INTERNATIONAL UNION
OF RAILWAYS

UIC

Creating intelligent tracks that progress from manual inspection to predictive maintenance

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European Rail Safety Days, 5 November 2021

UIC today

200
members in 95 countries

3,000
billion passenger-kilometres

10,000
billion tonne-kilometres

1
million kilometres of line

7
million rail personnel

Cooperation with over
100
institutions

700
UIC leaflets - new International Railway Solutions (IRS)

23
sectors
136
working groups
2000
experts

UIC organisation structure

RAILWAY SYSTEM
Infrastructure / TTI
Signalling
Telecom
Asset Management
Digital Modelling
Operations
Rolling Stock

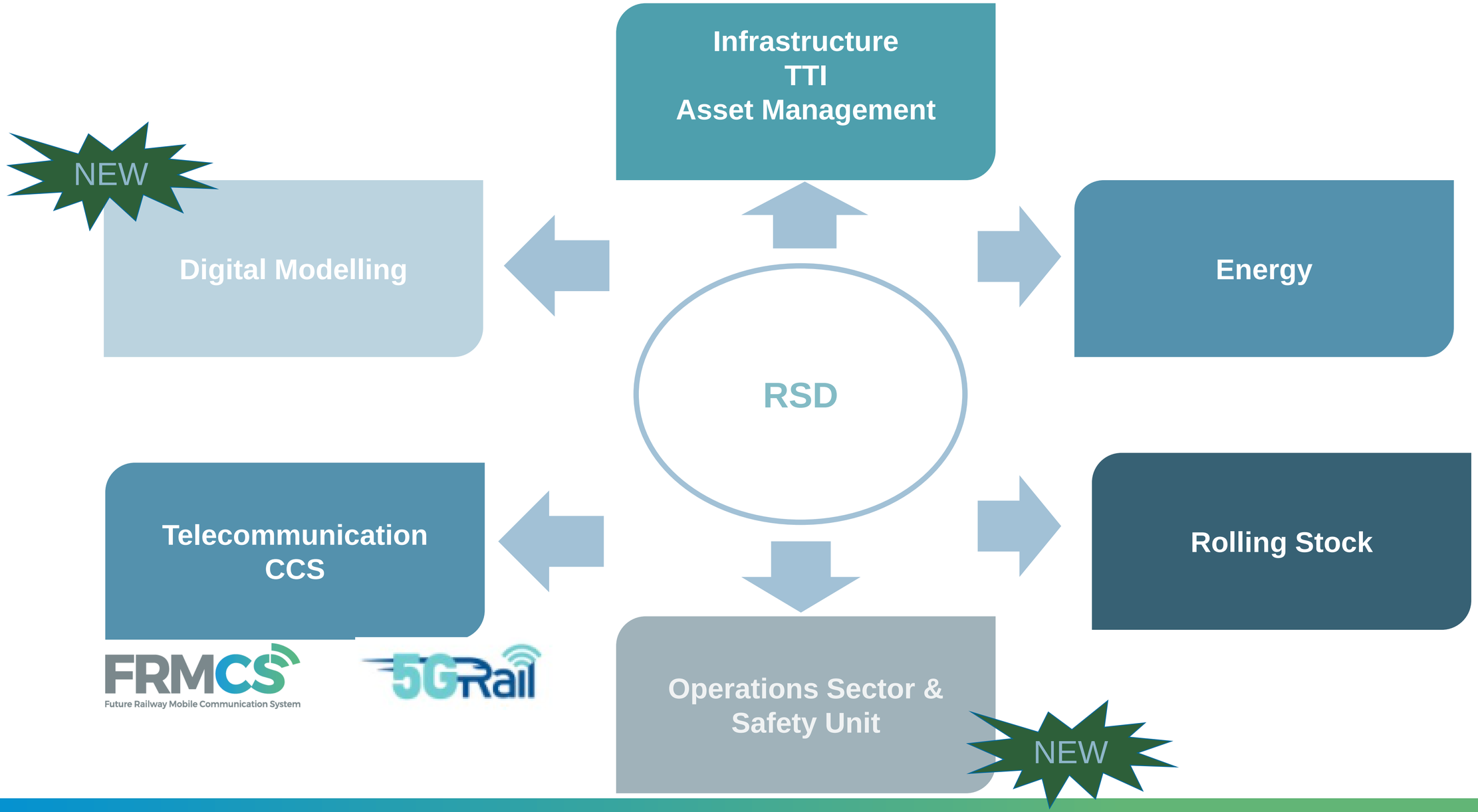
PASSENGER
Stations
Commercial & Services
Intercity & High-Speed

FREIGHT
Corridors
Combined Transport
IT

FUNDAMENTAL VALUES
Research
Safety, Security
Environment
Expertise
Development

COMMUNICATIONS · INSTITUTIONAL RELATIONS · HR & SOCIAL · FINANCE

Rail System Department



Published. IRS migration programme Infrastructure

IRS 70714 Classification of lines for the purpose of **track maintenance**

IRS 70779-10 Tunnel Asset Management and **maintenance principles**

IRS 70778-3 Recommendations for the inspection, assessment and **maintenance of masonry arch bridges**

IRS 70723 Technical aspects of **vegetation control and tree risk management**. Guidance and recommendations

NEW

IRS 70727 Track superstructure **decision-making**

UIC Leaflet → IRS

https://www.shop-etf.com/en/

Published. Technical Report

MILA (Harmonized Methodology for Infrastructure Lifetime Assessment)

Study of the **existing formulations and data related to the aging of the different railway components** and the main factors that allow predicting the real life of a certain asset

Publication 5-21003E Improving railway **maintenance decision-making:** lessons learned from the UIC MILA project

DELIVERABLES:

- State of the art
- Components-subsistems degradation models
- Real case model application: Adif calculation residual life
- Lesson learnt document

TECHNICAL SOLUTIONS FOR THE OPERATIONAL RAILWAY

FOCUS ON UIC'S ADDED VALUES

FRMCS

Freight

Passengers

Solutions to support sustainable railways and **carbon neutrality**

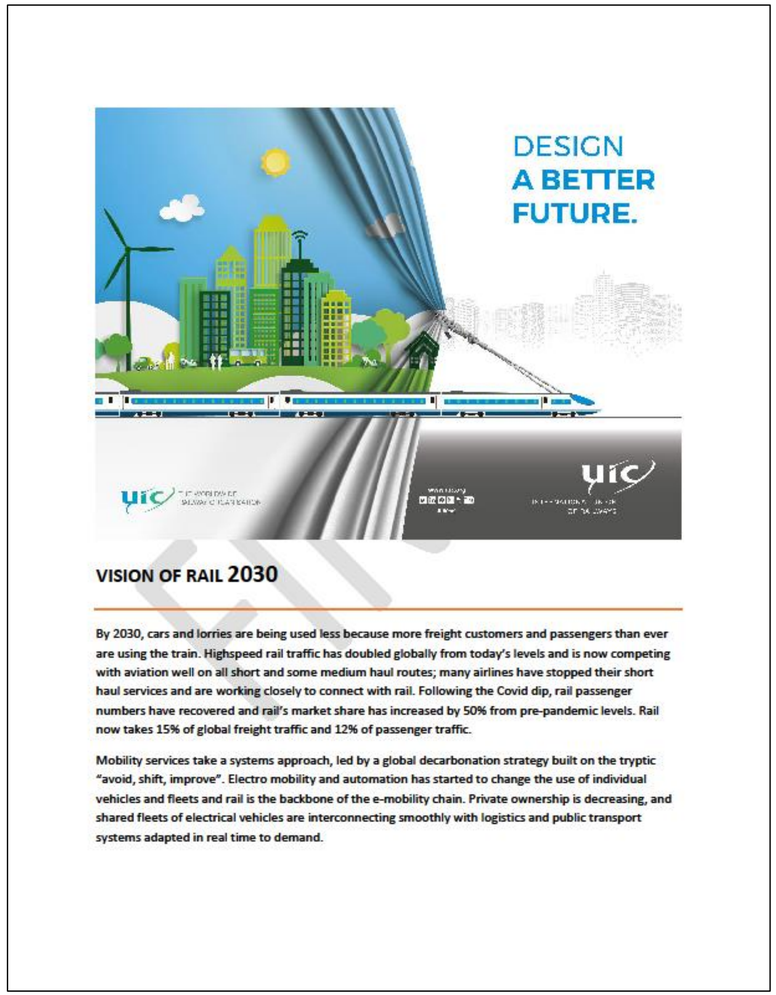
Security

Safety system and **Operational Excellence**

https://uic.org/IMG/pdf/20201126_uic_technical_solutions.pdf

VISION OF RAIL IN 2030

https://uic.org/IMG/pdf/uic-design-a-better-future-vision-of-rail-2030.pdf



- TRANSPORT MODAL SHIFT
- INCREASE OF THE RAILWAY CAPACITY
- CCS & FRMCS
- AUTOMATION
- LIGHTER TRAINS
- RAILWAY DIGITAL MODELLING
- FRUGAL ECO-DESIGN
- REDUCTION OF RAILWAY NOISE
- BIODIVERSITY
- GREEN ENERGY, HYDROGEN AND BATTERIES
- DIGITISATION IN RAIL FREIGHT
- GREEN LOGISTICS
- RESILIENCE OF RAILWAY INFRASTRUCTURES AND ROLLING STOCK TO CLIMATE CHANGE
- OPERATIONAL RESILIENCE TO CLIMATE CHANGE
- PREDICTIVE MAINTENANCE
- MULTIMODAL E-TICKETS
- INCLUSIVITY
- ACCESSIBILITY
- ACCELERATION OF THE CYCLE OF INNOVATION

MULTIANNUAL WORK PROGRAMME
INFRASTRUCTURE SUBSYSTEM

Physical layer of the rail system which, together with the other sectors of the Rail System, ensures **safe and reliable operations**

What we want to achieve

Increase the knowledge of our network using **innovative technologies** and **data-driven decisions** to monitor its behaviour, to adapt it to the new **climate change conditions**, to **automate and harmonise its maintenance**, to **increase its capacity** and to **control its costs**

How we are going to make it happen

- Programme 1: Automation and data-driven decision making
- Programme 2: Climate Change Adaptation
- Programme 3: Specifications and Standardisation

The way we work:

- Share and debate
- Go in-deep
- Collaborate with other UIC departments to achieve excellence in the sector
- Update procedures and algorithms
- Propose new safety-related operational procedures
- Explore new opportunities

MULTIANNUAL WORK PROGRAMME
TTI

The Interfaces and Interaction between Infrastructure Subsystem and Rolling Stock Sector (TTI) is at the intersection of the Rolling Stock and the Track and Structure Sectors. Its main purpose is to study **vehicle/infrastructure interaction**, taking a **holistic system-based approach**

What we want to achieve

Identify interactions and anticipate actions regarding acoustics, aerodynamics and railway dynamics and gauges, to respond to the needs and serve the interests of UIC members.

How we are going to make it happen

- Programme 1: Acoustics and Aerodynamics
- Programme 2: Railway dynamics and gauges
- Programme 3: Pantograph – Catenary
- Programme 4: Specifications and Standardisation

The way we work:

- Share, disseminate and debate
- In-depth research and testing
- Collaborate with other UIC departments to achieve excellence in the sector
- Update technical procedures and research associated algorithms
- Explore new opportunities: Hyperloop ecosystem

Ongoing Project. Migration IRS

D4R (Harmonized methodology for drone use for bridge inspections)

Objective: analyse hardware and software available and legal environment for bridges inspections through UAV. Procedures for the use of drones. Current trends of further development & other innovative technologies

Leaflet 778-4

Defects in railway bridges and procedures for maintenance

NEW

D4R-PT (Plain Track)

Future Project

NEW TTI

Railway Dynamic Measuring systems – Applications for Use

- **Objectives:** This project aims to find the right frame of application of different measuring systems at trackside and on-board

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- **Deliverables**
  - Benchmark studies
  - Infrastructure and RS requirements
  - Risk Management, LCC and maintenance strategy
  - Application guide for use – UIC Standard
  - Dissemination

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Stay in touch with UIC:

www.uic.org

#UICrail

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Thank you for your attention.