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12TH EUROPEAN RAIL TRANSPORT REGULATION SUMMARY

**"HOW TO DEFINE, MEASURE, AND IMPROVE THE PERFORMANCE
OF THE EUROPEAN RAILWAY SYSTEM?"**

A SUMMARY OF THE PRESENTATIONS

Florence, 2nd May 2016

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Forum Summary Document

■ PROGRAMME

08.30 - 09.00	Introduction to the Forum Matthias Finger EUI and EPFL Olivier Onidi Director for European Mobility Network, DG MOVE Annika Kroon Policy Officer, DG MOVE Unit Single European Rail Area
09.00 - 10.45	Which performance indicator is valuable for each stakeholder and how are they measured? Victor Vaugoin Head of Brussels Office, ÖBB Gilles Peterhans Secretary General, UIP Rail Arcangelo Fornelli Vice President, Hitachi Rail Round Table Discussion
10.45 - 11.00	Coffee break
11.00 - 12.45	What the core aspects of rail business are where performance needs to be improved? How to create right incentives? Antonio Manganelli Sector Regulation Manager, UK Competition and Markets Authority Markus Ksoll Head of Competition and Regulatory Policy, Deutsche Bahn Gregoire Marlot Head of railway strategy and regulation department, SNCF Veronica Elena Bocci Coordinator, DITECFER Round Table Discussion
12.45 - 13.45	Lunch break
13.45 - 15.30	How should national and EU rail market legislation evolve to safeguard better performance? Joseph Doppelbauer Executive Director, European Railway Agency Alice Polo Senior Interoperability and Safety Manager, UNIFE Ichiro Takahashi Head of Brussels Office, EJRC Michael Sünder Senior Advisor for Regulatory and International Affairs, SBB Round Table Discussion
15.30 - 15.45	Coffee break
15.45 - 16.45	What can we learn from the experience of benchmarking in the air sector? Rolf Tuchhardt Policy Officer, DG MOVE, Unit Single European Sky Round Table Discussion with all speakers and participants

The present document summarises the content of the presentations delivered during the [12th Florence Rail 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 top menu bar and select “Forums” among the “activities”. 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.

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12th Florence Rail Forum		Villa la Fonte San Domenico di Fiesole 2.5.2016
How to define, measure and improve the performance of the European Railway System?		
Matthias Finger		
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Introduction to the 12th Florence Rail Forum

Prof. Matthias Finger, Director of FSR-Transport and of the chair of Management of Network Industries (MIR), École Polytechnique Fédérale Lausanne (EPFL)

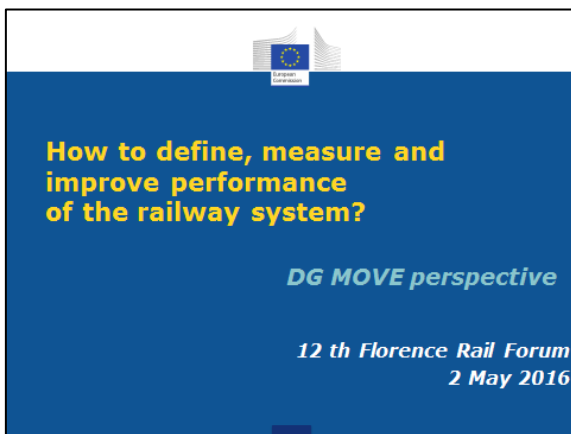
Introducing the 12th Florence Rail Forum on the performance of the railway system Prof Finger focused on the background of the question of performance of the European railways.

Everyone agrees that the performance of European railways can and should be improved especially to meet the ultimate goal of increasing the railways modal share. Prof Finger stressed that performance relates to Key Performance Indicators, yet there is no common agreement on the right KPIs, their definition and their measurement.

Most of the stakeholders have been working towards defining such KPIs since years, and positions have been taken. Building on this work, the 12th Florence Rail Forum aims at creating an open discussion on KPIs for the European railway system and how to get there with the largest possible agreement among stakeholders.

As usual at the Florence Rail Forums, discussions during the day follow four guiding questions, with the particularly interesting cross-modal reference to the air transport performance scheme. The four questions for the day are:

- Which performance indicators are of relevance for each stakeholder and how are they measured?
- What the core aspects of rail business are where performance needs to be improved? How to create right incentives?
- How should national and EU rail market legislation evolve to safeguard better performance?
- What can we learn from the experience of benchmarking the performance in the air transport sector?

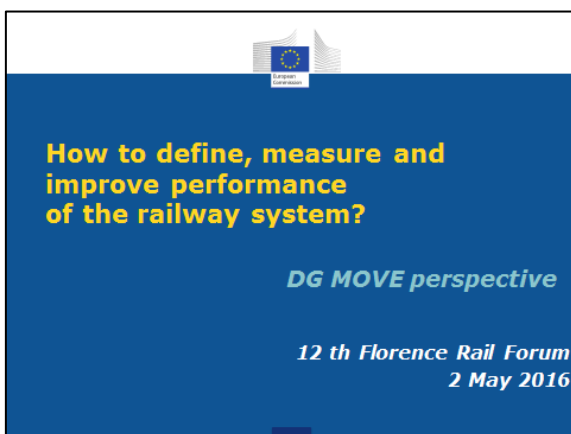


Introduction: How to define, measure, and improve the performance of the European railway system?

Olivier Onidi, Director for European Mobility Network, DG MOVE, European Commission

In his opening statement Mr Onidi pointed out the relevance of the topic of performance of the railway system and underlined the important role of ERA to make better specification and mutual recognition of rules.

Discussion on performance and indicators is already taking place in the framework of the platform for infrastructure managers (PRIME group) and railway operators (RU Dialogue). Therefore, Mr Onidi clarified, the reason the Commission is interested in the issue is not because any kind of specific regulation or strict performance regime is being prepared. In general, the question of how to improve the performance of the railway sector has become a cornerstone of the Commission's work. Indicators need to be developed beyond the current business practice: they could make way to replace stringent regulation with a more goal oriented approach. This Florence Rail Forum will be good for this: it starts with discussing the notion of Key Performance Indicators and then looks at how to make use of them on the example of the aviation sector. However, performance is also an important element of existing legislation in railways.



How to define, measure, and improve the performance of the European railway system? DG MOVE perspective

Annika Kroon, Policy Officer, Single European Rail Area, DG MOVE, European Commission

Ms Annika Kroon presented concept and objective of performance measurement, the role it plays in existing rail regulation and the distribution of responsibilities among the stakeholders involved.

Which are the relevant aspects of performance and how are they measured?

First and foremost, Ms Kroon explained that the answer to this question inevitably depends on who is asking and why. There are different levels on which performance is relevant: on the **company level** it is about operational and financial performance; on the **customer level** it is about price, availability and reliability of service; for **public authorities** the service quality, the state of the network and the cost are of highest relevance; **regulators** are concerned with accessibility, safety and overall performance; **EU institutions** look at the alignment with the EU transport policy goals that are interoperability, market access and the optimal use of EU funds. Furthermore, another influential variable is the scope of interest: one may look at a single company, at a single line, but also at a national transport system or at the European network.

Ms Kroon made reference to the different subsystems of the rail industry as each interface and interaction between them matters for performance: the level of integration between the various technical subsystems, the interactions between rail undertakings, infrastructure managers and service operators (nationally and cross borders), the interactions between rail companies and their (end)customers and finally the interactions between rail companies and public authorities subsidising service provision.

Which role for performance in current EU regulation?

Looking at the EU rail regulation, there are several elements linked to performance management.

As regards **EU technical regulation** applicable to **technical subsystems**:

- ERA monitors the performance in terms of interoperability standards
- Common Safety indicators are collected to facilitate the achievement of common safety targets
- TEN-T Guidelines prescribe Core Network Corridors that need to comply with certain infrastructure standards: for this specific targets and timelines are set

As regards **EU market regulation**, performance related provisions relate to different subsystems. First, looking at the **relationship between rail undertakings, infrastructure managers and service operators**, regulation is aiming at encouraging smooth cooperation between market participants:

- Directive 2012/34/EU (Single European Railway Area) mentions Performance schemes to encourage RUs and IMs to minimise disruptions and improve the reliability and punctuality of services (Article 35, Annex VI)
- According to the 4th Railway Package IMs shall cooperate to monitor and benchmark performance and to contribute to rail market monitoring
- The TEN-T Guidelines (Regulation (EU) No 1315/2013) define Core Network Corridors and foresee the monitoring of the relevant network development and activity in the multimodal corridors

Second, looking at **interactions between rail companies and their (end)customers**, the Passenger Rights regulation (Regulation (EC) No 371/2007) requires rail undertakings to establish and monitor quality management standards. Rail Freight Regulation (Regulation EU 913/2010) requires management boards to monitor and publish performance of rail freight services in corridors.

Third, on the **interactions between rail companies and public authorities**, the Single European Railway Area Directive foresees that the contractual agreements between infrastructure managers and authorities for infrastructure financing should include performance indicators (Article 30, Annex V). Also, Regulation No 1370/2007, as amended by the 4th Railway Package, will require that for directly awarded PSO contracts, performance requirements were defined in the contracts including on punctuality of services, frequency of train operations, quality of rolling stock and transport capacity for passengers (Article 5).

Who does what?

Ms Kroon illustrated that there is currently a lot of activity by the different stakeholders in the field of performance measurement and indicators definition, and this requires observing in order to map these activities. As of now, these initiatives risk to cause overlaps both in terms of monitoring and target and incentive setting. Ms Kroon restated that at this stage the European Commission wants to understand the initiatives on performance that have been done already in order to coordinate and make the results of the different initiatives comparable and mutually useful.

Purpose

The overall purpose of the European Commission action on performance and indicators setting is the accountability and continuous performance improvement of the rail sector starting from the understanding of the needs of the different players in the railway system. Performance management is a process that goes through several stages:

- Focusing: identifying topics, actors and indicators
- Monitoring: collecting data, agreeing on definitions for comparability, improving transparency
- Benchmarking: making comparisons, learning from results
- Targets setting: involving the sector and limited to some topics.

Such a process takes time and it has to be borne in mind that moving from comparison to benchmarking requires a lot of work, specifically data collection. For example, the PRIME group had worked for two years to move to the monitoring phase and may start benchmarking in 2018.



Key Performance Indicators in Railways- Who measures what?

Victor Vaugoin, European and International
Affairs, ÖBB Holding AG

Mr Vaugoin presented some insights on performance definition and measurement from the experience of ÖBB group, stressing the overall goal of improving performance of the railway system.

In the beginning Mr Vaugoin stressed that – ultimately – the primary reason for having KPIs in railway is gaining market share by improving performance. How to improve performance? The first steps should be an assessment of measures and consequently changes in strategy. However, in his view railway stakeholders should go beyond the mere performance and consider how the measurement will support employee performance review, organizational planning and health, daily operations and decision making. With regard to this though, there is not yet a common ground for KPIs because everybody agrees that they are a credible, measurable, relevant metrics to measure achievements, yet each stakeholder has its own, based on the different needs of the type of stakeholder and the different organizational structures that have developed in each country.

Infrastructure Managers, for instance, would set as most valuable dimensions for the success of the railway system the following: Efficiency, Service/Quality/Reliability, Innovation/Growth, Accessibility, Financial Effectiveness, Safety, and Asset Utilization. Mr Vaugoin recognised that these are definitely valuable but they are not perfect. Due to the complexity of the system and the lack of harmonization, in line with the RNE/PRIME approach, Mr Vaugoin stated that overall harmonization will be difficult to achieve yet it would be advisable to ensure a certain degree of harmonization.

Mr Vaugoin reminded the audience that a lot has been written and data have been collected, yet no formula has been found on how to create success for railway undertakings, infrastructure managers, or even integrated companies. He listed some key characteristics for Infrastructure Management benchmarking, highlighting in particular the need for sharing best practices at the right time. However, quick wins are often based on weak foundations.

To conclude, Mr Vaugoin recognised that KPIs can help railway companies to become more attractive for their customers and more efficient in their operations. To reach this goal, it would be appropriate to standardize and harmonize data to improve quality and comparability. However, the definition of KPIs should be thoroughly evaluated, and meaningful conclusions on the currently ongoing work of the stakeholders will probably come only in the medium-/long-term. Setting a KPI only for the sake of doing so will eventually be counterproductive and create a regulatory burden. In Mr Vaugoin's view, market- or company-driven initiatives should be preferred as healthy competition leads to innovation and overall increase of market share.



Which performance indicator is valuable for each stakeholder and how are they measured ?

12th European Rail Transport Regulation Forum
2nd of May 2016, Florence (IT)

Gilles Peterhans
Secretary General UIP

Which performance indicator is valuable for each stakeholder and how are they measured?

Gilles Peterhans, Secretary General, UIP Rail

How to improve the performance of the railway system? In his answer, Mr Peterhans stressed the utmost importance of data and highlighted some related assumptions: first and foremost, if you can't measure it, you can't improve it; secondly, there is no performance indicator that is right or wrong, it always depends on how data are looked at. In addition, Mr Peterhans pointed out the necessity to provide comprehensive and reliable data to support policy-makers in shaping the future of transport policies and in order to avoid bad decisions and distortions or amalgams in the data analysis.

Starting from the importance of data, Mr Peterhans mentioned some of the most valuable sources that wagon keepers use. In fact, wagon keepers often rely on statistical data derived from the RMMS (Rail Market Monitoring Scheme) or Sector reports to assess market developments and future investments opportunities. Furthermore, he indicated that ERA's interoperability and safety reports are used to identify relevant operational issues to be worked on.

Moving to the most valuable KPI for wagon keepers, he stressed the importance of using wagon performance information to assess the work potential of freight wagons. The mileage travelled in ton/km enables fine-tuning of maintenance regime, improves the probability of detection of depleted work potential, minimises wagon downtimes and can be used to improve wagons' operating performance. Mr Peterhans stressed that track and environmental transport conditions are further important factors which have a material impact on vehicle wear and tear, but are not at the focus yet. In this context, he saw the sharing of existing data via existing sources as the challenge infrastructure managers, railway undertakings and wagon keepers have to address to move towards improved rail freight performance without creating a new cost burden.

Most importantly, Mr Peterhans reflected upon the interpretation of statistical data: in fact, KPIs or data themselves are worthless unless the recipient knows how to interpret them. One of the most common mistakes is actually looking at the narrow picture, forgetting factors outside the railway system which directly influence its performance like for example industrial and environmental policy at national and European level, national laws on working hours, administrative workload,

taxes, or the technical heterogeneity of national systems.

Mr Peterhans concluded that performance indicators are not always conclusive, and that performance assessment and benchmarking is always very difficult. Therefore, he suggested concentrating on defining very few but reliable KPIs for which the data owner is known (to ensure data consistency), the collection workload is small (to avoid new costs burden) and the use of this KPI is clearly defined (to solve any confidentiality issue). Finally, he stressed the need to change the approach towards more openness for data collection and data sharing.



Which performance indicator is valuable for each stakeholder and how are they measured?

Arcangelo Fornelli, Vice President, Hitachi Rail Italy

At the beginning of his presentation, Mr Fornelli presented Hitachi Rail Italy, which is a Japanese brand yet a European based industry. Rail business is an important part of the group that accounts around 5% of the annual revenue, and it is connecting the Japanese and European experiences (with the two pillars of Ansaldo Breda and Ansaldo STS). In particular, Hitachi Rail Italy has been manufacturing rolling stock for more than 160 years under different brands, and one of the biggest factories (about 300.000sqm) is based in Pistoia (near Florence). As Mr Fornelli stressed, Tuscany has historically been a good place to develop rail technology: this is also demonstrated by the wise decision to found the DITECFER cluster of large companies, SMEs and Universities in the rail sector.

From the presentation of some of the products that Hitachi Rail Italy makes in this industrial plant, it emerged quite clearly that the role of precise data as well as the definition of KPIs is of utmost importance for manufacturers:

- The mass transit vehicles that are used in Florence are produced by Hitachi Rail Italy in Pistoia. In fact, Hitachi Rail Italy is part of the consortium that won the tender for the construction of the new tramline, which is up to become the backbone of the mobility of the city. → KPIs are one element to meet tenders requirements and project finance scheme
- Mainline and Mass Transit trains are produced in this plant, and are then distributed around the world. → harmonized data and KPIs are necessary for harmonization and scalability
- One of the most interesting products coming from the site is the unmanned metro (Copenhagen, Milan Line 5) as many networks are shifting towards unmanned operations. → KPIs are important to define the technical requirement that eventually allow to be more flexible, cost-efficient, safe and environmentally friendly
- The new high-speed train ETR1000 that can reach up to 360km/h and was tested on the Italian network up to 400km/h is produced here and is an example of the coordinated improvement that the infrastructure manager has made in coordination with the manufacturer and the operator to allow such a train to perform well and meet the customer

expectations even better. → a commonly agreed set of data and KPI is a fundamental element for the overall improvement of the railway system (rolling stock and network) thanks to better functioning service and possibility to operate internationally.

Mr Fornelli stressed the importance of KPIs in the industry as they are largely adopted to measure and benchmark various aspects of performance as well as competition: market share, financial indicator, customer satisfaction are the most important KPIs for industry to measure its own performance. With regard to this, each company is of course fixing strategic and operational goals. Mr Fornelli also recalled that KPIs have to be clearly defined and quantifiable, they should remain stable and target long term results as to allow progress evaluation.

Mr Fornelli also looked at KPIs for rolling stock, presenting the view of the industry, and he identified four elements towards effective operations:

- **Reliability:** the ability of an item to perform a required function for a stated period of time (continuity for correct service)
- **Availability:** the percentage of time an item is in a state to perform a required function under given conditions (readiness for correct service)
- **Maintainability:** the ability of an item to be retained in - or restored to - a specific condition when maintenance is performed
- **Safety:** absence of catastrophic consequences on users and environment

In addition, he also stressed the role of **lean maintenance**, and the changing approach from scheduled maintenance to condition based (preventive) maintenance thanks to the improvements for predictability brought by digitalization (sensors and software).

To conclude, Mr Fornelli spoke about the role of **environment and energy saving** as a KPI. The Environmental Product Declaration, which is currently not a mandatory instrument, communicates transparent and comparable information about the environmental impact of the product quantified by the Life Cycle Assessment from extraction of raw material to product final disposal. Percentages of recyclability and recoverability are the key elements in this.



2 May 2016, 12th Rail Forum – Florence School of Regulation

The role of competition in passenger rail services: performance and incentives

Antonio Manganelli
Sector Regulation Manager, CMA

The role of competition in passenger rail services: performance and incentives

Antonio Manganelli, Sector Regulation Manager, UK Competition and Markets Authority

Antonio Manganelli presented at the Forum the point of view of the UK Competition and Markets Authority (CMA), showing competition issues are relevant for performance as they influence both the targets and the incentives in the railway system.

First of all, Mr Manganelli stressed that performance can be defined in different ways depending on the subject (type of stakeholder and their interest) and objective of such a definition. The CMA, as a competition advocate, would focus on the positive effects of improved consumer welfare; increased allocative and dynamic efficiency and the correct incentives and information revealed by market dynamics.

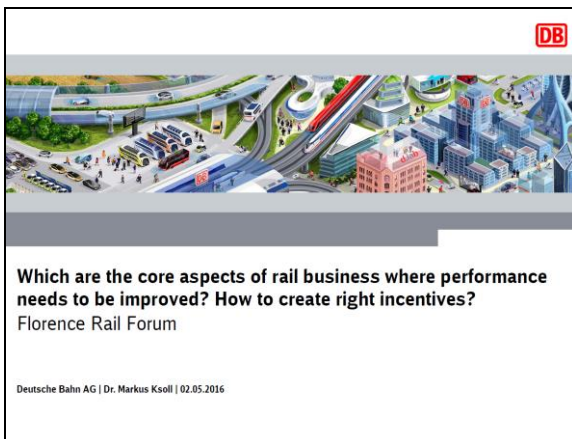
As Mr Manganelli explained reaching these effects will not be as straight forward in the railway sector as in other markets given the peculiarities of the economic, systemic and financial situation of the industry: on the one hand, in the railway sector there is still an extensive need of public funding that makes the distributional aspects very relevant (namely the ratio between the contributions from passengers and from taxpayers); on the other hand, the real benefit for the customer derives from systemic issues that are highly influenced by coordination among different actors. Therefore, talking about performance in the railway sector means talking about a systemic improvement where indicators and benchmarks have to fit the needs and goals of very different types of actors. Within this context, it is important to assess what could be the role of competition, seen in the two-fold perspective of competition for the market and competition in the market, to enhance the rail industry performance.

Moving to the UK case study, it has to be noted that the UK competition landscape is unique, with 99% of passenger train km operated by non-incumbents (against the European average of 27%), which results from the complete vertical separation and the extensive competition for the market through franchises. This system has delivered benefits in terms of passengers/km, cost-reduction and innovation; however the degree of competition in the market is very small (less than 1%).

The CMA recently conducted a policy project, assessing the scope for greater competition between passenger train operators to deliver benefits for passengers and to improve efficiency. The CMA recommended that the existing model in Great Britain of competition ‘for’ the market through the award of franchises is developed to allow greater scope for competition ‘in’ the market on key long-distance routes whilst addressing some of the limitations in the current model of competition. In particular the CMA proposed to give an increased role to open access

operators, the train operating companies authorised by the regulator to have access to the network on certain routes and compete with franchised operators. Addressing public funding issues through fully cost-reflective access charges and a 'PSO levy'.

Finally Mr Manganelli stressed that competition issues are relevant for the performance of the rail industry, in terms of pressure on fares, on quality of service and innovation. Moreover competition could have a positive impact on efficiency at train operator and network management levels, as it influences both the targets and the incentives in the railway system.



Which are the core aspects of rail business where performance needs to be improved? How to create right incentives?

Markus Ksoll, Head of Competition and Regulation Policy, DB

At the 12th Florence Rail Forum, Mr Markus Ksoll presented the point of view of Deutsche Bahn with regard to the current situation of the railway system and its performance, the measures embracing performance and the existing incentives.

First of all, Mr Ksoll acknowledged that the current situation of the railway performance is not fully satisfactory, and that there is room for improvement. On the bright side, Mr Ksoll showed that, since the first railway reform in 1994, the volumes of rail transportation in Germany have been strengthened by 37% in passengers and 62% in freight respectively, especially as far as long-distance volumes are concerned. On the other side, he stressed that considerable pressure is put on DB's rail business because of strikes and storms, and also the international financial pressure is putting some concern on the financial track record of railways in Germany:

- In particular, the return on capitals employed (ROCE) for the DB group has been fluctuating in the last 7 years, with an overall decrease despite the increase of capital employed (and about stable Earnings Before Interest and Taxes - EBIT). Based on the data referred to the most striking characteristics of the Germany railways is the high capital employed which results in an under-proportional profit contribution.
- Financial performance and overall quality of the service are closely linked, and the DB group faces many challenges in performance. Mr Ksoll particularly concentrated on rail operations: insufficient product quality, rising personnel and energy costs, competitive pressure (especially from other operators of rail freight transport and from the road long distance passenger transport), fragmentation of the regional transport and different tender procedures, and greater regulatory risks.
- Eventually, for both the financial aspects and the services related to rail operations, Mr Ksoll acknowledged that economic top targets have not been reached. The comparison of the indicators in 2014 and 2015 appeared to be particularly worrying, such as the deterioration of punctuality and the profitability.

Mr Ksoll stated that DB is proactively working to improve performance and facing the challenges outlined above. With a particular focus on digitalization, the "Zukunft Bahn" program (divided in three time-slots: 2016, 2017-2020, 2021-2030) has analysed these indicators and is designed to

cope with the current deficiencies. In the framework of this program, all the members of the DB group are working on several elements: punctuality, traveller information, wireless connection and maintenance (availability of spare parts, steering, and sites). Starting in 2016, the focus will be on raising punctuality, providing reliable information to passengers and making time spent on trains and at stations more enjoyable.

To conclude, Mr Ksoll looked at the incentives that are already there to improve the railway performance and pointed at one particular burden that is currently limiting performance. Major incentive schemes already exist and come from different sides: customers, shareholders, price-cap regulations and PSO contracts. They are aimed at lowering the costs, improving the quality and raise the investments of the railway system as a whole. External incentive-mechanisms should be consistently designed and in line with entrepreneurial measures. For example, rising maintenance and re-investment works deriving from multiannual contract are significantly increasing the costs in maintenance and replacement, raising new industry debates.



KPIs and Regulation

Gregoire Marlot, Head of Railway Strategy and Regulation Department, SNCF

Mr Gregoire Marlot provided the point of view of an incumbent operator that is part of a holding and that operates in different market sectors. Therefore, he presented the regulatory implications of the use of KPIs in relation with the situations of (natural or legal) monopoly, public service obligation, and open market.

First of all, Mr Marlot acknowledged the usefulness of KPIs to measure, alert and incentivize the performance of the railway system. However, he also warned about some critical aspects that can be summarized as follows: a) monitoring KPIs is costly, and it is an effort that has to be planned; b) an incorrect evaluation of the KPIs can generate wrong incentives; c) benchmarking can be meaningless, especially if there is no consistency between the values gathered by the different actors.

Mr Marlot then looked at KPIs in the different market segments:

- **Open market:** for the railway undertaking, KPIs are useful especially with regard to the **end-user**, as KPIs can provide the customers with information regarding standards and norms as well as the very content of the product that customers are purchasing. For example, KPIs can help the customer understand the data regarding the energy savings or the emissions of a given product (which can be train ride!). Moreover, KPIs can be useful also to the **producers/operators**, as they will be able to evaluate and compare their own offers building on their reputation certified via KPIs.
- **Public Service Obligation:** KPIs are particularly relevant as they are used to set the efficiency incentives in the tender process. They should be published in the call for tender and not be changed in the application phase of the contract. Also in this case, KPIs are of two kinds: customer oriented (safety, travel time, reliability and punctuality) and business oriented (quality of rolling stock, investments).
- **Natural and Legal Monopoly:** this can be the case of infrastructure managers, which have a natural monopoly on the infrastructure and face no competition. As there is no competition in this case, KPIs are to be incentivized through contracts that shall specify: user-oriented performance targets, the structure of funds allocated to the infrastructure services; the reporting obligations; the incentives to reduce the costs and the level of access charges. Similarly, in the situation of legal monopoly with a direct awarding of the market, KPIs are used to improve the performance on the same abovementioned aspects but can also be useful in relation to intermodal competition with other transport

modes and possible future opening of the market.

For each of these cases, Mr Marlot stressed the regulatory implications, which can be summarized as follows:

- **Open market:** first and foremost, regulation should help the end customer in getting useful information through the KPIs, whose availability should be made mandatory. Also, regulation should help in setting the level playing field both in terms of intra-modal and inter-modal competition. KPIs provided by the market should be reliable and neutral, as well as target-specific in the case of newly opened markets. Finally, KPIs should be monitored by an independent regulatory body.
- **Public Service Obligations:** regulation should work towards the application of the same KPIs that are already set for the open market and guarantee the targets for each KPI. Also, regulation should clarify all the other contractual KPIs (such as those related to investments, rolling stocks, maintenance) but not those related to efficiency.
- **Natural and Legal Monopoly:** the same KPIs of open market and PSO should apply, yet this situation is probably the most difficult to address as measuring productivity is very difficult (because of national burdens) and efficiency KPIs (lower costs) should not undermine the quality of the service (safety, quality of the maintenance, etc). In this case, regulation should probably provide for incentives to increase the performance.

To conclude, Mr Marlot stressed the aspect of the need for coherence and consistency between benchmarks so as not to undermine the efforts made by the actors in the railway system. In fact, as he showed, there are several cases where it is not possible to compare the data on the same issue that have been collected by the railway undertakings and the infrastructure managers.



Which are the core aspects of rail business where performance needs to be improved? How to create right incentives?

Veronica Elena Bocci, Coordinator,
DITECFER

Representing the Tuscan District for Rail Technologies, High-Speed, Safety and Security (DITECFER), Ms Bocci brought to the Forum the point of view of the Rail Clusters and in particular of the Small and Medium Enterprises (SMEs) that are part of them. She focused on the role of KPIs and on the methodology to define them.

In her introduction, Ms Bocci stressed the need to understand who the subject at the core of the rail business is. Micro, small and medium sized enterprises represent 90% of all businesses in the EU: they are at the backbone of the European economy generating 2/3 of all jobs. The DITECFER, as well as the other rail clusters present in Europe (10, that are represented by the ERCI for EU rail clusters), is in line with this figure. Therefore, she highlighted the importance of giving the voice to those very subjects that are often underrepresented. In this, the clusters (and the European projects that finance them) could serve as an incentive for the SMEs to be part of the KPIs definition.

SMEs are very committed to their role as developers of technical systems: it is well understood that the railway sector is facing several competitive and societal challenges at European and international level, so targets that help to improve performance have to be set. The EU and the ERRAC have defined some targets to be reached by 2030 and 2050 by the rail industry in terms of more punctuality, more frequency, more categories of passengers and more comfort, which can be translated in improvements of the technical characteristics of the service (reliability, capacity, accessibility, maintainability, interoperability/standardization, intermodality, safety, security) and in better energy/environmental impact (energy efficiency, noise, vibration, CO₂, Nox/PM10, waste management, electromagnetic emissions).

Looking ahead, as Ms Bocci explained, the bottom-up approach to define KPIs for these elements would be the preferred solution for SMEs. However, also for SMEs there is a real need for meaningful, consistent, comparable, reliable, and really useful KPIs. Setting unrealistic KPIs would be useless and even counterproductive: for SMEs, KPIs have to be useful, on the one hand, to measure their performance (internal use) and, on the other hand, to better communicate the results on those aspects that are core for their business (external use). To conclude, Ms Bocci suggested the creation of a platform for the submission of inputs on the type and characteristics of the indicators that should be used at the EU level.



SES Performance Scheme
ROLF Tuchhardt, Policy Officer, DG MOVE
Unit Single European Sky

Mr Rolf Tuchhardt brought in the perspective from a different sector by presenting the Performance Scheme of the Single European Sky (SES).

The performance scheme is part of the Single European Sky Policy initiative aimed at improving the overall performance of air traffic management (ATM) and air navigation services (ANS). The SES is made up of two packages: SES I adopted in 2004 and focusing primarily on capacity and safety as well as establishing Functional Airspace Blocks (FAB). The second package, SES 2, was adopted in 2009.

Yet historically, work towards the performance scheme actually goes back to the late 90ies and an analysis pointed out a lack of information on performance of the European ATM system and the problem of fragmented, inconsistent data.

The available data was inadequate and there was a lack of structured collation and dissemination. A more systematic approach to performance review was needed, including quality of service and cost measures. The objective was set out "to introduce strong, transparent and independent performance review, also for better basis for investment analyses and economic regulation."

The performance scheme today is implemented in 28 EU Member States plus Norway and Switzerland. It works on fixed reference periods (RP1 2012-14, RP2 2015-19) and four key performance areas (safety, environment, capacity, cost-efficiency). Union-wide performance targets and binding national/FAB targets consistent with Union-wide targets are set. The definition of these targets are based on a Commission assessment, assisted by the independent Performance Review Body (PRB). During the reference period there is an ongoing monitoring and reporting of performance.

How are the performance targets set and how are they measured?

Twelve Months before the start of the reference period the Commission defines EU-wider performance targets. Based on this, Member states have six months to draw up binding performance plans including concrete performance targets on the national or the FAB-level. Targets are defined also on further levels like the charging zone. Generally speaking, targets are set and monitored on Key Performance Indicators and in addition there are further performance

indicators only for monitoring.

Mr Tuchhardt presented the four key performance areas, what they are composed of, and some of the results achieved:

Safety: The Areas measured are effectiveness of safety management and application of the severity classification. Other items include reporting on the level of 'just culture', application of automated safety data recording systems and the level of occurrence reporting.

Cost-efficiency: The cost efficiency is measured by the Union-wide determined unit costs for en-route services and, furthermore, in the areas of unit costs for terminal services and cost of capital (level/composition asset base; return on equity).

Environment: To measure the environmental impact the horizontal en-route flight efficiency of actual and planned trajectory is compared to the most direct route.

Capacity: To measure the capacity performance the average en-route ATFM delay per flight is measured as well as the average arrival ATFM (Air Traffic Flow Management) delay caused by landing restrictions (local target).

Mr Tuchhardt pointed out some of the results achieved which are most importantly improvements in reduction of delays and an overall reduction of en-route unit costs.

Looking at the environmental performance KPI there has been a notable improvement between 2009 and 2014. Nevertheless the 2014 target has not been met and analysis for the exact reasons for this is underway.

In conclusion Mr Tuchhardt presented some opportunities for improvements in the future:

- there could be further efficiency gains on the individual ANSP level
- further improvements of the air space are possible for instance enabling free routes
- a more flexible capacity management could better match demand
- the deployment of new technologies such as those of the Pilot Common Projects could improve efficiency
- Service provision and oversight could be rationalized.



Remarks on the Performance of the European Railway System

Josef Doppelbauer, Executive Director,
European Railway Agency

In his presentation Mr Doppelbauer made some remarks on the Performance of the European Railway System.

Starting off he underlined the importance of benchmarking for the development of KPIs. There can be three perspectives on performance:

- On the individual, company level there is cost, profitability and quality of service.
- From the user perspective the factors are reliability, price, punctuality and quality of service.
- From the society perspective the factors are mobility, environmental impact, jobs and cost effectiveness.

Given that there is a growing dissatisfaction with the railways especially with regards to cost and quality of service there should be a process of developing benchmarking for the most important factors.

Mr Doppelbauer then presented a comparison with the aviation sector where benchmarking is common practice. He showed the development of KPIs for asset utilization, revenues and profitability in the aviation sector. In all these areas the situation looks far different for the railway sector giving railways a significant economic disadvantage. Summing up it can be stated that European railways have an issue with cost, quality and market share.

In order to explain the reasons for this competitive disadvantage Mr Doppelbauer pointed out that, as in all businesses, cost and quality of products are a function of volume and global supply base. In comparison to all other transport modes regulations, products, operating rules and importantly the supply chain remain largely national in railways whereas they are international in the other transport modes.

Different actors can lead and move the railways forward: customers push for more attractive railways driving the use of innovative digital technologies. The Single European Railway Area creates less fragmentation through EU wide regulation and harmonized processes. The increased market orientation of Railway Companies can bring down cost and improve quality. Technical harmonisation and in particular ERTMS are pushing forward interoperability. To conclude, Mr Doppelbauer identified some KPIs for each of the drivers of change:

- Business performance: to improve the current situation where assets are underutilized and costs of production are very high, KPIs should look at system costs and external costs,

evaluating the performance of the business model as a whole

- Technology: currently the long lifetime of rail assets and the long recovery costs are preventing innovation in general and digitalization in particular. KPIs should start at the customer needs and expectation and adapt the railway offer to the changing environment.
- Incentives for change: the current framework is highly fragmented and overregulated. Market opening and incentives for performance should become the main drivers of regulation along with full implementation of the existing laws.
- System quality and reliability: the low levels of quality, punctuality and reliability of railways should be improved. Such improvements can be quantified as to increase their performance.

Of course, Mr Doppelbauer stressed, these objectives are all ambitious, and the regulatory burden on rail should not un-necessarily be increased. However, working on performance and quantifying the elements of the railways system is the only way not to lose the intermodal competition. Setting targets and creating the right incentives will help to improve rail quality of service, in particular punctuality.



How should national and EU rail market legislation evolve to safeguard better performance?

Michael Sünder, Senior Advisor for Regulatory and International Affairs, SBB

Mr Sünder began his presentation by presenting some key facts on the performance of the Swiss Federal Railways. In 2015, national punctuality (3 minute punctuality) in passenger transport was at 87.8% (passenger punctuality) and 74.9% in freight transport making SBB the most punctual European railway operator with mixed traffic.

To safeguard a better performance of the system there is a need to employ the national network of contractual relations between the actors of the system as foreseen by European law: multi-annual contracts need to be established between Competent Authorities and Infrastructure Managers, a performance scheme needs to be in place between Infrastructure Managers and Railway Undertakings, whereas Public Service Obligations should be at the basis of the relationship between competent authorities and railway undertakings.

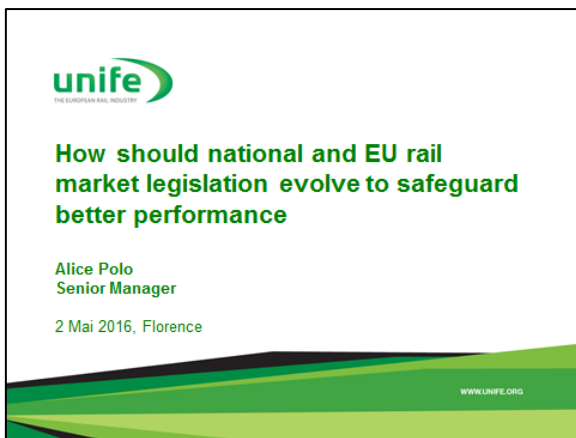
Mr Sünder then presented SBB's view on evolving national and EU rail market legislation in a way that safeguards better performance:

- The customer needs should be at the very top on the new decisions.
- New legal provisions should only be adopted when they are really needed with a focus on flexibility rather than on the one-size-fits-all approach.
- A system approach is needed rather than fostering individual interests.
- Long-term planning and a step by step rather than big bang approach, supported by underlying funding strategy.

In addition to that, the national networks of contractual relations should be aligned with European and / or Corridor needs; e. g. by introducing cross-border KPIs.

Finally, Mr Sünder presented some examples for possible cross-border KPIs as they would be particularly relevant for cross-border freight journeys. From the experience of SBB Cargo International, these could be based on three different categories:

- **Availability of market oriented rail infrastructure:** indicators could refer to normal train length (740 m) as a percentage of the whole corridor, to heavy paths (25 t) as a percentage of the whole corridor, to the number and length of passing loops for temporary train stops;
- **Capacity:** indicators should refer to the end-to-end journey time, the spare capacity for extra trains and the number of planned / unplanned stops;
- **Operations:** indicators should be about the end-to-end punctuality.



How should national and EU rail market legislation evolve to safeguard better performance

Alice Polo, Senior Interoperability and Safety Manager, UNIFE

Ms Polo presented the point of view of the rail supply industry focussing on how to achieve better performance. She presented 6 main aspects that are of relevance for the rail supply industry and have to be improved by the railway industry to increase its competitiveness.

- **Reduce Administrative Burden.** In UNIFE's view there is a growing administrative burden for the rail industry resulting from new national legislation that is added on existing European legislation. The reduction of unnecessary national rules should be one of the main targets of the Fourth Railway Package.
- **Innovation.** It has to be recalled that research and innovation in the rail sector are essential also with regard to larger societal challenges (climate change adaptation, decarbonisation, digitalisation).

Research and development is needed to increase capacity and reliability of the railway system while reducing its cost. The Shift2Rail program aims at delivering whole industry solutions by working together with the supply industry, IMs and RUs with the support of academia. UNIFE is the coordinator of two Shift2Rail lighthouse projects (Roll2Rail and IT2Rail) and involved as partner in another Shift2Rail project (In2Rail), and is thereby contributing to a consistent, cost-efficient, high capacity European rail network.

- **Digitalization.** A "UNIFE digitalisation Platform" was created in order to establish a better exchange within the rail supply industry about this topic. By this means the following priorities were identified: passenger experience, cyber Security, predictive maintenance and ERTMS.
- **Quality.** With regards to quality Ms Polo presented the IRIS (International Railway Industry Standard) -Certification: this has helped the industry to improve quality significantly over the past 10 years.
- **Financial support.** Ms Polo recalled that performing systems requires continuous investments. The funds available within the Connecting Europe Facility (CEF), the Cohesion Fund and the European Regional Development Fund (ERDF) need to be used efficiently.

Currently the first railway project under the new European Fund for Strategic Investments (EFSI) is realized in Italy: new trains for Trenitalia to operate within Lazio, Tuscany, Veneto, Piedmont and Liguria are financed with EUR 300 million.

- **European Parliament Resolution on the Competitiveness of the European Rail Supply Industry.** UNIFE fully supports the conclusion of the European Parliament resolution and would like all the different chapters identified to be fulfilled with the support of the European Institutions.

Conclusions

There is need for a strong support from the European and national institutions to increase the industry's competitiveness. The rail supply industry welcomes the Commission's "soft" approach to regulation that takes account of the entire sector approach. Concretely and according to the experience of UNIFE one of the most useful tools to increase the quality of products is adopting the IRIS standard.

The evaluation index for transport disruption

2 May, 2016
12th Florence Rail Forum
"How to define, measure, and improve the performance of the European railway system?"

Ichiro Takahashi
Executive Director
Brussels Branch
East Japan Railway Company (JR East)


The evaluation index for transport disruption

Ichiro Takahashi, Head of Brussels Office,
EJRC

Mr Takahashi presented a very concrete example of how KPIs are used in the Japanese railway system: namely optimization of RAMS as an evaluation method for transport disruptions that measures the effect of disruptions on passenger satisfaction. This evaluation method was developed by JR East and entered into force in 2012.

RAMS stands for the four assessments of reliability, availability, maintainability and safety. It requires the railway systems to which it is applied to maintain good balance, considering these four assessments as well as the need to have an overall economic efficiency. According to the established Railway Management System, attainment of in-service safety and availability targets can only be achieved by meeting all the reliability and maintainability requirements and controlling the ongoing, long-term, maintenance and operational activities and the system environment. It is interesting to notice that what is considered a "system" is decided on a case-by-case basis: it can be a single element/device or a large-scale system for which – though – some gaps still remain.

The existing evaluation method for transport disruption takes into consideration: (1) Number of train service cancellation, (2) Number of delayed trains, (3) Train delay time, (4) Number of passengers affected by transport disruption. Matching the RAMS risk levels and the frequency of these risks to happen, Mr Takahashi described the JR East idea and the levels of acceptability of the disruptions by the customers. This existing evaluation method does not always provide a clear picture on how much a transport disruption really affected the passengers though.

Therefore, JR East has developed a new index that enables more realistic evaluation. The system is called "POINT" (Personage Of INfluence on Transportation) and, basically, describes the number of passengers that had to wait longer than usual as a consequence of a disruption x delayed time.

Mr Takahashi outlined the calculation that is used to determine how an incident affects passengers across the system. The effects are then turned into a score according to a scale. In the case of internal causes, the result is multiplied by 3, to account for the negative effect on the company's image: a study had suggested that the level of complaint from passengers was three times higher for delays caused by internal causes than external causes. When a significant number of passengers are affected special measures are executed to revise management procedures and trace the progress over the following years.

In conclusion Mr Takahashi stressed that, after safety is sufficiently taken care of, availability should now be focused on in light of customer satisfaction. On the basis of "POINT" is possible to identify the required investment to make railways more attractive.

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	4 th Florence Intermodal Forum
9 March 2016	Executive Seminar on Air Traffic Management
2 May 2016	12 th Florence Rail Forum
3 May 2016	ERA-FSR Transport Executive Seminar on Digitalization
24 June 2016	5 th Annual Conference on the Regulation of Infrastructures
23 September 2016	6 th Florence Urban Forum
21 October 2016	8 th Florence Air Forum
25 November 2016	13 th Florence Rail Forum

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