

The S2R Joint Undertaking considers that proposals with a duration of 30 months would allow this topic to be addressed appropriately. Nevertheless this does not preclude submission and selection of proposals with another duration.

## **COMPLEMENTARITY**

As specified in section 2.3.1. of AWP 2020, in order to facilitate the contribution to the achievement of the S2R JU objectives, the options regarding 'complementary grants' of the S2R JU Model Grant Agreement and the provisions therein, including with regard to additional access rights to background and results for the purposes of the complementary grant(s), will be enabled in the corresponding S2R JU Grant Agreements.

The action that is expected to be funded under this topic will be complementary to the actions that are expected to be funded under the following topics:

- S2R-CFM-CCA-01-2019: Integrated mobility management (I2M), Energy and Noise & Vibration

## **EXPECTED IMPACT:**

### **Ground Vibration:**

Improvement of the planning process of new lines or the upgrade of existing lines by a common accepted model for impact studies on ground vibrations. The model will help to evaluate construction projects on their dedicated impact of ground vibration immission for citizens effected by railway vibration near to the tracks.

### **New Technologies - Auralisation and Visualisation (A&V)**

Access to a fully functional software for Auralisation and Visualisation allowing the possibility of listening and experiencing visually the noise of trains passing a certain track, long before it is built and test different noise mitigation measures as well as assess modification of the interior noise. The synthesized noise is based on physically correct noise generation mechanisms. The A&V tools shall be used to enable a clear communication and conscious and knowing decision making by demonstrating the planned railway vehicle or railway project not only visual but also acoustically real and thus more concretely and convincingly.

## **Type of Action: Research and Innovation Action (RIA)**

### **4.2.11 S2R-OC-IPX-01-2020: Innovation in guided transport**

#### **SPECIFIC CHALLENGE**

Since the the modern hyperloop proof of concept was coined in a white paper in 2013, and with the creation of Shift2Rail in 2014, many activities touching innovation in guided transport have arisen in Europe and elsewhere in the world. Technologies dealing with innovative control systems for vehicle to vehicle interaction, with communication and positioning systems (incl. in tunnel environments), advanced magnetic levitation, with innovative light materials, with energy storage and regeneration solutions have been investigated in a fragmented and competitive manner. The challenge is to channel

all these diverse innovations and technical solutions in a coherent framework that would potentially support a possible European implementation or migration of concepts towards other innovations in guided transport modes and to support interoperability with the Single European Railway Area (SERA).

## **SCOPE**

In order to address the challenges described above, proposals should aim to create under the umbrella of Shift2Rail a framework, where innovation in guided transport would converge in the view of safe operation of the future systems.

This activity would need to be able to gather all promoters, at least European, of technologies around hyperloop and together (but not necessarily limited to these two points):

- Define the enhanced / innovative modes in terms of:
  - Concept of operations
  - Safety cases
  - Functional specification
  - Operational conditions and testing methodologies / environment.
- Identify the potential transferability and synergies with Railways solutions, processes and procedures in general, and in particular from a technological perspective with the S2R innovations (Technology Demonstrators and IPx activities).

## **EXPECTED IMPACT:**

The expected impacts derive from gathering all relevant stakeholders around a common encompassing activity on innovative concepts for guided transport modes. The outcome of this activity should provide to the interested stakeholders the clarity on operational concepts and standardisation possibilities and also enable a structured discussion with policy-makers around safety/security and transport system(s) integration at European level.

Other expected impacts from these activities will be cross-fertilization of knowledge from other disciplines or from disruptive technologies and innovation (e.g. coming from hyperloop) not yet fully applicable to rail, which will encourage the exploration of innovative and unconventional ideas and research directions in guided transport modes.

## **Type of Action: Coordination and Support Action (CSA)**