- Reduced errors (human, in the processes, etc.)
- High efficiency / increased performance
- High automation and auto-adaptive systems
- Simplified supervision and fast problems resolution
- Reduced complexity, simplified and interoperable interfaces
- Reduced wayside architecture
- Reduced efforts for V&V and further bug fixing
- Improved flexibility

Type of Action: Research and innovation Action

S2R-OC-IPX-02-2018 – Transversal exploratory research activities and knowledge transfer

Specific Challenge:

Current activities in S2R are developing the fundamental building blocks that will allow the creation of the future railway interoperable system, but new disruptive technology can accelerate the pace or deviate the path.

This topic aim to strengthening the effectiveness of consensual exploratory research building in Europe, through continuous cooperation among the rail community, including decision-makers, to provide an orientation on the future needs and possible collaborative research on future and emerging innovative ideas.

This action will assist the rail-related European technology platforms (ETP) and will foster the creation of expertise and knowledge for the benefit of the future evolution of the rail system while supporting the competitiveness of the European rail sector.

This topic should stimulate the learning and exchange of knowledge from academia, research community and industrial partners build upon the S2R R&I results and also stimulating the transfer of new knowledge from other disciplines.

The challenge of this topic is also to consider, incorporate and further elaborate on the results of the complementary topic S2R-OC-IPX-03-2018: Innnovative/breakthough mobility concepts (with rail as backbone), in order to leverage the effect from a broad community of rail stakeholders (represented in the ETP) with transfer of knowledge and specialised PhD research activities.

Scope:

In order to address the challenges described above, the proposals should address the following workstream and coordination actions:

- Delivery of a Rail Sector observatory and roadmap:
    - monitoring, identification and analysis of new opportunities for innovative research of relevance to the evolution and attractiveness of the rail system and
    - development of a long-term perspective by focusing on innovative and interdisciplinary intermodal and multi-modal concepts considering rail as backbone beyond S2R scope and timeframe;

  The roadmap should contain information on the S2R Capabilities and its Building Blocks (described in the S2R Multi Annual Action Plan) in the long-term period for S2R concepts

evolution. It shall integrate emerging trends and recent existing strategic documentations on rail transport and research produced at European (e.g. STRIA) or national level.

- Delivery of compiled and analysed data and statistics on the rail advantages/benefits in Europe, as for example:
    - Statistics of GPD influence growth that rail provide as contribution in each Country
    - Statistics of employments in the sector, in manufacturing industry, service industries/mainline, urban and local operating companies and infrastructure managers, research centre, etc.
    - Comparative studies of rail (long distance, regional and urban) passenger/freight demographics in the different Countries and overall usage of rail/local/urban public rail transport
    - Impact of rail on climate change and comparative study with other transport modes, including emerging trends as electric cars and taking into account S2R foreseen results
    - Study on how rail can better serve multimodality supported by case studies
    - Rail capacity and bottlenecks in the different Countries
- Benchmarking activities and support to the creation and organization of innovative rail initiatives in close cooperation with the S2R JU coupled with the rail R&I funded at EU level under H2020 such as S2R Science Awards, S2R Hackaton events, TRA.

  Additionally, specifically addressing event/marketing activities of rail S2R funded innovations towards EU citizens.

  The Scientific community of the European rail Technology Platform should be involved.

Strong and focused consortia must be made-up of leading European experts for transport technologies from both sector and research providers. The implementation of this action requires close collaboration with the ETPs dealing with rail transport research and innovation. Cooperation with the S2R JU will be an essential element in this coordination and support action.

Note: The project must not subsidise any direct or indirect costs (e.g. secretariat) of the ETP organisations. In kind contributions from additional stakeholders are welcome.

The S2R JU will only fund one proposal under this topic.

Expected Impact:

The expected impacts from these activities will be cross-fertilization of knowledge from other disciplines or of disruptive technology and innovation not yet fully applicable to rail, that will encourage the exploration of innovative and unconventional ideas and research directions in rail.

Other expected impacts are the kick-starting of new ideas through dedicated S2R events and overall contributing to the evolution of the S2R activities. Additionally, gathering all relevant stakeholders around a common forward-looking activity that include also dissemination and communication activities, aim as well to create strong engagement of scientists, citizens, innovators and policy makers and non-rail stakeholders.

S2R-OC-IPX-03-2018: Innovative/breakthrough mobility concepts (with rail as backbone)

Specific Challenge:

Current activities in S2R are developing the fundamental building blocks that will allow the creation of the future railway interoperable system, but new disruptive concepts can accelerate the pace or deviate the path.

This topic aim to challenge the traditional rail approach with innovative and breakthrough concepts from a non-linear approach to existing technological evolution.

Scope:

In order to address the broad challenges described above, the proposals should foresee PhD research for indicatively a period between 12 to 24 months on the following thematic: Innovative/breakthrough mobility concepts that keep rail as backbone of a sustainable European Transport system.

The PhD researchers are expected regularly to liaise with the S2R JU and to present their research findings to the S2R events, including those organized with the European rail Research Technological Platform and submit scientific papers to relevant conferences (e.g. TRA, WCRR, etc. but also non-rail related).

This action may be requested to provide relevant inputs to the European rail Technology Platform.

The S2R JU expect to finance four proposals from universities or similar high level institutes covering each at least one PhD student activities.

Expected Impact:

Research results are expected to contribute to future S2R exploratory research and in general to open new possibilities and ideas for the S2R stakeholders and rail research community.

At the same time, the PhD researchers who are part of the S2R activities, are expected to become European ambassadors of the possible bright and innovative future that the rail sector has in the year to come.