



R&D in Railway Transport under Horizon 2020

Massimo Marianeschi
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TRAKO International Railway Fair
Gdansk, 25 September 2013

The European Rail Industry Association

- UNIFE represents the European Rail Supply Industry
- Based in Brussels since 1992
- A trusted partner of **European and International institutions** in all matters related to rail transport
- **Full members:**
Over 80 of the largest and medium-sized companies in the rail supply sector
- **Associated members:**
15 National Associations, representing almost 1000 suppliers of railway equipment
- UNIFE members have an **80% market share in Europe** and supply more than **50% of the worldwide production** of rail equipment and services.





■ 82 Full Members

■ 17 Associate members, incl. 15
National Associations

Growing support from the EU Institutions



***“We have to continue to invest heavily in research and innovation to make sure that rail stays competitive against other forms of transport [...]. The SHIFT²RAIL initiative will be instrumental in driving innovation in the years to come[...]**”*

Commissioner Siim Kallas, 17th June 2013



Growing support from the EU Institutions

“The European Commission will work with the Industry to make the SHIFT²RAIL Joint Undertaking a reality under Horizon 2020”

Jean-Eric Paquet, Director at DG MOVE, Hearing at the European Economic and Social Committee, 24 April 2013

“The Commission does consider that the scale of research and innovation effort and the policy need to complete the Single European Railway Area and build EU leadership in rail technologies presents a good case for a potential Joint Undertaking in the railway sector and will work with the industry to develop a proposal.”

European Commission, Communication on *“Public-private partnerships in Horizon 2020: a powerful tool to deliver on innovation and growth in Europe”*, 10 July 2013

- A proposal of the rail sector – elaborated since 2009 – for an ambitious **large-scale, market-oriented industrially-driven and multiannual R&I programme** that aims at helping EU rail industry to retain world leadership and at making the rail mode always more attractive
- A **public-private Joint Undertaking** under **Horizon 2020**
- Estimated budget of **1.15 billion Euros** over a **six to seven year period**
- **Green light of the European Commission** since June 2013
 - Launch of the pre-legislative process at EU level (public consultation + impact assessment phase)
 - **EC Legislative proposal** planned for the **end of 2013!**
- **Consortium ready** to build the Joint Undertaking in 2014 (pre-JTI R&D activities have already started!)

- About **15 years of cooperation** in R&D through FP5-6-7 normal calls
- Almost **4 years of technical and organisational preparation** for S²R
- More than **300 engineers and managers** are actively participating in the Brussels' preparation activities & **20 experts consultants** already employed
- **Many high level meetings** with national (Ministries) and European stakeholders (EU institutions)
- **6 National workshops** already organised in Austria, Germany, Italy, Poland, Spain, and the UK

Key targets

- ✓ **CAPACITY** (*increasing user demand*)
Up to **100%** increase
- ✓ **RELIABILITY** (*increase user satisfaction*)
Up to **50%** increase of reliability
- ✓ **LIFE CYCLE COSTS** (*boost competitiveness*)
Up to **50%** reduction of Life Cycle Costs

First estimation of scale of impacts/Economic returns (SHIFT²RAIL budget € 1 bn)

Market opportunity*

(accessible market during
20 years (2020–2040)
addressed by the SHIFT²RAIL
technologies)

about € 1,000 bn

Industry R&D to exploit SHIFT²RAIL innovations

(cost of development of
industrial products, including
suppliers and competitors)

about € 40 bn

Value added provided by SHIFT²RAIL

(creation of additional market
opportunities for the entire
rail sector)

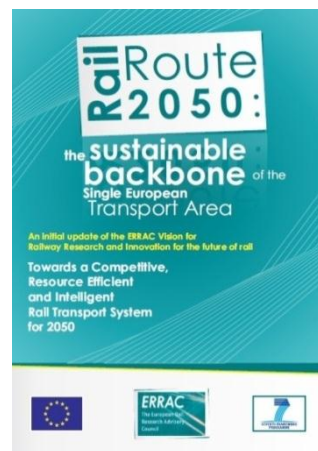
about € 100 bn

Implementing Europe 2020 objectives for a smart, sustainable and inclusive growth

**Modal Shift
&
Attractiveness**

Competitiveness

**Growth &
Jobs**



European Rail: A key economic sector for Europe

■ A wide range of rail stakeholders

- Rail manufacturers (rolling stock & system integrators, signalling, railway infrastructure, sub-systems)
- Infrastructure managers
- Operators (railway undertakings, light rail urban operators)
- Specialised universities and research institutes

■ Present in 26 EU Member States

■ Job creating

- 3 million families depend on rail employment in Europe

■ World leadership of the EU rail supply industry

- Supplying more than 50% of the world market
- 400 000 direct and indirect jobs in the EU



Global Rail Supply Market: Opportunities....

■ Major market opportunities for European companies

Rail supply markets are forecast to grow at a rate of 2.6% in the world in the next 6 years

Total market volume by region [EUR bn p.a.]



- **An ever-fiercer competition with Asian companies**

(Hitachi, Japan Transport Engineering Company, Hyundai Rotem, China CNR, China CSR...)



- **Asian countries are investing massively in R&D for their national rail industries!**





From collaborative experience within FP6/FP7 to a much more ambitious instrument

- **The good results achieved in FP7 normal R&D collaborative projects need to be taken at a further step to significantly contribute to the Railway overall competitiveness**
 - New collaborative R&D closer to the market needs is required in Horizon 2020 (from TRL 4 – limits of normal FP7 – to TRL 6/7)
- **After more than 10 years of cooperation in EU R&D, the promoters of this initiative investigated an instrument that could provide a step-change for the European rail system**
- **Challenge:**
 - How to allow a faster implementation of innovative technologies into final products on the market?**



Why launching SHIFT²RAIL as a large-scale EU research initiative?

- To maintain European industrial leadership in rail through innovation
- To manage research projects where industry creates the necessary critical mass and commitment for implementation by strengthening the confidence of potential investors, due to clarity of funding (named beneficiaries), budgeting and time horizons.
- To streamline the innovation process from research to demonstration, thus **shortening the time-to-market for key innovations**
- To fight against the fragmentation of the industrial R&I efforts and to align the entire industrial supply chain including SMEs, transport research and academic institutions

A great ambition for the rail sector: More, Better, Cheaper!

■ 3 major challenges

✓ **CAPACITY** Up to 100% increase

✓ **RELIABILITY** Up to 50% increase

✓ **LIFE CYCLE COSTS** Up to 50% of reduction

■ Impacting all segments of the rail market!



■ Making daily life easier for millions of European passengers and rail freight users!

SHIFT²RAIL research priorities



IP1: Energy & Mass Efficient Technologies for High Capacity Trains



IP2: Advanced Control & Signaling Systems



IP5: Technologies for Sustainable & Attractive European Freight



IP4: IT Solutions for a Seamless Attractive Railway



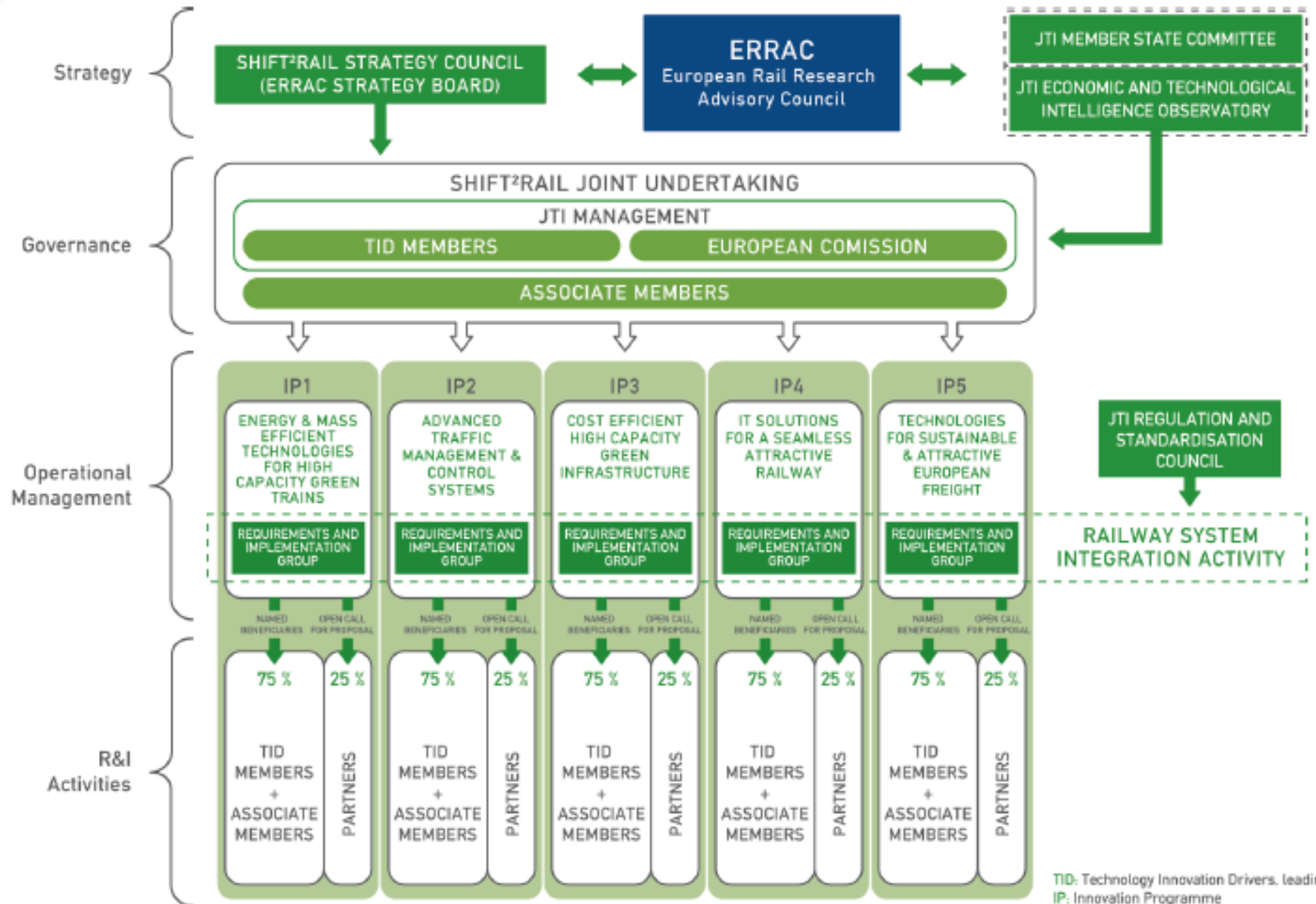
IP3: Cost Efficient High Capacity Infrastructure

- **Faster implementation of innovative technologies** into final products
- **Much closer to the market** than usual EU research instruments:
 1. Development of **prototypes in labs** (called “**technology demonstrators**”)
E.g. innovative braking system, doors, tracks, power supply and energy, etc...
 2. **Validation, integration** and **demonstration** in **real** railway **environment**
 - through “System Platform Demonstrations” developed for each market segment:
 - High Speed/Mainline
 - Regional
 - Urban/Metro & Suburban
 - Freight

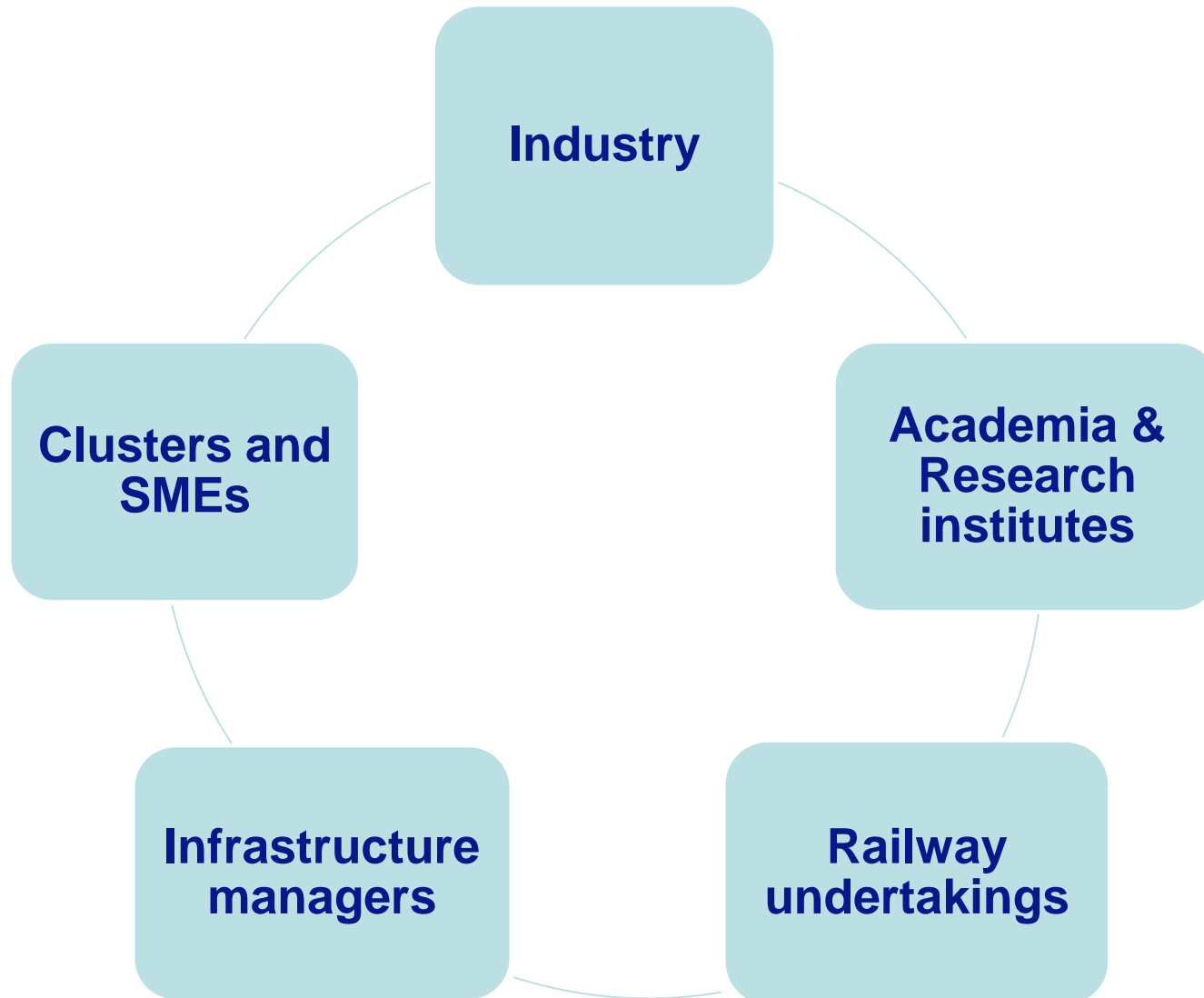




The Future JU structure



The future beneficiaries



Focus on the key role **Clusters, SMEs and Research Institutes** will play

- The Innovation Programmes will provide a **platform for SMEs and research institutes** to bring their products to the market and put their expertise at work.
- The critical mass and the long-term commitment of the JU members will **trigger the participation of a greater number of SMEs** – especially the most innovative – and **research institutes** in EU rail research.
- The benefits of this mechanism on SMEs and Research Institutes have already been demonstrated in existing JTIs (Cf. CleanSky)
- A substantial part of the **JTI budget (at least 25%) will be allocated to that scope** and managed through open calls for proposals.
- The ones wishing to contribute to SHIFT²RAIL technological innovations will be able to respond individually, or in partnerships, to such JTI specialised calls, **becoming JTI partners**.
- Ongoing exchanges with EURNEX and European Clusters of SMEs including the Southern Railway Cluster in Poland (Południowy Klaster Kolejowy)
- Instytut Kolejnictwa (IK) has already signed the MoU for Research Organisations

SHIFT²RAIL's preparation phase: the promoters

- **Already 15 major rail stakeholders** including Infrastructure Managers (Network Rail & Trafikverket) committed to provide significant resources on the long-term
- Many UNIFE members have **subsidiaries in Poland** which can be involved in the JTI.
- **Additional stakeholders are joining!**
 - New Infrastructure Managers, leading Railway Undertakings and industrial partners have joined
 - Polish companies are welcome to join the JTI by signing an MoU
 - IK Railway Institute has already joined the initiative
 - PKP involvement would be important for the project





SHIFT²RAIL: The decision-making process at EU level

■ Stage 1 – ongoing!

→ The European Commission launches a Public Consultation and Impact Assessment phase to prepare its official legislative proposal



- Green light to SHIFT²RAIL in June 2013 by the European Commission
- Public Consultation launched on Friday 28 June! Impact assessment under preparation

■ Stage 2

→ The European Commission publishes an official “Proposal for a Council Regulation setting up the Shift²Rail Joint Undertaking” → *in July Mr. Paquet confirmed in a public meeting that it will be ready by December 2013*

■ Stage 3

→ The European Parliament gives an Opinion in the framework of the Consultation procedure – **Target Spring 2014**

■ Stage 4

→ The Competitiveness (or Transport) Council of the EU officially gives its approval – **Target Spring 2014**

The crucial support of Polish Authorities

- We thank the **Polish Government** for its important support to SHIFT²RAIL
 - Strong support of Deputy State Secretary MASSEL
 - Deputy State Secretary JANKOWSKI officially expressed the support of Poland to the initiative at the last Transport EU Council (11 March)
- We thank Member of the European Parliament **Bogusław LIBERADZKI** (Member of the Transport Committee) for his strong support
- The **active support of important Polish Officials within the European Institutions** would also be key to make SHIFT²RAIL succeed
 - Mr Janusz LEWANDOWSKI, EU Commissioner for Financial Programming and Budget
 - Polish Members of the Research and Transport Committees of the European Parliament (Adam GIEREK, Lena KOLARSKA-BOBIŃSKA, Bogdan Kazimierz MARCINKIEWICZ, Artur ZASADA)



Thank you for your active support

For more information please visit:

www.shift2rail.org

■ MARKET:

Addresses a € 35.2bn worldwide market for High Speed, Conventional Mainline, Exclusively Freight, Metro and Light Rail Rolling Stock.

■ CHALLENGE:

Develop the future generation of trains that will be lighter, more energy efficient while being able to reduce today's travelling times, causing less track damage and less impact on the environment, thereby delivering a lower whole life cost.

■ CONTEXT:

Maintain a competitive European rolling stock supply industry in the worldwide market across rail segments.



Innovation Programme 2 ADVANCED TRAFFIC MANAGEMENT AND CONTROL SYSTEMS

■ MARKET:

Addresses a € 10.9bn worldwide market for Rail Control Systems for Mainline and Urban Transit applications and enhancing the interoperability of the two modes.

■ CHALLENGE:

Develop a new generation of signalling and control systems, building on current ERTMS, to enable intelligent traffic management with automatically driven trains and optimise capacity, reliability and minimise Life Cycle Costs. This will pave the way for driverless operations of trains made of virtually coupled rail vehicles – defined in IP1 – able to couple and decouple on the move.

■ CONTEXT:

Maintaining the dominance of ERTMS as a solution for railway signalling and control systems across the world, while extending synergies and interoperability with the urban and mass transit railway sectors and speeding up the time to market.



Innovation Programme 3

COST EFFICIENT HIGH CAPACITY INFRASTRUCTURE

■ **MARKET:**

Addresses the € 27.2bn worldwide market for High Speed, Conventional Mainline, Exclusively Freight, Metro and Light Rail Infrastructure.

■ **CHALLENGE:**

Deliver a new railway infrastructure system (including both infrastructure and energy subsystems) that provides a breakthrough which will radically improve capacity and performance and reduce costs.

■ **CONTEXT:**

Europe has a large and aging rail infrastructure, which results in high expenditure on maintenance. Change will be necessary to achieve the performance required at a reasonable cost, in order to achieve the modal shift to rail

→ We know the interest of Polish authorities on these key topics



Innovation Programme 4 SEAMLESS ATTRACTIVE RAILWAY TRANSPORT SYSTEM

■ MARKET:

Seeks to encourage growth in the 493.7bn Passenger Kilometres registered each year on the EU27 Mainline Passenger and Urban Transit Networks through modal shift and overall growth in mobility.

■ CHALLENGE:

Realise one of the key goals from the White Paper: “By 2020, establish the framework for a European multimodal transport information, management and payment system.”

■ CONTEXT:

Currently, the pan-European transport landscape is very fragmented, with many tickets in different formats and different payment means. At every stage of the journey cycle, end users can face difficulties caused by disruption or access to information.



Innovation Programme 5

SUSTAINABLE & ATTRACTIVE EUROPEAN FREIGHT TRANSPORT

■ MARKET:

Seeks to encourage major growth in the 361.6bn Tonne Kilometres registered within the EU27 Rail Freight sector by competitive modal shift and as well addresses the € 8.7bn worldwide market for Freight Wagons

■ CHALLENGE:

Define all technological and process breakthroughs necessary to contribute to the realisation of one of the key goals from the White Paper: 30% of road traffic switching to rail and inland waterways by 2030 and 50% by 2050.

■ CONTEXT:

Currently freight generally takes second place to passenger traffic within Europe.

■ Participation in future R&I activities

■ Named beneficiaries

- ☐ Members which will commit themselves to bring resources (financial resources, human resources and/or technical means) for the full duration of the project
- ☐ Depending on their degree of involvement/contribution, these Members will be either:
 - ☐ **TID Members** (Technology Innovation Drivers)
 - ☐ or **Associate Members**

■ Open calls for proposals

- ☐ A significant part of the total budget will be devoted to open calls for proposals for each IP
- ☐ The objective is clearly to trigger the participation of **SMEs** and **Research Institutes** through better-targeted calls

■ Open calls for tenders

■ Participation in the future governance structure

■ JTI Strategy Council and the key role of ERRAC

■ JTI advisory committees

- ☐ Member States Committee
- ☐ JTI Economic and Technological Intelligence Observatory (*Cf. opportunities for the IK Railway Institute*)

■ JTI Management (SHIFT²RAIL Joint Undertaking administration)

■ Requirements and Implementation groups (through ERRAC)

- Specification of needs by European Railway Undertakings and Infrastructure Managers
- PKP is invited to the launch of these groups on 23 April