challenges arising when the platform economy transforms the transport sector on a larger scale. This mainly concerns the financing of infrastructures, which needs to be guaranteed in spite of the fact that the current business models of infrastructure owners may not generate sufficient revenue in the future. It may become more of a role for regulation to protect those entities that invest a large amount of capital in infrastructure but also in rolling stock.

The argument was further raised that data or the data layer is becoming a new type of infrastructure based on common protocols and data formats. Regulation needs to ensure that such an infrastructure based on interoperable data is developed over the years. The analogy was made to the telecom sector where today a multitude of operators are on the market with no limitations to phone calls between customers of different companies.



The Engagement of Railway Undertakings in Mobility-as-a-Service (MaaS): Let's not Put the Cart Before the Horse

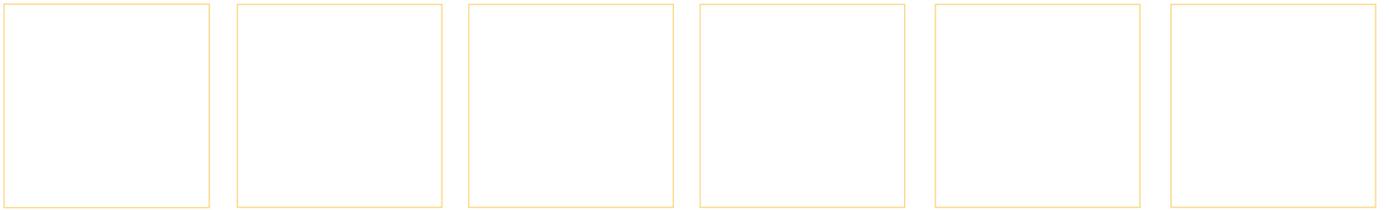
Maxime Audouin, EPFL, Lausanne

Throughout this Forum, we could understand that most European Railway Undertakings (RUs) are increasingly engaging in providing door-to-door ticketing and routing services. RUs are themselves increasingly offering new mobility services: on the one hand, they are offering traditional mobility modes (like urban public transportation and long-distance buses), on the other hand, they are offering more innovative services (like bike-sharing and car-sharing). In addition, they are seeking integrating ticketing and information from other transportation providers under one single digital interface. To the question why RUs are engaging on this path, one often-cited argument is their willingness to evolve from their traditional silo-organised rail operator role to being a mobility provider, thus integrating the new ICT-enabled shared mobility modes to their traditional core business, and supervising the whole mobility chain. In other words, RUs seem much interested in becoming what corresponds to the definition of 'MaaS operators'. But where it seems that European RUs are jumping one by one into the MaaS wagon, from which it is more than uncertain what monetary benefits they will retrieve, one might wonder true reasons for them to succumb the MaaS domino effect.

RUs high interest in MaaS can indeed be seen as a form of protectionism. On the one hand, it might be understood as data protectionism: no need to fully open their data if they play the role of integrators by managing the back-end, as well as the role of MaaS operator by taking care of the front-end. On the other hand, one might see it as protectionism towards their consumers: by becoming the MaaS operator, RUs will directly tackle their fears of losing a direct link with mobility services consumers.

But by having RUs adopting such approach, isn't there a risk of putting the cart before the horse? Isn't it more important to ensure the creation of an aggregated data layer, constituted of data from all transport providers, including from RUs, that would enable public

authorities to have a thorough and better understanding of mobility needs and behaviours from citizens, than already thinking about the service that will come on top of it and ensure to keep a direct connections with customers? Should sustainable business models be found, companies, including RUs, might then be able to propose mobility packages on top of this data layer. But let's not get blinded by the MaaS hype and ensure we get the data layer right by incentivising all transport operators to fully open their data, and regulating their exchange. Although MaaS has a big potential, it is at the moment mainly opening business opportunities, and should not make it hard for us to see the wood for the trees.



Data Sharing - How to Achieve Through-Ticketing? Is Mandatory Data Sharing Counterproductive?

Juan J. Montero, UNED University, Madrid

The difficulty to acquire rail tickets for international trips has been a long lasting obstacle for the creation of the Single European Railway Area (SERA). The debate on common information and through-ticketing schemes has become even more relevant as liberalisation will further fragment the market and new Railway Undertakings (RUs) identify ticketing schemes as a barrier to entry. In this framework, [Directive 2016/2370](#) empowers Member States to impose on RUs the obligation to participate in common information and through-ticketing schemes.

In terms of mere data availability, digitalisation is reducing the barriers to the flow of information. Technology companies are opening the path for new and original data mining strategies. As a consequence, an increasing amount of information is already available in the internet for passengers to organise their trips. One may say that digital interfaces create a more balanced flow of information and they empower customers that are not anymore only passively receiving information. A regulatory obligation is certainly not the only instrument to ensure the flow of information, and at this stage of digitalisation, probably it is not the most efficient instrument either.

Behind data sharing and integrated ticketing systems in a liberalised market, lies a more strategic debate on the commercialisation of railway services. This is not a mere horizontal debate among incumbents and new comers to the railway market. The vertical implications for the whole industry are even more relevant. The impact of Online Travel Agents (OTAs) in other industries, such as hotels and air travel, should be taken into consideration.

Furthermore, data sharing and ticket commercialisation raise the fundamental debate on how railways will integrate in a changing transport ecosystem. Online platforms have the power to transform transportation integrating different transport modes for customer-oriented door-to-door solutions. In the following years, the balance of power between online platforms and the underlying transport service providers will be defined.

The short-term debate on through-ticketing schemes might reduce the bargaining power of RUs vis-à-vis the platform providers in the future. Such long-term effects of regulation should be taken into consideration.

Juan Montero



Further Reading

[Florence School of Regulation Transport Area, 2017, '14th Florence Rail Forum Summary of presentations'](#)

More and more, railways are becoming just one element of a complex mobility system that is, thanks to the ICTs, increasingly integrated, connected, efficient and user-friendly, providing customers with seamless end-to-end journeys that combine all modes of transport available. The 14th Florence Rail Forum looked at the new emerging mobility system in a wider perspective, focusing especially on long-distance passenger transportation and the evolution of railways.

Representatives of the European Commission, major stakeholders as well as leading academics engaged in the discussions which addressed four central questions:

- What are the consequences of digitalisation on mobility services?
- What is the impact of new mobility services on the rail sector and its regulation?
- Which strategies for railway undertakings to address Mobility as a Service?
- Data sharing among mobility operators: legal obligations, voluntary cooperation and external disruptions

[Finger, Bert, Kupfer, Montero, Wolek, 2017, *Research for TRAN Committee – Infrastructure funding challenges in the sharing economy*, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels](#)

In this digital age, an expanding offer of smart applications and online booking platforms for travel has been very successful with customers. Therefore, there is a constant need to further adapt to and promote innovation with regard to new technologies in all modes of transport. These services, however, have financial implications: as they grow they take part of the revenue stream. This may mean that revenues flowing to transport companies are decreased, and that consequently the contributions to the maintenance and development of infrastructure are also reduced.

This study analyses the disruption created by shared mobility in the funding of transport infrastructure. While recognising the benefits of shared mobility in terms of reduction of private car use, the study identifies that there might be short-term negative effects on the

revenues of long distance railway and coach operators. It also points out other potential risks, which include capturing the revenues through commissions charged by platforms mediating mass-transit services (Mobility as a Service), freeriding and lower tax contributions. The study makes recommendations to reduce these risks.

[Frazzani, S., Grea, G., Zamboni, A., 2017, *Study on passenger transport by taxi, hire car with driver and ridesharing in the EU Final Report*, European Commission Study contract no. MOVE/D3/SER/2015-564/SI2.715085](#)

The purpose of this Study is to provide a comprehensive regulatory and market overview and analysis of the European taxi, hire car with driver and ridesharing markets across the EU. The Study intends to identify the main reasons behind the taxi markets upheaval and the impact of innovative services on the taxi markets. In various countries, taxi drivers and companies have vigorously protested against the efforts of innovative service providers to penetrate their respective markets, and challenged them before the courts on various grounds. Two preliminary rulings are also currently pending before the European Court of Justice.

The Study first analyses the relevant regulatory and administrative frameworks of all 28 EU Member States. It then provides a market analysis describing the dynamics of the taxi industry including employment, turnover, wages and other characteristics such as industrialisation and the presence of new transport innovations. Next, the Study provides in-depth case studies of the following cities: Amsterdam, Brussel Capital Region, London, Paris, Rome, Stockholm, Warsaw, and a cross border case of Vienna/Bratislava. The Study then displays the results of a consumer panel carried out in the above-mentioned selected cities, covering issues such as the user's purpose, preference and overall satisfaction with transport services. The Study wraps-up with our conclusions and recommendations, based on the results of our findings.

[Martin, E., Shaheen, S., 2016, *Impacts of car2go on Vehicle Ownership, Modal Shift, Vehicle Miles Traveled, and Greenhouse Gas Emissions: An Analysis of Five North American Cities*, IMR & TSRC](#)

Carsharing is the shared use of a vehicle fleet by members for trip making on a per trip basis. In this working paper, Martin and Shaheen identify four forms of carsharing in North America today: 1) roundtrip, 2) one-way, 3) peer-to-peer, and 4) fractional. Roundtrip carsharing has



been operating in North America for over 20 years. In 2010, one-way carsharing launched in North America in Austin, Texas, with the car2go service.

The authors designed their study to better understand how car2go is used; how it changes travel behaviour; and its impacts on vehicle ownership, driving, and greenhouse gas (GHG) emissions. Based on an analysis of the survey conducted between 2014 and 2015 by the authors in five cities (San Diego, Seattle, Vancouver, Calgary, and Washington, D.C.) and car2go activity data, Martin and Shaheen estimate the impacts that car2go has had on vehicles sold and suppressed by car2go members, modal shift, vehicle miles travelled (VMT), and GHG emissions.

This working paper has six sections including: 1) methodological overview, 2) impact of car2go on vehicle holdings, 3) car2go impacts on modal shift, 4) car2go and estimated changes in VMT, 5) GHG emission impacts, and 6) key takeaways.

[Oliver Wyman, 2016, *Mobility 2040 staying ahead of disruption*](#)

Driven by the fourth industrial revolution, technological convergence, new entrants in the mobility space, and changing travel behaviours, we expect the pace of innovation in passenger transportation to accelerate over the next quarter-century. Disruption to existing business models will be widespread, making some less viable, while others realize new opportunities and gain new strength. Competitive pressures will increase as customer spend and mindshare shift to new mobility providers. Eighty percent of incumbents in passenger transport say they don't feel well prepared for what's coming.

To gauge the potential shape of this emerging landscape, its challenges, and the adaptations it will require, Oliver Wyman conducted in-depth research and surveyed several hundred executives and experts in the transportation industry globally. This report *Mobility 2040: Staying Ahead of Disruption* provides an aggregated view of those perspectives.

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Robert Schuman Centre for Advanced Studies

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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), and Transport & Water.

The FSR-Transport Area's main activities are the European Transport Regulation Forums, which address policy and regulatory topics in different transport sectors. 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

Views expressed in this publication reflect the opinion of individual authors and not those of the European University Institute.

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