



European Partnership Stakeholder Forum

Rail Research and Innovation to Make Rail the Everyday Mobility

15 November 2022







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
LOGISTICS VALUE CHAIN**



DEVELOP A **STRONG
AND GLOBALLY
COMPETITIVE
EUROPEAN RAIL
INDUSTRY**

EUROPE'S RAIL:

ONE INTEGRATED R&I PROGRAMME

SYSTEM PILLAR

OPERATIONAL
CONCEPTS

FUNCTIONAL
SYSTEM
ARCHITECTURE

***A SINGLE COORDINATING
BODY FOR THE WHOLE
SECTOR EVOLUTION***

OPEN
INTERFACES TO
OTHER
TRANSPORT
MODES AND
BUSINESSES

SYSTEM
REQUIREMENT
SPECIFICATIONS

INNOVATION PILLAR

*TECHNOLOGICAL AND
OPERATIONAL SOLUTIONS
FOR SERVICES OF FUTURE*

FLAGSHIP
PROJECTS

LARGE-SCALE
DEMONSTRATIONS

EXPLORATORY AND
FUNDAMENTAL R&I

1

**EUROPEAN RAIL
TRAFFIC AND
MOBILITY
MANAGEMENT**

Manage and improve rail traffic at
EU level

Adjust rail traffic management in
function of the mobility demand

2

**DIGITALISATION &
AUTOMATION IN
TRAIN OPERATIONS**

ATO implementation

Digital train operations

3

**SUSTAINABLE AND
DIGITAL ASSETS**

Integrated assets testing &
life-cycle framework

Zero-emission, silent rail system

4

**COMPETITIVE,
DIGITAL, GREEN
RAIL FREIGHT**

New digital customer interaction &
innovative rail freight services

Multimodal and rail freight
innovation integration

5

**REGIONAL RAIL
SERVICES IN LOW
DENSITY AREAS**

New system approach to regional
rail services in low density areas

DEPLOYMENT GROUP

FUTURE SOLUTIONS DEPLOYED IN A COORDINATED AND CONSISTENT WAY AT EUROPEAN LEVEL, TAKING INTO ACCOUNT ALTERNATIVE ROLLOUT SCENARIOS, BEHAVIOURAL AND ORGANISATIONAL CHANGES, SYNERGIES WITH OTHER MODES OF TRANSPORT



Founding Members



On what EU-Rail is built upon

Shift2Rail



28
MEMBERS



412
PARTICIPANTS



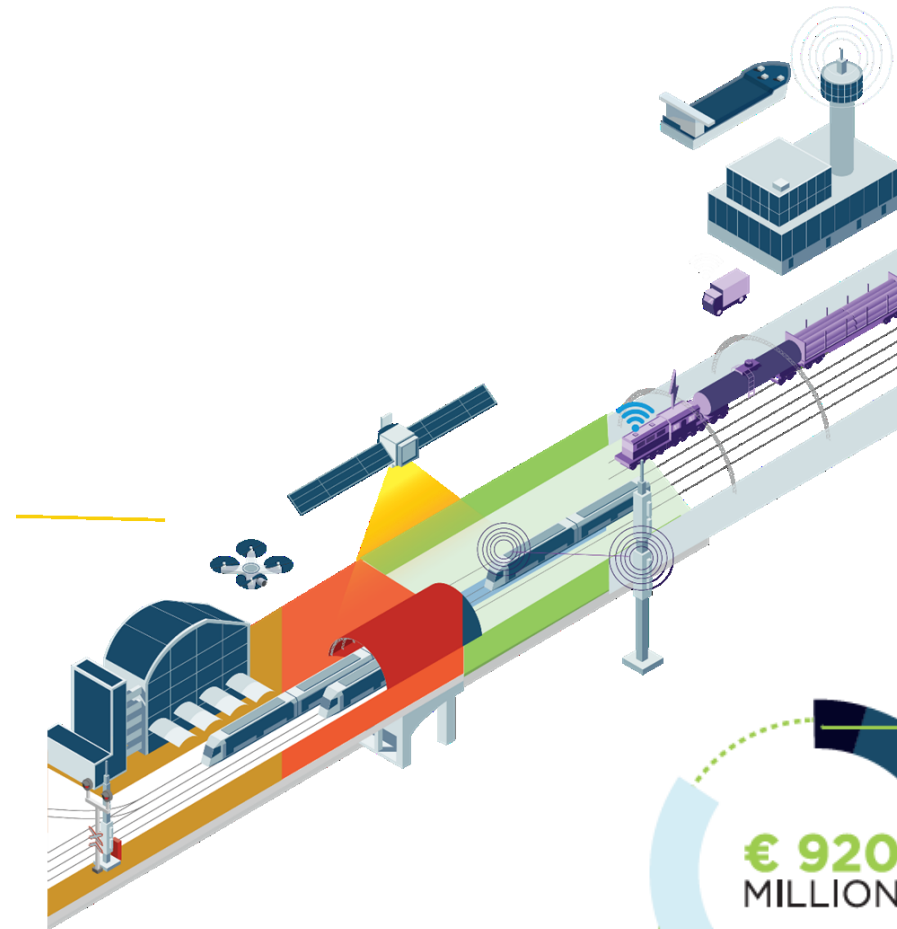
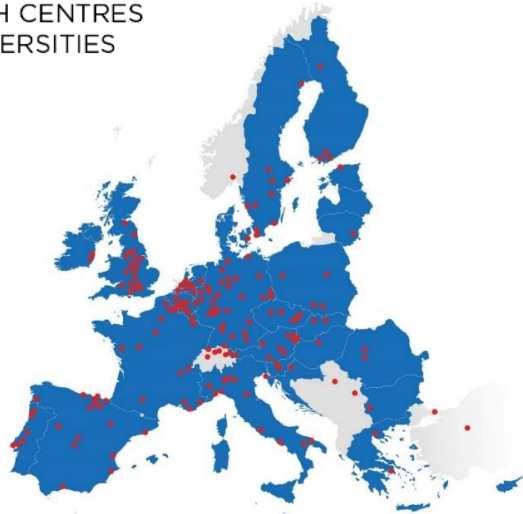
29
COUNTRIES



109
SMEs



113
RESEARCH CENTRES
AND UNIVERSITIES



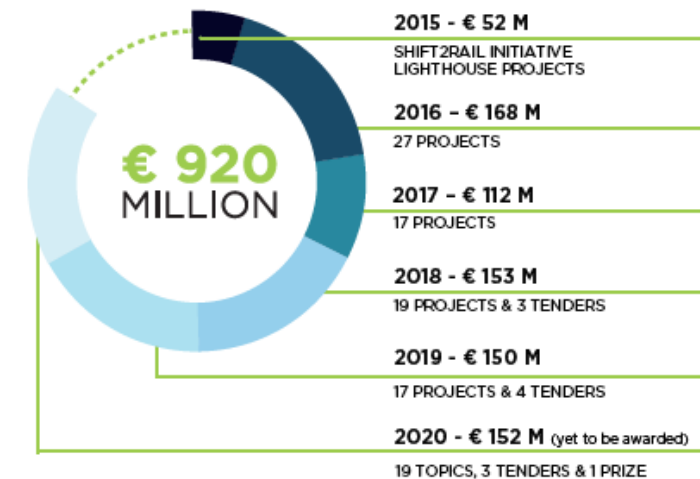
IP1 Cost-efficient and Reliable
Trains, including high-capacity
trains and high speed trains

IP2 Advanced Traffic Management
and Control System

IP3 Cost-efficient, Sustainable
and Reliable High Capacity
Infrastructure

IP4 IT Solutions for Attractive
Railways Services

CCA Cross Cutting
Activities



European Green Deal

EU policy
priorities

An economy that works for
people: New Industrial Strategy

A Europe fit for the digital age:
Shaping Europe's Digital Future

Europe in the world

Sustainable and Smart Mobility Strategy

EU-RAIL VISION

To deliver, via an integrated system approach, a high capacity, flexible, multi-modal, sustainable and reliable integrated European railway network by eliminating barriers to interoperability and providing solutions for full integration, for European citizens and cargo.



**CAPACITY
INCREASE**



**OPERATION
RELIABILITY**



**REDUCE
EMISSIONS**



**ENERGY
EFFICIENCY**



**LCC
REDUCTION**



**INCREASE
PUNCTUALITY**

EU-Rail Multi Annual Work Programme

Network management planning and control & Mobility Management in a multimodal environment

Network management planning and control (new processes and automation for decision support) & rail management in a multimodal environment (real-time demand-driven operations, including demand from other transport modes)

Digital Enablers

Provide Digital Twins Design toolbox for design as well as for validation, verification and test + a Federated data space where all digital elements of the system can play together in a coherent and interoperable way

Digital & Automated up to Autonomous Train Operations

Digital “Automated & Autonomous” Train Operations building upon the next gen Automatic Train Control based on ERTMS + enhancements on TCMS for integration at the on-board level

Intelligent & Integrated asset management

Knowledge from the digital transformation will feed back into the design, construction, manufacturing as well as into operation and maintenance process

A sustainable and green rail system

Innovative solutions and services based on leading edge technologies to minimize the overall energy consumption and environmental impact of the railway system



Innovation on new approaches for guided transport modes

Explore non-traditional and emerging flexible and/or high-speed guided transport systems, as well as to create opportunities for innovators to bring forward ideas for shaping those future systems

Regional rail services / Innovative rail services to revitalise capillary lines

Decreasing cost while offering a high quality of service and operational safety + increase customer satisfaction and attractiveness

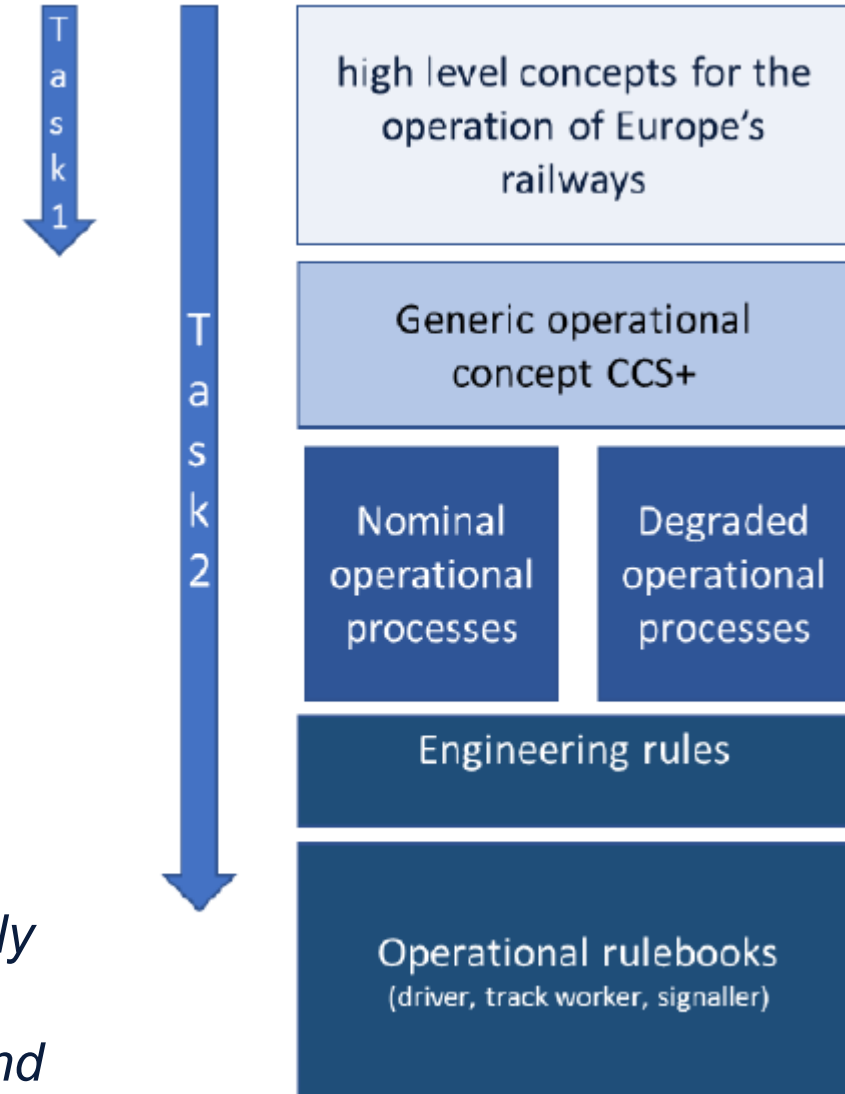
Sustainable Competitive Digital Green Rail Freight Services

Digitalization and automation of operational functions (e.g. DAC) and processes as well as increasing the efficiency of the immaterial (information/data) layer of transport in logistic

EU-Rail Multi Annual Work Programme

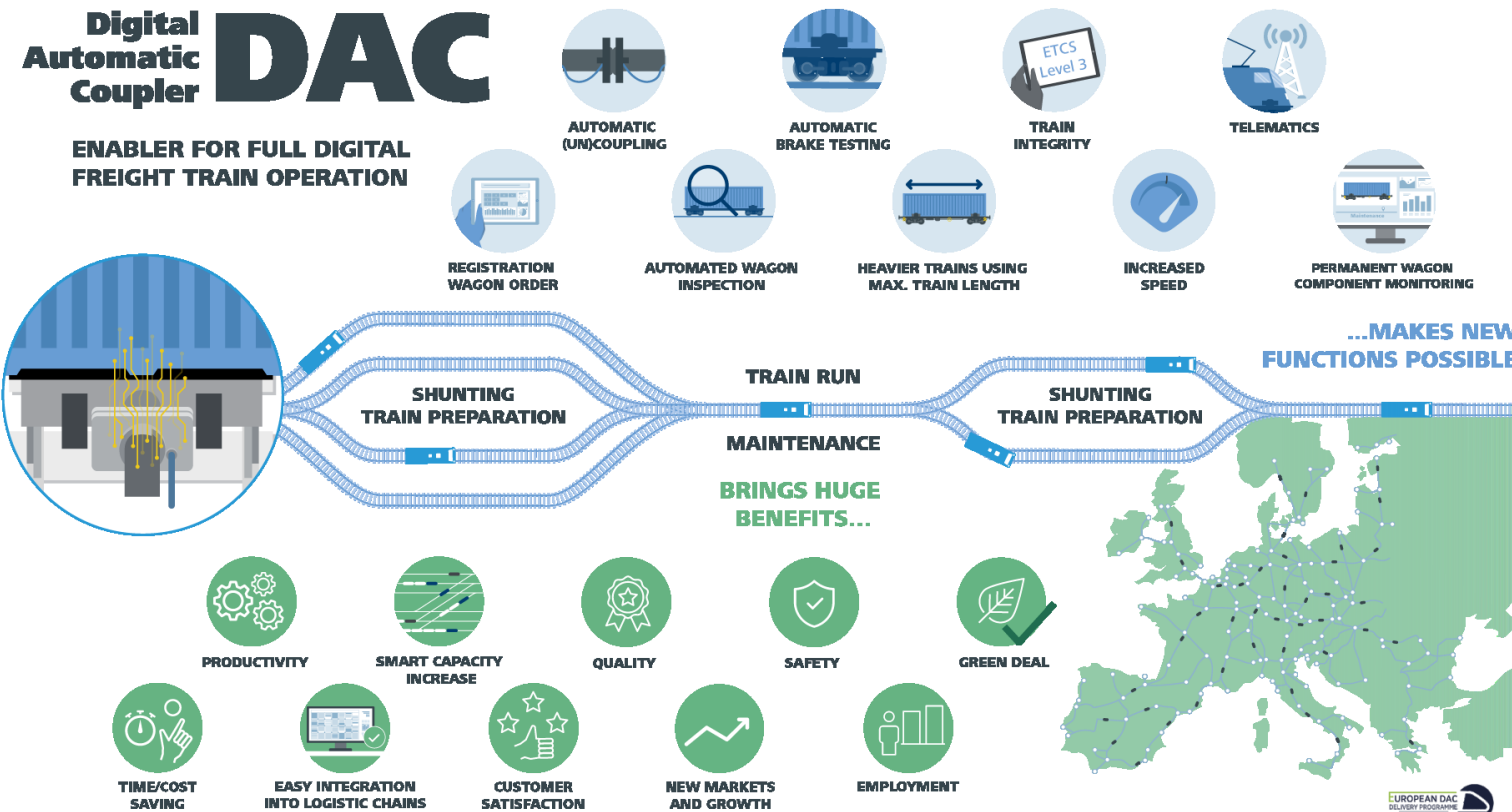
The System Pillar activities:

- develop a EU-Rail system architecture for a rail system which is
 - Open access to SERA
 - Performant and competitive;
 - Synchronised deployment
 - Full alignment with the future system
 - develop a harmonised functional and technical architecture (TMS, CCS, DAC), managing the complexity of interaction between the different sub-systems and with appropriate separation of safety-related and non-safety-related layers.
-
- *Guide the migration strategy in Europe implanting newly defined operational concepts*
 - *Inputs to Technical Specifications for Interoperability and harmonised standards*

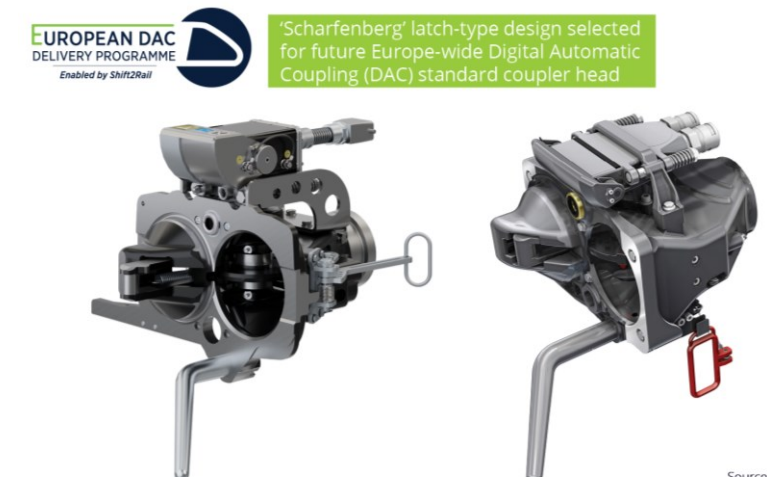


European DAC delivery programme:

An open platform for Full Digital Freight Train Operations



- › DAC is **more than just a coupler**
- › DAC is a key and unique **enabler for numerous applications**
- › DAC is not a stand-alone technology but the backbone for “**full digital freight train operations**” to achieve the ambitious transformation in European rail freight
- › This will allow the DAC to enable even more **use cases** and to **generate** a max. possible benefit



Synergies

- **Batt4EU**
 - S2R/Europe's Rail JU contributed, through its project PINTA3, to the KPIs/needs related to the energy traction in rail
 - The European Commission had launched the BATT4EU call 2022 in which, among others, there was a specific topic on rail needs in term of next-generation battery

Synergies

- **Collaboration with the Space and aviation sector:**
 - IP2 which contains a Technological Demonstrator on Safe Train Positioning, with the EU Agency for the Space Programme (EUSPA) as regards the introduction of GNSS for train positioning.
 - The EUSPA-financed CLUG project is also expected to provide a key building block to the overall work to be achieved within the Flagship Area 2 “Digital and Automated up to Autonomous train operations”.
 - A close cooperation with the sector has also been launched to work on relevant standardization topics, such as Digital Maps and GNSS Augmentation, both key component for the localization function. On this specific point, collaboration with the European Space Agency (ESA) has also been launched.
 - SESAR JU on matters related to multimodal mobility passenger solutions (as MaaS) through its projects related to the S2R innovation Programme 4, as well as related to traffic management and functional system architecture.

Synergies

- **Collaboration on Cybersecurity for rail:**
 - with the European collaboration in the field of Cyber Security for Railways (ER-ISAC) . Cooperation is covering aspects related to sharing best practices (e.g. product security verification, penetration testing, system verification and validation requirements in IEC standards) or also regarding the early analysis of the feasibility to establish a railway CSIRT (Computer Security Incident Response Team) at European level.
- **Other Collaborations:**
 - initial talks were initiated in 2021 with EuroHPC JU in order to look for possible services offered when in the course of the new programme significant computing capabilities would be needed (e.g. for traffic management prediction at European scale)
 - The JU also became an official member to the Digital PRIME working group, promoted by the European Commission together with rail infrastructure managers around traffic management improvements mainly.

How to participate

Ongoing Calls for Proposals

Europe's Rail Call for Proposals 2022-2

- Projects worth €35.8 million, against €14.7 million funding, are expected to be funded under the Europe's Rail 2022-2 Call for Proposals
- Deadline: 14 December 2022 at 17:00 CET.



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