Presentations of the topics open to non-JU Members from the S2R 2015-2016 calls for proposals

Shift2Rail Information Day for non-JU members (Open calls for proposals)

20 January 2016

IP1 - Cost-efficient and reliable trains

Shift2Rail Information Day for non-JU members (Open calls for proposals)

20 January 2016

Alexandra GURAU, S2R Programme Manager

Open call topics included in 2016 Annual Work Plan (currently open)

Topic number - IP	Topic name	Expected TRL	Type of action	Indicative Budget (EU contribution)
S2R-OC-IP1-01-2016	Tools and methodologies supporting the development of next generation traction systems, and brakes	2-3	RIA	€ 1 100 000
S2R-OC-IP1-02-2016	Technology feasibility studies supporting the development of next generation TCMS, and safe control for brakes	2-3	RIA	€ 7 000 000
TOTAL				€ 8 100 000

S2R-OC-IP1-01-2016 Tools and methodologies supporting the development of next generation traction systems, and brakes

Challenge:

- develop and contribute to implementing new methodologies, tools, norms & standards of reliability, noise, virtual validation and certification, and smart maintenance.

Scope (proposals expected to tackle both areas below):

1. Traction systems

✓Supply technology or prospective marketing work with a long term vision on market needs, business models and technologies for use in real markets (2020 and beyond)

✓Proposals should tackle all five work streams (*digitalisation and big data, prospective market studies, eco-labelling, very high-power density and energy density*)

2. Adhesion

✓analysis of existing regulations and development of roadmaps for further optimisation of braking in low adhesion management situations taking into account the conformity assessment process

Expected impacts: Develop solutions to at least TRL 2-3 which will improve the operational performance of the traction & braking system; optimise LCC

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: up to €1 100 000

S2R-OC-IP1-02-2016 Technology feasibility studies supporting the development of next generation TCMS, and safe control for brakes

Challenge:

- Provide the next generation of TCMS built on a new architecture based on distributed functions with standardised interfaces, with due consideration to safety-critical and security functionalities
- Provide electronic HW-SW platform to manage all the braking functions according to proper high safety levels (SIL3, SIL4)

Scope (proposals expected to tackle both areas below):

- ✓ **TCMS** – identify and assess suitable technologies to support the development of the new railway vehicle control and monitoring systems.
- Proposals should tackle all three complementary and cross-dependant work streams (*Drive-by-data*; *Functional Distribution Architecture; Virtual placing in the market)*
- ✓ **Safe control for brakes** – define criteria for certification for higher safety levels and bringing in “safety transversal knowledge” through Notified Bodies competence and competence in fields like automotive or aeronautics.

S2R-OC-IP1-02-2016 Technology feasibility studies supporting the development of next generation TCMS, and safe control for brakes

Expected impacts:

- **TCMS**: improvements in reliability and safety, while at the same time reducing investment and life cycle costs
- **Safe control for brakes**: safety transversal knowledge would lead to improvement and simplification of railway safety technology with positive effect on LCC, maintainability and time-to-market

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: up to € 7 000 000

IP2 - Advanced traffic management and control systems

Shift2Rail Information Day for non-JU members (Open calls for proposals)

20 January 2016

Dorota SZELIGOWSKA, S2R Programme Manager

Open call topics included in 2015 S2R JU Annual Work Plan (currently open)

Topic number - IP	Topic name	Expected TRL	Type of action	Indicative Budget (EU contribution)
S2R-OC-IP2-01-2015	Threat detection and profile protection definition for cyber-security assessment	3	RIA	€ 1 500 000
S2R-OC-IP2-02-2015	IT virtualisation of testing environment	3	RIA	€ 1 000 000
S2R-OC-IP2-03-2015	Technical specifications for a new Adaptable Communication system for all Railways.	2-3	RIA	€ 500 000
TOTAL				€ 3 000 000

S2R-OC-IP2-01-2015: Threat detection and profile protection definition for cyber-security assessment

Challenge:

- protect the integrity of infrastructure, rolling stock, staff and passengers against physical and cyber attacks
- ensure the continuity and quality of public transport under all conditions

Scope:

- Perform security assessment of railway systems
- Identification and analysis of the different cyber-attack threats applicable to different railway segments, incl. identification and specification of countermeasures or mitigation strategies
- development of a specification of the Protection Profiles applicable to railway signalling applications

Expected impacts:

- Improving the operational security level of the different rail segments and the robustness of the railway information, control and signalling sub-systems

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: up to €1 500 000

S2R-OC-IP2-02-2015: IT virtualisation of testing environment

Challenge:

- Define a dedicated system test architecture for the lab tests
- Specify a standardised method to derive and describe test cases
- Fix a common test process framework

Scope:

- Develop the concept of virtualisation for holistic railway testing environment
- Develop an open IT virtualisation of hardware (HW) and software (SW) platform with potential of real form, virtual or simulated implementation

Expected impacts:

- Reduce the amount, time and cost of the on-site tests for signalling systems
- Contribute to the development of a Zero on-Site Testing environment

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: up to €1 000 000

S2R-OC-IP2-03-2015: Technical specifications for a new Adaptable Communication system for all Railways

Challenge:

- Provide an adaptable train-to-ground IP communication system with enhanced throughput, safety and security functionalities to take advantage of new technologies, in the light of the programmed end of GSM-R

Scope:

- Definition of new business model scenarios for the use of the more advanced radio technologies in the railways domain
- Analysis and definition of conditions in which the use of public radio communication network instead of dedicated networks could be possible

Expected impacts:

- Optimise costs for the railway wayside to train communication system
- Enable the possibility to offer new services or to enhance the signalling applications

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: up to € 500 000

IP3 - Cost-efficient, Sustainable and Reliable High Capacity Infrastructure

Shift2Rail Information Day for non-JU members (Open calls for proposals)

20 January 2016

Georgios PATRIS, S2R Programme Manager

Open call topics included in 2016 Annual Work Plan (currently open)

Topic number - IP	Topic name	Expected TRL	Type of action	Indicative Budget (EU contribution)
S2R-OC-IP3-01-2016	Research into new radical ways of changing trains between tracks	3-4	RIA	€ 5 000 000
TOTAL				€ 5 000 000

S2R-OC-IP3-01-2016
Research into new radical ways of changing trains between tracks

Challenge:

- radical changes in the design and technology of the track system that should lead to significant improvements of capacity, reliability, safety, investment and operating costs

Scope:

- next generation of track and switches and crossings (S&C) design towards **intelligent** systems
- smart design and material science solutions targeting **simplified** systems
- **new** switching function using novel kinematic elements and mechatronics technology

Expected impacts:

- improvements in capacity, reliability and safety, while at the same time reducing investment and life cycle costs

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: up to €5 000 000

IP4 - IT Solutions for attractive railway services

Shift2Rail Information Day for non-JU members (Open calls for proposals)

20 January 2016

Dorota SZELIGOWSKA, S2R Programme Manager

Shift2Rail Open call topics included in 2016 S2R JU Annual Work Plan (currently open)

Topic number - IP	Topic name	Expected TRL	Type of action	Indicative Budget (EU contribution)
S2R-OC-IP4-01-2016	Interoperability Framework governance, ensuring its market uptake and sustainability	N/A	CSA	€ 2 000 000
S2R-OC-IP4-02-2016	Interoperability Framework Converters	2-4	RIA	€ 1 000 000
TOTAL				€ 3 000 000

S2R-OC-IP4-01-2016: Interoperability Framework governance, ensuring its market uptake and sustainability

Challenge:

- Remaining fragmentation and incompatibility of interchange formats and protocols both within and across transport sectors
- Lack of a coherent transport ecosystem and proper integration of the rail sector

Scope:

- Design a proper governance and management structure for the “Interoperability framework”, incl. the use cases for end-users and stakeholders
- Analyse the conditions for a market uptake of a multimodal market place supported by a semantic web of transportation, incl. identification of business opportunities, stakeholders, market restrictions and requirements

Expected impacts:

- Ensure a large acceptance of the “Interoperability Framework” by various modes, warranting a development of a true transport ecosystem

Type of Action: Coordination and Support Action (CSA)
Estimated EU contribution per proposal: up to €1 000 000

S2R-OC-IP4-02-2016: Interoperability Framework Converters

Challenge:

- Mask the complexity of the transport ecosystem by providing an “Interoperability framework”, which is able to address the variability of standards and protocols existing in different transport modes

Scope:

- Develop components which create mediation and translation between different standards and protocols, resulting in an automated discovery and configuration of heterogeneous systems from different transport modes

Expected impacts:

- Foster a broader inclusion of railway operators into multimodal travel services

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: up to €1 000 000

IP5 - Technologies for Sustainable & Attractive European Freight

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20 January 2016

Georgios PATRIS, S2R Programme Manager

Open call topics included in 2015 Annual Work Plan (currently open)

Topic number - IP	Topic name	Expected TRL	Type of action	Indicative Budget (EU contribution)
S2R-OC-IP5-01-2015	Freight Automation on lines and in yards	3-5	RIA	€ 1 000 000
S2R-OC-IP5-02-2015	Improved vehicle/train dynamics	2-4	RIA	€ 1 000 000
S2R-OC-IP5-03-2015	Intelligent freight wagon with predictive maintenance	3-5	RIA	€ 1 500 000
TOTAL				€ 3 500 000

S2R-OC-IP5-01-2015 – Freight Automation on lines and in yards

Challenge:

- to effectively and efficiently address automated driving and automation of processes in the marshalling yards

Scope:

- automated driving with focus on obstacle detection technologies
- automation of disposition processes in marshalling yards aiming at real time yard management

Expected impacts:

- improved of punctuality, reliability and flexibility of rail freight
- Reduced operating costs

Type of Action: Research and Innovation Action (RIA)

Estimated EU contribution per proposal: up to €1 000 000

S2R-OC-IP5-02-2015 – Improved vehicle/train dynamics

Challenge:

- to contribute to shifting freight from road to rail by providing more attractive, flexible and customer oriented rail freight services.

Scope:

- specify, design and develop two or three axle track friendly, low noise and low LCC bogies
- develop technical solutions for longer trains

Expected impacts:

- improved technical, environmental and operational characteristics of trains, including lower LCC

Type of Action: Research and Innovation Action (RIA)

Estimated EU contribution per proposal: up to €1 000 000

S2R-OC-IP5-03-2015 - Intelligent freight wagon with predictive maintenance

Challenge:

- develop solutions for cargo condition **monitoring** and **traceability**, reduce the tare **weight** of wagons and deploy ICT solutions for intelligent **maintenance**

Scope:

- cargo condition monitoring technologies
- wagon design, focusing on different material concepts
- predictive maintenance with the use of on-board devices

Expected impacts:

- significantly increase the competitiveness of rail freight transport through improved attractiveness and reduced operating costs

Type of Action: Research and Innovation Action (RIA)

Estimated EU contribution per proposal: up to €1 500 000

Cross-cutting activities (CCA)

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20 January 2016

Alexandra GURAU, S2R Programme Manager

Open call topics included in 2015 Annual Work Plan (currently open)

Topic number - IP	Topic name	Expected TRL	Type of action	Indicative Budget (EU contribution)
S2R-OC-CCA-01-2015	Long-term needs of different actors in the railway sector	1-3	RIA	€ 400 000
S2R-OC-CCA-02-2015	Energy usage, generation and saving approaches	3-5	RIA	€ 800 000
S2R-OC-CCA-03-2015	Noise reduction methodologies	3-5	RIA	€ 1 000 000
S2R-OC-CCA-04-2015	Safer infrastructure – improved object detection and prevention of safety critical events and integrated mobility	3-5	RIA	€ 1 300 000
TOTAL				€ 3 500 000

S2R-OC-CCA-01-2015 Long-term needs of different actors in the railway sector

Challenge:

- Understanding the users' long-term needs and requirements of the sector´s services and products in order to develop the railway system of the future.

Scope (proposals expected to tackle all the areas below)

- Collect and analyse the long-term changes in future needs of actors and users of the railway sector and customer requirements
- Analyse mega-trends, scenarios and disruptions to the "landscape of mobility", changing the circumstances for railway, in 2022, 2030 and 2050
- Analyse the implications for the railway sector in case of car usage reduction, i.e. by 10% or more
- Match the outcome of customer requirements, scenarios and society effects of the aforementioned studies with the objectives of S2R Master Plan

Expected impacts:

- Improve the sustainability in the transport sector and clearly show the market uptake potential and enable long-term decision-making in the railway sector

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: € 400 000

S2R-OC-CCA-02-2015 Energy usage, generation and saving approaches

Challenge:

- Develop solutions for reduction of energy consumption including a standardized simulation methodology for estimation of energy consumption in the railway sector

Scope:

- Analyse the energy requirements for urban rail traffic all over Europe
- Develop an energy simulation model and provide a simulation tool allowing the evaluation of energy consumption (high speed, regional, urban and freight)
- Develop the optimum drive strategies and energy management for different propulsion systems and traffic segments.
- Analyse the losses of energy within the traction chain including their cooling needs for different traction systems
- Develop a global vision of energy in railways including smart management of railway networks.

Expected impacts:

- Enable decision-making with regard to which innovations should be applied when new trains or infrastructure assets are purchased
- Reduction of the environmental impact and increase the competitiveness of rail transport due to reduced energy costs

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: € 800 000

S2R-OC-CCA-03-2015 Noise reduction methodologies

Challenge:

- As noise and vibration represent one of the biggest environmental challenges for the railway sector, it is essential to facilitate effective noise and vibration management.

Scope (proposals expected to tackle all the areas below)

- Evaluation and monitoring of impact on traffic noise scenarios of S2R research and innovation activities
- Develop interior noise simulation model
- New Technologies: auralisation and visualisation
- Perform and demonstrate feasibility of active and other new noise control technology on noise proof windows

Expected impacts:

- Improved attractiveness and comfort for rail users and reduced exposure to noise and vibration;
- Improved cost effective methods for analysis and selection of exterior and interior noise mitigation actions;
- Improved methods and tools for simulation of interior noise including source characterisation and specification as well as methodologies for cost effectiveness of exterior noise scenarios.

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: € 1 000 000

S2R-OC-CCA-04-2015 Safer infrastructure – improved object detection and prevention of safety critical events and integrated mobility

Challenge:

- Ensuring and enhancing the safety of rail operations
- Integrated approach for a quality-oriented operational railway planning

Scope (proposals expected to tackle both areas below):

1. Safety
- Develop a global approach to an integrated management system for the safety of the railway system, based on a global risk assessment model

2. Integrated mobility (smart planning)
- improvement of basic micro-level railway network simulation models and test its implementation

Expected impacts:

- enable decision-making to manage the safety of the railway system at a global level
- help to deliver precise railway network simulation to support railway operational planning

Type of Action: Research and Innovation Action (RIA)
Estimated EU contribution per proposal: € 1 300 000