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**EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT**

*Accompanying the document*

**Proposal for a Council Regulation establishing the Shift2Rail Joint Undertaking**

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# COMMISSION STAFF WORKING DOCUMENT

## EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT

### *Accompanying the document*

#### **Proposal for a Council Regulation establishing the Shift2Rail Joint Undertaking**

#### **1. INTRODUCTION**

This Executive Summary outlines the main findings and conclusions of the Impact Assessment report accompanying the Commission proposal for a Council Regulation establishing the Shift2Rail Joint Undertaking under Horizon 2020 (H2020) for an EU coordinated approach to research and innovation in the rail sector in support of the completion of the Single European Railway Area (SERA).

The proposal follows the White Paper on a Roadmap to a Single European Transport Area<sup>1</sup>, which stresses the need to create a SERA to achieve a more competitive and resource-efficient European transport system and address major societal challenges relating to rising traffic demand, congestion, energy supply and climate change. The Commission Communication ‘Partnering in Research and Innovation’ further highlights that public-private partnerships (PPPs) can help to address such challenges and strengthen Europe’s competitive position.

#### **2. PROBLEM DEFINITION**

##### **2.1. Key challenges in the EU rail sector**

Ambitious EU goals on climate change, energy use and environmental protection mean the railway sector will be required to take on a larger share of transport demand in the next decades.

However, the European rail network still finds it difficult to challenge the dominance of road transport. Despite large public subsidies and significant investments in infrastructure and high technology products, the modal share of rail freight has actually decreased in the past decade, while the modal share of passenger rail has remained constant.

Also, although the European rail supply industry still leads at world level, it is increasingly challenged by overseas suppliers, mainly in Asia, who are investing massively in R&I.

The long-term competitive success of European rail, vis-à-vis both other transport modes and foreign competitors, thus depends on continuous product, service and process innovation, which, in turn, requires large-scale and coordinated investments in R&I.

##### **2.2. The main problems that require action**

Innovation throughout the whole rail value chain is a strategic enabler to complete the SERA and boost the competitiveness of the rail sector. Yet, past R&I efforts in the rail sector at EU level have not been sufficiently targeted towards the broader policy goal of completing the SERA and the market uptake and impact of EU rail R&I projects has been low and slow.

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<sup>1</sup> COM/2011/0144 final

## 2.3. Problem drivers

Four important drivers have been identified which contribute to these problems.

### 2.3.1. *Fragmentation of R&I efforts*

Asides from the fragmentation of R&I budgets across Member States, coordination of R&I efforts in the rail sector is further constrained due to the following forms of fragmentation:

**Fragmentation among railway ecosystems**, with a patchwork of disparate regional and national systems, networks and technical operating standards. The industry has thus had to develop tailored vehicles, designed to meet the unique constraints of relatively small national markets. This high level of product customisation and lack of European standardisation not only constitutes a barrier to the SERA, it also results in increased production costs and low operational margins that do not allow for significant investments into speculative technology-oriented research and limit market uptake of innovations.

**Fragmentation among the subsystems of the rail sector.** Complex interactions between subsystems (infrastructure, rolling stock and signalling equipment manufacturers, railway undertakings and infrastructure managers) limit the potential of improving one specific part of the system or of proposing breakthrough solutions that have an impact on the whole system and that can be deployed in the complete SERA.

**Fragmentation along the innovation life cycle.** EU research efforts focus primarily on pre-competitive innovation at low Technology Readiness Levels so that there are few large-scale demonstration projects and a significant part of knowledge generated by the European R&I projects never finds its way to the market.

### 2.3.2. *Low leverage of EU rail R&D investment*

The current set-up of EU rail R&I limits the direct leverage of EU funding. In rail projects, the average share of private funding was just 34%. Relatively low participation rates of private companies in projects also mean that many projects target relatively low technology levels, thereby limiting indirect leverage effects linked to additional private investments after project completion.

### 2.3.3. *Limited and uncoordinated participation of stakeholders along the rail value chain*

The current "bottom-up" project initiation approach to rail R&I does not allow for a comprehensive programmatic approach and means individual projects are not necessarily aligned together and with overall EU policy goals. The formation of ad-hoc consortia means the whole value chain is not necessarily represented and hinders the continuous collaboration of partners beyond single projects, resulting in reduced confidence among partners.

### 2.3.4. *High costs, risks and lead times of R&I investments*

Generic innovation risks are heightened in the rail sector by:

- Complex interactions between different rail segments and the need for synchronicity between innovations.
- Long product lifecycles, inhibiting the rapid deployment of new rail technologies.
- Unequal distribution of innovation benefits between stakeholders, reducing incentives to invest in new technologies.
- Lack of synergies with other industrial sectors, especially in emerging technologies.

## **2.4. Most affected stakeholders and needs assessment**

The proposed initiative will affect all actors in the rail sector, helping to boost their competitive edge and reduce costs. Other industrial sectors, including tiered suppliers and actors in economic subsectors that make use of the goods and services provided by the rail sector, may also be affected.

By contributing to reduce infrastructure and operating costs, the initiative will help to reduce the scale of subsidies paid out by national governments. By retaining European leadership in the rail sector, this will also help to create new high quality European jobs.

Passengers and freight service users will be indirectly affected as reliability and quality of services are enhanced. Improved competitiveness of the rail sector, combined with increased capacity, will help it to take on an increased share of transport demand, thereby contributing to reduce traffic congestion and CO<sub>2</sub> emissions. Citizens' health and wellbeing will also be positively affected thanks to reduced noise pollution from rail.

## **2.5. Subsidiarity**

### *2.5.1. Legal basis*

The EU's right to act in this area is set out in Article 187 of the Treaty on the Functioning of the European Union, which allows for the setting up of joint undertakings or any other structure necessary for the efficient execution of Union research, technological development and demonstration programmes.

### *2.5.2. Necessity and EU added value*

Levels of rail R&I funding have historically been low, with investments suffering from fragmentation and inefficiencies, due to differences in national programmes. The pooling and coordination of R&I efforts at EU level stands a better chance of success given the transnational nature of the infrastructure and technologies to be developed in support of the SERA, and the need to achieve a sufficient mass of resources. Action at EU level will help to rationalise research programmes and ensure interoperability of the systems developed. This standardisation will open a wider market and promote competition.

## **3. OBJECTIVES**

The general objective is to better align EU rail R&I efforts to support the completion of the SERA, while accelerating the market take-up of innovative solutions, thereby increasing the competitiveness of the EU rail sector, vis-à-vis both other transport modes and foreign competitors.

More specifically, the initiative will seek to:

- Foster focused, coordinated and long-term investment in EU rail R&I;
- Increase the leverage effect of EU rail R&I funding;
- Establish sustained networks and knowledge exchange between diverse stakeholders;
- Mitigate risks linked to innovation;
- Increase the operational performance and cost-effectiveness of rail R&I.

## 4. POLICY OPTIONS

Since R&I activities supporting the rail industry are foreseen under H2020, the options considered for implementing rail R&I activities include:

- the continuation of the **Collaborative Research (CR)** model applicable under 7th Framework Programme while integrating H2020 improvements, such as simplified monitoring arrangements and more emphasis on demonstration (baseline option);
- The establishment of a **contractual PPP (cPPP)**, entailing a flexible contractual agreement between the Commission and private partners to work towards a common programme based on a roadmap drawn up by the latter, using standard collaborative research and innovation projects.
- The establishment of an **institutional PPP (iPPP)**, entailing the creation of a dedicated administrative structure for coordinating rail R&I, in the form of a Union body under Article 187 TFEU, thereby providing a framework for public and private players to work together and take joint decisions.
- The coordination of R&I activities by the **European Railway Agency (ERA)**, entailing a modification of the Agency's founding Regulation to enable it to undertake R&I activities next to its role as a regulatory authority.

## 5. ASSESSING THE IMPACTS

### 5.1. General approach to the assessment of impacts

The analysis covers exclusively the impact of the type of structure set up to implement rail R&I activities and therefore focuses primarily on the following input impacts:

- Focus and coordination of research efforts
- Leverage of EU rail R&I funding
- Broad stakeholder participation and sustained networks
- Mitigation of innovation risks
- Operational performance and cost-effectiveness

### 5.2. Summary of impacts

Under **CR**, the changes foreseen under H2020 will lead to simpler and more coherent participation rules, increasing the accessibility and attractiveness of programmes, facilitating access to specific expertise, and enabling successful applicants to get working faster. There will be more emphasis on innovation and close-to-market activities and a shift to bi-annual work programmes will enable enhanced continuity. However, projects financed are likely to remain at lower technology readiness levels and the synchronicity and coherence of projects will be hindered by individual calls. Ad-hoc project-level participation will limit the possibility of involving the full value chain of stakeholders and of building sustained networks of cooperation. The lack of a clear intellectual property rights framework for multiple projects and the absence of firm industry commitment mean the leverage of EU funds will remain similar to current levels.

A **cPPP** would facilitate the setting of clear objectives, a focus on a limited number of research sectors and coordination across several research themes. The work programme would be aligned to industry needs, containing detailed intellectual property rules, and

including demonstration activities, favourable to strong market uptake. However, given the bottom-up approach and the absence of co-governance arrangements with the Commission, R&I priorities would be less geared towards EU policy goals. Pre-determined industry commitments may ensure increased leverage but this is not guaranteed as legal commitments are limited to single projects. The system of individual calls could hinder the synchronicity of projects and the involvement of actors from the full rail value chain.

Under an **iPPP**, the coordination, programming and execution of rail R&I activities would be the responsibility of a single, dedicated administrative structure, ensuring more continuity and less fragmentation of R&I efforts. The development of a long-term strategy, in close cooperation with all market players, will ensure that R&I projects support the competitiveness of the rail sector, while the Commission's leading role will ensure the alignment of the R&I agenda with SERA objectives. The stable nature of the iPPP, the clear definition of intellectual property rules, and the firm commitment from the EU will give confidence to public and private partners, thus stimulating higher investment levels. Legally-binding commitments from industry to match EU funds will ensure a direct leverage effect at least 30% higher than other options. As the conditions for participation could be managed in a flexible and transparent manner, the iPPP would be able to ensure broad stakeholder participation and a targeted approach towards SMEs.

Putting **ERA** in charge of R&I coordination would ensure that the long-term strategy is in line with EU policy goals, although it could overly restrict it to standardisation and interoperability issues given ERA's core mandate and lack of commercial expertise. The existence of a dedicated structure, with strong technical expertise and established networks, would ensure strong leadership and coordination. Nevertheless, given the absence of formal commitments from industry the direct leverage effect is likely to be relatively low. More importantly, the combination of ERA's role as a regulatory authority with a role of R&I coordination and management could pose a severe conflict of interest. Also, it is uncertain that ERA would have sufficient resources to manage the substantial budget for rail R&I activities.

In terms of cost-effectiveness, although an iPPP would cost marginally more than other options overall, the fact that industry commits to covering half of administrative costs, means operating an iPPP is in fact 17% to 35% less costly for the Commission than other options.

## 6. COMPARING THE OPTIONS

The following table summarises the assessment of the different policy options.

Parameters		Baseline	cPPP	iPPP	ERA
<b>Focus and coordination</b>	Long-term strategy	=	+	+	+
	Relevance to EU	=	=	+	=
	Coordination	=	+	++	++
<b>Leverage of EU rail R&amp;I funding</b>	Direct leverage (private co-funding)	1.5	=/+ 1.5 to 2	++ at least 2	1.5
	Firm commitment	=	+	++	=
<b>Broad participation and sustained networks</b>	Representation of the full value chain	=	=	+	=
	Sustained partnerships	=	+	++	=
<b>Mitigation of innovation risks</b>	Relevance to industry and Technological	=	++	+	-

	readiness levels				
	Intellectual property protection	=	+	++	-
<b>Operational performance</b>	Set-up time	No start-up delay	- 9-12 months	-- 2 years including legislative procedure	-- 3 years including legislative procedure
	Success rates	20%	+ 20-30%	++ 30-40%	= 20%
	Average time-to-grant	250	+ 210	+ 160-240	= 250
<b>Cost-effectiveness</b>	Annual equivalent cost to Commission	EUR 4.7 million	+ EUR 4.9 million	++ EUR 3.2 million	++/-- EUR 3.8 million
<b>Economic, social and environmental outcomes</b>		=	+	++	=

**Legend:** = : baseline or equivalent to the baseline  
+ to ++ : low to high improvement compared to the baseline  
- to -- : low to high worsening compared to the baseline

Based on the assessment and the results of the public consultation, the iPPP option emerges as the most appropriate option to achieve the stated objectives, despite the longer delays required to establish its structure.

#### 6.1.1. Governance structure

The following principles will be taken into account when developing the governance structure of the future iPPP:

- **Strong link with EU policy:** The EU should retain an important role in the iPPP to ensure R&I activities are aligned to EU policy goals.
- **Broad stakeholder participation:** Membership should be open to all actors of the rail sector to ensure a systems approach to innovation, integrating all components of the rail value chain.
- **Expertise:** Scientific and advisory bodies should be set up to provide relevant technical expertise to the iPPP. Also, given its extensive expertise on interoperability issues and integration of the railway system, ERA must be involved in the work of the iPPP.

#### 6.1.2. Budget

Current industry estimates of rail R&I needs range from EUR 800 million to EUR 1 billion. The EU would cover 50% of this cost, putting its contribution at around EUR 450 million, to come from the H2020 budget.

Industrial partners will contribute the remaining 50%, through in cash and in kind contributions. They will also contribute on a 50/50 basis to all administrative costs.

It is estimated that the future structure would require roughly 20 full-time staff and that administrative costs would account for roughly 3% of operational expenditure.

## 7. MONITORING AND EVALUATION

The future monitoring and evaluation system will cover the legality and regularity of transactions carried out by the new structure, as well as the performance of R&I activities to ensure that these contribute to the strategic work programme. This includes:

- Project level and work package monitoring and reporting on a quarterly basis, based on a concise set of reliable key performance indicators defined by the Executive Director and validated by the Administrative Board.
- Programme level monitoring and reporting, based on project and work package data, and including the monitoring of the quality of deliverables against a set of satisfaction criteria; the monitoring of project management to verify its overall quality and the compliance with the strategic work programme.

Evaluations of the implementation of the Regulation, to be carried out by the Commission every three years from the start of the activities of the iPPP and at least one year before expiry term of the iPPP, aimed at assessing whether the partnership in its current setup has been efficient and effective.