

<b>General Information</b>	
Preliminary title of the European Partnerships	European Partnership for Transforming Europe's rail system
Short description of the partnership	Define, design and implement the full spectrum of rail research and innovation activities – from fundamental research to large-scale demos – to trigger a major transformation towards a digital, automated and decarbonised mobility system, maximize the socio-economic benefits and deliver on the EU policy goals.
Services directly involved	DG MOVE, DG RTD
Context and problem definition	<p>The initiative will address the challenges faced by the rail sector, through a targeted and coordinated approach focusing on the needs of the rail system and its users and with key enablers such as automation, digitalization and decarbonisation. R&amp;I investments to support this therefore contribute in a significant way to the strategy of greenhouse gas emissions reduction.</p> <p>The completion of the Single European Railway Area (SERA) is on track, but more needs to be done to remove remaining administrative, technical and regulatory obstacles that hold back the rail sector in terms of market opening and interoperability. Rail research challenges have already been recognised. under previous and current Framework Programmes. In particular, the Shift2Rail JU set up in 2014 under Horizon 2020, has brought the industry together, delivering a number of demonstrators across the whole rail value chain. This is a significant step forward compared to fragmented collaborative R&amp;I activities carried out under previous Framework Programmes in the rail sector.</p> <p>The main issue that the initiative will address is the need to strengthen the role of rail in the transport system, given its advantages in terms of environmental performance, land use, energy consumption and safety. More specifically, rail services still lack competitiveness (cost efficiency) and attractiveness (reliability) of in comparison with other modes, and lack of appropriate integration of freight. Given the complexity of the rail sector, deep coordination and alignment of public and private funding are essential in order to address this problem. The potential areas of intervention are:</p> <ul style="list-style-type: none"> <li>- R&amp;I and deployment to increase competitiveness, attractiveness, punctuality, reliability, integration of freight</li> <li>- Alignment of funding</li> <li>- Effectiveness and efficiency of implementation of the programme</li> <li>- Coordination, which is vital given the complexity of rail.</li> </ul> <p>Important contextual elements to be considered here are, inter alia, current technological trends and anticipated future ones, societal challenges, as well as game changers, for example automated traffic management, signalling, information systems, automated train operation. The initiative will also address the problems of slow deployment and market uptake of innovative solutions in order to make railways more attractive.</p>
Objectives and expected impacts	<p>The Partnership has the following main objectives:</p> <ul style="list-style-type: none"> <li>• Strengthening the role of rail in the transport system by increasing the cost-efficiency and reliability of EU rail services</li> <li>• Reinforcing the global technological leadership of the European rail industry</li> </ul> <p>The estimated timeframe to achieve the Partnership objectives is 2021- 2030.</p> <p>The future programme will be aligned with the EU policy objectives and should have a stronger focus on freight, integrating rail into digital multimodal mobility and logistics chains. Building on the activities carried out under Shift2Rail JU, technical priorities will be reviewed on the basis of emerging trends, such as</p>

	<p>digitalisation of the sector, need for decarbonising transport and automation. The new Programme will be more focussed and with a limited number of priorities, such as freight and automation. Moreover, the ambition is to complement research and innovation activities by additional mechanisms to ensure and accelerate the deployment of innovation on the rail network. Particular attention will be also paid to contributing to cost reduction in rail.</p> <p>The initiative is expected to deliver through research and innovation the technological solutions to ensure a transformation of the railway system, allowing it to become the backbone of an integrated and sustainable mobility system in Europe. By facilitating greater reliability, flexibility and capacity, it will enhance competitiveness of rail vis-à-vis both other transport modes, and ultimately promote a shift from other modes to rail. The initiative will significantly advance the concepts needed for a transformation of rail by means of a system-integrated approach with decarbonisation, automation and digitalization (big data, artificial intelligence, distributed ledger technologies, new scientific approaches, etc.) at its core.</p> <p>With reference to the Horizon Europe objectives, the initiative will have scientific and economic impact, for example through the promotion of innovative emerging technologies, cost reduction in rail applications through optimised energy use, reduced lifetime infrastructure costs, increased performance, digitalisation and automation. Moreover, the new partnership is expected to have social benefits in terms of employment, sustainability, safety and security. The increased role of rail in European transport will drive the reduction in the use of fossil fuels resulting in lower greenhouse gas and pollutant emissions.. The initiative will also have an indirect impact on a number of fundamental rights: for example, persons with disabilities will benefit due to the contribution of the initiative to make rail services more attractive for passengers with various needs also by increasing accessibility of railway stations and rolling stock.</p>
<p>Necessity test: rationale for a European Partnership</p>	<p>The nature of rail as a highly integrated system means that, in order to maximise impact, innovation needs to be delivered across the system, with constant requirements to upgrade infrastructure, rolling stock and traffic management. Fragmented research efforts do not deliver this.</p> <p>A system level approach is vital, given the need to preserve and enhance interoperability across the EU network, and to ensure a critical mass of demand to allow industrialisation of innovation. This will result in a common forward-looking vision for the Single European Railway Area embraced by all stakeholders. The pooling and coordination of R&amp;I efforts at EU level stands a good chance of success given the transnational nature of the infrastructure and technologies to be developed in support of the Single European Railway Area, 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.</p> <p>A dedicated partnership is able to address rail-specific issues in a way that could not be done through ‘regular’ collaborative R&amp;I or other forms of Partnerships under Horizon Europe, notably:</p> <ul style="list-style-type: none"> <li>- Fragmentation among railway ecosystems, i.e. a patchwork of different regional and national systems, networks and technical operating standards.</li> <li>- Fragmentation among rail subsystems. Complex interactions between subsystems (infrastructure, rolling stock and signalling equipment) and actors (manufacturers, railway undertakings and infrastructure managers) limit the potential development of specific elements of the system and the implementation of breakthrough solutions, which have an impact on the system as a whole.</li> <li>- Fragmentation along the innovation life cycle. Uncoordinated EU research activities generated by European R&amp;I projects in the past resulted in very low market uptake of rail innovative solutions. This resulted in a limited</li> </ul>

	<p>direct leverage effect of EU funding.</p> <ul style="list-style-type: none"> <li>- The "bottom-up" approach of rail collaborative research projects resulted in an uncoordinated programming approach and poor alignment with EU policy goals.</li> </ul> <p>The experience with the Shift2Rail JU has shown that the challenges are better addressed at EU level through setting a common research strategic agenda and coordination of the research and innovation activities from the public and private sectors. Legally binding commitments of the industry have led to a high level of engagement of all stakeholders.</p>
Relevant for the following parts of Horizon Europe	<p>Pillar II 'Global Challenges and European Industrial Competitiveness'</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cluster Health</li> <li><input type="checkbox"/> Cluster Culture, creativity and inclusive society</li> <li><input type="checkbox"/> Cluster Civil Security for Society</li> <li><input type="checkbox"/> Cluster Digital, Industry and Space</li> <li><input checked="" type="checkbox"/> Cluster Climate, Energy and Mobility</li> <li><input type="checkbox"/> Cluster Food, Bioeconomy Natural Resources, Agriculture and Environment</li> <li><input type="checkbox"/> Cross-cluster</li> <li><input type="checkbox"/> Pillar III 'Innovative Europe'</li> </ul>
Currently identified links with other partnership candidates / Union programmes	<p>The partnership for transforming Europe's rail system will build on the regular exchanges facilitating transfer of knowledge of S2R JU with other JUs (in particular FCH, but also Clean Sky and SESAR). Therefore, synergies between projects, additional value and leverage effect cross-sectors can be envisaged with the following partnerships candidate:</p> <ul style="list-style-type: none"> <li>- Integrated Air Traffic Management</li> <li>- Clean Aviation</li> <li>- Clean Hydrogen</li> </ul> <p>Moreover, the step from the research &amp; development stage to the market could be improved through synergies with other programmes (e.g. Cohesion Fund and CEF which will focus on deployment of new transport technologies generated under Horizon Europe and elsewhere).</p>
Does the proposed partnership build on currently active ones?	<p>The proposed institutionalised partnership builds upon the existing Shift2Rail JU, which was established until 31 December 2024, and will launch its last calls in 2020.</p>
Expected type and composition of partners	<p>The proposed partnership could have members representing the sector in a comprehensive and balanced manner, i.e. representatives of the European manufacturing industry, railway operators and infrastructure managers including urban, from across the EU. An appropriate and flexible governance structure will be defined during the preparatory phase.</p> <p>The members would perform R&amp;I activities related to the core of the programme (mostly applied research). With regard to fundamental research, collaborative projects completely open in terms of participation would be funded in accordance with the Horizon Europe rules.</p> <p>Finally, particular attention will be paid to increase participation of SMEs and start-ups to ensure that new ideas, project, solutions specifically rail related would find an opportunity to connect with the sector and explore the possibilities to scale up.</p> <p>In the process of setting up the programme of the proposed partnership, different consultation processes with key stakeholders, regions, scientific communities as well as with end users would take place in order to ensure an upstream involvement and commitment of the whole rail sector.</p>
Contributions and commitments expected from partners	<p>The funding rate could be indicatively 50%. This would include in-kind contributions – person hours, existing assets, etc. – but also in cash through the investments made by the core members and associated participants in order to perform their activities in the proposed partnership, and possible additional</p>

	activities directly linked to the exploitation and uptake of results from projects
Currently envisaged implementation mode(s).	<input type="checkbox"/> Co-programmed European Partnership <input type="checkbox"/> Co-funded European Partnership <input checked="" type="checkbox"/> Institutionalised European Partnership <ul style="list-style-type: none"> <li><input type="checkbox"/> Article 185</li> <li><input checked="" type="checkbox"/> Article 187</li> <li><input type="checkbox"/> EIT-KIC</li> </ul>
Justification of the implementation mode	<p>The current S2R JU demonstrates the added value of an institutionalised partnership by having the rail stakeholders (manufacturers, infrastructure managers and operators – and actors beyond rail) working together towards railway system changes aligned with the EU policy goals. The development of a long term R&amp;I strategy – in close cooperation with and supported by all market players – in the framework of an institutionalised partnership ensures evolution and consistency of the R&amp;I activities at European level.</p> <p>The legal certainty offered by this form of partnership together with the outstanding level of expertise of the stakeholders involved and the firm commitment from the Union contribute to building trust among the public and private partners, thus stimulating significant investments in R&amp;I. Moreover, the legally binding commitments of the industry to match the Union contribution ensure not only a direct leverage but also a high level of engagement of all stakeholders involved for achieving successful results.</p> <p>The visibility of the sector ensured by an institutionalised partnership cannot be offered by any other form of intervention; moreover, it allows generating and increasing the interest and therefore the growth of Investments in R&amp;I through the involvement of new players as well as creating new market opportunities, for example for SMEs.</p> <p>S2R JU has shown that the efficient coordination of a long-term programme enforced by a dedicated organisation and committed members and partners triggers the large interest of R&amp;I actors in participating to the Programme.</p> <p>An institutionalised partnership provides the opportunity for a strong alignment of the R&amp;I activities with the EU policy needs and objectives. It ensures that higher Technology Readiness Levels (TRL) result in innovative solutions targeting a major system transformation with a clear impact on future standards and regulatory framework.</p> <p>The institutionalised partnership goes well beyond the specific market needs or interests of the stakeholders involved; coordinated R&amp;I activities aligned with the EU policy goals have a major socio-economic impact for the benefit of businesses and citizens for example by reducing life-cycle costs, increasing capacity as well as the reliability and punctuality of rail services.</p> <p>Other forms of Partnerships would not be able to overcome the fragmentation and gather the stakeholders to deliver such transformation in an integrated system. For example, a contractual approach would have unfocused piecemeal results – as shown by research projects funded under previous FPs whose results did not reach the market – which would risk undermining the progress achieved and the policy ambition of the Union in terms of ensuring interoperability and rapid market take up, thus supporting overall policy objectives on mobility, decarbonisation, energy management and digitalization.</p>
Proposed starting year	The partnership is expected to start implementation in 2021 to ensure a smooth transition between the current and the next Programme. This will also facilitate keeping the favourable momentum and foster the market uptake of solutions that will be ready for deployment by that time.