Update on the Shift2Rail Joint Undertaking

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Session d'information sur l'entreprise commune du domaine du ferroviaire Shift2Rail

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Shift2Rail: key past milestones

- **16 June 2014:** Adoption of the Council Regulation No 642/2014
- **7 July 2014:** Formal establishment of the S2R JU
- **9 July 2014:** Nomination of the **Executive Director ad Interim**
- **30 July 2014:** Formal establishment of the **Governing Board** of the S2R JU
- **6 October 2014:** Launch of the **call for associated members** to the S2R JU
- **21 October 2014:** Formal establishment of the **States Representatives Group**
- **16 November 2014:** Entry into service of **first staff** of the S2R JU
- **10 February 2015:** Endorsement of the Shift2Rail **Master Plan** by the Council
- **31 March 2015:** Adoption of the S2R Master Plan by the Governing Board
- **April 2015:** Signature by the Commission of the first grants for the **'lighthouse' projects**, which are part of the Union contribution to the JU
- **28 May 2015:** Formal establishment of the **Scientific Committee**
- **16 July 2015:** Finalisation of the evaluation of the **call for associated members**
- **August 2015:** Launch of the development of the **Multi-Annual Action Plan** between the JU, Founding Members and candidate Associated Members

Latest developments:

- **Selection of Associated Members:** conclusion of the 2nd stage of the call for AMs and final decision from the Commission
  - Following the results of the evaluations, the Governing Board of S2R had listed **19 succesful candidates**, which had been invitated from September to further negotiations with the Interim Executive Director on their proposed activities and contributions.

- Approval by the S2R Governing Board of **Membership Agreements** with the S2R JU.

- The Governing Board reserved the right to launch **a second call for associated members** in the future to address lacks key competences / capabilities to carry out strategic activities.

Latest developments:

- **Multi-Annual Action Plan finalised:** the Governing Board adopted the S2R MAAP on November 27
- Adoption of the **S2R Annual Work Plans 2015-2016** by the Governing Board
- The **launch of calls for proposals** to JU members and through open call (non-JU Members)
  - The objective is to launch calls for members and non-members (open calls) as part of the first work plans of the JU and grant the first projects after summer 2016 (following standard 3 months submission time and evaluation of proposals)
  - The projects should contribute to the realisation of the objectives of the S2R Master Plan and are an integral part of the S2R MAAP
  - Open-calls will be used to cover gaps in the expertise of JU members and to fund fundamental research in relation to the Shift2Rail activities

S2R Multiannual Action Plan

Background

What is the S2R MAAP?

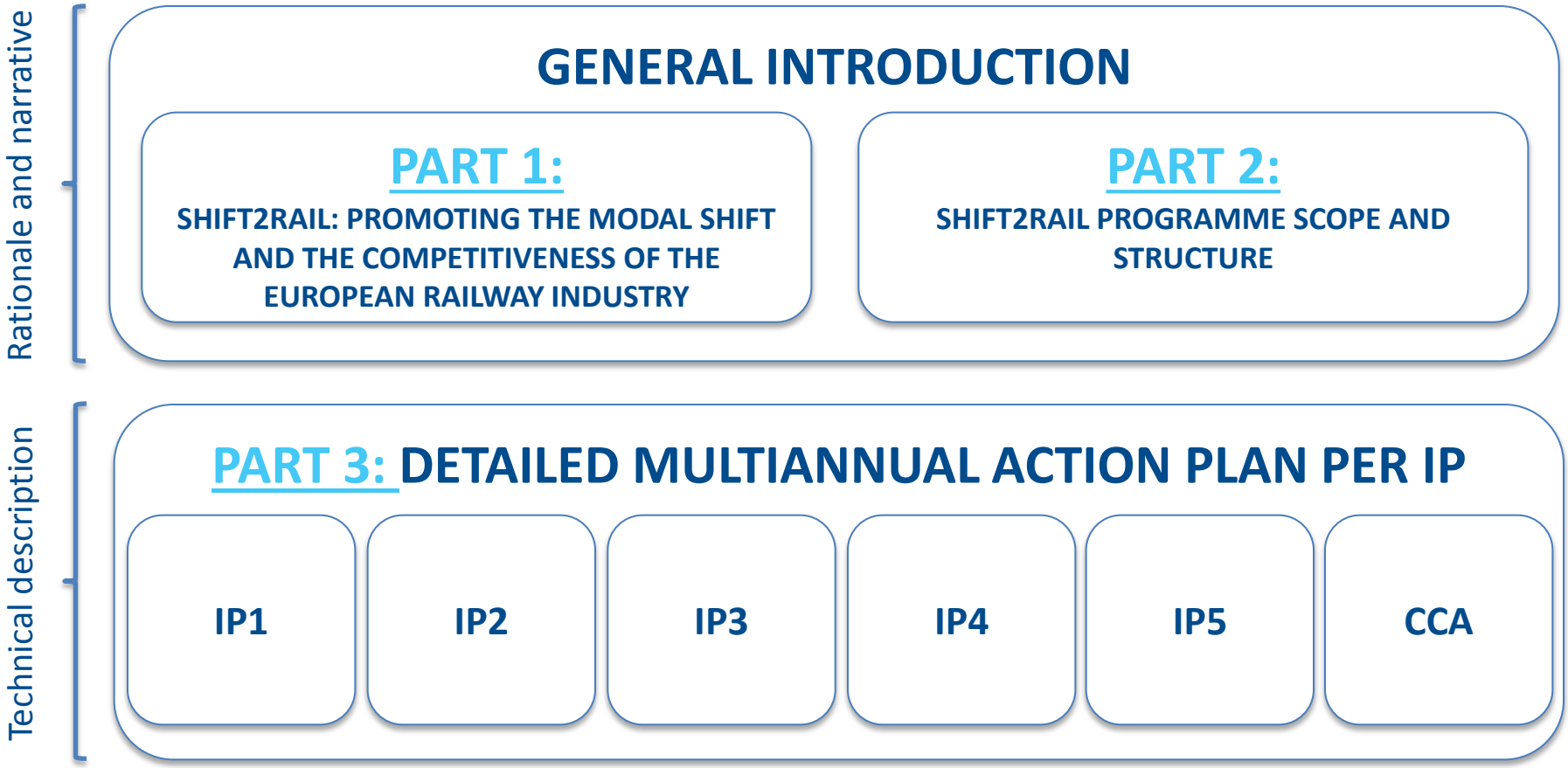
- The MAAP is a long-term investment planning document, which translates the strategic research and innovation priorities for the rail sector, as described in the S2R Master Plan, into **concrete actions, milestones and deliverables** to be undertaken collaboratively by the S2R JU in the period 2015-2024.
- The MAAP has been **developed collaboratively** between the founding members of the S2R JU other than the Union and the pre-selected candidate associated members of the S2R JU, with the support and coordination of the S2R JU interim Executive Director and the S2R Programme Office.
- The **advisory bodies of the S2R JU** (Scientific Committee, States Representatives Group) **and the European Railway Agency** have been consulted on the MAAP and their recommendations taken into account.

What is the S2R MAAP?

- The MAAP includes all the activities that are foreseen to be co-funded by the S2R JU. It currently contains the description of activities worth an estimated **value of about EUR 765 million** (a reserve of the S2R JU budget has been left aside for contingency reasons, e.g. outcome of evaluation review cases, second call for associated members). The estimated total value of the total S2R activities, which will have to be reflected in the next version of the MAAP, is estimated at EUR 777 million.
- These activities will either be undertaken directly by the JU members other than the Union, or implemented by non-JU members following calls for proposals or calls for tenders.
- The document will serve as the **basis for preparing the annual work plans** of the S2R JU, thereby helping to ensure continuity and synchronicity of investments.
- It is a **living document** that will be updated on a regular basis.

S2R Multiannual Action Plan

Structure of the MAAP



Structure of the MAAP - details

General introduction

- PART 1: SHIFT2RAIL: PROMOTING THE MODAL SHIFT AND THE COMPETITIVENESS OF THE EUROPEAN RAILWAY INDUSTRY
  - Meeting the challenges set in H2020
  - Rationale for S2R
  - S2R governance structure
- PART 2 – SHIFT2RAIL PROGRAMME SCOPE AND STRUCTURE
  - S2R programme structure
  - Summary of Major Demonstrations and Technology Developments

PART3: Detailed multiannual action plan per IP

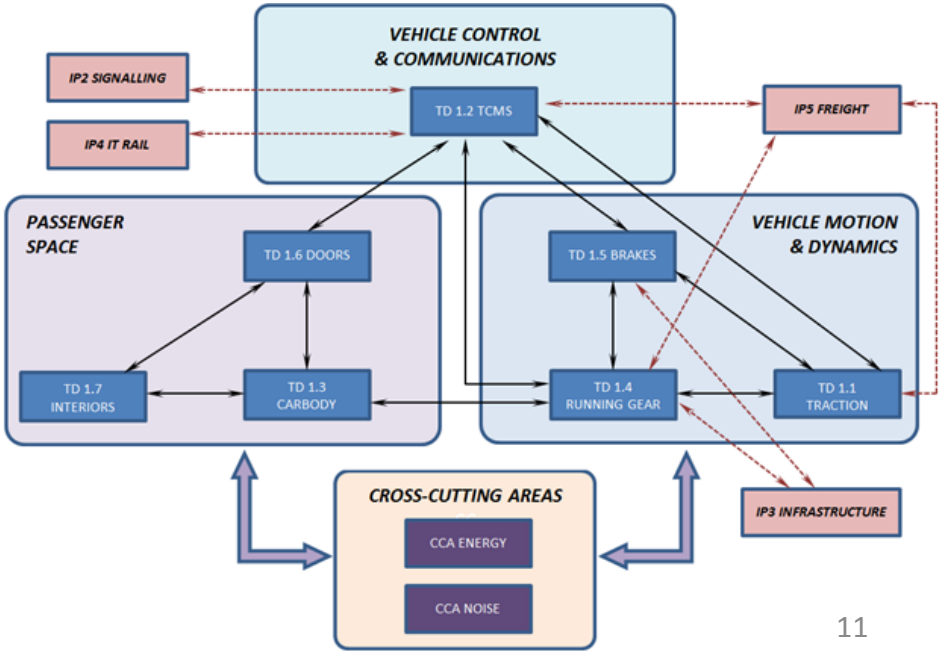
1. Context and motivation
2. Objectives of the IP and expected results
3. Past and ongoing European & national research projects
4. Set-up and structure of the IP
5. Technical Demonstrators (TDs) of the IP: incl. Concept and objectives of the TD, technical ambition of the TD, specific Demonstration activities and contribution to ITDs/SPDs, impact of the TD, implementation of the work programme and planning and budget

IP1 - Cost Efficient and Reliable Trains

Expected value of the entire IP (incl. open calls, without reserve): EUR 221.5M

Overview of the Technical Demonstrators

- TD1.1 – Traction Systems
- TD1.2 – Train Control and Monitoring System (TCMS)
- TD1.3 - Carbody Shell
- TD1.4 - Running Gear
- TD1.5 – Brakes Systems
- TD1.6 - Doors and Access Systems
- TD1.7 - Train Modularity In Use (TMIU)

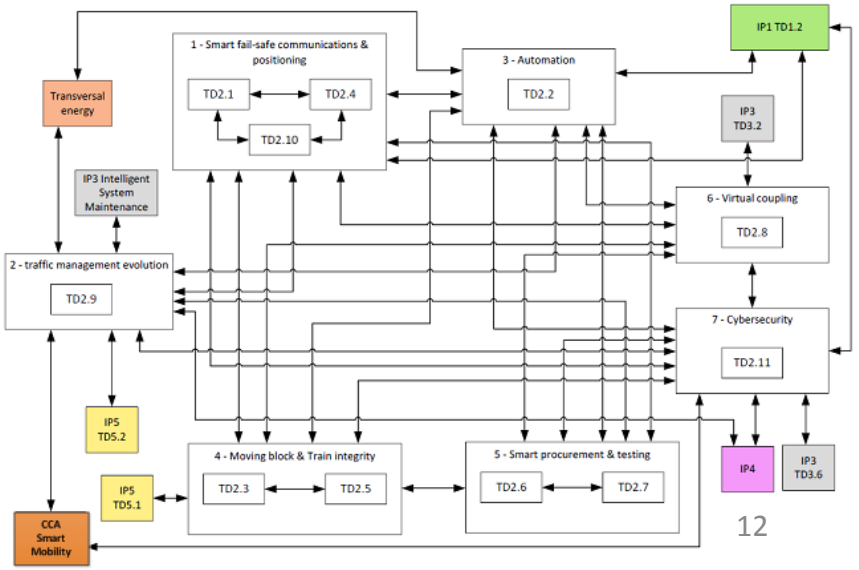


IP2 - Advanced Traffic Management and Control Systems

Expected value of the entire IP (incl. open calls, without reserve): EUR 191,4M

Overview of the Technical Demonstrators

- TD2.1 – Adaptable communications for all railways
- TD2.2 – Railway network capacity increase (ATO up to GoA4 - UTO)
- TD2.3 - Moving Block
- TD2.4 - Fail-Safe Train Positioning (including satellite technology)
- TD2.5 – On-board Train Integrity
- TD2.6 - Zero on-site testing
- TD2.7 - Formal methods and standardisation
- TD2.8 – Virtually - Coupled Train Sets
- TD2.9 – Traffic management evolution
- TD2.10 - Smart radio-connected objects
- TD2.11 – Cyber Security

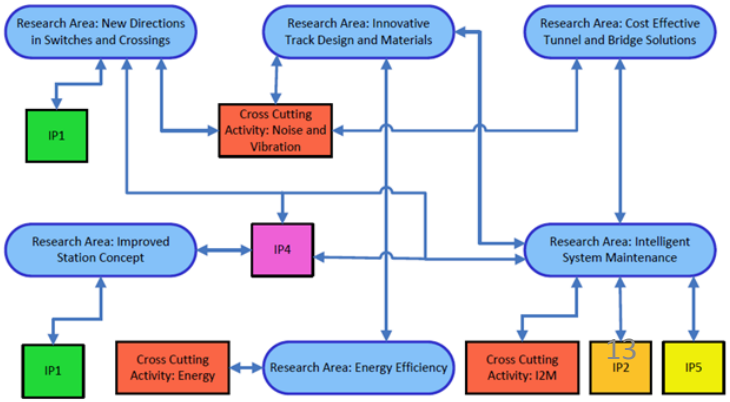


IP3 - Cost Efficient and Reliable Infrastructure

Expected value of the entire IP (incl. open calls, without reserve): EUR 150,3M€

Overview of the Technical Demonstrators

- TD3.1 – Enhanced Switch & Crossing System
- TD3.2 – Next Generation Switch & Crossing System
- TD3.3 - Optimised Track System
- TD3.4 - Next Generation Track System
- TD3.5 – Proactive Bridge and Tunnel Assessment, Repair and Upgrade
- TD3.6 - Dynamic Railway Information Management System
- TD3.7 - Railway Integrated Measuring and Monitoring System
- TD3.8 – Intelligent Asset Management Strategies
- TD3.9 – Smart Power Supply
- TD3.10 - Smart Metering
- TD3.11 – Future Stations

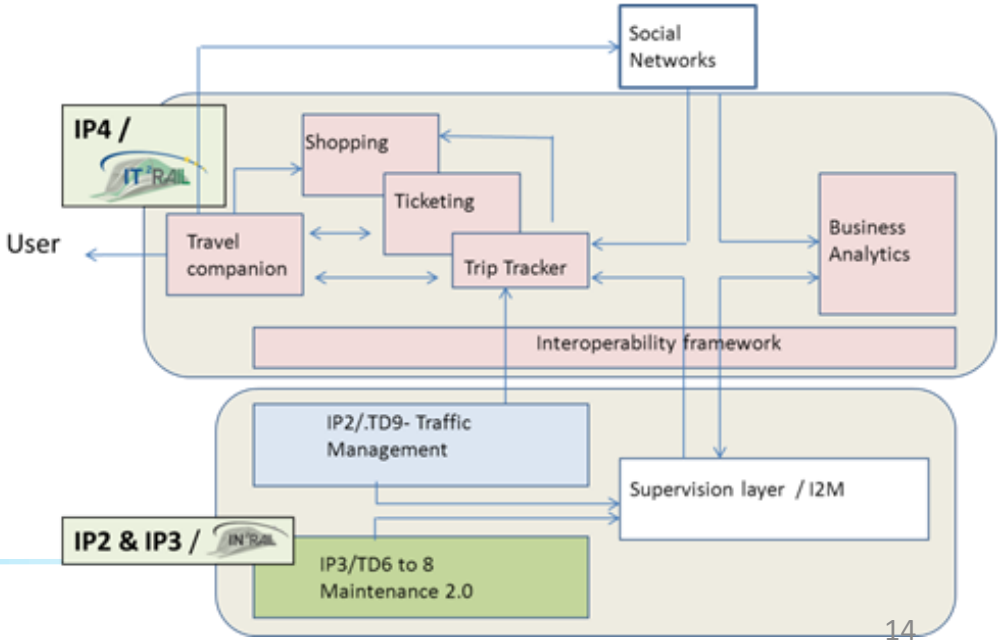


IP4 - IT Solutions for Attractive Railway Services

Expected value of the entire IP (incl. open calls, without reserve): EUR 84,8M€

Overview of the Technical Demonstrators

- TD4.1 – Interoperability Framework
- TD4.2 – Travel Shopping
- TD4.3 - Booking & Ticketing
- TD4.4 - Trip Tracker
- TD4.5 – Travel Companion
- TD4.6 - Business Analytics Platform
- TD4.7 – integrated TD



IP5 - Technologies for sustainable and attractive European rail freight

Expected value of the entire IP (incl. open calls, without reserve): EUR 82,1M

Overview of the Technical Demonstrators

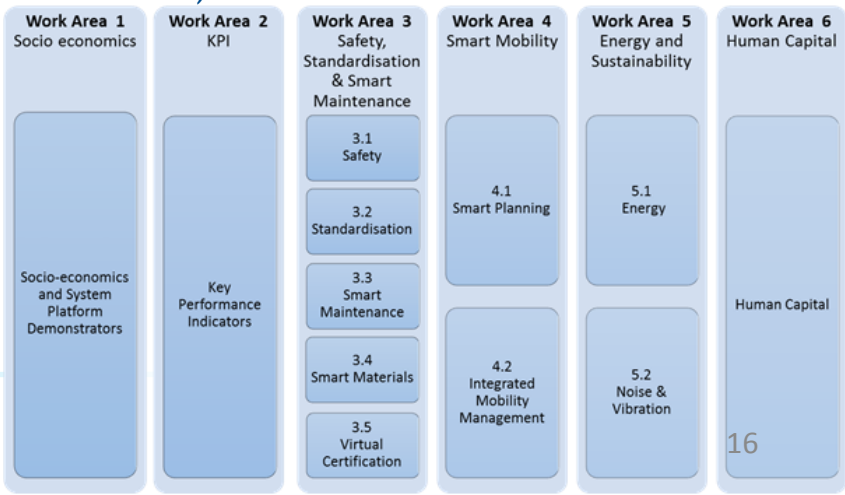
- TD5.0 – Business analytics and implementation strategies
- TD5.1 – Freight electrification, brakes and telematics
- TD5.2 – Access and Operation
- TD5.3 - Wagon design
- TD5.4 - Novel Terminal, Hubs, Marshalling Yards, Sidings
- TD5.5 – New Freight Propulsion Concepts
- TD5.6 - Autonomous train operation

CCA – Cross Cutting Activities

Expected value of the entire IP (incl. open calls, without reserve): EUR 34,6M

Overview of the Working Areas

- Work Area 1 - Long-term needs and socio-economic research
- Work Area 2 – KPI method development and integrated assessment
- Work Area 3 – Safety, Standardisation, Smart Maintenance, Smart Materials & Virtual certification
- Work Area 4 –Smart Mobility (Smart Planning & Integrated Mobility Management)
- Work Area 5 Energy and Sustainability (Noise & Vibration)
- Work Area 6 – Human Capital



Example of a Technology Demonstrator

TD1.2 Train Control and Monitoring System Demonstrator

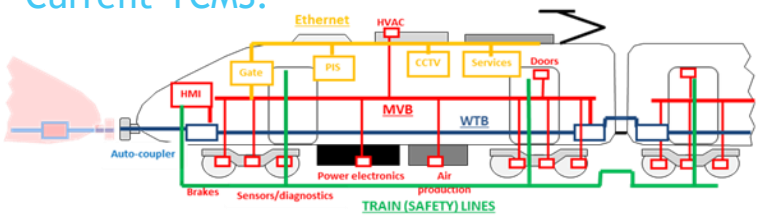
- Technological output to be delivered by this TD:

  New generation TCMS architectures and components with wireless capabilities, enhanced throughput, safety and security functionalities, supporting distributed function execution and mechanisms for easier authorisation.

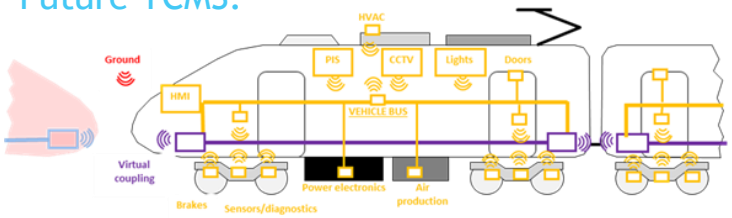
- Specific achievements to be delivered by this TD:

  1. Reduce the amount and weight of cabling for train control by half (Save 10 km of cable in each 20 m railcar). Reduce the space used by electronics hardware by 25%
  2. Ability to implement SIL4 functions in the TCMS to perform additional safety-critical tasks.
  3. Increase in the availability of trains related to the functioning of train control and monitoring by 50%
  4. Ability to couple any pair of multiple unit of different types, a feature currently totally non-existent and can significantly increase line capacity
  5. Support technologically the development of the “virtual coupling” concept, which can dramatically increase the capacity of lines
  6. Reduce cost, time and effort in project engineering, integration and authorisation phases by 50%

Current TCMS:



Future TCMS:

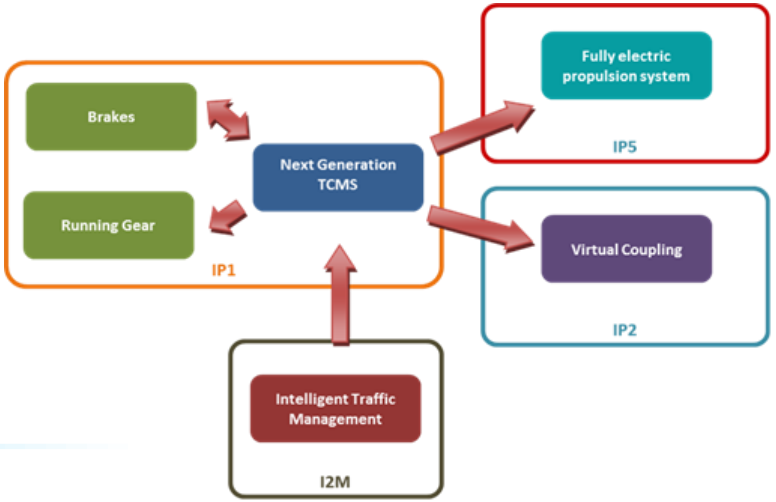


Example of a Technology Demonstrator

- the contribution of TD 1.2 TCMS to the different ITDs of Shift2Rail :

Research Area	Specific Techn. objective	Specification Activities	Demonstrator Market	Demonstrator TRL	Focus of activity
Train Control & Monit. System	Wireless TCMS	Radio techn., architecture and protocols	Metro	6/7	Incorporate wireless technologies to the train communication network solutions (i.e. train backbone, consist network and train to ground communication).
			Regional	6/7	
	Drive-by-data	Architecture, protocols	Metro	6/7	Provide a train-wide communication network for full TCMS support including the replacement of train lines, connecting safety functions up to SIL4 (incl. signalling).
			Regional	5	
	Functional distribution architecture	Specification, architecture and interface definition	Metro	6/7	New architectural concept based on standard framework & application profiles, distributed computing to allow execution of compliant functions on end devices distributed along the vehicle meeting different safety & integrity requirements
			Regional	5	
				6/7	Support the Functional Open Coupling
	Virtual Placing on the Market	Technology definition, protocols and procedures	Generic	6/7	Standardised simulation framework in which all subsystems of the train will be simulated, allowing remote and distributed testing including hardware in-the-loop through heterogeneous communication networks.

- Interaction with other TDs and IPs:



- Planning (budget estimated at 48,8M€):

TASKS		TRL
TD1.2	TCMS	
	1.2.0 General specification	-
	1.2.1 Wireless TCMS	6/7
	1.2.2 Drive-by-data	6/7
	1.2.3 Functional distribution architect.	6/7
	1.2.4 Virtual placing on the market	5
	1.2.5 Integration, demo & assessment	6/7
	1.2.6 Technical coordination	-

S2R Multiannual Action Plan

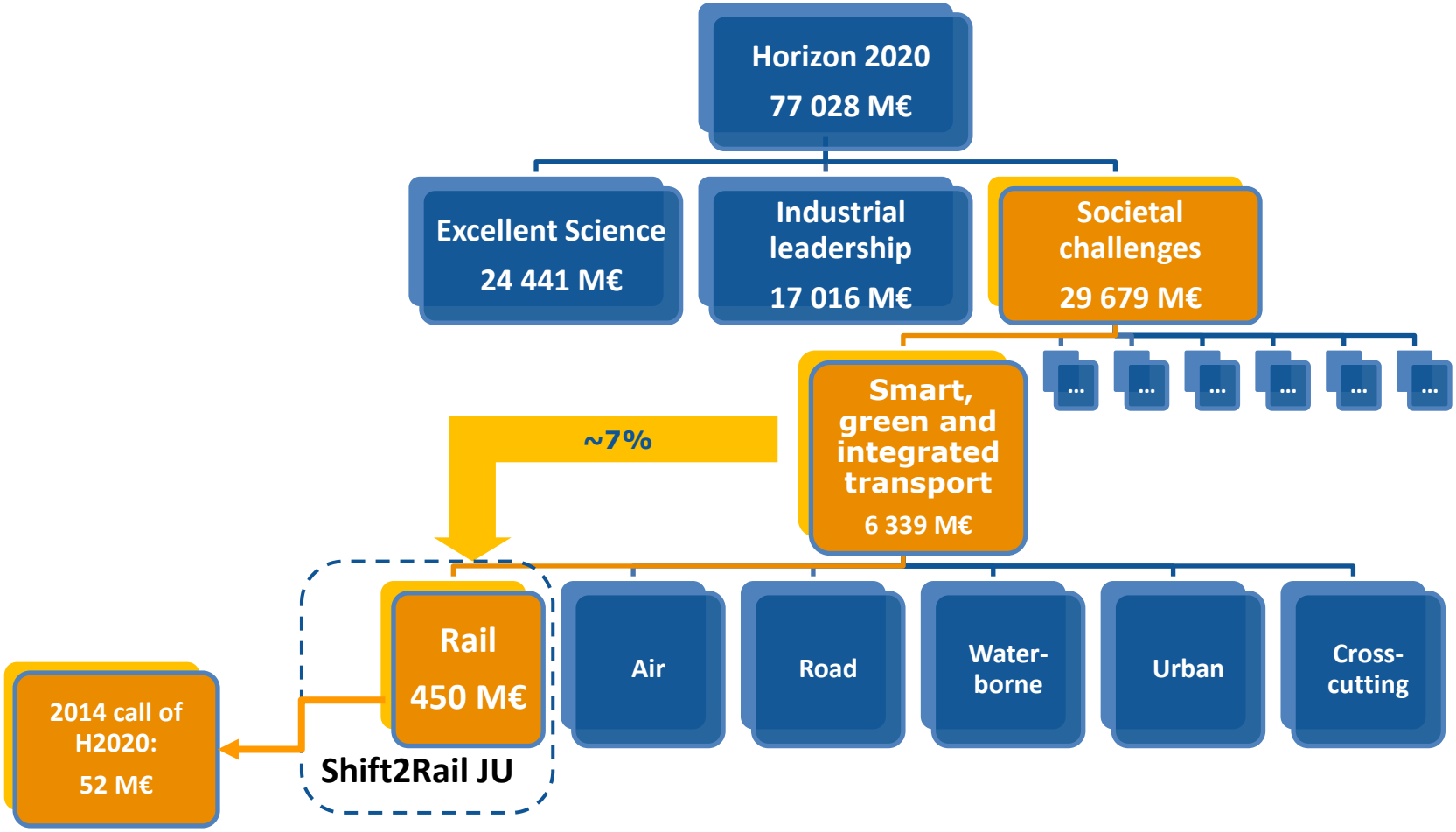
Its importance

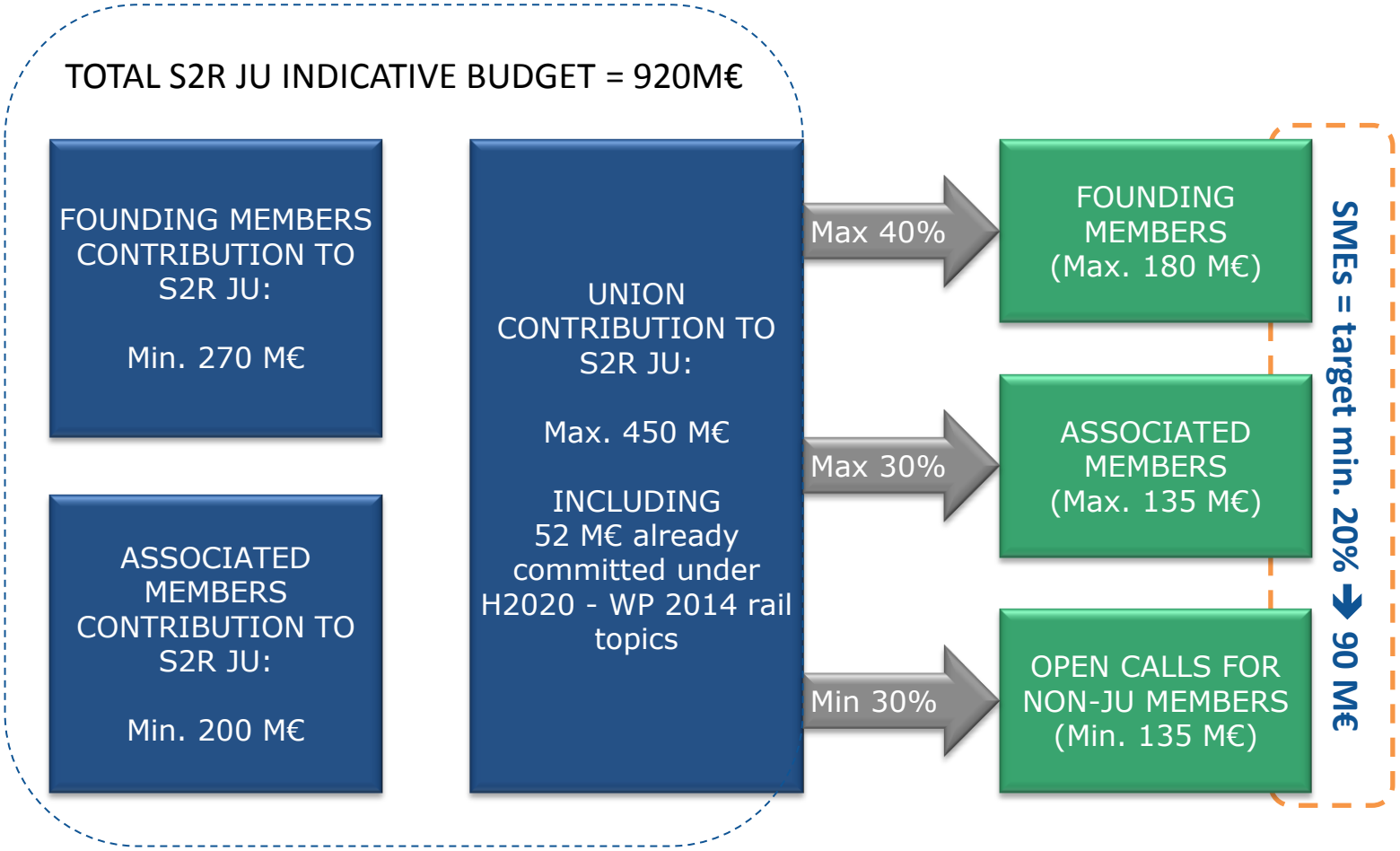
The MAAP importance

- It constitutes a reference document along life of the JU, therefore all grants awarded for the action/projects should aims to implement part of the Multi Annual Action Plan ('MAAP').
- It constitutes the base for qualitative content of the JU Membership Agreements.
- It will facilitate the preparation of result-oriented Annual Work Plans.
- It is the first document collectively built with the S2R structure: coordinated by an initial JU programme team with challenging efforts provided by the shadow IP Steering Committees, System Group, the Scientific Committee, the State Representative Group, the ERA and the EC.

The implementation of the Union funding

Rail R&I under Horizon 2020




TOTAL S2R JU INDICATIVE BUDGET = 920M€
FOUNDING MEMBERS CONTRIBUTION TO S2R JU:
Min. 270 M€
ASSOCIATED MEMBERS CONTRIBUTION TO S2R JU:
Min. 200 M€
UNION CONTRIBUTION TO S2R JU:
Max. 450 M€
INCLUDING 52 M€ already committed under H2020 - WP 2014 rail topics
Max 40%
Max 30%
Min 30%
FOUNDING MEMBERS (Max. 180 M€)
ASSOCIATED MEMBERS (Max. 135 M€)
OPEN CALLS FOR NON-JU MEMBERS (Min. 135 M€)
SMEs = target min. 20% ➔ 90 M€

List of Members

Founding Members

- European Commission
- Alstom Transport
- Ansaldo STS
- Bombardier Transportation
- Construcciones y Auxiliar de Ferrocarriles
- Network Rail
- Siemens
- Thales
- Trafikverket

Associated Members

- AERFITEC consortium
- Amadeus IT Group
- AZD Praha
- CFW consortium
- Deutsche Bahn
- Diginext
- EUROC consortium
- Faiveley Transport
- HaCon
- Indra Sistemas
- Kapsch CarrierCom
- Knorr-Bremse
- MER MEC
- Patentes Talgo
- Railenium Swi'TRACK'EN consortium
- Smart DeMain consortium
- SmartRaCon consortium
- SNCF

Thank you for your support to S2R!

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