Bundesministerium
für Verkehr,
Innovation und Technologie

FTI-Initiative
MdZ transnational
Shift2Rail 2018

Ausschreibungsleitfaden

3. Ausschreibung

Einreichfrist
25. April 2018, 12:00 Uhr

FFG

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0 Das Wichtigste in Kürze

Das bmvit stellt ein Budget von max. 2,1 Mio. EUR für die Ausschreibung „Shift2Rail - Call for proposals for associated Joint Undertaking members“ bis 2020 zur Verfügung. Weitere 2 Mio. EUR werden von den Ländern Niederösterreich und Steiermark zur Verfügung gestellt.

Somit stehen im Rahmen von **Shift2Rail** für die transnationalen Ausschreibungen für Forschungseinrichtungen aus Österreich über die Laufzeit von Shift2Rail insgesamt 4 Mio. EUR zur Verfügung.

Ausschreibungsübersicht	
	Instrument
	Transnationales Kooperatives F&E-Projekt
Schwerpunkte	**Ausschreibungsschwerpunkte** Zuordnung von Instrumenten zu Subschwerpunkten (Vgl *Kapitel 2)*
Schwerpunkte	alle in Kapitel 2 beschrieben
beantragte Förderung in €	min. 100.000.- bis max. 2 Mio.
Förderungsquote	max. 80 % bzw. max. own contribution
Laufzeit in Monaten	max. 36
Kooperations-erfordernis	Ja siehe Instrumentenleitfaden
Budget gesamt	**ca. 4 Millionen € (2015-2020)**
Sprache	Deutsch und Englisch
Ansprech-person	Christian Pecharda +43 (0)5 7755-5030 christian.pecharda@ffg.at
Information im Web	https://www.ffg.at/shift2rail_call2018

Die Einreichung ist ausschließlich via eCall (https://ecall.ffg.at) möglich und hat vollständig und rechtzeitig bis zum Ende der Einreichfrist zu erfolgen. Eine **spätere Einreichung** (nach 12:00 Uhr) wird **nicht mehr berücksichtigt** und führt zum Ausschluss aus dem Auswahlverfahren!

Bitte beachten Sie:

Sind die Formalvoraussetzungen für eine Projekteinreichung entsprechend den Konditionen und Kriterien des jeweiligen Förderungsinstruments nicht erfüllt und handelt es sich um nicht-behebbare Mängel, wird das Förderungsansuchen bei der Formalprüfung aufgrund der erforderlichen Gleichbehandlung aller Förderungsansuchen ausnahmslos aus dem weiteren Verfahren ausgeschieden und formal abgelehnt!

Zeitplan:

Einreichschluss:	25. April 2018, **12:00 Uhr**
Formalprüfung:	Mai 2018
Evaluierung:	Sommer 2018
Förderentscheidung:	Herbst 2018

Themenverantwortung bmvit:

Shift2Rail:	Sarah Bittner-Krautsack

Programmmanagement FFG:

Verkehrsinfrastruktur:	Christian Pecharda

Fragen zum Kostenplan - Projektcontrolling & Audit

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1 Motivation

Shift2Rail ist eine Public-Privat-Partnership zwischen der Europäischen Union und dem Eisenbahnsektor. Für das Vorhaben steht über die Laufzeit von sechs Jahren ein Budget von 920 Mio. Euro zur Verfügung, davon 450 Mio. Euro aus Horizon 2020, dem EU-Programm für Forschung und Innovation. Die restlichen 470 Mio. Euro waren als Beitrag seitens der Gründungsmitglieder und assoziierten Mitglieder aufzustellen. Dafür können sich die Gründungsmitglieder bis zu 200 Mio. EUR und die assoziierten Mitglieder bis zu 135 Mio. EUR aus den 450 Mio. EUR aus Horizon 2020 durch Teilnahme an den Call for proposals for the JU members bis 2020 holen.

Ziel des Forschungs- und Innovationsvorhabens Shift2Rail ist es, die Wettbewerbsfähigkeit der europäischen Bahnindustrie zu sichern und zu stärken und gleichzeitig einen Beitrag zur Erreichung der Verlagerungsziele aus dem Weißbuch Verkehr zu leisten. Die Entwicklung, Integration, Demonstration und Validierung innovativer Technologien und Lösungen für Schienenfahrzeuge, Infrastruktur und Verkehrsmanagementsysteme und -dienste soll die Markteinführung entscheidender technologischer Neuerungen beschleunigen und erleichtern.

1.1 Ziele der Ausschreibung

Die transnationale Ausschreibung verfolgt folgende Ziele:

- Bündelung der österreichischen Stärken im Bereich Forschung und Innovation im Bahnsektor für die Teilnahme an der europäischen Forschungs- und Technologieentwicklung im Bahnsektor als Beitrag zur Sicherung der Wettbewerbsfähigkeit der österreichischen Bahnindustrie und Wissensaufbau in der österreichischen Bahnforschung

- Forcierung der systemischen Betrachtung des Systems Bahn und seiner Schnittstellen zu anderen Verkehrsträgern als Beitrag zu den Verlagerungszielen der Europäischen Kommission aus dem Weißbuch Verkehr und der Ziele des Gesamtverkehrsplan aus 2012 (Umweltfreundlichkeit und Effizienz des Verkehrssystems, Verlagerungsziele)

2 Ausschreibungsschwerpunkte

Die transnationale Ausschreibung ist zu folgenden Schwerpunkten geöffnet:

2.1 Research into optimised and future railway infrastructure (S2R-CFM-IP3-01-2018)

2.2 Technology demonstrators for competitive, intelligent rail freight operation (S2R-CFM-IP5-01-2018)

2.1 Research into optimised and future railway infrastructure (S2R-CFM-IP3-01-2018)

Specific challenge: In the coming years, we can expect a strong growth in rail transport demand, accompanied by aging infrastructure and growing effects of climate change.

With respect to the rail infrastructure, in order to face these demands, this call consists of research work aiming at enhancing, optimising and developing switches & crossings (linked to TD 3.1 Enhanced switch & crossing system demonstrator and to TD3.2 Next generation switch & crossing system of the S2R MAAP) as well as track systems (linked to TD 3.3 Optimised track system and TD3.4 Next generation track system of the MAAP) including drainage management, in order to ensure optimal line usage and capacity.

The call also includes research on extending the life of bridges and tunnel assets (directly linked to TD 3.5 Proactive bridge and tunnel assessment, repair and upgrade demonstrator of the S2R MAAP) through better approaches for assessing, maintaining, repairing and upgrading these structures. The focus should be on proactive maintenance and operation of all these assets, considering the needs and costs across their whole life including disruption of service.

Scope:

In order to address the challenges described above, the proposals should address all the following work streams, in line with the S2R MAAP:

- Further improve, develop and implement the whole system modelling approaches for track & S&C, to gain an understanding of how alternative asset designs, materials, etc. affect the overall performance of the railway system. The whole system modelling approach will be validated by simulations, which will enable faster implementation of new technologies by reducing timely and expensive physical testing. A hybrid testing approach will be taken, meaning that state-of-the-art simulation tools, laboratory and field tests will work collectively to provide a whole system assessment (up to TRL 6). In this context the action will make use of developments from earlier S2R IP3 complimentary projects in order to deliver the required tools for the track and S&C demonstrator implementation based on the design for reliability concept. These will use the following principles: Performance, Reliability, Availability and Maintainability and change managed through the Common Safety Method approach.

- Continue development of Track and S&C Technology Demonstrators (up to TRL 6) to meet functional requirements and establish efficient maintenance procedures. This includes modular track and S&C systems, non-ballasted Track Support solutions (*i.e.* slab and Asphalt Track), control of track stiffness variations in transition zones, advanced welding and repair technologies (e.g. induction welding) and the innovative use of materials and advanced manufacturing techniques (e.g. new rail material, additive manufacturing of crossings and other S&C components.) New rail concepts will also be considered, in addition to improving the performance of the current design. These concepts should reduce the environmental footprint such as noise and vibration from traffic as well as other pollution from the life cycle of the railway system.
- Develop proof of concept (TRL3) for a bespoke, localised automatic tamping operation (road-rail type vehicle) to enable localised repair of track geometry deterioration, going beyond the current state-of-the-art techniques, which include the use of large tamping machines that result in the disturbance of 'good' ballast during the treatment of localised track faults.
- Develop proof of concept for ability to monitor European-wide track stiffness in a more efficient way & establish thresholds for maintenance alerts & interventions. This will then be considered alongside the measuring and monitoring techniques developed in the wider S2R IP3 programme (TRL 3). Current state-of-the-art monitoring techniques can only be deployed on a site by site basis therefore a means of monitoring infrastructure is required to enable predictive and preventative maintenance in Europe, taking into account the relative outcome of the project SMARTE (GA H2020-777627). This will also enable track renewals to be optimised through site prioritisation based upon degradation rates and associated risk.
- Service life extension of bridges and tunnels by a combination of deterioration monitoring, proactive maintenance and upgrading technologies for enhanced performance (up to TRL 6). This includes technology for assessing fatigue consumption, methods to increase bearing and fatigue capacity, ways of mitigation of clogged tunnel drainage pipes, technologies for enhanced optical methods for tunnel inspection, and development of partly autonomous monitoring networks with on-site processing capabilities;
- Continue developing requirements for railway bridges for high speed lines. This includes enhanced understanding of dynamic effects based on tests or simulations in a relevant environment, for example, on a bridge not intentionally built for high speed traffic (up to TRL 5). This will include development of proposals for a modernised design approach including design limits for bridges and the interface with rolling stock, and enhanced knowledge to improve the potential of virtual testing and the tools for compatibility checks between the existing infrastructure and the rolling stock. It is expected that the results will pave the way for the closure of the related open points in the INF TSI. This particular workstream entails collaboration with the European Union Agency for Railways.
- Develop detailed specification including cost benefit and root cause analysis of the importance of effective drainage management within the track system; the impact on track geometry; and methodologies to identify drainage assets across the infrastructure (up to TRL 2). This will assess the true cost of ineffective water management across the industry.

- Develop process for identifying all drainage assets (buried assets); carry out horizon scanning for inspection techniques deployed in other industries for buried assets, to support development of a specification for pro-active inspection of the drainage system. This will involve data gathering, data analysis; and a specification for identification of drainage assets and pro-active inspection techniques for the rail industry to support effective water management (up TRL 3).

This action will build upon the successes and available results of existing and finalised projects, such as In2Track (GA H2020-730841) and S-Code (GA H2020-730849.) This action will take validated and available past projects outputs through to an early system prototype stage. This will run in parallel to incorporating further innovations and technology developments i.e. drainage management. A physical prototype of an enhanced S&C solution will be evaluated and installed for preparation of the final Technology Demonstrator. As part of the installation preparations, safety validation of the final system will be undertaken using the Common Safety Method – Risk Assessment (CSM-RA) process. European railway sites and test facilities will be assessed for hosting the final Integrated Technology Demonstrators (ITD) within future S2R activities.

The action expected to be funded from this topic will be complementary to actions carried out within the following topic:

- S2R-CFM-IP3-01-2016: Research into enhanced track and switch and crossing system (In2Track)
- S2R-CFM-CCA-01-2017 “Improving Railway Services for Users and Operators” (Impact-2)

As specified in section 2.3.1 of S2R AWP for 2018, in order to facilitate the contribution to the achievement of S2R objectives, the options regarding 'complementary grants' of the S2R 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 Grant Agreements.

The action shall actively contribute to the S2R KPIs development. This shall lead to publicly available deliverable, quantified indicatively on a semi-annual basis.

The planned activities of the action should take into account the revised MAAP part A.

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

Expected impact:

The action will result in specifications, the start of Common Safety Method Risk Assessment activities to support deployment of the demonstrators, and production of performance indicators to assess demonstrator performance. The innovative technology developed will enable a change in building and operating railway infrastructure compared to present practised methods. With successful prototypes, capacity and reliability should increase together with reduction of costs for railway transports. Substantial contribution is expected in the following areas:

- Development of a framework for virtual assessment and approval with enhanced prediction capabilities;
- Improved LCC, RAMS and environmental aspects through enhanced design of track and S&C components;

- Design of next generation track and S&C components in order to enhance LCC, RAMS and environmental aspects;
- LCC and RAMS improvements through assessment and management of track and S&C status focusing on key parameters and relevant limits on operational conditions;
- Improved RAMS through monitoring solutions to obtain reliable and objective measures of the asset status;
- Improved RAMS and LCC through advanced maintenance and repair technologies;
- Reduced LCC through service life extension technologies including upgrading solutions for bridges and tunnels;
- Reduced delay costs from ineffective water management (flooding); reduced costs associated with track geometry faults; improved resilience to climate change; improved attractiveness of railway;
- Reduced costs for railway bridges on high speed lines.

Specific metrics and methods to measure and achieve impacts should be included in the proposals, with the objective to achieve by the end of the S2R Programme the quantitative and qualitative targets defined in the S2R MAAP related to TD3.1 to TD3.5 in line with the relative Planning and Budget.

The research and innovation activities results shall be brought in the form of a demonstrator and prototype(s) as mentioned here above in the context of InnoTrans 2020, including on the S2R JU stand, to show the impacts intended to be achieved.

Type of action: Innovation Action

Ausgeschriebene Instrumente (Vgl. Tabelle 1):

→ Transnationale kooperative F&E-Projekte
Industrielle Forschung oder Experimentelle Entwicklung

2.2 Technology demonstrators for competitive, intelligent rail freight operation (S2R-CFM-IP5-01-2018)

Specific challenge:

Within the challenges highlighted in the IP5 part of the S2R Master Plan, the following specific challenges should be addressed by the proposal in answer to this topic:

- New **Automatic Couplers**, provided with electrical and data transmission functionalities, need to be implemented. The specific challenges of this call are to complete the detailed design, build up a unitary demonstrator and test it on the innovative wagons developed in TD5.3.
- **Telematics and Electrification** will enable Condition Based Maintenance (CBM). Telematics should contribute to collect, transmit and use the necessary information required by CBM strategy. Electrification should be responsible for supplying the required energy to the telematics by means of the Energy Management System (EMS).
- **Improved methods for annual and short term timetable planning** and in traffic operations should increase overall capacity and raise punctuality by developing methods and processes in this direction.
- The work stream of **Real-time network management** aims at reducing or even eliminating inefficiencies by integrating medium to short-term and operational planning at yards/terminals and in the railway network.
- Future **freight wagon design** for the core and extended markets as defined in the S2R - MAAP shall contribute to increased reliability of the freight transport while increasing the payload per meter of train.
- Future main line electric freight locomotives must feature highly flexible **freight propulsion** systems with reduced operational costs. The challenge in this call is to merge all results from the projects FR8RAIL (S2R-CFM-IP5-01-2015) and FR8HUB (S2R-CFM-IP5-01-2017) and demonstrate the performance as well as to evaluate, specify and design the required systems and processes.
- The freight sector needs to find ways to rapidly decrease unit costs to improve its competitiveness against the road sector. Major boundaries are the readiness of infrastructure for longer trains and the maximum load on the coupling hook, which limits the maximum weights of trains. **Distributed Power** in freight trains could solve this problem by distributing the traction and braking forces **for long freight trains up to 1,500 m**.
- In order to achieve the advantages with ATO/DAS, the integration with the TMS-system is of importance. **Automated Train Operation (ATO) and Driver Advisory Systems that are connected (C-DAS) to the Traffic Management Systems** in the train control centres of the IM provide means to enhance capacity, improve punctuality and optimize energy consumption of the railway system.

Scope:

In order to address the challenges described above, the proposals should address all the following elements, in line with the S2R MAAP:

The work expected in work stream 1 concerning "Automatic Coupling" (TD 5.1) should:

- Complete the mechanical and electric design of the Automatic Coupler Demonstrator, based on the concept design developed in FR8RAIL project (S2R-CFM-IP5-01-2015).
- Calculate an estimation of the production costs for an industrialization of the technical solution in Europe.
- Manufacture and assemble the Automatic Coupler Demonstrator.
- Test the Automatic Coupler Demonstrator, in a test bench, to assure that the maximum specified forces are reached without damaging the system. This is a prototype demonstrator operating in a traction-compression test bench, in normal laboratory conditions.

The activity is expected to finish with prototype demonstration in a TRL6 level.

The work expected in work stream 2 concerning "Telematics and Electrification" (TD 5.1) should be based on the results obtained in the projects FR8RAIL (S2R-CFM-IP5-01-2015) and FR8HUB (S2R-CFM-IP5-01-2017) and should cover (TD5.1.3) the integration of the different components and processes defined prior to the validation:

- Telematics integration
    - Specification of the integration of the telematics (WMS, wOBU, FTSMS) within the new wagon (TD5.3) design including new wheels and axles (TD5.3) and within the currently available wagons.
    - Specification of the integration of the telematics with other systems such as Automatic Coupler (TD5.1), Access and Operation (TD5.2) and Novel Terminal, Hubs, Marshalling yards, Sidings (TD5.4).
    - Definition of test scenarios with research vehicles in combination with other systems from Access and Operation (TD5.2) and Novel Terminal, Hubs, Marshalling yards, Sidings (TD5.4).
- CBM integration
    - Specification of a target process including an approval process for diagnosis-based maintenance and a migration-process for all relevant stakeholders.
    - Aggregation of data from locomotive and wagons, comparison actual values and threshold values (system based) and deduction of specific maintenance tasks if threshold value is reached (system based).
    - Integration of the web-interface for train data visualization, incl. a standardized interface for existing external and maintenance systems.

The activities concerning telematics and CBM are expected to validate – proof of concept –the integration of the different components and processes in a laboratory (TRL 4).

The work expected in work stream 3 concerning "Improved Methods for time table planning" (TD 5.2) should:

- Improve methods for timetable planning including aspects of decision support for operational traffic and traffic information that improves both capacity utilization and customer satisfaction of rail freight systems.
- Further develop concepts from the project ARCC (S2R-CFM-IP5-02-2015) into a demonstrator with shared information about ad-hoc planning and daily timetable.
- Testing the concept and impact to rail freight in a demonstrator.

The activity is expected to provide a demonstrator of the proposed concepts in infrastructure management with at least TRL 5.

The work expected in work stream 4 concerning "Real-time network management" (TD 5.2) should:

- Improve interaction between Railway network and yards/terminals including aspects of decision support for operational traffic and traffic information that improves capacity, efficiency and punctuality especially for freight trains.
- Testing the concept and impact to rail freight in a demonstrator.

The activity is expected to provide a demonstrator of the proposed concepts in infrastructure management with at least TRL 5.

The work expected in work stream 5 concerning "Core and Extended Market Wagon" (TD 5.3) should include:

- Structural, aeroacoustical & aerodynamical drag optimized wagon design concept and proof of concept for core and extended market wagon 2020 Optimized (wheel-rail interface, Life Cycle Costs, higher speed, track degradation, noise reduction) running gear design concept and proof of concept for core and extended market wagon 2020
- Standard interfaces definition and integration towards electrification, telematics, CBM as well as autonomous coupling & train operation

The activities for the core and extended market wagon are expected to validate – proof of concept – the impact of the design and the fit with CBM (TRL 4)

Complementary to and building on the results of the work done in the projects FFL4E (S2R-CFM-IP5-03-2015) and FR8HUB (S2R-CFM-IP5-01-2017), the following work is expected in the work stream 6 concerning "Freight Propulsion Systems" (TD 5.5):

- Develop and manufacture functional prototypes for hybrid propulsion systems.
- Validation and measurement of the performance of the hybrid propulsion system prototypes defined, designed and partially developed in the projects FFL4E (S2R-CFM-IP5-03-2015) and FR8HUB (S2R-CFM-IP5-01-2017).

Complementary to the work being done in ARCC, the following work is expected in the work stream 6 concerning "Freight Propulsion Systems" (TD 5.5):

- Define all actions required and performed for a train composition
- Study how these actions can be automated
- Develop a concept for automating the whole process
- Define the systems and process requirement specification
- Develop and construct some selected technologies

The activities concerning Freight Propulsion Systems are expected to validate selected technologies in the laboratory or in a relevant environment with at least TRL 4.

Complementary to and building on the results of the work done in the project FFL4E (S2R-CFM-IP5-03-2015) the work expected in work stream 7 concerning "Long Trains with Distributed Power (DP)" (TD 5.5) should include the following activities:

- Further development of DP-technology for usage in trains up to 1500 m
- Demonstration of DP-technology in trains up to 850 m
- Demonstration or simulation of Distributed Power in 1500 m trains

The activity is expected to provide a DP-technology demonstration in a train up to 1,500 m with at least TRL 6.

The work expected in work stream 8 concerning "ATO/DAS" (TD 5.6) should:

- Analyse the requirements of TMS-users and railway undertakings for real-time data for usage in a Connected DAS and ATO module, making sure that requirements of TMS-users will be taken up by IP2.
- Integrate requirements in the definition of standard interfaces in alignment with other ongoing projects like ARCC and X2-Rail-1 (S2R-CFM-IP2-01-2015), making sure that requirements for the standard DAS/TMS interface will be taken up by IP2 to analyse and utilise them in the design of ATO/TMS interfaces for live data, to create maximum synergies
- Realize first concept and simulation of connected DAS
- Evaluate the impact C-DAS can have on the performance of rail freight

The activity is expected to provide a technology for the exchange of real-time data and its demonstration with at least TRL 4.

Due to the strong link of this work stream with the current and future activities in IP2 and the input that the results of this topic will provide, the succeeding proposal will set up an advisory board with representatives of IP2.

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-OC-IP5-01-2018: Radio communication and simulation of train dynamics for Distributed Power within long trains

This action shall closely work with the action stemming from the complementary open call, to ensure integration of projects' results into S2R solutions.

The action expected to be funded from this topic will also be complementary to actions carried out following the topics:

- S2R-CFM-IP5-01-2015: Development of functional requirements for sustainable and attractive European rail freight
- S2R-CFM-IP5-02-2015: Start-up activities for freight automation
- S2R-CFM-IP5-03-2015: Freight propulsion concepts
- S2R-CFM-IP5-01-2017: Real-time information applications and energy efficient solutions for rail freight
- S2R-CFM-IP2-01-2015: Start-up activities for Advanced Signaling and Automation System
- S2R-CFM-IP2-01-2017: Enhancing railway signaling systems thanks to applying satellite positioning; developing an on-board safe Train Integrity; applying formal methods approach and standardised interfaces, and enhancing Traffic Management System (TMS) functions

As specified in section 2.3.1 of S2R AWP for 2018, in order to facilitate the contribution to the achievement of S2R objectives, the options regarding 'complementary grants' of the S2R 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 Grant Agreements.

The action shall actively contribute to the S2R KPIs development. This shall lead to publicly available deliverable, quantified indicatively on a semi-annual basis.

The planned activities of the action should take into account the revised MAAP part A.

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

Expected impact:

The foreseen research activities are expected to contribute to the creation of a framework for an effective railway for freight as a part of the logistical value chain in a more automated way via intelligent equipment and railway terminals enabling the provision of accurate information to end customers and operators.

The foreseen research activities in work stream 1 "Automatic Coupling" are expected to:

- Enable longer trains lengths (up to 1,500 m), operating at higher speeds, as a result of increased coupler load transmission capacity.
- Lead to reduced train composition times (up to 30 %), and lower operation costs.
- Data and electrical transmission will allow the installation of sensors in the trains, required for an enhanced Condition Based Maintenance, and the possibility to monitor the status of the goods remotely.

The foreseen research activities in work stream 2 “Telematics and Electrification” are expected to contribute to:

- Further advancement of the reliability and efficiency of rail freight based on the results of the projects FR8RAIL (S2R-CFM-IP5-01-2015) and FR8HUB (S2R-CFM-IP5-01-2017);
- A significant reduction of derailments through furthering CBM implementation;
- Reaching a 10 % reduction of maintenance operational expenses to increase rail freight business competitiveness.

The foreseen research activities in work stream 3 “Improved Methods for time table planning” are expected to:

- Provide methods that acknowledge the specific needs and opportunities of the rail freight system.
- Provide methods to timetable planning that increase the competitiveness of the rail freight system, while also considering the performance of the total rail system.
- Improve operational capacity utilization, robustness and punctuality by 10-15 %.

The foreseen research activities in work stream 4 “Real-time network management” are expected to:

- Provide methods that improve the efficiency of the network as a whole including decision support for railway network, marshalling yards and terminals.
- Conclude the requirements on other supporting activities and systems (e. g. data availability, planning methods, integration between yard operation and line management) that are necessary for improved performance.

The foreseen research activities in work stream 5 “Core and Extended Market Wagon” are expected to contribute to the overall MAAP Impacts by:

- Reducing the weight of freight wagons, to maximise the payload/ deadweight ratio.
- Significantly contributing to the improvement of reliability
- Reducing total operating costs for the vehicle and infrastructure by up to 30% combining novel design of running gears, predictive maintenance methods and improved aerodynamics
- Analysing of possible improvements on the acoustical behaviour of wagons
- Providing standard mechanical and electrical interfaces for modular, scalable wagon design for operational interoperability

The foreseen research activities in work stream 6 “Freight Propulsion” are expected to:

- Improve energy efficiency and operational flexibility
- Significantly reduce time requirement of train composition
- Optimize train composition process, thus a cost reduction
- Make automated processes available

The foreseen research activities in work stream 7 “Long Trains” are expected to:

- deliver a Distributed Power technology ready for market entrance, and
- enable operators to increase train lengths up to twice the current train lengths and therefore increase their competitiveness rapidly.

The foreseen research activities in work stream 8 “ATO/DAS” are expected to:

- Eliminate obstacles that prevent rail freight from reaching the potential of ATO/DAS systems
- Increase robustness of the system
- Proof the value of C-DAS for optimizing energy consumption, increasing punctuality and capacity in the rail freight system

Specific metrics and methods to measure and achieve impacts should be included in the proposals, with the objective to achieve by the end of the S2R Programme the quantitative and qualitative targets defined in the S2R MAAP related to TD5.1, TD5.2, TD5.3, TD5.5 and TD5.6 in line with the relative planning and budget.

Type of action: Innovation Actions (TRL 6)

Ausgeschriebene Instrumente (Vgl. Tabelle 1):

→ Transnationale kooperative F&E-Projekte
Industrielle Forschung oder Experimentelle Entwicklung

3 Ausschreibungsdokumente

Die Projekteinreichung ist ausschließlich elektronisch **via eCall** unter der Webadresse https://ecall.ffg.at möglich. Als Teil des elektronischen Antrags sind die **Projektbeschreibung** (inhaltliches Förderungsansuchen) sowie etwaige Anhänge über die eCall Upload-Funktion anzuschließen.

Für Einreichungen im gewählten Instrument (siehe Ausschreibungsübersicht) sind die jeweils spezifischen Vorlagen zu verwenden.

Förderkonditionen, Ablauf der Einreichung und Förderkriterien sind im jeweiligen **Instrumentenleitfaden** beschrieben. Die nachfolgende Übersicht zeigt für die jeweiligen Instrumente die relevanten Dokumente.

Übersicht Ausschreibungsdokumente - Förderung zum Download: https://www.ffg.at/shift2rail_call2018	
Transnationale kooperative F&E-Projekte IF oder EE*	Instrumentenleitfaden transnationale kooperative F&E-Projekte (Projektbeschreibung von JU S2R)
Allgemeine Regelungen zu Kosten	Kostenleitfaden (Kostenanerkennung in FFG-Projekten)

** IF Industrielle Forschung, EE Experimentelle Entwicklung*

Zusätzlich zum Instrumentenleitfaden gelten für diese Ausschreibung folgende Spezifikationen:

- ✓ Zu Kapitel 1.4: Die Ausschreibung steht ausschließlich für **österreichische Forschungseinrichtungen** offen, die Partner im Virtual Vehicle Austria Consortium+ sind, welches assoziiertes Mitglied in Shift2Rail ist. Das sind das Kompetenzzentrum - Das virtuelle Fahrzeug Forschungs-gesellschaft mbH, Materials Center Leoben Forschung GmbH und AC2T research GmbH.

- ✓ zu Kapitel 1.5: Die **beantragte Förderung** darf weder die maximale Quote des Instrumentenleitfadens noch den Eigenanteil (own contribution) übersteigen.

- ✓ Als **Projektkosten** sind im eCall die Gesamtkosten des JU Projektes anzugeben.

- ✓ Als **inhaltliche Projektbeschreibung** ist der selbe Antrag zu verwenden und im eCall hochzuladen, der an das JU gerichtet ist.

- ✓ Um das **Kooperationskriterium** zu beurteilen, werden die Gesamtsummen der nicht national geförderten Partner herangezogen. Eine Detailkostenaufstellung der nicht national geförderten Partner ist nicht erforderlich.

4 Rechtsgrundlagen

Die Ausschreibung basiert auf der Richtlinie zur Förderung der wirtschaftlich – technischen Forschung, Technologieentwicklung und Innovation (FTI – Richtlinie 2015) Themen-FTI-RL.

Bezüglich der Unternehmensgröße ist die jeweils geltende KMU-Definition gemäß EU-Wettbewerbsrecht ausschlaggebend. Hilfestellung zur Einstufung finden sie unter: https://www.ffg.at/recht-finanzen/rechtliches_service_KMU

Sämtliche EU-Vorschriften sind in der jeweils geltenden Fassung anzuwenden.