ANNUAL ACTIVITY REPORT 2018

Executive View

Shift2Rail

Moving European Railway Forward

A full version of the Annual Activity Report 2018 is available here:

ANNUAL ACTIVITY REPORT 2018

Executive View

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SHIFT2RAIL IN 2018

CARLO M. BORGHINI | Executive Director

"During this year we have continued our efforts to work together with our Members and the sector at large to promote the competitiveness of the European rail industry and meet the EU's changing transport needs for European citizens and freight businesses."

2018 marked a turning point for Shift2Rail Joint Undertaking showing its capability to deliver tangible innovative solutions answering to the evolving needs of rail stakeholders. Game-changing demonstrators showcased at InnoTrans 2018 including virtually connected trams, noise and vibration monitoring and mitigating technologies, smart energy metering, passenger ticketing and travel companion, intelligent video gate and digital brake test for freight trains received a large coverage during and after the event. These demonstrators mark a key moment in the ongoing work being performed by Shift2Rail Members and beneficiaries to transform the rail system with these innovative solutions expected to be industrialized and ready for market uptake from 2022.

Thanks to the commitment and ongoing work of Shift2Rail staff, Members and beneficiaries, our five Innovation Programmes (IPs) and Cross Cutting Activities (CCA) are on target and in line with the expected planning. In cooperation with its Members, Shift2Rail has progressed during 2018 towards its goals that contribute to a sustainable, punctual, interoperable, high-capacity rail system, providing a backbone for the whole mobility and transport sector in Europe.

Shift2Rail together with its Members has investWed more than € 600 million in three years in rail R&I activities. This by itself is a major achievement as it represents a significant increase in the efforts to innovate the sector as a whole. In addition, Shift2Rail has been able to support the digital transformation programmes of infrastructure managers and operators that are crucial for bringing the rail sector to a new level.

Shift2Rail has started to deliver on its mission to bring the sector together and show the capacity to evolve towards new ideas and technologies, while importantly maintaining a delivery oriented approach. We look forward to continuing this work together with our Members.

"Rail transport is the centre piece of our Vision 0 strategy to make the transport sector and the EU carbon neutral. During the last year, by continuing to pool and coordinate research and innovation efforts at European level, Shift2Rail has become an essential element in achieving our objective of making rail even more cost-effective, available and an attractive mode of transport that connects citizens and businesses in Europe."

VIOLETA BULC | Commissioner for Transport

CALL 2018 IN FIGURES

325
PARTICIPANTS

19 PROJECTS
FOR A TOTAL VALUE OF
€ 152.6 MILLION

SHIFT2RAIL
CO-FUNDING
€ 77.3 MILLION

12
OPEN CALL
PROJECTS

76 SMES
40 RETRAINED

21
EU MEMBER
STATES

57.1 %
OF WOMEN PROJECT
COORDINATORS IN
H2020

EXECUTIVE SUMMARY

The Shift2Rail Joint Undertaking (S2R JU) is a public-private partnership under the Horizon 2020 Framework Programme[1] established to manage and coordinate mission-oriented Research and Innovation (R&I) activities for a major transformation in rail systems in Europe. The S2R JU was officially established on 7 July 2014, following the adoption of Council Regulation (EU) No 642/2014 of 16 June 2014 establishing the Shift2Rail Joint Undertaking (S2R Regulation). During 2018, the S2R JU has progressed towards achieving its targets, delivering the S2R Programme implementation ensuring an effective and efficient sound financial management.

Programme Status

2018 saw the progress of the R&I activities launched in the previous years. They are now well on track and largely proceeding at cruise speed. A new wave of R&I activities (Call 2018) started at year end. In total, it is estimated that the Total Project Cost of the activities performed in 2018 amounts to EUR 83.4 million.

During the month of April 2018 the S2R JU assessed its R&I activities through its second Control Gate assessment[2]. This exercise took into account the deliverables and reports submitted in the context of the Annual Review of the 2015-2016 Projects coordinated by the other Members than the European Union (hereinafter Other Members). The S2R JU also ensured through this process that the recommendations made during the first Control Gate Assessment where properly applied. Overall the S2R JU noticed an increased understanding of the assessment made both in quality term then in content; such a result is also due to the fact that for the first time the S2R JU was in capacity to assess a significant number of technical deliverables for the reviewed projects.

It has to be mentioned, although, that the quality of some submitted deliverables was below standard and the S2R JU requested several re-submission re-opening deliverables and suspending technical reports. This process has been therefore particularly demanding.

In addition, this process is integrated in the overall Programme monitoring realized through the quarterly meetings of the Innovation Programmes (IPs) where it is assessed how the different R&I activities organized in Projects are progressing in a coherent and integrated manner.
The S2R JU decided not to insert the 2017 Other Members Projects in the Control Gate assessment process of 2018 (no Project Review) due to the limited number of results available; those projects will perform their first Control Gate assessment in 2019. The S2R JU programme team conducted also projects review meetings for non-S2R Members during 2018.

The European Commission tasked also the S2R JU to assess the technical progress from the mid-term report of the four S2R Lighthouse Projects (LP), stemmed from the 2014 H2020 transport call administratively managed by DG Move (IN2Rail (LP), IT2RAIL (LP) and SMART-RAIL (LP)) and by DG RTD (ROLL2RAIL (LP)).

This Programme assessment allowed the S2R JU to confirm that overall the progress of the activities has been in line with the expectations; considering the status of the progress of the TDs reported in Section 1.7. Only few TDs show delays compared to the initial scheduling, mostly due to external factors. In such cases, the JU has requested the concerned Project Teams to put in place the necessary mitigating measures.

Shift2Rail's Contribution to the United Nations' Sustainable Development Goals

The R&I work performed by the S2R JU contributes to, at least, 6 out of 17 UN SDG. In particular, the S2R Programme contributes to:

- Building resilient infrastructure
- Promoting inclusive and sustainable industrialization processes – at manufacturing or operational levels
- Fostering innovation at all levels of the value chain
- Promoting inclusive and sustainable economic growth, tackling also aspects related to human capital opportunities and impact of new technologies on future skills and competences
- New mobility and transport models towards smart and sustainable cities and regions, connecting people and providing new socio-economic opportunities
- The urgent actions taken at Union level to combat climate change and its impacts,
- Promoting gender equality at all its levels.

During the last three years of activities and more in 2018, S2R shifted from being technology driven to a mission oriented Programme, designed to meet passengers and shippers needs, contributing to achieve sustainable mobility and transport, where railway offers an integrating platform in a multimodal approach, enabled by new technologies, in particular digitalization, automation, telecoms and satellite services. S2R remains strongly delivery oriented while coupling the need to further explore new solutions to harvest their full benefits.

PASSENGER TRAINS
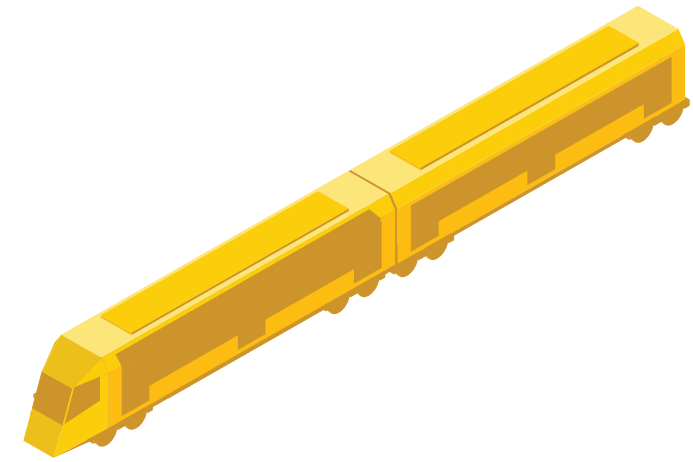
Positive progress has been reported on all TDs that on average have reached around 95% of the estimated work planned in 2018. The initial results in each TDs show that the investment in research and innovation is going to bring the expected results in terms of more efficient, lighter, automated and customer oriented passenger trains.

Most of the TDs are arriving at TRL 4/5 so not yet at the demonstrations' level. During 2018, synergies between IP1 and IP2 have been strengthen in particular with regard to Train Control and Monitoring System (TCMS) and telecoms. The IP1 programme has also contributed with valuable results to CCA work areas (Noise and Vibration, Smart Maintenance, Virtual Certification, etc.).

TRAFFIC MANAGEMENT
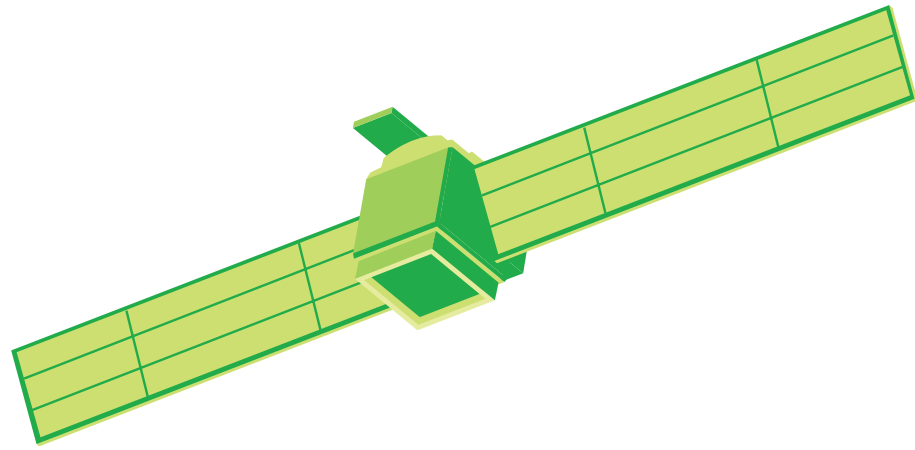
This innovation programme is one of the cornerstones of the S2R Programme; only through the achievement of virtual coupling, moving blocks, train integrity new concepts of traffic management enabled by positioning, telecoms, ATO and digitalization it will be possible to harvest the system benefits of the S2R Programme and meet the capacity objective. Although in line with the planning not all these technologies are expected to reach "demonstrator" level by the end of the present Programme, the work performed in 2028 has contributed to more focused R&I.

In July 2018, the infrastructure managers (IM) members of the S2R JU brought up a series of concerns about the progress of IP2 as well as some focus areas to deliver the key system transformation that is expected from the S2R Programme in the years to come. In particular, they brought forward the idea of a "railway command, control and signalling architecture" (RCA) that would contribute to a system integrated approach towards IP2 innovative solutions.

This work was discussed in different meetings within IP2 and it was agreed to assess the impact of the RCA on the S2R Programme (IP2 mainly but also IP1 and IP5). The initial content of RCA is expected by mid-2019 and, where needed, it will allow the planning of IP2 in a manner to bring the in depth discussion within the S2R community, so that operational requirements will meet technology solutions to deliver the next generation of railway systems.

As a result, the aforementioned realignment will contribute to accelerate the delivery approach of IP2 technological enablers. ATO TD has achieved a major milestone in the summer 2018 with the finalisation and publication of the draft specifications for ATO over ETCS GoA2. These specifications have been reviewed by the ERA (as ERTMS System Authority) supported by the ERTMS Users Group (EUG) and UNISIG (a working group from UNIFE, the rail manufacturing industry association, that contribute to the ERTMS/ETCS technical specifications) in order to assess the possible impact on the current ERTMS/ETCS specifications. This was a key milestone to ensure that the uptake of the results of this TD and prepare the integration of this functions and its specifications in the Control Command and Signalling TSI, in the next revision, currently targeted by 2022.

With regard to moving blocks, some demonstrations realized by S2R Members under their national programmes showed the opportunities provided by the introduction of such solutions, although the demonstrations were ring-fenced to a specific context. Some areas of concern are related to the availability of new telecoms technologies and some strategic decisions, where the S2R Programme works in strict collaboration with others, such as FRMCS (UIC project) and ETSI.

Also in the case of IP2, the maturity level of the R&I activities varies between TDs and the completion of the work is estimated at around 90% in 2018.

OPTIMIZED INFRASTRUCTURE
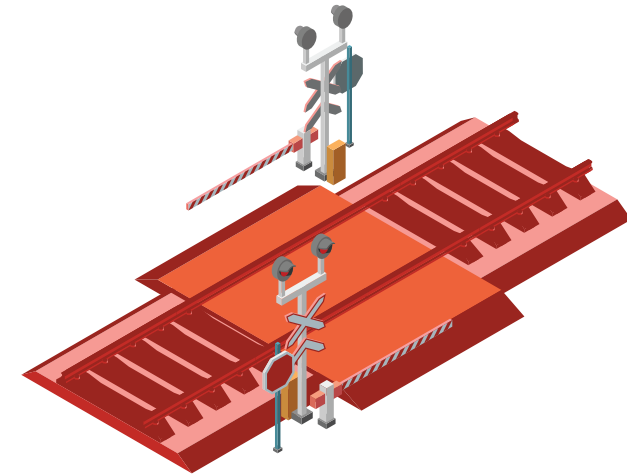
The heterogeneous nature of IP3 is developing in relation to funds released to date. Switches and crossings, track and bridges and tunnels activities have achieved early stage research and preparatory work towards operational environment demonstrators.

Good progress has been achieved in the areas contributing to intelligent asset management strategies. The status of the TDs shows the opportunity that would be provided by the implementation of new concepts of intelligent asset management (shifting from reactive to proactive maintenance) in terms of capacity and Life Cycle Cost (LCC).

Also in the field of energy, the scenarios developed in the relevant TDs demonstrated opportunities for the definition of strategies for efficient energy management contributing to the reduction of energy losses and to the reduction of the infrastructure investment costs.

DIGITAL SERVICES

During 2018, the IP has reported great progress towards delivering, by the end of the Programme, the Integrated Technical Demonstrator. Although legal issues related to the status of HaCon combined with the delays in the input from the Lighthouse Project affected the delivery of some TDs results, the concerned Members showed strong commitment continuing their activities to deliver IP4 TDs, inter alia.

Good progress has been achieved in the Interoperability Framework, showing that the semantic interoperability appear to be sound. The work of IP4 has been evolving also to take into account new services and the integration with other modes of transport and mobility services, approaching the Mobility as a Service (MaaS) concept.

RAIL FREIGHT
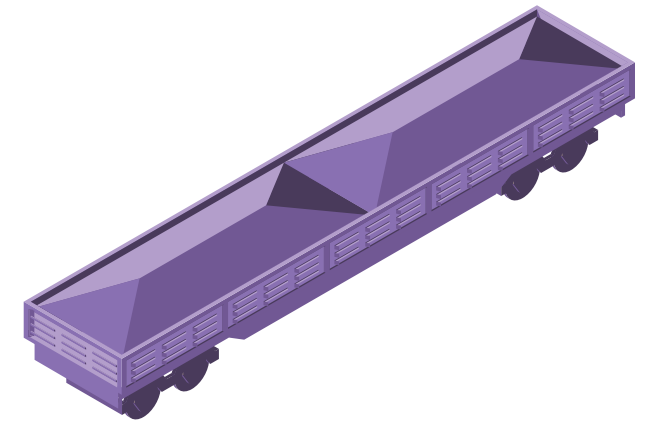
The Other Members involved in IP5 proposed a reorganization of the IP, as mentioned in the relevant section. During 2018, the links between IP2 and IP5 on ATO have been reinforced.

IP5 progress during 2018 is estimated at 80% compared to the expected targets, although most of the deliverables were met and the projects show good progress towards achieving the results. Although this IP is one of the smallest within the S2R Programme, the JU created opportunities with other IPs building clear synergies. Great expectations are included in IP5, considering the work performed in 2018 on ATO and automatic couplers.

CROSS-CUTTING ACTIVITIES
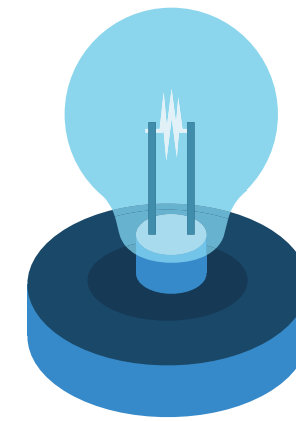
The Cross-Cutting Activities showed a slower pace compared to the other IPs, due to the need to establish internal procedures for cooperation with the IPs on which the results rely significantly as well as due to availability of key partners inside the different entities involved.

These cross-cutting activities ensure that the R&I activities within the different Innovation Programmes are closely aligned in order to guarantee consistency within the entire S2R Programme.

The CCA Work Areas (WAs) are largely dependent on the input provided by the rest of the Programme; this process has not been always easy and sometime negatively impacted the progress. The case of the S2R KPI model is a clear example where key effort has been performed but results are not yet at the expected level. In 2018 the

S2R JU put in place new cross-IP communication procedures that will support to build the links and to better engage the other IPs in topics of transversal nature.

Initial Programme results have been presented in the Transport Research Arena 2018, while some were showed as Technology Demonstrators quick-wins at the InnoTrans 2018 event. Some 20 demonstrators were presented showing the capacity of the S2R Membership to deliver the system transformation expected and also going beyond. The virtually coupled trams' demonstrator, a combination of different IPs/TDs showed in a specific environment the opportunity offered by telecoms nextgen, positioning, etc.; this flagship demonstrator is part of an overall system of systems approach where all TDs are working together to bring new railway concepts to Europe.

PROGRAMME MANAGEMENT AND MAAP

In terms of Programme Management, the S2R JU also took some corrective measures for a correct synchronisation of the Programme, resulting in the acceptance of few deliverables submission delays that will not, in principle, affect the overall Programme results. During this process, it clearly appeared that there is not a continuous internal communication process within the Other Members' entities; the current matrix structure of the Programme does not facilitate the implementation due to the fact that often those in charge of projects do not report to those seating in the S2R GB or other key governance bodies.

During the year, the Other Members in coordination with the JU continued to update the technical part of the MAAP (Multi-Annual Action Plan), the MAAP Part B, to align it with the vision set in the MAAP Executive View Part A and taking stock of the results of the ongoing Projects, of new technologies/businesses emerging and demonstration and deployment activities. This work is expected to be finalised by mid-2019 and adopted by the S2R GB by year end at the latest.During the year, the Other Members in coordination with the JU continued to update the technical part of the MAAP, the MAAP Part B, to align it with the vision set in the MAAP Executive View Part A and taking stock of the results of the ongoing Projects, of new technologies/businesses emerging and demonstration and deployment activities. This work is expected to be finalised by mid-2019 and adopted by the S2R GB by year end at the latest.

R&I ACTIVITIES LAUNCHED IN 2018 IN PREPARATION FOR 2019

In June 2018, the S2R JU awarded 19 grants as a result of the 2018 call for proposals launched in January 2018.

17 grant agreements were signed between November and December 2018 normally allowing the start of the projects in December 2018. 2 grant agreements will be signed in early 2019. The value of the R&I activities of this 2018 Call amounts to EUR 151.1 million, to be co-funded by S2R JU up to a maximum of EUR 76.5 million[3]. As in the case of the previous years and for the full duration of the Programme, the Other Members of the S2R JU agreed to a funding rate of maximum 44.44% (this would mean a net 41.44% for an Other Member after having considered its obligations), demonstrating a strong commitment to deliver the most ambitious Railway R&I Programme for a major transformation to rail systems, once deployed.

331 entities, of which 76 SMEs (23.0%), participated to the 2018 Call 2018. They represented 24 States, of which 21 EU Member States and 3 Countries Associated to the Horizon 2020 Framework Programme (See Annex C for details). To facilitate a future stronger participation from the EU-13 Member States, feedbacks received by the S2R JU suggests that it will be important to integrate successful S2R R&I results with longer-term demonstration and deployment activities, encompassing a wider geographical sector involvement and impact across Europe.

In December 2017, the S2R JU started the process for the preparation of the 2019 Call that was finally published on 15 Jan 2019 in the Horizon 2020 Funding & tender opportunities portal and based on the original version of the AWP 2019 adopted by the S2R JU GB on 4 December 2018. This lengthy process includes the key contribution of the S2R Members, the review and advice at different points of the SC, SRG, ERA and UR-ID and the adoption by the S2R GB, after the overall work was finalized under the responsibility of the Executive Director.

Since its appointment, the Executive Director was requested by the Members to ensure the streamline of the S2R Programme, starting with its administration. The Executive Director, together with the Programme Office, looked at the simplification process introduced by the European Commission through the Lump Sum Grant approach; after extensive internal discussions and analysis decided to propose to the S2R GB, as part of the AWP 2018, the adoption of the Lump Sum Grant approach, which was subsequently implemented through the Lump Sum Pilot in the CFM part of the 2018 Call. This met R&I stakeholders expectations that public international bodies in charge of mission-oriented Programmes, such as the S2R JU, are willing and capable to experiment with both bringing in new expertise (e.g. establishing novel forms of collaboration to pool and share expert knowledge) and changing routines and processes to build dynamic organisational capabilities (including performance management, procurement, grants, etc.). The S2R JU is at the forefront of such processes in a risk management approach.

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[3]   In fact the total value of the funding made available by the S2R JU at the launch of the call was of EUR 77.3 million, which resulted in grants awarded and signed for a total amount of funding of EUR 76.5 million.

PROJECTS 2018

IP1: PASSENGER TRAINS

Project Title		Period	Project Value
CONNECTA-2	CONNECTA-2 aims at contributing to the Shift2Rail's next generation of TCMS architectures and components, combining the new drive-by-data concept for train control together with wireless information transmissions.	01/10/2018 31/03/2021	€ 10 575 888,84
PINTA2	IP1 Traction TD1 and Brakes TD5 – Phase 2	01/09/2018 30/11/2020	€ 28 534 183,73
SAFE4RAIL-2	Smart Planning and Virtual Certification	01/10/2018 30/04/2021	€ 3 991 632,50

IP2: TRAFFIC MANAGEMENT

Project Title		Period	Project Value
EMULRADIO4RAIL	Emulation of radio access technologies for railway communications	01/12/2018 31/05/2020	€ 748 097,50
GATE4RAIL	GNSS Automated Virtualized Test Environment for RAIL	01/12/2018 30/11/2020	€ 1 019 993,75
MOVINGRAIL	Moving block and Virtual coupling New Generations of RAIL signalling	01/12/2018 31/12/2020	€ 1 299 135
X2RAIL-3	Advanced Signalling, Automation and Communication System (IP2 and IP5) – Prototyping the future by means of capacity increase, autonomy and flexible communication	01/12/2018 30/11/2021	€ 38 885 434,82

IP3: OPTIMIZED INFRASTRUCTURE

Project Title		Period	Project Value
ASSETS4RAIL	Measuring, monitoring and data handling for railway assets; bridges, tunnels, tracks and safety systems	01/12/2018 31/05/2021	€ 5 506 631,25
IN2TRACK2	Research into enhanced track and switch and crossing system 2	01/11/2018 30/04/2021	€ 30 162 671,14

IP4: DIGITAL SERVICES

Project Title		Period	Project Value
MAASIVE	Passenger service platform specifications for an enhanced multi-modal transport eco-system including Mobility as a Service (MaaS)	01/11/2018 31/05/2021	€ 11 692 236,26
SHIFT2MAAS	Shift2Rail IP4 enabling Mobility as a Service and seamless passenger experience	01/12/2018 31/12/2020	€ 1 499 906,25
SPRINT	Semantics for performant and scalable interoperability of multimodal transport	01/12/2018 31/12/2020	€ 1 999 500

IP5: RAIL FREIGHT

Project Title		Period	Project Value
FR8RAILII	Digitalization and Automation of Freight Rail	01/05/2018 30/04/2021	€ 12 375 552,16
M2O	Make rail the hope for protecting nature to future operation	01/12/2018 30/11/2020	€ 599 955

CCA

Project Title		Period	Project Value
PLASA-2	Smart Planning and Virtual Certification	01/09/2018 31/10/2020	€ 1 853 347,78

IPX

Project Title		Period	Project Value
B4CM	Blockchains as a Distributed Ledger for Attribution of RCM Data in Rail	01/12/2018 30/11/2021	€ 124 951,25
FLEX-RAIL	Paradigm shifts for railway – Technology uptake strategies for a lean, integrated and flexible railway system	01/12/2018 30/06/2021	€ 1 099 230
MVDC-ERS	Flexible medium voltage DC electric railway systems	01/12/2018 30/11/2021	€ 125 000
TER4RAIL	Transversal Exploratory Research Activities for Railway	01/12/2018 30/11/2020	€ 499 992,50

SHIFT2RAIL OVERVIEW

Name

Shift2Rail Joint Undertaking (S2R JU)

The Shift2Rail Joint Undertaking is a public-private partnership in the rail sector, providing a platform for cooperation that drives innovation in the years to come. The S2R JU pursues research and innovation (R&I) activities in support of the achievement of the Single European Railway Area and should improve the attractiveness and competitiveness of the European rail system.

Objectives

The S2R JU contributes to:

- a 50 % reduction of the life-cycle cost of the railway transport system (i.e. costs of building, operating, maintaining and renewing infrastructure and rolling stock),
- a 100 % increase in the capacity of the railway transport system,
- a 50 % increase in the reliability and punctuality of rail services (measured as a 50 % decrease in unreliability and late arrivals).

The S2R JU shall propose innovative solutions to be explored, tested and demonstrated in operational environment and/or "zero on site" to achieve market uptake. Beyond that, with the deployment of its innovative solutions the S2R JU will foster connections between people, regions, cities, and businesses, supporting the socioeconomic objectives of the Union

Founding Legal Act

Council Regulation (EU) No 642/2014 of 16 June 2014 establishing the Shift2Rail Joint Undertaking1 (S2R Regulation)

Executive Director (ED)

Mr Carlo M. Borghini, as from 16 May 2016

Governing Board (S2R GB)

European Commission (EC) members (at 31/12/2018):

- Henrik HOLOLEI, DG MOVE
- Elisabeth WERNER, MOVE DDG 2

EC alternate (at 31/12/2018):

- Clara DE LA TORRE, DG RTD
- Ratso SIGNE (RTD.I)

Industry members (at 31/12/2018):

- ALSTOM Nicolas CASTRES-SAINT-MARTIN
- ANSALDO STS Nadia MAZZINO
- AZD Praha Vladimir KAMPIK
- BOMBARDIER TRANSPORTATION Massimo SIRACUSA
- CAF Imanol ITURRIOZ
- DEUTSCHE BAHN Hans Peter LANG
- EUROC Thomas PETRASCHEK
- HACON Lars DEITERDING
- INDRA Javier Rivilla LIZANO
- KNORR - BREMSE Martin DEUTER
- NETWORK RAIL (Industrial Spokesperson) Andy DOHERTY
- SIEMENS Roland EDEL
- SMARTDEMAIN Henk SAMSON
- SMARTRACON Michael Meyer zu HÖRSTE
- SNCF Carole DESNOST THALES Alberto PARRONDO
- TRAFIKVERKET Bo OLSSON
- VVAC+ Filip KITANOSKI
- Industry alternates (at 31/12/2018):

- ALSTOM Sophie PERROCHEAU
- ANSALDO STS Antonella TROMBETTA
- AZD Praha Michal PAVEL
- BOMBARDIER TRANSPORTATION Richard FRENCH
- CAF Jorge DE CASTRO
- DEUTSCHE BAHN Ralf MARXEN
- EUROC (to be appointed)
- HACON Rolf GOOßMANN
- INDRA Jesus LACOSTA GIMENO
- KNORR - BREMSE Susanne SCHMIDT
- NETWORK RAIL Graham HOPKINS
- SIEMENS Jürgen SCHLACHT
- SMARTDEMAIN Javier Bonilla DÍAZ
- SMARTRACON Jaizki MENDIZABAL
- SNCF Christophe Chéron
- THALES Yves PERREAL
- TRAFIKVERKET Christer LOFVING
- VVAC+ Erik STOCKER

Other participants (at 31/12/2018):

- Carlo M BORGHINI Executive Director of the S2R JU

Observers (at 31/12/2018):

- Josef DOPPELBAUER
- Angela DI FEBBRARO
- Miroslav HALTUF

Other bodies

Scientific Committee (SC)
States Representatives Group (SRG)
Innovation Programmes' Steering Committees (IP SteCos)

Staff

23 (On-going staff recruitment) at 31 December 2018, including 3 Seconded National Experts (SNEs)

2018 Budget

Total voted budget of EUR 84.8 million in commitment appropriations, of which EUR 81.4 million for operational expenditure, EUR 3.4 million for administrative expenditure. In payment appropriations, the total voted budget was EUR 81.6 million in payment appropriations, of which EUR 67.4 million for operational expenditure, EUR 4.5 million for administrative expenditure and EUR 9.7 million of unused appropriations not required in the financial year but needed to meet early 2019 payments. The large amount of unused payment appropriations is due to the delay in the award of the 2018 Call, which was due to causes, legal issues, independent from the Call itself and S2R JU.

Budget implementation

The Budget implementation in terms of commitment appropriations is at 100% and at 82.3% in terms of payment appropriations (in case of payment appropriations, excluding the unused appropriations not required in the financial year). The implementation of Administrative budget was EUR 3.4 million in commitment appropriations and of EUR 3.4 million in payment appropriations. Applying sound financial management, the JU make use of multi-annual framework contracts in particular in Title 2; nevertheless suppliers submit relevant invoices with delays and usually in accordance with their accounting after year-end; this resulted in payment appropriations implementation at 63.4% of the voted budget, which corresponds to only 3% to the JU Budget. The Operational Budget was implemented at EUR 81.4 million in commitment appropriations and EUR 55.8 million (82.8%) in payment appropriations. Due to unforeseeable reasons, outside the control of the JU, two of the pre-financing payments resulting from the call 2018 became due in 2019 only and resulted the majority (EUR 83 million) of un-used operational Payment Appropriations for the year.

Grants

In October 2018, the S2R JU awarded 19 grants as a result of the 2018 Call launched on 11 January 2018 based on the amended Annual Work Plan (AWP) 2018. 17 grants agreements were signed between November and December 2018, allowing the timely start of the projects. As indicated earlier, 2 grants agreements will be signed beginning of 2019. In total, the grants will co-fund Research and Innovation activities up to EUR 77.3 million against a total value of EUR 152.6 million. In this respect, it should be noted that the Founding Members other than the Union and the Associated Members (jointly referred to as the "Other Members") agreed to limit their requests for funding to 44.44% of the total project cost. The lowest in overall H2020 Programme.

Strategic Research Agenda

The S2R JU Programme is described in the Multi-Annual Action Plan (MAAP) adopted by the S2R GB in 2015. A new MAAP Executive View (Part A) has been adopted by the S2R GB on 27 October 2017.

Call implementation

The AWP 2018 was implemented already at the beginning of the year, nevertheless due to legal issues beyond the control of the S2R JU and independent from the Call itself, resulted in the award only at a Governing Board meeting on 26 October 2018. With an

exceptional commitment and effort, the Other Members and OC together with the JU were able to reach the signature of 17 out of 19 grants, as mentioned, while 2 will be signed early 2019. In accordance with a multi-annual calendar, all the preparatory works

of the Call 2019 were realized in 2018 and on 4 December 2018, the S2R GB adopted the AWP 2019 and budget.

Participation, including SMEs

Under the 2018 Call, 76 Small and Medium Enterprises (SMEs) participated to the 2018 Call (23.0%) and 40 SMEs were retained for funding (21.6%). SME's represent 31.5% of the entities selected in the Open Calls projects.

Shift2Rail

Founding Members

ALSTOM

BOMBARDIER

CAF

Hitachi Rail STS

NetworkRail

SIEMENS

THALES

TRAFIKVERKET

Associate Members

AMADEUS

ŽCD PRAHA

DB

DIGINEXT be visionary

Faiveley Transport — A Wabtec Company

HaCon

indra

KNORR-BREMSE

kontron S&T Group

MERMEC — AN ANGEL COMPANY

SNCF

Talgo

Competitive Freight Wagon Consortium (CFW)

ConTraffic

DLR

WBN — Tradition since 1835

ceit — IK4 Research Alliance

DIE BAHNINDUSTRIE. — VDB VERBAND DER BAHNINDUSTRIE IN DEUTSCHLAND E.V.

Virtual Vehicle Austria consortium+ (VVAC+)

virtual vehicle

FCP

getzner — engineering a quiet future

KIRCHDORFER CONCRETE SOLUTIONS

Plasser & Theurer

voestalpine — ONE STEP AHEAD.

WIENER LINIEN

AVL

PJM

TATRAVAGÓNKA POPRAD

ACT research

MCL

Smart DeMain (SDM) consortium

Strukton Rail

acciona Construction

DLR

Fraunhofer IVI

cemosa — Ingeniería y Control

European Rail Operating community Consortium (EUROC)

ÖBB — Immer in Bewegung

bls

CP — COMBOIOS DE PORTUGAL

VÄYLÄ — Finnish Transport Infrastructure Agency

Infraestruturas de Portugal

PKP — POLSKIE KOLEJE PAŃSTWOWE Spółka Akcyjna

ProRail

SBB CFF FFS

Slovenske železnice

TCDD

AERFITEC

AERnnova

FIDAMC

tecnalia — Inspiring Business

Swi'Tracken consortium

RAILENIUM — TEST & RESEARCH CENTRE

U.PORTO

TATA STEEL

Universidad del País Vasco — Euskal Herriko Unibertsitatea

Universidade do Minho

vossloh

izt — Institute for Futures Studies and Technology Assessment

egis

EURO TUNNEL

TRONICO — ALCEN

Smart Rail Control (SmartRaCon) consortium

DLR

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