

15TH FLORENCE RAIL FORUM SUMMARY

"PRIVATE FINANCING OF RAILWAY INFRASTRUCTURES"

A SUMMARY OF THE PRESENTATIONS

Florence, 24th November 2017

Editors: Matthias Finger, Nadia Bert, David Kupfer, Kathryn Bouchard

Forum Summary Document

PROGRAMME

08.30 - 08.45	Welcome coffee					
08.45 - 09.15	Introduction to the Forum					
	Matthias Finger Transport Area of the Florence School of Regulation (EUI) and Chair of Management of Network Industries (EPFL)					
	Karel Vinck European Coordinator for ERTMS					
	Keir Fitch European Commission, DG MOVE					
09.15 - 11.00	What are the biggest railway investment challenges and how can public and private funds address them?					
	Paul Mazataud SNCF Réseau					
	Frank Miram DB					
	Luis Nistal Martínez ADIF					
	Luca Arnold SBB					
	Round Table Discussion					
11.00 - 11.15	Coffee break					
11.15 - 12.45	CEF2, EFSI and MFF – which role for private investment in the context of the EU's future financial framework?					
	Keir Fitch DG MOVE					
	Alberto Mazzola FS Italiane					
	Victor Vaugoin ÖBB					
	Raffaele Zurlo Brenner Basis Tunnel					
	Round Table Discussion					
12.45 - 13.45	Lunch break					
13.45 - 15.00	How can the rail sector attract private capital? How to ensure that private investment in infrastructure will guarantee sustainability?					
	Beat Mueller Swiss Postbus					
	Kenji Murasaki JR East					
	Round Table Discussion					
15.00 - 15.15	Coffee break					
15.15 - 16.45	Private money for (public) infrastructures what can be learned from past experience, other sectors and other regions?					
	Daniel Herfurth University of Konstanz					
	Lorenzo Casullo OECD					
	Veronica Elena Bocci DITECFER					
	Round Table Discussion with all speakers and participants					
16.45 - 17.00	Conclusions					
	Matthias Finger Transport Area of the Florence School of Regulation (EUI) and Chair of Management of Network Industries (EPFL)					

The present document summarises the content of the presentations delivered during the <u>15th</u> <u>Florence Rail Forum</u>, 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 <u>florence-school.eu</u>, 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.



In his introduction to the 15th Florence Rail Forum, Mr Karel Vinck, European ERTMS Coordinator, reflected upon the current critical moment in the history of European railways. He stressed the need to fundamentally change the traditional way of doing business and the mentality of European stakeholders towards a more rational and evidence-based approach. To do so, he started illustrating the framework of financing as well as some priorities in the 2030 horizon, the date when the European Rail Traffic Management System (ERTMS) should be operational on the 9 Core Network Corridors (CNC).

Looking back, Mr Vinck acknowledged that a lot has been done in the past 10 years in building and maintaining an interoperable railway system. However, he stressed that the railways in the European Union (EU) will be interoperable only when the trains will be able to run from north to south and from east to west on the European tracks without any major obstacle whether technical, operational or administrative. And this is not yet the case.

Mr Vinck explained that the main hindrance to interoperability was the signalling system. Each Member State had its own system, and all of these different systems had to be reduced to one, which today is known as ETCS. Thanks to the work of many executives, from Member States to infrastructure managers (IMs) to in the industry, today ERTMS enjoys both the necessary support and tools, which can be summarised as follows:

- 1. ERTMS is legally agreed by 28 Member States including the UK to be implemented as the basic system for all;
- 2. The deployment of the full interoperability system will be along the lines of the 9 European Core Network Corridors, which are getting operational;
- 3. The European deployment plan has been officially adopted and it includes very ambitious targets based on the priority to make the railway undertakings (RUs) competitive on an efficient and compliant EU infrastructure;
- 4. The funding of the program agreed by the European Commission and the Member States allocates significant financing means for the realization of the plan. The stakeholders have signed important Memorandums of Understanding (MOUs), and the European Union Agency for Railways has been recognized, and an action plan has been set up to follow the European deployment plan.

Mr Vinck stressed the importance of the deployment plan, an instrument which was drafted in 2016 and submitted for approval in 2017. Its main characteristic is that it answers to the need to reach the objective of interoperability and to balance it with the availability of means, both financial and human. The

deployment plan was supported by an action plan, which includes firm commitments to achieve interoperability following 4 principles:

- Users first, and not design first. This is a fundamental change from an approach that used to see the IMs deciding on what they wanted leaving the RUs to adapt. This principle should be turned around: RUs will be equipped with one standard across the EU Member States. IMs will have to accept this and work together with them.
- 2. Standardized on-board equipment.
- 3. Focus on the implementation over two phases. Thanks to concrete plans for 2017 and 2023, it is more likely that pressure will be perceived on the system. Concretely, the goal of 40% of the implementation of ERTMS finished by '23 would help in achieving the second part of the program in 2023-2030.
- 4. Cost structure that supports competitiveness of the railway system. There are some business cases on the Core Network Corridors which make them attractive for investment. It is necessary to introduce to the system the importance of financial returns on investment. This is not a classical approach to railway financing but in the future financial returns need to be present for investments in railway infrastructure.

Mr Vinck suggested that to tackle the challenge of delivering a competitive sustainable passenger and freight service we must go further than the action plan. He listed a set of crucial questions for the railway industry:

- How are we matching our words and deeds?
- Do stakeholders understand they must accept to cooperate?
- Is the EU industry prepared to get closer to IMs and RUs not in the traditional buyer seller relation but in a common striving to deliver the requested quality of infrastructure and rolling stock equipment and services?
- Are the national safety authorities ready to consider the interoperability requirement as predominant compared to the existing national rules?
- How can we match the funding and financing over a long period covering more than 10 years?

Mr Vinck then briefly presented the basis of the business case approach the commission is working with. Business cases are made for each of the 9 corridors based on three scenarios: first, a conservative scenario that simply takes all the data and asks what is the return? Second, a more ambitious scenario where some realistic improvements are estimated based on existing knowledge. Third, a more ambitious scenario is testing the impact of a full track-side Level 2 ERTMS deployment. This scenario serves as a theoretical reference to illustrate the benefits possible with a full deployment. The scenarios are regularly updated based on newly available information and data.

The success of the interoperability objective is directly linked to the attitudes of each of the stakeholders. An overall positive attitude can improve the success of the two phase European deployment plan. A successful deployment depends also on everyone's commitment and willingness to enter unknown territory especially when it comes to deploying new digital technology. A change of attitude also implies to stop thinking about the railways as an economic stimulant but as an economic and social strategy. If we are sufficiently aware of these opportunities, then we cannot shy away from the efforts needed to realize them.



Rail: EU funding context Keir Fitch Head of Unit Rail Safety and Interoperability European Commission, DG MOVE

Mr Keir Fitch, Head of Unit "Rail Safety & Interoperability" at DG MOVE, introduced the subject of the 15th Florence Rail Forum – financing of railway infrastructure – stressing that this is a key issue, because it is related to the challenges and the opportunities ahead for the rail sector in the upcoming years. And the railway sector will be at the core of the mobility mix of the future. In fact, railways should play a pivotal role in ensuring decarbonisation, providing safe and effective access to cities and developing freight crossing throughout the continent.

What are the most profound challenges for the sector? According to Mr Fitch, the **historical dependence** of the railway sector on public finance, which is now under constraint, must be borne in mind. In a context of increasing competition from other transport modes, he stressed that rail remains politically important - because it is considered as a safe and clean transport mode. But, with development of automation and increasing decarbonisation of other modes, some of the perceived advantages of rail may be reduced.

Mr Fitch explained that the great dependency on public money grew over the past 50 years and subsidies for infrastructures have been fairly accepted. Because of this, business investments have been contrasted. Even in those cases where new infrastructure was built (and building new infrastructure is much less risky than updating the old one), public money has been used. However, we should concede that a major why rail is heavily subsidized is to deal with the market failures and a **lack of a level playing field**. If the other modes properly internalized their externalities, it would be easier to make rail economically viable. Bold governments sometimes make steps in the right direction but fully addressing the issue is politically very hard, so very often distortions go uncorrected. This justifies the continuing subsidy of rail, but makes it harder to go out and make a normal business case.

Mr Fitch stressed that **technology has a huge potential for railways**. Several novelties, from broad automatic train operation to automated traffic management, and passenger/freight information flows could be introduced. Furthermore, technology could contribute to bringing down the costs of maintenance through remote monitoring of infrastructure and could seize the opportunity and need to transform those parts which are not electrified to take advantage of clean alternative fuels and stay competitive. In particular, he stressed the need to develop financing models and robust investment plans to transform the whole system, which does need many billions of euros. This could build on the integrated planning done for ERTMS deployment. In this respect, Mr Fitch called for general commitment to solve the chicken-egg dilemma: in fact, it is not enough to invest on part of a corridor, but rather the entire corridor/network needs to be considered. Investments are needed across the whole network to really transform it, otherwise there would be large sums of money invested without seeing the benefits to the public and without delivering return on investments. Mr Fitch stressed that there are cases that could be of interest for private investments and PPP, yet business cases have to be proven. Today we need to see how we can deliver that proof: if we can, then there is a huge case for rail for the future.

What are the biggest railway investment challenges and how can public and private funds address them?

Paul Mazataud

SNCF Réseau

Mr Mazataud addressed the biggest railway investment challenges and how public and private funds can answer them. In France, investments are currently focused less on new lines and more on conventional existing lines for several reasons. Firstly, the existing network is too old. In France, infrastructure is around 33 years old. Therefore, without new investments speed limitations will need to be imposed or lines will need to be closed. Secondly, there are performance problems on some lines. New technologies can improve performance. Thirdly, most necessary new lines have already been completed. And finally, investing in existing lines is more environmentally friendly than investing in new lines.

Furthermore, more and more renewals will be necessary because of aging infrastructure. In some cases those renewals can be combined with enhancements and digitalisation. Mr Mazataud pointed out that ERTMS is good but not as good as it can be if it is combined with automated traffic management and train operations. All of this together is forming a new paradigm for the rail business. There is a business model for digital/smart railway that will be similarly meaningful to the industry as automation is for the automobile industry.

Investment volumes in Europe grow and will continue to do so. Investments have increased from €20bnin 2011 to €34bn in 2014 including renewals. According to Mr Mazataud this growth should continue for three reasons:

- 1. For western countries, renewals are necessary to avoid speed limitations and closures in the future.
- 2. For central and eastern European countries there is a massive investment program funded by the EU Cohesion fund.
- 3. All countries will need to integrate digitalisation for increased performance, safety, productivity, and interoperability. The European Court of Auditors recently calculated that for ERTMS alone the investment needed will be €80bn by 2030.

Therefore, cumulative investments in Europe between now and 2030 will be somewhere between €500bn and €1,000bn.

How to fund these investments? There are three potential sources: first, revenue from operators as is normal in other businesses. In railways this would be the payment of track access charges by the operators. Today this represents only approx. 30% of total expenses for infrastructure operators. It varies from 0-44% across Member States but averages at only about 30% and is therefore not enough to fund all necessary investments. Most of the funding comes from a list of grants from local, national and European authorities. In some cases, investments are also funded by "bad debts", i.e. debts that are not financially backed by future revenues. In essence, these bad debts stay indefinitely in the balance sheet of the rail infrastructure manager (IM) unless a public authority decides to take it back.

The rail sector in general is highly subsidised, and the scope for private investments backed by tangible revenues is somehow limited to track access charges.

The majority of European IMs are fully financed by their governments. This is for example the case in Austria and, since 2014, in the United Kingdom. The main argument is that as the government provides a significant amount of grants to the IM, it is easier and better to fully control its financing. The consequence of this situation is that IMs are not normal companies and more comparable to an administrative body.

SNCF Réseau is one of the rare IMs that regularly tap the financial markets to finance its business.

Unfortunately, this does not reflect a healthy situation as, with €46bn of debt, the debt/operational margin ratio is not sustainable.

In its history SNCF Réseau has put 5 PPPs in place on new infrastructures – either high speed lines or stations – and it was done mainly because of a lack of human resources. The experience has been positive with budgets and deadlines being kept. However, there is no intention on the part of SNCF Réseau to engage in any new PPPs as there are no investment in new lines planned in the future. Setting up a PPP for an existing line has proven difficult in the past.

Therefore, it can be said that private financing is limited, but not impossible, in the rail infrastructure industry. Where it exists, it is mostly concentrated on new high speed lines, which is not where the sector will be investing in the near future.

The European Commission, however, has put forward the blending scheme to finance new projects. It is a combination of grants and private financing. Assignment of grants is subject to the amount of debt that is at least equal to the requested grants. This is a good idea for two reasons: firstly, it takes into account that most rail projects need grants to exist; and secondly, it creates strong incentives for IMs and governments to tap financial markets. Member States are thereby pushed to transform IMs into normal companies. In the future the blending scheme should be kept and used even more often.

To conclude, there is a need for all possible innovations for private financing in the rail business. This will stimulate investment in not just rail but the economy overall. Private investment in the rail business will also enable rail IMs to be more independent from their governments and to operate more like regular companies.

Florence Rail Forum: Private and Public Finance for Railway Infrastructure Florence, November 24th, 2017

latory Affairs | Deutsche Bahn AG | 24.11.2017

Private and Public Finance for Railway Infrastructure

Frank Miram Director Economic, Political and Regulatory Affairs

Deutsche Bahn

Like other countries, Germany has an investment challenge owed to large replacement backlogs and to digital upgrades of the networks that will need to be financed. Digital upgrades such as ERTMS can enhance capacity by solving bottlenecks without requiring new infrastructure. In Germany, infrastructure managed by DB is financed approx. 2/3 privately, i.e. from DB's own funds, and 1/3 publicly. For the moment EU funds cover around 4% of the public grants. DB's own funds cover 100% of OPEX and about 30% in the long-term average of investment expenses. These private resources are mainly refinanced from infrastructure access charges paid by the railway undertakings. CAPEX is largely financed from public funds. Public finance is crucial to maintain user charges at a competitive level. Different criteria need to be applied for ensuring efficient and purposeful use of funds depending on whether they are private or public. Private funds imply an expected return on investment, whereas public spending is derived from a cost benefit ratio taking into account external effects. Regarding the efficient use of private funds, the German experience shows that a combination of incentive regulation (price cap regulation) and private corporate governance structures are the best measures to ensure an efficient use of own funds.

Regarding the efficient use of public grants, Germany has had positive experiences with multi-annual contracts.

What would an appropriate new European multi annual financial framework look like? Most importantly, rail infrastructure needs adequate EU funding to accompany national financing schemes. To cope with the large challenges Member States are facing, funding levels should be maintained or increased. The sector has to put forward arguments for why it is better to invest in rail infrastructure projects as opposed to others. Railways need to join forces to put forward their arguments when bargaining. Recent CEF conferences indicate that the Commission is aware of the importance of a high class interconnected European rail network for a competitive single market.

Also, funds must be used efficiently and non-bureaucratically. The instruments currently in place are working well but could be improved. The new blending instruments, which include the use of small public money to trigger larger private investments, do not have much added value for the railways, at least in Germany. Blending is similar to a classical PPP project which may help railways in getting attractive credit and loan conditions from the capital market. But ultimately rail can only be financed by users and taxpayers. Private investment will not cover the necessary volume so blending and PPP models cannot replace public funds.

DB does apply for blending calls where it is useful, but it is of limited scope. The flagship, the CEF program was successful and should continue beyond 2020 with the following priorities: ongoing financing of the TEN-T core network. An INEA midterm review confirmed its success, and rail profited greatly from the program. Also, sustainability and environmental performance should be a funding priority in the future,

as should innovation and digitalization ERTMS and automated train operations have huge potential for the future, but investment requirements are extremely high. Today, when experts come forward with investment plans we've heard numbers around €40bn for Germany alone through 2030. It is not realistic to raise these figures from public sources, yet technology is improving and may bring costs down. Rail freight in general needs attention. A master plan has been put into place in Germany to improve the sector's competitiveness. The Netherlands are also setting up a master plan, and a European master plan would be desirable, too.

Finally, Shift2Rail, the research and innovation program for rail, launched in 2016 with a volume of €900 million (€420 million EU funding) contains a wide range of innovation topics. Shift2Rail II should be vested with higher EU funding volumes, focusing on research in digitization, automation (e.g. automated coupling) and environmental friendly vehicle technologies (e.g. hybrid-technologies).

In conclusion, the instruments available at the European level provide a good toolbox which can still be improved. Public funds are and will always be the main pillar of infrastructure financing and the industry must fight for high level public support.



What are the biggest railway investment challenges? How can public and private funds address them? Luis Nistal Martínez Vice-director of EU Funds D. Financial Planning and Budgeting

ADIF

Mr Nistal Martinez introduced the challenges being faced in Spain in railway infrastructure funding and how Spain has dealt with them.

He started by underlining the ultimate objective of supporting economic competitiveness: it is to benefit citizens, users, freight, companies and overall development.

Improving the rail system refers to improvements in safety, service and sustainability. Innovation, digitalization and people are all imperative and new technology will allow Infrastructure Managers (IM) to interact more effectively with all stakeholders.

Where should investments be made? First, global and basic networks need to be developed. It is important to focus investment where people need it. Sometimes this can also be a simple electrification project.

Mr Nistal Martinez supported upgrading existing networks to make them interoperable. All investment in the coming years needs to be focused on and contribute to interoperability. There are new transport modes, for example car sharing, which need to be integrated into the overall system to become accessible to all stakeholders. Multimodality is becoming a topic not just for ports and freight but also for urban transport.

He focused on the importance of accessibility for all users, and the use of predictive maintenance technology to prioritize where any renewals should be done.

Mr Nistal Martinez underlined that co-financing is necessary to cover the funding gap from what is not covered by the access charges. Traditionally in Spain the government has co-funded investment through equities and subsidies, and long-term finance from the EAV. In the Spanish case EU grants are close to 20% of the total budget for infrastructure.

One of the key issues when it comes to funding from EU grants is that if objectives are not met, the funds are lost. This is a good motivation for achievement. A framework contract with multi-annual investment plans not just for new sections but also for renewals, with specific KPIs, should be a way to give a subsidy that is aligned with the political development of the network.

On the private investment side, we have seen that if a section is tendered as a whole (tracks and assembly, signalling and telecommunication facilities) it is better than if the processes are split. Some aspects are more capital-intensive and risky, so it is easier to spread across project aspects.

Finally, Mr Nistal Martinez mentioned that the Spanish experience with PPP projects have been positive, because tendering started when projects were mature. When projects were not mature, PPP experience

was not as good as the conventional way.

To conclude Mr Nistal Martinez listed some other examples for private financing currently present in the Spanish system:

- Transfer of credit rights to an investor Project bonds •
- •
- Green bonds



Managing advantages of PPP with public funding -Financing of Rail Infrastructure in Switzerland

Luca Arnold Head of Regulatory and International Affairs

SBB

Mr Arnold introduced the Swiss perspective to the railway investment challenges and ways to address them through public and private funding. He pointed out that Switzerland had recently changed its infrastructure funding model based on a public vote.

Mr Arnold underlined that infrastructure needs to be seen not just as the physical infrastructure, but also the digital infrastructure. Investment in digital infrastructure is often much more efficient, and it is becoming more important.

Looking at PPPs as a model, what are the assumptions for such a model to work in rail infrastructure? First of all, the priority must be the maintenance of existing infrastructure; the remaining funds can be used for building new infrastructure. The subsequent maintenance cost of any new infrastructure needs to be fully taken into account. This lifecycle approach is also a pre-condition for PPPs. Risk allocation is also crucial because private investors will always make sure to minimize their own risk and shift risk as much as possible to the public entities. When it comes to raising funds, government or state-owned companies are generally better placed to raise funds especially in times of negative interest rates.

Switzerland recently created the public rail infrastructure fund based on a public vote. Whereas previously, there was a time limited fund for special projects, this new system based on a permanent fund is more sustainable and long term oriented. The funding is entirely public and comes from the ordinary federal budget together with earmarked revenues. The earmarked funds give politicians an opportunity to incentivize a shift from road to rail and thus promote policy goals through infrastructure funding. Earmarked funds come from a special performance based heavy vehicles tax and partly from the mineral oil tax. The fund's earmarked deposits are indexed and evolve together with inflation so that the fund adapts to changes. The fund is not just for expanding the network but primarily for maintaining and operating it.

The general principle is important to highlight once more, only once operation and maintenance costs are covered, expansion of the network by new infrastructure projects is allowed. In the long term in such a dense system as in Switzerland it is preferable to enhance efficiency and capacity of physical infrastructure by investing in digital infrastructure rather than expanding the physical infrastructure.

Regarding private investors, as in other countries, railway stations are very attractive for being lucrative. In Switzerland it was a conscious political choice to make them an integral part of the railway system in order to cross subsidize infrastructure through their revenues.

In conclusion Mr Arnold pointed out that Switzerland believes in an integral funding system that looks at the entire lifecycle of the infrastructure, which must be seen as a holistic system. One single public funding source, in the Swiss experience, is the most effective in balancing the many interests in the system and achieve what is in the overall systemic interests.



Rail: EU Funding Context

Keir Fitch Head of Unit Rail Safety and Interoperability European Commission, DG MOVE

Mr Fitch began with an overview of the current funding situation, which had seen an increase in resources for the 2014-2020 Connecting Europe Facility transport budget to achieve greater investment in technology and digital. A midterm review is underway at the moment and so far, objectives are being reached. Rail has been one of the main beneficiaries, with the biggest part (75%) of CEF funds going to rail. This is positive but also challenging for the future because it has been perceived as unfair by other transport modes who are lobbying to change the balance of the funding. Mr Fitch stressed that to make the case for maintaining such a high share in the future the rail sector needs to address some of the problems notably the slow take-up of ERTMS as has been illustrated by a European Court of Auditors' report.

Looking to the future, the next financing period is going to be extremely challenging. Brexit is a big issue, and the UK has always been a significant contribution to the budget (around 13%), which will presumably disappear. There are also changing priorities because of geopolitical developments, which call for more investment in defense and issues with migration. The Commission still believes for CEF there has been positive economic return on the program so the work going on at the Commission still asks for a significant increase in the CEF budget. The Commission expectation is to make this proposal in May or June next year, which would be just the beginning of negotiations with Member States and European Parliament.

The Commission's approach is that given these pressures on the budget, we should see some more innovative financing methods. The EFSI is seen as a successful program that is able to leverage the funds that are out in the markets looking for homes. Existing funds need to be leveraged with EFSI2 in the short term and the next MFF in the long term. There will be greater pressure to make more use of non-grant instruments. This is challenging for rail due to the need for substantial public investment counteracting the non-level playing field and the failure of the other modes to internalize external costs. Stakeholders should make a strong case for the continuation of a grant element in funding to rail. There will need to be creative ways to use methods such as blending to obtain necessary funds.

Where are we in terms of EFSI? It has been a success with large amounts of money being mobilized. From the rail perspective though we see that relatively few rail projects are in the total mix and road projects are taking a larger share. It seems that this is also due to toll roads having an easier revenue stream. Rail projects have been successful mainly with rolling stock: it is easier to use private finance in rolling stock projects than for infrastructure because the Return on Investment is more direct.

Finally, Mr Fitch addressed research funding: the Commission hopes to extend Shift2Rail, which they believe has been highly successful in bringing together all stakeholders, resulting in a huge reduction in fragmentation in rail research and more market-oriented research. An area that could be looked at more closely also in terms of dedicated funds is deployment: there should be a structure that guarantees rapid

deployment of technologies. It is important to point out the success of the dedicated research programs Shift2Rail and SESAR JU. Feedback from the rail community would be useful for ideas on how innovation funds could be used in the future. This is important to make the case for the continuation of these important investments in rail innovation.



Which role for private funding for ERTMS deployment?

Innovative Financing, view from FS

Alberto Mazzola

Senior VP International Affairs

Ferrovie dello Stato Italiane

In his introduction, Mr Mazzola pointed out the large investments that are necessary in the upcoming financial period (2021-2027) to complete the large-scale projects in the CEF, and he referred to grants as the most effective way to invest. He presented ERTMS as a suitable case for (public-)private investments.

Mr Mazzola introduced ERTMS and began by pointing out that, despite huge amounts of planning and investment, the project has been running far too slow: in the past 22 years only 10% of the core network has been equipped with ERTMS. So, he presented an idea for innovative financing developed by Ferrovie dello Stato Italiane (FS Italiane) in the framework of the roadmap "CER UIC Boosting railways for the 21st century" that could have the project running more quickly. According to this idea, if prices remain the same, the installation of ERTMS on the core network (53,000km) and 50% of vehicles will cost roughly 15 – €20bn. Together with DG MOVE and the major European insurance companies, FS Italiane identified the Rhine-Alpine Corridor (RALP) as pilot project where to test the ERTMS implementation scheme. It emerged that private capital could be ready for a long-term investment on a project like ERTMS deployment that should have revenues in the long term.

The idea is to set up a fund for Infrastructure Managers (IM) and Railway Undertakings (RU) where the payment to RUs is not reimbursed until ERTMS is implemented. If the infrastructure managers do not equip the corridor then RUs shall not reimburse the funding. This idea is an incentive for the ERTMS deployment, as it provides for a grace period to RUs before reimbursing the funding received and favors dismissing the legacy system reducing IMs maintenance costs. Mr Mazzola presented some figures on the nine Core TEN-T rail corridors and the return of ERTMS investment for each corridor. Explaining the details of the functioning of the deployment fund structure, Mr Mazzola stressed that the structure might be improved and adapted to specific circumstances, but a European scale deployment should be achieved in 7-10 years, and yet there must be an important role of the Commission to undertake a project of this scale that involves many Member States. None of the stakeholders can do this project on their own; on the contrary, a scheme for Europe is necessary. Mr Mazzola conceded that the project can start on a corridor base, yet it should be replicable and extensible to the rest of Europe.

To conclude, Mr Mazzola noted however that there is a general lack of funds which is holding the entire ERTMS project back and upholding the need for the legacy system. He stressed the need for the railway sector to operate as a system (passengers, freight, infrastructure managers should work together), and highlighted that only the Commission has the power to bring everyone together for such a large-scale project. The obstacles are not technical, but are rather financial and on the scalability, replicability and ability to test the mechanism.



The Austrian System of Financing Railway Infrastructure

Victor Vaugoin Head of Brussels Office ÖBB

Mr Vaugoin introduced the railway financing system in Austria, which can be described as traditional. ÖBB is a joint-stock company owned by the government which operates and manages a medium sized network of about 5,000km, around 600 of which are equipped with ERTMS, although just baseline. ÖBB benefits from EU funding schemes including CEF grants and EFSI, which financed a large fleet of new rolling stock. Perhaps the size of the country means that the scalability of the projects does not lend themselves to PPPs. There is not a strong business case for these financing schemes.

ÖBB used to issue bonds until 2014, but now is no longer active on the capital market. They are financing themselves through a 6-year masterplan agreed to by the government giving the Infrastructure Manager the necessary security for its planning. The Brenner-Base tunnel is of course using a chunk of EU funding, but most projects are financed is through government backed bonds, which for ÖBB is a fairly unbureaucratic process. The easiness with which the Infrastructure Manager can access government grants may perhaps even lead to complacency. Yet in times of very low interest rates it is the cheapest way of refinancing the companies' debt.

The current system is cheap and effective, and the government of Austria would like to continue the current funding scheme. In Austria some cross-financing has been used as proposed by the eurovignette directive, although currently it is only available for mountainous areas. Now, a proposal released by the Commission last May allows for an expansion of the scope. The amounts that can be generated through cross-financing are by far not enough, yet they have an important steering effect, which can be highly beneficial for environmental reasons especially for Austria's congested transit routes.

ÖBB would like to see existing EIB loans for blending projects and considers the finalization of the core network as a trans-political goal of the European Union. ÖBB is aligned to the current system, yet it has become clear recently that the Commission is prone to increase the use of PPP. Historically there have been many examples of different ways of financing railway infrastructure through public and private investments and one can learn from the experiences. Austria does not claim to follow the best or only way but it has found a solution that is working well for them.

The political and regulatory risks of PPPs need to be kept in mind especially for smaller markets: in the event of lower than calculated traffic volumes it is often the public authority that is blamed for the lower income generated by the infrastructure. ÖBB understands the difficulty of the Commission to defend rail sector funding in the negotiations for the multi-national framework. Yet Austria would like to keep the current system as much as possible as no better methods have been proven to be working.



The Brenner Base Tunnel -Lessons Learnt Raffaele Zurlo

> CEO BBT SE

Mr Zurlo focused his presentation on the Brenner Basis Tunnel Project and its institutional framework. In the beginning he showed the nine railway corridors highlighting the Scandinavian – Mediterranean corridor, where the Brenner Basis Tunnel is being constructed between Italy and Austria between Fortezza (I) and Innsbruck (AT). The section is not only of strategic significance but also environmentally a remarkable section. The new tunnel will replace the old line which was constructed in 1876 and is still in use today. The tunnel crosses the Alps at their base staying at an elevation of 790 meters which will improve the speed of the trains and the loads that each train is able to carry. This will result in shorter travel times and more efficient overall transportation, which is crucial for the overarching goal of achieving significant modal shift.

Mr Zurlo also highlighted the historical dimension of the project in the context of European integration: he pointed out that in the very same region where the tunnel is being built, battles were fought between Austrians and Italians about a century ago. Today, both countries work together on this infrastructure project. This is mainly thanks to the European project.

Going into some more details about the project Mr Zurlo pointed out the tunnel is rather a "system of tunnels". He showed a cross-section of the tunnel being constructed, with two railway tunnels about 10 meters in diameter connected with galleries that provide the opportunity to use one railway tunnel as a way out in case there are problems on the other tunnel. There is also an exploratory tunnel built ahead of the railway tunnels, in order to carry out geological and geotechnical investigations.

So how was this project realized? Essentially through the establishment of a so called special purpose vehicle (SPV) company on the parts of Italy and Austria, which each hold 50% of shares (*Brenner Basistunnel BBT SE*). In Austria the shareholder is ÖBB and in Italy it is Ferrovie dello Stato. Since 2007 when the project began, \in 1.47bn have been invested and 80km out of 230 total km of tunnels have been excavated and an exploratory tunnel has been built. The cost is borne by Italy and Austria, with each state funding half of the project with the support of EU funds. The cofounding rules for the project prescribe that the EU can contribute up to 40% for the costs of construction and 50% of costs for research activity. On the Italian side all civil work activities have been contracted and that point is almost reached in Austria as well. Construction of the railway tunnel should be complete in 2027. The TEN-T program and CEF programs are contributing about \in 1.6bn to in total. Each year the project undergoes a construction risk analysis with updates to forecasts for the timetable and project costs.

In conclusion Mr Zurlo pointed out his most important lesson learnt from the project, which is the importance of establishing an independent and properly working SPV as is the case for BBT-SE. Such a company needs a management that is fully authorized to develop the project independently without being affiliated to a government. Mr Zurlo also pointed to the crucial role of the European Union and suggested an even stronger involvement of the EU actors in supervisory or even management boards.



Japanese national railways' reform and focusing on nontransportation businesses

Kenji Murasaki

Deputy Director Brussels Office JR East - East Japan Railway Company

Mr Murasaki began his presentation introducing Japan National Railways (JNR) which underwent substantial reform in 1987. The company was established in 1949 as a public corporation but in 1964 faced some major challenges: first, problems with the public corporation system and second, problems with nationwide uniform organization. Historically Japan has vertically integrated private railway companies operating on a commercial basis with retail, office and hotel activities included in their operations. This was the model for JNR's reform.

JR East is the biggest operator and has an annual operating revenue of €24bn. The proportion of nontransport business revenues is 32%. JR East has expanded its non-transportation businesses. In Tokyo station for example, there are shops, offices and hotels. JR East invests in stations in order to make the most of spaces where a lot of passengers are walking. Some spaces had unrealized potential like warehouses, staff offices and meeting rooms that were converted into shops for increased profit. Those spaces were moved to spaces where passengers were not present. The important thing is that retail spaces are located where passengers are.

Mr Murasaki showed images of how JR East has taken advantage of small spaces in stations and on platforms to sell the goods that are the most popular for passengers, and to make stations hubs of activity where people go to spend time and money even if they are not necessarily traveling. They have also introduced a quick payment card option to encourage shopping in their stations.

Advertisements in stations are one of the best ways to get information to passengers. Morning and evening rush hours are the best times for advertising. The JR East group therefore coordinates a project that promotes local regional products thus encouraging more travel, and then more shopping. JR East focuses on town development centered around railway stations, meaning they build new, innovative stations in rural or previously unreachable towns.



Organizational Arrangement and Reform of the Motorway Infrastructure Financing

in Germany

Daniel Herfurth University of Konstanz

Mr Herfurth presented the organizational arrangement and reform of the motorway financing system in Germany as a comparative example for the railway industry. He started his presentation with an introduction to the currently applied dual structure of motorway infrastructure financing in Germany: classically, the federal states (Länder) use and manage the money that comes from the federal level, with the federal level retaining the overall responsibility as well. This system is called "federal order management". In 2003, a second structure was introduced, the so called "VIFG model". The Transport Infrastructure Financing Company (VIFG) was formed as an organization at the federal level to finance traffic infrastructure via PPP projects on behalf of the German Ministry of Transport. The introduction of the "VIFG model" was motivated by two circumstances: first, the states turned out to be bottlenecks for planning which resulted in funds being left unused in some cases. Second, the introduction of a debt ceiling at the federal level reduces the leeway for a system highly dependent on the federal budget such as the "federal order management".

Currently, Germany is introducing a third system which is going to replace the dual structure explained above: The so called "BAB-Gesellschaft" is 100% located at the federal level and will apply the PPP approach on a larger scale. Mr Herfurth described the experience so far under the "VIFG model" which is very similar to the projected "BAB-Gesellschaft". He presented two diagrams comparing the costs of the two models currently employed under the dual structure. In doing so, a contradiction became obvious: according to the Federal Authority on Budget Controlling, costs are equal in both models, while according to the German Ministry of Transport, the "VIFG model" appears to be cheaper.

However, empirical evidence shows that all structures run under the "VIFG model" are actually in debt. This can eventually lead to higher costs for the taxpayer compared to the costs incurred when the state acts on its own via "federal order management". So, disestablishing the "federal order management" completely and applying the new system on a larger scale could lead to the entire system falling into debt. This scenario is not unlikely since the "BAB-Gesellschaft" is not allowed to go into debt and therefore, it depends on using private capital. This risk is also highlighted by the Federal Authority on Budget Controlling which states that private capital creates uncertainty that may lead to higher costs in total.

Mr Herfurth then embedded the case of German motorways in the framework of New Institutional Economics in order to draw some general conclusions about the involvement of private capital in public infrastructures:

- Knowledge as a resource: privates should only be involved if they have additional knowledge. This is not the case in road financing as the federal government has got more experience in building roads.
- Efficiency margin: the larger part of the costs for road infrastructure is the maintenance costs, not the construction costs. There is, however, little margin for improving efficiency in road

maintenance.

• Procurement cost: finding the appropriate private contractor may create more costs than procuring the different tasks involved in road construction directly.

In conclusion, Mr Herfurth underlined the importance of distinguishing the effectiveness and efficiency dimension. While the debate tends to focus on efficiency, the effectiveness (degree of achievement of objectives) dimension is the more important category when it comes to public policy: basic decisions over the desired capacity and maintenance level are truly political and a matter of effectiveness. Thus, they should overrule operation-oriented efficiency goals. If such a perspective is taken, giving large road infrastructure projects to private actors cannot be supported.



Rail Infrastructure Funding and Financing - ITF/OECD Perspectives

Lorenzo Casullo Economist and Policy Analyst

Mr. Casullo brought the perspective of the International Transport Forum (ITF) on rail infrastructure funding and financing in Europe addressing the issue of the financial sustainability of railways. The International Transport Forum is a think tank at the OECD with 59 member countries.

He began by stressing the difference between finance and funding: funding is "money for today", meaning the ability of member states to have a financially sustainable infrastructure. Financing on the hand is "money for tomorrow", which also depends on the ability to pay for it today. Recently the ITF/OECD worked on several roundtable discussions and identified some key issues: why is railway funding not sufficient? And, in the light of insufficient funding, can the railways afford the higher cost of private funding? There are three main reasons for these discussions. First, there is currently an opaque allocation of large sums of public money to railway undertakings, second there are inefficient operations and sub-optimal utilization of networks and (with notable differences between countries) and, finally, rising liabilities and few successful PPPs in the sector.

Mr. Casullo presented some figures on rail industry funding in the EU28. A large part of funding comes from grants or subsidies, some from commercial operations at stations and the majority from revenues and charges (this portion being higher in passenger than in freight). He noted that maintenance expenditures has been rising dramatically currently making up approximately 50% of Infrastructure Manager's costs. Mr. Casullo also showed data comparing investment in Europe with investment in the US and Japan pointing out that Japan which is a more mature system spends more on maintenance and operations than on new infrastructure projects.

So, how can we fix the finance problem with from an international comparison experience? Mr. Casullo noted Japan's ability to benchmark and extract lessons is important to point out. Europe is lacking standardized financial indicators and there is a lack of sharing of best practices across Member States. He presented some suggestions to close the funding gap including a renewed focus on revenue maximization to allow long term stability, better planning and improved efficiency. Revenue maximization and diversification are low hanging fruits that can be achieved through better utilization by improving offers and attracting more customers. Once revenue streams are strengthened, it will be possible to attract better financing deals from the private sector.

Mr. Casullo also touched on improving procurement options, where rail can learn a lot from road, aviation and maritime. A discreet asset like an airport, port, or motorway will always be more attractive for private capital than the railway systems which is more prone to shocks and instability. But measures such as co-funding can reduce risks and ensure future projects are lower risk liabilities. Currently 40% of debt in European IMs is not just bad debt, but it is also dangerous debt because it is off balance sheet. In spite of changes in accounting rules this issue has not been properly addressed yet.



Private money for (public) infrastructures what can be learned from past experience, other sectors and other regions?

Veronica Elena Bocci

Coordinator

Ditecfer - District for Rail Technologies, High Speed, Safety & Security"

Ms. Bocci represented the District for Rail Technologies, High Speed, Networks Safety and Security (DITECFER), the railways technology cluster in Tuscany made up of 125 companies including engineering companies, construction companies and rolling stock manufacturers among which a very high number of SMEs. She presented a series of case studies illustrating what private funding could actually refer to for the railway industry.

The first case presented was motorways in Italy. Most motorways in Italy are run by private companies using the concession model, which could be called the cash-cow model, as a steady operational income covers costs and provides a return on investment, although, technically, there is an operational risk born by the operator. When Directive 2004/18/EC regulating public procurements went into effect, it created a favorable framework for bottom up, private initiatives under the project financing model. Concessionaries operating smaller motorways realized that they had more markets to exploit so many smaller companies worked together forming an umbrella company to create a critical mass for further private investments in new infrastructure, both in Italy and in other countries. Ms. Bocci raised a question mark whether a similar model would be feasible for European railways.

The next case was the Brenner Basis tunnel and the role of road revenues to finance railways. Ms Bocci stressed that when talking about the tunnel it has to be kept in mind that out of the total sum to be invested 1.5 bn will come from the company operating the Brenner motorway in Italy. Their contribution is not owed to the Eurovignette directive (that allows for a reallocation of road charges for infrastructure projects) but to the initiative of the shareholders of the road operating company. The shareholders of the company are the regional public entities of the area through which the tunnel runs through and thus those most affected by traffic and aware of the public need to shift traffic from road to rail. Their support was connected to granting the company an extension of its operating concession so they could recover the funds invested through the road charges. This arrangement has caused some frictions and an EU infringement case had to be mitigated with the European Commission, because some saw the agreement in breach with EU competition law. An agreement was found that significantly lowered the years for which the extension of the concession was granted.

In another case study Ms. Bocci presented the Nairobi-Mombasa Express Railway (470kms) a line that was opened a short time ago. A leading Italian engineering company was awarded the design and engineering of the new railway line. The company was working on a tender financed by the World Bank and the Kenyan government. However, the tender was later cancelled when China entered the market offering their technological solutions, and importantly their money. The Kenyan government cancelled the tender and awarded it directly to China, with direct funding via a concessionary loan that paid for 80% of the \$3.2 bn. Now the Chinese experts are training the Kenyan workers to operate the line in the future.

Ms. Bocci's last case study was the Trans-Kalahari railway project (1,550 km), a railway line for

transporting European-bound coal exports from Botswana to Walvis Bay port in Namibia. A group of contractors were working together on the integrated tender, which included not only the construction of the line but also the enlargement and preparation of the port that needed to be extended in order to cater for large coal ships. However, as the price of coal was dropping the project had to be stopped as it had become economically nonviable. Currently a feasibility study is assessing whether the project could be realized in the future expanding the scope of the railway project from being dedicated to coal to become a multi-sectoral project unlocking positive effects on the economy as a whole.

Some lessons learned were that PPPs and concessions are only reliable ways of financing if they are really profitable. Cross-financing is an effective tool, but should only be used when a real public interest exists and, in the case of the Brenner, when the private investment is balanced with a longer concession. Private rail supply industries should take care of their core business and seek to be paid for their technologies according to progress of works, they cannot replace the tasks of the general contractor.

FSR-Transport: Contacts

Director:	Prof. Finger	Matthias						
	email:		matthias.finger@epfl.ch				To go directly to the FSR-	
Coordinator:	David Kupf	er					Transport home	
	email:		FSR.Trans	port@ei	ui.eu		page wi	th your
	tel:		+39.055.4685.862				mobile device:	
	address:		Transport Florence Regulation	Area Scho	of ool	the of		
			European Institute		Unive	rsity		
			Via Boccac	cio 121				
			50133 Firenze – Italy					

For specific information on FSR-Transport and up-to-date information on our events, please refer to our website following the transport link on the menu bar:

www.florence-school.eu