

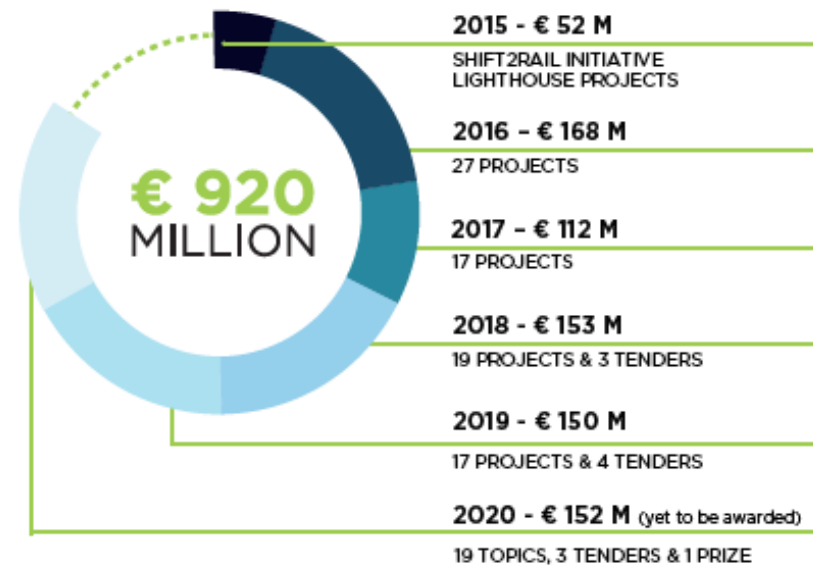
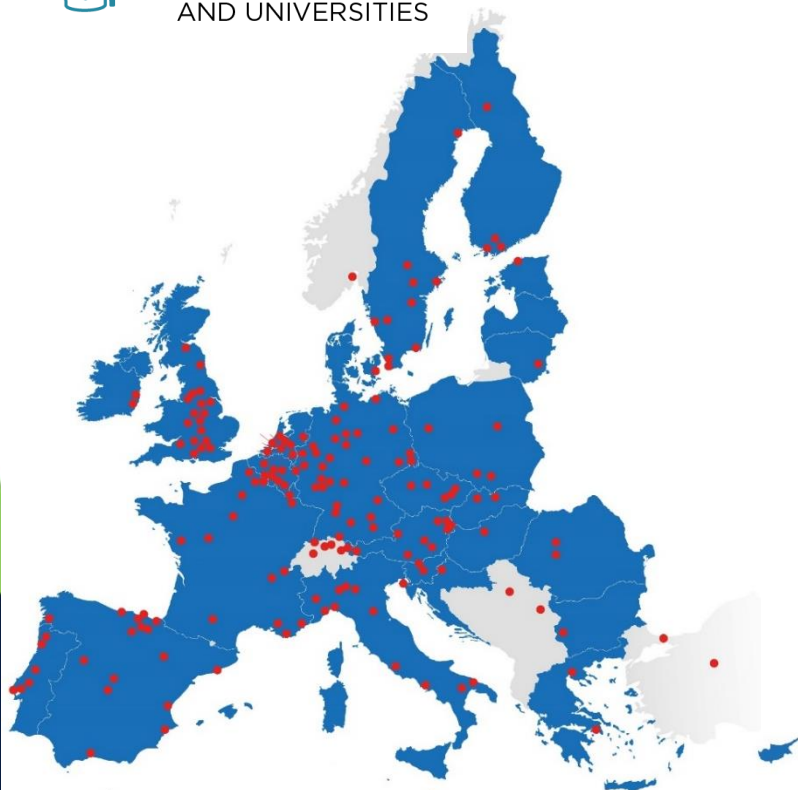
# Shift2Rail, moving together to 2030

RIAMS - STRATEGIC OPERATOR MANAGEMENT  
KEYNOTE PANEL - Strategies For Organizational  
Change to Accelerate The Pace Of Digital  
Transformation In Rail: Everything Is Related To  
Management

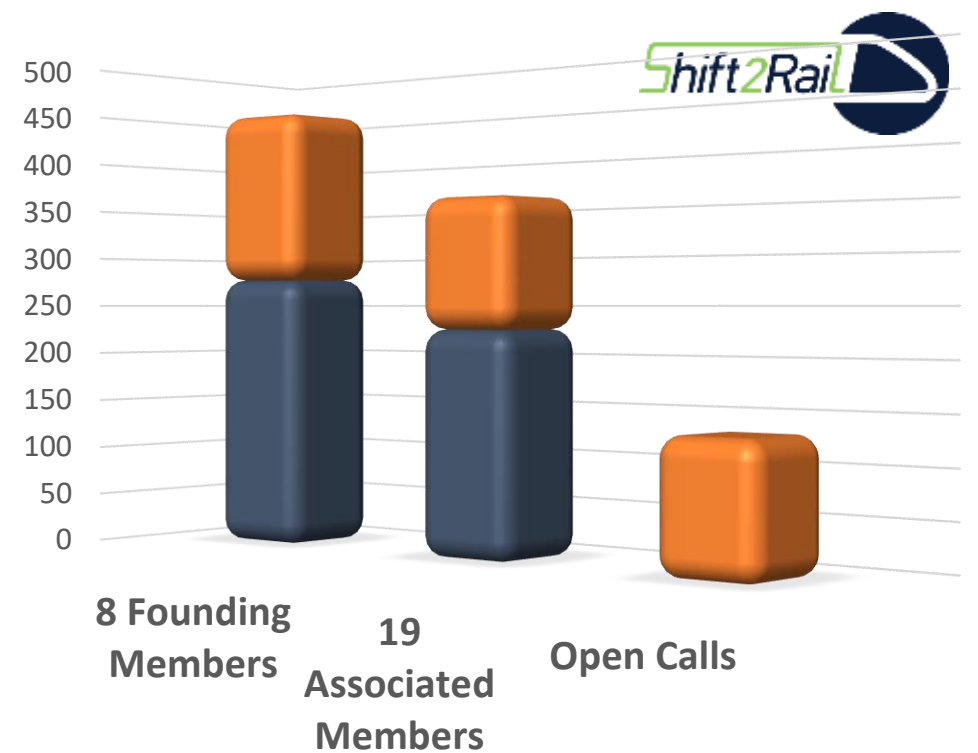
- Overcoming organizational challenges and building a common vision for the digital transformation **across the operational departments of the organisation**
- Digital cost benefit analysis: what areas of the infrastructure should operators prioritize for digitalization to deliver **short term** cost savings, operational improvements and digital investment in rail
- Applying new technologies in **a legacy** infrastructure and managing the compliance and safety impacts in new implementations
- Taking advantage of the opportunity to renew or upgrade **your** digital solutions, plan for success in your upcoming renewals

-  **28**  
MEMBERS
-  **412**  
PARTICIPANTS
-  **29**  
COUNTRIES
-  **109**  
SMEs
-  **113**  
RESEARCH CENTRES  
AND UNIVERSITIES

## AN OPEN and ACTIVE ORGANISATION

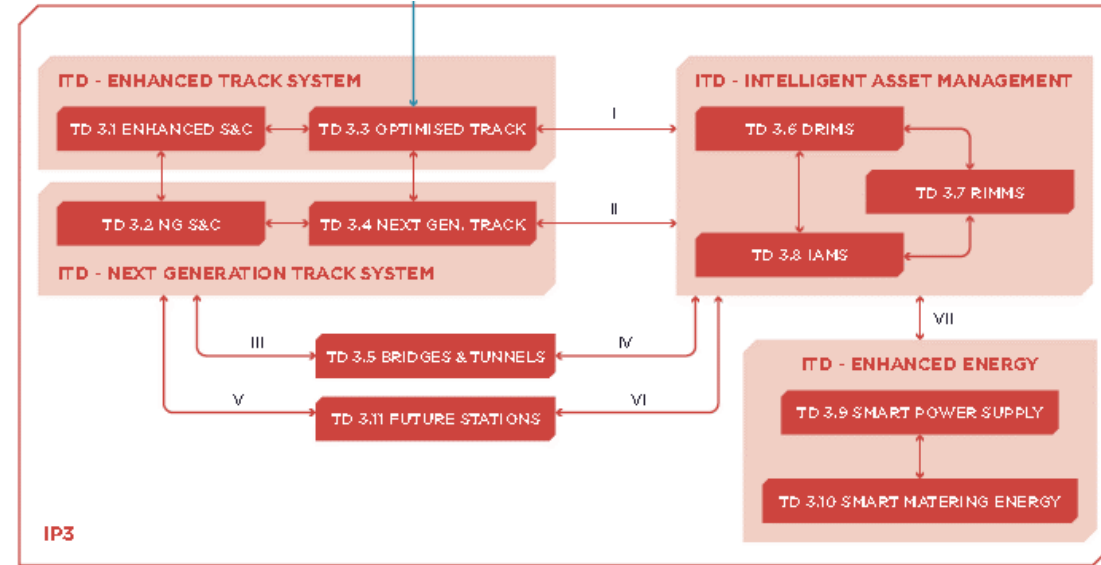
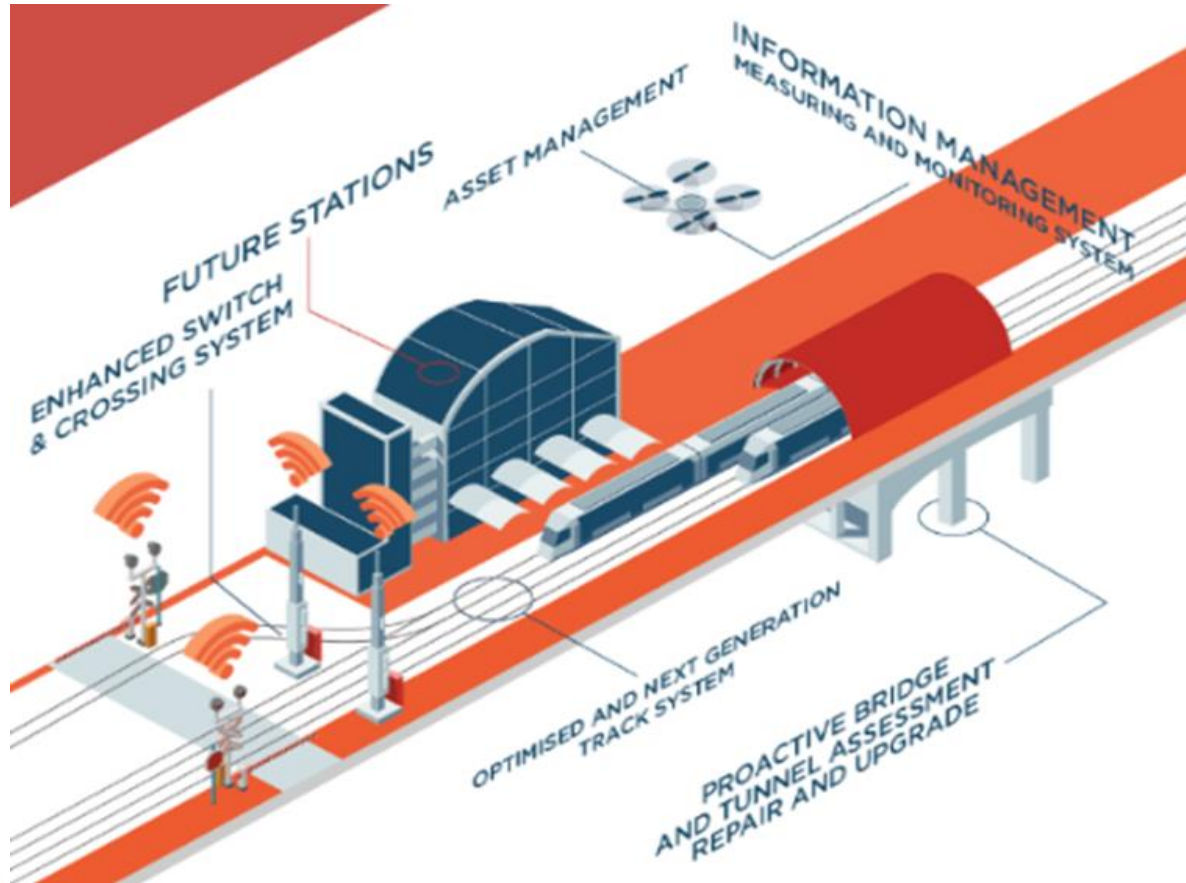


\*incl. at least 120M€  
of additional activities



Values as at 1 Sept 2016 in Million EUR

# IP3: Cost-Efficient and Reliable High-Capacity Infrastructure



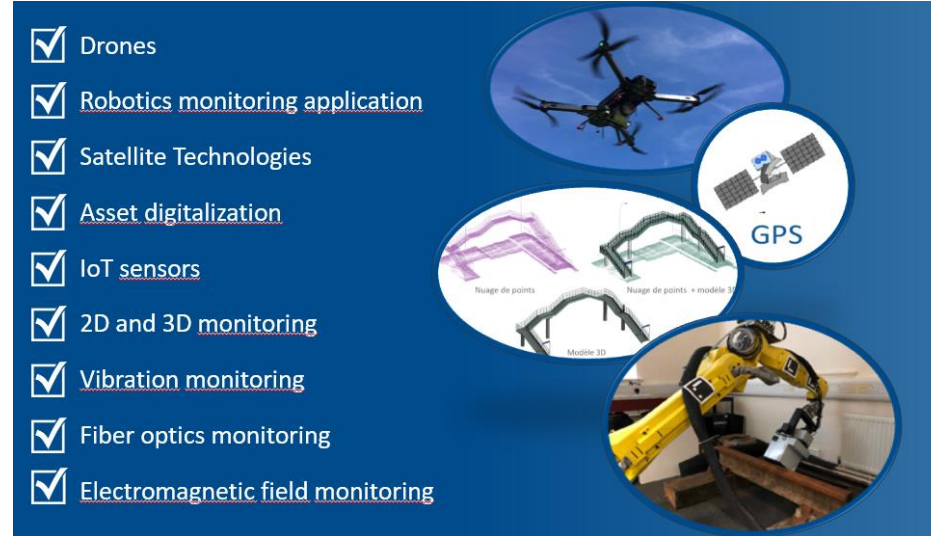
IP	Research Area	Specific Technological demonstration of	characteristics					Overall high level focus/objective
			Market	Testing time - YEAR start	Testing time - YEAR end	Country	TRL	
IP3	TD3.1 Enhanced Switch & Crossing System	RAMS optimised S&C	Generic	2019	2023	AT	6/7	Monitoring programme foe S&C including: Geometry and overrunning, casting, novel rail grade, resilient pads, rail fastening system, base plates, switch roller system, etc.
		Joint Welding of bainitic components		2020	2023	FR	5/6	Experimental evaluation of fatigue of cast manganese-crossing for welding technology to join bainitic with pearlite steel components.
	TD3.2 Next Generation Switch & Crossing System Demonstrator	Next Generation S&C System	Generic	2021	2023	UK	5/6	Test next generation design, control, materials and manufacturing to provide a step change in asset performance as a whole (sub)system
		Low N&V Tramway Crossing	Urban/Suburban	2021	2023	TBD	6/7	Test overall performance of a girder rail swing nose crossing in service for the reduction of N&V
		Materials and Components	Generic	2019	2023	UK, SE, FR	4/7	Next generation S&C materials and components tests (i.e. adjustable fastening systems)
		Asphalt Track		2021	2023	UK	6/7	A site trial for demonstration to assess future assessment of asphalt performance.
	TD3.3 Optimised Track System	Transition zone	Generic	2019	2023	SE	5/6	tests on improvement of the transition between open track and bridges, open track and S&C, ballasted track and slab track
		new slab track		2019	2023	SE	7	test of a Modular Slab track solution reducing maintenance costs
		Innovative use of materials		2019	2023	AT	5/6	test of innovative use of materials and advanced manufacturing techniques
		Laser clad coating on rails		2020	2023	AT	5/6	test of laser clad coatings on rails nearby and on rail joints; laser hardening and laser cladding of worn rail zones
	TD3.4 Next Generation Track System	Rail Defect Repair	Generic	2020	2023	UK	7	Thermocouple instrumented trials on process for different rail steel grades
	TD3.5 Proactive Bridge and Tunnel Assessment, Repair and Upgrade Demonstrator	Tunnel improvements		2020	2023	FR, UK	7	Reduce track and tunnel closure by offsite manufacturing and increase quality
			2020	2023	AT	7	Predict calcite clogging over time	
		Bridge improvements	Urban/Suburban	2020	2023	DE	6	Efficient monitoring of noise emission and installation of passive noise dampers.
			Generic	2020	2023	UK	7	Extend bridge service life by lowering fatigue
				2021	2023	SE	7	Increase bearing capacity and remaining fatigue life of concrete bridges and increasing safety.
			High Speed	2020	2023	SE	7	Make high speed traffic possible on existing bridges with proven dynamic properties
	Integrated Technological Demonstrators Asset	Strategic long-term	Generic	2021	2022	PT, UK	6	Test of a strategical decision support tool based on the tactical planning tool
		Tactical and Operational short term		2021	2022	UK, SE DE NL, ES, FR	6/7	maintenance process and strategies through knowledge extracted from information coming from available data and monitoring systems
		Metro/ Tram Asset Management	Urban/Suburban	2021	2022	IT	7	Demonstrator focusing on minimising maintenance costs, optimising the use of resources while maximising network

# Infrastructure Innovation Programme (IP3) - Focus on Maintenance

# Intelligent Asset Management : results achieved

## ✓ Railway Integrated Measuring and Monitoring System (RIMMS) - Data collection. (TRL 4/5)

- Development & assessment of non-intrusive monitoring methods of critical infrastructure assets
- Development of on-board prototypes solution for Infrastructure (S&Cs, Track Geometry, Track defects, etc.)
- Monitoring of the impact of rolling-stock to the infrastructure (Wheel defects, rolling stock defects)



# Intelligent Asset Management :results achieved

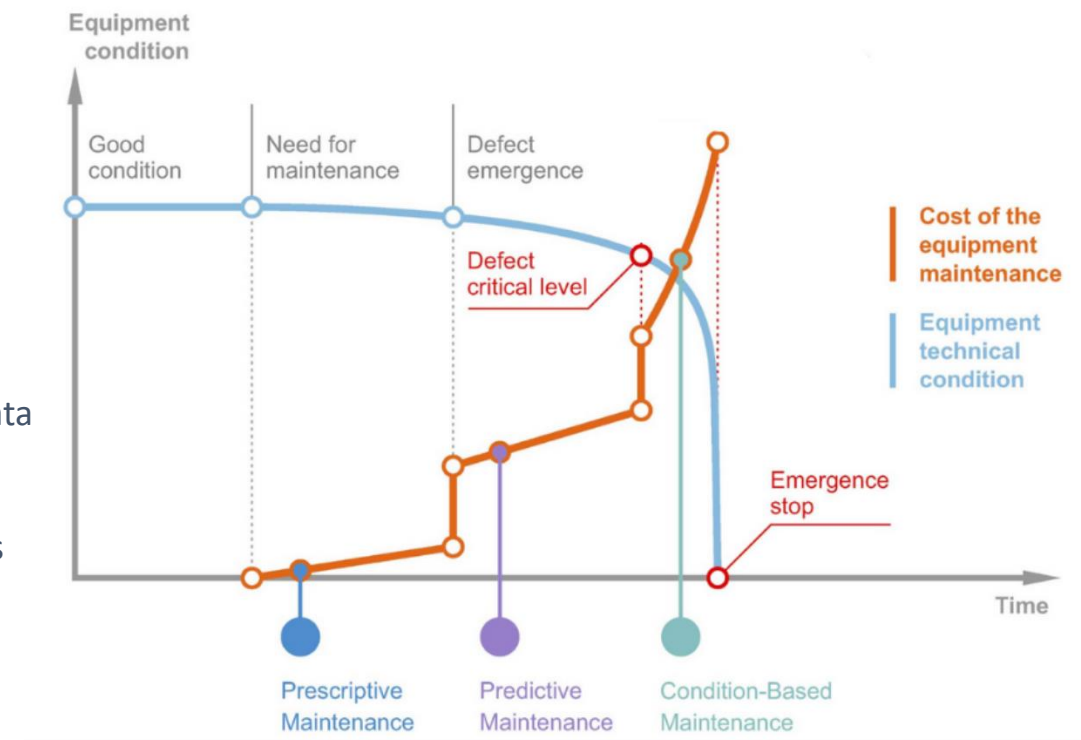


## ✓ Dynamic Railway Information Management System (DRIMS) – Data Management (TRL 4/5)

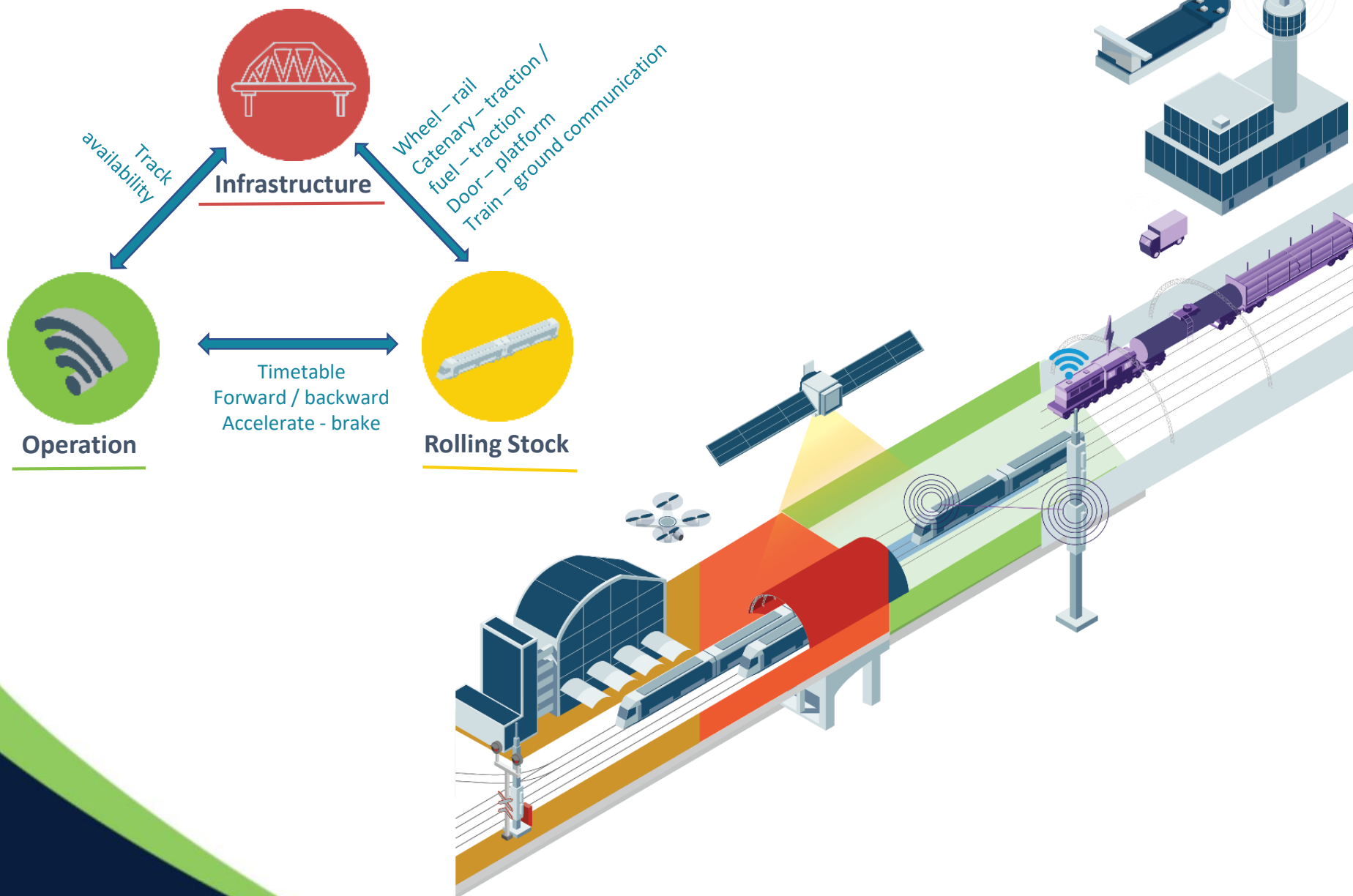
- ➔ Various techniques of process mining, anomaly detection and predictive analytics have been applied to a set of use cases involving different aspects of railway assets (such as earthworks, bridges, track geometry, rail defects, S&C, track circuits and track equipment)
- ➔ Validation in 2 use cases of the Integration Layer and the Conceptual Data Model with 2 prototypes transferring proprietary data to the end user through a standard data model.

## ✓ Intelligent Asset Management Strategies (IAMS) – Decision support (TRL4/5)

- ➔ Based on 8 real live use cases, three different support tools have been developed (5 prototypes developed):
  - Generic framework to identify time horizon, building blocks and data flow
  - Modelling guideline to formalize the decision problem
  - RAMS & LCC methodology to integrate risk assessment approaches
- ➔ Development and validation of 2 prototypes for enhanced maintenance execution : Integrated inspection and tamping process and Robotic Maintenance Execution



# Railway - System of Systems



**IP1** Cost-efficient and Reliable Trains, including high-capacity trains and high speed trains

**IP2** Advanced Traffic Management and Control System

**IP3** Cost-efficient, Sustainable and Reliable High Capacity Infrastructure

**IP4** IT Solutions for Attractive Railways Services

**IP5** Technology for Sustainable and Attractive European Rail Freight

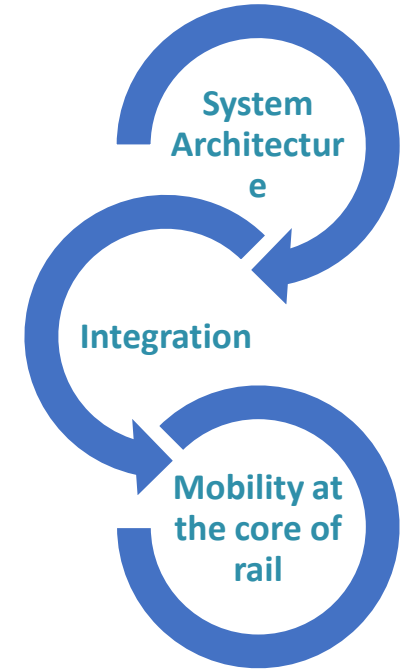
**CCA** Cross Cutting Activities

# Achieving the rail integration, digital is key:



A structure of components, their relationships, and the principles and guidelines governing their design functional evolution over times:

- Integration of the S2R Innovative Solutions for the ERTMS Game Changers (*ATO GoA2, GoA3/4, Adaptable Communication System, Moving Block, Train Positioning*) together with sectorial initiatives (*RCA, OCORA*)
- Integration of S2R interoperable solutions as *Intelligent Mobility Management (enlarged TMS), next gen TCMS, smart connected object controllers, condition based maintenance* for all kind of assets, etc.
- Aligning all ongoing modelling initiatives (RTM, EULynx, IFC, RailML, TAP/TAF; SensorML etc.) in terms of principles and digital data exchange format with the S2R solution on a EU shared *Conceptual Data Model*



**Going for global performance definitely requires to master, design and simulate the Railway System as a whole, including its connection with other transport modes**

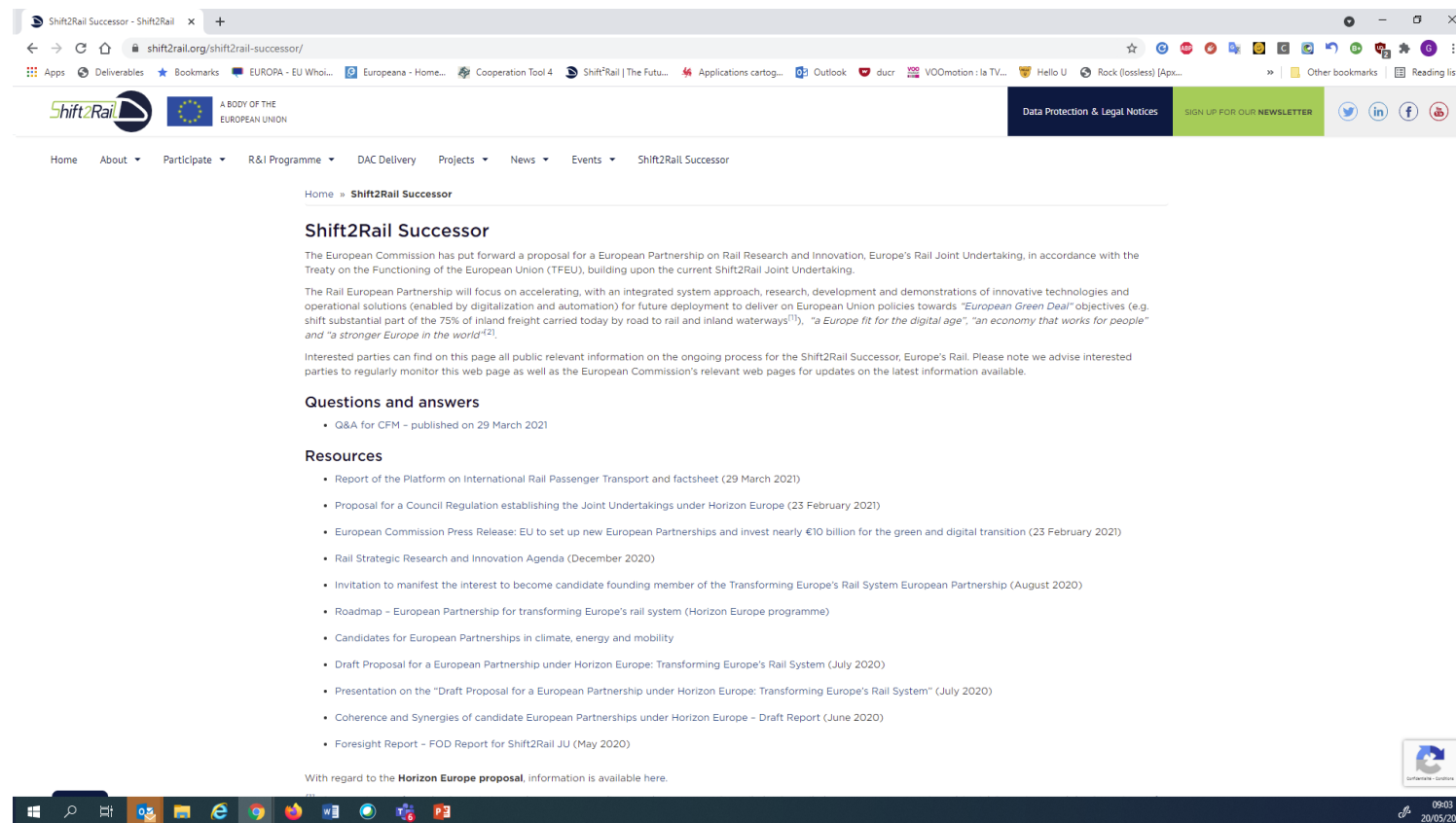


# Europe Rail JU

Moving European Railway Forward

## Proposal for a COUNCIL REGULATION establishing the Joint Undertakings under Horizon Europe: [https://ec.europa.eu/transparency/documents-register/detail?ref=COM\(2021\)87&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=COM(2021)87&lang=en)

All validated information available transparently at <https://shift2rail.org/shift2rail-successor/>



The screenshot shows the Shift2Rail Successor website in a web browser. The page has a header with the Shift2Rail logo and the text "A BODY OF THE EUROPEAN UNION". Below the header is a navigation menu with links: Home, About, Participate, R&I Programme, DAC Delivery, Projects, News, Events, and Shift2Rail Successor. The main content area is titled "Shift2Rail Successor" and contains the following text:

The European Commission has put forward a proposal for a European Partnership on Rail Research and Innovation, Europe's Rail Joint Undertaking, in accordance with the Treaty on the Functioning of the European Union (TFEU), building upon the current Shift2Rail Joint Undertaking.

The Rail European Partnership will focus on accelerating, with an integrated system approach, research, development and demonstrations of innovative technologies and operational solutions (enabled by digitalization and automation) for future deployment to deliver on European Union policies towards "European Green Deal" objectives (e.g. shift substantial part of the 75% of inland freight carried today by road to rail and inland waterways<sup>[1]</sup>), "a Europe fit for the digital age", "an economy that works for people" and "a stronger Europe in the world"<sup>[2]</sup>.

Interested parties can find on this page all public relevant information on the ongoing process for the Shift2Rail Successor, Europe's Rail. Please note we advise interested parties to regularly monitor this web page as well as the European Commission's relevant web pages for updates on the latest information available.

**Questions and answers**

- Q&A for CFM - published on 29 March 2021

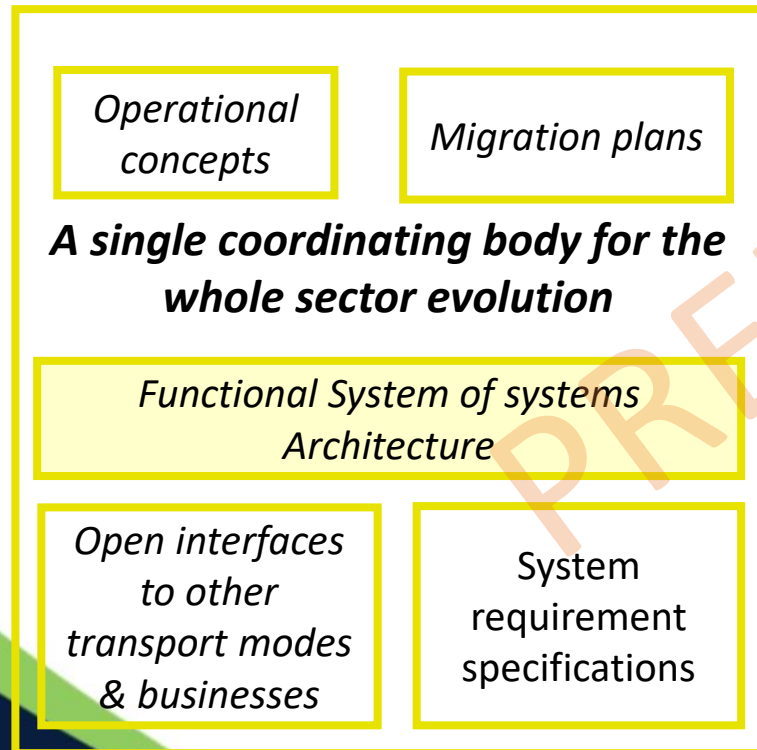
**Resources**

- Report of the Platform on International Rail Passenger Transport and factsheet (29 March 2021)
- Proposal for a Council Regulation establishing the Joint Undertakings under Horizon Europe (23 February 2021)
- European Commission Press Release: EU to set up new European Partnerships and invest nearly €10 billion for the green and digital transition (23 February 2021)
- Rail Strategic Research and Innovation Agenda (December 2020)
- Invitation to manifest the interest to become candidate founding member of the Transforming Europe's Rail System European Partnership (August 2020)
- Roadmap - European Partnership for transforming Europe's rail system (Horizon Europe programme)
- Candidates for European Partnerships in climate, energy and mobility
- Draft Proposal for a European Partnership under Horizon Europe: Transforming Europe's Rail System (July 2020)
- Presentation on the "Draft Proposal for a European Partnership under Horizon Europe: Transforming Europe's Rail System" (July 2020)
- Coherence and Synergies of candidate European Partnerships under Horizon Europe - Draft Report (June 2020)
- Foresight Report - FOD Report for Shift2Rail JU (May 2020)

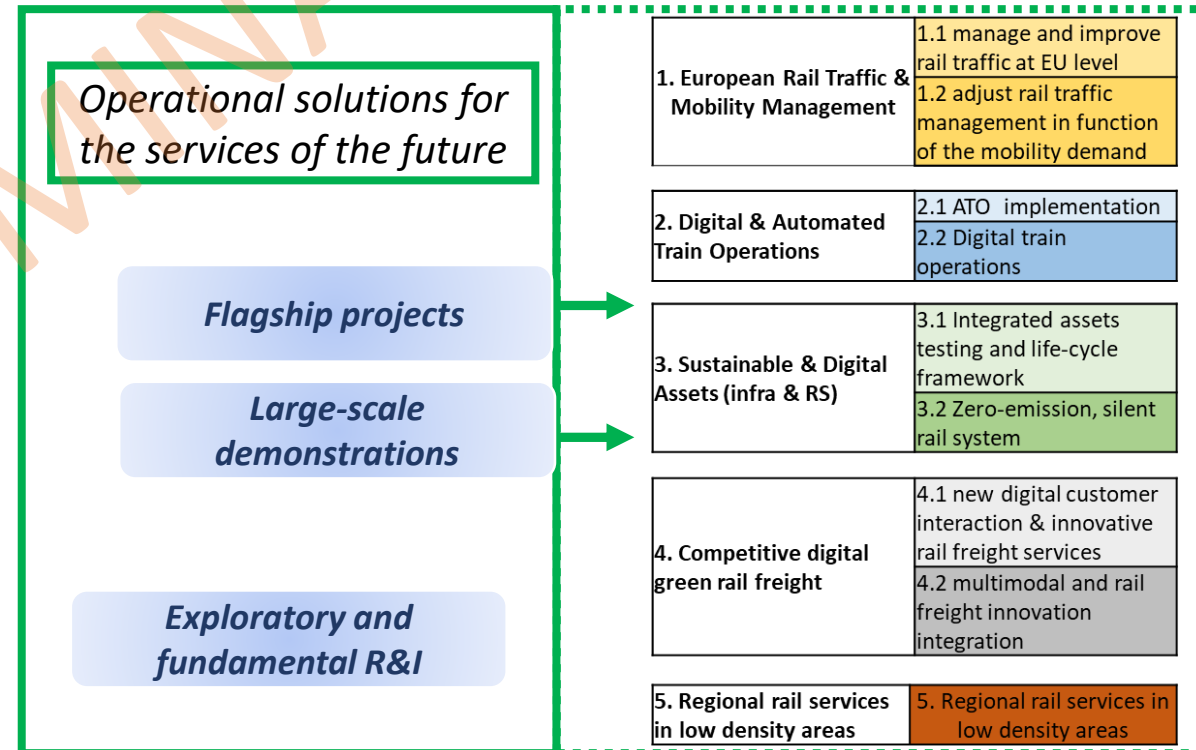
With regard to the **Horizon Europe proposal**, information is available here.

- Deliver an integrated European railway network by design
- Develop a unified operational concept and a functional system architecture for integrated European rail traffic and CCS/automation
  - Deliver a sustainable and resilient rail system
- Deliver a competitive green rail freight fully integrated into the logistic value chain
  - Development of a strong and globally competitive European rail industry

## System Pillar



## Innovation Pillar



## Founding Members



## Associated Members



### Virtual Vehicle Austria Consortium (VVAC+)



### European Rail Operating community Consortium (EUROC)



### Swi'Tracken Consortium



### Smart DeMain(SDM) Consortium



### AERFITEC



### Competitive Freight Wagon Consortium(CFW)



### Smart Rail Control (SmartRaCon) consortium

